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"AS-BUILT" DESIGN SPECIFICATION FOR CLASY PROGRAM MODIFICATION

Job Order 71-593

TIRF (77-0055)

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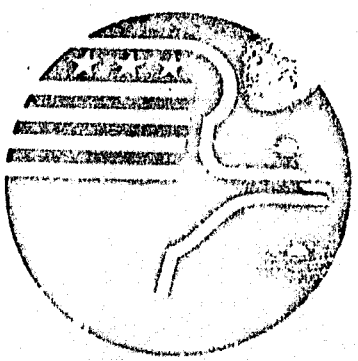
Prepared By
Lockheed Electronics Company, Inc.
Systems and Services Division
Houston, Texas

Contract NAS 9-15200

For

EARTH OBSERVATIONS DIVISION

SPACE AND LIFE SCIENCES DIRECTORATE



National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
Houston, Texas

April 1978 LEC-12185

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"AS-BUILT" DESIGN SPECIFICATION
FOR
CLASY PROGRAM MODIFICATION

Job Order 71-593

TIRF (77-0055)

Prepared By

P. J. Aucoin
C. Horton

APPROVED BY

for James A Wilkinson

Philip L. Krumm, Acting Supervisor
Scientific Applications Section

Prepared By
Lockheed Electronics Company, Inc.
For

Earth Observations Division
Science and Applications Directorate

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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CONTENTS

1. SCOPE

This specification establishes the modifications to the CLASY program as specified in TIRF 77-0055, titled CLASY Program Modification.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification:

TIRF: 77-0055

Memorandum dated March 17, 1976, from Rice University, Institute of Computer Sciences (D. L. Van Rooy) to Ken Baker/TF3, NASA-JSC; Reference: documentation of SUPER-SCRAM

McCray, B.: Modifications to the CLASY Program, JSC-12602, LEC-1048, NASA/JSC (Houston), April 1977.

3. SYSTEM DESCRIPTION

3.1 HARDWARE DESCRIPTION

The CLASSY clustering program, as modified, is operational on the IBM 370-148 at Purdue LARS under the CMS370 operating system. The program utilizes the IBM Fortran IV-G compiler.

3.2 SOFTWARE DESCRIPTION

The CLASSY system of subprograms was originated by Dr. Michael Rassbach formerly a NRC post-doctoral fellow for NASA-JSC, Earth Observations Division (TF), and currently the president of ELOGIC, Inc.

CLASSY was designed and implementation as an interative statistical clustering algorithm which had theoretical promise for application to classification of earth resources (image) data acquired from the LANDSAT satellite.

The driver program for the clustering system in CLASSY. The data handling subprograms for the system are READTP and STATIS. READTP reads the input data file and writes the selected data on a disk file for acquisition by the interative statistical subprogram STATIS. STATIS operates on one pixel at a time to update cluster statistics. When a given cluster has received more than a specified number of points as assigned on a fractional, probabilistic basis, STATIS calls ADJUST to make the cluster split/combine decisions. The set of pixels is examined N times by STATIS during the clustering procedure where N is specified by the user. Statistics are printed for each cluster as it is generated, when it is significantly modified, and at the end of each iteration. At the end of selected iterations and after the last iteration, a cluster map is drawn showing the cluster assignment for each pixel.

A one-channel LARSYS tape is generated at the end of the last iteration.

The CLASSY system of subprograms consists of the main driver program, CLASSY, 57 CLASSY.subprograms, 11 LARSYS subprograms and CMS370 system routines.

The overall CLASSY system is flowcharted in Appendix A. Listings of the routines are shown in Appendix B. Sample output from the CLASSY system is shown in Appendix C.

3.2.1 SOFTWARE COMPONENT NO. 1 (CLASY)

3.2.1.1 Linkages

CLASY is the driver program of the CLASY clustering system. CLASY calls SETUP9, READTP, MULTI, and CLUSMP.

3.2.1.2 Interfaces

The common blocks INFORM, CLUSTR, CLUS, MISC, and STPAR and calling arguments are used in the program CLASY as interfaces with other routines in the clustering system.

3.2.1.3 Inputs

The required input to the CLASSY program consists of one set of control cards and one tape (or file) containing the multichannel image data.

CLASSY calls SETUP9, which reads the input control cards. These cards and their functions are described in the discussion of SETUP9 (section 3.2.2.6).

The image data tape (file) is presumed to be in either of two specific formats--either "LARSYS II" format or "UNIVERSAL" format. The tape (file) reading program in CLASSY, TAPERD, accepts either of these formats and self-determines the correct method of reading the data.

3.2.1.4 Outputs

The output from CLASSY are three disk files; two are report files and one is a one-channel data file. Interium reporting of statistical parameters and diagnostic data is providing during the iterative cluster-forming process as a brief summary on one disk file and a full report of statistical data is reported on the other disk file.

Portions of each of the report files are maps with symbolic representations of areas clustered, to form these maps each pixel is classified using the statistics (mean and covariance) from the final cluster set determined by CLASSY. The symbols on the map represent the cluster which is the most likely parent distribution for the given pixel. The map is output by subprogram CLUSMP which also produces the one-channel data tape containing a header record and the line image records of the clusters.

Sample output is shown in Appendix C.

3.2.1.5 Storage Requirement

Not applicable.

3.2.1.6 Description

CLASSY is the driver program for the clustering routines.

3.2.1.7 Flowchart

See Appendix A for system flowchart.

3.2.1.8 Listings

See Appendix B for program listing.

3.2.1.9 Restrictions

The known restrictions inherent in the program are (1) the program will not successfully execute with only one channel, (2) a data vector containing a zero value in the channel of interest will cause an error termination of the program's execution, (3) the size of the original image data set read from the input tape and placed on drum must be containable in 840,000 characters of drum storage available to the random access routines. The 840,000 character limitation can be changed by request of the Research, Test and Evaluation Support Group.

3.2.2 SOFTWARE COMPONENT NO. 2 SETUP9

3.2.2.1 Linkage

SETUP9 is called from CLASSY. SETUP9 calls NXTCHR and NUMBER, which are entry points in subroutine FIND.

3.2.2.2 Interface

Interface is accomplished through calling arguments and the following common blocks: INFORM, SUPCUM, and CLUSTR.

3.2.2.3 Inputs

Inputs are described in Section 3.2.2.6.

3.2.2.4 Output

SETUP9 writes a summary of the input to CLASSY. If an error is detected, SETUP9 writes the following message "INVALID INPUT CARD-- "IGNORED" and processing continues.

3.2.2.5 Storage Requirement

Not applicable.

3.2.2.6 Description

SETUP9 reads and analyzes all cards input to the CLASSY program. The following control cards are input to the modified CLASSY program, to be analysed by SETUP9. In all cards, the "keyword" begins in card column 1, and any parameters on the card are placed from card column 11 through 72, inclusive.

1. "CHANNEL" CARD (i.e., "CHANNEL 1,5,9,13")

The "CHANNEL" card specifies the channel numbers to be used in clustering the multi-channel data vectors.

2. "NPTS" CARD

The "NPTS" card is used to specify the number of pixels to skip between the pixels in the original data when selecting a subset of pixels for analysis. Zero is the default value.

3. "HED1" card

4. "HED2" card

These two cards may be used to specify any arbitrary heading for the printer output, including the cluster map. Any alphanumeric characters put into card columns 11-72 of these two cards will be output as a page heading.

5. "COMMENT" card

The "COMMENT" card is equivalent in use and format with the "HED1" and "HED2" cards, described above.

6. "DATE" card

This card is used to specify the date or any eight characters. Will be printed at the upper right hand corner or each page of printer output.

7. "ITER" card

The "ITER" card allows the user to specify the number of interations through the data to be made by subrout-nes STATIS.

8. "MAP" card

The "MAP" card allows the user to request cluster maps on all iterium iteraitons or up to 10 specific iterations. Iterations must be entered separately; groups of numbers are not allowed.
Examples: 1,3,5,7,9
ALL

3.2.3 SOFTWARE COMPONENT NO. 3 READTP (LAST,IDATA,TOPID)

3.2.3.1 Linkage

READTP is called from CLASSY. READTP calls READ, RWRITE, CMERR, UNIF RINIT, TAPHDR, LAREAD, FLDINT, LINERD, FDLINT and ERTRAN.

3.2.3.2 Interface

Interface is accomplished through calling arguments and the following common blocks: INFORM, CLUSTR, CLUS, MISC, and STPAR.

3.2.3.3 Inputs

Image data tape described in 3.2.1.3
LAST and TOPID - not used
IDATA - input buffer.

3.2.3.4 Output

READTP outputs the following error message:
End-Of-Tape Reached before end of field.

3.2.3.5 Storage Requirement

Not applicable.

3.2.3.6 Description

READTP performs the input image data handling functions and makes the image data available in two formats to the iterative statistical subprograms STATIS and CLUSMP.

The original image data from the designated area of the input file is stored as one continuous block of data on a randomly accessible file. This file is used as an input file by this subroutine and by the subroutine CLUSMP.

The data read from the newly created file is scrambled by reading blocks of pixels from disjoint areas of the file, scrambling the order of the pixels and writing this data to another portion of the file as continuous records to be read by subroutine STATIS.

3.2.3.7 Flowchart

See Appendix A for system flowchart.

3.2.3.8 Listings

See Appendix B for program listing.

3.2.4 SOFTWARE COMPONENT NO. 4 MULTI (PV)

3.2.4.1 Linkage

MULTI is called from CLASSY. MULTI calls DATFIX, ALFREE, CLINIT. STATIS and CLDUMP.

3.2.4.2 Interface

Interface is accomplished through calling arguments and the following common blocks: CLUS,MISC,STPAR,INFORM and CLUSTR.

3.2.4.3 Inputs

PV - Dummy array

3.2.4.4 Output

None.

3.2.4.5 Storage Requirements

Not applicable

3.2.4.6 Description

MULTI calls the routines to initialize the clustering algorithm.

3.2.4.7 Flowchart

See Appendix A for system flowchart.

3.2.4.8 Listings

See Appendix B for program listing.

3.2.5 SOFTWARE COMPONENT NO. 5 STATIS(KROTIN,PV,SUM,SKEW,KURT, OSUM,OVAR)

3.2.5.1 Linkages

STATIS is called by MULTI. STATIS calls DISC, CLASY2, CORECT, DOTSQ, VPV, VMTV, MPVS, ADJUST, CLDUMP, and EXP.

3.2.5.2 Interface

Interface is accomplished through calling arguments and the following common blocks: CLUS, MISC, STPAR, CLUSTR, and RAND.

3.2.5.3 Inputs

KROTIN - top node.
PV - dummy array.

3.2.5.4 Outputs

STATIS outputs two warning messages. They are: "***WARNING ON THE__ INDEX(KL=", "**SUSPECTED BAD DATA POINT --STATIS** IDO=__,ROOT__,VECTOR__"

SUM - sum matrix
SKEW - skewness matrix
KURT - kurtosis matrix
OSUM - old sum matrix
OVAR - old covariance matrix

3.2.5.5 Storage Requirements

Not applicable.

3.2.5.6 Description

STATIS updates the proportion, mean vector, and covariance matrix for each cluster using maximum likelihood iteration. The routine first updates these parameters with each new data point and later makes updates only after a complete pass through all of the data has been completed. STATIS also accumulates measures of multivariate skewness and kurtosis. If a cluster has subclsuters the log of the likelihood ratio of the parent cluster to the subclusters is also accumulated. STATIS calls ADJUST when the weight for a given cluster has exceed a threshold value.

3.2.5.7 Flowchart

See Appendix A for system flowchart.

3.2.5.8 Listings

See Appendix B for program listing.

3.2.6 SOFTWARE COMPONENT NO. 6 ADJUST(KLIN,SUM,SKEW,KURT,OSUM, OVAR)

3.2.6.1 Linkage

Adjust is called from STATIS. ADJUST calls GET, TR, DOTSQ, SQMTX, MINV, UNIF, CLER, TRIMTX, DENCAL, SPLIT, FREE, CLDUMP, SEPER, SUBLIM, ELIM, CORECT, JOIN, APRIOR, SQRT, ALDG, EXP, and XPRI.

3.2.6.2 Interface

Interface is accomplished through calling arguments and the following common blocks: CLUS, MISC, STPAR, CLUSTR, and JOINPR.

3.2.6.3 Inputs

KLIN - current cluster
SUM - sum matrix
SKEW - skewness matrix
KURT - kurtosis matrix
OSUM - old sum matrix
OVAR - old covariance matrix

3.2.6.4 Outputs

ADJUST prints out three brief messages concerning statistical information and three error messages. They are; "ADJUST__ WEIGHT__WAS__SPFAC__CHANGE__ __ __", "STATISTICS: TRACE__ SKEW__KURT__TESTS(SPLIT>0): __ __ __", ###HAVE SPLIT__WEIGHT__ SUBS__ __", "W/OVOL ERROR IN ADJUST: KL,W,NEW W,VOL __ __ __ __", "***EXTRAPOLATION PROBLEM IN ADJUST: ITER, INDEX(KL), VOLIN, OVOL, CVOL__ __ __ __ __", "LOG ERROR IN ADJUST: I, IM, KL, K/VRIN= __ __ __ __ __ __"

3.2.6.5 Storage Requirements

Not applicable.

3.2.6.6 Description

ADJUST subtracts off old data from the sums accumulated in STATIS and used in STATIS to calculate the proportion, mean vector, and covariance matrix for a cluster. There is also a system for extrapolating cluster parameters which is not currently used.

ADJUST forms scalar measures of multivariate skewness and kurtosis and test these against thresholds also computed in ADJUST to determine if a cluster should be split. ADJUST also does all other test for discrete restructuring of the cluster free including tests for calls to JOIN, ELIM, SUBLIM, and SEPER.

3.2.6.7 Flowchart

See Appendix A for system flowchart.

3.2.6.8 Listings

See Appendix B for program listing.

3.2.7 SOFTWARE COMPONENT NO. 7 CLDUMP (KLHED)

CLDUMP calls CLPR to print all of the class headed by KLHED.

3.2.7.1 Linkages

CLDUMP is called by MULTI and STATIS

CLDUMP calls CLPR and ISPLIT.

3.2.7.2 Interfaces

CLDUMP uses common blocks /CLUS/, /MISC/, /STPAR/, and /CLUSTR/.
CLDUMP calls CLPR and ISPLIT.

3.2.7.3 Inputs

KLHED - Head of class of nodes.

3.2.7.4 Outputs

Message:
DUMP OF OBSERVED CLUSTERS FROM ____, _____

3.2.7.5 Storage Requirement

Not applicable.

3.2.7.6 Description

CLDUMP calls CLPR to print the statistics for each of the clusters in the portion of the tree headed by KLHED.

3.2.7.7 Flowchart

See Appendix A.

3.2.7.8 Listings

See Appendix B for program.

3.2.8 SOFTWARE COMPONENT NO. 8 CLPR (KLIN,SUM,SKEW,KURT)

CLPR prints all the variables indexed by KL.

3.2.8.1 Linkages

CLPR is called by CLDUMP.

CLPR calls MORSTR, SQMTX, MINV, FREE

3.2.8.2 Interfaces

CLPR uses common blocks /CLUS/, /MISC/, and /STPAR/.

3.2.8.3 Inputs

KL - cluster index
IN - level of cluster in tree
SUM - mean array
SKEW - skewness matrix
KURT - kurtosis matrix

3.2.8.4 Outputs

A listing of the statistics for cluster KL is written to unit 6. The index and symbol for cluster is written to unit 3.

3.2.8.5 Storage Requirement

Not Applicable.

3.2.6. Description

The permanent statistics for cluster KC are written to unit 6. The mean, covariance, kurtosis, old mean and old covariance are calculated and written to unit 6. The index and symbol are written to unit 3.

3.2.8.7 Flowchart

See Appendix A.

3.2.8.8 Listings

See Appendix B for program.

3.2.9.1 SOFTWARE COMPONENT NO. 9 CLUSMP (MAP,LSTITR)

CLUSMP prints the cluster map. The cluster map has each pixel represented by a symbol representing its cluster type.

3.2.9.1 Linkages

CLUSMP is called from ADJUST and CLASSY.

3.2.9.2 Interfaces

Interface is accomplished through the calling arguments and the following common blocks: ARRAY, GLOBAL, CLUSTR, MISC, CLUS, STPAR.

3.2.9.3 Inputs

MAP - Positive indicates a 1 channel file is to be written.
Zero indicates that the 1 channel file is not to be written.

LSTITR - Positive indicates this is the last indication.
Zero indicates this is not the last indication.

3.2.9.4 Outputs

A cluster map is written to file 3.
A cluster map is written to file 6.
One channel LARSYS file written to file 16.

3.2.9.5 Storage Requirement

Not applicable.

3.2.9.6 Description

CLUSMP reads the data is its original format, assigns a cluster number to each pixel and creates cluster maps for the terminal (unit 3) and line printer (unit 6) and a one channel LARSYS data tape (unit 16).

3.2.9.7 Flowchart

See Appendix A.

3.2.9.8 Listings

See Appendix B for program.

3.2.10 SOFTWARE COMPONENT NO. 10 CLUST (BIGP,NDO,KLOUT,KROTIN, SUM)

CLUST classifies each point for the purpose of generating a map.

3.2.10.1 Linkages

CLUST is called by CLUSMP.
CLUST calls ISPLIT, CORECT and DOTSQ.

3.2.10.2 Interfaces

CLUST uses common block /MISC/, /STPAR/ and /BIGCOM/.

3.2.10.3 Inputs

BIGP - Input data vector
NDO - Number of data points
KLOUT - Top node of output class
KROTIN - Index of node 0
SUM - Position of sum vector is cluster

3.2.10.4 Outputs

The following error messages are written to unit 6.

::::: WARNING ::::: IN CLUST, KROT = _____

::::: WARNING ::::: IN CLUST, AT CHECKPOINT _____, KL = _____

3.2.10.5 Storage Requirement

Not applicable.

3.2.10.6 Description

CLUST determines the cluster most nearing matching each point and classifies the point as belonging to that cluster.

3.2.10.7 Flowchart

See Appendix A.

3.2.10.8 Listings

See Appendix B for program.

3.2.11 SOFTWARE COMPONENT NO. 11 DATFIX

DATFIX initializes constants in /CLUS/, /MISC/ and /STPAR/.

3.2.11.1 Linkages

DATFIX is called by MULTI.

3.2.11.2 Interfaces

DATFIX uses common blocks /CLUS/, /MISC/ and /STPAR/.

3.2.11.3 Inputs

None.

3.2.11.4 Outputs

None.

3.2.11.5 Storage Requirement

Not applicable.

3.2.11.6 Description

Constants are initialized.

3.2.11.7 Flowchart

See Appendix A.

3.2.11.8 Listings

See Appendix B for program.

3.2.12 SOFTWARE COMPONENT NO. 12 DENCAL (KL,RATIO,OLW)

DENCAL adjusts the denominator offset and proportion of KL.

3.2.12.1 Linkages

DENCAL is called by ADJUST.

3.2.12.2 Interfaces

DENCAL uses common blocks /CLUS/, /MISC/ and /STPAR/.

3.2.12.3 Inputs

KL - node to be adjusted.
RATIØ - proportion of points contained by parent cluster.

3.2.12.4 Outputs

OLW - old weight.

3.2.12.5 Storage Requirement

Not applicable.

3.2.12.6 Description

New proportion = Ratio * all proportion
OLW = old W(KFATH)
Nodes are assumed to be reconnected in their new position.

3.2.12.7 Flowchart

See Appendix A.

3.2.12.8 Listings

See Appendix B for program.

3.2.13 SOFTWARE COMPONENT NO. 13 ELIM (KEL)

This routine eliminates the cluster KEL from the cluster tree and frees the storage.

3.2.13.1 Linkages

ELIM is called by ADJUST.
ELIM calls SUBLIM and TR FREE.

3.2.13.2 Interfaces

ELIM uses common blocks /CLUS/, /MISC/ and /STPAR/.

3.2.13.3 Inputs

KEL - top node to be release.

3.2.13.4 Outputs

None.

3.2.13.5 Storage Requirement

Not applicable.

3.2.13.6 Description

ELIM prints a message that the cluster has been eliminated. If the cluster has only one SUBLIM is called to eliminate it also. TRFREE is called to eliminate the cluster and its subs.

3.2.13.7 Flowchart

See Appendix A.

3.2.13.8 Listings

See Appendix B for program.

3.2.14 SOFTWARE COMPONENT NO. 14 JOIN (KAI,KBI,SUM,SKEW,KURT, OSUM,OVAR,VVV,B,A,D)

JOIN creates a parent cluster for KAI and KBI.

3.2.14.1 Linkages

JOIN is called by ADJUST.
JOIN calls MORSTR, SQMTX, MINV, APRIOR, DENCAL, TRIMTX, CLPR and SQRT.

3.2.14.2 Interfaces

JOIN uses common blocks /CLUSTR/, /CLUS/, /MISC/ and /STPAR/.

3.2.14.3 Inputs

KAI - Cluster to be joined
KBI - Cluster to be joined
SUM - Sum matrix
SKEW - Skewness matrix
KURT - Kurtosis matrix
OSUM - Old sum matrix
OVAR - Old covariance matrix
VVV - Dummy array
B - Dummy array
A - Dummy array
D - Dummy array

3.2.14.4 Outputs

SUM - Sum matrix
SKEW - Skewness matrix
KURT - Kurtosis matrix
OSUM - Old sum matrix
OVAR - Old covariance matrix

3.2.14.5 Storage Requirement

Not applicable.

3.2.14.6 Description

JOIN does the following functions:

(1) locates clusters KAI and KBI in the tree.
(2) creates a new cluster
(3) inserts new cluster in tree and links to subclusters.
(4) removes KA from old tree.
(5) remove KB from old tree.
(6) calculates statistics for new cluster.
(7) prints data for new clusters KAI and KBI.

3.2.14.7 Flowchart

See Appendix A.

3.2.14.8 Listings

See Appendix B for program.

3.2.15 SOFTWARE COMPONENT NO. 15 PRTREE (TOPNOD)

3.2.15.1 Linkages

PRTREE is called by ADJUST.
PRTREE calls BNI4A1.

3.2.15.2 Interfaces

PRTREE uses common block /CLUS/.

3.2.15.3 Inputs

A node tree printed on units 3 and 6.

3.2.15.5 Storage Requirement

Not applicable.

3.2.15.6 Description

PRTREE determines the location and proportion of each node of the tree. A line is printed for each level of the tree showing the nodes on that line and the proportion of points in each node relative to the total number of points.

3.2.15.7 Flowchart

See Appendix A.

3.2.15.8 Listings

See Appendix B for program.

3.2.16 SOFTWARE COMPONENT NO. 16 SEPER (KL)

SEPER removes a cluster in favor of its subclusters.

3.2.16.1 Linkages

SEPER is called by ADJUST.
SEPER calls CLPR, DENCAL, FREE.

3.2.16.2 Interfaces

SEPER uses common block /MISH/.

3.2.16.3 Inputs

KL - node to be removed.

3.2.16.4 Outputs

None.

3.2.16.5 Storage Requirement

Not applicable.

3.2.16.6 Description

SEPER brings all of the subclusters of KL up to the level of KL itself and then eliminates KL.

3.2.16.7 Flowchart

See Appendix A.

3.2.16.8 Listings

See Appendix B for program.

3.2.17 SOFTWARE COMPONENT NO.17 SPLIT (KL,SUM,SKEW,KURT,OSUM, OVAR,ORT,DSQ,SG,TAU,ERE,VER,DUM,DSG,DTAU)

SPLIT is called seperate one cluster into two clusters.

3.2.17.1 Linkages

SPLIT is called by ADJUST. SPLIT calls MORSTR, SQMTX, EIGROT, MLT, MVEC, MTVEC, ACOM, APRIOR, MINV.

3.2.17.2 Interfaces

SPLIT uses common blocks /MISH/ and /CMBK10/.

3.2.17.3 Inputs

KL - node to be removed
SUM - sum matrix
SKEW - skewness matrix
KURT - kurtosis matrix
ORT - coordinate transformation
DSQ - multiple use array
ERE - multiple use array
VER - multiple use array
DUM - multiple use array
DTAU - derivitive of objective function with respect to TAU.

3.2.17.4 Outputs

SUM - sum matrix
OSUM - old sum matrix
OVAR - old covariance matrix
DSG - E * ORT
TAU - square root of covariance matrix for subcluster A.
SG - square root of covariance matrix for subcluster B.

3.2.17.5 Storage Requirement

Not applicable.

3.2.17.6 Description

(1) Generate the centered versions of the variance, skewness, and kurtosis.

(2) Shift to frame with unit inverse covariance matrix.

(3) Initialize and make a good initial guess.

(4) If Egienvalue negative, adjust "good guess" tempories.

(5) Generate actual initial values.

(6) Iterate to refine values.

(7) Generate two new subclusters.

(8) Create names and linkages for new clusters KA and KB.

(9) Create statistics for new subclusters.

3.2.17.7 Flowchart

See Appendix A.

3.2.17.8 Listings

See Appendix B for program.

3.2.18 SOFTWARE COMPONENT NO. 18 SUBLIM (KLHED)

SUBLIM eliminates the subclusters of the node KLHED.

3.2.18.1 Linkages

SUBLIM is called by ELIM and ADJUST.
SUBLIM calls TRREE.

3.2.18.2 Interfaces

SUBLIM uses common block /MISH/.

3.2.18.3 Inputs

KLHED - parent node.

3.2.18.4 Outputs

None.

3.2.18.5 Storage Requirement

Not applicable.

3.2.18.6 Description

SUBLIM eliminates all of the subcluster for node KLHED by calling TRFREE for each one of them. SUBLIM then reset the SPFAC and PQRAT terms for KLHED.

3.2.18.7 Flowchart

See Appendix A.

3.2.18.8 Listings

See Appendix B for program.

4. OPERATION

CLASSY is operational of the IBM 370/148 computer at LARS, West Lafayette, Indiana.

CLASSY is executed by entering the following commands after signing on the on the computer system.

```
DEF STOR 2M

IPL CMS370

TAPEA (tape number)

PFILE

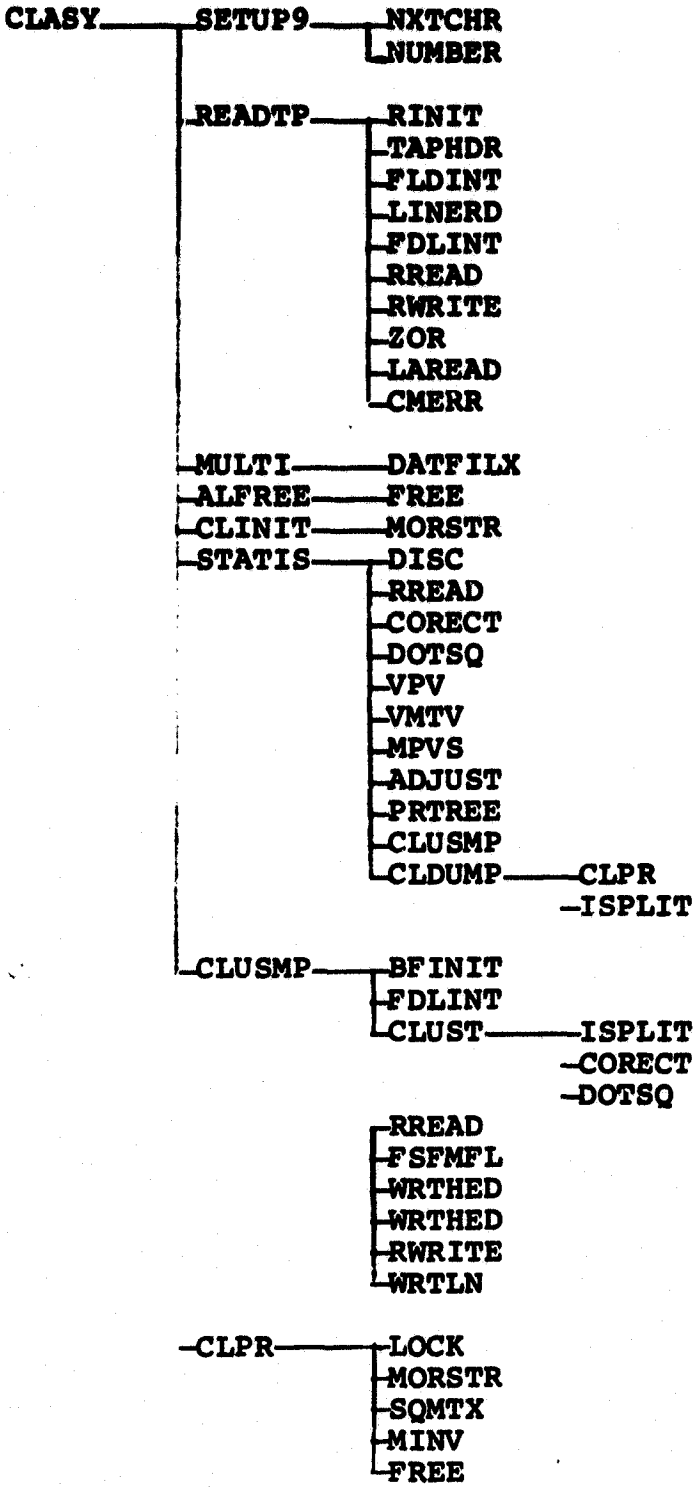
AA CLASSY
```

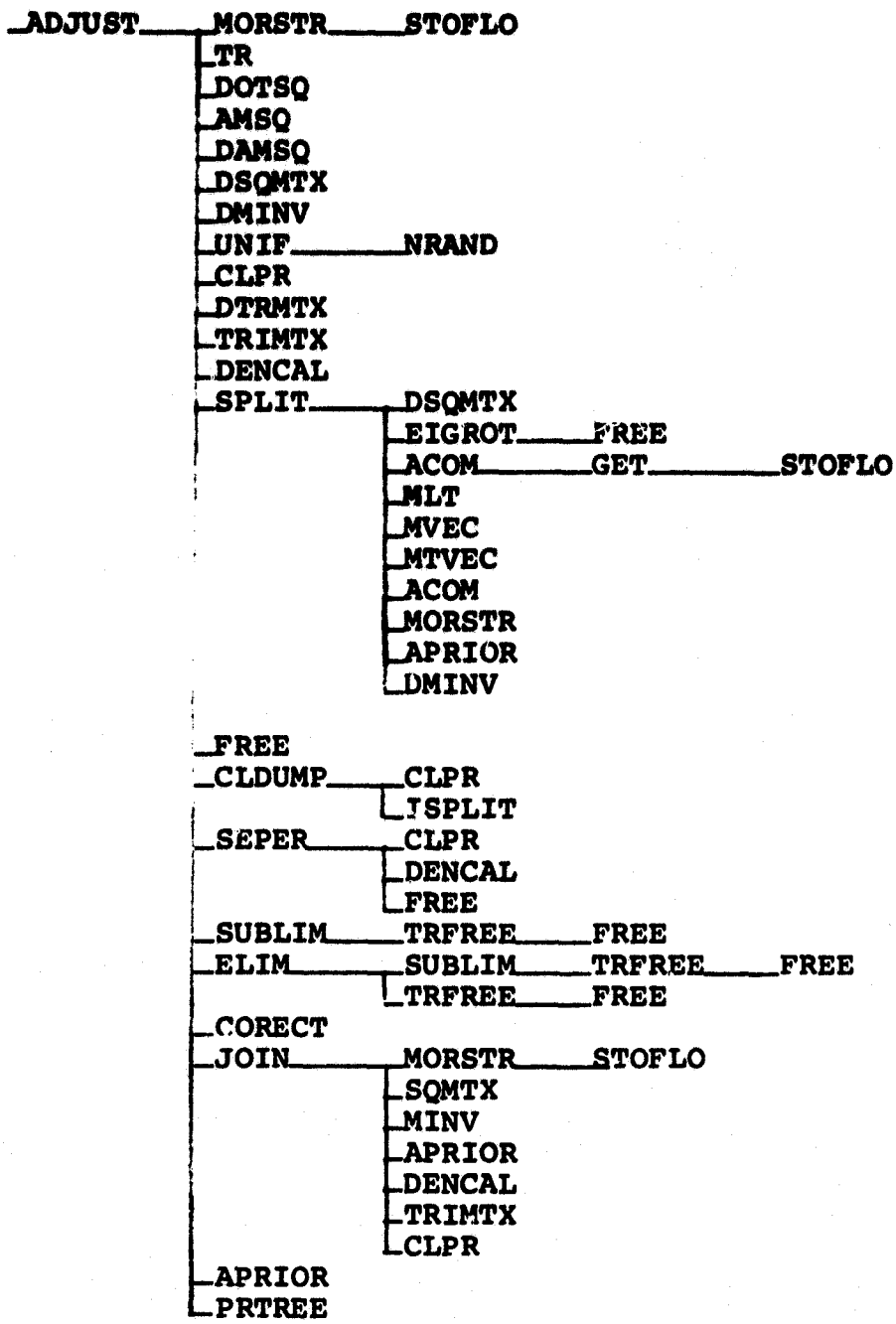
Control input is read from FILE FT21F002.

Output is on unit 3 and 6 which are assigned in the PFILE EXEC.

APPENDIX A

CLASSY FUNCTIONAL FLOWCHART


CLASY
SETUP9
NXTCHR
NUMBER
READTP
RINIT
TAPHDR
FLDINT
LINERD
FDLINT
RREAD
RWRITE
ZOR
LAREAD
CMERR
MULTI
DATFILX
ALFREE
FREE
CLINIT
MORSTR
STATIS
DISC
RREAD
CORECT
DOTSQ
VPV
VMTV
MPVS
ADJUST
PRTREE
CLUSMP
CLDUMP
CLPR
ISPLIT
CLUSMP
BFINIT
FDLINT
CLUST
ISPLIT
CORECT
DOTSQ
RREAD
FSFMFL
WRTHED
WRTHED
RWRITE
WRTLN
CLPR
LOCK
MORSTR
SQMTX
MINV
FREE


ADJUST
MORSTR
STOFLO
TR
DOTSQ
AMSQ
DAMSQ
DSQMTX
DMINV
UNIF
NRAND
CLPR
DTRMTX
TRIMTX
DENCAL
SPLIT
DSQMTX
EIGROT
FREE
ACOM
GET
STOFLO
MLT
MVEC
MTVEC
ACOM
MORSTR
APRIOR
DMINV
FREE
CLDUMP
CLPR
ISPLIT
SEPER
CLPR
DENCAL
FREE
SUBLIM
TRFREE
FREE
ELIM
SUBLIM
TRFREE
FREE
TRFREE
FREE
CORECT
JOIN
MORSTR
STOFLO
SQMTX
MINV
APRIOR
DENCAL
TRIMTX
CLPR
APRIOR
PRTREE

APPENDIX B

CLASSY LISTINGS

FILE: ACOM FORTRAN A

```
      SUBROUTINE ACOM(A,B,C)                                                    AC000010
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,              AC000020
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SBLTH,           AC000030
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                  AC000040
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           AC000050
     4    BETTER,MODE,COPLEN,SPCOR                                              AC000060
      REAL*8 A(MQ,MQ),B(MQ,MQ),C(MQ,MQ)                                         AC000070
       REAL*8 SUM                                                               AC000080
      DO 13 I=1,MQ                                                              AC000090
      DO 13 J=1,I                                                               AC000100
      SUM=0.                                                                    AC000110
      DO 12 K=1,MQ                                                              AC000120
   12 SUM=SUM+B(I,K)*C(K,J)+C(I,K)*B(K,J)                                       AC000130
      A(I,J)=SUM                                                                AC000140
   13 A(J,I)=SUM                                                                AC000150
      RETURN                                                                    AC000160
      END                                                                       AC000170
```

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I.F: ADJUST   FORTRAN   A

      SUBROUTINE ADJUST(KLIN,SUM,SKEW,KURT,OSUM,OVAR)                          ADJ00010
                                                                               ADJ00020
       COMMON/CLUSTR/IHEGIN,TOTWRD,CLSNAM,IPT,NOFLD,SYM(61),                   ADJ00030
     1  LNCAT,PRNT(4),KLAC,PRTME,PROUT,TOTPIX,                                ADJ00040
     2 SCRAM1,BUFPIX,BUFTOT,NHUFSD,NDUMP,LBUFD                               ADJ00050
     3,MAXRF,AREA,NWDS,NWDRS,NPTS,LBUF,IQ1,NOCYCL                            ADJ00060
       INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX              ADJ00070
     ),BUFTOT,CLSNAM                                                         ADJ00080
       DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),         ADJ00090
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),              ADJ00100
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),         ADJ00110
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),               ADJ00120
     4 OPRIOR(9),ODEN(8)                                                     ADJ00130
       DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                       ADJ00140
       REAL*8 ALINK,RVOLO,VMOTO,DOUBP,DDW                                    ADJ00150
       EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                   ADJ00160
       EQUIVALENCE (LINK(31),LSUBS(30))                                      ADJ00170
       EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),              ADJ00180
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),   ADJ00190
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),       ADJ00200
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),        ADJ00210
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),      ADJ00220
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),    ADJ00230
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),      ADJ00240
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),       ADJ00250
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),        ADJ00260
     9 (LINK(31),GREF(8))                                                    ADJ00270
       COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBS7M,NWANT,LINK(14000)             ADJ00280
       DIMENSION MXAR(3),LR(3),LV(3)                                         ADJ00290
       EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                              ADJ00300
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)             ADJ00310
                                                                             ADJ00320
       COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          ADJ00330
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,        ADJ00340
     2    INDXVL,VFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,               ADJ00350
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VPJOIN,WSIM,WDELSM,        ADJ00360
     4    METTEM,MODE,CORLEN,SPCOR                                           ADJ00370
                                                                             ADJ00380
       DIMENSION PACCEL(2),MACCEL(2),VACCEL(2)                               ADJ00390
                                                                             ADJ00400
       COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,       ADJ00410
     1     PACCEL,MACCEL,VACCEL                                              ADJ00420
       COMMON /INFORM/HEAD(42), MAPTAP,      DATAPE,      SAVTAP,    MAXFET,ADJ00430
     1                PAGSIZ, TAPCHK,      TRNSYM,      TSTSYM,            ADJ00440
     2                DUPSYM, THRSYM,      MAXDIV,      MINDIV,    SPLMAX,ADJ00450
     3                SERIAL, TAPESV,      FILESV,                         ADJ00460
     4                MAXCLS, NOCLS2,      MAXFLD,      NOFLD2,    NOFLD3,ADJ00470
     5                NOTRFD, NOFEAT,      NOFET2,      NOFET4,    VARSIZ,ADJ00480
     6                VARSZ2, VARSZ4,      YSIZ  ,      NOSPEC,    NOHIST,ADJ00490
     7                NOGRP, DIVSIZ,    KEEPLV,    PRTLEV,    YSIZ  ,    ADJ00500
     8                XHGH  , XLOW  ,      SPCRAS,      NOCLS3,    PCTSZ ,ADJ00510
     9           IBLOCK(30), FETVEC(30), FETVC2(30), HISVEC(30),           ADJ00520
     #           INVERT(30), RESTVC(30)                                    ADJ00530
                                                                           ADJ00540
       COMMON /SPPAR/ GAMMET,DELMET,SGTMET,ORCOV,ORSKEW,URKURT,EXMNSQ,     ADJ00550
     1     SHRMIN,EXMAX,GAMLEN,TSQINI,DAMP,DOBPMS,DIAG,TIM0,TIM1,ITERMX,   ADJ00560
     2     SPRED,ITER                                                      ADJ00570
       REAL SUM(1),SKEW(1),KURT(1),OSUM(1),OVAR(1)                         ADJ00580
       REAL FV(16),SV(16)                                                  ADJ00590
       COMMON /JOINPR/WDJOIN,RLIM,NOJO,NOELIM                              ADJ00600
       DATA NADJ/700/                                                      ADJ00610
                                                                           ADJ00620
        DATA IFIRST /0/                                                    ADJ00630
                                                                           ADJ00640
PURPOSE--TO MAKE MISC ADJUSTMENTS TO THE NODE CORRESPONDING TO CLASS       ADJ00650
            (1)  CHANGES CONTINUOUS STATISTICS                             ADJ00660
            (2)  TESTS FOR AND INITIATES DESCRETE TRANSFORMATIONS          ADJ00670
                                                                           ADJ00680
ADJUST WAS DESIGNED TO INCLUDE A NUMERIC EXTRAPOLATION SYSTEM THAT         ADJ00690
  HAS NOT BEEN COMPLETED.  PARAMETERS  VACCEL,  MACCEL  AND PACCEL         ADJ00700
  HAVE BEEN SET TO 0 TO NULLIFY THIS SYSTEM.                               ADJ00710
                                                                           ADJ00720
VALUES  SMOT,  VMOT,  PMOT  ARE CALC. BUT NOT USED                         ADJ00730
                                                                           ADJ00740
INDEX IS A FLAG THAT IS NEGATIVE IF THERE HAS BEEN A COMPLETE PASS         ADJ00750
   THROUGH DATA IN STATIS WITHOUT CALLING ADJUST                           ADJ00760
LINK   = SIBLING NODE                                                      ADJ00770
LSUB   = CHILD NODE                                                        ADJ00780
LSUPER = PARENT NODE                                                       ADJ00790
```

FILE: ADJUST FORTRAN A

```
C   OVAR    = OLD COVAR MATRIX MATRIX                                          ADJ00800
C   OVOL    = VOLUME MEASURE   MATRIX                                          ADJ00810
C   PMOT    = CHANGE IN PRIOR SINCE LAST CALL TO ADJUST                        ADJ00820
C   SMOT    = CHANGE IN MEAN VECTOR                                            ADJ00830
C   SKTES -- MEASURE OF SKEWNESS                                               ADJ00840
C   STW -STANDARDIZED WEIGHT                                                   ADJ00850
C   TRKTES  = MEASURE OF KURTOSIS                                              ADJ00860
C   URKTES  = MEASURE OF KURTOSIS                                              ADJ00870
C   VMOT    = CHANGE IN VARIANCE                                               ADJ00880
C   VRIN    = INVERSE OF COVAR MATRIX                                          ADJ00890
C   WAITF   = AGE FACTOR, DELAYS DECISIONS UNTIL A SIGNIFICANT NUMBER OF       ADJ00900
C     ITERATIONS HAVE OCCURRED                                                 ADJ00910
C                                                                              ADJ00920
C                                                                              ADJ00930
      IF (IFIRST .EQ. 0) WRITE (6,9999) PACCEL(1),PACCEL(2),                   ADJ00940
     1 MACCEL(1),MACCEL(2)                                                     ADJ00950
9999  FORMAT ('PACCEL,MACCEL',4F10.4)                                          ADJ00960
      IFIRST = 1                                                               ADJ00970
      KL=KLIN                                                                  ADJ00980
      KF=LSUPER(KL)                                                            ADJ00990
C                                                                              ADJ01000
C   GET WORKING STORAGE FOR SUBROUTINE ADJUST (MQ=NO. CHANNELS)                ADJ01010
      MQS=MQ*MQ                                                                ADJ01020
       LMQS = 2*MQS                                                            ADJ01030
      MQSM1 = MQS-1                                                            ADJ01040
C   CHANGE BE:BASSBACH 3/21/77                                                 ADJ01050
      MQP=MQ + 1                                                               ADJ01060
      LA=MORSTR(LMQS)                                                          ADJ01070
      LB=MORSTR(LMQS)                                                          ADJ01080
      LD=MORSTR(LMQS)                                                          ADJ01090
      LVA=MORSTR(LMQS)                                                         ADJ01100
       LA2 = LA/2 + 1                                                          ADJ01110
       LB2 = LB/2 + 1                                                          ADJ01120
       LD2 = LD/2 + 1                                                          ADJ01130
       LVA2 = LVA/2 + 1                                                        ADJ01140
C                                                                              ADJ01150
C   CALC DIFFERENCE IN THE WEIGHT FOR CLUSTER KL (CURRENT - OLD)               ADJ01160
      DDW=W(KL)-OW(KL)                                                         ADJ01170
      DW = DDW                                                                 ADJ01180
      FW = W(KL)                                                               ADJ01190
      KADTY=1                                                                  ADJ01200
      IF (INDEX(KL).LT.0) FW = OW(KL)                                          ADJ01210
C                                                                              ADJ01220
C   INDEX IS A FLAG THAT IS NEGATIVE IF THERE HAS BEEN A COMPLETE PASS         ADJ01230
C     THROUGH DATA IN STATIS WITHOUT CALLING ADJUST                            ADJ01240
      IF(INDEX(KL).LT.0) KADTY=2                                               ADJ01250
C   CALCULATE STATISTICS.                                                      ADJ01260
C PROPERTY,KURT SHOULD BE ADJUSTED FOR THE DISCRETE POINT                      ADJ01270
C EFFECT (SIMILAR TO SHEPHERD,S CORRECTION).  THIS HAS NOT YET BEEN            ADJ01280
C DONE, BUT SHOULD NOT HAVE ANY MAJOR EFFECT, SINCE  KURT IS USED              ADJ01290
C ONLY IN THE CRUDE SCAN.                                                      ADJ01300
      STW=FW/DW                                                                ADJ01310
C                                                                              ADJ01320
C   PARAMETERS FOR SPLIT TEST                                                  ADJ01330
      TRK=TR(KURT(KL+1),VRIN(KL+1))*STW                                        ADJ01340
       J = KL + 1                                                              ADJ01350
       K = J + 9                                                               ADJ01360
      SK=DOTSQ(SKEW(KL+1),VRIN(KL+1))*STW                                      ADJ01370
      URK=(AMSQ(KURT(KL+1),VRIN(KL+1))*STW*STW-TRK*TRK/AMQ)*DW                 ADJ01380
      TRK=(TRK-AMQ*(AMQ+2.))*SQRT(DW)                                          ADJ01390
C                                                                              ADJ01400
C   DELAY FACTOR TO GIVE YOUNG CLASSES TIME TO GROW                            ADJ01410
      WAITF=1.+WAIT/DW                                                         ADJ01420
C                                                                              ADJ01430
C   ACTUAL TEST VALUES.  CHI PARAMETERS  ARE CHI**2 VALUES CALC. IN            ADJ01440
C   CLINIT SIMILARLY FOR RND PARAMETERS.                                       ADJ01450
      TRKTES=TRK**2-DW*TRRND-TRCHI*WAITF                                       ADJ01460
      SKTES=SK-SKRND*DW-SKCHI*WAITF                                            ADJ01470
      URKTES=URK-URKRND*DW-URKCHI*WAITF                                        ADJ01480
C                                                                              ADJ01490
C   EXTRAPOLATE THE PARAMETERS.                                                ADJ01500
C                                                                              ADJ01510
C   PREPARE VARIANCE AND VOLUME                                                ADJ01520
102   CONTINUE                                                                 ADJ01530
      CALL DSUMTX(ALINK(LB2),VRIN(KL+1))                                       ADJ01540
      CALL DSUMTX(ALINK(LA2),OVAR(KL+1))                                       ADJ01550
      CALL DMINV(ALINK(LD2),ALINK(LVA2),ALINK(LB2),RVOL)                       ADJ01560
       RVOLD=RVOL                                                              ADJ01570
      OVOL=-DLOG(DABS(RVOLD))/AMQ-ALOG(ABS(FW))                                ADJ01580
```

```
FILE: ADJUST   FORTRAN  A

      WR=DW/OW(KL)                                                          ADJ01590
      WINFC=4.*DW*OW(KL)/W(KL)**2                                           ADJ01600
C                                                                           ADJ01610
C  SV = CHANGE IN CUM                                                       ADJ01620
C  FV = EXTRAPOLATION FACTOR FOR SUM                                        ADJ01630
C  EXTRAPOLATION DIFFERS FOR TWO TYPES OF STATISTICS (SGN(INDEX(RL))        ADJ01640
      DO 103 I=1,MQ                                                         ADJ01650
      SV(I)=SUM(I+KL)-OSUM(I+KL)                                            ADJ01660
  103 FV(I)=SV(I)-WR*OSUM(I+KL)                                             ADJ01670
      LVX2=LD2                                                              ADJ01680
      LAX2=LA2                                                              ADJ01690
      IF(KADTY.EQ.1) GO TO 134                                              ADJ01700
      LVX2=LA2                                                              ADJ01710
      LAX2=LD2                                                              ADJ01720
C                                                                           ADJ01730
C  CHANGE SUMS OF SQUARES                                                   ADJ01740
C  EXTR SUM OF SQUARES                                                      ADJ01750
  134 CONTINUE                                                              ADJ01760
      DO 104 I=1,MQS                                                        ADJ01770
      ALINK(LA2+I-1) = ALINK(LVX2+I-1)-ALINK(LAX2+I-1)                      ADJ01780
  104 ALINK(LVA2+I-1) = ALINK(LB2+I-1) - WR*ALINK(LAX2+I-1)                 ADJ01790
C                                                                           ADJ01800
C  CALCULATE SMOT (CHG IN MEAN VECTOR), VMOT (CHG IN VARIANCE),             ADJ01810
C  PMOT (CHG IN PRIOR) SINCE LAST CALL TO ADJUST                            ADJ01820
C                                                                           ADJ01830
C  THESE ARE INTENDED TO INDICATE RATE OF MOTION OF CLUSTER STATISTICS      ADJ01840
C  FOR INCOMPLETE SYSTEM TO CALC. NEXT ADJUSTMENT POINT.                    ADJ01850
      SMOT=DOTSQ(FV(1),VRIN(KL+1))*EW/DW**2                                 ADJ01860
      VMOTD=DAMSQ(ALINK(LVA2),VRIN(KL+1))*(EW/DW)**2                        ADJ01870
        VMOT = VMOTD                                                        ADJ01880
C  *WARNING:  DALP HAS NOT BEEN CALCULATED YET. NEXT LINE INVALID           ADJ01890
      PMOT=DALP**2                                                          ADJ01900
C                                                                           ADJ01910
C                                                                           ADJ01920
C  TRACE 1--ADJUST SUMMARY PRINTOUT                                         ADJ01930
      TMOT = 0.                                                             ADJ01940
      PRINT 701,INDEX(KL),W(KL),OW(KL),SPFAC(KL),PMOT,TMOT,SMOT,VMOT        ADJ01950
  701 FORMAT('  ***ADJUST',I4,'  WEIGHT',F11.1,'  WAS',F11.1,              ADJ01960
     1    '   SPFAC',E12.5,'   CHANGE',E11.5,1X,E11.5,1X,E11.5,1X,E11.5)   ADJ01970
      PRINT 353, TRK,SK,URK,TRKTES,SKTES,URKTES                             ADJ01980
  353 FORMAT('  STATISTICS: TRACE',F11.1,'  SKEW',F11.1,'  KURT',F11.1,     ADJ01990
     1 /,10X,'TESTS (SPLIT=0): ',E11.5,6X,E11.5,6X,F11.5)                   ADJ02000
C                                                                           ADJ02010
C  TRACE 2--ACTUAL ADJUST PRINT ON SELECTIVE                                ADJ02020
      IF(W(KL).GT.UNIF(4500.)*PROP(KL).OR.W(KL).LE.0.OR.DW.LE.0.OR.RVOL     ADJ02030
     *  .LE.0)CALL CLPR(KL,NADJ,SUM,SKEW,KURT)                             ADJ02040
      IF(W(KL).LE.0.OR.DW.LE.0.OR.RVOL.LE.0.00)PRINT771,KL,W(KL),DW,RVOL    ADJ02050
  771 FORMAT(1X,'W/OVOL ERROR IN ADJUST:KL,W,NEW W,VOL',I6,3E15.7)          ADJ02060
C                                                                           ADJ02070
C  NADJ = ADJUSTMENT CONSTANT                                               ADJ02080
      NADJ=NADJ+1                                                           ADJ02090
      WKP=W(KL)                                                             ADJ02100
      W(KL)=DW                                                              ADJ02110
C                                                                           ADJ02120
C  STATISTICS--NEW WEIGHT                                                   ADJ02130
      KK=LSUBS(KL)                                                          ADJ02140
C                                                                           ADJ02150
C                                                                           ADJ02160
C  ADJUST TOTAL WEIGHT IN SUBCLUSTERS, IF ANY                               ADJ02170
C                                                                           ADJ02180
C  LOCATE RIGHT-MOST NODE                                                   ADJ02190
                                                                            ADJ02200
      IF(KK.EQ.0) GO TO 109                                                 ADJ02210
      CHW=W(KL)-WKP                                                         ADJ02220
  108 CTOT(KK)=CTOT(KK)+CHW                                                 ADJ02230
      KK=LINK(KK)                                                           ADJ02240
      IF(KK.NE.0) GO TO 108                                                 ADJ02250
  109 WR=W(KL)/DW                                                           ADJ02260
          INDIC = 1                                                         ADJ02270
C                                                                           ADJ02280
C  WR= EXTRAPOLATE MEAN                                                     ADJ02290
C  EXF = TEMP. EXTRAPOLATION FACTOR                                         ADJ02300
C  CHANGE RF:BASSBACH 3/21/77                                               ADJ02310
      EXF=WINFC*VACCEL(KADTY)                                               ADJ02320
      DO 113 I=1,MQ                                                         ADJ02330
      SUM(KL+I)=WR*(SV(I)+EXF*FV(I))                                        ADJ02340
  113 OSUM(KL+I)=SUM(KL+I)                                                  ADJ02350
C CHANGE RF:BASSBACH 3/21/77                                                ADJ02360
C                                                                           ADJ02370
```

```
C  SET NEXT ADJUSTMENT POINTS WITH MINIMUM                                    ADJ02380
        DDUMP = 1. + DWFAC                                                   ADJ02390
      WADJ(KL)=W(KL)*(1.+DWFAC)                                              ADJ02400
      IF(W(KL).LT.WSIM) WADJ(KL)=2.D0*W(KL)+WDELSM                           ADJ02410
       WRITE (6,9997) WADJ(KL),W(KL),WSIM                                    ADJ02420
9997  FORMAT (' WADJ(KL),W(KL),WSIM',7F10.1)                                 ADJ02430
C                                                                            ADJ02440
C  DISCRETE POINT (SHEPHARD,S) CORRECTION (TO COVARIANCE ONLY)               ADJ02450
C     DCORR=(DW+WADJ(KL))/24                                                 ADJ02460
C     IF(KADTY.EQ.2)DCORR=DW/12.                                             ADJ02470
C  ***  WARNING:  CHANGE DO:LOOP FOR DOUBLE PRECISION ***                    ADJ02480
C     DO 118 I=1,MQS,MQP                                                     ADJ02490
C118  LINK(LR+I-1)=LINK(LR+I-1) + DCORR                                      ADJ02500
C                                                                            ADJ02510
C  EXTRAPOLATE COVARIANCE                                                    ADJ02520
      EXF=WINFC*MACCEL(KADTY)                                                ADJ02530
      ITX=0                                                                  ADJ02540
  117 DO 114 I=1,MQS                                                         ADJ02550
114   ALINK(LD2+I-1) = WR*(ALINK(LR2+I-1) + EXF*ALINK(LVA2+I-1))             ADJ02560
      CALL DTRMTX(OVAR(KL+1),ALINK(LD2))                                     ADJ02570
      CALL DMINV(ALINK(LVA2),ALINK(LD2),ALINK(LD2),VOLIN(KL))                ADJ02580
      EXF =EXF*.3                                                            ADJ02590
C                                                                            ADJ02600
C  EXTRAPOLATED COVARIANCE MUST BE POSITIVE DEFINITE, ELSE LOOP              ADJ02610
      ITX=ITX+1                                                              ADJ02620
      IF(ITX.EQ.25)EXF=0.                                                    ADJ02630
      IF(VOLIN(KL).LT.0..AND.ITX.LT.26) GO TO 117                            ADJ02640
      CVOL=ALOG(ABS(VOLIN(KL)))/AMQ-ALOG(ABS(W(KL)))                         ADJ02650
C                                                                            ADJ02660
C  ALSO REQUIRE NOT TOO RAPID CHANGE IN VOLUME                               ADJ02670
      IF(ABS(OVOL-CVOL).GT.VOLLIM.AND.ITX.LT.26.AND.EXF.GT.0.) GO TO 117     ADJ02680
C CHANGE RE:PASSBACH 3/21/77                                                 ADJ02690
C                                                                            ADJ02700
C  ERROR MESSAGE                                                             ADJ02710
      IF(ITX.GE.10)PRINT 772,ITX,INDEX(KL),VOLIN(KL),OVOL,CVOL               ADJ02720
 772  FORMAT(/,' ***EXTRAPOLATION PROBLEM IN ADJUST:ITER,INDEX(KL),VOLI      ADJ02730
     * N,OVOL,CVOL',I4,I6,3E15.7)                                            ADJ02740
C CHANGE RE:PASSBACH 3/21/77                                                 ADJ02750
C                                                                            ADJ02760
C  STORE COVARIANCE MATRIX                                                   ADJ02770
      IF(ITX.GE.20)CALL CLPR(KL,NADJJ,SUM,SKEW,KURT)                         ADJ02780
      CALL DTRMTX(VPIN(KL+1),ALINK(LVA2))                                    ADJ02790
C                                                                            ADJ02800
C  PROPORATION CALC)/EXTRAPOLATION                                           ADJ02810
      EXF=WINFC*MACCEL(KADTY)                                                ADJ02820
      PRK=PROP(KL)                                                           ADJ02830
      DEN=W(KF)-CTOT(KL)                                                     ADJ02840
      CINV=CIN(KL)-OCIN(KL)                                                  ADJ02850
      PROP(KL)=(CINV)/(DEN-ODEN(KL))                                         ADJ02860
C  ERROR MESSAGE--PROPORATION CALCULATION                                    ADJ02870
      IF(PROP(KL).GT.0..AND.PROP(KL).LE.1.) GO TO 139                        ADJ02880
      PRINT 639,INDEX(KL),PRK,PROP(KL),PRIRCM(KF),W(KL),CIN(KL),             ADJ02890
     1   OCIN(KL),CINV,W(KF),CTOT(KL),DEN,ODEN(KL)                           ADJ02900
 639  FORMAT(' ALPHA ERROR:PRK,P,CM,W',I3,4E9.4/'    (ERROR CONT) CIN',     ADJ02910
     1  3E9.4,'  W(KF),CTOT,DEN,ODEN',4E9.4)                                 ADJ02920
C  CHANGE RE:PASSBACH 3/21/77                                                ADJ02930
C  PRINTOUT CLUSTER                                                          ADJ02940
      CALL CLPR(KL,NADJ,SUM,SKEW,KURT)                                       ADJ02950
      PROP(KL)=PRK                                                           ADJ02960
 139  ALP=ALOG(PROP(KL))                                                     ADJ02970
      ALPO=ALOG(OPROP(KL))                                                   ADJ02980
      DALP=ALP-ALPO                                                          ADJ02990
      PFAC=EXP(EXF*DALP)                                                     ADJ03000
      PROP(KL)=PROP(KL)*PFAC                                                 ADJ03010
      OPROP(KL)=PROP(KL)                                                     ADJ03020
      PRIRCM(KF)=PRIRCM(KF)+PROP(KL)-PRK                                     ADJ03030
      CIN(KL)=CINV*PFAC                                                      ADJ03040
      OCIN(KL)=CIN(KL)                                                       ADJ03050
      ODEN(KL)=(CIN(KL)/PROP(KL)*PRIRCM(KF))                                 ADJ03060
      CTOT(KL)=W(KF)-ODEN(KL)                                                ADJ03070
C  ADJUST PROPORATIONS OF SUBS                                               ADJ03080
      KK=LSUBS(KF)                                                           ADJ03090
 141  CALL DENCAL(KK,1./PRIRCM(KF),W(KF))                                    ADJ03100
      KK=LINK(KK)                                                            ADJ03110
      IF(KK.NE.0) GO TO 141                                                  ADJ03120
C                                                                            ADJ03130
C                                                                            ADJ03140
C  ACTUAL TEST FOR SPLITTING                                                 ADJ03150
C  SPLIT THE CLUSTER                                                         ADJ03160
```

```
C                                                                       ADJ03170
C  IF THERE ARE SUBS, SKIP POSSIBLE SPLITTING OF CLUSTER.              ADJ03180
C  CALLS ADJUST WHEN WEIGHT FOR A GIVEN CLUSTER EXCEEDS THE THRESHOLD   ADJ03190
      IF(LSUBS(KL).NE.0) GO TO 200                                      ADJ03200
C                                                                       ADJ03210
C  IF TRKTES, URKTES (MEASURES OF KURTOSIS) OR                          ADJ03220
C    SKTES (MEASURES OF SKEWNESS) IS POSITIVE SPLIT CLUSTER             ADJ03230
      IF(TRKTES.LT.0..AND.SKTES.LT.0..AND.URKTES.LT.0.) GO TO 200       ADJ03240
C                                                                       ADJ03250
C                                                                       ADJ03260
C  GET WORKING STORAGE FOR SPLIT, CALL SPLIT, PRINT RESULTS AND         ADJ03270
C    FREE WORKING STORAGE                                               ADJ03280
      NSGSQ=MORSTR(LMQS)                                                ADJ03290
      NTAUSQ=MORSTR(LMQS)                                               ADJ03300
      NDUM=MORSTR(LMQS)                                                 ADJ03310
      NDSG=MORSTR(LMQS)                                                 ADJ03320
      NDTAU=MORSTR(LMQS)                                                ADJ03330
       NSGSQ2 = NSGSQ/2 + 1                                             ADJ03340
       NTAUS2 = NTAUSQ/2 + 1                                            ADJ03350
       NDUM2 = NDUM/2 + 1                                               ADJ03360
       NDSG2 = NDSG/2 + 1                                               ADJ03370
       NDTAU2 = NDTAU/2 + 1                                             ADJ03380
C                                                                       ADJ03390
C  DO SPLIT                                                             ADJ03400
      CALL SPLIT(KL,SUM,SKEW,KURT,OSUM,OVAR,                            ADJ03410
     1 ALINK(LA2),ALINK(LB2),ALINK(LD2),ALINK(LVA2),ALINK(NSGSQ2),      ADJ03420
     2 ALINK(NTAUS2),ALINK(NDUM2),ALINK(NDSG2),ALINK(NDTAU2))           ADJ03430
        KC = LSUBS(KL)                                                  ADJ03440
          CALL PRTREE(KL)                                               ADJ03450
      KC=LSUBS(KL)                                                      ADJ03460
      KDC=LINK(KC)                                                      ADJ03470
C                                                                       ADJ03480
C  TRACE 4                                                              ADJ03490
      PRINT 354, INDEX(KL),W(KL),INDEX(KC),INDEX(KDC),ITER              ADJ03500
      WRITE (3,354) INDEX(KL),W(KL),INDEX(KC),INDEX(KDC),ITER           ADJ03510
354   FORMAT(' ***HAVE SPLIT',I3,' WEIGHT',F8.1,' SUBS',2I3,' ITER',I4) ADJ03520
C                                                                       ADJ03530
C  FREE STORAGE                                                         ADJ03540
        CALL CLDUMP(KL)                                                 ADJ03550
      CALL FREE(NSGSQ,LMQS)                                             ADJ03560
      CALL FREE(NTAUSQ,LMQS)                                            ADJ03570
      CALL FREE(NDUM,LMQS)                                              ADJ03580
      CALL FREE(NDSG,LMQS)                                              ADJ03590
      CALL FREE(NDTAU,LMQS)                                             ADJ03600
      GO TO 204                                                         ADJ03610
C                                                                       ADJ03620
C  DO NOT CHECK FOR SEPARATION OR TO ELININATE SUBS                     ADJ03630
C   ELIMINATE THIS CLUSTER IN FAVOR OF ITS SUBCLUSTERS, IF IT IS        ADJ03640
C     SPLIT WITH ODDS GREATER THAN SEPTH.                               ADJ03650
  200 IF(SPFAC(KL).LE.SEPTH*SPCOR) GO TO 30                             ADJ03660
      CALL SEPER(KL)                                                    ADJ03670
C                                                                       ADJ03680
C  DO NOT PROCESS DELETED CLUSTER FURTHER                               ADJ03690
      GO TO 300                                                         ADJ03700
C                                                                       ADJ03710
C  ELIMINATE THE SUBS, IF IT HAS SUBS AND EITHER                        ADJ03720
C     (1)  SPLITTING LESS THAN SUBLIM THRESHOLD, OR                     ADJ03730
C     (2)  IT IS SIMILAR TO SUBS AND SPLITTING LESS THAN SPMVTH         ADJ03740
   30 CONTINUE                                                          ADJ03750
C   ELIMINATE THE SUBCLUSTERS IF THEY ARE DOMINATED BY THE MAIN         ADJ03760
C     CLUSTER.                                                          ADJ03770
      SPRND=(SPFAC(KL)-OPRIOR(KL))/SPCOR                                ADJ03780
      IF((SPRND.LE.SBLTH.OR.PORAT(KL)/DW.LT.PORATH.AND.SPRND            ADJ03790
     1.LT.SPMVTH).AND.LSUBS(KL).NE.0) CALL SUBLIM(KL)                   ADJ03800
C   ELIMINATE THIS CLUSTER (AND PERHAPS ITS COCLUSTER) IF ITS           ADJ03810
C     PROPORTION BECOMES TOO SMALL.                                     ADJ03820
C                                                                       ADJ03830
C  ELIMINATE IF PROPORTION TOO SMALL AND ELIN PARAMETER NOELIM IS OFF   ADJ03840
  204 IF(PROP(KL).GE.ELIMTH.OR.NOELIM.NE.0)  GO TO 205                  ADJ03850
      CALL ELIM(KL)                                                     ADJ03860
C                                                                       ADJ03870
C  DO NOT TRY TO PROCESS FURTHER                                        ADJ03880
      GO TO 300                                                         ADJ03890
  205 KDC=LSUPER(KL)                                                    ADJ03900
      KDC=LINK(KL)                                                      ADJ03910
C                                                                       ADJ03920
C  CALL JOIN IF A SIMILAR CLUSTER HAS BEEN FOUND                        ADJ03930
C                                                                       ADJ03940
C  CLUSTER MUST BE SELECTIVELY CHOSEN                                   ADJ03950
```

FILE: ADJUST FORTRAN A

```
C     JOIN CONTROL PARAMETER NOJO MUST BE OFF, AND THERE MUST BE A          ADJ03960
C     STRUCTURALLY VOID JOIN AVAILABLE                                      ADJ03970
C                                                                           ADJ03980
C  FIND LIKELY OVERLAPS OF THIS CLUSTER WITH THOSE FURTHER DOWN THE LIST     ADJ03990
      IF(W(KL).LT.UNIF(WDJOIN).OR.NOJO.NE.0.OR.LINK(KL).EQ.0.               ADJ04000
     1    OR.LSUBS(KCC).EQ.KL.AND.LINK(KDC).EQ.0) GO TO 250                 ADJ04010
      RMIN=1.E26                                                            ADJ04020
      K=LINK(KL)                                                            ADJ04030
C                                                                           ADJ04040
CC    DO NOT CHECK ON RANDOM BASIS CONTROLLED BY PARAMETER PJOIN.  THIS IS   ADJ04050
CC    NECESSARY TO AVOID REPEATING BAD JOIN TRIES.                          ADJ04060
  211 IF(PJOIN.LT.UNIF(1.7) GO TO 213                                       ADJ04070
      WW=W(K)/W(KL)                                                         ADJ04080
      CALL CORECT(FV,SUM(KL+1),WW,SUM(K+1))                                 ADJ04090
      RR=(DOTSQ(FV,VRIN(KL+1))+DOTSQ(FV,VRIN(K+1))*WW)*.5/W(KL)             ADJ04100
C                                                                           ADJ04110
CCC   CHECK DIFFERENCE IN DIAGONAL COVARIANCE MATRIX ELEMENTS.              ADJ04120
C                                                                           ADJ04130
CCC    ***  WARNING ***  THIS CHECK IS NOT INVARIANT UNDER GENERAL LINEAR    ADJ04140
CCC                      TRANSFORMATION.                                    ADJ04150
      DO 212 I=1,MQ                                                         ADJ04160
      IM=MXAR(I+1)                                                          ADJ04170
C                                                                           ADJ04180
CC    THIS ERROR MIGHT OCCUR DUE TO ROUNDING ERROR.                         ADJ04190
      IF(VRIN(KL+IM)*VRIN(K+IM).LE.0.) PRINT 612,I,IM,INDEX(KL),INDEX       ADJ04200
     1   (K),KL,K,(J,VRIN(KL+J),VRIN(K+J),J=1,MM)                          ADJ04210
  612 FORMAT(' LOG ERROR IN ADJUST:   I,IM,KL,K/VRIN=',215,213,217/(I5      ADJ04220
     1    ,2F13.6))                                                         ADJ04230
  212 RR=RR+VRJOIN*(ALOG(ABS(VRIN(KL+IM)/VRIN(K+IM))+1.E-25)**2)            ADJ04240
      RR=RR/(.18*(WW-1./WW)**2+1.)                                          ADJ04250
C                                                                           ADJ04260
C   THE FOLLOWING VALUES SYMMETRICALLY WEIGHTED MEASURE                     ADJ04270
      IF(RR.GT.RMIN) GO TO 213                                              ADJ04280
C                                                                           ADJ04290
C   BEST SO FAR, CHECK IF CLUSTER IS JOINABLE                               ADJ04300
      KMAX=K                                                                ADJ04310
      RMIN=RR                                                               ADJ04320
  213 K=LINK(K)                                                             ADJ04330
C                                                                           ADJ04340
C   LOOP OVER CLUSTERS                                                      ADJ04350
      IF(K.GT.0) GO TO 211                                                  ADJ04360
C                                                                           ADJ04370
C   IS BEST GOOD ENOUGH                                                     ADJ04380
      IF(RMIN.GT.RLIM*AMQ) GO TO 250                                        ADJ04390
C                                                                           ADJ04400
C   DO JOIN                                                                 ADJ04410
      NJO=JOIN(KL,KMAX,SUM,SKEW,KURT,OSUM,OVAR,LINK(LA),LINK(LB),           ADJ04420
     1    LINK(LO),LINK(LVA))                                               ADJ04430
      CALL PRTREE (KF)                                                      ADJ04440
  250 CONTINUE                                                              ADJ04450
C                                                                           ADJ04460
C                                                                           ADJ04470
CCC   CALCULATE SCALAR MEASUREMENTS OF SKEWNESS AND KURTOSIS TO BE USED     ADJ04480
CC      IN A TEST OF NORMALITY                                              ADJ04490
C                                                                           ADJ04500
C                                                                           ADJ04510
C   ZERO OUT SKEWNESS AND KURTOSIS (ACCUMULATED ONLY 1 BLOCK AT A TIME)     ADJ04520
      DO 141 I=1,MQ                                                         ADJ04530
  141 SKEW(KL+I)=0.                                                         ADJ04540
C                                                                           ADJ04550
C   DO RANGES OVER WHOLE TRIANGULAR ARRAY                                   ADJ04560
      DO 142 I=1,MM                                                         ADJ04570
  142 KURT(KL+I)=0.                                                         ADJ04580
C                                                                           ADJ04590
C   ADJUST DW(56) AND SPLITTING VARIABLES                                   ADJ04600
C   SPLITTING OF PARENT CLUSTER IS TO BE ROUNDED                            ADJ04610
      SPFAC(KF)=AMAX1(SPFAC(KF),AMIN1(SPFAC(KF)+DW*BETTER,OPRIOR(KF)))      ADJ04620
      PORAT(KL)=0.                                                          ADJ04630
      SPFAC(KL)=-9999.9                                                     ADJ04640
      IF(LSUBS(KL).NE.0) SPFAC(KL)=APRIOR(KL)                               ADJ04650
      OPRIOR(KL)=SPFAC(KL)                                                  ADJ04660
C                                                                           ADJ04670
C   VOLUME AND COEFFICIENT CALCULATIONS                                     ADJ04680
      OCON(KL)=ODCON                                                        ADJ04690
      VOLIN(KL)=ABS(VOLIN(KL))*.8756510763E-26*(6.283185307/W(KL))**MQ      ADJ04700
      VOLRT(KL)=SQRT(VOLIN(KL))                                             ADJ04710
      OW(KL)=W(KL)                                                          ADJ04720
C                                                                           ADJ04730
                                                                            ADJ04740
```

FILE: ADJUST FORTRAN A

```
C  CHECK STATISTICS TYPE                                                    ADJ04750
      WADJ(KL)=W(KL)*(1.+DWFAC)                                            ADJ04760
      IF(W(KL).LT.WSIM) WADJ(KL)=2.D0*W(KL)+WDFLSM                         ADJ04770
      INDEX(KL) = IABS(INDEX(KL))                                          ADJ04780
      IF (IDADJ(KL) .LE. NPTSO)  INDEX(KL) = -IABS(INDEX(KL))              ADJ04790
      WRITE (3,9998) IDADJ(KL),NPTSO,INDEX(KL),W(KL),WADJ(KL)              ADJ04800
      WRITE (6,9998) IDADJ(KL),NPTSO,INDEX(KL),W(KL),WADJ(KL)              ADJ04810
9998  FORMAT (' IDADJ,NPTSO,INDEX,W,WADJ',3I6,2F12.2)                      ADJ04820
      IDADJ(KL) = NPTSO + TOTPIX                                           ADJ04830
  399 CONTINUE                                                             ADJ04840
C                                                                          ADJ04850
CC  CALC WRAP-AROUND POINT                                                 ADJ04860
CC                                                                         ADJ04870
C  FREE ALL THE WORKING STORAGE FOR ADJUST                                 ADJ04880
      CALL FREE(LA,LMQS)                                                   ADJ04890
      CALL FREE(LH,LMQS)                                                   ADJ04900
      CALL FREE(LD,LMQS)                                                   ADJ04910
      CALL FREE(LVA,LMQS)                                                  ADJ04920
      IF (NOELIM .GT. 0) NOELIM = NOELIM - 1                               ADJ04930
      RETURN                                                               ADJ04940
      END                                                                  ADJ04950
```

FILE: ALFREE FORTRAN A

```
      SUBROUTINE ALFREE (KLHED, LEN)                                    ALF00010
C  THIS ROUTINE FREES THE STRING STARTED BY KLHED.                       ALF00020
      COMMON/CLUS/ JUNK(12),NARL,NTOP,NTBS7M,NWANT,LINK(14000)          ALF00030
      IF(KLHED).EQ.0) RETURN                                            ALF00040
      KL=KLHED                                                          ALF00050
   10 KLK=LINK(KL)                                                      ALF00060
      CALL FREE(KL,LEN)                                                 ALF00070
      KL=KLK                                                            ALF00080
      IF(KL)10,99,10                                                    ALF00090
   99 KLHED=0                                                           ALF00100
      RETURN                                                            ALF00110
      END                                                               ALF00120
```

FILE: AMSO FORTRAN A

```
      REAL FUNCTION AMSO(AM,AMET)                                       AMS00010
C       CALCULATES THE TRACE OF THE SQUARE OF THE MATRIX AM, RELATIVE   AMS00020
C         TO THE METRIC AMET.                                           AMS00030
C       AMSO = TRACE(AM*AMET*AM*AMET)                                   AMS00040
      DIMENSION MXAR(31),LR(3),LV(3)                                    AMS00050
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                          AMS00060
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        AMS00070
C                                                                       AMS00080
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KHOOT,EPS,DELT,      AMS00090
     1    AMU,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,   AMS00100
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          AMS00110
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    AMS00120
     4    METTER,MODE,CORLEN,SPCOR                                      AMS00130
C                                                                       AMS00140
      REAL AM(475),AMET(475)                                            AMS00150
       REAL*8 AMSOD,AMSODD,ROW,COL                                      AMS00160
      AMSOD=0.                                                          AMS00170
      AMSODD=0.                                                         AMS00180
      DO 20 I=1,MQ                                                      AMS00190
      DO 19 J=1,I                                                       AMS00200
      ROW=0.                                                            AMS00210
      COL=0.                                                            AMS00220
      IKLOC=MXAR(I)                                                     AMS00230
      KJLOC=MXAR(J)                                                     AMS00240
      DO 10 K=1,J                                                       AMS00250
      ROW=ROW+AM(IKLOC+1)*AMET(KJLOC+1)                                 AMS00260
      COL=COL+AM(KJLOC+1)*AMET(IKLOC+1)                                 AMS00270
      IKLOC=IKLOC+1                                                     AMS00280
   10 KJLOC=KJLOC+1                                                     AMS00290
      KJLOC=KJLOC+J                                                     AMS00300
      IF(I.EQ.J) GO TO 12                                               AMS00310
      JP=J+1                                                            AMS00320
      DO 11 K=JP,I                                                      AMS00330
      ROW=ROW+AM(IKLOC+1)*AMET(KJLOC)                                   AMS00340
      COL=COL+AM(KJLOC)*AMET(IKLOC+1)                                   AMS00350
      IKLOC=IKLOC+1                                                     AMS00360
   11 KJLOC=KJLOC+K                                                     AMS00370
   12 IF(I.EQ.MQ) GO TO 14                                              AMS00380
      IKLOC=IKLOC+I                                                     AMS00390
      IP=I+1                                                            AMS00400
      DO 13 K=IP,MQ                                                     AMS00410
      ROW=ROW+AM(IKLOC)*AMET(KJLOC)                                     AMS00420
      COL=COL+AM(KJLOC)*AMET(IKLOC)                                     AMS00430
      IKLOC=IKLOC+K                                                     AMS00440
   13 KJLOC=KJLOC+K                                                     AMS00450
   14 CONTINUE                                                          AMS00460
   19 AMSOD=AMSOD+ROW*COL                                               AMS00470
   20 AMSODD=AMSODD+ROW*COL                                             AMS00480
      AMSOD=AMSOD+AMSOD-AMSODD                                          AMS00490
       AMSO = AMSOD                                                     AMS00500
C       WE MUST COUNT EACH OFF-DIAGONAL TWICE. AMSODD AVOIDS DOUBLE-    AMS00510
C         COUNTING THE DIAGONAL TERMS.                                  AMS00520
      RETURN                                                            AMS00530
      END                                                               AMS00540
```

FILE: APRIOR FORTRAN A

```
      FUNCTION APRIOR(KL)                                                   APR00010
C   THIS ROUTINE CALCULATES THE APRIORI PROBABILITY FOR THE                  APR00020
C     CLUSTER KL AS OPPOSED TO ITS TWO SUBCLUSTERS KA AND KB.               APR00030
C     THE PROBABILITY CALCULATED HAS NOTHING TO DO WITH THE                 APR00040
C     DATA, BUT CONTAINS ONLY THE USERS' BIAS IN FAVOR OF FEWER             APR00050
C     CLUSTERS.   IF APRIOR IS SET TOO LARGE (WHERE 1. IS TOO LARGE)        APR00060
C     THEN THE ALGORITHM WILL GENERATE TOO MANY CLUSTERS (I.E.:             APR00070
C     ONE CLUSTER PER DATA POINT)   EXTREMELY SMALL VALUES OF               APR00080
C     APRIOR WILL DECREASE THE NUMBER OF CLUSTERS CREATED.  IN GENERAL,     APR00090
C     EXCEPT FOR EXTREMELY STATISTICALLY SENSITIVE PROBLEMS,                APR00100
C     ANY SMALL VALUE OF APRIOR IS SUFFICIENT; IN THE LIMIT OF              APR00110
C     INFINITE DATA, THE ALGORITHM WILL FIND THE CLUSTERS ANYHOW.           APR00120
C     APRIOR MUST BE POSITIVE, TYPICALLY 3.**(-MQ).                         APR00130
      DIMENSION MXAR(31),LR(3),LV(3)                                        APR00140
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          APR00150
     1   AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SALTH,        APR00160
     2   INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTH,AMOFAC,               APR00170
     3   AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,         APR00180
     4   HETTER,MODE,CORLEN,SPCOR                                           APR00190
      APRIOR=VFAC*AMQ*BIAS                                                  APR00200
      RETURN                                                                APR00210
      END                                                                   APR00220
```

```
FILE: CLASY    FORTRAN  A

C*****************************************************************************CLA00010
C                                                                              CLA00020
      IMPLICIT INTEGER (A-X)                                                   CLA00030
      COMMON /RAND/ NX                                                         CLA00040
      COMMON /INFORM/HEAD(42), MAPTAP,     DATAPE,     SAVTAP,    MAXFET,CLA00050
     1                PAGSIZ, TAPCHK,     TRNSYM,     TSTSYM,            CLA00060
     2                DUMSYM, THRSYM,     MAXDIV,     MINDIV,    SPLMAX,CLA00070
     3                SERIAL, TAPESV,     FILESV,                        CLA00080
     4                MAXCLS, NOCLS2,     MAXFLD,     NOFLD2,    NOFLD3,CLA00090
     5                NOTHFD, NOFEAT,     NOFET2,     NOFET4,    VARSIZ,CLA00100
     6                VARSZ2, VARSZ4,     XSIZ  ,     NOSPEC,    NOHIST,CLA00110
     *                NOGRP, DIVSIZ,   KEEPLV,    PRTLEV,    YSIZ  ,    CLA00120
     8                XHGH  , XLOW  ,     SPCRAS,     NOCLS3,    PCTSZ ,CLA00130
     9IBLOCK(30),FETVEC(30),FETVC2(30), HISVEC(30),INVERT(30),BESTVC(30)CLA00140
C                                                                              CLA00150
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61)  ,                CLA00160
     1              LNCAT, PRNT(4)  , KLBC  , PRTME, PROUT, TOTPIX,          CLA00170
     2  SCRAM1,HUFPIX,HUFTOT,NHUFSD,NDUMP,LHUFD                               CLA00180
     3, MAXHF, AREA, NWDS, NWDRS, NPTS, LAUF, IQ1,NOCYCL                      CLA00190
C                                                                              CLA00200
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,HUFPIX,HUFTOT          CLA00210
     1 ,CLSNAM                                                                CLA00220
C                                                                              CLA00230
      COMMON /ARRAY/TOP, ARRAY(18000)                                          CLA00240
C   TOPID SHOULD EQUAL VALUE FOR NAREA IN CALO                                 CLA00250
C                                                                              CLA00260
      DIMENSION W(1),PORAT(1),VOLIN(1),VOLRT(1),DCON(1),PPASS(1),PCOND(1)CLA00270
      DIMENSION LSUBS(1),IDADJ(1),INDEX(1),LSUPER(1),NSZMP(1)                  CLA00280
      DIMENSION VRIN(475),GEN(999),GREF(999),ODEN(1)                           CLA00290
      DIMENSION PST(1),PCUM(1),DISS(1),WADJ(1),OPWOP(1),OW(1),SPFAC(1)         CLA00300
      DIMENSION PRINCM(1),OPRIOR(1),PROP(1),CIN(1),CTCT(1),OCIN(1)             CLA00310
      COMMON/CLUS/  JUNK(12),NAPL,NTOP,NTRSZM,NWANT,LINK(14000)                CLA00320
      DIMENSION MXAR(31),LR(3),LV(3)                                           CLA00330
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                                 CLA00340
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)               CLA00350
C                                                                              CLA00360
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,             CLA00370
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SPRTH,VFAC,AMM,SMLTH,          CLA00380
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GPACTM,AMOFAC,                 CLA00390
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           CLA00400
     4    BETTER,MODE,CORLEN,SPCOR                                             CLA00410
C                                                                              CLA00420
      DIMENSION PACCEL(2),MACCEL(2),VACCEL(2)                                  CLA00430
C                                                                              CLA00440
      COMMON /STRAP/WAIT,CONLV,SKRND,SKCHI,TRRND,TRCHI,URKRND,URKCHI,          CLA00450
     1    PACCEL,MACCEL,VACCEL                                                 CLA00460
C                                                                              CLA00470
C   INITIALIZE RANDOM NUMBER GENERATOR                                         CLA00480
      NX = 0                                                                   CLA00490
C   SET NO OF ITERATIONS THROUGH TOTAL DATA TO 10 AS A DEFAULT VALUE           CLA00500
      NOCYCL = 10                                                              CLA00510
C                                                                              CLA00520
      TOP = 18000                                                              CLA00530
C                                                                              CLA00540
C   SETUP REREAD BUFFER                                                        CLA00550
      CALL REREAD (30,80)                                                      CLA00560
C                                                                              CLA00570
C   CALL SETUP9 TO READ INPUT CARDS                                            CLA00580
C                                                                              CLA00590
      CALL SETUP9                                                              CLA00600
111     FORMAT (10A4)                                                          CLA00610
C   CALL READTP TO READ CLASS AND FIELD DEFINITION CARDS AND TO READ           CLA00620
C   THE FIELDS OF DATA FROM THE IMAGE TAPE AND TO STORE DATA ON DRUM           CLA00630
C                                                                              CLA00640
C   NWDS = TOTAL NO. WORDS AVAIL ON DRUM (SEE CALL TO RINIT IN READTP)         CLA00650
   10 CALL READTP(LAST,LINK(200),TOPID)                                        CLA00660
C   SET PRINT COUNTERS                                                         CLA00670
      PRTME=1                                                                  CLA00680
      PROUT=1                                                                  CLA00690
      LNCAT=0                                                                  CLA00700
C                                                                              CLA00710
C   CALL MULTI TO PERFORM CLUSTERING                                           CLA00720
      TOP = 18000                                                              CLA00730
       CALL MULTI (  ARRAY(IPT)  )                                             CLA00740
C                                                                              CLA00750
C   PRINT CLUSTER MAP                                                          CLA00760
      MAP = 1                                                                  CLA00770
      CALL CLUSMP (MAP)                                                        CLA00780
C   IF(LAST.NE.1) GO TO 10                                                     CLA00790
```

ORIGINAL PAGE IS
OF POOR QUALITY

FILE: CLASY FORTRAN A

```
      STOP                                                          CLA00800
      END                                                           CLA00810
```

FILE: CLDUMP FORTRAN A

```
      SUBROUTINE CLDUMP(KLHED)                                                  CLD00010
C     THIS ROUTINE PRINTS OUT ALL THE CLASSES VIA ROUTINE 'CLPR'.               CLD00020
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),             CLD00030
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),                 CLD00040
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),            CLD00050
     3 PQRAT(13),DISS(12),PPASS(11),PST(11),OCIN(10),PCOND(7),                  CLD00060
     4 OPRIOR(9),ODEN(8)                                                        CLD00070
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                           CLD00080
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                       CLD00090
      EQUIVALENCE (LINK(3),LSUBS(30))                                           CLD00100
      EQUIVALENCE(LINK(3),LSUPER(29)),  (LINK(31),IDADJ(28)),                   CLD00110
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),      CLD00120
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),          CLD00130
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),           CLD00140
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),         CLD00150
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)),       CLD00160
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),         CLD00170
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),          CLD00180
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),           CLD00190
     9 (LINK(31),GREF(8))                                                       CLD00200
      COMMON/CLUS/ JUNK(12),NARL,NTOP,NTBS7M,NWANT,LINK(14000)                  CLD00210
      DIMENSION MVAR(3),LR(3),LV(3)                                             CLD00220
      EQUIVALENCE (LW(1),LVRIN),(LR(2),LKURT),                                  CLD00230
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)                CLD00240
C                                                                               CLD00250
      COMMON /MISC/ MO,MM,LP,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,              CLD00260
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SHLTH,           CLD00270
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                  CLD00280
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           CLD00290
     4    METTER,MODE,CORLEN,SPCOR                                              CLD00300
C                                                                               CLD00310
      DIMENSION PACCEL(2),MACCEL(2),VACCEL(2)                                   CLD00320
C                                                                               CLD00330
      COMMON /SIPAW/WAIT,CONLV,SKRND,SKCHI,TRHND,TRCHI,URKRND,URKCHI,           CLD00340
     1     PACCEL,MACCEL,VACCEL                                                 CLD00350
C                                                                               CLD00360
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,                  CLD00370
     1              LNCAT, PRNT(4) , KLPC , PRTME, PROUT, TOTPIX,               CLD00380
     2  SCRAM1,HUFPIX,HUFTOT,NHUFSO,NDUMP,LAUFD                                CLD00390
     4, MAXRF, AREA, NWDS, NWORS, NPTS, LBUF, IQ1,NOCYCL                        CLD00400
C                                                                               CLD00410
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,HUFPIX,HUFTOT           CLD00420
     1 ,CLSNAM                                                                  CLD00430
C                                                                               CLD00440
      LOGICAL ISPLIT,IJSP                                                       CLD00450
      NOFKL=0                                                                   CLD00460
      KL=KLHED                                                                  CLD00470
      WRITE (6,9876) KLHED,INDEX(KLHED),LSUPER(KLHED)                           CLD00480
9876  FORMAT (' KL,INDEX,LSUPER',6I6)                                           CLD00490
      KROOT=LSUPER(KL)                                                          CLD00500
      KLIN=LINK(KL)                                                             CLD00510
      PRINT 210,INDEX(KL),KL                                                    CLD00520
  210 FORMAT('1DUMP OF OBSERVED CLUSTERS FROM',I3,I7)                           CLD00530
      LEVEL=0                                                                   CLD00540
      GO TO 11                                                                  CLD00550
    9 LEVEL=LEVEL+1                                                             CLD00560
   10 NSYMB(KL)=0                                                               CLD00570
      IJSP = ISPLIT(KL)                                                         CLD00580
      IF(ISPLIT(KL)) GO TO 19                                                   CLD00590
      NOFKL=NOFKL+1                                                             CLD00600
      NSYMB(KL)=NOFKL                                                           CLD00610
19    CONTINUE                                                                  CLD00620
      CALL CLPR(KL,LEVEL,GEN(LSUM),GEN(LSKEW),GEN(LKURT))                       CLD00630
      IJSP=ISPLIT(KL)                                                           CLD00640
      KEEP=KL                                                                   CLD00650
      KL=LSUBS(KL)                                                              CLD00660
      IF(KL.NE.0.AND.(ISPLIT(KEEP).OR.PROUT.LE.2)) GO TO 9                      CLD00670
   17 KL=LINK(KEEP)                                                             CLD00680
      IF(KL.EQ.KLIN) GO TO 99                                                   CLD00690
   11 IF(KL)10,20,10                                                            CLD00700
   20 KL=LSUPER(KEEP)                                                           CLD00710
      LEVEL=LEVEL-1                                                             CLD00720
      KEEP =KL                                                                  CLD00730
      IF(KL.NE.KROOT) GO TO 17                                                  CLD00740
   99 RETURN                                                                    CLD00750
      END                                                                       CLD00760
```

FILE: CLINIT FORTRAN A

```
      SUBROUTINE CLINIT(KROT)                                                CLI00010
C     THIS ROUTINE CONTAINS THE VARIOUS STATEMENTS NECESSARY TO              CLI00020
C        INITIALIZE THE CLUSTERING ALGORITHM.                                CLI00030
      REAL*8 XTEMP,YTEMP,ZTEMP,DURK,DURKD                                    CLI00040
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),          CLI00050
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),              CLI00060
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),         CLI00070
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),               CLI00080
     4 OPRIOR(9),ODEN(8)                                                     CLI00090
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                        CLI00100
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                    CLI00110
      EQUIVALENCE (LINK(3),LSUBS(30))                                        CLI00120
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),               CLI00130
     1 (LINK(3),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),CLI00140
     2 (LINK(3),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),        CLI00150
     3 (LINK(3),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),         CLI00160
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),      CLI00170
     5 (LINK(3),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(3),PQRAT(13)),      CLI00180
     6 (LINK(3),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(3),PST(11)),        CLI00190
     7 (LINK(3),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(3),VRIN(7)),         CLI00200
     8 (LINK(3),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(3),ODEN(8)),          CLI00210
     9 (LINK(3),GREF(8))                                                     CLI00220
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTHS7M,NWANT,LINK(14000)              CLI00230
      DIMENSION MXAR(31),LR(3),LV(3)                                         CLI00240
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                               CLI00250
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)             CLI00260
C                                                                            CLI00270
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,           CLI00280
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SALTH,        CLI00290
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,               CLI00300
     3    AMQMIN,AMQMAX,AMQRAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,         CLI00310
     4    BETTER,MODE,CORLEN,SPCOR                                           CLI00320
C                                                                            CLI00330
      COMMON /STPAR/WAIT,CONLV,SKRND,SKCHI,TRRND,TRCHI,URKRND,URKCHI,        CLI00340
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                      CLI00350
C                                                                            CLI00360
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,               CLI00370
     1              LNCAT, PRNT(4) , KLHC , PRTMF, PROUT, TOTPIX,            CLI00380
     2  SCRAM),HUFPIX,BUFTOT,NHUFSO,NDUMP,LHUFD                             CLI00390
     3, MAXBF, AREA, NWDS, NWDRS, NPTS, LBUF, IO1,NOCYCL                     CLI00400
C                                                                            CLI00410
      INTEGER IOTWRD,SYM,PRNT,PRTMF,PROUT,TOTPIX,SCRAM),HUFPIX,BUFTOT        CLI00420
     1 ,CLSNAM                                                               CLI00430
C                                                                            CLI00440
      COMMON /INITL/WTNEW,DEVINI,CHANIN                                      CLI00450
      CHIVAL(DF)=DF*(1.-.222/DF*CONLV*SQRT(.222/DF))**3                      CLI00460
C                                                                            CLI00470
      AMQ=MQ                                                                 CLI00480
C  WE FIRST SET UP VARIOUS INDEX ARRAYS FOR A PARTICULAR                     CLI00490
C     NUMBER OF CHANNELS MQ.                                                 CLI00500
C     SET UP THE TRIANGULAR POSITION ARRAY MXAR.                             CLI00510
      MM=0                                                                   CLI00520
      DO 10 I=1,31                                                           CLI00530
      MXAR(I)=MM                                                             CLI00540
   10 MM=MM+I                                                                CLI00550
      MM=MXAR(MQ+1)                                                          CLI00560
      AMM=MM                                                                 CLI00570
C NOW WE SET UP THE ORIGIN VECTORS, LR AND LV, OF THE VARIOUS ARRAYS         CLI00580
C     AND VECTORS IN A CLUSTER NODE.                                         CLI00590
      NINCLS=1                                                               CLI00600
C *****  THIS CONSTANT MUST BE SET TO THE NUMBER OF ARRAYS *****             CLI00610
      DO 21 I=1,3                                                            CLI00620
      LR(I)=NINCLS                                                           CLI00630
   21 NINCLS=NINCLS+MM                                                       CLI00640
      DO 22 I=1,3                                                            CLI00650
      LV(I)=NINCLS                                                           CLI00660
   22 NINCLS=NINCLS+MQ                                                       CLI00670
      NSCALS = 25                                                            CLI00680
      NINCLS=NINCLS+NSCALS-1                                                 CLI00690
C  WE MUST ALSO SET UP SOME THRESHOLDS FOR USE BY THE STATISTICAL            CLI00700
C     SYSTEM.                                                                CLI00710
      SKCHI=(AMQ+2.)*(AMQ+4.)*CHIVAL(AMQ)                                    CLI00720
      URKCHI=AMQ*(AMQ+4.)*(AMQ+6.)/(AMQ-.999)*CHIVAL(AMM-1.)                 CLI00730
      TRCHI=CONLV*CONLV*(AMQ*(AMQ+2.)*(AMQ+3.)*8.)                           CLI00740
C  WE NOW CREATE THE HEAD NODE OF THE CLUSTER TREE.  THIS IS NOT             CLI00750
C     AN ACTUAL CLUSTER, AND DOES NOT HAVE STORAGE FOR ANY                   CLI00760
C     OF THE STATISTICAL ARRAYS.                                             CLI00770
      NPTSO=0                                                                CLI00780
      KROOT=MORSTR(NSCALS)                                                   CLI00790
```

FILE: CLINIT FORTRAN A

```
C    MAKE FIRST NODE START AT AN ODD NUMBER                                    CLI00800
       IF (MOD(NTOP,2) .NE. 1) NTOP = NTOP + 1                                 CLI00810
       LINK(KROT)=-262139                                                      CLI00820
       LSUPER(KROT)=-262142                                                    CLI00830
       IDADJ(KROT)=999999                                                      CLI00840
       INDEX(KROT)=-0                                                          CLI00850
       SPFAC(KROT)=99999.                                                      CLI00860
       W(KROT)=WTINIT                                                          CLI00870
       OW(KROT)=W(KROT)                                                        CLI00880
       PORAT(KROT)=0.                                                          CLI00890
       PROP(KROT)=1.                                                           CLI00900
       OPROP(KROT)=1.                                                          CLI00910
       CIN(KROT)=W(KROT)                                                       CLI00920
       OCIN(KROT)=CIN(KROT)                                                    CLI00930
       CTOT(KROT)=0.                                                           CLI00940
       ODEN(KROT)=W(KROT)                                                      CLI00950
       PATRCH(KROT)=1.                                                         CLI00960
C  NEXT THE INITIAL NODE IS SET UP. TOGETHER WITH SOME CONTROL THRESHOLDS      CLI00970
   57 KFIR=MORSTR(NINCLS)                                                     CLI00980
       DO 54 J=1,MM                                                           CLI00990
       GREF(KFIR+LOVAR+J)=0.                                                  CLI01000
       GREF(KFIR+LKURT+J)=0.                                                  CLI01010
   54  VRIN(KFIR+J)=0.                                                        CLI01020
       DEV2WT=DEVINI*DEVINI*WTINIT                                            CLI01030
       DO 53 J=1,MQ                                                           CLI01040
       GREF(KFIR+LSUM+J)=WTINIT*CHANIN                                        CLI01050
       GREF(KFIR+LOSUM+J)=WTINIT*CHANIN                                       CLI01060
       KLJ=KFIR+MXAR(J+1)                                                     CLI01070
       VRIN(KLJ)=1./DEV2WT                                                    CLI01080
       GREF(KLJ+LOVAR)=DEV2WT                                                 CLI01090
       GREF(KLJ+LKURT)=(MQ+2)*DEV2WT                                          CLI01100
   53  GREF(KFIR+LSKEW+J)=0.                                                  CLI01110
       VOLRT(KFIR)=.9357622969E-13*(2.506628275*DEVINI)**MQ                   CLI01120
       VOLIN(KFIR)=VOLRT(KFIR)**2                                             CLI01130
C      VOLIN*EXP(OCON)=(2*PI)**MQ*DET(COVARIANCE)=(2*PI/W)**MQ/DET(VRIN)      CLI01140
       ODCON=MQ*ALOG(WTINIT)+60.                                              CLI01150
       OCON(KFIR)=ODCON                                                       CLI01160
       W(KFIR)=WTINIT                                                         CLI01170
       OW(KFIR)=WTINIT                                                        CLI01180
       CIN(KFIR)=W(KFIR)                                                      CLI01190
       OCIN(KFIR)=CIN(KFIR)                                                   CLI01200
       WADJ(KFIR)=WADJIN                                                      CLI01210
       SPFAC(KFIR)=-9999.                                                     CLI01220
       PORAT(KFIR)=0.                                                         CLI01230
       CTOT(KFIR)=0.                                                          CLI01240
       ODEN(KFIR)=W(KFIR)                                                     CLI01250
       PROP(KFIR)=1.                                                          CLI01260
       OPROP(KFIR)=1.                                                         CLI01270
       PATRCH(KFIR)=1.                                                        CLI01280
       LINK(KFIR)=0                                                           CLI01290
       LSUBS(KFIR)=0                                                          CLI01300
       LSUPER(KFIR)=KROT                                                      CLI01310
       LSUBS(KROT)=KFIR                                                       CLI01320
       TOTPIX = TOTWRD/MQ                                                     CLI01330
       IDADJ(KFIR)=TOTPIX                                                     CLI01340
       INDEX(KFIR)=INDXVL                                                     CLI01350
       PRINT 273,MQ,CONLV,TRCHI,SKCHI,URKCHI,KROT,KFIR                        CLI01360
  273 FORMAT (1) CONFIDENCE LEVELS',I4,' CHANNELS',F8.4,'  CHISQUARES',      CLI01370
     1     3E11.5/'   ROOT',I5,'   FIRST',I5)                                CLI01380
       RETURN                                                                 CLI01390
       END                                                                    CLI01400
C                                                                             CLI01410
C *****  THIS CONSTANT MUST BE SET TO THE NUMBER OF VECTORS *****             CLI01420
```

FILE: CLMP FORTRAN A

```
      SUBROUTINE CLUSMP                                                 CLM00010
C*                                                                      CLM00020
C*    THE PURPOSE OF CLUSMP IS TO PRINT THE CLUSTER MAP.  THE CLUSTER   CLM00030
C*    MAP HAS EACH PIXEL REPRESENTED BY A SYMBOL.  EACH SYMBOL          CLM00040
C*    REPRESENTS A CLUSTER TYPE                                         CLM00050
C*                                                                      CLM00060
      IMPLICIT INTEGER (A-Z)                                            CLM00070
C                                                                       CLM00080
      COMMON /ARRAY/TOP, ARRAY(18000)                                   CLM00090
C                                                                       CLM00100
      DIMENSION BUFER(1), COL(3,110), OUT(110), FL(8), FLDINF(6),       CLM00110
     1 CLUSTN(110), NBLK(61), NBLKT(61)                                 CLM00120
C                                                                       CLM00130
C                                                                       CLM00140
      COMMON /GLOBAL/HEAD(63), MAPTAP,    DATAPE,    SAVTAP,   BMFILE,CLM00150
     1  BMKEY,HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,DRUMAD,  CLM00160
     2  ASAVFL,NHSUN,NHSTFI  , DUPSYM, THRSYM,     MAXDIV,     MIN      CLM00170
C                                                                       CLM00180
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,          CLM00190
     1                LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,     CLM00200
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                        CLM00210
     3, MAXBF, AREA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL                CLM00220
C                                                                       CLM00230
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT   CLM00240
     1 ,CLSNAM                                                          CLM00250
C                                                                       CLM00260
      DIMENSION NTR(32)                                                 CLM00270
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),     CLM00280
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),         CLM00290
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),    CLM00300
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),          CLM00310
     4 OPRIOR(9),ODEN(8)                                                CLM00320
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                   CLM00330
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))               CLM00340
      EQUIVALENCE (LINK(3),LSUBS(30))                                   CLM00350
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          CLM00360
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),CLM00370
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),  CLM00380
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),   CLM00390
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)), CLM00400
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)),CLM00410
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)), CLM00420
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),  CLM00430
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),   CLM00440
     9 (LINK(31),GREF(8)),  (LINK(31),NTR(31))                          CLM00450
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRSZM,NWANT,LINK(14000)         CLM00460
      DIMENSION MXAR(3),LR(3),LV(3)                                     CLM00470
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                          CLM00480
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        CLM00490
C                                                                       CLM00500
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROUT,EPS,DELT,      CLM00510
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,FLIMTH,SFPTH,VFAC,AMM,SHLTH,   CLM00520
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          CLM00530
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    CLM00540
     4    BETTER,MODE,CORLEN,SPCOR                                      CLM00550
C                                                                       CLM00560
      COMMON /STPAR/WAIT,CONLV,SKRND,SKCHI,TRRND,TRCHI,URKRND,URKCHI,   CLM00570
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                 CLM00580
C                                                                       CLM00590
      LOGICAL NFIN                                                      CLM00600
      REAL BUFFR                                                        CLM00610
C                                                                       CLM00620
      EQUIVALENCE (COL(1,1),ARRAY(2001))                                CLM00630
      EQUIVALENCE (OUT(1)  ,ARRAY(2400))                                CLM00640
      EQUIVALENCE (CLUSTN(1),ARRAY(2510))                               CLM00650
      EQUIVALENCE (NBLK(1),ARRAY(2620))                                 CLM00660
      EQUIVALENCE (NBLKT(1),ARRAY(2730))                                CLM00670
      EQUIVALENCE (BUFER(1),ARRAY(3001))                                CLM00680
      EQUIVALENCE (FLDINF(1),LINSTR) ,(FLDINF(4),SAMSTR),               CLM00690
     1            (FLDINF(2),LINEND) ,(FLDINF(5),SAMEND),               CLM00700
     2            (FLDINF(3),LININC) ,(FLDINF(6),SAMINC)                CLM00710
C*    FIELD INFORMATION STORED AS FOLLOWS                               CLM00720
C*                                                                      CLM00730
C*    ARRAY(1)    =FIRST FIELD NAME FOR THIS CLASS                      CLM00740
C*         (2)    =NO. OF VERTICES FOR THIS FIELD (NV)                  CLM00750
C*         (3)-(3+NV*2)   = ACTUAL VERTEX NUMBERS                       CLM00760
C*         (3+NV*2)   =TOTAL PIXELS FOR THIS FIELD                      CLM00770
C*         (4+NV*2)-(10+NV*2) = FLDINF BLOCK FOR THIS FIELD             CLM00780
C*                                                                      CLM00790
```

```
FILE: CLMP     FORTRAN  A

      DATA BLANK/' '/                                                          CLM00800
C                                                                              CLM00810
CC                                                                             CLM00820
CC                        *****  INITIALIZE *****                            CLM00830
9999   CONTINUE                                                                CLM00840
      LNCAT=0                                                                  CLM00850
       NOFEAT = 40                                                             CLM00860
      IPT=1                                                                    CLM00870
         MAXPOP = 61                                                           CLM00880
      DO 25 I=1,MAXPOP                                                         CLM00890
   25 NBLKT(I)=0                                                               CLM00900
C                                                                              CLM00910
C  CALL MAXIMUM BUFFER SIZE THAT IS AN EVEN NUMBER OF PIXELS                   CLM00920
      TOP = 14000                                                              CLM00930
      MAXBUF =(TOP - 3000)/NOFEAT * NOFEAT                                     CLM00940
C  MXBF = MAX BUFFER SIZE                                                      CLM00950
      MXBF=3300                                                                CLM00960
C*                                                                             CLM00970
CC                                                                             CLM00980
C                    **********                                                CLM00990
      DO 600 IFLD=1,NOFLD                                                      CLM01000
C                                                                              CLM01010
CC                                                                             CLM01020
C  XTRA = SEGMENTS ALREADY PROCESSED                                           CLM01030
      XTRA=0                                                                   CLM01040
C  NFIN = FALSE IF ONLY 1 PAGE NEEDED                                          CLM01050
      NFIN=.FALSE.                                                             CLM01060
C  NV = NO OF VERTICES FOR THIS FIELD                                          CLM01070
      NV=ARRAY(IPT+1)                                                          CLM01080
C  TOTSAM = TOTAL PIXELS FOR THIS FIELD                                        CLM01090
      TOTSAM=ARRAY(IPT+2+NV*2)                                                 CLM01100
C                                                                              CLM01110
C  MOVE DATA DEFINING LINES AND SAMPLES                                        CLM01120
      DO 30 I=1,5                                                              CLM01130
      FLDINF(I)=ARRAY(IPT+2+I+NV*2)                                            CLM01140
   30 CONTINUE                                                                 CLM01150
C                                                                              CLM01160
C  BLANK OUTPUT BUFFER                                                         CLM01170
      DO 40 I=1,110                                                            CLM01180
   40 OUT(I)=BLANK                                                             CLM01190
C                                                                              CLM01200
C  ZERO COUNT OF POINTS IN CLUSTER                                             CLM01210
      DO 45 I=1,MAXPOP                                                         CLM01220
   45 NBLK(I)=0                                                                CLM01230
C*                                                                             CLM01240
C*    CHECK IF ALL OF CLUSTER MAP CAN FIT ACROSS ONE PAGE--ONLY 110            CLM01250
C*    SYMBOLS ARE PRINTED ACROSS THE PAGE FOR EVERY LINE.  THE PROGRAM         CLM01260
C*    WILL PRINT THE ENTIRE CLUSTER MAP IN 110 SYMBOL SEGMENTS                 CLM01270
C*                                                                             CLM01280
CC                                                                             CLM01290
C                                                                              CLM01300
C  SET STARTING ADDRESS AND ENDING ADDRESS FOR LINE                            CLM01310
      STCLM=SAMSTR                                                             CLM01320
      ENCLM=SAMEND                                                             CLM01330
C                                                                              CLM01340
CC  CK FOR MORE THAN 110 SEGMENTS SPECIFIED AND RESET MAXIMUM IF NECESSRY      CLM01350
C   NFIN = FALSE. IF 1 LINE     TRUE. IF 2 OR MORE LINES                       CLM01360
C                                                                              CLM01370
   50 IF(((ENCLM-SAMSTR)/SAMINC+1-XTRA).LE. 110) GO TO 80                      CLM01380
      ENCLM=  (100+XTRA)*SAMINC + SAMSTR                                       CLM01390
      NFIN=.TRUE.                                                              CLM01400
C                                                                              CLM01410
C       * READ 1 BUFFER OF DATA *                                              CLM01420
CC                                                                             CLM01430
C  TWRD = TOTAL WORDS LEFT TO BE READ                                          CLM01440
27    TWRD = TOTWRD                                                            CLM01450
C  READ FULL BUFFER OF DATA UNLESS ONLY PARTIAL BUFFER OF DATA LEFT            CLM01460
      NOWRD = MAXBUF                                                           CLM01470
      IF (TWRD .LT. NOWRD) NOWRD = TWRD                                        CLM01480
C  IBEGIN IS BEGINNING OF SCRAMBLED DATA                                       CLM01490
      CALL BREAD (IBEGIN, BUFER, NOWRD, DUMMY)                                 CLM01500
      NOPASS = IBEGIN + NOWRD                                                  CLM01510
      TWRD = TWRD - NOWRD                                                      CLM01520
      BUFAD = 1                                                                CLM01530
C                                                                              CLM01540
C                        *** SET COLUMN HEADINGS ***                           CLM01550
   80 CONTINUE                                                                 CLM01560
      J=0                                                                      CLM01570
      DO 100 I=SAMSTR,SAMEND,SAMINC                                            CLM01580
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FILE: CLMP     FORTRAN  A

      IF( I .LT. STCLM)GO TO 100                                          CLM01590
      IF( I .GT. ENCLM)GO TO 110                                          CLM01600
      J=J+1                                                               CLM01610
      COL(1,J)=I/100                                                      CLM01620
      COL(2,J)=MOD(I,100)/10                                              CLM01630
      COL(3,J)=MOD(I,10)                                                  CLM01640
  100 CONTINUE                                                            CLM01650
C                                                                         CLM01660
C                          *** WRITE HEADINGS ***                         CLM01670
  110 LPTS=J                                                              CLM01680
      WRITE(6,500)                                                        CLM01690
      WRITE(6,HEAD)                                                       CLM01700
      WRITE(6,510)ARRAY(IPT),TOTSAM                                       CLM01710
C*    PRINT COLUMN NUMBERS FOR CLUSTER MAP                                CLM01720
      DO 120 I=1,3                                                        CLM01730
  120 WRITE(6,520)(COL(I,J),J=1,LPTS)                                     CLM01740
      WRITE(6,500)                                                        CLM01750
  500 FORMAT(/)                                                           CLM01760
  510 FORMAT(//2X,A6,//' TOTAL NUMBER OF POINTS IN THIS FIELD',I7)        CLM01770
  520 FORMAT(9X,110I1)                                                    CLM01780
C                                                                         CLM01790
C                                                                         CLM01800
C                    ******  PROCESS ONE LINE OF DATA  ******             CLM01810
C                                                                         CLM01820
      DO 300 LINE=LINSTR,LINEND,LININC                                    CLM01830
C*                                                                        CLM01840
C*    CALL FDLINT TO OBTAIN FIELD INTERSECTIONS FOR THIS LINE             CLM01850
      CALL FDLINT(ARRAY(IPT+2),NV,FL,LINE,SAMPS,NI)                       CLM01860
C     WRITE (3,9967) NI,SAMSTR,SAMINC,SAMEND,NOFEAT,IE,IB,FL(1),FL(2)     CLM01870
9967  FORMAT ('CLUSMP NI,SAMSTR,SAMINC,SAMEND,NOFEAT,IE,IB,FL(1),FL(2)',CLM01880
     1  /, 917)                                                          CLM01890
C                                                                         CLM01900
C                    *****  PROCESS EACH INTERCEPT *****                 CLM01910
      DO 200 I=1,NI,2                                                     CLM01920
      NOEX=0                                                              CLM01930
C                                                                         CLM01940
C*    SAVE THE BEGINNING AND END NUMBERS OF THIS INTERCEPT FOR ARRAY OUT  CLM01950
C*    WHICH IS PRINTED                                                    CLM01960
      IB =(FL(I)-SAMSTR)/SAMINC +1                                        CLM01970
      IE =(FL(I+1)-SAMSTR)/SAMINC+1                                       CLM01980
C     WRITE (3,9968) IB,IE                                                CLM01990
      IF(MOD(SAMSTR,SAMINC) .NE. MOD(FL(I),SAMINC))IB =IB +1              CLM02000
      TNPTS=(IE-IB+1)*NOFEAT                                              CLM02010
      IF(IB  .GT. IE )TNPTS=0                                             CLM02020
      IF(IB  .GT. IE ) GO TO 140                                          CLM02030
C                                                                         CLM02040
C*    CHECK IF INTERCEPTS ARE WITHIN PRINTOUT LIMITS                      CLM02050
      IF(FL(I) .GT. ENCLM) GO TO 140                                      CLM02060
      IF(FL(I+1) .LT. STCLM) GO TO 140                                    CLM02070
      GO TO 150                                                           CLM02080
C                                                                         CLM02090
C*    THESE CARDS ARE USED TO SET UP THE OUTPUT FOR BLANK LINES OR BLANK  CLM02100
C*    SPACES OR AREAS OUTSIDE OF PRINT LIMITS                             CLM02110
  140 CONTINUE                                                            CLM02120
      IF (I+1 .NE. NI) WRITE (6,141)                                      CLM02130
141   FORMAT (1X)                                                         CLM02140
      GO TO 200                                                           CLM02150
C                                                                         CLM02160
C                                                                         CLM02170
  150 CONTINUE                                                            CLM02180
C*    RESAVE BEGINNING AND END NUMBERS FOR ARRAY OUT IF INTERCEPT(S)      CLM02190
C*    EXCEEDS PRINT LIMIT                                                 CLM02200
      IF(FL(I) .GE. STCLM) GO TO 152                                      CLM02210
      IBO=IB                                                              CLM02220
      IB=(STCLM-SAMSTR)/SAMINC+1                                          CLM02230
      IF(MOD(SAMSTR,SAMINC) .NE. MOD(STCLM,SAMINC))IB=IB+1                CLM02240
C*                                                                        CLM02250
C*    STORE NUMBER OF EXTRA POINTS THAT ARE IN INTERCEPT BUT ARE          CLM02260
C*    OUTSIDE THE PRINT LIMITS ON LEFT SIDE                               CLM02270
      NOEX=(IB-IBO)*NOFEAT                                                CLM02280
      BUFAD=BUFAD+NOEX                                                    CLM02290
  152 IF(FL(I+1) .GT. ENCLM)IE=(ENCLM-SAMSTR)/SAMINC+1                    CLM02300
C*                                                                        CLM02310
C*    SET PRINT LIMITS IN THE 1-110 LIMITS WHEN THE NUMBERS WOULD EXCEED  CLM02320
C*    110 ON ANOTHER PASS THROUGH THE DATA                                CLM02330
      IB=IB-XTRA                                                          CLM02340
      IE=IE-XTRA                                                          CLM02350
      IF(IB .GT. IE) GO TO 140                                            CLM02360
      NSETS=IE-IB+1                                                       CLM02370
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FILE: CLMP      FORTRAN  A

      NPNTS=NSETS*NOFEAT                                                    CLM02380
C                                                                           CLM02390
  155 CONTINUE                                                              CLM02400
C*                                                                          CLM02410
C*    CHECK IF NEEDED DATA IN THIS INTERCEPT IS IN TWO BUFFERS              CLM02420
C*                                                                          CLM02430
      IF (BUFAD + NPNTS .LE. NOWRD) GO TO 170                               CLM02440
C                                                                           CLM02450
C                                                                           CLM02460
C           **  COMPLETE LINE IS NOT IN BUFFER **                         CLM02470
C                                                                           CLM02480
C  IS ANY OF LINE IN CURRENT BUFFER?                                        CLM02490
      DIFF = BUFAD - NOWD                                                   CLM02500
      IF (BUFAD .LT. NOWRD) GO TO 157                                       CLM02510
C                                                                           CLM02520
C  NONE OF CURRENT LINE IS IN BUFFER. SET NEW BUFFER POINTER TO             CLM02530
C  SKIP OVER EXTRANEOUS POINTS                                              CLM02540
      ADRESS = ADRESS + DIFF                                                CLM02550
      TWRD = TWRD - DIFF                                                    CLM02560
      BUFAD = 1                                                             CLM02570
      GO TO 165                                                             CLM02580
C                                                                           CLM02590
C  SOME OF CURRENT BUFFER IS NEEDED. MOVE IT TO BEGINNING OF BUFFER         CLM02600
157   KOUNT = NOWRD - BUFAD + 1                                             CLM02610
      DO 160 I = 1,KOUNT                                                    CLM02620
      BUFFER(I) = BUFFER(BUFAD)                                             CLM02630
160   BUFAD = BUFAD + 1                                                     CLM02640
C                                                                           CLM02650
C  RESET BUFFER ADRES TO END OF OLD DATA                                    CLM02660
      BUFAD = KOUNT + 1                                                     CLM02670
C                                                                           CLM02680
C  READ DATA INTO REMINDER OF BUFFER                                        CLM02690
165   NOWRD = MAXBUF - BUFAD + 1                                            CLM02700
      IF (TWRD .LT. NOWRD) NOWRD = TWRD                                     CLM02710
      CALL BREAD(ADRESS,BUFFER(BUFAD),NOWRD,STAT)                           CLM02720
      ADRESS = ADRESS + NOWRD                                               CLM02730
      TWRD = TWRD - NOWRD                                                   CLM02740
      BUFAD = 1                                                             CLM02750
C                                                                           CLM02760
C*    CALL CLUST TO OBTAIN THE CLUSTER SUBSCRIPT SO THAT THE CLUSTER        CLM02770
C*    SYMBOLS CAN BE COMPUTED FOR EACH SET OF FL'S WITHIN THE               CLM02780
C*    START(STCLM) AND END(ENCLM)                                           CLM02790
170   CONTINUE                                                              CLM02800
9999  FORMAT ('IN.IF,CLUSTN 1-10',2I5,/,10I7)                               CLM02810
      CALL CLUST (BUFFER(BUFAD), NSETS, CLUSTN, KLBC, GEN(LSUM))            CLM02820
C                                                                           CLM02830
      L=0                                                                   CLM02840
C*                                                                          CLM02850
C*    STORE SYMBOLS FOR OUTPUT                                              CLM02860
      DO 173 K=IA,IF                                                        CLM02870
      L=L+1                                                                 CLM02880
      NUM=CLUSTN(L)                                                         CLM02890
C     SET SYMBOL--THE SUBSCRIPT FOR SYM IS RESET TO 1 THROUGH MAXPOP        CLM02900
       NTEMP = OSYMB(NUM)                                                   CLM02910
      J=MOD(NSYMB(NUM)-1,MAXPOP)+1                                          CLM02920
      IF ( J .LE. 0 )  J = 47                                               CLM02930
      LNCAT=MAXO(LNCAT,J)                                                   CLM02940
      OUT(K)=SYM(J)                                                         CLM02950
C*    SAVE THE NUMBER OF PIXELS ASSIGNED TO THIS CLUSTER                    CLM02960
  173 NBLK(J)=NBLK(J)+1                                                     CLM02970
C                                                                           CLM02980
190   BUFAD = BUFCT + NPNTS                                                 CLM02990
C                                                                           CLM03000
  200 CONTINUE                                                              CLM03010
C                                                                           CLM03020
  400 CONTINUE                                                              CLM03030
C                                                                           CLM03040
C                       ** END OF GENERATION OF LINES FOR 1 PAGE **         CLM03050
C                                                                           CLM03060
C  CHECK FOR ADDITIONAL PAGES                                               CLM03070
310   IF(.NOT. NFIN)GO TO 400                                               CLM03080
C                                                                           CLM03090
C  MULTIPLE PAGES. RESET BOUNDARIES                                         CLM03100
      XTRA=(ENCLM-SAMSTR)/SAMINC + 1                                        CLM03110
      STCLM=ENCLM+1                                                         CLM03120
      ENCLM=SAMEND                                                          CLM03130
      NFIN=.FALSE.                                                          CLM03140
C                                                                           CLM03150
C  GO TO PROCESS ADDITIONAL PAGES                                           CLM03160
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      GO TO 27                                                          CLM03170
C                                                                       CLM03180
  400 CONTINUE                                                          CLM03190
C                                                                       CLM03200
C                 **  END OF CLUSTER MAP **                             CLM03210
C                   ** PRINT COUNTS **                                  CLM03220
C                                                                       CLM03230
      DO 465 I=1,MAXPOP                                                 CLM03240
  465 NBLKT(I)=NBLKT(I)+NBLK(I)                                         CLM03250
C                                                                       CLM03260
      WRITE(6,570)                                                      CLM03270
  570 FORMAT(//2X,'POINTS PER CLUSTER IN THIS FIELD'/3X,'CLUSTER',      CLM03280
     * 5X,'SYMBOL',5X,'POINTS'/)                                       CLM03290
C                                                                       CLM03300
      LNCAT=MOD(LNCAT-1,MAXPOP)+1                                       CLM03310
C                                                                       CLM03320
C                                                                       CLM03330
      DO 580 I=1,LNCAT                                                  CLM03340
  580 WRITE(6,590)I,SYM(I),NBLK(I)                                      CLM03350
  590 FORMAT(6X,I2,10X,A1,7X,I5)                                        CLM03360
C                                                                       CLM03370
      IPT=IPT+9+NV*2                                                    CLM03380
  600 CONTINUE                                                          CLM03390
C                                                                       CLM03400
C                                                                       CLM03410
      WRITE(6,HEAD)                                                     CLM03420
      WRITE(3,750)LNCAT                                                 CLM03430
  750 FORMAT(//' TOTAL NUMBER OF CLUSTERS =',I3)                        CLM03440
C                                                                       CLM03450
      TOTPTS=TOTWRD/NOFFAT                                              CLM03460
C                                                                       CLM03470
      WRITE(6,760) TOTPTS                                               CLM03480
  760 FORMAT(/' TOTAL NUMBER OF POINTS =',I5)                           CLM03490
C                                                                       CLM03500
      WRITE(6,770)                                                      CLM03510
  770 FORMAT(//' CLUSTER     SYMBOL     POINTS IN CLUSTER')            CLM03520
C                                                                       CLM03530
      DO 775 J=1,LNCAT                                                  CLM03540
  775 WRITE(6,780)J,SYM(J),NBLKT(J)                                     CLM03550
  780 FORMAT(4X,I2,9X,A1,10X,I7)                                        CLM03560
C                                                                       CLM03570
      RETURN                                                            CLM03580
      END                                                               CLM03590
C*                                                                      CLM03600
                                                                        CLM03610
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FILE: CLPR      FORTRAN  A

      SUBROUTINE CLPR(KL,ID,SUM,SKEW,KURT)                                  CLP00010
C  THIS ROUTINE PRINTS OUT ALL THE VARIABLES BELONGING TO SOME              CLP00020
C   CLASS INDEXED BY KL.                                                   CLP00030
      DIMENSION NTR(32)                                                     CLP00040
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),         CLP00050
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),             CLP00060
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),        CLP00070
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),              CLP00080
     4 OPRIOR(9),ODEN(8)                                                    CLP00090
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                       CLP00100
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                   CLP00110
      EQUIVALENCE (LINK(3),LSUBS(30))                                       CLP00120
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),              CLP00130
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),  CLP00140
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),      CLP00150
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),       CLP00160
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),     CLP00170
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),   CLP00180
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),     CLP00190
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),      CLP00200
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),       CLP00210
     9 (LINK(31),GREF(8)),  (LINK(31),NTR(31))                              CLP00220
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRSZM,NWANT,LINK(14000)             CLP00230
      DIMENSION MXAR(31),LR(3),LV(3)                                        CLP00240
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                              CLP00250
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)            CLP00260
C                                                                           CLP00270
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          CLP00280
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,       CLP00290
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,OWFAC,GRACTM,AMOFAC,              CLP00300
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,       CLP00310
     4    BETTER,MODE,CORLEN,SPCOR                                          CLP00320
C                                                                           CLP00330
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URBND,URKCHI,        CLP00340
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                    CLP00350
      REAL RTEMP(30)                                                        CLP00360
      REAL SUM(1),SKEW(1),KURT(1)                                           CLP00370
      REAL AMEAN(16),OMEAN(16)                                              CLP00380
      IF(KL.EQ.0) RETURN                                                    CLP00390
      PRR=1.                                                                CLP00400
      LPCC=LSUPER(KL)                                                       CLP00410
      IF (KL .EQ. 119) LPCC = 119                                           CLP00420
       IF (KL .EQ. 119) PRR = 0.                                            CLP00430
      IF(KL .NE. 119 .AND. INDEX(KL).NE.0) PRR=PROP(KL)/PRIRCM(LPCC)        CLP00440
      PRINT 101,ID,INDEX(KL),PRR,W(LPCC),SPFAC(KL),W(KL),OW(KL),            CLP00450
     1  WADJ(KL),IDADJ(KL),PROP(KL),CIN(KL),CTOT(KL),OPROP(KL),OCIN(KL),    CLP00460
     2    ODEN(KL),PORAT(KL),VOLIN(KL),VOLRT(KL),DCON(KL)                   CLP00470
  101 FORMAT('0CLUSTER',I4,'  INDEX',I4,'  PROPORTION',F11.5,               CLP00480
     1    ' W PARENT',F9.3,/,'  SPLIT',F11.4/                               CLP00490
     2    ' WEIGHT',F12.3,2X,'WAS',F12.3,                                   CLP00500
     3     4X,'ADJUST',F12.3,'  ID',I6/                                     CLP00510
     4    ' PROPORTION: PROP',F8.5,'  CIN',F8.2,'  CTOT',F8.2/              CLP00520
     5 ' OLD PROP',F9.6,'  CIN',F7.2,'  ODEN',F7.2,'  DIFFER',F7.2/         CLP00530
     6    ' VOLUME',F8.2,'   ROOT',F8.2,'   DCON',F8.2)                     CLP00540
      LPCD=LINK(KL)                                                         CLP00550
      LPCDC=LSUBS(KL)                                                       CLP00560
C     WRITE (3,9912) KL,LPCD,LPCDC                                          CLP00570
9912  FORMAT (' KL,LPCD,LPCDC',3I8)                                         CLP00580
      IF (LPCD .GE. 0 .AND. LPCDC .GE. 0) PRINT 102,KL,INDEX(LPCD),         CLP00590
     1 LINK(KL),INDEX(LPCDC),LSUBS(KL),INDEX(LPCC),LSUPER(KL),NSYMB(KL)    CLP00600
  102 FORMAT('0 LOCATION',I5,'  LINK',I3,I5,'  SUBS',I3,I5,'  SUPER',       CLP00610
     1    I3,I5,'  SYMBOL',I6)                                             CLP00620
      WRITE (6,103) INDEX(KL),NSYMB(KL)                                     CLP00630
      WRITE (3,103) INDEX(KL),NSYMB(KL)                                     CLP00640
103   FORMAT (' INDEX = ',I6,'     SYMBOL = ',I6)                           CLP00650
      PRINT 112,PST(KL),PCOND(KL),PCUM(KL),PRIRCM(KL)                       CLP00660
  112 FORMAT('0NET PROB',F7.2,'  DIRECT',F7.2,'  CUMS',                     CLP00670
     1    F7.2,' *',F7.2)                                                   CLP00680
C                                                                           CLP00690
      XTEMP = 10.**(-25)                                                    CLP00700
      IF(PCUM(KL).LT.XTEMP.OR.PRIRCM(KL).LT.XTEMP)  PRINT 104,              CLP00710
     1  PCUM(KL),PRIRCM(KL)                                                CLP00720
  104 FORMAT(T29,'CUMS',E10.5,' * ',F10.5,//)                             CLP00730
      IF(INDEX(KL).EQ.0) RETURN                                             CLP00740
      WUSE=W(KL)                                                            CLP00750
      OWUSE=OW(KL)                                                          CLP00760
      IF(INDEX(KL).GE.0) GO TO 5                                            CLP00770
      WUSE=OW(KL)                                                           CLP00780
      OWUSE=W(KL)                                                           CLP00790
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FILE: CLPR FORTRAN A

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    5 TRK=0.                                                                CLP00800
      OVSK=0.                                                               CLP00810
      DO 2 I=1,MQ                                                           CLP00820
      LOD=LOCK(I,I)                                                         CLP00830
      TRK=TRK+KURT(KL+LOD)                                                  CLP00840
      OVSK=OVSK+GREF(LOSUM+KL+I,**2                                         CLP00850
      OMEAN(I)=GREF(LOSUM+I+KL)/OW(KL)                                      CLP00860
    2 AMEAN(I)=SUM(I+KL)/W(KL)                                              CLP00870
      PRINT 113,(AMEAN(I),I=1,MQ)                                           CLP00880
  113 FORMAT(*0 MEAN *,6X,8F7.2/(12X,8F7.2))                                CLP00890
C                                                                           CLP00900
      MQS=MQ*MQ                                                             CLP00910
C CHANGE RE:RASSHACH 3/21/77                                                CLP00920
      LA=MORSTR(MQS)                                                        CLP00930
C CHANGE RE:RASSHACH 3/21/77                                                CLP00940
      LB=MORSTR(MQS)                                                        CLP00950
      CALL SQMTX(ALINK(LB),VRIN(KL+1))                                      CLP00960
      CALL MINV(ALINK(LA),ALINK(LB),ALINK(LB),CVL)                          CLP00970
      DO 6 I=1,MQS                                                          CLP00980
    6 ALINK(LA+I-1)=ALINK(LA+I-1)/WUSE                                      CLP00990
      PRINT 116,(ALINK(LA+J-1),J=1,MQ)                                      CLP01000
  116 FORMAT(*0 COVARIANCE*,12F7.2/(12X,8F7.2))                             CLP01010
      DO 7 I=2,MQ                                                           CLP01020
    7 PRINT 105, I,(ALINK(LA+MQ*I+J-MQ-1),J=1,MQ)                           CLP01030
  105 FORMAT(5X,I5,2X,8F7.2/(16X,8F7.2))                                    CLP01040
C                                                                           CLP01050
C                                                                           CLP01060
      IF(TRK.EQ.0.) GO TO 150                                               CLP01070
      PRINT 107,(SKEW(KL+I),I=1,MQ)                                         CLP01080
  107 FORMAT(*0 SKEW(*W)  *,1X,8F7.1/(12X,8F7.1))                           CLP01090
       GO TO 200                                                            CLP01100
120     CONTINUE                                                            CLP01110
      DO 300 J=1,MQ                                                         CLP01120
      LOD=LOCK(I,J)                                                         CLP01130
      N=LOD+KL                                                              CLP01140
  300 KTEMP(J)=KURT(N)                                                      CLP01150
      PRINT 108, (KTEMP(J),J=1,MQ)                                          CLP01160
  108 FORMAT(*0   KURT(*W)   I*,2X,5F13.6/(16X,5F13.6))                     CLP01170
      DO 8 I=2,MQ                                                           CLP01180
      DO 308 J=1,MQ                                                         CLP01190
      LOD=LOCK(I,J)                                                         CLP01200
      LCH=LOD+KL                                                            CLP01210
  308 KTEMP(J)=KURT(LCH)                                                    CLP01220
    8 PRINT 105,I, (KTEMP(J),J=1,MQ)                                       CLP01230
  150 IF(OVSK.EQ.0..OR.OPROP(KL).EQ.PROP(KL).AND.INDEX(KL).GT.0)            CLP01240
     1     GO TO 200                                                        CLP01250
      PRINT 163,(OMEAN(I),I=1,MQ)                                           CLP01260
  163 FORMAT(/,*     OLD MEAN*,6X,5F13.6/(12X,5F13.6))                      CLP01270
      CALL SQMTX(ALINK(LA),GREF(LOVAR+KL+1))                                CLP01280
      DO 156 I=1,MQS                                                        CLP01290
  156 ALINK(LA+I-1)=ALINK(LA+I-1)/OWUSE                                     CLP01300
      PRINT 166,(ALINK(LA+J-1),J=1,MQ)                                      CLP01310
  166 FORMAT(*0   OLD COVARIANCE*,5F13.6/(16X,5F13.6))                      CLP01320
      DO 157 I=2,MQ                                                         CLP01330
  157 PRINT 105,I,(ALINK(LA+MQ*I+J-MQ-1),J=1,MQ)                            CLP01340
  200 CALL FREE(LA,MQS)                                                     CLP01350
      CALL FREE(LB,MQS)                                                     CLP01360
      PRINT 109                                                             CLP01370
  109 FORMAT(/)                                                             CLP01380
      RETURN                                                                CLP01390
      END                                                                   CLP01400
```

FILE: CLPRM FORTRAN A

```
      SUBROUTINE CLPRM(KL,IN,SUM,SKEW,KURT)                                  CLP00010
C  ******** THIS ROUTINE MUST BE COMPLILED USING RFOR.  *****                 CLP00020
C  THIS ROUTINE PRINTS OUT ALL THE VARIABLES BELONGING TO SOME                CLP00030
C   CLASS INDEXED BY KL.                                                      CLP00040
      DIMENSION NTR(32)                                                      CLP00050
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),          CLP00060
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),              CLP00070
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),         CLP00080
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),               CLP00090
     4 OPRIOR(9),ODEN(8)                                                     CLP00100
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                        CLP00110
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                    CLP00120
      EQUIVALENCE (LINK(31),LSUBS(30))                                       CLP00130
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),               CLP00140
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),   CLP00150
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),       CLP00160
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),        CLP00170
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),      CLP00180
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),    CLP00190
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),      CLP00200
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),       CLP00210
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),        CLP00220
     9 (LINK(31),GREF(8)),  (LINK(31),NTR(31))                               CLP00230
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRSZM,NWANT,LINK(14000)              CLP00240
      DIMENSION MXAR(31),LR(3),LV(3)                                         CLP00250
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                               CLP00260
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)             CLP00270
C                                                                            CLP00280
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,           CLP00290
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SHLTH,        CLP00300
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,               CLP00310
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,        CLP00320
     4    BETTER,MODE,COPLEN,SPCOR                                           CLP00330
C                                                                            CLP00340
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,        CLP00350
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                     CLP00360
      REAL SUM(1),SKEW(1),KURT(1)                                            CLP00370
      REAL AMEAN(15),OMEAN(16)                                               CLP00380
C                                                                            CLP00390
C  RETURN IF NO INDEX GIVEN                                                  CLP00400
      IF(KL.EQ.0) RETURN                                                     CLP00410
C                                                                            CLP00420
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,               CLP00430
     1                LNCAT, PRNT(4) , KLRC , PRTME, PROUT, TOTPIX,          CLP00440
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                             CLP00450
     3, MAXRF, AREA, NWDS, NWDRS, NPTS, LBUF, I01,NOCYCL                    CLP00460
C                                                                            CLP00470
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT        CLP00480
     1 ,CLSNAM                                                               CLP00490
C                                                                            CLP00500
C                                                                            CLP00510
C  PRINT GENERAL INFORMATION FOR CLUSTER                                     CLP00520
      PRINT 101,IN,INDEX(KL),PROP(KL),SPFAC(KL),W(KL),OW(KL),WADJ(KL),       CLP00530
     1  IDADJ(KL),CIN(KL),CTOT(KL),OPROP(KL),OCIN(KL),PORAT(KL),             CLP00540
     2    VOLIN(KL),VOLRT(KL),DCON(KL)                                       CLP00550
  101 FORMAT('0CLUSTER',I4,' INDEX',I3,'  PROPORTION',F9.6,                  CLP00560
     1    '  SPLITTING',E11.6/                                               CLP00570
     2  5X,'WEIGHT',F12.3,2X,'WAS',F12.3,                                   CLP00580
     3    4X,'ADJUST',F12.3,'  ID',I6/                                       CLP00590
     4    5X,'PROPORTION: CIN',E12.5,'   CTOT',F12.5/5X,'OLD PROP',F9.6,     CLP00600
     5    '   CIN',F12.5,'    DISTINCT',E12.5/5X,'VOLUME',E14.6,             CLP00610
     6    '   ROOT',E14.6,'   DCON',F13.7)                                   CLP00620
      PRINT 112,PST(KL),PCOND(KL),PCUM(KL),PRIRCM(KL)                        CLP00630
  112 FORMAT(5X,'DET PROB',E10.5,'   DIRECT',E10.5,'   CUMS',                CLP00640
     1    E10.5,' *',E10.5)                                                  CLP00650
C                                                                            CLP00660
C  RETURN IF KL IS ROOT NODE                                                 CLP00670
      IF(KL.EQ.KROOT) RETURN                                                 CLP00680
C                                                                            CLP00690
C  CALC OMEAN AND A MEAN                                                     CLP00700
      TRK=0.                                                                 CLP00710
      OVSK=0.                                                                CLP00720
      DO 2 I=1,MO                                                            CLP00730
      ITEMP = KL + LOCK(I,I)                                                 CLP00740
      TRK = TRK + KURT(ITEMP)                                                CLP00750
      OVSK=OVSK+GREF(LOSUM+KL+I)**2                                          CLP00760
      OMEAN(I)=GREF(LOSUM+I+KL)/OW(KL)                                       CLP00770
    2 AMEAN(I)=SUM(I+KL)/W(KL)                                               CLP00780
C                                                                            CLP00790
```

```
FILE: CLPNM    FORTRAN  A

C  PRINT A MEAN(MEAN)                                                    CLP00800
      PRINT 113,(AMEAN(I),I=1,MQ)                                       CLP00810
  113 FORMAT('0   MEAN',10X,5E13.6/(12X,5E13.6))                        CLP00820
C                                                                       CLP00830
C  GET TEMPORARY STORAGE                                                CLP00840
      MQS=MQ*MQ                                                         CLP00850
      LA=MORSTR(MQ*MQ)                                                  CLP00860
      LB=MORSTR(MQ*MQ)                                                  CLP00870
C                                                                       CLP00880
C                                                                       CLP00890
      CALL SQMTX(ALINK(LB),VRIN(KL+1))                                  CLP00900
C                                                                       CLP00910
C                                                                       CLP00920
      CALL MINV(ALINK(LA),ALINK(LB),ALINK(LB),CVL)                      CLP00930
C                                                                       CLP00940
C  CALC A LINK                                                          CLP00950
      DO 6 I=1,MQS                                                      CLP00960
    6 ALINK(LA+I-1)=ALINK(LA+I-1)/W(KL)                                 CLP00970
C                                                                       CLP00980
C  PRINT ALINK (COVARIANCE)                                             CLP00990
CC                                                                      CLP01000
      PRINT 116,(ALINK(LA+J-1),J=1,MQ)                                  CLP01010
  116 FORMAT('0   COVARIANCE     ',5E13.6/(16X,5E13.6))                 CLP01020
      DO 7 I=2,MQ                                                       CLP01030
    7 PRINT 105, I,(ALINK(LA+MQ*I+J-MQ-1),J=1,MQ)                       CLP01040
  105 FORMAT(11X,I5,2X,5E13.6/(16X,5E13.6))                             CLP01050
C                                                                       CLP01060
C  PRINT SKEW                                                           CLP01070
      PRINT 107,(SKEW(KL+I),I=1,MQ)                                     CLP01080
  107 FORMAT('0   SKEW(*W)   ',4X,5E13.6/(12X,5E13.6))                  CLP01090
      DO 1070 J=1,MQ                                                    CLP01100
      II = KL + LOCK(1,J)                                               CLP01110
      III = KURT(II)                                                    CLP01120
 1070 PRINT 108,III                                                     CLP01130
  108 FORMAT('0   KURT(*W)    1',2X,5E13.6/(16X,5F13.6))                CLP01140
C                                                                       CLP01150
C                                                                       CLP01160
      DO 8 I=2,MQ                                                       CLP01170
      DO 8 J = 1,MQ                                                     CLP01180
      II = KL + LOCK(I,J)                                               CLP01190
      III = KURT(II)                                                    CLP01200
    8 PRINT 105, III                                                    CLP01210
C                                                                       CLP01220
  150 IF(OVSK.EQ.0.) GO TO 200                                          CLP01230
C                                                                       CLP01240
CC                                                                      CLP01250
      PRINT 163,(OMEAN(I),I=1,MQ)                                       CLP01260
  163 FORMAT('     OLD MEAN',6X,5E13.6/(12X,5E13.6))                    CLP01270
C                                                                       CLP01280
C                                                                       CLP01290
      CALL SQMTX(ALINK(LA),GREF(LOVAR+KL+1))                            CLP01300
C                                                                       CLP01310
C                                                                       CLP01320
      DO 156 I=1,MQS                                                    CLP01330
  156 ALINK(LA+I-1)=ALINK(LA+I-1)/OW(KL)                                CLP01340
      PRINT 166,(ALINK(LA+J-1),J=1,MQ)                                  CLP01350
  166 FORMAT('0   OLD COVARIANCE',5E13.6/(16X,5E13.6))                  CLP01360
C                                                                       CLP01370
C                                                                       CLP01380
      DO 157 I=2,MQ                                                     CLP01390
  157 PRINT 105,I,(ALINK(LA+MQ*I+J-MQ-1),J=1,MQ)                        CLP01400
C                                                                       CLP01410
C  RETURN TEMP STORAGE                                                  CLP01420
C                                                                       CLP01430
C                                                                       CLP01440
  200 CALL FREE(LA,MQS)                                                 CLP01450
      CALL FREE(LB,MQS)                                                 CLP01460
      PRINT 109                                                         CLP01470
  109 FORMAT(/)                                                         CLP01480
      RETURN                                                            CLP01490
      END                                                               CLP01500
```

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FILE: CLUSMP   FORTRAN  A

      SUBROUTINE CLUSMP (NUFILE)                                          CLU00010
C*                                                                        CLU00020
C*    THE PURPOSE OF CLUSMP IS TO PRINT THE CLUSTER MAP.  THE CLUSTER     CLU00030
C*    MAP HAS EACH PIXEL REPRESENTED BY A SYMBOL.  EACH SYMBOL            CLU00040
C*    REPRESENTS A CLUSTER TYPE                                           CLU00050
C*                                                                        CLU00060
      IMPLICIT INTEGER (A-Z)                                              CLU00070
C                                                                         CLU00080
      COMMON /ARRAY/TOP, ARRAY(18000)                                     CLU00090
C                                                                         CLU00100
      DIMENSION IPFEAT (2)                                                CLU00110
      DIMENSION BUFFR(1), COL(3,110), OUT(110), FL(8), FLDINF(6),         CLU00120
     1 CLUSTN(110), NALK(61), NALKT(61)                                   CLU00130
C                                                                         CLU00140
C                                                                         CLU00150
      COMMON /GLOBAL/HEAD(63), MAPTAP,     DATAPE,     SAVTAP,    AMFILE,CLU00160
     1  AMKEY,HISFIL,HISKEY,TRFORM,ERIPTR,ERPKEY,MAPUNT,NOFILE,DRUMAD,     CLU00170
     2  ASAVFL,NASUN,NHSTFI  , DUPSYM, THRSYM,     MAXDIV,     MIN        CLU00180
C                                                                         CLU00190
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,            CLU00200
     1               LNCAT, PRNT(4) , KLAC , PRTME, PROUT, TOTPIX,        CLU00210
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LAUFD                          CLU00220
     3, MAXHF, AREA, NWDS, NWDWS, NPTS, LBUF, IQ1,NOCYCL                  CLU00230
C                                                                         CLU00240
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT     CLU00250
     1 ,CLSNAM                                                            CLU00260
C                                                                         CLU00270
      DIMENSION NTH(32)                                                   CLU00280
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),       CLU00290
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),           CLU00300
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),OCON(14),      CLU00310
     3 PORAT(13),OISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),            CLU00320
     4 OPRIOR(9),ODEN(8)                                                  CLU00330
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                     CLU00340
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                 CLU00350
      EQUIVALENCE (LINK(31),LSUBS(30))                                    CLU00360
      EQUIVALENCE (LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),           CLU00370
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),CLU00380
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),    CLU00390
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),     CLU00400
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),   CLU00410
     5 (LINK(31),VOLRT(15)),  (LINK(31),OCON(14)),  (LINK(31),PORAT(13)), CLU00420
     6 (LINK(31),OISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),   CLU00430
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),    CLU00440
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),     CLU00450
     9 (LINK(31),GREF(8)),  (LINK(31),NTH(3))                             CLU00460
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRS7M,NWANT,LINK(14000)           CLU00470
      DIMENSION MXAR(3),LR(3),LV(3)                                       CLU00480
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                            CLU00490
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)          CLU00500
C                                                                         CLU00510
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,        CLU00520
     1    AMU,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,     CLU00530
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMUFAC,            CLU00540
     3    AMONIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,      CLU00550
     4    BETTER,MODE,CURLEN,SPCOR                                        CLU00560
C                                                                         CLU00570
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,     CLU00580
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                   CLU00590
C                                                                         CLU00600
      LOGICAL HELP                                                        CLU00610
      REAL BUFFR                                                          CLU00620
C                                                                         CLU00630
      EQUIVALENCE (COL(1,1),ARRAY(2001))                                  CLU00640
      EQUIVALENCE (OUT(1)  ,ARRAY(2400))                                  CLU00650
      EQUIVALENCE (CLUSTN(1),ARRAY(2510))                                 CLU00660
      EQUIVALENCE (NALK(1),ARRAY(2620))                                   CLU00670
      EQUIVALENCE (NALKT(1),ARRAY(2730))                                  CLU00680
      EQUIVALENCE (BUFFR(1),ARRAY(3001))                                  CLU00690
      EQUIVALENCE (FLDINF(1),LINSTR) ,(FLDINF(4),SAMSTR),                 CLU00700
     1            (FLDINF(2),LINEND) ,(FLDINF(5),SAMEND),                 CLU00710
     2            (FLDINF(3),LININC) ,(FLDINF(6),SAMINC)                  CLU00720
C*    FIELD INFORMATION STORED AS FOLLOWS                                 CLU00730
C*                                                                        CLU00740
C*    ARRAY(1)    =FIRST FIELD NAME FOR THIS CLASS                        CLU00750
C*         (2)    =NO. OF VERTICES FOR THIS FIELD (NV)                    CLU00760
C*         (3)-(3+NV*2)  = ACTUAL VERTEX NUMBERS                          CLU00770
C*         (3+NV*2)  =TOTAL PIXELS FOR THIS FIELD                         CLU00780
C*         (4+NV*2)-(10+NV*2) = FLDINF BLOCK FOR THIS FIELD               CLU00790
```

FILE: CLUSMP FORTRAN A

```
C*                                                                      CLU00800
      DATA BLANK/' '/                                                   CLU00810
C                                                                       CLU00820
C                                                                       CLU00830
C                          *****  INITIALIZE *****                      CLU00840
C  IBEGIN = START OF DISK AREA,  TOTWRD = TOTAL WORDS OF DATA           CLU00850
      IBAFAD = IBEGIN + TOTWRD + TOTWRD                                 CLU00860
C ACTUAL LINE SIZE = (SAMEND-SAMSTR)/SAMINC + 1, LINE SIZE USED         CLU00870
C   IS SET IN READTP AND IS 200                                         CLU00880
      LINSIZ = 200                                                      CLU00890
C  INITIALIZE OUTPUT FILE                                               CLU00900
      IPUNIT = 16                                                       CLU00910
      IPCHAN = 1                                                        CLU00920
      IPFEAT(1) = 1                                                     CLU00930
      IPFRMT = 1                                                        CLU00940
C                                                                       CLU00950
      LNCAT=0                                                           CLU00960
      IPT=1                                                             CLU00970
      MAXPOP = 61                                                       CLU00980
      DO 25 I=1,MAXPOP                                                  CLU00990
   25 NMLAT(I)=0                                                        CLU01000
C                                                                       CLU01010
C                                                                       CLU01020
C                                                                       CLU01030
C                    **********                                         CLU01040
      DO 600 IFLD=1,NOFLD                                               CLU01050
C                                                                       CLU01060
      IPFILE = IFLD - 1                                                 CLU01070
C                                                                       CLU01080
C  XTRA = SEGMENTS ALREADY PROCESSED                                    CLU01090
      XTRA=0                                                            CLU01100
C  NFIN = FALSE IF ONLY 1 PAGE NEEDED                                   CLU01110
      NFIN=.FALSE.                                                      CLU01120
C  NV = NO OF VERTICES FOR THIS FIELD                                   CLU01130
      NV=ARRAY(IPT+1)                                                   CLU01140
C  TOTSAM = TOTAL PIXELS FOR THIS FIELD                                 CLU01150
      TOTSAM=ARRAY(IPT+2+NV*2)                                          CLU01160
C                                                                       CLU01170
C  MOVE DATA DEFINING LINES AND SAMPLES                                 CLU01180
      DO 30 I=1,5                                                       CLU01190
      FLDINE(I)=ARRAY(IPT+2+I+NV*2)                                     CLU01200
   30 CONTINUE                                                          CLU01210
C                                                                       CLU01220
C  SET SAMPLE SIZE AND WRITE HEADER                                     CLU01230
      IPSAMP = (SAMEND-SAMSTR)/SAMINC + 1                               CLU01240
      REWIND IPUNIT                                                     CLU01250
      IF (NUFILE .NE. 0) CALL FSEMFL (IPUNIT,IPFILE,DUMMY)             CLU01260
      IF (NUFILE.NE.0) CALL WRTHED (IPCHAN,IPFEAT,IPSAMP,IPFRMT,IPUNIT) CLU01270
C                                                                       CLU01280
C   CALC BUFFER SIZE AS EVEN MULTIPLE OF LINE SIZE                      CLU01290
      TOP = 18000                                                       CLU01300
      TOTPIX = NO * IPSAMP                                              CLU01310
      MAXBUF = ((TOP - 3000)/TOTPIX) * TOTPIX                           CLU01320
C                                                                       CLU01330
C  BLANK OUTPUT BUFFER                                                  CLU01340
      DO 40 I=1,110                                                     CLU01350
   40 OUT(I)=BLANK                                                      CLU01360
C                                                                       CLU01370
C  ZERO COUNT OF POINTS IN CLUSTER                                      CLU01380
      DO 45 I=1,MAXPOP                                                  CLU01390
   45 NMLK(I)=0                                                         CLU01400
C*                                                                      CLU01410
C*    CHECK IF ALL OF CLUSTER MAP CAN FIT ACROSS ONE PAGE--ONLY 110     CLU01420
C*    SYMBOLS ARE PRINTED ACROSS THE PAGE FOR EVERY LINE.  THE PROGRAM  CLU01430
C*    WILL PRINT THE ENTIRE CLUSTER MAP IN 110 SYMBOL SEGMENTS          CLU01440
C*                                                                      CLU01450
C                                                                       CLU01460
C  SET STARTING ADDRESS AND ENDING ADDRESS FOR LINE                     CLU01470
      STCLM=SAMSTR                                                      CLU01480
      ENCLM=SAMEND                                                      CLU01490
C                                                                       CLU01500
C  CK FOR MORE THAN 110 SEGMENTS SPECIFIED AND RESET MAXIMUM IF NECESSRYCLU01510
C  NFIN = FALSE. IF 1 LINE    TRUE. IF 2 OR MORE LINES                 CLU01520
C                                                                       CLU01530
   50 IF(((ENCLM-SAMSTR)/SAMINC+1-XTRA).LE. 110) GO TO 60               CLU01540
      ENCLM=  (110+XTRA)*SAMINC + SAMSTR                                CLU01550
      NFIN=.TRUE.                                                       CLU01560
C                                                                       CLU01570
C       * READ 1 BUFFER OF DATA *                                       CLU01580
```

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C                                                                       CLU01590
C  TWRD = TOTAL WORDS LEFT TO BE READ                                  CLU01600
60      TWRD = TOTWRD                                                   CLU01610
C  READ FULL BUFFER OF DATA UNLESS ONLY PARTIAL BUFFER OF DATA LEFT     CLU01620
        NOWRD = MAXBUF                                                  CLU01630
        IF (TWRD .LT. NOWRD) NOWRD = TWRD                               CLU01640
C  IBEGIN IS BEGINNING OF SCRAMBLED DATA                                CLU01650
        CALL MREAD (IBEGIN, BUFER, NOWRD, DUMMY)                        CLU01660
        ADDRESS = IBEGIN + NOWRD                                        CLU01670
        TWRD = TWRD - NOWRD                                             CLU01680
        NUREAD = 1                                                      CLU01690
C                                                                       CLU01700
C                          *** SET COLUMN HEADINGS ***                  CLU01710
    80  CONTINUE                                                        CLU01720
        J=0                                                             CLU01730
        DO 100 I=SAMSTR,SAMEND,SAMINC                                   CLU01740
        IF( I .LT. STCLM)GO TO 100                                      CLU01750
        IF( I .GT. ENCLM)GO TO 110                                      CLU01760
        J=J+1                                                           CLU01770
        COL(1,J)=I/100                                                  CLU01780
        COL(2,J)=MOD(I,100)/10                                          CLU01790
        COL(3,J)=MOD(I,10)                                              CLU01800
   100  CONTINUE                                                        CLU01810
C                                                                       CLU01820
C                          *** WRITE HEADINGS ***                       CLU01830
   110  LPTS=J                                                          CLU01840
        WRITE(6,500)                                                    CLU01850
        WRITE(6,NUREAD)                                                 CLU01860
        WRITE(6,510)ARRAY(IPT),TOTSAM                                   CLU01870
C*      PRINT COLUMN NUMBERS FOR CLUSTER MAP                            CLU01880
        DO 120 I=1,3                                                    CLU01890
   120  WRITE(6,520)(COL(I,J),J=1,LPTS)                                 CLU01900
        WRITE(6,500)                                                    CLU01910
   500  FORMAT(/)                                                       CLU01920
   510  FORMAT(///25X,A6,//' TOTAL NUMBER OF POINTS IN THIS FIELD',I7)  CLU01930
   520  FORMAT(5X,110(1))                                               CLU01940
C                                                                       CLU01950
C                                                                       CLU01960
C                     ******  PROCESS ONE LINE OF DATA  ******          CLU01970
C                                                                       CLU01980
C  PREVLN = NO OF LINES WRITTEN ON DISK PREVIOUS TO LINE BEING WRITTEN  CLU01990
        PREVLN = 0                                                      CLU02000
        DO 300 LINE=LINSTR,LINEND,LININC                                CLU02010
C*                                                                      CLU02020
C*      CALL FDLINT TO OBTAIN FIELD INTERSECTIONS FOR THIS LINE         CLU02030
        CALL FDLINT(ARRAY(IPT+2),NV,FL,LINE,SAMPS,NI)                   CLU02040
C                                                                       CLU02050
C                       *****  PROCESS EACH INTERCEPT *****            CLU02060
        DO 200 I=1,NI,2                                                 CLU02070
        NOEX=0                                                          CLU02080
C                                                                       CLU02090
C*      SAVE THE BEGINNING AND END NUMBERS OF THIS INTERCEPT FOR ARRAY OUTCLU02100
C*      WHICH IS PRINTED                                                CLU02110
        IB =(FL(I)-SAMSTR)/SAMINC +1                                    CLU02120
        IE =(FL(I+1)-SAMSTR)/SAMINC+1                                   CLU02130
        IF(MOD(SAMSTR,SAMINC) .NE. MOD(FL(I),SAMINC))IB =IB +1          CLU02140
        INPTS=(IE-IB+1)*MO                                              CLU02150
        IF(IB  .GT. IE )INPTS=0                                         CLU02160
        IF(IB  .GT. IE ) GO TO 174                                      CLU02170
C                                                                       CLU02180
C*      CHECK IF INTERCEPTS ARE WITHIN PRINTOUT LIMITS                  CLU02190
        IF(FL(I) .GT. ENCLM) GO TO 174                                  CLU02200
        IF(FL(I+1) .LT. STCLM) GO TO 174                                CLU02210
        GO TO 150                                                       CLU02220
C                                                                       CLU02230
C                                                                       CLU02240
  150   CONTINUE                                                        CLU02250
C*      RESAVE BEGINNING AND END NUMBERS FOR ARRAY OUT IF INTERCEPT(S)  CLU02260
C*      EXCEEDS PRINT LIMIT                                             CLU02270
        IF(FL(I) .GE. STCLM) GO TO 152                                  CLU02280
        IBO=IB                                                          CLU02290
        IB=(STCLM-SAMSTR)/SAMINC+1                                      CLU02300
        IF(MOD(SAMSTR,SAMINC) .NE. MOD(STCLM,SAMINC))IB=IB+1            CLU02310
C*                                                                      CLU02320
C*      STORE NUMBER OF EXTRA POINTS THAT ARE IN INTERCEPT BUT ARE      CLU02330
C*      OUTSIDE THE PRINT LIMITS ON LEFT SIDE                           CLU02340
        NOEX=(IB-IBO)*MO                                                CLU02350
        NUREAD=NUREAD+NOEX                                              CLU02360
        INPTS = INPTS - NOEX                                            CLU02370
```

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FILE: CLUSMP   FORTRAN  A

  152 IF(FL(I+1) .GT. ENCLM)IE=(ENCLM-SAMSTR)/SAMINC+1                    CLU02380
C                                                                        CLU02390
C*    SET PRINT LIMITS IN THE 1-110 LIMITS WHEN THE NUMBERS WOULD EXCEED CLU02400
C*    110 ON ANOTHER PASS THROUGH THE DATA                               CLU02410
      IB=IB-XTRA                                                         CLU02420
      IE=IE-XTRA                                                         CLU02430
      IF(IB .GT. IE) GO TO 174                                           CLU02440
      NSETS=IE-IB+1                                                      CLU02450
      NPNTS=NSETS*MD                                                     CLU02460
C                                                                        CLU02470
  155 CONTINUE                                                           CLU02480
C*                                                                       CLU02490
C*    CHECK IF NEEDED DATA IN THIS INTERCEPT IS IN TWO BUFFERS           CLU02500
C*                                                                       CLU02510
      IF (BUFAD + NPNTS - 1 .LE. NOWRD) GO TO 170                        CLU02520
C                                                                        CLU02530
C                                                                        CLU02540
C           **  READ NEXT RECORD **                                      CLU02550
C                                                                        CLU02560
C                                                                        CLU02570
165   NOWRD = MAXBUF                                                     CLU02580
      IF (TWRD .LT. NOWRD) NOWRD = TWRD                                  CLU02590
      IF (NOWRD .LE. 0) GO TO 168                                        CLU02600
      CALL RREAD(ADRESS,BUFFER(1),NOWRD,STAT)                            CLU02610
      ADRESS = ADRESS + NOWRD                                            CLU02620
      TWRD = TWRD - NOWRD                                                CLU02630
168   BUFAD = NOEX + 1                                                   CLU02640
C                                                                        CLU02650
C*    CALL CLUST TO OBTAIN THE CLUSTER SUBSCRIPT SO THAT THE CLUSTER     CLU02660
C*    SYMBOLS CAN BE COMPUTED FOR EACH SET OF FL'S WITHIN THE            CLU02670
C*    START(STCLM) AND END(ENCLM)                                        CLU02680
170   CONTINUE                                                           CLU02690
      CALL CLUST (BUFFER(BUFAD), NSETS, CLUSTN, KLAC, GEN(LSUM))         CLU02700
C                                                                        CLU02710
      L=0                                                                CLU02720
C*                                                                       CLU02730
C*    STORE SYMBOLS FOR OUTPUT                                           CLU02740
      DO 173 K=IB,IE                                                     CLU02750
      L=L+1                                                              CLU02760
      NUM=CLUSTN(L)                                                      CLU02770
C     SET SYMBOL--THE SUBSCRIPT FOR SYM IS RESET TO 1 THROUGH MAXPOP     CLU02780
       NTEMP = NSYMB(NUM)                                                CLU02790
      J=MOD(NSYMB(NUM)-1,MAXPOP)+1                                       CLU02800
      IF ( J .LE. 0 )  J = 47                                            CLU02810
      LNCAT=MAX0(LNCAT,J)                                                CLU02820
      OUT(K)=SYM(J)                                                      CLU02830
C*    SAVE THE NUMBER OF PIXELS ASSIGNED TO THIS CLUSTER                 CLU02840
  173 NBLK(J)=NBLK(J)+1                                                  CLU02850
C                                                                        CLU02860
C  WRITE DATA ON SCRATCH DISK TO COMBINE PAGES AND WRITE LINE OF NEW FILCLU02870
174   DADRES = PREVLN * LINSIZ + XTRA + BASEAD                           CLU02880
      IF (NUFILE.NE.0) CALL RWRITE (DADRES, CLUSTN, NSETS, DUMMY)        CLU02890
C           ***  PRINT LINE OF OUTPUT AND BLANK BUFFER ***              CLU02900
       WRITE (6,275) LINE, (OUT(K),K=1,LPTS)                             CLU02910
      IF (LINE .LE. 4) WRITE (3,9275) LINE, (OUT(K),K=1,LPTS)            CLU02920
275   FORMAT (2X,I5,2X,110A1)                                            CLU02930
9275  FORMAT (2X,I5,2X,60A1,/,9X,50A1)                                   CLU02940
C                                                                        CLU02950
      IF (NUFILE .EQ. 0) GO TO 301                                       CLU02960
      DO 280 K=1,110                                                     CLU02970
280   OUT(K) = BLANK                                                     CLU02980
C                                                                        CLU02990
190   BUFAD = BUFAD + INPTS                                              CLU03000
C                                                                        CLU03010
  200 CONTINUE                                                           CLU03020
C                                                                        CLU03030
  300 PREVLN = PREVLN + 1                                                CLU03040
C                                                                        CLU03050
301   CONTINUE                                                           CLU03060
C                     ** END OF GENERATION OF LINES FOR 1 PAGE **        CLU03070
C                                                                        CLU03080
C  CHECK FOR ADDITIONAL PAGES                                            CLU03090
310   IF(.NOT. NFIN)GO TO 400                                            CLU03100
C                                                                        CLU03110
C  MULTIPLE PAGES, RESET BOUNDARIES                                      CLU03120
      XTRA=(ENCLM-SAMSTR)/SAMINC + 1                                     CLU03130
      STCLM=ENCLM+1                                                      CLU03140
      ENCLM=SAMEND                                                       CLU03150
      NFIN=.FALSE.                                                       CLU03160
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FILE: CLUSMP   FORTRAN  A

C                                                                       CLU03170
C  GO TO PROCESS ADDITIONAL PAGES                                      CLU03180
      GO TO 60                                                          CLU03190
C                                                                       CLU03200
  400 CONTINUE                                                          CLU03210
C                                                                       CLU03220
C            **  WRITE DATA FROM SCRATCH DISK TO DRUM)                  CLU03230
C                                                                       CLU03240
      IF (NUFILE .EQ. 0) GO TO 455                                      CLU03250
C   ENDTAP = INDICATOR THAT LAST RECORD HAS BEEN WRITTEN                CLU03260
      ENDTAP =                                                          CLU03270
      INCRE = 0                                                         CLU03280
      DO 450 LINE = LINSTR,LINEND,LININC                                CLU03290
      IF (LINE .GT. (LINEND-LININC)) ENDTAP = -1                        CLU03300
      ADRES = HASEAD + INCRE                                            CLU03310
      CALL NREAD (ADRES, BUFER, LINSIZ, DUMMY)                          CLU03320
      CALL WRTLN (BUFER, ENDTAP)                                        CLU03330
C     WRITE (6,9965) (BUFER(I),I=1,196)                                 CLU03340
9965  FORMAT (' NEW FILE',6012,/,6012,/,6012,/,5012)                    CLU03350
450   INCRE = INCRE + LINSIZ                                            CLU03360
C                                                                       CLU03370
C                                                                       CLU03380
C              **  END OF CLUSTER MAP **                                CLU03390
C                                                                       CLU03400
C                ** PRINT COUNTS **                                     CLU03410
C                                                                       CLU03420
455   DO 465 I=1,MAXPOP                                                 CLU03430
  465 NBLKT(I)=NBLKT(I)+NBLK(I)                                         CLU03440
C                                                                       CLU03450
      WRITE(6,570)                                                      CLU03460
  570 FORMAT(//2X,'POINTS PER CLUSTER IN THIS FIELD',/3X,'CLUSTER',     CLU03470
     * 5X,'SYMBOL',5X,'POINTS',/)                                       CLU03480
C                                                                       CLU03490
      LNCAT=MOD(LNCAT-1,MAXPOP)+1                                       CLU03500
C                                                                       CLU03510
C                                                                       CLU03520
      DO 590 I=1,LNCAT                                                  CLU03530
  580 WRITE(6,590)I,SYM(I),NBLK(I)                                      CLU03540
  590 FORMAT(6X,I2,10X,A1,7X,I5)                                        CLU03550
C                                                                       CLU03560
      IPT=IPT+9+NV*2                                                    CLU03570
  600 CONTINUE                                                          CLU03580
C                                                                       CLU03590
C                                                                       CLU03600
      WRITE(6,HEAD)                                                     CLU03610
      WRITE(3,750)LNCAT                                                 CLU03620
  750 FORMAT(//' TOTAL NUMBER OF CLUSTERS =',I3)                        CLU03630
C                                                                       CLU03640
      TOTPTS=TOTWDS/NV                                                  CLU03650
C                                                                       CLU03660
      WRITE(6,760) TOTPTS                                               CLU03670
  760 FORMAT(/' TOTAL NUMBER OF POINTS =',I5)                           CLU03680
C                                                                       CLU03690
      WRITE(6,770)                                                      CLU03700
  770 FORMAT(//' CLUSTER     SYMBOL     POINTS IN CLUSTER')            CLU03710
C                                                                       CLU03720
      DO 775 J=1,LNCAT                                                  CLU03730
  775 WRITE(6,780)J,SYM(J),NBLKT(J)                                     CLU03740
  780 FORMAT(4X,I2,9X,A1,10X,I7)                                        CLU03750
C                                                                       CLU03760
      RETURN                                                            CLU03770
      END                                                               CLU03780
```

```
FILE: CLUST    FORTRAN  A

      SUBROUTINE CLUST(BIGP,NDO,KLOUT,KROTIN,SUM)                       CLU00010
C    THIS PROGRAM TAKES EACH INPUT POINT AND CLASSIFIES IT.             CLU00020
C       FOR THE PURPOSE OF GENERATING A MAP.                            CLU00030
C                                                                       CLU00040
C  CLUST ARGUMENTS (CLUST DRAWN FROM STATIS)                            CLU00050
C     BIGP      INPUT DATA VECTOR                                       CLU00060
C     NDO       NO. DATA POINTS                                         CLU00070
C     KLOUT     KL OF OUTPUT CLASS                                      CLU00080
C     KROTIN    ROOT VERTEX                                             CLU00090
C     SUM       POSITION OF SUM VECTOR IN CLUSTER.                      CLU00100
C          OUTPUT SYMBOL IS DERIVED FROM NSYMB(KL)                      CLU00110
C                                                                       CLU00120
      DIMENSION NTB(32)                                                 CLU00130
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),     CLU00140
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),         CLU00150
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),    CLU00160
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),          CLU00170
     4 OPRIOR(9),ODEN(8)                                                CLU00180
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                   CLU00190
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))               CLU00200
      EQUIVALENCE (LINK(31),LSUBS(30))                                  CLU00210
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          CLU00220
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),CLU00230
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),  CLU00240
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),   CLU00250
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)), CLU00260
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),CLU00270
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)), CLU00280
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),  CLU00290
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),   CLU00300
     9 (LINK(31),GREF(8)),  (LINK(31),NTB(31))                          CLU00310
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)         CLU00320
      DIMENSION MXAR(31),LR(3),LV(3)                                    CLU00330
      EQUIVALENCE  (LR(1),LVRIN),(LR(2),LKURT),                         CLU00340
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        CLU00350
C                                                                       CLU00360
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      CLU00370
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SHLTH,   CLU00380
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          CLU00390
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    CLU00400
     4    BETTER,MODE,CORLEN,SPCOR                                      CLU00410
C                                                                       CLU00420
      COMMON /STPAR/WAIT,CONLV,SKRND,SKCHI,TRRND,TRCHI,URKRND,URKCHI,   CLU00430
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                 CLU00440
      DIMENSION BIGP(MO,NDO),KLOUT(NDO),SUM(1)                          CLU00450
      COMMON/BIGCOM/ BIGDUM                                             CLU00460
      REAL REL(16)                                                      CLU00470
      LOGICAL ISPLIT                                                    CLU00480
      XP(DIST)=EXP(-.5*DIST)                                            CLU00490
      KROT=KROTIN                                                       CLU00500
C                                                                       CLU00510
      IF ( KROT .LE. 0 )  WRITE(6,1000)  KROT                           CLU00520
 1000 FORMAT(     2X,'::::::: WARNING :::::::  IN CLUST,  KROT=',3X,    CLU00530
     *   I10      )                                                     CLU00540
      IF (KROT .LE. 0) RETURN                                           CLU00550
C                                                                       CLU00560
      DO 399 I00=1,NDO                                                  CLU00570
C  INSPECT EACH POINT                                                   CLU00580
      PMAX=-1.                                                          CLU00590
      KMAX=0                                                            CLU00600
C  CHANGE RF:RASSBACH 3/21/77                                           CLU00610
C  USES PCOND FOR PPASS, DIST FOR DISS(KL)                              CLU00620
      PCOND(KROT)=1.                                                    CLU00630
      PTOT=0.                                                           CLU00640
      ISEC=0                                                            CLU00650
      KL=LSUBS(KROT)                                                    CLU00660
C                                                                       CLU00670
      NCKPT = 1                                                         CLU00680
C                                                                       CLU00690
      IF ( KL .LE. 0 )  WRITE(6,2000)   NCKPT , KL                      CLU00700
 2000 FORMAT(     2X,'::::::::::: WARNING :::::::  IN CLUST, AT CHECKPOINCLU00710
     *I1 , 2X, I3, 3X, ', KL=' , I8      )                             CLU00720
      IF (KL .LE. 0) RETURN                                             CLU00730
C                                                                       CLU00740
      KPATH=KROT                                                        CLU00750
C   GO DOWN CLUSTER TREE                                                CLU00760
C CHANGE RF:RASSBACH 3/21/77                                            CLU00770
  130 PCOND(KL)=PROP(KL)/(PRIRCM(KPATH))*PCOND(KPATH)                   CLU00780
      IF(.NOT.ISPLIT(KL)) GO TO 131                                     CLU00790
```

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FILE: CLUST    FORTRAN  A

      KPATH=KL                                                          CLU00800
      KL=LSUBS(KL)                                                      CLU00810
      NCKPT = 2                                                         CLU00820
C                                                                       CLU00830
      IF ( KL .LE. 0 )  WRITE(6,2000)  NCKPT , KL                       CLU00840
      IF (KL .LE. 0) RETURN                                             CLU00850
      GO TO 130                                                         CLU00860
  131 CALL CORECT(REL,HIGP(1,IDO),W(KL),SUM(KL+1))                      CLU00870
C  CHANGE RE:RASSBACH 3/21/77                                           CLU00880
      DIST=DOTSW(REL,VMIN(KL+1))*W(KL)                                  CLU00890
      IF(ABS(DIST+DCON(KL)).LE. 160.) GO TO 531                         CLU00900
      GO TO 139                                                         CLU00910
  531 CONTINUE                                                          CLU00920
C  CHANGE RE:RASSBACH 3/21/77                                           CLU00930
      P=XP(DIST+DCON(KL))/VOLPT(KL)*PCOND(KL)                           CLU00940
      PTOT=PTOT+P                                                       CLU00950
      IF(P.LE.PMAX.OR.ISPLIT(KL))                                       CLU00960
     1   GO TO 139                                                      CLU00970
      PMAX=P                                                            CLU00980
      KMAX=KL                                                           CLU00990
  139 KL=LINK(KL)                                                       CLU01000
      IF(KL)130,149,130                                                 CLU01010
C    GO UP TREE                                                         CLU01020
C  CHANGE RE:RASSBACH 3/21/77                                           CLU01030
C 149 PCOND(KL) = 0                                                     CLU01040
C                                                                       CLU01050
  149  KL = KPATH                                                       CLU01060
C                                                                       CLU01070
      PCOND(KL) = 0                                                     CLU01080
      KPATH=LSUPER(KL)                                                  CLU01090
      NCKPT = 3                                                         CLU01100
C                                                                       CLU01110
      IF ( KL .LE. 0 )  WRITE(6,2000)  NCKPT, KL                        CLU01120
      IF (KL .LE. 0) RETURN                                             CLU01130
C                                                                       CLU01140
      IF(KL.NE.KROT) GO TO 131                                          CLU01150
  399 IW=KLOUT(IDO)                                                     CLU01160
      KLOUT(IDO)=KMAX                                                   CLU01170
      IF(PTOT.NE.0.) PMAX=PMAX/PTOT                                     CLU01180
C     0     IF(II.LT.ITLIM) GO TO 399                                   CLU01190
C     0  646 PRINT 647,IDO,W(KROT),KL,ISEC,(KTR(I),I=1,ITLIM)           CLU01200
  647 FORMAT('0LOOP IN CLUST:IDO,W(KROT),KL,SECTION',I5,E11.5,215       CLU01210
     1   /(1X,14I5))                                                    CLU01220
  399 CONTINUE                                                          CLU01230
      RETURN                                                            CLU01240
      END                                                               CLU01250
```

FILE: CMERR FORTRAN A

```
      SUBROUTINE CMERR                                                  CME00010
      WRITE (6,10)                                                      CME00020
   10 FORMAT (*CMERR--FATAL ERROR, END OF EXECUTION*)                   CME00030
      STOP                                                              CME00040
      END                                                               CME00050
```

FILE: CORECT FORTRAN A

```
      SUBROUTINE CORECT (REL,PV,P,S)                                    COR00010
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      COR00020
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SBLTH,   COR00030
     2    TNDXVL,WFAC,NPTSO,PURATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          COR00040
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WUELSM,   COR00050
     4    METTER,MODE,CORLEN,SPCOR                                      COR00060
      REAL REL(30), PV(30), S(30)                                       COR00070
      DO 10 I = 1,MQ                                                    COR00080
        REL(I) = PV(I) - S(I) / P                                       COR00090
        II = I                                                          COR00100
C     WRITE (6,9999) II,REL(I),PV(I),S(I),P                             COR00110
9999  FORMAT (1HCORECT I,REL,PV,S,P ,I4,4(F10.4,2X))                    COR00120
10      CONTINUE                                                        COR00130
      RETURN                                                            COR00140
      END                                                               COR00150
```

FILE: DAMSQ FORTRAN A

```
      REAL FUNCTION DAMSQ*8 (AM,AMET)                                          DAM00010
C       CALCULATES THE TRACE OF THE SQUARE OF THE MATRIX AM, RELATIVE          DAM00020
C         TO THE METRIC AMET.                                                  DAM00030
C       DAMSQ = TRACE(AM*AMET*AM*AMET)                                         DAM00040
      DIMENSION MXAR(31),LR(3),LV(3)                                           DAM00050
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                                 DAM00060
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)               DAM00070
C                                                                              DAM00080
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,             DAM00090
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SHLTH,          DAM00100
     2    TNDXVL,WFAC,NPTSQ,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                 DAM00110
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           DAM00120
     4    METTER,MODE,COMLEN,SPCOM                                            DAM00130
C                                                                              DAM00140
      REAL*8 AM(475)                                                           DAM00150
       REAL AMET(475)                                                          DAM00160
       REAL*8 DAMSQ,DAMSQD,ROW,COL                                             DAM00170
      DAMSQ=0.                                                                 DAM00180
      DAMSQD=0.                                                                DAM00190
      DO 20 I=1,MQ                                                             DAM00200
      DO 19 J=1,I                                                              DAM00210
      ROW=0.                                                                   DAM00220
      COL=0.                                                                   DAM00230
      IKLOC=MXAR(I)                                                            DAM00240
      KJLOC=MXAR(J)                                                            DAM00250
      DO 10 K=1,J                                                              DAM00260
      ROW=ROW+AM(IKLOC+1)*AMET(KJLOC+1)                                        DAM00270
      COL=COL+AM(KJLOC+1)*AMET(IKLOC+1)                                        DAM00280
      IKLOC=IKLOC+1                                                            DAM00290
   10 KJLOC=KJLOC+1                                                            DAM00300
      KJLOC=KJLOC+J                                                            DAM00310
      IF(I.EQ.J) GO TO 12                                                      DAM00320
      JP=J+1                                                                   DAM00330
      DO 11 K=JP,I                                                             DAM00340
      ROW=ROW+AM(IKLOC+1)*AMET(KJLOC)                                          DAM00350
      COL=COL+AM(KJLOC)*AMET(IKLOC+1)                                          DAM00360
      IKLOC=IKLOC+1                                                            DAM00370
   11 KJLOC=KJLOC+K                                                            DAM00380
   12 IF(I.EQ.MQ) GO TO 14                                                     DAM00390
      IKLOC=IKLOC+I                                                            DAM00400
      IP=I+1                                                                   DAM00410
      DO 13 K=IP,MQ                                                            DAM00420
      ROW=ROW+AM(IKLOC)*AMET(KJLOC)                                            DAM00430
      COL=COL+AM(KJLOC)*AMET(IKLOC)                                            DAM00440
      IKLOC=IKLOC+K                                                            DAM00450
   13 KJLOC=KJLOC+K                                                            DAM00460
   14 CONTINUE                                                                 DAM00470
   19 DAMSQ=DAMSQ+ROW*COL                                                      DAM00480
   20 DAMSQD=DAMSQD+ROW*COL                                                    DAM00490
      DAMSQ=DAMSQ+DAMSQ-DAMSQD                                                 DAM00500
C       WE MUST COUNT EACH OFF-DIAGONAL TWICE. DAMSQD AVOIDS DOUBLE-           DAM00510
C         COUNTING THE DIAGONAL TERMS.                                         DAM00520
      RETURN                                                                   DAM00530
      END                                                                      DAM00540
```

FILE: DATFIX FORTRAN A

```
      SUBROUTINE DATFIX                                                 DAT00010
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),     DAT00020
     1 PCUM(26),PRIMCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),         DAT00030
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLPT(15),DCON(14),    DAT00040
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),          DAT00050
     4 OPRIOR(9),ODEN(8)                                                DAT00060
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                   DAT00070
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))               DAT00080
      EQUIVALENCE (LINK(31),LSUBS(30))                                  DAT00090
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          DAT00100
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIMCM(25)),DAT00110
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),  DAT00120
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),   DAT00130
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)), DAT00140
     5 (LINK(31),VOLPT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),DAT00150
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)), DAT00160
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),  DAT00170
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),   DAT00180
     9 (LINK(31),GREF(8))                                               DAT00190
      COMMON/CLUS/  JUNK(12),NAPL,NTOP,NTRSZM,NWANT,LINK(14000)         DAT00200
      DIMENSION MXAR(3),LR(3),LV(3)                                     DAT00210
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                          DAT00220
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        DAT00230
C                                                                       DAT00240
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      DAT00250
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SBLTH,   DAT00260
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,OWFAC,GRACTM,AMOFAC,          DAT00270
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    DAT00280
     4    BETTER,MODE,CONLEN,SPCOR                                      DAT00290
C                                                                       DAT00300
      COMMON /STPAR/WAIT,CONLV,SKRND,SKCHI,TRRND,TRCHI,URKRND,URKCHI,   DAT00310
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                 DAT00320
      COMMON/SPPAR/ GAMMET,DELMET,SGTMET,ORCOV,ORSKEW,ORKURT,EXMNSQ,    DAT00330
     1    SHRMIN,EXMAX,GAMCEN,TSQINI,DAMP,DORPMS,DIAG,TIMO,TIMI,ITERMX,  DAT00340
     2    SPRED                                                         DAT00350
      COMMON /INITL/WTNEW,DEVINI,CHANIN                                 DAT00360
      COMMON /JOINPR/WDJOIN,RLIM,NOJO,NOELTM                            DAT00370
      MODE=0                                                            DAT00380
       CONLV=3.                                                         DAT00390
       WFAC=10.                                                         DAT00400
      WAIT=150.                                                         DAT00410
      WDELSM=20.                                                        DAT00420
      WSIM=400.                                                         DAT00430
      WADJIN=200.                                                       DAT00440
      CONLV=CONLV*SPCOR                                                 DAT00450
      DO 20 I=1,NTRSZM                                                  DAT00460
   20 LINK(I)=0                                                         DAT00470
      RETURN                                                            DAT00480
      END                                                               DAT00490
```

FILE: DENCAL FORTRAN A

```
      SUBROUTINE DENCAL(KL,RATIO,OLW)                                          DEN00010
C                                                                              DEN00020
C                                                                              DEN00030
C                                                                              DEN00040
C  THIS ROUTINE ADJUSTS THE DENOMINATOR OFFSET AND PROPORTION OF KL.           DEN00050
C     NEW PROP=RATIO*OLD PROP          -----    OLW=OLD W(KFATH)               DEN00060
C     THE NODES MUST ALREADY BE RECONNECTED TO THEIR NEW POSITIONS.            DEN00070
      DIMENSION NTR(32)                                                        DEN00080
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),            DEN00090
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),                DEN00100
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),           DEN00110
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),                 DEN00120
     4 OPRIOR(9),ODEN(8)                                                       DEN00130
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                          DEN00140
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                      DEN00150
      EQUIVALENCE (LINK(31),LSUBS(30))                                         DEN00160
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),                 DEN00170
     1  (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),    DEN00180
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),         DEN00190
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),          DEN00200
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),        DEN00210
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)),      DEN00220
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),        DEN00230
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),         DEN00240
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),          DEN00250
     9 (LINK(31),GREF(8)),  (LINK(31),NTR(31))                                 DEN00260
      COMMON/CLUS/  JUNK(12),NARL,NTOP,MTBS7M,NWANT,LINK(14000)                DEN00270
      DIMENSION MXAR(31),LR(3),LV(3)                                           DEN00280
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                                 DEN00290
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)               DEN00300
C                                                                              DEN00310
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,             DEN00320
     1    AMG,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SBLTH,          DEN00330
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                 DEN00340
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           DEN00350
     4    BETTER,MODE,COPLEN,SPCOR                                             DEN00360
C                                                                              DEN00370
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,          DEN00380
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                       DEN00390
C                                                                              DEN00400
C                                                                              DEN00410
      PROP(KL)=PROP(KL)*RATIO                                                  DEN00420
      OPROP(KL)=OPROP(KL)*RATIO                                                DEN00430
      KF=LSUPER(KL)                                                            DEN00440
      OLF=CTOT(KL)                                                             DEN00450
      CTOT(KL)=W(KF)-(OLW-CTOT(KL))/RATIO                                      DEN00460
      ODEN(KL)=ODEN(KL)/RATIO                                                  DEN00470
      RETURN                                                                   DEN00480
      END                                                                      DEN00490
```

FILE: DISC FORTRAN A

```
      INTEGER FUNCTION DISC(N)                                          DIS00010
      COMMON /RAND/NX                                                   DIS00020
      NX=NRAND(NX)                                                      DIS00030
      DISC=N*(FLOAT(NX)/2147483649.)                                    DIS00040
      RETURN                                                            DIS00050
      END                                                               DIS00060
```

FILE: DMINV FORTRAN A

```
      SUBROUTINE DMINV(A,B,C,VOL)                                       DMI00010
C  THIS ROUTINE CALCULATES A=THE INVERSE OF C, A=C**-1.  IT ALSO        DMI00020
C     RETURNS THE DETERMINANT OF C IN VOL.  THE SQUARE ARRAY            DMI00030
C     B IS TEMPORARY STORAGE, AND MAY BE IDENTICAL TO C.                DMI00040
C     VOL=-DABS(DET(C)) IF C IS NOT POSITIVE DEFINITE.                  DMI00050
C                                                                       DMI00060
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      DMI00070
     1   AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,    DMI00080
     2   INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,           DMI00090
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    DMI00100
     4   METTEW,MODE,CORLEN,SPCOR                                       DMI00110
C                                                                       DMI00120
      REAL*8  A(MQ,MQ),B(MQ,MQ),C(MQ,MQ)                               DMI00130
       REAL*8 Z,VOLL                                                    DMI00140
      VOLL=1.                                                           DMI00150
      DO 11 I=1,MQ                                                      DMI00160
      DO 10 J=1,MQ                                                      DMI00170
      B(I,J)=C(I,J)                                                     DMI00180
   10 A(I,J)=0.                                                         DMI00190
   11 A(I,I)=1.                                                         DMI00200
      DO 22 I=1,MQ                                                      DMI00210
      VOLL=VOLL*B(I,I)                                                  DMI00220
      IF(B(I,I).LE.0.) VOLL=-DABS(VOLL)                                 DMI00230
      Z=1./B(I,I)                                                       DMI00240
      DO 21 J=1,MQ                                                      DMI00250
      B(I,J)=B(I,J)*Z                                                   DMI00260
   21 A(I,J)=A(I,J)*Z                                                   DMI00270
      DO 22 IP=1,MQ                                                     DMI00280
      IF(IP.EQ.I) GO TO 22                                              DMI00290
      Z=B(IP,I)                                                         DMI00300
      DO 23 J=1,MQ                                                      DMI00310
      B(IP,J)=B(IP,J)-B(I,J)*Z                                          DMI00320
   23 A(IP,J)=A(IP,J)-A(I,J)*Z                                          DMI00330
   22 CONTINUE                                                          DMI00340
       VOL = VOLL                                                       DMI00350
      RETURN                                                            DMI00360
      END                                                               DMI00370
```

FILE: DOTSQ FORTRAN A

```
      FUNCTION DOTSQ(V,AMET)                                                DOT00010
C       CALCULATES THE INNER PRODUCT V.V RELATIVE TO THE METRIC AMET        DOT00020
      DIMENSION NTH(32)                                                     DOT00030
      DIMENSION INDEX(27),LSUMS(30),LSUPER(29),IDADJ(28),NSYMR(12),         DOT00040
     1 PCUM(26),PRIMCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),             DOT00050
     2 WADJ(20),W(19),OPPOP(18),OW(17),VOLIN(16),VOLPT(15),DCON(14),        DOT00060
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),              DOT00070
     4 OPPIOP(9),ODEN(8)                                                    DOT00080
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                       DOT00090
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                   DOT00100
      EQUIVALENCE (LINK(3),LSUMS(30))                                       DOT00110
      EQUIVALENCE(LINK(3),LSUPER(29)),  (LINK(31),IDADJ(28)),               DOT00120
     1 (LINK(31),NSYMM(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIMCM(25)),  DOT00130
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),      DOT00140
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),       DOT00150
     4 (LINK(31),OPPOP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),     DOT00160
     5 (LINK(31),VOLPT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),   DOT00170
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),     DOT00180
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),      DOT00190
     8 (LINK(31),GEN(7)),  (LINK(31),OPPIOP(9)),  (LINK(31),ODEN(8)),       DOT00200
     9 (LINK(31),GREF(8)),  (LINK(31),NTA(31))                              DOT00210
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRS7M,NWANT,LINK(14000)             DOT00220
      DIMENSION MAP(31),LR(3),LV(3)                                         DOT00230
      EQUIVALENCE (LR(1),LVPIN),(LR(2),LKURT),                              DOT00240
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)            DOT00250
C                                                                           DOT00260
      COMMON /MISC/ MO,MM,LP,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          DOT00270
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SHLTH,       DOT00280
     2    INDXVL,WFAC,OPTSQ,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,              DOT00290
     3    AMOJIN,AMOMAX,AMORAT,VOLLIM,MIAS,PJOIN,VRJOIN,WSIM,WDELSM,        DOT00300
     4    METTER,MODE,CONLEN,SPCOR                                          DOT00310
C                                                                           DOT00320
      COMMON /STRAN/WAIT,CONLV,SKRND,SKCHI,TWRND,TRCHI,URKRND,URKCHI,       DOT00330
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                     DOT00340
      REAL V(30),AMET(475)                                                  DOT00350
      REAL*8 DOTSQ,DGDOT                                                    DOT00360
      DOTSQ=0.                                                              DOT00370
      DGDOT=V(1)*V(1)*AMET(1)                                               DOT00380
      DO 10 I=2,MO                                                          DOT00390
      MX=MXAR(I)                                                            DOT00400
    7 DO 8 J=2,I                                                            DOT00410
    8 DOTSQ=DOTSQ+V(I)*V(J-1)*AMET(MX+J-1)                                  DOT00420
   10 DGDOT=DGDOT+V(I)*V(I)*AMET(MX+I)                                      DOT00430
C       THE DIAGONALS ARE HANDLED SEPARATELY BECAUSE EACH OFF-              DOT00440
C       DIAGONAL APPEARS TWICE, AND SO MUST BE DOUBLED.                     DOT00450
      DOTSQ=DOTSQ+DOTSQ+DGDOT                                               DOT00460
      DOTSQ = DOTSQ                                                         DOT00470
      RETURN                                                                DOT00480
      END                                                                   DOT00490
```

FILE: DSQMTX FORTRAN A

```
      SUBROUTINE DSQMTX(SQ,AM)                                          DSQ000010
        REAL*8 SQ                                                       DSQ000020
C  THIS SUBROUTINE EXPANDS MATRIX AM FROM TRIANGULAR FORM AND MAKES     DSQ000030
C    AN MQ*MQ SQUARE SYMMETRIC MATRIX IN SQ(DIM MQ*MQ).                 DSQ000040
C                                                                       DSQ000050
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      DSQ000060
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,   DSQ000070
     2    INDXVL,WFAC,NPTSQ,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          DSQ000080
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    DSQ000090
     4    BETTER,MODE,CORLEN,SPCOR                                      DSQ000100
C                                                                       DSQ000110
      DIMENSION AM(475),SQ(900)                                         DSQ000120
      LOC=0                                                             DSQ000130
      IMQ=0                                                             DSQ000140
      DO 11 I=1,MQ                                                      DSQ000150
      IJ=I                                                              DSQ000160
      DO 10 J=1,I                                                       DSQ000170
      LOC=LOC+1                                                         DSQ000180
      SQ(IJ)=AM(LOC)                                                    DSQ000190
      SQ(IMQ+J)=AM(LOC)                                                 DSQ000200
   10 IJ=IJ+MQ                                                          DSQ000210
   11 IMQ=IMQ+MQ                                                        DSQ000220
      RETURN                                                            DSQ000230
      END                                                               DSQ000240
```

```
FILE: DTRMTX    FORTRAN  A

      SUBROUTINE [illegible](TRI,SQ)                                    DTR00010
      REAL*8 SQ                                                         DTR00020
C     THIS ROUTINE TAKES THE LOWER TRIANGLE OF SQ(DIM MQ*MQ) AND PUTS   DTR00030
C        IT INTO SYMMETRIC MATRIX FORM IN TRI.                          DTR00040
C                                                                       DTR00050
      DIMENSION MXAR(31),LR(3),LV(3)                                    DTR00060
      COMMON /MISC/ MQ,MM,LR,LV,NTNCLS,MXAR,WTINIT,KROOT,EPS,DELT,      DTR00070
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,FLIMTH,SEPTH,VFAC,AMM,SHLTH,   DTR00080
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          DTR00090
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,HIAS,PJOIN,VRJOIN,WSIM,WDELSM,   DTR00100
     4    HFTTHR,MODE,CORLEN,SPCOR                                      DTR00110
C                                                                       DTR00120
      DIMENSION TRI(475),SQ(900)                                        DTR00130
      DO 10 I=1,40                                                      DTR00140
      MX=MXAR(I)                                                        DTR00150
      IJ=I                                                              DTR00160
      DO 10 J=1,I                                                       DTR00170
      TRI(MX+J)=SQ(IJ)                                                  DTR00180
   10 IJ=IJ+MQ                                                          DTR00190
      RETURN                                                            DTR00200
      END                                                               DTR00210
```

FILE: EIGROT FORTRAN A

```
      SUBROUTINE EIGROT(LP,NM,R,E,V)                                    EIG00010
C  THIS ROUTINE CALLS SYSTEM ROUTINES TO GENERATE AN EIGENROTATION OF    EIG00020
C       REAL*8 V(NM,NM),  R(NM,NM),E(NM)                                EIG00030
C    AN LP*LP SUBMATRIX OF THE ARRAY R. THE EIGENVALUES ARE RETURNED    EIG00040
C    IN E AND THE EIGENVECTOR MATRIX IS IN V (DIM NM*NM), WHERE         EIG00050
C      THE SECOND INDEX RUNS OVER EIGENVECTORS, AND THE FIRST           EIG00060
C      WITHIN THEM.                                                     EIG00070
C      THE STORAGE ALLOCATION SYSTEM (MORSTR,FREE) IS ALSO USED.        EIG00080
C  THE LOWER TRIANGLE OF R IS DESTROYED.                                EIG00090
C                                                                       EIG00100
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)         EIG00110
C                                                                       EIG00120
      LP2 = 2 * LP                                                      EIG00130
      ID=MORSTR(LP2)                                                    EIG00140
      IA=MORSTR(LP2)                                                    EIG00150
C                                                                       EIG00160
C     WRITE (6,9999) LP,NM, ((R(I,J),I=1,NM),J=1,NM)                    EIG00170
9999  FORMAT (' PRE TRIDMX  LP,NM,P  ',2I8,/ ,                          EIG00180
     1   4(4(F10.2,2X) / ))                                             EIG00190
      CALL TRIDMX(LP,NM,R,LINK(ID),LINK(IA))                            EIG00200
       LID = ID + LP -1                                                 EIG00210
       LIA = IA + LP - 1                                                EIG00220
C     WRITE (6,9998) LP,NM, ((R(I,J),I=1,NM),J=1,NM),                   EIG00230
C    1   (LINK(I),I=ID,LID), (LINK(I),I=IA,LIA)                        EIG00240
9998  FORMAT (' POST TRIDMX,LP,NM,R,ID,IA',2I8,/,                       EIG00250
     1   4(4(F10.2,2X) / ))                                             EIG00260
      IW=MORSTR(LP2)                                                    EIG00270
      IF=MORSTR(LP2)                                                    EIG00280
C     WRITE (6,9997)  (E(I),I=1,4)                                      EIG00290
9997  FORMAT (' PRE EIGVAL E',/,  4(4(F10.2,2X) / ))                    EIG00300
      CALL EIGVAL(LP,E,LINK(ID),LINK(IA),LINK(IW),LINK(IF))             EIG00310
      LIW = IW + 3                                                      EIG00320
      LIF = IF + 3                                                      EIG00330
C     WRITE (6,9996) LP,(E(J),J=1,4),(LINK(I),I=ID,LID),                EIG00340
C    1   (LINK(I),I=IA,LIA),(LINK(I),I=IW,LIW),(LINK(I),I=IF,LIF)       EIG00350
9996  FORMAT (' POST EIGVAL EP,E,ID,IA,IW,IF',6I8,/,                    EIG00360
     1   4(4(F10.2,2X) / ))                                             EIG00370
      CALL EIGVEC(LP,NM,R,LINK(ID),LINK(IA),E,V,LINK(IF),LINK(IW))      EIG00380
      CALL FREE(ID,LP)                                                  EIG00390
      CALL FREE(IA,LP)                                                  EIG00400
      CALL FREE(IW,LP)                                                  EIG00410
      CALL FREE(IF,LP)                                                  EIG00420
      RETURN                                                            EIG00430
      END                                                               EIG00440
```

FILE: EIGVAL FORTRAN A

```
      SUBROUTINE EIGVAL (LP, E, A, B, W, F)                                  EIG00010
        IMPLICIT REAL*8 (A-H,O-Z)                                            EIG00020
C   THIS SUBROUTINE WAS COPIED FROM THE 1110 PROGRAM                         EIG00030
      REAL*8 E(LP), A(LP), B(LP), W(LP)                                      EIG00040
      REAL*8 F(LP)                                                           EIG00050
C                                                                            EIG00060
      AM = DABS(A(1))                                                        EIG00070
      BM = 0.                                                                EIG00080
      DO 1 I =2,LP                                                           EIG00090
      AM = DMAX1(AM,DABS(A(I)))                                              EIG00100
1     BM = DMAX1(BM,DABS(B(I)))                                              EIG00110
      BD = AM + BM + BM                                                      EIG00120
      DO 6 I = 1,LP                                                          EIG00130
      A(I) = A(I)/BD                                                         EIG00140
      B(I) = B(I) /BD                                                        EIG00150
      F(I) = -1.0                                                            EIG00160
6     W(I) = 1.0                                                             EIG00170
      DO 50 K = 1,LP                                                         EIG00180
8     CONTINUE                                                               EIG00190
      IF((W(K)-F(K))/DMAX1(DABS(W(K)) +DABS(E(K)),1.0-24)-5.E-7)50,50,10     EIG00200
10    X = (W(K) + F(K)) * 0.5                                                EIG00210
C                                                                            EIG00220
      S2 = 1.0                                                               EIG00230
      F(1) = A(1) - X                                                        EIG00240
      IF (F(1)) 102,104,104                                                  EIG00250
102   S1 = -1.0                                                              EIG00260
      N = 0                                                                  EIG00270
      GO TO 105                                                              EIG00280
104   S1 = 1.0                                                               EIG00290
      N = 1                                                                  EIG00300
105   DO 120 I = 2,LP                                                        EIG00310
      IF (S1(I)) 106,113,106                                                 EIG00320
106   IF (B(I-1)) 107, 114, 107                                              EIG00330
107   IF (DABS(F(I-1)) - 1.E-15) 111, 112, 112                               EIG00340
111   F(I-1) = F(I-1) * 1.E15                                                EIG00350
112   F(I) = (A(I) - X) * F(I-1) - B(I) * B(I) * F(I-2)                      EIG00360
      IF (I .EQ. 2) F(I) = (A(I) - X) * F(I-1)                               EIG00370
      GO TO 115                                                              EIG00380
113   F(I) = (A(I) - X) * S1                                                 EIG00390
      GO TO 115                                                              EIG00400
114   F(I) = (A(I) - X) * F(I-1) - DSIGN(B(I) * B(I),S2)                     EIG00410
115   S2 = S1                                                                EIG00420
      IF (F(I)) 116, 117, 116                                                EIG00430
116   S1 = DSIGN(S1,F(I))                                                    EIG00440
      IF (S1 * S2) 117, 120, 117                                             EIG00450
117   N = N + 1                                                              EIG00460
120   CONTINUE                                                               EIG00470
      N = LP - N                                                             EIG00480
      IF (N .LT. K) GO TO 20                                                 EIG00490
12    DO 15 J = K,N                                                          EIG00500
15    W(J) = X                                                               EIG00510
20    N = N + 1                                                              EIG00520
      IF (LP .LT. N) GO TO 8                                                 EIG00530
24    DO 26 J = N,LP                                                         EIG00540
      IF ( X- F(J)) 8,25,26                                                  EIG00550
25    F(J) = X                                                               EIG00560
      GO TO 8                                                                EIG00570
50    CONTINUE                                                               EIG00580
      DO 60 I = 1,LP                                                         EIG00590
      A(I) = A(I) * BD                                                       EIG00600
      B(I) = B(I) * BD                                                       EIG00610
60    W(I) = (W(I) + F(I)) * BD * 0.5                                        EIG00620
      J = LP                                                                 EIG00630
      K = 1                                                                  EIG00640
      DO 80 I = 1,LP                                                         EIG00650
      IF (DABS(W(K)) - DABS(W(J))) 63,63,65                                  EIG00660
63    F(I) = W(J)                                                            EIG00670
      J = J - 1                                                              EIG00680
      GO TO 80                                                               EIG00690
65    F(I) = W(K)                                                            EIG00700
      K = K + 1                                                              EIG00710
80    CONTINUE                                                               EIG00720
      RETURN                                                                 EIG00730
      END                                                                    EIG00740
```

FILE: EIGVEC FORTRAN A

```
      SUBROUTINE EIGVEC (LP,NM,R,A,B,E,V,P,Q)                          EIG00010
       IMPLICIT REAL*8 (A-H,O-Z)                                       EIG00020
C  THIS SUBROUTINE WAS COPIED FROM THE 1110 SYSTEM                      EIG00030
      DIMENSION R(NM,NM), A(LP), B(LP), E(LP), V(NM,NM), P(LP), Q(LP)  EIG00040
      LP1 = LP - 1                                                     EIG00050
      DO 50 IX = 1,LP                                                  EIG00060
      X = A(1) - E(IX)                                                 EIG00070
      Y = B(2)                                                         EIG00080
C                                                                      EIG00090
      DO 10 I = 1,LP1                                                  EIG00100
      IF (DABS(X) -DABS(R(I,1))) 4,6,8                                 EIG00110
4     P(I) = R(I,1)                                                    EIG00120
      Q(I) = A(I+1) - E(IX)                                            EIG00130
      V(I,IX) = R(I,2)                                                 EIG00140
      Z = -X/P(I)                                                      EIG00150
       X = Z * Q(I) + Y                                                EIG00160
       IF (LP1 .NE. I) Y = Z * V(I,IX)                                 EIG00170
      GO TO 10                                                         EIG00180
6     IF (X) 8,7,8                                                     EIG00190
7      X = 1.0E-10                                                     EIG00200
8     P(I) = X                                                         EIG00210
      Q(I) = Y                                                         EIG00220
      V(I,IX) = 0.0                                                    EIG00230
      X = A(I+1) - (R(I+1) / X * Y + E(IX))                            EIG00240
      Y = R(I,2)                                                       EIG00250
10    CONTINUE                                                         EIG00260
C                                                                      EIG00270
20      IF (X) 21, 28, 21                                              EIG00280
21    V(LP,IX) = 1.0/X                                                 EIG00290
C                                                                      EIG00300
22    I = LP1                                                          EIG00310
      V(I,IX) = (1. - Q(I) * V(LP,IX)) / P(I)                          EIG00320
      X = V(LP,IX)**2 + V(I,IX) **2                                    EIG00330
25    I = I-1                                                          EIG00340
      IF (I) 26,30,26                                                  EIG00350
26    V(I,IX) = (1.0 - (Q(I)*V(I+1,IX) + V(I,IX) * V(I+2,IX))) / P(I)  EIG00360
      X = X + V(I,IX) ** 2                                             EIG00370
      GO TO 25                                                         EIG00380
28    V(LP,IX) = 1.0E10                                                EIG00390
      GO TO 22                                                         EIG00400
30    X = DSQRT(X)                                                     EIG00410
      DO 31 I = 1,LP                                                   EIG00420
31    V(I,IX) = V(I,IX) / X                                            EIG00430
C                                                                      EIG00440
      IF (LP.EQ.2) GO TO 50                                            EIG00450
      DO 42 KK = 2,LP1                                                 EIG00460
      K = LP - KK + 1                                                  EIG00470
      Y = 0.0                                                          EIG00480
      DO 35 I = K,LP                                                   EIG00490
35     Y = Y + V(I,IX) * R(I,K-1)                                      EIG00500
      DO 40 I = K,LP                                                   EIG00510
40    V(I,IX) = V(I,IX) - 2.0*Y*R(I,K-1)                               EIG00520
42    CONTINUE                                                         EIG00530
50    CONTINUE                                                         EIG00540
      RETURN                                                           EIG00550
      END                                                              EIG00560
```

FILE: ELIM FORTRAN A

```
      SUBROUTINE ELIM(KEL)                                                  ELI00010
C  THIS ROUTINE ELIMINATES THE CLUSTER KEL FROM THE CLUSTER TREE            ELI00020
C      AND FREES THE STORAGE.                                               ELI00030
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),         ELI00040
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),             ELI00050
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),        ELI00060
     3 PORAT(13),DISS(12),PPASS(11),PST(11),OCIN(10),PCOND(7),              ELI00070
     4 OPRIOR(9),ODEN(8)                                                    ELI00080
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                       ELI00090
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                   ELI00100
      EQUIVALENCE (LINK(31),LSUBS(30))                                      ELI00110
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),              ELI00120
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),  ELI00130
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),      ELI00140
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),       ELI00150
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),     ELI00160
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),   ELI00170
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),     ELI00180
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),      ELI00190
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),       ELI00200
     9 (LINK(31),GREF(8))                                                   ELI00210
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRS7M,NWANT,LINK(14000)             ELI00220
      DIMENSION MXAR(3),LR(3),LV(3)                                         ELI00230
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                              ELI00240
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)            ELI00250
C                                                                           ELI00260
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          ELI00270
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,       ELI00280
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,              ELI00290
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,HIAS,PJOIN,VRJOIN,WSIM,WDELSM,       ELI00300
     4    BETTER,MODE,CORLEN,SPCOR                                          ELI00310
C                                                                           ELI00320
      COMMON /STHAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,       ELI00330
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                    ELI00340
C                                                                           ELI00350
C  KF=PARENT, KMEX=1ST SIB, LS = OFFSPRING                                  ELI00360
      KF=LSUPER(KEL)                                                        ELI00370
      KMEX=LINK(KEL)                                                        ELI00380
      LS=LSUBS(KEL)                                                         ELI00390
      PRINT 719,INDEX(KEL),INDEX(KMEX),INDEX(LS),INDEX(KF)                  ELI00400
719   FORMAT ('0***ELIMINATE',I4,'    LINK,LSUBS,LSUPER=',3I3)              ELI00410
      WRITE (3,719) INDEX(KEL),INDEX(KMEX),INDEX(LS),INDEX(KF)              ELI00420
C                                                                           ELI00430
C  FIRST, USE SUBLIM IF THERE ARE ONLY 2 SUBCLUSTERS AT THIS LEVEL.         ELI00440
      LSS=LSUBS(KF)                                                         ELI00450
      IF(KF.EQ.KROOT.AND.LINK(LSS).EQ.0) RETURN                             ELI00460
      LKT=LINK(LSS)                                                         ELI00470
      IF(LINK(LKT).NE.0.OR.KF.EQ.KROOT) GO TO 5                             ELI00480
    4 CALL SUBLIM(KF)                                                       ELI00490
      CALL PRTREE (KF)                                                      ELI00500
      RETURN                                                                ELI00510
C                                                                           ELI00520
C                                                                           ELI00530
C   NOW WE REMOVE THE CLUSTER FROM VARIOUS LISTS.                           ELI00540
C                                                                           ELI00550
    5 K=LSUBS(KF)                                                           ELI00560
      IF(K.EQ.KEL) GO TO 13                                                 ELI00570
C                                                                           ELI00580
C  KEL NOT 1ST OFFSPRING                                                    ELI00590
    7 KOLD=K                                                                ELI00600
      K=LINK(K)                                                             ELI00610
      IF(K.EQ.0) PRINT 666,KEL,KF,KOLD,LSUBS(KF)                            ELI00620
  666 FORMAT('0 **STRUCTURAL ERROR AT ELIM: KEL,KFATH,KOLD,INIT',5I9)       ELI00630
      IF(K.NE.KEL) GO TO 7                                                  ELI00640
C                                                                           ELI00650
C  NODE KEL FOUND, AS NTH OFFSPRING (N NOT 1), SET LINK OF N-1 TO N+1       ELI00660
      LINK(KOLD)=LINK(K)                                                    ELI00670
      GO TO 15                                                              ELI00680
C                                                                           ELI00690
C  NODE KEL IS 1ST OFFSPRING, SET 1ST OFFSPRING LINK TO LINK FROM KEL       ELI00700
   13 LSUBS(KF)=LINK(K)                                                     ELI00710
   15 LINK(KEL)=0                                                           ELI00720
C                                                                           ELI00730
C   NOW DROP THE CLUSTER AND ITS SUBS                                       ELI00740
      CALL TPFREE(KEL,NINCLS)                                               ELI00750
      RETURN                                                                ELI00760
      END                                                                   ELI00770
```

FILE: EXPP FORTRAN A

```
      FUNCTION EXPP(Y)                                                  EXP00010
      REAL*8 DEXPP,TERM,A,XX,E                                          EXP00020
9999  FORMAT ('DEXPP',2E12.6)                                           EXP00030
      E = 1.0 D-50                                                      EXP00040
      XX = Y                                                            EXP00050
      IF (XX .LT. 0.) XX = -XX                                          EXP00060
      TERM = 1.0                                                        EXP00070
      DEXPP = 1.0                                                       EXP00080
      N = 1                                                             EXP00090
10    CONTINUE                                                          EXP00100
      TERM = TERM * XX/N                                                EXP00110
      A = DABS(TERM)                                                    EXP00120
      N = N + 1                                                         EXP00130
      IF (A .LE. E) GO TO 20                                            EXP00140
      DEXPP = DEXPP + TERM                                              EXP00150
      GO TO 10                                                          EXP00160
20    CONTINUE                                                          EXP00170
      IF (Y .LT. 0.) DEXPP = 1.0D0/DEXPP                                EXP00180
      EXPP = DEXPP                                                      EXP00190
      RETURN                                                            EXP00200
      END                                                               EXP00210
```

FILE: FREE FORTRAN A

```
      SUBROUTINE FREE (LOCATE,LENGTH)                                    FRE00010
C                                                                        FRE00020
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTHSZM,NWANT,LINK(14000)          FRE00030
C                                                                        FRE00040
CC                                                                       FRE00050
CC  PURPOSE--TO RETURN STORAGE TO LINK FILE                              FRE00060
CC                                                                       FRE00070
CC       INPUT  LOCATE-LOCATION OF BLOCK OF STORAGE                      FRE00080
CC              LENGTH-LENGTH OF BLOCK OF STORAGE                        FRE00090
CC                                                                       FRE00100
CC                                                                       FRE00110
C   CALCULATE SIZE MOD 32                                                FRE00120
      SIZE = MOD(LENGTH,32)                                              FRE00130
C                                                                        FRE00140
C   LINK TO OLD FIRST ENTRY FOR SIZE                                     FRE00150
      LINK(LOCATE) = LINK(SIZE)                                          FRE00160
C                                                                        FRE00170
C   SET FIRST ENTRY OF THIS SIZE TO LOCATE                               FRE00180
      LINK(SIZE) = LOCATE + LENGTH * 65536                               FRE00190
C     WRITE (6,9999)LOCATE,LENGTH,LINK(LOCATE),LINK(SIZE)               FRE00200
C9999 FORMAT (1X,LOCATE,LENGTH,LINK(LOC),LINK(SZ)',4I8)                  FRE00210
C                                                                        FRE00220
      RETURN                                                             FRE00230
      END                                                                FRE00240
C                                                                        FRE00250
```

FILE: ISPLIT FORTRAN A

```
      LOGICAL FUNCTION ISPLIT (KLI)                                     ISP00010
      DIMENSION NTR(32)                                                 ISP00020
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),     ISP00030
     1 PCUM(26),PNIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),         ISP00040
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),    ISP00050
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),          ISP00060
     4 OPRIOR(9),ODEN(8)                                                ISP00070
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                   ISP00080
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))               ISP00090
      EQUIVALENCE (LINK(31),LSUBS(30))                                  ISP00100
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          ISP00110
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PNIRCM(25)),ISP00120
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),  ISP00130
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),   ISP00140
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)), ISP00150
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),ISP00160
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)), ISP00170
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),  ISP00180
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),   ISP00190
     9 (LINK(31),GREF(8)),  (LINK(31),NTR(31))                          ISP00200
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRSZM,NWANT,LINK(14000)         ISP00210
      DIMENSION MXAR(3),LR(3),LV(3)                                     ISP00220
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                          ISP00230
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        ISP00240
C                                                                       ISP00250
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      ISP00260
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AHM,SBLTH,   ISP00270
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          ISP00280
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    ISP00290
     4    BETTER,MODE,CORLEN,SPCOR                                      ISP00300
C                                                                       ISP00310
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,   ISP00320
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                 ISP00330
      KL = KLI                                                          ISP00340
      LSR = LSUBS(KL)                                                   ISP00350
      ISPLIT = LSR .NE. 0  .AND. (SPFAC(KL) .GT. 0.   .OR.              ISP00360
     1 IABS(INDEX(LSR)) .LT. IABS(INDEX(KL)))                           ISP00370
      RETURN                                                            ISP00380
      END                                                               ISP00390
```

FILE: JOIN FORTRAN A

```
      INTEGER FUNCTION JOIN(KAI,KBI,SUM,SKEW,KURT,OSUM,OVAR,VVV,B,A,D)   JOI00010
C                                                                        JOI00020
CCCCC JOIN  RAISES THE HYPOTHESIS THAT KA AND KB ARE THE SAME CLUSTER.   JOI00030
C       KB MUST BE OBTAINABLE FROM KA VIA LINK.                          JOI00040
CCCCC                                                                    JOI00050
CCCCC CREATE NEW CLUSTER -JOIN- WITH KA AND KB AS SUBCLUSTERS            JOI00060
CCCCC WARNING: CALLING SUBROUTINE MUST ASSURE THAT KB IS TO RIGHT OF KA  JOI00070
CCCCC *****  *****  *****  *****  *****  *****  *****  *****  *****     JOI00080
C                                                                        JOI00090
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),      JOI00100
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),          JOI00110
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),     JOI00120
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),           JOI00130
     4 OPRIOR(9),ODEN(8)                                                 JOI00140
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                    JOI00150
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                JOI00160
      EQUIVALENCE (LINK(31),LSUBS(30))                                   JOI00170
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),           JOI00180
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),JOI00190
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),   JOI00200
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),    JOI00210
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),  JOI00220
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),JOI00230
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),  JOI00240
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),   JOI00250
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),    JOI00260
     9 (LINK(31),GREF(8))                                                JOI00270
C                                                                        JOI00280
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,           JOI00290
     1                 LNCAT,  PRNT(4)  , KLAC , PRTME, PROUT, TOTPIX,   JOI00300
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                         JOI00310
     3, MAXHF, AREA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL                JOI00320
C                                                                        JOI00330
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT    JOI00340
     1 ,CLSNAM                                                           JOI00350
C                                                                        JOI00360
      COMMON/CLUS/  JUNK(12),NAPL,NTOP,NTRSZM,NWANT,LINK(14000)          JOI00370
      DIMENSION MXAR(31),LR(3),LV(3)                                     JOI00380
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                           JOI00390
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)         JOI00400
C                                                                        JOI00410
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,       JOI00420
     1    AMU,ODCON,XOVFLO,YUNFLO,WADJIN,FLIMTH,SEPTH,VFAC,AMM,SBLTH,    JOI00430
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,           JOI00440
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,     JOI00450
     4    BETTER,MODE,CORLEN,SPCOR                                       JOI00460
C                                                                        JOI00470
      COMMON /STRAP/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,    JOI00480
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                 JOI00490
C                                                                        JOI00500
      REAL SUM(1),SKEW(1),KURT(1),OSUM(1),OVAR(1)                        JOI00510
      REAL A(MQ,MQ),B(MQ,MQ),D(MQ,MQ)                                   JOI00520
      REAL VVV(MQ,MQ)                                                    JOI00530
C                                                                        JOI00540
C       *** FIND CLUSTERS KA AND KB, MOVE THEM FROM OLD STRING           JOI00550
C  TO NEWLY CREATED  STRING CONTAINING ONLY KA AND KB ***                JOI00560
C  KA      = GIVEN CLUSTER                                               JOI00570
C  KB      = GIVEN CLUSTER                                               JOI00580
      KA=KAI                                                             JOI00590
      LS=LSUPER(KA)                                                      JOI00600
      KB=KBI                                                             JOI00610
      JOIN=0                                                             JOI00620
C                                                                        JOI00630
C  LIKKA  = NEAT SIBLING OF KA                                           JOI00640
C  LSUPKA = PARENT OF KA                                                 JOI00650
      LIKKA=LINK(KA)                                                     JOI00660
      LSUPKA=LSUPER(KA)                                                  JOI00670
C                                                                        JOI00680
C  LSUBS(LSUPKA) = 1ST OFFSPRING OF PARENT OF KA                         JOI00690
C  LINK(LIKKA)   = SIB OF SIB OF KA                                      JOI00700
C  OK FOR CLUSTER THAT IS NOT CONNECTED TO PARENT, PROB UNNECESSARY      JOI00710
      IF(LSUBS(LSUPKA).EQ.0.AND.LINK(LIKKA).EQ.0) RETURN                 JOI00720
C                                                                        JOI00730
C  JOIN = NEW CLUSTER                                                    JOI00740
      JOIN=MORSTR(NINCLS)                                                JOI00750
C                                                                        JOI00760
C  CREATE NEW CLUSTER -JOIN-                                             JOI00770
      INDXVL=INDXVL+1                                                    JOI00780
      INDEX(JOIN)=INDXVL                                                 JOI00790
```

FILE: JOIN FORTRAN A

```
      IOADJ(JOIN)=NPTSO*TOTPIX                                          JOI00800
      PRINT 717,INDEX(KA),INDEX(KB),INDEX(JOIN)                         JOI00810
717   FORMAT (' ***JOINING ',I4,' AND ',I4,' TO GET ',I4)               JOI00820
      WRITE (3,717) INDEX(KA),INDEX(KB),INDEX(JOIN)                     JOI00830
C                                                                       JOI00840
C  SET PARENT OF JOIN FROM PARENT OF KA                                 JOI00850
C  SET LINK OF JOIN TO 1ST OFFSPRING OF PARENT                          JOI00860
C  SET JOIN TO BE 1ST OFFSPRING                                         JOI00870
C  SET OFFSPRING OF JOIN TO BE KA                                       JOI00880
      LSUPER(JOIN)=LS                                                   JOI00890
      LINK(JOIN)=LSUBS(LS)                                              JOI00900
      LSUBS(LS)=JOIN                                                    JOI00910
      LSUBS(JOIN)=KA                                                    JOI00920
C                                                                       JOI00930
C  LINK DOWN SIBS OF JOIN TO KA                                         JOI00940
      K=JOIN                                                            JOI00950
   30 KO=K                                                              JOI00960
      K=LINK(K)                                                         JOI00970
      IF(K.NE.KA) GO TO 30                                              JOI00980
C                                                                       JOI00990
C  REMOVE KA FROM OLD FAMILY                                            JOI01000
C  RESET SIB POINTER FOR ELEMENT LINKING TO KA TO POINT TO LINK FROM KA JOI01010
C  SET SIB POINTER OF KA TO POINT TO KB                                 JOI01020
C  SET UP PARENT POINTER OF KA TO BE JOIN                               JOI01030
      LINK(KO)=LINK(KA)                                                 JOI01040
      LINK(KA)=KB                                                       JOI01050
      LSUPER(KA)=JOIN                                                   JOI01060
C                                                                       JOI01070
C  LINK FROM KA TO KB--PROGRAM WILL ABORT IS KA DOES NOT PRECEDE KB     JOI01080
      K=KO                                                              JOI01090
   35 KO=K                                                              JOI01100
      K=LINK(K)                                                         JOI01110
      IF(K.NE.KB) GO TO 35                                              JOI01120
C                                                                       JOI01130
C  RESET SIB POINTER THAT POINTS TO KB TO POINT TO SIB OF KB            JOI01140
      LINK(KO)=LINK(KB)                                                 JOI01150
C                                                                       JOI01160
C  SET KB TO POINT TO 0                                                 JOI01170
C  SET PARENT OF KB TO BE JOIN                                          JOI01180
      LINK(KB)=0                                                        JOI01190
      LSUPER(KB)=JOIN                                                   JOI01200
C                                                                       JOI01210
C  CREATE NEW TREE                                                      JOI01220
       CALL PRTREE (KS)                                                 JOI01230
C                                                                       JOI01240
C                          *** CALCULATE STATISTICS FOR NEW CLUSTER *** JOI01250
      CALL SOMTX(VVV,VRIN(KB+1))                                        JOI01260
      CALL MINV(B,D,VVV,DD)                                             JOI01270
      CALL SOMTX(VVV,VRIN(KA+1))                                        JOI01280
      CALL MINV(A,D,VVV,DD)                                             JOI01290
C                                                                       JOI01300
C   GET COVARIANCES OF THE PARTS.                                       JOI01310
C   CALCULATE INITIAL WEIGHTS                                           JOI01320
      W(JOIN)=WFAC*AMO*SPCOR                                            JOI01330
      OW(JOIN)=W(JOIN)                                                  JOI01340
      WADJ(JOIN)=W(JOIN)*WADJIN                                         JOI01350
C                                                                       JOI01360
C   CALCULATE SPLITTING FACTORS                                         JOI01370
      SPFAC(JOIN)=APPIOR(JOIN)                                          JOI01380
      OPRIOR(JOIN)=SPFAC(JOIN)                                          JOI01390
C                                                                       JOI01400
C   CALCULATE PROPORTIONS FOR PARENT(JOIN) AND SUBS (KA , KB)           JOI01410
      PORAT(JOIN)=0.                                                    JOI01420
      PROP(JOIN)=PROP(KA)+PROP(KB)                                      JOI01430
      OPROP(JOIN)=PROP(JOIN)                                            JOI01440
      PRTRCM(JOIN)=1.                                                   JOI01450
      CALL DENCAL(KA,1./PROP(JOIN),W(LS))                               JOI01460
      CALL DENCAL(KB,1./PROP(JOIN),W(LS))                               JOI01470
      CIN(JOIN)=CIN(KA)*PROP(KA)+CIN(KB)*PROP(KB)                       JOI01480
      OCIN(JOIN)=CIN(JOIN)                                              JOI01490
      ODEN(JOIN)=CIN(JOIN)/PROP(JOIN)                                   JOI01500
      CTOT(JOIN)=W(LS)-ODEN(JOIN)                                       JOI01510
C                                                                       JOI01520
C   CALCULATE WEIGHTING COEFFICIENTS (TEMPORARY-FOR MEANS AND COVAR)    JOI01530
C                                                                       JOI01540
      CF=W(JOIN)/(W(KB)*W(KB))*PROP(KA)*PROP(KB)                        JOI01550
      FA=W(KB)/W(KA)                                                    JOI01560
      CA=PROP(KA)*W(JOIN)/W(KA)                                         JOI01570
      CH=PROP(KB)*W(JOIN)/W(KB)                                         JOI01580
```

```
FILE: JOIN      FORTRAN  A

      CHV=CA                                                                    JOI01590
      IF(INDEX(KA).LT.0) CHV=CHV*W(KA)/OW(KA)                                   JOI01600
C     CALCULATE WEIGHTED OVERALL MEANS AND COVARIANCE                           JOI01610
      DO 21 I=1,MO                                                              JOI01620
      SUM(JOIN,I)=CA*SUM(KA,I)+CB*SUM(KB,I)                                     JOI01630
      SKEW(JOIN,I)=0.                                                           JOI01640
      OSUM(JOIN,I)=SUM(JOIN,I)                                                  JOI01650
      DELTA=CB*(FA*SUM(KA,I)-SUM(KB,I))                                         JOI01660
C                                                                               JOI01670
C     COVARIANCE=COVAR(KA)+COVAR(KB)+DISPLACEMENT**2 (WITH COEFFICIENTS)        JOI01680
      DO 21 J=1,MO                                                              JOI01690
   21 O(I,J)=CA*A(I,J)+CHV*H(I,J)+DELTA*(FA*SUM(KA,J)-SUM(KB,J))                JOI01700
C                                                                               JOI01710
C     PUT COVARIANCE INTO JOIN NODE, CALCULATE VOLUME                           JOI01720
      CALL TRIMTX(COVAR(JOIN,1),O)                                              JOI01730
      CALL MINV(VVV,0,0,VOLIN(JOIN))                                            JOI01740
      CALL TRIMTX(VARIN(JOIN,1),VVV)                                            JOI01750
C                                                                               JOI01760
C     ZERO OUT KURT                                                             JOI01770
      DO 22 I=1,MM                                                              JOI01780
   22 KURT(JOIN,I)=0.                                                           JOI01790
C                                                                               JOI01800
C     COVARIANCE MUST BE POSITIVE DEFINITE                                      JOI01810
      IF(VOLIN(JOIN).LE.0.) PRINT 653,LS,JOIN,VOLIN(LS),VOLIN(JOIN)             JOI01820
  653 FORMAT(' VOLUME ERROR IN JOIN: CLASSES,VOLUMES',2I5,2E10.5)               JOI01830
      VOLIN(JOIN)=ABS(VOLIN(JOIN))*.875651076E-26*(6.283185307/W(JOIN))**MO     JOI01840
     1                                                                          JOI01850
C                                                                               JOI01860
C     PUT VOLUME (VOLIN) IN INTERNAL FORM, CALCULATE VOLRT, INIT DCON           JOI01870
      VOLRT(JOIN)=SQRT(VOLIN(JOIN))                                             JOI01880
      DCON(JOIN)=ODCON                                                          JOI01890
      OW(JOIN)=W(JOIN)                                                          JOI01900
C                                                                               JOI01910
C                        *** PRINT DATA FOR NEW CLUSTER ***                     JOI01920
C     PRINT OUT (IF DESIRED)                                                    JOI01930
      CALL CLPR(JOIN,-1,SUM,SKEW,KURT)                                          JOI01940
      CALL CLPR(KA,-2,SUM,SKEW,KURT)                                            JOI01950
      CALL CLPR(KB,-2,SUM,SKEW,KURT)                                            JOI01960
      RETURN                                                                    JOI01970
      END                                                                       JOI01980
```

FILE: MINV FORTRAN A

```
      SUBROUTINE MINV(A,B,C,VOL)                                        MIN00010
C   THIS ROUTINE CALCULATES A=THE INVERSE OF C. A=C**-1.  IT ALSO       MIN00020
C     RETURNS THE DETERMINANT OF C IN VOL.  THE SQUARE ARRAY            MIN00030
C     B IS TEMPORARY STORAGE, AND MAY BE IDENTICAL TO C.                MIN00040
C     VOL=-DABS(DET(C)) IF C IS NOT POSITIVE DEFINITE.                  MIN00050
C                                                                       MIN00060
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      MIN00070
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,   MIN00080
     2    INDXVL,WFAC,NPTSQ,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          MIN00090
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,   MIN00100
     4    METTER,MODE,CORLEN,SPCOR                                      MIN00110
C                                                                       MIN00120
      REAL  A(MQ,MQ),B(MQ,MQ),C(MQ,MQ)                                  MIN00130
       REAL*8 Z,VOLL                                                    MIN00140
      VOLL=1.                                                           MIN00150
      DO 11 I=1,MQ                                                      MIN00160
      DO 10 J=1,MQ                                                      MIN00170
      B(I,J)=C(I,J)                                                     MIN00180
   10 A(I,J)=0.                                                         MIN00190
   11 A(I,I)=1.                                                         MIN00200
      DO 22 I=1,MQ                                                      MIN00210
      VOLL=VOLL*B(I,I)                                                  MIN00220
      IF(B(I,I).LE.0.) VOLL=-DABS(VOLL)                                 MIN00230
      Z=1./B(I,I)                                                       MIN00240
      DO 21 J=1,MQ                                                      MIN00250
      B(I,J)=B(I,J)*Z                                                   MIN00260
   21 A(I,J)=A(I,J)*Z                                                   MIN00270
      DO 22 IP=1,MQ                                                     MIN00280
      IF(IP.EQ.I) GO TO 22                                              MIN00290
      Z=B(IP,I)                                                         MIN00300
      DO 23 J=1,MQ                                                      MIN00310
      B(IP,J)=B(IP,J)-B(I,J)*Z                                          MIN00320
   23 A(IP,J)=A(IP,J)-A(I,J)*Z                                          MIN00330
   22 CONTINUE                                                          MIN00340
       VOL = VOLL                                                       MIN00350
      RETURN                                                            MIN00360
      END                                                               MIN00370
```

FILE: MLT FORTRAN A

```
      SUBROUTINE MLT(A,B,C)                                                  MLT00010
C                                                                            MLT00020
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,           MLT00030
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,        MLT00040
     2    INDXVL,PFAC,NPTSQ,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,               MLT00050
     3     AMOMIN,AMOMAX,AMONAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,       MLT00060
     4    BETTER,MODE,COPLEN,SPCOR                                          MLT00070
C                                                                            MLT00080
      REAL*8 SUM,A(MQ,MQ),B(MQ,MQ),C(MQ,MQ)                                 MLT00090
      DO 13 I=1,MQ                                                          MLT00100
      DO 13 J=1,MQ                                                          MLT00110
      SUM=0.                                                                MLT00120
      DO 12 K=1,MQ                                                          MLT00130
   12 SUM=SUM+B(I,K)*C(K,J)                                                 MLT00140
   13 A(I,J)=SUM                                                            MLT00150
      RETURN                                                                MLT00160
      END                                                                   MLT00170
```

FILE: MORSTR FORTRAN A

```
      FUNCTION MORSTR(LENGTH)                                                  MOR00010
C SUBROUTINE WAS PREVIOUSLY GET, BUT WAS CHANGED TO HAVE AN INTEGER NAME       MOR00020
C                                                                              MOR00030
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)                MOR00040
C                                                                              MOR00050
C  THE PURPOSE OF THIS ROUTINE IS TO ALLOCATE STORAGE SPACE                    MOR00060
C                                                                              MOR00070
C       INPUT--LENGTH  SIZE OF SPACE NEEDED IN WORDS                           MOR00080
C                                                                              MOR00090
C       OUTPUT-GET  INDEX IN THE LINK FILE TO THE REQUESTED SPACE              MOR00100
C                                                                              MOR00110
C                                                                              MOR00120
      NARL = 13996                                                             MOR00130
C  CALCULATE INDEX TO LINK TABLE FOR MORE STORAGE FROM SIZE                    MOR00140
      MORSTR = MOD(LENGTH,32)                                                  MOR00150
C                                                                              MOR00160
C  CK TABLE FOR PREVIOUSLY RETURNED ENTRY                                      MOR00170
 10   LSTLNK = MORSTR                                                          MOR00180
      LINKKT = LINK(MORSTR)                                                    MOR00190
      IF (LINKKT .EQ. MORSTR) GO TO 100                                        MOR00200
C                                                                              MOR00210
C  LINK TO MORE STORAGE IS IN THE LAST 16 BITS OF LINK ENTRY                   MOR00220
      MORSTR = MOD(LINKKT,65536)                                               MOR00230
      IF (MORSTR .EQ. 0) GO TO 100                                             MOR00240
C                                                                              MOR00250
C  ENTRY WAS RETURNED, CHECK SIZE                                              MOR00260
      KOUNT = LINKKT/65536                                                     MOR00270
      IF (KOUNT .NE. LENGTH) GO TO 10                                          MOR00280
C                                                                              MOR00290
C  RETURN SIZE                                                                 MOR00300
      LINK(LSTLNK) = LINK(MORSTR)                                              MOR00310
      RETURN                                                                   MOR00320
C                                                                              MOR00330
C                                                                              MOR00340
C  NO MATCHING ENTRY, RETURN MORE STORAGE FORM TOP OF LINK ARRAY               MOR00350
100   CONTINUE                                                                 MOR00360
      IF (MOD(NTOP,2) .NE. 1) NTOP = NTOP + 1                                  MOR00370
      MORSTR = NTOP                                                            MOR00380
      NTOP = NTOP + LENGTH                                                     MOR00390
C                                                                              MOR00400
C                                                                              MOR00410
CK TABLE FOR OVERFLOW                                                          MOR00420
      IF (NTOP .LT. NARL) RETURN                                               MOR00430
C                                                                              MOR00440
      WRITE (6,200)                                                            MOR00450
200   FORMAT (' NO MORE SPACE AVAILABLE IN LINK ARRAY')                        MOR00460
      WRITE (3,200)                                                            MOR00470
      STOP                                                                     MOR00480
      END                                                                      MOR00490
```

```
FILE: MPVS     FORTRAN  A

      SUBROUTINE MPVS(AM,C,V)                                                   MPV00010
C        SETS AM=AM+V*V*C     (TENSOR PRODUCT)                                  MPV00020
C                                                                              MPV00030
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,             MPV00040
     1    AMO,OUCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,          MPV00050
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                 MPV00060
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           MPV00070
     4    BETTER,MODE,CORLEN,SPCOR                                             MPV00080
C                                                                              MPV00090
      REAL AM(475),V(30)                                                       MPV00100
      LOC=0                                                                    MPV00110
      DO 10 I=1,MO                                                             MPV00120
      DO 10 J=1,I                                                              MPV00130
      LOC=LOC+1                                                                MPV00140
   10 AM(LOC)=AM(LOC)+V(I)*V(J)*C                                              MPV00150
      RETURN                                                                   MPV00160
      END                                                                      MPV00170
```

FILE: MTVEC FORTRAN A

```
      SUBROUTINE MTVEC(U,A,V)                                                   MTV00010
      DIMENSION NTB(32)                                                         MTV00020
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IOADJ(28),NSYMB(12),             MTV00030
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),                 MTV00040
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),            MTV00050
     3 PORAT(13),OISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),                  MTV00060
     4 OPRIOR(9),ODEN(8)                                                        MTV00070
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                           MTV00080
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                       MTV00090
      EQUIVALENCE (LINK(31),LSUBS(30))                                          MTV00100
      EQUIVALENCE (LINK(31),LSUPER(29)),  (LINK(31),IOADJ(28)),                 MTV00110
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),      MTV00120
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),          MTV00130
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),           MTV00140
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),         MTV00150
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),       MTV00160
     6 (LINK(31),OISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),         MTV00170
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),          MTV00180
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),           MTV00190
     9 (LINK(31),GREF(8)),  (LINK(31),NTB(31))                                  MTV00200
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTAS7M,NWANT,LINK(1400)                  MTV00210
      DIMENSION MXAR(31),LR(3),LV(3)                                            MTV00220
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                                  MTV00230
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)                MTV00240
C                                                                               MTV00250
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,              MTV00260
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SALTH,           MTV00270
     2    INDXVL,AFAC,NPTSO,PORATH,SPMVTH,OWFAC,GRACTM,AMOFAC,                  MTV00280
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,            MTV00290
     4    WITTER,MODE,CORLEN,SPCOR                                              MTV00300
C                                                                               MTV00310
      COMMON /STRAW/WAIT,CONLV,SKHND,SKCHI,TRHND,TRCHI,URKBND,URKCHI,           MTV00320
     1    PACCEL(2),MACCEL(2),VACCEL(2)                                         MTV00330
      REAL*8 U(MO),V(MO),A(MO,MO)                                               MTV00340
       REAL*8 SUM                                                               MTV00350
      DO 13 I=1,MO                                                              MTV00360
      SUM=0.                                                                    MTV00370
      DO 12 J=1,MO                                                              MTV00380
   12 SUM=SUM+A(J,I)*V(J)                                                       MTV00390
   13 U(I)=SUM                                                                  MTV00400
      RETURN                                                                    MTV00410
      END                                                                       MTV00420
```

```
FILE: MULTI     FORTRAN  A

      SUBROUTINE MULTI(PV)                                                      MUL00010
C                                                                               MUL00020
C   PURPOSE--CALL DATFIX,ALFREE,CLINIT,STATIS,CLDUMP                            MUL00030
C                                                                               MUL00040
      COMMON /INFORM/HEAD(42), MAPTAP,      DATAPE,      SAVTAP,    MAXFET,MUL00050
     1                PAGSIZ,  TAPCHK,     TRNSYM,      TSTSYM,           MUL00060
     2                DUPSYM,  THRSYM,     MAXDIV,      MINDIV,    SPLMAX,MUL00070
     3                SERIAL,  TAPESV,     FILESV,                        MUL00080
     4                MAXCLS,  NOCLS2,     MAXFLD,      NOFLD2,    NOFLD3,MUL00090
     5                NOTRFD,  NOFEAT,     NOFET2,      NOFET4,    VARSIZ,MUL00100
     6                VARSZ2,  VARSZ4,     XSIZ  ,      NOSPEC,    NOHIST,MUL00110
     7                NOGRP,   DIVSIZ,   KEEPLV,    PRTLEV,    YSIZ  ,    MUL00120
     8                XHIGH ,  XLOW ,      SPCHAS,      NOCLS3,    PCTSZ ,MUL00130
     9IBLOCK(30),FFTVEC(30),FFTVC2(30), HISVEC(30),INVERT(30),BESTVC(30)MUL00140
C                                                                               MUL00150
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,                  MUL00160
     1               LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,              MUL00170
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                                MUL00180
     3, MAXRF, AREA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL                       MUL00190
C                                                                               MUL00200
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT           MUL00210
     1 ,CLSNAM                                                                  MUL00220
C                                                                               MUL00230
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),             MUL00240
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),                 MUL00250
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),            MUL00260
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),                  MUL00270
     4 OPRIOR(9),ODEN(8)                                                        MUL00280
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                           MUL00290
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                       MUL00300
      EQUIVALENCE (LINK(31),LSUBS(30))                                          MUL00310
      EQUIVALENCE (LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),                 MUL00320
     1 (LINK(31),NSYMB(12)), (LINK(31),PCUM(26)), (LINK(31),PRIRCM(25)),MUL00330
     2 (LINK(31),CIN(24)), (LINK(31),CTOT(23)), (LINK(31),PROP(22)),            MUL00340
     3 (LINK(31),SPFAC(21)), (LINK(31),WADJ(20)), (LINK(31),W(19)),             MUL00350
     4 (LINK(31),OPROP(18)), (LINK(31),OW(17)), (LINK(31),VOLIN(16)),           MUL00360
     5 (LINK(31),VOLRT(15)), (LINK(31),DCON(14)), (LINK(31),PQRAT(13)),MUL00370
     6 (LINK(31),DISS(12)), (LINK(31),PPASS(12)), (LINK(31),PST(11)),           MUL00380
     7 (LINK(31),OCIN(10)), (LINK(31),PCOND(7)), (LINK(31),VRIN(7)),            MUL00390
     8 (LINK(31),GEN(7)), (LINK(31),OPRIOR(9)), (LINK(31),ODEN(8)),             MUL00400
     9 (LINK(31),GREF(2))                                                       MUL00410
      COMMON/CLUS/  JUNK(12),NAKL,NTOP,NTBS7M,NWANT,LINK(14000)                 MUL00420
      DIMENSION MXAP(3),LR(3),LV(3)                                             MUL00430
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                                  MUL00440
     1    (LR(3),LOVAP),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)                MUL00450
C                                                                               MUL00460
      COMMON /MISC/ MQ,MM,LP,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,              MUL00470
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SRLTH,           MUL00480
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                  MUL00490
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           MUL00500
     4    BETTER,MODE,COPLEN,SPCOR                                              MUL00510
C                                                                               MUL00520
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,           MUL00530
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                        MUL00540
C                                                                               MUL00550
      DIMENSION   PV(1,1)                                                       MUL00560
C                                                                               MUL00570
C   CALL DATFIX TO INITIALIZE VARIABLES                                         MUL00580
      CALL DATFIX                                                               MUL00590
      MQ=NOFEAT                                                                 MUL00600
      MM=(MQ*(MQ+1))/2                                                          MUL00610
C                                                                               MUL00620
C   CALL ALFREE TO FREE STRING STARTED BY KLBC                                  MUL00630
      CALL ALFREE(KLBC,NINCLS)                                                  MUL00640
C                                                                               MUL00650
C   CALL CLINIT TO INITIALIZE THE CLUSTERING ALGORITHM                          MUL00660
      CALL CLINIT(KLBC)                                                         MUL00670
      KROOT=KLBC                                                                MUL00680
C                                                                               MUL00690
C   CALL STATIS TO CLASSIFY EACH POINT AND UPDATE STATISTICS                    MUL00700
      CALL STATIS(KLBC,PV,GEN(LSUM),GEN(LSKEW),GEN(LKURT),GEN(LOSUM),           MUL00710
     *  GEN(LOVAR))                                                           MUL00720
C K: PRINT OUT ALL CLASSES.                                                     MUL00730
      PROUT=3                                                                   MUL00740
C                                                                               MUL00750
C   CALL CLDUMP TO PRINT ALL CLASSES FOR ENTIRE TREE UNDER KLBC                 MUL00760
      CALL CLDUMP(KLBC)                                                         MUL00770
      PROUT=1                                                                   MUL00780
      RETURN                                                                    MUL00790
```


C-2

FILE: MULTI FORTRAN A

```
      END                                                          MUL00800
```

FILE: MVEC FORTRAN A

```
      SUBROUTINE MVEC(U,A,V)                                                    MVE00010
C                                                                               MVE00020
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,              MVE00030
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SFPTH,VFAC,AMM,SBLTH,           MVE00040
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                  MVE00050
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           MVE00060
     4    RETTEP,MODE,CORLEN,SPCOR                                             MVE00070
C                                                                               MVE00080
      REAL*8 U(MQ),V(MQ),A(MQ,MQ)                                               MVE00090
       REAL*8 SUM                                                               MVE00100
      DO 13 I=1,MQ                                                              MVE00110
      SUM=0.                                                                    MVE00120
      DO 12 J=1,MQ                                                              MVE00130
   12 SUM=SUM+A(I,J)*V(J)                                                       MVE00140
   13 U(I)=SUM                                                                  MVE00150
      RETURN                                                                    MVE00160
      END                                                                       MVE00170
```

FILE: NRAND FORTRAN A

```
      FUNCTION NRAND(NX)                                                NRA00010
      DATA MODD,MULT,INC/2147483369,731881067,123456791/                NRA00020
      NX=MOD(NX*MULT+INC,MODD)                                          NRA00030
      NRAND=IABS(NX)                                                    NRA00040
      RETURN                                                            NRA00050
      END                                                               NRA00060
```

FILE: ORD1 FORTRAN A

```
      SUBROUTINE ORD1(A,I1,I2,N)                                        ORD00010
      DIMENSION A(N)                                                    ORD00020
      IXSTOP=I2-1                                                       ORD00030
      IF ((IXSTOP-I1).LT.1) GO TO 210                                   ORD00040
      DO 200 J=I1,IXSTOP                                                ORD00050
      JP1=J+1                                                           ORD00060
      IF (ABS(A(J)).LE.ABS(A(JP1))) GO TO 200                           ORD00070
      COPY=A(J)                                                         ORD00080
      A(J)=A(JP1)                                                       ORD00090
      A(JP1)=COPY                                                       ORD00100
      K=J                                                               ORD00110
  150 K=K-1                                                             ORD00120
      IF (K.LT.I1) GO TO 200                                            ORD00130
      KP1=K+1                                                           ORD00140
      IF (ABS(A(K)).LE.ABS(A(KP1))) GO TO 200                           ORD00150
      COPY=A(K)                                                         ORD00160
      A(K)=A(KP1)                                                       ORD00170
      A(KP1)=COPY                                                       ORD00180
      GO TO 150                                                         ORD00190
  200 CONTINUE                                                          ORD00200
  210 CONTINUE                                                          ORD00210
      RETURN                                                            ORD00220
      END                                                               ORD00230
```

FILE: PACLMP FORTRAN A

```
      SUBROUTINE CLUSMP                                                 PAC00010
C*                                                                      PAC00020
C*    THE PURPOSE OF CLUSMP IS TO PRINT THE CLUSTER MAP.  THE CLUSTER   PAC00030
C*    MAP HAS EACH PIXEL REPRESENTED BY A SYMBOL.  EACH SYMBOL          PAC00040
C*    REPRESENTS A CLUSTER TYPE                                         PAC00050
C*                                                                      PAC00060
      IMPLICIT INTEGER (A-Z)                                            PAC00070
C                                                                       PAC00080
      COMMON /ARRAY/TOP, ARRAY(18000)                                   PAC00090
C                                                                       PAC00100
       DIMENSION IPFEAT(2)                                              PAC00110
C                                                                       PAC00120
      DIMENSION BUFER(1), COL(3,110), OUT(110), FL(8), FLDINF(6),       PAC00130
     1 CLUSTN(110), NBLK(61), NBLKT(61)                                 PAC00140
C                                                                       PAC00150
C                                                                       PAC00160
      COMMON /GLOBAL/HEAD(63), MAPTAP,     DATAPE,     SAVTAP,   RMFILE,PAC00170
     1  RMKEY,HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,DRUMAD,   PAC00180
     2  ASAVFL,NHSUN,NHSTFI  , DUPSYM, THRSYM,     MAXDIV,     MIN      PAC00190
C                                                                       PAC00200
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,          PAC00210
     1               LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,      PAC00220
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                        PAC00230
     3, MAXBF, APEA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL               PAC00240
C                                                                       PAC00250
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT   PAC00260
     1 ,CLSNAM                                                          PAC00270
C                                                                       PAC00280
      DIMENSION NTB(32)                                                 PAC00290
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),     PAC00300
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),         PAC00310
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),    PAC00320
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),          PAC00330
     4 QPRIOR(9),ODEN(8)                                                PAC00340
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                   PAC00350
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))               PAC00360
      EQUIVALENCE (LINK(31),LSUBS(30))                                  PAC00370
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          PAC00380
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),PAC00390
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),  PAC00400
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),   PAC00410
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)), PAC00420
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)),PAC00430
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)), PAC00440
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),  PAC00450
     8 (LINK(31),GEN(7)),  (LINK(31),QPRIOR(9)),  (LINK(31),ODEN(8)),   PAC00460
     9 (LINK(31),GREF(8)),  (LINK(31),NTB(31))                          PAC00470
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)         PAC00480
      DIMENSION MXAR(3),LR(3),LV(3)                                     PAC00490
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                          PAC00500
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        PAC00510
C                                                                       PAC00520
      COMMON /MISC/ MO,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      PAC00530
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,   PAC00540
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,OWFAC,GRACTM,AMOFAC,          PAC00550
     3    AMOMIN,AMOMAX,AMOPAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    PAC00560
     4    BETTER,MODE,CORLEN,SPCOR                                      PAC00570
C                                                                       PAC00580
      COMMON /STRAN/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,   PAC00590
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                PAC00600
C                                                                       PAC00610
      LOGICAL NFIN                                                      PAC00620
      REAL BUFER                                                        PAC00630
C                                                                       PAC00640
      EQUIVALENCE  (COL(1,1),ARRAY(2001))                               PAC00650
      EQUIVALENCE  (OUT(1)  ,ARRAY(2400))                               PAC00660
      EQUIVALENCE  (CLUSTN(1),ARRAY(2510))                              PAC00670
      EQUIVALENCE  (NBLK(1),ARRAY(2620))                                PAC00680
      EQUIVALENCE  (NBLKT(1),ARRAY(2730))                               PAC00690
      EQUIVALENCE  (BUFER(1),ARRAY(3001))                               PAC00700
      EQUIVALENCE  (FLDINF(1),LINSTR) ,(FLDINF(4),SAMSTR),              PAC00710
     1             (FLDINF(2),LINEND) ,(FLDINF(5),SAMEND),              PAC00720
     2             (FLDINF(3),LININC) ,(FLDINF(6),SAMINC)               PAC00730
C*    FIELD INFORMATION STORED AS FOLLOWS                               PAC00740
C*                                                                      PAC00750
C*    ARRAY(1)    =FIRST FIELD NAME FOR THIS CLASS                      PAC00760
C*         (2)    =NO. OF VERTICES FOR THIS FIELD (NV)                  PAC00770
C*         (3)-(3+NV*2)  = ACTUAL VERTEX NUMBERS                        PAC00780
C*         (3+NV*2)  =TOTAL PIXELS FOR THIS FIELD                       PAC00790
```

FILE: PACLMP FORTRAN A

```
C*          (4+NV*2)-(10+NV*2) = FLDINF BLOCK FOR THIS FIELD                  PAC00800
C*                                                                            PAC00810
      DATA BLANK/' '/                                                         PAC00820
C                                                                             PAC00830
C                                                                             PAC00840
C                     *****  INITIALIZE *****                                 PAC00850
C                                                                             PAC00860
C        **  INITIALIZE OUTPUT FILE  **                                       PAC00870
      IPUNIT = 16                                                             PAC00880
      IPCHAN = 1                                                              PAC00890
      IPFEAT(1) = 1                                                           PAC00900
      IPFRMT = 1H                                                             PAC00910
      IPSAMP = (SAMEND-SAMSTR)/SAMINC + 1                                     PAC00920
      FMDTAP = 0                                                              PAC00930
C                                                                             PAC00940
      LNCAT=0                                                                 PAC00950
      IPT=1                                                                   PAC00960
         MAXPOP = 61                                                          PAC00970
      DO 25 I=1,MAXPOP                                                        PAC00980
   25 NRLKT(I)=0                                                              PAC00990
C                                                                             PAC01000
C  CALL MAXIMUM BUFFER SIZE THAT IS AN EVEN NUMBER OF PIXELS                  PAC01010
      TOP = 18000                                                             PAC01020
      MAXBUF =(TOP - 3000)/MQ * MQ                                            PAC01030
C*                                                                            PAC01040
C                                                                             PAC01050
C                                                                             PAC01060
C                     **********                                              PAC01070
      DO 600 IFLD=1,NOFLD                                                     PAC01080
C                                                                             PAC01090
C    WRITE HEADING FOR NEW FILE                                               PAC01100
      CALL *RTHED (IPCHAN,IPFEAT,IPSAMP,IPFRMT,IPUNIT)                        PAC01110
C                                                                             PAC01120
C  XTRA = SEGMENTS ALREADY PROCESSED                                          PAC01130
      XTRA=0                                                                  PAC01140
C  NFIN = FALSE IF ONLY 1 PAGE NEEDED                                         PAC01150
      NFIN=.FALSE.                                                            PAC01160
C  NV = NO OF VERTICES FOR THIS FIELD                                         PAC01170
      NV=ARRAY(IPT+1)                                                         PAC01180
C  TOTSAM = TOTAL PIXELS FOR THIS FIELD                                       PAC01190
      TOTSAM=ARRAY(IPT+2+NV*2)                                                PAC01200
C                                                                             PAC01210
C  MOVE DATA DEFINING LINES AND SAMPLES                                       PAC01220
      DO 30 I=1,5                                                             PAC01230
      FLDINF(I)=ARRAY(IPT+2+I+NV*2)                                           PAC01240
   30 CONTINUE                                                                PAC01250
C                                                                             PAC01260
C  BLANK OUTPUT BUFFER                                                        PAC01270
      DO 40 I=1,110                                                           PAC01280
   40 OUT(I)=BLANK                                                            PAC01290
C                                                                             PAC01300
C  ZERO COUNT OF POINTS IN CLUSTER                                            PAC01310
      DO 45 I=1,MAXPOP                                                        PAC01320
   45 NRLK(I)=0                                                               PAC01330
C*                                                                            PAC01340
C*    CHECK IF ALL OF CLUSTER MAP CAN FIT ACROSS ONE PAGE--ONLY 110           PAC01350
C*    SYMBOLS ARE PRINTED ACROSS THE PAGE FOR EVERY LINE.  THE PROGRAM        PAC01360
C*    WILL PRINT THE ENTIRE CLUSTER MAP IN 110 SYMBOL SEGMENTS                PAC01370
C*                                                                            PAC01380
C                                                                             PAC01390
C  SET STARTING ADDRESS AND ENDING ADDRESS FOR LINE                           PAC01400
      STCLM=SAMSTR                                                            PAC01410
      ENCLM=SAMEND                                                            PAC01420
C                                                                             PAC01430
C  CK FOR MORE THAN 110 SEGMENTS SPECIFIED AND RESET MAXIMUM IF NECESSRY      PAC01440
C  NFIN = FALSE. IF 1 LINE     TRUE, IF 2 OR MORE LINES                       PAC01450
C                                                                             PAC01460
   50 IF(((ENCLM-SAMSTR)/SAMINC+1-XTRA).LE. 110) GO TO 60                     PAC01470
      ENCLM=  (100+XTRA)*SAMINC + SAMSTR                                      PAC01480
      NFIN=.TRUE.                                                             PAC01490
C                                                                             PAC01500
C       * READ 1 BUFFER OF DATA *                                             PAC01510
C                                                                             PAC01520
C  TWRD = TOTAL WORDS LEFT TO BE READ                                         PAC01530
   60 TWRD = TOTWRD                                                           PAC01540
C  READ FULL BUFFER OF DATA UNLESS ONLY PARTIAL BUFFER OF DATA LEFT           PAC01550
      NOWRD = MAXBUF                                                          PAC01560
      IF (TWRD .LT. NOWRD) NOWRD = TWRD                                       PAC01570
C  IBEGIN IS BEGINNING OF SCRAMBLED DATA                                      PAC01580
```

```
FILE: PACLMP   FORTRAN  A

      CALL RREAD (IBEGIN, BUFER, NOWRD, DUMMY)                          PAC01590
      ADRESS = IBEGIN + NOWRD                                           PAC01600
      TWRD = TWRD - NOWRD                                               PAC01610
      BUFAD = 1                                                         PAC01620
C                                                                       PAC01630
C                        *** SET COLUMN HEADINGS ***                    PAC01640
   80 CONTINUE                                                          PAC01650
      J=0                                                               PAC01660
      DO 100 I=SAMSTR,SAMEND,SAMINC                                     PAC01670
      IF( I .LT. STCLM)GO TO 100                                        PAC01680
      IF( I .GT. ENCLM)GO TO 110                                        PAC01690
      J=J+1                                                             PAC01700
      COL(1,J)=I/100                                                    PAC01710
      COL(2,J)=MOD(I,100)/10                                            PAC01720
      COL(3,J)=MOD(I,10)                                                PAC01730
  100 CONTINUE                                                          PAC01740
C                                                                       PAC01750
C                        *** WRITE HEADINGS ***                         PAC01760
  110 LPTS=J                                                            PAC01770
      WRITE(6,500)                                                      PAC01780
      WRITE(6,HEAD)                                                     PAC01790
      WRITE(6,510)ARRAY(IPT),TOTSAM                                     PAC01800
C*    PRINT COLUMN NUMBERS FOR CLUSTER MAP                              PAC01810
      DO 120 I=1,3                                                      PAC01820
  120 WRITE(6,520)(COL(I,J),J=1,LPTS)                                   PAC01830
      WRITE(6,500)                                                      PAC01840
  500 FORMAT(/)                                                         PAC01850
  510 FORMAT(//2X,A5,//' TOTAL NUMBER OF POINTS IN THIS FIELD',I7)      PAC01860
  520 FORMAT(9X,110I1)                                                  PAC01870
C                                                                       PAC01880
C                                                                       PAC01890
C                    ******  PROCESS ONE LINE OF DATA  ******          PAC01900
C                                                                       PAC01910
      DO 300 LINE=LINSTR,LINEND,LININC                                  PAC01920
C*                                                                      PAC01930
C*    CALL EDLINT TO OBTAIN FIELD INTERSECTIONS FOR THIS LINE           PAC01940
      CALL EDLINT(ARRAY(IPT+2),NV,FL,LINE,SAMPS,NI)                     PAC01950
C                                                                       PAC01960
C                        *****  PROCESS EACH INTERCEPT *****           PAC01970
      DO 200 I=1,NI,2                                                   PAC01980
      NOEX=0                                                            PAC01990
C                                                                       PAC02000
C*    SAVE THE BEGINNING AND END NUMBERS OF THIS INTERCEPT FOR ARRAY OUTPAC02010
C*    WHICH IS PRINTED                                                  PAC02020
      IE =(FL(I)-SAMSTR)/SAMINC +1                                      PAC02030
      IF =(FL(I+1)-SAMSTR)/SAMINC+1                                     PAC02040
      IF(MOD(SAMSTR,SAMINC) .NE. MOD(FL(I),SAMINC))IB =IB +1            PAC02050
      TNPTS=(IE-IB+1)*MQ                                                PAC02060
      IF(IB  .GT. IE )TNPTS=0                                           PAC02070
      IF(IB  .GT. IE ) GO TO 140                                        PAC02080
C                                                                       PAC02090
C*    CHECK IF INTERCEPTS ARE WITHIN PRINTOUT LIMITS                    PAC02100
      IF(FL(I) .GT. ENCLM) GO TO 140                                    PAC02110
      IF(FL(I+1) .LT. STCLM) GO TO 140                                  PAC02120
      GO TO 150                                                         PAC02130
C                                                                       PAC02140
C*    THESE CARDS ARE USED TO SET UP THE OUTPUT FOR BLANK LINES OR BLANKPAC02150
C*    SPACES OR AREAS OUTSIDE OF PRINT LIMITS                           PAC02160
  140 CONTINUE                                                          PAC02170
      IF (I+1 .NE. NI) WRITE (6,141)                                    PAC02180
  141 FORMAT (1X)                                                       PAC02190
      GO TO 190                                                         PAC02200
C                                                                       PAC02210
C                                                                       PAC02220
  150 CONTINUE                                                          PAC02230
C*    RESAVE BEGINNING AND END NUMBERS FOR ARRAY OUT IF INTERCEPT(S)    PAC02240
C*    EXCEEDS PRINT LIMIT                                               PAC02250
      IF(FL(I) .GE. STCLM) GO TO 152                                    PAC02260
      IHO=IB                                                            PAC02270
      IB=(STCLM-SAMSTR)/SAMINC+1                                        PAC02280
      IF(MOD(SAMSTR,SAMINC) .NE. MOD(STCLM,SAMINC))IB=IB+1              PAC02290
C*                                                                      PAC02300
C*    STORE NUMBER OF EXTRA POINTS THAT ARE IN INTERCEPT BUT ARE        PAC02310
C*    OUTSIDE THE PRINT LIMITS ON LEFT SIDE                             PAC02320
      NOEX=(IB-IHO)*MQ                                                  PAC02330
      BUFAD=BUFAD+NOEX                                                  PAC02340
      TNPTS = TNPTS - NOEX                                              PAC02350
  152 IF(FL(I+1) .GT. ENCLM)IE=(ENCLM-SAMSTR)/SAMINC+1                  PAC02360
C*                                                                      PAC02370
```

```
FILE: PACLMP   FORTRAN  A

C*      SET PRINT LIMITS IN THE 1-110 LIMITS WHEN THE NUMBERS WOULD EXCEEDPAC02380
C*      110 ON ANOTHER PASS THROUGH THE DATA                              PAC02390
        IR=IR-XTRA                                                        PAC02400
        IE=IE-XTRA                                                        PAC02410
        IF(IR .GT. IE) GO TO 140                                          PAC02420
        NSETS=IE-IR+1                                                     PAC02430
        NPNTS=NSETS*MQ                                                    PAC02440
C                                                                         PAC02450
  155 CONTINUE                                                            PAC02460
C*                                                                        PAC02470
C*      CHECK IF NEEDED DATA IN THIS INTERCEPT IS IN TWO BUFFERS          PAC02480
C*                                                                        PAC02490
        IF (RUFAD + NPNTS .LE. NOWRD) GO TO 170                           PAC02500
C                                                                         PAC02510
C                                                                         PAC02520
C             **  COMPLETE LINE IS NOT IN BUFFER **                       PAC02530
C                                                                         PAC02540
C   IS ANY OF LINE IN CURRENT BUFFER?                                     PAC02550
        DIFF = RUFAD - NOWRD - 1                                          PAC02560
        IF (RUFAD .LE. NOWRD) GO TO 157                                   PAC02570
C                                                                         PAC02580
C   NONE OF CURRENT LINE IS IN BUFFER. SET NEW BUFFER POINTER TO          PAC02590
C   SKIP OVER EXTRANEOUS POINTS                                           PAC02600
        ADRESS = ADRESS + DIFF                                            PAC02610
        TWRD = TWRD - DIFF                                                PAC02620
        RUFAD = 1                                                         PAC02630
        GO TO 165                                                         PAC02640
C                                                                         PAC02650
C   SOME OF CURRENT BUFFER IS NEEDED. MOVE IT TO BEGINNING OF BUFFER      PAC02660
  157   KOUNT = NOWRD - RUFAD + 1                                         PAC02670
        DO 160 I = 1,KOUNT                                                PAC02680
        BUFFR(I) = BUFFR(RUFAD)                                           PAC02690
  160   RUFAD = RUFAD + 1                                                 PAC02700
C                                                                         PAC02710
C   RESET BUFFER ADRES TO END OF OLD DATA                                 PAC02720
        RUFAD = KOUNT + 1                                                 PAC02730
C                                                                         PAC02740
C   READ DATA INTO REMINDER OF BUFFER                                     PAC02750
  165   NOWRD = MAXBUF - RUFAD + 1                                        PAC02760
        IF (TWRD .LT. NOWRD) NOWRD = TWRD                                 PAC02770
        IF (NOWRD .LE. 0) GO TO 168                                       PAC02780
        CALL RREAD(ADRESS,BUFFR(RUFAD),NOWRD,STAT)                        PAC02790
        ADRESS = ADRESS + NOWRD                                           PAC02800
        TWRD = TWRD - NOWRD                                               PAC02810
  168   RUFAD = 1                                                         PAC02820
C                                                                         PAC02830
C*      CALL CLUST TO OBTAIN THE CLUSTER SUBSCRIPT SO THAT THE CLUSTER    PAC02840
C*      SYMBOLS CAN BE COMPUTED FOR EACH SET OF FL*S WITHIN THE           PAC02850
C*      START(STCLM) AND END(ENCLM)                                       PAC02860
  170   CONTINUE                                                          PAC02870
 9968   FORMAT (*IR,IE,CLUSTN 1-10*,2I6,/,10I7)                          PAC02880
        CALL CLUST (BUFFR(RUFAD), NSETS, CLUSTN, KLBC, GEN(LSYM))        PAC02890
C   **   WRITE LINE OF DATA ON NEW FILE   **                            PAC02900
C   RESET END OF FILE INDICATOR IF LAST RECORD                            PAC02910
        IF (LINE .GT. (LINEND - LININC)) ENDTAP = -1                      PAC02920
        IF (XTRA .EQ. 0) CALL WRTLN (CLUSTN,ENDTAP)                       PAC02930
C                                                                         PAC02940
        L=0                                                               PAC02950
C*                                                                        PAC02960
C*      STORE SYMBOLS FOR OUTPUT                                          PAC02970
        DO 173 K=IR,IE                                                    PAC02980
        L=L+1                                                             PAC02990
        NUM=CLUSTN(L)                                                     PAC03000
C       SET SYMBOL--THE SUBSCRIPT FOR SYM IS RESET TO 1 THROUGH MAXPOP    PAC03010
         NTEMP = NSYMB(NUM)                                               PAC03020
        J=MOD(NSYMB(NUM)-1,MAXPOP)+1                                      PAC03030
        IF ( J .LE. 0 )  J = 47                                           PAC03040
        LNCAT=MAXO(LNCAT,J)                                               PAC03050
        OUT(K)=SYM(J)                                                     PAC03060
C*      SAVE THE NUMBER OF PIXELS ASSIGNED TO THIS CLUSTER                PAC03070
  173   NBLK(J)=NBLK(J)+1                                                 PAC03080
C             ***  PRINT LINE OF OUTPUT AND BLANK BUFFER ***              PAC03090
          WRITE (6,275) LINE, (OUT(K),K=1,LPTS)                           PAC03100
        IF (LINE .LE. 4) WRITE (3,9275) LINE, (OUT(K),K=1,LPTS)           PAC03110
  275   FORMAT (2X,I5,2X,110A1)                                           PAC03120
 9275   FORMAT (2X,I5,2X,60A1,/,9X,50A1)                                  PAC03130
C                                                                         PAC03140
        DO 280 K=1,110                                                    PAC03150
  280   OUT(K) = BLANK                                                    PAC03160
```

```
FILE: PACLMP   FORTRAN  A

C                                                                       PAC03170
100   BUFAD = BUFAD + TNPTS                                             PAC03180
C                                                                       PAC03190
  200 CONTINUE                                                          PAC03200
C                                                                       PAC03210
  300 CONTINUE                                                          PAC03220
C                                                                       PAC03230
C                        ** END OF GENERATION OF LINES FOR 1 PAGE **    PAC03240
C                                                                       PAC03250
C  CHECK FOR ADDITIONAL PAGES                                           PAC03260
310   IF(.NOT. NFIN)GO TO 400                                           PAC03270
C                                                                       PAC03280
C  MULTIPLE PAGES. RESET BOUNDARIES                                     PAC03290
      XTRA=(FNCLM-SAMSTR)/SAMINC + 1                                    PAC03300
      STCLM=FNCLM+1                                                     PAC03310
      FNCLM=SAMEND                                                      PAC03320
      NFIN=.FALSE.                                                      PAC03330
C                                                                       PAC03340
C  GO TO PROCESS ADDITIONAL PAGES                                       PAC03350
      GO TO 60                                                          PAC03360
C                                                                       PAC03370
  400 CONTINUE                                                          PAC03380
C                                                                       PAC03390
C                **  END OF CLUSTER MAP **                            PAC03400
C                                                                       PAC03410
C                  ** PRINT COUNTS **                                   PAC03420
C                                                                       PAC03430
      DO 465 I=1,MAXPOP                                                 PAC03440
  465 NBLKT(I)=NBLKT(I)+NBLK(I)                                         PAC03450
C                                                                       PAC03460
      WRITE(6,570)                                                      PAC03470
  570 FORMAT(//2X,'POINTS PER CLUSTER IN THIS FIELD'/3X,'CLUSTER',      PAC03480
     * 5X,'SYMBOL',5X,'POINTS'/)                                        PAC03490
C                                                                       PAC03500
      LNCAT=MOD(LNCAT-1,MAXPOP)+1                                       PAC03510
C                                                                       PAC03520
C                                                                       PAC03530
      DO 580 I=1,LNCAT                                                  PAC03540
  580 WRITE(6,590)I,SYM(I),NBLK(I)                                      PAC03550
  590 FORMAT(5X,I2,10X,A1,7X,I5)                                        PAC03560
C                                                                       PAC03570
      IPT=IPT+4+NV*2                                                    PAC03580
  600 CONTINUE                                                          PAC03590
C                                                                       PAC03600
C                                                                       PAC03610
      WRITE(6,HEAD)                                                     PAC03620
      WRITE(3,750)LNCAT                                                 PAC03630
  750 FORMAT(//' TOTAL NUMBER OF CLUSTERS =',I3)                        PAC03640
C                                                                       PAC03650
      TOTPTS=TOTNPO/NO                                                  PAC03660
C                                                                       PAC03670
      WRITE(6,760) TOTPTS                                               PAC03680
  760 FORMAT(/' TOTAL NUMBER OF POINTS =',I5)                           PAC03690
C                                                                       PAC03700
      WRITE(6,770)                                                      PAC03710
  770 FORMAT(//' CLUSTER     SYMBOL     POINTS IN CLUSTER')            PAC03720
C                                                                       PAC03730
      DO 775 J=1,LNCAT                                                  PAC03740
  775 WRITE(6,780)J,SYM(J),NBLKT(J)                                     PAC03750
  780 FORMAT(4X,I2,9X,A1,10X,I7)                                        PAC03760
C                                                                       PAC03770
      RETURN                                                            PAC03780
      END                                                               PAC03790
C*                                                                      PAC03800
```

FILE: PCMMAT FORTRAN A

```
      DIMENSION AW(4,4),C(4),R(4),U(4),V(4)                              PCM00010
      DIMENSION JM(4),T(10),A(4,4)                                       PCM00020
      DIMENSION W(4,4)                                                   PCM00030
      N=4                                                                PCM00040
      NM=N-1                                                             PCM00050
      IN=1                                                               PCM00060
      DO 1999 KK=1,N                                                     PCM00070
      JM(KK)=KK                                                          PCM00080
 1999 CONTINUE                                                           PCM00090
      DO 3 I=1,4                                                         PCM00100
      DO 4 J=1,4                                                         PCM00110
      W(I,J)=-.5                                                         PCM00120
      IF (I.EQ.J) W(I,J)=.5                                              PCM00130
    4 CONTINUE                                                           PCM00140
    3 CONTINUE                                                           PCM00150
      WRITE (16,7777)                                                    PCM00160
 7777 FORMAT(//2X,'START INPUT')                                         PCM00170
      READ(15,7778) T(I)                                                 PCM00180
 7778 FORMAT(F10.6)                                                      PCM00190
      WRITE(6,7787) T(I)                                                 PCM00200
 7787 FORMAT(//2X,'T=',F10.6)                                            PCM00210
      DO 201 I=1,N                                                       PCM00220
      DO 202 J=1,T                                                       PCM00230
      KK=KK+1                                                            PCM00240
      A(I,J)=T(KK)                                                       PCM00250
  202 CONTINUE                                                           PCM00260
  201 CONTINUE                                                           PCM00270
      CALL MTMLS6(A,W,AW,N,N)                                            PCM00280
      DO 12 J=1,N                                                        PCM00290
      DO 13 I=1,N                                                        PCM00300
      AWIJ=AW(I,J)                                                       PCM00310
      U(I)=W(I,J)*AWIJ                                                   PCM00320
      V(I)=AWIJ**2                                                       PCM00330
   13 CONTINUE                                                           PCM00340
      C(J)=SUPSUM(U,N,N)                                                 PCM00350
      R(J)=SUPSUM(V,N,N)                                                 PCM00360
   12 CONTINUE                                                           PCM00370
      DO 14 J=1,N                                                        PCM00380
      U(J)=R(J)                                                          PCM00390
   14 CONTINUE                                                           PCM00400
    5 CONTINUE                                                           PCM00410
      RSUM=SUPSUM(U,N,N)                                                 PCM00420
C     MAIN LOOP                                                          PCM00430
   30 CONTINUE                                                           PCM00440
      WRITE(6,42)                                                        PCM00450
   42 FORMAT(//2X,'AFTER 36 CONTINUE, W COLUMNWISE')                     PCM00460
      DO 30 K=1,3                                                        PCM00470
      CALL MINDEX(R,JM,K,N)                                              PCM00480
      IS=JM(K)                                                           PCM00490
      IF (R(IS).LE.0.0) GO TO 60                                         PCM00500
   34 RMIN=R(IS)                                                         PCM00510
C     ITERATIVE SUB LOOP                                                 PCM00520
      DO 31 IK=K,NM                                                      PCM00530
      I31=IK+1                                                           PCM00540
      IR=JM(I31)                                                         PCM00550
      DO 32 I=1,N                                                        PCM00560
      U(I)=AW(I,IS)*AW(I,IR)                                             PCM00570
      V(I)=W(I,IS)*AW(I,IR)                                              PCM00580
   32 CONTINUE                                                           PCM00590
      WAAW=SUPSUM(U,N,N)                                                 PCM00600
      WAW=SUPSUM(V,N,N)                                                  PCM00610
      DEL=WAAW-2.*C(IS)*WAW                                              PCM00620
      DEL=(DEL/R(IS))**2                                                 PCM00630
      EPS=.01*(.01+(R(IR)/R(IS))-1.)                                     PCM00640
      IF (DEL.LT.EPS) GO TO 31                                           PCM00650
      GAMMA=C(IS)                                                        PCM00660
      RHO=R(IS)                                                          PCM00670
      DO 33 J=1,NM                                                       PCM00680
C     FORM ITERATION MATRIX                                              PCM00690
      SM11=R(IS)+(C(IS)-GAMMA)**2                                        PCM00700
      SM22=R(IR)+(C(IR)-GAMMA)**2                                        PCM00710
      SM12=WAAW-2.*GAMMA*WAW                                             PCM00720
      EIGEN=0.5*(SM11+SM22-SQRT((SM11-SM22)**2+4.*SM12**2))              PCM00730
      X1=SM22-EIGEN                                                      PCM00740
      X2=-SM12                                                           PCM00750
      DEL=SQRT(X1**2+X2**2)                                              PCM00760
      X1=X1/DEL                                                          PCM00770
      X2=X2/DEL                                                          PCM00780
      IF (EIGEN.LE.0.0) GO TO 35                                         PCM00790
```

FILE: PCMMAT FORTRAN A

```
      ERRCM=1.0-.01                                                     PCM00800
      IF (EIGEN.GT.RHO*ERRCM) GO TO 35                                  PCM00810
      DO 34 I=1,N                                                       PCM00820
      U(I)=(X1*AW(I,IS)+X2*AW(I,IB))*(X1*W(I,IS)+X2*W(I,IB))            PCM00830
   34 CONTINUE                                                          PCM00840
      GAMMA=SUPSUM(U,N,N)                                               PCM00850
      RHO=EIGEN                                                         PCM00860
   33 CONTINUE                                                          PCM00870
   35 CONTINUE                                                          PCM00880
      DO 36 I=1,N                                                       PCM00890
      WIIS=W(I,IS)                                                      PCM00900
      WIIB=W(I,IB)                                                      PCM00910
      U(I)=X1*WIIS + X2*WIIB                                            PCM00920
      V(I)=X2*WIIS - X1*WIIB                                            PCM00930
      W(I,IS)=U(I)                                                      PCM00940
      W(I,IB)=V(I)                                                      PCM00950
      AWIIS=AW(I,IS)                                                    PCM00960
      AWIIB=AW(I,IB)                                                    PCM00970
      U(I)=X1*AWIIS+X2*AWIIB                                            PCM00980
      V(I)=X2*AWIIS-X1*AWIIB                                            PCM00990
      AW(I,IS)=U(I)                                                     PCM01000
      AW(I,IB)=V(I)                                                     PCM01010
      U(I)=W(I,IS)*U(I)                                                 PCM01020
      V(I)=W(I,IB)*V(I)                                                 PCM01030
   36 CONTINUE                                                          PCM01040
      WRITE(16,40) IS                                                   PCM01050
   40 FORMAT(//2X,'IS=',I4)                                             PCM01060
      WRITE(16,420) (W(I,IS),I=1,N)                                     PCM01070
      WRITE(16,41) IB                                                   PCM01080
   41 FORMAT(//2X,'IB=',I4)                                             PCM01090
      WRITE(16,420) (W(I,IB),I=1,N)                                     PCM01100
  420 FORMAT(//,8(E12.6))                                               PCM01110
      C(IS)=SUPSUM(U,N,N)                                               PCM01120
      C(IB)=SUPSUM(V,N,N)                                               PCM01130
      DO 37 I=1,N                                                       PCM01140
      U(I)=(AW(I,IS)-C(IS)*W(I,IS))**2                                  PCM01150
      V(I)=(AW(I,IB)-C(IB)*W(I,IB))**2                                  PCM01160
   37 CONTINUE                                                          PCM01170
      R(IS)=SUPSUM(U,N,N)                                               PCM01180
      R(IB)=SUPSUM(V,N,N)                                               PCM01190
      IF(R(IS).LE.0.0) GO TO 60                                         PCM01200
   31 CONTINUE                                                          PCM01210
C     END OF SUB LOOP                                                   PCM01220
      IF (R(IS).LT.RE*C(IS)**2) GO TO 30                                PCM01230
      IF (RMIN.GT.4.0*R(IS)) GO TO 38                                   PCM01240
      GO TO 30                                                          PCM01250
   60 CONTINUE                                                          PCM01260
      JM(K)=JM(IN)                                                      PCM01270
      JM(IN)=IS                                                         PCM01280
      WRITE(16,100) K,JM(K),IN,JM(IN)                                   PCM01290
  100 FORMAT(//2X,'K=',I4 ,'JM=',I4,'IN=',I4,'JM=',I4)                 PCM01300
      R(IS)=0.0                                                         PCM01310
      IN=IN + 1                                                         PCM01320
      IF (IN.GE.N) GO TO 70                                             PCM01330
      GO TO 39                                                          PCM01340
   30 CONTINUE                                                          PCM01350
   70 CONTINUE                                                          PCM01360
      WRITE(6,71)                                                       PCM01370
   71 FORMAT(//2X,'REACHED THE END')                                    PCM01380
      END                                                               PCM01390
```

```
FILE: PROCES   FORTRAN  A

C         PROCES    LARS  0106                                                  PR000010
C                                                                               PR000020
C*******************************************************************************PR000030
C                                                                               PR000040
C PROCES     DUMMY LOAD POINT FOR OVERLAY MODULES                               PR000050
C            WRITTEN 8/5/72 BY EARL RODD                                        PR000060
C            REVISED 1/22/73 BY EARL RODD                                       PR000070
C                                                                               PR000080
C*******************************************************************************PR000090
C                                                                               PR000100
      SUBROUTINE PROCES (ARRAY, TOP)                                            PR000110
C                                                                               PR000120
C*******************************************************************************PR000130
C                                                                               PR000140
C     THIS IS A DUMMY PROGRAM USED TO RESOLVE A REFERENCE                       PR000150
C     IN THE ROOT MODULE AS THE POINT AT WHICH OVERLAY                          PR000160
C     MODULES BEGIN.  THE ARRAY A IS USED TO FORCE THE                          PR000170
C     SYSTEMS FREE STORAGE ABOVE OVERLAY MODULES.                               PR000180
C     (SEE SYSTEM MANUAL)                                                       PR000190
C                                                                               PR000200
C*******************************************************************************PR000210
C                                                                               PR000220
      DIMENSION A(34000)                                                        PR000230
      RETURN                                                                    PR000240
      END                                                                       PR000250
```

FILE: PRTREF FORTRAN A

```
      SUBROUTINE PRTREF(TOPNOD)                                          PRT00010
      IMPLICIT INTEGER (A-Z)                                             PRT00020
C  THE PURPOSE OF THIS SUBROUTINE IS TO PRINT A NODE TREE                 PRT00030
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),      PRT00040
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),          PRT00050
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),OCON(14),     PRT00060
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),           PRT00070
     4 OPRIOR(9),ODEN(8)                                                 PRT00080
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                    PRT00090
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                PRT00100
      EQUIVALENCE (LINK(31),LSUBS(30))                                   PRT00110
      EQUIVALENCE (LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          PRT00120
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),PRT00130
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),   PRT00140
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),    PRT00150
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),  PRT00160
     5 (LINK(31),VOLRT(15)),  (LINK(31),OCON(14)),  (LINK(31),PORAT(13)),PRT00170
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),  PRT00180
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),   PRT00190
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),    PRT00200
     9 (LINK(31),GREF(8))                                                PRT00210
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBS7M,NWANT,LINK(14000)          PRT00220
      DIMENSION POS(120)                                                 PRT00230
      DIMENSION X(1000),Y(1000)                                          PRT00240
      DATA IBLANK /1H /                                                  PRT00250
C  ZERO X AND Y LOCATION FOR NODES                                        PRT00260
      MAXNOD = 1000                                                      PRT00270
      TOPNDE = 119                                                       PRT00280
         IF (TOPNDE .EQ. 0) RETURN                                       PRT00290
      DO 10 I = 1,MAXNOD                                                 PRT00300
      X(I) = 0                                                           PRT00310
      Y(I) = 0                                                           PRT00320
10    CONTINUE                                                           PRT00330
C                                                                        PRT00340
      NODE = TOPNDE                                                      PRT00350
      IRIGHT = 1                                                         PRT00360
      LINENO = 1                                                         PRT00370
      MAXLIN = 1                                                         PRT00380
       HIGHND = 100                                                      PRT00390
C                                                                        PRT00400
C             *** SAVE LOCATION OF NODE ***                              PRT00410
C                                                                        PRT00420
50    NUMBER = IABS(INDEX(NODE))                                         PRT00430
      IF (NUMBER .EQ. 0) NUMBER = 100                                    PRT00440
      X(NUMBER) = IRIGHT                                                 PRT00450
      Y(NUMBER) = LINENO                                                 PRT00460
       IF (NODE .GT. HIGHND) HIGHND = NODE                               PRT00470
C                                                                        PRT00480
      LSTNOD = NODE                                                      PRT00490
C                                                                        PRT00500
C               *** PROCESS SUB ***                                      PRT00510
      NODE = LSUBS(NODE)                                                 PRT00520
      IF (NODE .LE. 0) GO TO 100                                         PRT00530
C                                                                        PRT00540
C  SUB EXITS, INCREMENT LINE NUMBER                                      PRT00550
      LINENO = LINENO + 1                                                PRT00560
      IF (LINENO .GT. MAXLIN) MAXLIN = LINENO                            PRT00570
      GO TO 50                                                           PRT00580
C                                                                        PRT00590
C               *** PROCESS SIBLING ***                                  PRT00600
100   NODE = LINK (LSTNOD)                                               PRT00610
      IF (NODE .LE. 0) GO TO 200                                         PRT00620
C  SIBLING EXITS, INCREMENT COLUMN NUMBER                                PRT00630
      IRIGHT = IRIGHT + 1                                                PRT00640
      GO TO 50                                                           PRT00650
C                                                                        PRT00660
C             ** FIND NEXT NON-ZERO NODE **                              PRT00670
 200   LINENO = LINENO - 1                                               PRT00680
      IF (LINENO .LE. 1) GO TO 300                                       PRT00690
      NODE = LSUPER(LSTNOD)                                              PRT00700
      IF (NODE .EQ. TOPNDE) GO TO 300                                    PRT00710
      LSTNOD = NODE                                                      PRT00720
      GO TO 100                                                          PRT00730
C                                                                        PRT00740
C             *** PRINT NODES ***                                        PRT00750
C                                                                        PRT00760
C  PRINT LINESZ NODES PER LINE, SET MIN AND MAX COLS FOR PAGE            PRT00770
300   MINCOL = 1                                                         PRT00780
      LINESZ = 17                                                        PRT00790
```

FILE: PRTREE FORTRAN A

```
C                                                                       PRT00800
310   MAXCOL = MINCOL + LINESZ - 1                                      PRT00810
C           ** PRINT LINE                                               PRT00820
      DO 400 LINE = 1,MAXLIN                                            PRT00830
C                                                                       PRT00840
        ICT = 0                                                         PRT00850
C  BLANK BUFFER                                                         PRT00860
      DO 320 I = 1,120                                                  PRT00870
320   POS(I) = IBLANK                                                   PRT00880
C                                                                       PRT00890
C  CK NODE FOR THIS LINE                                                PRT00900
        DO 370 NODE = 1,HIGHND                                          PRT00910
      NDLINE = Y(NODE)                                                  PRT00920
       IF (NDLINE .NE. LINE) GO TO 370                                  PRT00930
C                                                                       PRT00940
      COLNO = X(NODE)                                                   PRT00950
      IF (COLNO .LT. MINCOL  .OR.  COLNO .GT. MAXCOL) GO TO 370"        PRT00960
C                                                                       PRT00970
C  NODE ON THIS PAGE                                                    PRT00980
      COLNO = MOD(COLNO,LINESZ)                                         PRT00990
      IF (COLNO .EQ. 0) COLNO = LINESZ                                  PRT01000
       COLNO = (COLNO-1) * 3 + 1                                        PRT01010
      NUMBER = NODE                                                     PRT01020
      CALL HN144I (POS(COLNO),3,NUMBER)                                 PRT01030
      ICT = 1                                                           PRT01040
370   CONTINUE                                                          PRT01050
C                                                                       PRT01060
C  LINE COMPLETE, PRINT IT                                              PRT01070
        IF (ICT .EQ. 0) GO TO 400                                       PRT01080
      WRITE (3,380) (POS(L),L=1,51)                                     PRT01090
      WRITE (6,380) (POS(L),L=1,51)                                     PRT01100
380   FORMAT (17(1X,3A1))                                               PRT01110
C                                                                       PRT01120
400   CONTINUE                                                          PRT01130
C                                                                       PRT01140
C  END OF PAGE, SKIP TO NEW PAGE                                        PRT01150
      WRITE (3,410)                                                     PRT01160
410   FORMAT (/)                                                        PRT01170
C   CK FOR MORE PAGES                                                   PRT01180
      MINCOL = MINCOL + LINESZ                                          PRT01190
      IF (MINCOL .LE. IRIGHT) GO TO 310                                 PRT01200
C                                                                       PRT01210
       RETURN                                                           PRT01220
       END                                                              PRT01230
```

```
FILE: READTP   FORTRAN  A

C      THIS SUBROUTINE COORDINATES THE ROUTINES TO READ FIELDS OF DATA   REA00010
C*     FROM THE IMAGE TAPE AND STORE IT ON A DRUM FILE FOR THE CLASY     REA00020
C*     SUBROUTINES.  RANDOM ACCESS ROUTINES ARE USED FOR DRUM I/O. (RINITREA00030
C*     AND RWRITE).                                                      REA00040
C*                                                                       REA00050
       SUBROUTINE READTP(LAST,IDATA,TOPID)                               REA00060
       IMPLICIT INTEGER (A-Z)                                            REA00070
       REAL    UNIF,Z  ,  ZOR  ,  X  ,  FJ , PIXFL , TEMP               REA00080
       REAL CHUF                                                         REA00090
       DIMENSION FLDINF(6),IDATA(1),FL(12)                               REA00100
C                                                                        REA00110
       DIMENSION CHUF(1),PIXEL(1),NUM(1)                                 REA00120
C                                                                        REA00130
       COMMON/ARRAY/ TOP, ARRAY(18000)                                   REA00140
C                                                                        REA00150
       COMMON /INFORM/HEAD(42), MAPTAP,      DATAPE,     SAVTAP,   MAXFFT,REA00160
      1                PAGSIZ, TAPCHK,      TRNSYM,     TSTSYM,          REA00170
      2                DUPSYM, THRSYM,      MAXDIV,     MINDIV,   SPLMAX,REA00180
      3                SERIAL, TAPESV,      FILESV,                      REA00190
      4                MAXCLS, NOCLS2,      MAXFLD,     NOFLD2,   NOFLD3,REA00200
      5                NOTRFD, NOFEAT,      NOFET2,     NOFET4,   VARSIZ,REA00210
      6                VARSZ2, VARSZ4,      XSIZ   ,    NOSPEC,   NOHIST,REA00220
      *                NOGRP, DIVSIZ,    KEEPLV,    PRTLEV,    YSIZ  ,   REA00230
      8                XHGH   , XLOW  ,     SPCBAS,     NOCLS3,   PCTSZ ,REA00240
      9 BTBLOCK(30),FETVEC(30),FETVC2(30), HISVEC(30),INVERT(30),BESTVC(30)REA00250
C                                                                        REA00260
       COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,          REA00270
      1               LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,      REA00280
      2  SCRAM1,BUFPIX,BUFTOT,NHUFSD,NDUMP,LBUFD                        REA00290
      3, MAXBF, AREA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL               REA00300
C                                                                        REA00310
       INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT   REA00320
      1 ,CLSNAM                                                          REA00330
C                                                                        REA00340
C                                                                        REA00350
       EQUIVALENCE (CHUF(1),ARRAY(2001)),(PIXEL(1),ARRAY(21))            REA00360
       EQUIVALENCE (NUM(1),ARRAY(9010))                                  REA00370
       EQUIVALENCE (FLDINF(1),LINSTR), (FLDINF(4),SAMSTR),               REA00380
      *            (FLDINF(2),LINEND), (FLDINF(5),SAMEND),               REA00390
      *            (FLDINF(3),LININC), (FLDINF(6),SAMINC)                REA00400
C*                                                                       REA00410
C*     RESERVE 2000 LOCATIONS OF 'ARRAY' FOR FIELD DEFINITION INFORMATION.REA00420
C*     THE REMAINDER OF 'ARRAY' IS USED FOR I/O BUFFERS.                 REA00430
C*                                                                       REA00440
C*     FIELD INFORMATION STORED AS FOLLOWS                               REA00450
C*        ARRAY(1)    =FIRST FIELD NAME FOR THIS CLASS                   REA00460
C*             (2)    =NO. OF VERTICES FOR THIS FIELD  (NV)              REA00470
C*             (3)-(3+NV*2)  = ACTUAL VERTEX NUMBERS                     REA00480
C*             (3+NV*2)  =TOTAL PIXELS IN THIS FIELD                     REA00490
C*             (4+NV*2)-(10+NV*2) = FLDINF BLOCK FOR THIS FIELD          REA00500
       COMMON /TESTCM/ ITEST(100), NTEST(100), MTEST(100),ISUM,MSUM,NSUM REA00510
C                                                                        REA00520
C  INITIALIZE CONSTANTS TO CHECK SCRAMBLING                              REA00530
       DO 2 I=1,100                                                      REA00540
       ITEST(I) = 0                                                      REA00550
       MTEST(I) = 0                                                      REA00560
 2     NTEST(I) = 0                                                      REA00570
       ISUM = 0                                                          REA00580
       MSUM = 0                                                          REA00590
       NSUM = 0                                                          REA00600
       IF(NOCL.GT.0)GO TO 10                                             REA00610
C      CALL RINIT(IBEGIN,NWDS)                                           REA00620
       IBEGIN = 1                                                        REA00630
       DEFINE FILE 22(2100,200,U,ID)                                     REA00640
       DRUMAD = 1                                                        REA00650
       DRMWDS = 420000                                                   REA00660
       WRITE (22'1) DRUMAD                                               REA00670
       DATAPE = 11                                                       REA00680
       CALL TAPHDR(DATAPE,0)                                             REA00690
10     CONTINUE                                                          REA00700
       ADDRES=IBEGIN                                                     REA00710
       TWRD=0                                                            REA00720
       LAST=0                                                            REA00730
       TOTWRD=0                                                          REA00740
       PFINDX=2001                                                       REA00750
         TOP = 18000                                                     REA00760
       MAXDIM=TOP-2000                                                   REA00770
       BUFSIZ= MAXDIM/NOFEAT  * NOFEAT                                   REA00780
       NOFLD=0                                                           REA00790
```

FILE: READTP FORTRAN A

```
      IPT=1                                                                  READ0R00
      IF(NOCL.GT.0) WRITE (6,1500) NXTCLS                                    READ00810
C*                                                                           READ00820
C*    READ A FIELD DESCRIPTION FROM CARDS.                                   READ00830
20    ICK = LAREAD(ARRAY(IPT),ARRAY(IPT+2),FLDINF,ARRAY(IPT+1) )             READ00840
      IF(ICK.LT.0)GO TO 100                                                  READ00850
      IF(ICK.EQ.0)GO TO 150                                                  READ00860
      NV=ARRAY(IPT+1)                                                        READ00870
      NOFLD=NOFLD+1                                                          READ00880
      NSAMP=(SAMEND-SAMSTR)/SAMINC+1                                         READ00890
      FLDSAM=0                                                               READ00900
      IB=IPT+2                                                               READ00910
      IE=IB+NV*2-1                                                           READ00920
      WRITE (6,1600) NOFLD,ARRAY(IPT),NV,SAMINC,LININC,                      READ00930
     *          (ARRAY(I),I=IB,IE)                                           READ00940
C*                                                                           READ00950
C*    POSITION TAPE FOR THIS FIELD                                           READ00960
      CALL FLDINT(FLDINF,FFTVEC,NOFEAT)                                      READ00970
      KNT=0                                                                  READ00980
      DO 70 LINE=LINSTR,LINEND,LININC                                        READ00990
      CALL LINERD(IDATA,ENDTAP)                                              READ01000
      IF(ENDTAP.EQ.-1)GO TO 800                                              READ01010
C*                                                                           READ01020
C*    FIND SAMPLE INTERSECTS FOR THIS LINE - NI=NO. OF INTERSECTS            READ01030
      CALL FDLINT(ARRAY(IPT+2),NV,FL,LINE,SAMPS,NI)                          READ01040
C*                                                                           READ01050
C*    STORE DATA ON THIS LINE INTO OUTPUT BUFFER                             READ01060
      DO 60 I=1,NI,2                                                         READ01070
      IB =(FL(I)-SAMSTR)/SAMINC + 1                                          READ01080
      IE =(FL(I+1)-SAMSTR)/SAMINC + 1                                        READ01090
      IF(MOD(SAMSTR,SAMINC) .NE. MOD(FL(I),SAMINC))IB=IB+1                   READ01100
      IF(IB .GT. IE)GO TO 60                                                 READ01110
      DO 50 J=IB,IE                                                          READ01120
      KNT=KNT+1                                                              READ01130
      DO 50 K=1,NOFEAT                                                       READ01140
      IWRD=IWRD + 1                                                          READ01150
      ITEMP = (K-1)*NSAMP + J                                                READ01160
      CBUF(IWRD) = IDATA(ITEMP)                                              READ01170
C                                                                            READ01180
C  CK FOR FULL BUFFER, WRITE BUFFER IF FULL                                  READ01190
      IF(IWRD.LT.BUFSIZ)GO TO 50                                             READ01200
      TOTWRD=TOTWRD + IWRD                                                   READ01210
      CALL RWRITE(ADDRES, CBUF(1), BUFSIZ, LSTAT)                            READ01220
C  COUNT OCCUPANCES OF VALUES FOR TEST OF SCRAMBLING                         READ01230
      CALL TEST (CBUF(1), BUFSIZ, ITEST, ISUM)                               READ01240
9941  FORMAT (' ADDRES,BUFSIZ,ISUM=',2I10,/,(10I7))                         READ01250
      ADDRES=ADDRES + BUFSIZ                                                 READ01260
      IWRD=0                                                                 READ01270
   50 CONTINUE                                                               READ01280
   60 CONTINUE                                                               READ01290
      FLDSAM=FLDSAM+SAMPS                                                    READ01300
70    CONTINUE                                                               READ01310
C                                                                            READ01320
C  EMPTY BUFFER                                                              READ01330
        IF (IWRD .EQ. 0) GO TO 75                                            READ01340
        TOTWRD = TOTWRD + IWRD                                               READ01350
       CALL RWRITE (ADDRES, CBUF(1), IWRD, LSTAT)                            READ01360
       CALL TEST (CBUF(1),IWRD,ITEST,ISUM)                                   READ01370
75    CONTINUE                                                               READ01380
C                                                                            READ01390
      IPT = IPT + NV*2 + 2                                                   READ01400
      ARRAY(IPT)=KNT                                                         READ01410
      DO 80 I=1,6                                                            READ01420
      IPT=IPT+1                                                              READ01430
80    ARRAY(IPT)=FLDINF(I)                                                   READ01440
      IPT=IPT+1                                                              READ01450
      IF(IPT+30 .GT.2000)GO TO 700                                           READ01460
      GO TO 20                                                               READ01470
C*                                                                           READ01480
C*    CLASS NAME CARD ENCOUNTERED - REREAD PREVIOUS CARD TO GET NAME         READ01490
100   NOCL=NOCL+1                                                            READ01500
      IF(NOCL.GT.1)GO TO 120                                                 READ01510
      READ(30,1100) NXTCLS                                                   READ01520
      WRITE (6,1500) NXTCLS                                                  READ01530
      GO TO 20                                                               READ01540
C                                                                            READ01550
C                                                                            READ01560
120   CLSNAM=NXTCLS                                                          READ01570
      READ(30,1100)NXTCLS                                                    READ01580
```

FILE: READTP FORTRAN A

```
      GO TO 155                                                                 REA01590
C                                                                               REA01600
150   CLSNAM=NXTCLS                                                            REA01610
155   LAST=1                                                                    REA01620
C                    **** SCRAMBLE DATA  ****                                   REA01630
C                                                                               REA01640
C        PURPOSE:  SCRAMBLE THE ORDER OF A SET OF INTEGERS, IN THE              REA01650
C                  RANGE  1 - NPIXEL , AND USE THIS SCRAMBLED SET OF            REA01660
C                  INTEGERS TO SCRAMBLE THE LOCATIONS OF INPUT DATA             REA01670
C                  WITHIN THE INPUT DATA BUFFER.  OUTPUT THE SCRAMBLED          REA01680
C                  DATA ON THE DRUM.                                            REA01690
C  BUFTOT = NO. OF AVAIL WORDS IN SCRATCH AREA 'ARRAY'                          REA01700
160   TOP = 16000                                                               REA01710
      BUFTOT = (( TOP - IPT+1 )/NOFEAT) * NOFEAT                                REA01720
C  BUFSIZ = 1/2 OF TOTAL WORDS ON FAST STORAGE DEVICE BUFFER (ARRAY)            REA01730
      BUFSIZ = BUFTOT/2                                                         REA01740
      NBUFSD = 0                                                                REA01750
C  NOWDS = TOTAL NO. OF WORDS AVAIL IN FAST STORAGE                             REA01760
C  TOTWRD = TOTAL NUMBER OF WORDS IN ORIG DATA ON DRUM                          REA01770
C  SCRAM1 = 1ST WORD OF AVAIL FAST STORAGE + LENGTH OF ORIG DATA UNLESS         REA01780
      SCRAM1 = IBEGIN + TOTWRD                                                  REA01790
C        SCRAMBLE THE INPUT DATA , PLACE THE SCRAMBLED DATA ON DRUM,            REA01800
C        FOR SUBSEQUENT ACCESS BY SUBROUTINES STATIS AND CLASY1                 REA01810
C                                                                               REA01820
C  IPT = 1ST AVAIL WORD IN SCRATCH AREA 'ARRAY'                                 REA01830
C  BUFSIZ = 1/2 OF TOTAL AVAIL WORDS IN BUFFER 'ARRAY'                          REA01840
C  BUFPIX = SIZE OF 'ARRAY'/NO OF CHANNELS                                      REA01850
180   BUFPIX = BUFTOT/NOFEAT                                                    REA01860
C                                                                               REA01870
C                    ***   INITIALIZE  ***                                      REA01880
C      Z = ZOR( 145927 )                                                        REA01890
C        READ THE INPUT PIXELS FROM DRUM INTO THE BUFFER SPACE, AND             REA01900
C        SCRAMBLE THE PIXELS IN THE INPUT BUFFER                                REA01910
C                                                                               REA01920
C  INADDR = NEXT WORD OF ORIG DATA                                              REA01930
      INADDR = IBEGIN                                                           REA01940
C  OUTADD = NEXT AVAIL WORD FOR SCRAMBLED DATA                                  REA01950
      OUTADD = SCRAM1                                                           REA01960
C  NM1 = NO OF CHANNELS - 1                                                     REA01970
      NM1 = NOFEAT - 1                                                          REA01980
C                                                                               REA01990
C                 *** CALCULATE TRIAL SLICE  ***                                REA02000
C  NBUFS  = NO. OF BUFFERS OF DATA                                              REA02010
C  TOTWRD = TOTAL WORDS OF DATA                                                 REA02020
C  FEAT   = NO OF CHANNELS                                                      REA02030
C  MAXBUF = MAXIMUM BUFFER SIZE * NO. OF BUFFERS                                REA02040
C  SLICE  = LARGEST CHUNK THAT WILL FIT IN A BUFFER, NBUFSD TIMES               REA02050
C  SECTION = ARRAY CREATED FROM SLICES OF DATA FROM EACH BUFFER                 REA02060
C                                                                               REA02070
C  CALC TRIAL SLICE                                                             REA02080
200   NBUFS = (TOTWRD + BUFSIZ -1) / BUFSIZ                                     REA02090
210   MAXBUF = BUFSIZ * NBUFS                                                   REA02100
      TSLICE = (MAXBUF/NBUFS) / NBUFS                                           REA02110
C  SLICE MUST BE EVEN MULT OF NO OF CHANNELS                                    REA02120
      IF (TSLICE .GE. NOFEAT) GO TO 230                                         REA02130
C                                                                               REA02140
      WRITE (6,1220) TOTWRD,NBUFS, NOFEAT, TSLICE                               REA02150
1220  FORMAT (' READTP--ERROR IN CALC BUFFER SLICES, TOTAL WORDS =',I8,         REA02160
     1 ' NO WDS IN BUFF = ',I6,' NO CHAN=',I6,' TRIAL SLICE=',I6)               REA02170
      CALL CMERR                                                                REA02180
C                                                                               REA02190
C  CALC SLICE AS EVEN MULT OF NO CHANNELS                                       REA02200
230   SLICE = (TSLICE/NOFEAT) * NOFEAT                                          REA02210
C  TOTAL WORDS READ = ( 1 SLICE FROM N BUFFERS)  N BUFFERS TIMES                REA02220
      SECTSZ = SLICE * NBUFS                                                    REA02230
      TOTSTS = SECTSZ * NBUFS                                                   REA02240
C                                                                               REA02250
C  NUMBER OF WORDS IN EACH BUFFER * NO OF BUFFERS MUST BE .GE. TOT WDS          REA02260
      IF (TOTSTS .GE. TOTWRD) GO TO 240                                         REA02270
      NBUFS = NBUFS + 1                                                         REA02280
      GO TO 210                                                                 REA02290
C                                                                               REA02300
C                                                                               REA02310
 240  CONTINUE                                                                  REA02320
C                                                                               REA02330
C  READ N BUFFERS OF DATA                                                       REA02340
      DO  600  K=1,NBUFS,1                                                      REA02350
C                                                                               REA02360
C                                                                               REA02370
```

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FILE: READTP   FORTRAN  A

C                *** READ SLICES OF DATA  ***                                  REA02380
C                                                                              REA02390
C  SLICE DATA--READ SOME DATA FROM EACH SECTION EXCEPT POSSIBLY LAST            REA02400
C  SECTION.  START EACH READ IN FIRST SECTION                                   REA02410
C                                                                              REA02420
C  INADDR = NEXT WORD OF ORIG DATA                                             REA02430
C                                                                              REA02440
410   RADRES = INADDR + (K-1) * SLICE                                          REA02450
      NWORDS = 0                                                               REA02460
C                                                                              REA02470
      NDXRD = 1                                                                REA02480
      DO 420 J = 1,NHUFS                                                       REA02490
      SIZRD = SLICE                                                            REA02500
      CURADS = RADRES + (J-1) * SECTSZ                                         REA02510
C                                                                              REA02520
C  CK IF MORE DATA IS NEEDED FROM LAST BUFFER                                  REA02530
      IF (TOTWRD - CURADS  .LT. 0) GO TO 420                                   REA02540
C                                                                              REA02550
      LASTWD = CURADS + SLICE - 1                                              REA02560
      IF (TOTWRD .LT. LASTWD) SIZRD = TOTWRD - CURADS + 1                      REA02570
      CALL PREAD (CURADS, PIXEL(NDXRD), SIZRD, STATUS)                         REA02580
      NDXRD = NDXRD + SIZRD                                                    REA02590
      NWORDS = NWORDS + SIZRD                                                  REA02600
420   CONTINUE                                                                 REA02610
C                                                                              REA02620
C                                                                              REA02630
C         CONSTRUCT A SET OF SCRAMBLED INTEGERS IN THE RANGE 1 - NPIXEL        REA02640
C                                                                              REA02650
C  CREATE SCRAMBLED INTEGERS ONLY WHEN BUFFER SIZE CHANGES                     REA02660
1395  CONTINUE                                                                 REA02670
C  NPIXEL = NO. OF SETS OF CHANNELS IN ONE BUFFER                              REA02680
      NPIXEL = NWORDS/NOFEAT                                                   REA02690
      IF (K .GE. 2  .AND.  LSTNPX .EQ. NPIXEL) GO TO 480                       REA02700
      LSTNPX = NPIXEL                                                          REA02710
C                                                                              REA02720
      DO  440  I = 1,NPIXEL,1                                                  REA02730
440   NUM(I) = I                                                               REA02740
C                                                                              REA02750
      NP1 = NPIXEL + 1                                                         REA02760
C                                                                              REA02770
      DO  460  J=1,4,1                                                         REA02780
C                                                                              REA02790
      DO  450  J10=1,NPIXEL                                                    REA02800
      J = NPIXEL - J10 + 1                                                     REA02810
      X = UNIF(1.)                                                             REA02820
      FJ = J                                                                   REA02830
      NN = FJ * X + 1.                                                         REA02840
      LL = NP1 - J                                                             REA02850
      NTEMP = NUM(LL)                                                          REA02860
      NUM(LL) = NUM(NN)                                                        REA02870
450   NUM(NN) = NTEMP                                                          REA02880
C                                                                              REA02890
460   CONTINUE                                                                 REA02900
C                                                                              REA02910
C                                                                              REA02920
C                      *** SCRAMBLE DATA  ***                                  REA02930
C  NOPIXEL = NO. OF SETS OF CHANNELS IN ONE BUFFER                             REA02940
480   NPXM1 = NPIXEL - 1                                                       REA02950
      DO 500 I=1,NPXM1,2                                                       REA02960
      N = NUM(I) * NOFEAT - NM1                                                REA02970
      L = NUM(I+1) * NOFEAT - NM1                                              REA02980
C                                                                              REA02990
C  NOFEAT = NO. OF CHANNELS                                                    REA03000
      DO  490  J=1,NOFEAT,1                                                    REA03010
      NN = N + J - 1                                                           REA03020
      LL = L + J - 1                                                           REA03030
      TEMP = PIXEL(NN)                                                         REA03040
      PIXEL(NN) = PIXEL(LL)                                                    REA03050
490   PIXEL(LL) =  TEMP                                                        REA03060
500   CONTINUE                                                                 REA03070
C                                                                              REA03080
C  ADD FACTOR TO EACH PIXEL                                                    REA03090
      DO 510 I = 1,NWORDS                                                      REA03100
      Z = UNIF(1.)                                                             REA03110
      X = Z - .5                                                               REA03120
      PIXEL(I) = PIXEL(I) + X                                                  REA03130
510   CONTINUE                                                                 REA03140
C                                                                              REA03150
C                                                                              REA03160
```

FILE: READTP FORTRAN A

```
C              *** WRITE SCRAMBLED DATA ON DRUM ***                              REA03170
C                                                                                REA03180
C          PUT THE BUFFER OF SCRAMBLED PIXELS BACK ON THE DRUM                   REA03190
C                                                                                REA03200
C   OUTADD = NEXT AVAIL WORD FOR SCRAMBLED DATA                                  REA03210
C   PIXEL = SCRAMBLED DATA                                                       REA03220
C   NWORDS = NO. OF WORDS IN CURRENT BUFFER                                      REA03230
       CALL RWRITE( OUTADD , PIXEL , NWORDS , OSTAT )                            REA03240
C   COUNT OCCURANCES OF VALUES FOR TEST OF SCRAMBLING                            REA03250
       CALL TEST (PIXEL,NWORDS,NTEST,NSUM)                                       REA03260
       OUTADD = OUTADD + NWORDS                                                  REA03270
C                                                                                REA03280
400    CONTINUE                                                                  REA03290
       RETURN                                                                    REA03300
700    WRITE(6,1300)                                                             REA03310
       CALL CMERR                                                                REA03320
 800   WRITE(6,1400)                                                             REA03330
       CALL CMERR                                                                REA03340
1100   FORMAT(10A,A4)                                                            REA03350
1300   FORMAT(' FIELD DEFINITION INFORMATION EXCEEDS 2000 WORDS')                REA03360
1400   FORMAT(' END-OF-TAPE REACHED BEFORE END OF FIELD')                        REA03370
1500   FORMAT(//40X,'FIELDS TO BE CLUSTERED FOR CLASS',1X,A4//                   REA03380
      *  36X,'SAMPLE',3X,'LINE'/5X,'FIELD NAME',3X,                              REA03390
      *  'NO. OF VERTICES',3X,'INC.  ',3X,'INC.',30X,'VERTICES')                 REA03400
1600   FORMAT(1X,I2,4X,A4,I2X,I2,10X,I2,6X,I2,5X,                                REA03410
      *  5('(',I4,',',I4,')',2X)/2(52X,5('(',I4,',',I4,')',2X)/))                REA03420
       END                                                                       REA03430
```

FILE: SEPER FORTRAN A

```
      SUBROUTINE SEPER(KL)                                                  SEP00010
C  THIS ROUTINE IS CALLED WHENEVER IT HAS BEEN DECIDED THAT A              SEP00020
C     CLUSTER SHOULD BE SPLIT FOR GOOD.  THE CLUSTER HAS PREVIOUSLY       SEP00030
C     BEEN SPLIT BY THE ROUTINE SPLIT, AND SUFFICIENT STATISTICS          SEP00040
C     HAVE NOW BEEN GATHERED TO CONFIRM THAT THE CLUSTER CAN BE           SEP00050
C     SPLIT UP ON A STATISTICALLY SIGNIFICANT BASIS.                      SEP00060
C  THE ROUTINE TAKES THE CLUSTER AT KL, AND BRINGS UP ALL ITS             SEP00070
C     DAUGHTER CLUSTERS TO THE SAME LEVEL AS KL ITSELF.  KL IS            SEP00080
C     THEN ELIMINATED.                                                    SEP00090
      DIMENSION NTB(32)                                                   SEP00100
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),       SEP00110
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),           SEP00120
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),      SEP00130
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),            SEP00140
     4 OPRIOR(9),ODEN(8)                                                  SEP00150
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                     SEP00160
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                 SEP00170
      EQUIVALENCE (LINK(31),LSUBS(30))                                    SEP00180
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),            SEP00190
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),SEP00200
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),    SEP00210
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),     SEP00220
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),   SEP00230
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)), SEP00240
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),   SEP00250
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),    SEP00260
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),     SEP00270
     9 (LINK(31),GREF(8)),  (LINK(31),NTB(31))                            SEP00280
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBS7M,NWANT,LINK(14000)           SEP00290
      DIMENSION MXAR(3),LR(3),LV(3)                                       SEP00300
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                            SEP00310
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)          SEP00320
C                                                                         SEP00330
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,        SEP00340
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,     SEP00350
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,            SEP00360
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,     SEP00370
     4    BETTER,MODE,CORLEN,SPCOR                                        SEP00380
C                                                                         SEP00390
      COMMON /STPAR/WAIT,CONLV,SKAND,SKCHI,TRAND,TRCHI,URKAND,URKCHI,     SEP00400
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                  SEP00410
C                                                                         SEP00420
C                                                                         SEP00430
C                        *** CALC NEW RATIO AND PASSF ***                 SEP00440
C                                                                         SEP00450
      KS=LSUPER(KL)                                                       SEP00460
      N = LSUBS(KL)                                                       SEP00470
C                                                                         SEP00480
      PRINT 571, INDEX(KL),INDEX(KS),INDEX(N),SPFAC(KL)                   SEP00490
      WRITE (3,571) INDEX(KL),INDEX(KLS),INDEX(N),SPFAC(KL)               SEP00500
571   FORMAT ('0***SEPERATE ',I3,' SUPER,SUBS ',2I3,' SPFAC ',E11.5)      SEP00510
C                                                                         SEP00520
      RATIO=PROP(KL)/PRIRCM(KL)                                           SEP00530
      PASSF=PST(KL)/(PCUM(KL)*PRIRCM(KL))                                 SEP00540
C                                                                         SEP00550
C                                                                         SEP00560
C                        *** REMOVE KL ***                                SEP00570
C                                                                         SEP00580
C  K       = FIRST OFFSPRING OF PARENT OF KL                              SEP00590
C  FIRST WE FIND KL IN THE LIST OF LSUBS OF KS, AND REMOVE IT.            SEP00600
      K=LSUBS(KS)                                                         SEP00610
      IF(K.NE.KL) GO TO 20                                                SEP00620
C  FIRST OFFSPRING OF KL = K, RESET FIRST OFFSPRING TO LINK(KL)           SEP00630
      LSUBS(KS)=LINK(KL)                                                  SEP00640
      GO TO 29                                                            SEP00650
C                                                                         SEP00660
C  FIND CLUSTER KL                                                        SEP00670
20    KOLD=K                                                              SEP00680
      K=LINK(K)                                                           SEP00690
      IF(K.LE.0) GO TO 666                                                SEP00700
      IF(K.NE.KL) GO TO 20                                                SEP00710
C                                                                         SEP00720
C  SET LINK OF KOLD = LINK OF KL                                          SEP00730
25    LINK(KOLD)=LINK(KL)                                                 SEP00740
C                                                                         SEP00750
C                        CHECK FOR VOID SUBCLUSTERS OF KL                 SEP00760
C                                                                         SEP00770
C  PROCESS EACH SUBCLUSTER.                                               SEP00780
29    K=LSUBS(KL)                                                         SEP00790
```

FILE: SEPER FORTRAN A

```
      KOLD=KL                                                                   SEP00800
   10 CONTINUE                                                                  SEP00810
      IF (K.GT.0) GO TO 614                                                     SEP00820
  666 PRINT 664,KL,K,KOLD                                                       SEP00830
  664 FORMAT('0BAD SUBINDEX IN SEPER: KL,K, K OLD=',2I6,I12)                    SEP00840
      CALL CLPR(KL,666,GEN(LSUM),GEN(LSKEW),GEN(LKURT))                         SEP00850
      CALL CLPR(KOLD,666,GEN(LSUM),GEN(LSKEW),GEN(LKURT))                       SEP00860
      RETURN                                                                    SEP00870
C                                                                               SEP00880
CC                                                                              SEP00890
CC                 *** SET PARENT OF EACH OFFSPRING FROM PARENT OF KL           SEP00900
C                                                                               SEP00910
  614 CONTINUE                                                                  SEP00920
      LSUPER(K)=KS                                                              SEP00930
C                                                                               SEP00940
C  CALL DENCAL TO ADJUST THE DENOMINATOR OFFSET AND PROPORTION OF KL            SEP00950
      CALL DENCAL(K,RATIO,W(KL))                                                SEP00960
      PST(K)=PST(K)*PASSF                                                       SEP00970
C                                                                               SEP00980
C  GET NEXT SIBLING                                                             SEP00990
      KOLD=K                                                                    SEP01000
      K=LINK(K)                                                                 SEP01010
      IF(K.NE.0) GO TO 10                                                       SEP01020
C                                                                               SEP01030
CC                 *** SET LAST OFFSPRING OF KL TO POINT TO OLD 1ST           SEP01040
CC                     OFFSPRING OF KL,S PARENT.                              SEP01050
CC                     SET KL,S PARENT TO POINT TO 1ST OFFSPRING OF KL ***    SEP01060
C                                                                               SEP01070
C  KS     = PARENT OF KL                                                        SEP01080
C  NOW ADD THE SUBCLUSTER LIST OF KL TO THAT OF KS                              SEP01090
      LINK(KOLD)=LSUBS(KS)                                                      SEP01100
      LSUBS(KS)=LSUBS(KL)                                                       SEP01110
      CALL FREE(KL,NINCLS)                                                      SEP01120
      CALL PRTREE (KS)                                                          SEP01130
      RETURN                                                                    SEP01140
      END                                                                       SEP01150
```

```
FILE: SETUP9   FORTRAN  A

      SUBROUTINE SETUP9                                                 SET00010
C*****************************************************************    SET00020
C                                                                       SET00030
C  THE PURPOSE OF SUBROUTINE SETUP9 IS TO READ AND ANALYZE ALL CARD     SET00040
C  INPUT TO THE PROGRAM                                                 SET00050
C                                                                       SET00060
C*****************************************************************    SET00070
C                                                                       SET00080
      IMPLICIT INTEGER (A-X)                                            SET00090
C                                                                       SET00100
      COMMON /INFORM/HEAD(42), MAPTAP,     DATAPE,     SAVTAP,   MAXFET,SET00110
     1               PAGSIZ, TAPCHK,     TRNSYM,     TSTSYM,           SET00120
     2               DUPSYM, THRSYM,     MAXDIV,     MINDIV,   SPLMAX,SET00130
     3               SERIAL, TAPESV,     FILESV,                       SET00140
     4               MAXCLS, NOCLS2,     MAXFLD,     NOFLD2,   NOFLD3,SET00150
     5               NOTRFD, NOFEAT,     NOFET2,     NOFET4,   VARSIZ,SET00160
     6               VARSZ2, VARSZ4,     XSIZ  ,     NOSPEC,   NOHIST,SET00170
     *               NOGRP, DIVSIZ,   KEEPLV,   PRTLEV,   YSIZ  ,      SET00180
     X               XHIGH  , XLOW  ,    SPCHAS,     NOCLS3,   PCTSZ ,SET00190
     9IHLOCK(30),FETVEC(30),FETVC2(30), HISVEC(30),INVERT(30),BESTVC(30)SET00200
      DIMENSION  HED1(10),  HED2(10),  DATE(2),  COMENT(10),  TEMP(1)   SET00210
      EQUIVALENCE  (HED1(1),HEAD(3)),   (DATE(1),  HEAD(15)),           SET00220
     *             (HED2(1),HEAD(20)),   (COMENT(1),HEAD(32))           SET00230
      COMMON /SUPCOM/ INTAPE,STATUS,COL,CODE1,CODE2,CARD(62)            SET00240
C                                                                       SET00250
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,          SET00260
     1               LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,      SET00270
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                        SET00280
     3, MAXHF, AREA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL                SET00290
C                                                                       SET00300
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT   SET00310
     1 ,CLSNAM                                                          SET00320
C                                                                       SET00330
C                                                                       SET00340
      DIMENSION SMBLS(61)                                               SET00350
      DATA  SMBLS/'1','2','3','4','5','6','7','8','9','A','B','C','D', SET00360
     *            'E','F','G','H','I','J','K','L','M','N','O','P','Q', SET00370
     2            'R','S','T','U','V','W','X','Y','Z','_','|','-','/', SET00380
     3            '-','*','+','$','@','=',':',' ','=','+',')','(',':', SET00390
     4            '&','>','!','?',1H',',',',','.',' ','0' /             SET00400
      DATA BLANK/' '/, KOMMA/','/                                       SET00410
      DIMENSION INVEC(11)                                               SET00420
      DATA INVEC/'CHAN','HED1','HED2','DATE','COMM','NPTS','NPOS' ,     SET00430
     * 'SYMB','PRTN','END','ITER'/                                      SET00440
      ICNT=0                                                            SET00450
      K0 = 0                                                            SET00460
      DO 5 I=1,61                                                       SET00470
    5 SYM(I)=SMBLS(I)                                                   SET00480
      NOFEAT=0                                                          SET00490
      WRITE(6,530)                                                      SET00500
   10 READ(21,480)CODE,CARD                                             SET00510
      WRITE(6,550)CODE,CARD                                             SET00520
      COL=0                                                             SET00530
C  SET NUMBER OF VALID CARD TYPES                                       SET00540
      CNUM = 11                                                         SET00550
C  DETERMINE CARD TYPE                                                  SET00560
      DO 20 I=1,CNUM                                                    SET00570
      IF(CODE .EQ. INVEC(I))GO TO(30,50,70,90,110,130,150,170,190,      SET00580
     * 260,270),I                                                       SET00590
   20 CONTINUE                                                          SET00600
C                                                                       SET00610
C  INVALID CARD TYPE                                                    SET00620
      WRITE(6,490)CODE,CARD                                             SET00630
      GO TO 10                                                          SET00640
C                                                                       SET00650
C     CHANNEL CARD                                                      SET00660
C                                                                       SET00670
   30 J = NXTCHR(CARD,COL)                                              SET00680
      IF (J .EQ. BLANK)GO TO 10                                         SET00690
      COL=COL-1                                                         SET00700
      NOFEAT = NUMBER(CARD,COL,FETVEC,NOFEAT)                           SET00710
      VARSIZ=(NOFEAT*(NOFEAT+1))/2                                      SET00720
      GO TO 10                                                          SET00730
C                                                                       SET00740
C  HED1 CARD                                                            SET00750
C                                                                       SET00760
   50 READ (30,500)HED1                                                 SET00770
      GO TO 10                                                          SET00780
C                                                                       SET00790
```

```
FILE: SETUP9   FORTRAN  A

C   HED2 CARD                                                                    SET00800
C                                                                                SET00810
    70 READ (30,500) HED2                                                        SET00820
       GO TO 10                                                                  SET00830
C                                                                                SET00840
C   DATE CARD                                                                    SET00850
C                                                                                SET00860
    80 READ(30,510)DATE                                                          SET00870
       GO TO 10                                                                  SET00880
C                                                                                SET00890
C   COMMENT CARD                                                                 SET00900
C                                                                                SET00910
   110 READ(30,500)COMENT                                                        SET00920
       GO TO 10                                                                  SET00930
C                                                                                SET00940
C   NPTS CARD,NUMBER OF DATA POINTS FOR EACH CHANNEL RETURNED TO                 SET00950
C   CLASY3 EACH CALL TO CLASY2                                                   SET00960
C                                                                                SET00970
   130 J=NUMBER(CARD,COL,NPTS,K0)                                                SET00980
       GO TO 10                                                                  SET00990
C                                                                                SET01000
C   NPOS CARD,NUMBER OF DRUM POSITIONS FROM WHICH TO OBTAIN DATA FOR             SET01010
C   CLASY3,SO THAT THE DATA WILL BE SCRAMBLED                                    SET01020
C                                                                                SET01030
   150 J=NUMBER(CARD,COL,NPOS,K0)                                                SET01040
       GO TO 10                                                                  SET01050
C                                                                                SET01060
C   SYMBOL CARD                                                                  SET01070
C                                                                                SET01080
   170 ICNT=ICNT+1                                                               SET01090
       IF(ICNT .GT. 61) GO TO 10                                                 SET01100
   180 M=NXTCHR(CARD,COL)                                                        SET01110
       IF( M .EQ. BLANK)GO TO 10                                                 SET01120
       IF(M .EQ. COMMA)GO TO 180                                                 SET01130
       SYM(ICNT)=M                                                               SET01140
       GO TO 170                                                                 SET01150
C                                                                                SET01160
C      PRINT OPTION CARD                                                         SET01170
C                                                                                SET01180
   190 J=NXTCHR(CARD,COL)                                                        SET01190
       IF (J .EQ. BLANK)GO TO 10                                                 SET01200
       COL=COL-1                                                                 SET01210
       J=NUMBER(CARD,COL,PRNT,K0)                                                SET01220
       GO TO 10                                                                  SET01230
C                                                                                SET01240
C   *END* CARD                                                                   SET01250
C                                                                                SET01260
   260 RETURN                                                                    SET01270
C                                                                                SET01280
C  ITERATION CARD                                                                SET01290
270    J = NXTCHR (CARD,COL)                                                     SET01300
       WRITE (3,9999) J                                                          SET01310
       IF (J .EQ. BLANK) GO TO 10                                                SET01320
       COL = COL - 1                                                             SET01330
       K = NUMBER (CARD,COL,TEMP,K0)                                             SET01340
       NOCYCL = TEMP(1)                                                          SET01350
       WRITE (3,9999) J,NOCYCL                                                   SET01360
9999   FORMAT ('NOCYCL=',A4,1X,I8)                                               SET01370
       GO TO 10                                                                  SET01380
C                                                                                SET01390
C  FORMATS                                                                       SET01400
   490 FORMAT(A4,4X,62A1)                                                        SET01410
   490 FORMAT(' INVALID INPUT CARD--IGNORED'/T5,A4,4X,62A1)                      SET01420
   500 FORMAT(10X,10A6)                                                          SET01430
   510 FORMAT(10X,2A6)                                                           SET01440
   550 FORMAT(5X,A6,4X,62A1)                                                     SET01450
   630 FORMAT(//' INPUT SUMMARY'//)                                              SET01460
       END                                                                       SET01470
```

FILE: SPLIT FORTRAN A

```
      SUBROUTINE SPLIT(KL,SUM,SKEW,KURT,OSUM,OVAR,ORT,DSQ,                  SPL00010
     1    SG,TAU,ERE,VER,DUM,DSG,DTAU)                                      SPL00020
      IMPLICIT REAL*8 (A-H,O-Z)                                             SPL00030
       REAL*8 SUMM,SUMV,GRADSQ,DDSG,DDSG1,DDSG2,DDSG3,DDSG4                 SPL00040
       REAL*8 DELIN,DRES,ERT,HTR,SIG,GAM,GP,GM,AA,BB,TMG,TRD,DELSQ          SPL00050
      REAL*8 FRCOV,ERSKEW,ERKURT,OBJ,GAMCGN,GMCF,EXPECT                     SPL00060
       REAL*8 REST,ORFST,THIMP,PCTIMP,SSIZ,SMOV,DKURT,DKRTGM,DSKEW          SPL00070
       REAL*8 DDS,TVDSQ,TDEL,DVDEL,TSPROA,TDEL,DVDEL,TVDSQ2                 SPL00080
      REAL*8 DERED,TERED,TR2VD4,DVD2D2,DCOV2,D2,D3,DSKEW2,DKURT2            SPL00090
       REAL*8 DS,D4,SG1,TAU1Q,DD3,DERED,TEREDQ,TR2VD4,DB7DSQ,UNIDS          SPL00100
        REAL*8 UNIDSQ                                                       SPL00110
C                                                                           SPL00120
C                                                                           SPL00130
C     THIS ROUTINE HAS THE FOLLOWING FUNCTIONS                              SPL00140
C       (1)   TO GUESS THE OPTIMAL AXIS TO SPLIT THE CLUSTER ON, USING      SPL00150
C             USING SKEWNESS AND KURTOSIS DATA.                             SPL00160
C       (2)   TO GENERATE TWO NEW CLUSTERS CORRESPONDING TO THE             SPL00170
C             PROBABLE HALVES OF THE OLD CLUSTER                            SPL00180
C       (3)   TO BUILD THEM INTO THE TREE                                   SPL00190
C                                                                           SPL00200
       REAL*8 IITEMP, IITEMP, IJTEMP                                        SPL00210
       DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12)         SPL00220
       REAL*4PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),       SPL00230
      2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),       SPL00240
      3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),             SPL00250
      4 OPRIOR(9),ODEN(8)                                                   SPL00260
       REAL*4 VRIN(475),GEN(999),GREF(999)                                  SPL00270
        REAL*8 ALINK(1)                                                     SPL00280
       EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                  SPL00290
       EQUIVALENCE (LINK(31),LSUBS(30))                                     SPL00300
       EQUIVALENCE(LINK(3),LSUPER(29)),  (LINK(31),IDADJ(28)),              SPL00310
      1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)) SPL00320
      2 ,(LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),    SPL00330
      3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),      SPL00340
      4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),    SPL00350
      5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)),  SPL00360
      6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),    SPL00370
      7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),     SPL00380
      8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),      SPL00390
      9 (LINK(31),GREF(8))                                                  SPL00400
       COMMON /JOINPR/WDJOIN,RLIM,NOJO,NOELIM                               SPL00410
       COMMON/CLUS/  JUNK(12),NARL,NTOP,NTRSZM,NWANT,LINK(14000)            SPL00420
       DIMENSION MXAR(3),LR(3),LV(3)                                        SPL00430
       EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                             SPL00440
      1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)           SPL00450
C                                                                           SPL00460
       REAL*4 WTINIT,EPS,DELT,AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,        SPL00470
      1 SEPTH,VFAC,AMM,SHLTH,WFAC,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,        SPL00480
      2 AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM           SPL00490
      3 ,BETTER,COPLEN,SPCOR                                                SPL00500
       COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,         SPL00510
      1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SHLTH,      SPL00520
      2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,             SPL00530
      3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,      SPL00540
      4    BETTER,MODE,COPLEN,SPCOR                                         SPL00550
C                                                                           SPL00560
       COMMON /STPAR/WAIT,CONLV,SKRND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,      SPL00570
      1     PACCEL(2),MACCEL(2),VACCEL(2)                                   SPL00580
C                                                                           SPL00590
        REAL*4 WAIT,CONLV,SKRND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,            SPL00600
      1 PACCEL,MACCEL,VACCEL                                                SPL00610
       COMMON/CLUSTP/ IBEGIN,TOTWRD,CLSNAM,IPT,NOFLD, SYM(61) ,             SPL00620
      1                LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,        SPL00630
      2   SCRAM1,BUFPIX,BUFTOT,NBUFSO,NDUMP,LBUFD                          SPL00640
      3,  MAXHF,  APEA,  NWDS,  NWDRS,  NPTS,  LBUF,  IQ1,NOCYCL           SPL00650
C                                                                           SPL00660
       INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT      SPL00670
      1 ,CLSNAM                                                             SPL00680
C                                                                           SPL00690
       REAL SUM(1),SKEW(1),KURT(1),OSUM(1),OVAR(1)                          SPL00700
       REAL*8 DSQ(MQ,MQ),SG(MQ,MQ),TAU(MQ,MQ),ERE(MQ,MQ),                  SPL00710
      1   VER(MQ,MQ),ORT(MQ,MQ),DUM(MQ,MQ),DSG(MQ,MQ),DTAU(MQ,MQ)          SPL00720
C                                                                           SPL00730
C                                                                           SPL00740
C     TO SAVE STORAGE, WE USE SEVERAL ARRAYS FROM THE CALLING               SPL00750
C       SEQUENCE IN MORE THAN ONE WAY.  SINCE WE CANNOT EQUIVALENCE         SPL00760
C       NAMES IN THE CALLING SEQUENCE, THESE ARRAYS HAVE NON-MNEMONIC       SPL00770
C       IDENTIFIERS.  IN PARTICULAR,                                        SPL00780
C         DSQ IS ALSO USED AS THE TRANSPOSE OF ORT                          SPL00790
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C         ERE IS ALSO USED AS SG**2 AND AS D(OBJECTIVE)/D(SG**2)                SPL00800
C         VEW IS ALSO USED AS TAU**2 AND AS D(OBJECTIVE)/D(TAU**2)              SPL00810
C         DUM IS A DUMMY ARRAY USED IN MANY WAYS                                SPL00820
C                                                                               SPL00830
C   THE ITERATION USES SG AND TAU AS THE SQUARE ROOT OF THE COVARIANCE          SPL00840
C   MATRIX, TO INSURE POSITIVE DEFINITENESS                                     SPL00850
C                                                                               SPL00860
C   CONTROL PARAMETERS                                                          SPL00870
C                                                                               SPL00880
      COMMON/SPPAR/ GAMMFT,DELMFT,SGTMFT,ORCOV,ORSKEW,ORKURT,EXMNSQ,            SPL00890
     1     SHRMIN,EXMAX,GAMCFN,TSQINI,DAMP,DORPMS,DIAG,TIM0,TIM1,ITERMX,        SPL00900
     2     SPRED,ITER                                                           SPL00910
      REAL*4 GAMMFT,DELMFT,SGTMFT,ORCOV,ORSKEW,ORKURT,EXMNSQ,                   SPL00920
     1 SHRMIN,EXMAX,GAMCFN,TSQINI,DAMP,DORPMS,TIM0,TIM1,SPRED                   SPL00930
      REAL*8 DEL(16),SPROA(16),T(16),TPVD(16),DOFL                              SPL00940
     1 (16),DSQT(16),VDFL(16),VDSQD(16),S(16),E(16),                            SPL00950
     2    EVURT(16),EREO(16)                                                   SPL00960
      REAL*8 R(1)                                                               SPL00970
      EQUIVALENCE (EREO(1),R(1))                                                SPL00980
      LOGICAL DIAG                                                              SPL00990
      DATA IBLANK,ISTARS /'    ','*****'/                                       SPL01000
      DATA GRADSQ,GRADRT/1.,1./                                                 SPL01010
C                                                                               SPL01020
      MQS=MQ*MQ                                                                 SPL01030
C  DORFAC = MAXIMUM TIME.   TIM0,TIM1, DORPMS IN COMMON CBLO                    SPL01040
      DORFAC=(TIM0+AMQ*TIM1)*DORPMS                                             SPL01050
C                                                                               SPL01060
C  WE MUST FIRST GENERATE CENTERED VERSIONS OF THE VARIANCE, SKEWNESS,          SPL01070
C    AND KURTOSIS.                                                              SPL01080
C                                                                               SPL01090
      VARIANCE                                                                  SPL01100
C                                                                               SPL01110
C  EXPAND VRIN AND KURT                                                         SPL01120
      WQ=1E0/W(KL)                                                              SPL01130
      CALL DSQMTX(DUM,VRIN(KL+1))                                               SPL01140
      WQ=AMQ+2E0                                                                SPL01150
      CALL DSQMTX(DTAU,KURT(KL+1))                                              SPL01160
C                                                                               SPL01170
C  REMOVE WEIGHT FACTOR FROM SKEW                                               SPL01180
      DO  61  I=1,MQ                                                            SPL01190
C     SKEWNESS=  SKEW                                                           SPL01200
      S(I)=SKEW(I+KL)*WQ                                                        SPL01210
   61 CONTINUE                                                                  SPL01220
C                                                                               SPL01230
  120 CONTINUE                                                                  SPL01240
C   SHIFT TO FRAME WITH UNIT INVERSE COVARIANCE MATRIX (DUM).                   SPL01250
C  COORDINATE TRANSMATION CREATED IN ORT, EIGENVALUES IN E                      SPL01260
      CALL EIGROT(MQ,MQ,DUM,E,ORT)                                              SPL01270
C                                                                               SPL01280
C  DILATE ALONG COORDINATE AXES TO MAKE COVAR A UNIT MATRIX                     SPL01290
      DO 101  I=1,MQ                                                           SPL01300
      E(I)=E(I)*W(KL)                                                           SPL01310
      EE = DSQRT(DABS(E(I)))                                                    SPL01320
C                                                                               SPL01330
      DO 101  J=1,MQ                                                           SPL01340
      ORT(J,I)=EE*ORT(J,I)                                                      SPL01350
  101 DSQ(I,J)=ORT(J,I)                                                         SPL01360
C                                                                               SPL01370
C  DO THE LINEAR TRANSFORMATIONS                                                SPL01380
      CALL MLT(DUM,DTAU,ORT)                                                    SPL01390
      CALL MLT(DTAU,DSQ,DUM)                                                    SPL01400
      CALL MVEC(R,DSQ,S)                                                        SPL01410
C                                                                               SPL01420
C  THE PROBLEM IS NOW IN A FRAME WHERE THE COVAR MATRIX IS A UNIT MATRIX        SPL01430
C                                                                               SPL01440
  121 CONTINUE                                                                  SPL01450
C                                                                               SPL01460
C  INITIALIZE AND MAKE GOOD INITIAL GUESS                                       SPL01470
      GAM=.0000100                                                              SPL01480
C                                                                               SPL01490
C  FIND FRAME WHERE KURTOSIS IS DIAGONAL                                        SPL01500
      CALL EIGROT(MQ,MQ,DTAU,EVURT,DUM)                                         SPL01510
C   KURTOSIS=KURT-(MQ+2)*COVAR   (IN TRANSFORMED FRAME.)                        SPL01520
      DO 68  I=1,MQ                                                            SPL01530
   68 EVURT(I)=EVURT(I)*WQ-RQ                                                   SPL01540
C                                                                               SPL01550
C  ROTATE SKEWNESS TO THAT FRAME                                                SPL01560
      CALL MTVEC(S,DUM,R)                                                       SPL01570
                                                                                SPL01580
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C  INITIALIZATION                                                        SPL01590
      DELIN=.3                                                          SPL01600
      IHES=0                                                            SPL01610
      RTSM=0.                                                           SPL01620
      ORTSM=0.                                                          SPL01630
      TRN=.05*AMQ                                                       SPL01640
      TRSQ=TRN*TRN                                                      SPL01650
      AMXVAL=0E0                                                        SPL01660
C  FIND MAX NEGATIVE EIGENVALUE  CALC ROOT SUMS FOR SKEWNESS ADJUSTMENT SPL01670
      DO 111 I=1,MQ                                                     SPL01680
      IF(EVURT(I).GT.AMXVAL) GO TO 103                                  SPL01690
      AMXVAL=EVURT(I)                                                   SPL01700
      IHES=I                                                            SPL01710
  103 RT = DSQRT(32.D0*DMAX1(0.D0,EVURT(I))+TRSQ)                       SPL01720
      RTSM=RTSM+RT                                                      SPL01730
  111 ORTSM=ORTSM+1./RT                                                 SPL01740
      TCOF=4.*AMQ                                                       SPL01750
C                                                                       SPL01760
C  CK FOR NEG EIGENVALUE                                                SPL01770
      IF(IHES.EQ.0) GO TO 118                                           SPL01780
C                                                                       SPL01790
C   NEGATIVE EIGENVALUE, ADJUST 'GOOD GUESS' TEMPORARIES                SPL01800
      DELIN=DSQRT(DSQRT(-8.*AMXVAL))                                    SPL01810
      SAH = DABS(S(IHES))                                               SPL01820
      RTSM=RTSM+5.3333333*SAH/DELIN-TRN                                 SPL01830
      ORTSM=ORTSM-1./TRN                                                SPL01840
      TCOF=TCOF+.333333                                                 SPL01850
C                                                                       SPL01860
C  POS AND NEG EIGENVALUE ADJUSTMENTS                                   SPL01870
C  CK FOR NEG EIGENVALUE                                                SPL01880
  118 TRN=TRN-(TCOF*TRN-RTSM)/(TCOF-TRN*ORTSM)                          SPL01890
      TRSQ=TRN*TRN                                                      SPL01900
C                                                                       SPL01910
      IF(IHES.EQ.0) GO TO 119                                           SPL01920
C                                                                       SPL01930
C   NEG EIGENVALUE, ADJUST 'GOOD GUESS' TEMPORARIES                     SPL01940
      ERT = DSQRT(-10.666667D0*AMXVAL)                                  SPL01950
C                                                                       SPL01960
C  THE COS-ACOS EXPRESSION FINDS THE ROOT OF A CUBIC                    SPL01970
      ITEMP = (SAH*(4.*SAH-TRN*DELIN)/(AMXVAL*ERT))                     SPL01980
      IITEMP = DMAX1(-.99999D0,ITEMP)                                   SPL01990
      IJTEMP = DMIN1(.99999D0,IITEMP)                                   SPL02000
      DELIN = SAH/S(IHES) * DMIN1(2.D0,DSQRT(ERT*DCOS(.3333333D0*       SPL02010
     1    DARCOS(IJTEMP))))                                             SPL02020
      DHES=200*S(IHES)/DELIN-.5D0*TRN                                   SPL02030
C  IN ANY CASE, CREATE FACTOR USED IN MEAN DISPLACEMENT CALC            SPL02040
  119 DELFAC=DELIN**6*DKURT/DABS(DSKEW)*.5D0+2.5D0/DSQRT(DABS(TRN)/AMQ) SPL02050
C                                                                       SPL02060
C                                                                       SPL02070
C  GENERATE ACTUAL INITIAL VALUES                                       SPL02080
      DO 115 I=1,MQ                                                     SPL02090
      FI=1./E(I)                                                        SPL02100
C                                                                       SPL02110
C  INITIAL COVARIANCE MATRICES AND ROTATION MATRICES                    SPL02120
      DO 112 J=1,MQ                                                     SPL02130
      DSG(J,I)=FI*ORT(J,I)                                              SPL02140
      SG(J,I)=0E0                                                       SPL02150
  112 TAU(J,I)=0E0                                                      SPL02160
C                                                                       SPL02170
C   CALCULATE MEAN DISPLACEMENT USING SKEWNESS                          SPL02180
      ERT=(DSQRT(DMAX1(0D0,.32.D0*FVURT(I)+TRSQ))-TRN)*.25D0            SPL02190
      RTR=2.*ERT+TRN                                                    SPL02200
      DEL(I)=4.*S(I)*RTR/(DELFAC+RTR*RTR)                               SPL02210
      IF(I.NE.IHES) GO TO 113                                           SPL02220
C                                                                       SPL02230
C   SPECIAL CALCULATION ALONG MAX NEG EIGENVECTOR                       SPL02240
      ERT=DHES                                                          SPL02250
      DEL(I)=DELIN                                                      SPL02260
  113 SIG = DABS(1E0-.25E0*DEL(I)*DEL(I))                               SPL02270
C                                                                       SPL02280
C  CALCULATE COVARIANCE MATRIX DIAGONALS                                SPL02290
      DDSG1 = 2.D0*SIG-.001D0                                           SPL02300
       DDSG2 = SIG+ERT                                                  SPL02310
                                                                        SPL02320
       DDSG3 = DMIN1(DDSG1,DDSG2)                                       SPL02330
      DDSG4 = DMAX1(0.D0,DDSG3)                                         SPL02340
       DDSG=DSQRT(DDSG4)                                                SPL02350
         SG(I,I) = DDSG                                                 SPL02360
  115 TAU(I,I)=DSQRT(DMAX1(SIG-ERT,.001D0))                             SPL02370
```

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FILE: SPLIT    FORTRAN  A

      CALL MLT (ORT,USG,DUM)                                                SPL02380
C                                                                           SPL02390
C  INITIALIZE ITERATIONS                                                    SPL02400
      SSIZ=-.0AE0                                                           SPL02410
      BEST=1030                                                             SPL02420
      ITER=0                                                                SPL02430
C                                                                           SPL02440
CC    ITERATION CYCLE STARTS HERE.                                          SPL02450
CC                                                                          SPL02460
CC    CALCULATE OBJECTIVE FUNCTION.                                         SPL02470
CC                                                                          SPL02480
CC   TEMPORARIES DEPENDING ON GAM                                           SPL02490
C                                                                           SPL02500
  150 GP=.5D0*(1D0+GAM)                                                     SPL02510
      GM=.5D0-.5D0*GAM                                                      SPL02520
      AA=GM*GP                                                              SPL02530
      BB=1.5D0*GAM*GAM-.5D0                                                 SPL02540
C                                                                           SPL02550
C  CALC SIGMA SQ., TAU SQ AND DIFFERENCE (DSQ)                              SPL02560
      CALL MLT(ERR,SG,SG)                                                   SPL02570
      CALL MLT(VER,TAU,TAU)                                                 SPL02580
C                                                                           SPL02590
C  NOTE--MQS CAUSES PROCESSING OF WHOLE ARRAY                               SPL02600
      DO 162 I=1,MQS                                                        SPL02610
  162 DSQ(I,1)=ERR(I,1)-VER(I,1)                                            SPL02620
C                                                                           SPL02630
C  CALC DEL**2, TRACE DSQ                                                   SPL02640
      TRD=0E0                                                               SPL02650
      DELSQ=0E0                                                             SPL02660
      DO 161 I=1,MQ                                                         SPL02670
      DELSQ=DELSQ+DEL(I)*DEL(I)                                             SPL02680
  161 TRD=TRD+DSQ(I,I)                                                      SPL02690
C                                                                           SPL02700
C  CALC DSQ*DEL, DSQ*DSQ                                                    SPL02710
      CALL MVEC(M,DSQ,DEL)                                                  SPL02720
      CALL MLT(DUM,DSQ,DSQ)                                                 SPL02730
C                                                                           SPL02740
C  TEMPS FOR OBJECTIVE FUNC CALC                                            SPL02750
      TMG=TRD-GAM*DELSQ                                                     SPL02760
      BRR=BB*DELSQ-GAM*TRD                                                  SPL02770
      GAM2=2E0*GAM                                                          SPL02780
      GAMDEL=GAM*DELSQ                                                      SPL02790
      ERCOV=AMQ                                                             SPL02800
      ERSKEW=0E0                                                            SPL02810
      ERKURT=0E0                                                            SPL02820
C                                                                           SPL02830
C  VECTORS AND ARRAYS USED HERE ARE ALSO USED IN THE DERIVATIVE CALC        SPL02840
C  CALC ACTUAL ERRORS                                                       SPL02850
      DO 165 I=1,MQ                                                         SPL02860
C     DELTA 3                                                               SPL02870
      SPROA(I)=TRD*DEL(I)+2E0*R(I)-GAMDEL*DEL(I)                            SPL02880
      T(I)=AA*SPROA(I)-S(I)                                                 SPL02890
      DO 166 J=1,MQ                                                         SPL02900
C     DELTA 2                                                               SPL02910
      ERR(I,J)=AA*DEL(I)*DEL(J)+GP*ERR(I,J)+GM*VER(I,J)                     SPL02920
      ERCOV=ERCOV+ERR(I,J)**2                                               SPL02930
C     DELTA 4                                                               SPL02940
      VER(I,J)=AA*(TMG*DSQ(I,J)+2E0*DUM(I,J)+BRR*DEL(I)*DEL(J)-             SPL02950
     1   GAM2*(DEL(I)*R(J)+DEL(J)*R(I)))                                    SPL02960
C                                                                           SPL02970
C  CALC ERRORS IN KURTOSIS(ERKURT), COVARIANCE(ERCOV), SKEWNESS(ERSKEW)     SPL02980
  166 ERKURT=ERKURT+VER(I,J)     **2                                        SPL02990
      ERCOV=ERCOV-2E0*ERR(I,I)                                              SPL03000
      ERKURT=ERKURT+(-2E0*VER(I,I)+EVURT(I))*EVURT(I)                       SPL03010
      VER(I,I)=VER(I,I)-EVURT(I)                                            SPL03020
      ERR(I,I)=ERR(I,I)-1E0                                                 SPL03030
  165 ERSKEW=ERSKEW+T(I)*T(I)                                               SPL03040
C     TEST NEW POINT                                                        SPL03050
C                                                                           SPL03060
C  CALC OBJECTIVE FUNCTION                                                  SPL03070
C  OBCOV, OBSKW, OBKURT ARE USED AS PARAMETERS DEFINED IN CAL0              SPL03080
      OBJ=OBCOV*ERCOV+OBSKEW*ERSKEW+OBKURT*ERKURT                           SPL03090
      GAMCGN=GAM*GAMCEN                                                     SPL03100
      GMCE=1E0+GAM*GAMCGN                                                   SPL03110
      OBJ=OBJ*GMCE                                                          SPL03120
C                                                                           SPL03130
C  CALC STEP SIZE (SSIZ) AND                                                SPL03140
      OBEST=BEST                                                            SPL03150
      IF(ITER.EQ.0) PCTIMP=.25                                              SPL03160
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FILE: SPL.IT FORTRAN A

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      EXPECT=SSIZ*GRADRT*GMCF                                                  SPL03170
      SHRINK=1.+(BEST-OBJ)/EXPECT                                              SPL03180
       DSHRMN = SHRMIN                                                         SPL03190
      SHRINK=DMAX1(.5D0/DMAX1(SHRINK,1.D-10),DSHRMN)                           SPL03200
C                                                                              SPL03210
C  OK TO SEE IF OBJECTIVE FUNCTION HAS IMPROVED                                SPL03220
      IF(OBJ.LE.BEST) GO TO 170                                                SPL03230
C   OBJ FUNCTION HAS NOT IMPROVED, SHRINK STEP SIZE, SKIP NEW DERIV CALC       SPL03240
      SMOV=(SHRINK-1E0)*SSIZ                                                   SPL03250
      SSIZ=SSIZ*SHRINK                                                         SPL03260
        IF (DABS(SSIZ) .LT. 1E-10)  GO TO 200                                  SPL03270
      THIMP=DMIN1(THIMP,OBJ)                                                   SPL03280
      PCTIMP=PCTIMP-PCTIMP*DAMP*.7                                             SPL03290
      GO TO 190                                                                SPL03300
C                                                                              SPL03310
C   OBJ FUNCTION IMPROVED, CONCLUDE STEP SIZE CALC                             SPL03320
  170 THIMP=DMIN1(BEST-OBJ,OBJ)                                                SPL03330
      PCTIMP=PCTIMP+(THIMP/OBJ-PCTIMP)*DAMP                                    SPL03340
      XTEMP = PCTIMP * OBJ                                                     SPL03350
      IF(PCTIMP*OBJ.LE.OBJFAC.OR.ITER.GT.ITFRMX)   GO TO 200                   SPL03360
      BEST=OBJ                                                                 SPL03370
      DEXMAX = EXMAX                                                           SPL03380
      SHRINK=DMIN1(DSQRT(EXMNSQ*(1E0-SHRINK)**2),DEXMAX)                       SPL03390
      SSIZ=SSIZ*SHRINK                                                         SPL03400
      SMOV=SSIZ                                                                SPL03410
C                                                                              SPL03420
C     CALCULATE DERIVATIVES                                                    SPL03430
C   TEMP SCALARS DEPENDING ON OBKURT, OBSKEW DEFINITION                        SPL03440
      DKURT=AA*OBKURT                                                          SPL03450
      DKRTGM=DKURT*GAM                                                         SPL03460
      DSKEW=AA*OBSKEW                                                          SPL03470
      DD5=-2E0*DKRTGM                                                          SPL03480
C   TEMP VECTORS AND MATRIX PRODUCTS                                           SPL03490
      CALL MVEC(EPED,ERE,DEL)                                                  SPL03500
      CALL MVEC(DSQT,DSQ,T)                                                    SPL03510
      CALL MVEC(VDEL,VER,DEL)                                                  SPL03520
      CALL ACOM(DUM,VER,DSQ)                                                   SPL03530
      CALL MVEC(VDSQD,DUM,DEL)                                                 SPL03540
C   INITIALIZE FOR INNER PRODUCTS                                              SPL03550
      TVDSQ2=0E0                                                               SPL03560
      TDEL=0E0                                                                 SPL03570
      DVDEL=0E0                                                                SPL03580
      TSPROA=0E0                                                               SPL03590
C   CALC. INNER PRODUCTS                                                       SPL03600
      DO 171 I=1,MQ                                                            SPL03610
      TDEL=TDEL+DEL(I)*T(I)                                                    SPL03620
      DVDEL=DVDEL+DEL(I)*VDEL(I)                                               SPL03630
      TSPROA=TSPROA+T(I)*SPROA(I)                                              SPL03640
      TVDSQ2=TVDSQ2+DUM(I,I)                                                   SPL03650
  171 TRVD(I)=DSKEW*T(I)+DD5*VDEL(I)                                           SPL03660
C   INITIALIZE FOR MORE INNER PRODUCTS                                         SPL03670
      DERED=0E0                                                                SPL03680
      TEREDQ=0E0                                                               SPL03690
      TR2VD4=0E0                                                               SPL03700
      DVD2D2=0E0                                                               SPL03710
      DCOV2=2E0*OBCOV*AA                                                       SPL03720
C   CALC. DERIVATIVE COEFFICIENT TEMPORARIES                                   SPL03730
      D2=2E0*AA*(OBKURT*(BB*DVDEL-.5E0*GAM*TVDSQ2)-OBSKEW*GAM*TDEL)            SPL03740
      D3=DSKEW*(TRD-GAM*DELSQ)                                                 SPL03750
      DSKEW2=2E0*DSKEW                                                         SPL03760
      DKURT2=2E0*DKURT                                                         SPL03770
      D5=DKURT2*BBP                                                            SPL03780
      D6=-2E0*DKURT2*GAM                                                       SPL03790
      SG1=OBCOV*GP                                                             SPL03800
      TAU1=OBCOV*GM                                                            SPL03810
      UNIDSQ=DSKEW*TDEL+DKURT*.5E0*TVDSQ2-DKRTGM*DVDEL                         SPL03820
      DD3=DKURT*TRD-DKRTGM*DELSQ                                               SPL03830
C                                                                              SPL03840
C   CALC  MATRIX TEMPS AND DOT PRODUCTS                                        SPL03850
      DO 175 I=1,MQ                                                            SPL03860
      DERED=DERED+DEL(I)*ERED(I)                                               SPL03870
      DVD2D2=DVD2D2+DEL(I)*VDSQD(I)                                            SPL03880
C                                                                              SPL03890
C   DDEL IS THE DERIVATIVE WITH RESPECT TO DEL                                 SPL03900
      DDEL(I)=DCOV2*ERED(I)+D2*DEL(I)+D3*T(I)+DSKEW2*DSQT(I)+D5*VDEL(I)+SPL03910
     1  D6*VDSQD(I)                                                            SPL03920
      DO 174 J=1,MQ                                                            SPL03930
      TEREDQ=TEREDQ+ERE(I,J)*DSQ(I,J)                                          SPL03940
      TR2VD4=TR2VD4+DSQ(I,J)*DUM(I,J)                                          SPL03950
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      DRYDSQ=TPVD(I)*DEL(J)+TPVD(J)*DEL(I)                                  SPL03960
     1           +DD3*VER(I,J)+DKURT2*DUM(I,J)                              SPL03970
      VER(I,J)=TAU1*ERE(I,J)-DBYDSQ                                         SPL03980
  174 ERE(I,J)=SG1*ERE(I,J)+DBYDSQ                                          SPL03990
      ERE(I,I)=ERE(I,I)+UNIDSQ                                              SPL04000
  175 VER(I,I)=VER(I,I)-UNIDSQ                                              SPL04010
C   CALC DERIVATIVES WITH RESPECT TO COVARIANCE MATRIX ROOTS                 SPL04020
      CALL ACOM(DSG,SG,ERE)                                                 SPL04030
      CALL ACOM(DTAU,TAU,VER)                                               SPL04040
C   CALC DERIVATIVE WITH RESPECT TO GAM                                     SPL04050
      DGAM=ORCOV*(-.5E0)*(GAM*DERED-TEREDQ)-OBSKEW*(.5E0*GAM*TSPROA+        SPL04060
     1    AA*DELSQ*TDEL)-OBKURT*(GAM*(.25E0*TVDSQ2*TRD+.5E0*TR2VD4+          SPL04070
     2    (RR-.5E0)*DELSQ*DVDEL)-                                           SPL04080
     3    .5E0*RR*(.5E0*DELSQ*TVDSQ2+DVDEL*TRD+2E0*DVD2D2))+                SPL04090
     4    GAMCGN/(GMCF*GMCF)*OBJ                                            SPL04100
C   CALC THE SQ. OF THE DERIVATIVE AND ITS ROOT                             SPL04110
      SUMM=0E0                                                              SPL04120
      SUMV=0E0                                                              SPL04130
      DO 181 I=1,MQ                                                         SPL04140
      SUMV=SUMV+DDEL(I)*DDEL(I)                                             SPL04150
      DO 181 J=1,MQ                                                         SPL04160
      SUMM=SUMM+DSG(I,J)*DSG(I,J)+DTAU(I,J)*DTAU(I,J)                       SPL04170
  181 CONTINUE                                                              SPL04180
      GRADSQ=SUMM*SGTMET+SUMV*DELMET+DGAM*DGAM*GAMMET                       SPL04190
      GRADRT=DSQRT(GRADSQ)                                                  SPL04200
C                                                                           SPL04210
C   SET UP AND TEST POINT.                                                  SPL04220
C   ENTRY FROM NO DERIVATIVE CALC.                                          SPL04230
  190 CONTINUE                                                              SPL04240
  194 CONTINUE                                                              SPL04250
C                                                                           SPL04260
C                                                                           SPL04270
C   MOVE TO NEW POINT                                                       SPL04280
  195 SMOV=SMOV/GRADRT                                                      SPL04290
      SGTMOV=SMOV*SGTMET                                                    SPL04300
      DO 191 I=1,MQS                                                        SPL04310
      SG(I,1)=SG(I,1)+SGTMOV*DSG(I,1)                                       SPL04320
      TAU(I,1)=TAU(I,1)+SGTMOV*DTAU(I,1)                                    SPL04330
191   CONTINUE                                                              SPL04340
      DELMOV=DELMET*SMOV                                                    SPL04350
      DO 192 I=1,MQ                                                         SPL04360
  192 DEL(I)=DEL(I)+DELMOV*DDEL(I)                                          SPL04370
      GAM=GAM+SMOV*GAMMET*DGAM                                              SPL04380
C                                                                           SPL04390
C   ITERATE AND LIMIT NUMBER OF ITERATIONS                                  SPL04400
      ITER=ITER+1                                                           SPL04410
      IF (ITER.GT.ITERMX) GO TO 200                                         SPL04420
      GO TO 150                                                             SPL04430
C                                                                           SPL04440
C                                                                           SPL04450
C   *** GENERATE TWO NEW SUBCLUSTERS **                                     SPL04460
C                                                                           SPL04470
C   SHIFT COORDINATE FRAME BACK                                             SPL04480
  200 CONTINUE                                                              SPL04490
C                                                                           SPL04500
C   CALC DSQ = TRANSPOSE OF OLD OLD ROTATION                                SPL04510
  250 DO 251 I=1,MQ                                                         SPL04520
      DO 251 J=1,MQ                                                         SPL04530
  251 DSQ(J,I)=ORT(I,J)                                                     SPL04540
C   DSG AND DTAU ARE TEMP ARRAYS FOR COVARIANCES                            SPL04550
      CALL MLT (DSG,SG,SG)                                                  SPL04560
      CALL MLT(DTAU,TAU,TAU)                                                SPL04570
C                                                                           SPL04580
C   SMEAR THE MATRICES OUT BY THE ARBITRARY FACTOR 'SPRED' FROM CRLO        SPL04590
      DO 253 I=1,MQ                                                         SPL04600
      DO 253 J=1,MQ                                                         SPL04610
      SPREDD=.2*SPRED*DEL(I)*DEL(J)                                         SPL04620
      IF(I.EQ.J) SPREDD=SPREDD+SPRED                                        SPL04630
      DSG(I,J)=DSG(I,J)+SPREDD                                              SPL04640
  253 DTAU(I,J)=DTAU(I,J)+SPREDD                                            SPL04650
C                                                                           SPL04660
C   DO ACTUAL ROTATION                                                      SPL04670
      CALL MLT(DUM,DSG,DSQ)                                                 SPL04680
      CALL MLT(DSG,ORT,DUM)                                                 SPL04690
      CALL MLT(DUM,DTAU,DSQ)                                                SPL04700
      CALL MLT (DTAU,ORT,DUM)                                               SPL04710
      CALL MVEC (P,ORT,DEL)                                                 SPL04720
C   CREATE AND LINK NEW CLUSTERS                                            SPL04730
      KA=MORSTR(NINCLS)                                                     SPL04740
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```
      KB=MORSTR(NINCLS)                                                 SPL04750
C                                                                       SPL04760
C  CREATE NAMES AND LINKAGES FOR NEW CLUSTERS KA, KB                    SPL04770
      INDXVL=INDXVL+2                                                   SPL04780
      INDEX(KA)=INDXVL-1                                                SPL04790
      INDEX(KB)=INDXVL                                                  SPL04800
      LINK(KB)=0                                                        SPL04810
      LSUBS(KB)=0                                                       SPL04820
      LSUBS(KA)=0                                                       SPL04830
      LINK(KA)=KB                                                       SPL04840
      LSUBS(KL)=KA                                                      SPL04850
      LSUPER(KA)=KL                                                     SPL04860
      LSUPER(KB)=KL                                                     SPL04870
C                                                                       SPL04880
C  IOADJ = ADJUSTMENT POSITION IN TERMS OF INPUT POINTS                 SPL04890
      IOADJ(KA)=NPTSO+TOTPIX                                            SPL04900
      IOADJ(KB)=IOADJ(KA)                                               SPL04910
C                                                                       SPL04920
C  SET UP WEIGHTS AND PROPORTIONS                                       SPL04930
      PROP(KA)=GP                                                       SPL04940
      PROP(KB)=GM                                                       SPL04950
      OPROP(KA)=GP                                                      SPL04960
      OPROP(KB)=GM                                                      SPL04970
      SPFAC(KA)=-9999.                                                  SPL04980
      SPFAC(KB)=-9999.                                                  SPL04990
      PORAT(KA)=0.                                                      SPL05000
      PORAT(KB)=0.                                                      SPL05010
      PRTRCM(KL)=1.                                                     SPL05020
      SPFAC(KL)=APRIOR(KL)                                              SPL05030
      OPRIOR(KL)=SPFAC(KL)                                              SPL05040
C  SET PARAMETERS.                                                      SPL05050
      WSTART=WFAC*AMO*SPCOR                                             SPL05060
      W(KA)=WSTART                                                      SPL05070
      OW(KA)=W(KA)                                                      SPL05080
      CIN(KA)=WSTART*PROP(KA)                                           SPL05090
      OCIN(KA)=CIN(KA)                                                  SPL05100
      ODEN(KA)=CIN(KA)/GP                                               SPL05110
      CTOT(KA)=W(KL)-ODEN(KA)                                           SPL05120
      W(KB)=WSTART                                                      SPL05130
      OW(KB)=W(KB)                                                      SPL05140
      CIN(KB)=WSTART*PROP(KB)                                           SPL05150
      OCIN(KB)=CIN(KB)                                                  SPL05160
      ODEN(KB)=CIN(KB)/GM                                               SPL05170
      CTOT(KB)=W(KL)-ODEN(KB)                                           SPL05180
      WADJ(KA)=W(KA)+WADJIN                                             SPL05190
      WADJ(KB)=W(KB)+WADJIN                                             SPL05200
C                                                                       SPL05210
C  INVERT COVAR MATRIX AND CALC VOLUME                                  SPL05220
      CALL DMINV(SG,DUM,DSG,VOLIN(KA))                                  SPL05230
      CALL DMINV(TAU,DUM,DTAU,VOLIN(KB))                                SPL05240
      IF(VOLIN(KA).LE.0..OR.VOLIN(KB).LE.0.) PRINT 653,KL,KA,KB,        SPL05250
     1    VOLIN(KL),VOLIN(KA),VOLIN(KB)                                 SPL05260
  653 FORMAT('0VOLUME ERROR IN SPLIT: CLASSES, VOLUMES',3I5,3E10.2)      SPL05270
      VOLIN(KA) = ABS(VOLIN(KA))*.8756510763E-26*(6.283185307)**MQ      SPL05280
      VOLIN(KB) = ABS(VOLIN(KB))*.8756510763E-26*(6.283185307)**MQ      SPL05290
      VOLRT(KA) = SQRT(VOLIN(KA))                                       SPL05300
      VOLRT(KB) = SQRT(VOLIN(KB))                                       SPL05310
      OCON(KA)=ODCON                                                    SPL05320
      OCON(KB)=ODCON                                                    SPL05330
      LOC=0                                                             SPL05340
C                                                                       SPL05350
C  SET UP ALL THE ARRAYS AND VECTORS FOR NEW CLUSTER                    SPL05360
      DO 210 I=1,MQ                                                     SPL05370
      SKEW(KA+I)=0.                                                     SPL05380
      SKEW(KB+I)=0.                                                     SPL05390
      SUM(KA+I)=WSTART*(SUM(I+KL)/W(KL)+GM*R(I))                        SPL05400
      SUM(KB+I)=WSTART*(SUM(I+KL)/W(KL)-GP*R(I))                        SPL05410
      OSUM(KA+I)=SUM(KA+I)                                              SPL05420
      OSUM(KB+I)=SUM(KB+I)                                              SPL05430
      DO 210 J=1,I                                                      SPL05440
C                                                                       SPL05450
C  LOC IS A LOCAL INDEX WITHIN TRIANGULAR ARRAYS                        SPL05460
      LOC=LOC+1                                                         SPL05470
      VRIN(KA+LOC)=SG(I,J)/WSTART                                       SPL05480
      VRIN(KB+LOC)=TAU(I,J)/WSTART                                      SPL05490
      KURT(KA+LOC)=0.                                                   SPL05500
      KURT(KB+LOC)=0.                                                   SPL05510
      OVAR(KA+LOC)=DSG(I,J)*WSTART                                      SPL05520
  210 OVAR(KB+LOC)=DTAU(I,J)*WSTART                                     SPL05530
```

```
FILE: SPLIT     FORTRAN  A

      NOFLIM = 0                                                    SPL05540
      RETURN                                                        SPL05550
      END                                                           SPL05560
```

FILE: SQMTX FORTRAN A

```
      SUBROUTINE SQMTX(SQ,AM)                                                  SQM00010
        REAL SQ,AM                                                             SQM00020
C  THIS SUBROUTINE EXPANDS MATRIX AM FROM TRIANGULAR FORM AND MAKES            SQM00030
C    AN MQ*MQ SQUARE SYMMETRIC MATRIX IN SQ(DIM MQ*MQ).                        SQM00040
C                                                                              SQM00050
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,             SQM00060
     1   AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,           SQM00070
     2   INDXVL,WFAC,NPTSQ,FRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                   SQM00080
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,           SQM00090
     4   BETTER,MODE,CORLEN,SPCOR                                              SQM00100
C                                                                              SQM00110
      DIMENSION AM(475),SQ(900)                                                SQM00120
      LOC=0                                                                    SQM00130
      IMQ=0                                                                    SQM00140
      DO 11 I=1,MQ                                                             SQM00150
      IJ=I                                                                     SQM00160
      DO 10 J=1,I                                                              SQM00170
      LOC=LOC+1                                                                SQM00180
      SQ(IJ)=AM(LOC)                                                           SQM00190
      SQ(IMQ+J)=AM(LOC)                                                        SQM00200
   10 IJ=IJ+MQ                                                                 SQM00210
   11 IMQ=IMQ+MQ                                                               SQM00220
      RETURN                                                                   SQM00230
      END                                                                      SQM00240
```

FILE: STATIS FORTRAN A

```
      SUBROUTINE STATIS(KROTIN,PV,SUM,SKEW,KURT,OSUM,OVAR)                  STA00010
C                                                                           STA00020
C  PURPOSE                                                                  STA00030
C    (1)  TAKE EACH INPUT POINT AND CLASSIFY IT (ON A FRACTIONAL,           STA00040
C           PROBABILISTIC BASIS.)                                           STA00050
C    (2)  UPDATES THE VARIOUS STATISTICAL PARAMETERS ASSOCIATED WITH THE    STA00060
C           CLASSES INDICATED.                                              STA00070
C    (3)  CALLS ADJUST TO CHECK TO SEE IF ANY OF THESE CLASSES ARE          STA00080
C           POTENTIALLY TWO AND REFER THOSE TO THE ROUTINE ' SPLIT'         STA00090
C                                                                           STA00100
      INTEGER   BUFSIZ , BUFCNT                                             STA00110
C                                                                           STA00120
C  THIS PROGRAM TAKES EACH INPUT POINT AND CLASSIFIES IT                    STA00130
C       (ON A FRACTIONAL, PROBABILISTIC BASIS).  IT THEN                    STA00140
C       UPDATES THE VARIOUS STATISTICAL PARAMETERS ASSOCIATED               STA00150
C       WITH THE CLASSES INDICATED AND CHECKS TO SEE IF                     STA00160
C       ANY OF THESE CLASSES IS POTENTIALLY TWO.  THOSE WHICH               STA00170
C       ARE ARE REFERRED TO THE ROUTINE ' SPLIT'.                           STA00180
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),         STA00190
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),             STA00200
     2 WADJ(20),W(19),OPPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),       STA00210
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),              STA00220
     4 OPRIOR(9),ODEN(8)                                                    STA00230
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                       STA00240
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                   STA00250
      EQUIVALENCE (LINK(31),LSUBS(30))                                      STA00260
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(3),IDADJ(28)),               STA00270
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),  STA00280
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),      STA00290
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),       STA00300
     4 (LINK(31),OPPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),    STA00310
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),   STA00320
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),     STA00330
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),      STA00340
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),       STA00350
     9 (LINK(31),GREF(8))                                                   STA00360
      COMMON/CLUS/ JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)              STA00370
      DIMENSION MXAR(3),LR(3),LV(3)                                         STA00380
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                              STA00390
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)            STA00400
C                                                                           STA00410
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          STA00420
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,       STA00430
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,              STA00440
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,       STA00450
     4    BETTER,MODE,CORLEN,SPCOR                                          STA00460
C                                                                           STA00470
      DIMENSION PACCEL(2),MACCEL(2),VACCEL(2)                               STA00480
C                                                                           STA00490
      COMMON /STRAR/WAIT,CONLV,SKHND,SKCHI,TRHND,TRCHI,URKHND,URKCHI,       STA00500
     1     PACCEL,MACCEL,VACCEL                                             STA00510
C                                                                           STA00520
      COMMON/CLUSTR/ IBEGIN,TOTWRD,CLSNAM,IPT,NUFLD, SYM(61) ,              STA00530
     1                LNCAT, PRNT(4) , KLBC , PRTME, PROUT, TOTPIX,         STA00540
     2  SCRAM1,BUFPIX,BUFTOT,NBUFSD,NDUMP,LBUFD                            STA00550
     3, MAXBF, AREA, NWDS, NWDRS, NPTS, LBUF, IQ1,NOCYCL                    STA00560
C                                                                           STA00570
      INTEGER TOTWRD,SYM,PRNT,PRTME,PROUT,TOTPIX,SCRAM1,BUFPIX,BUFTOT       STA00580
     1 ,CLSNAM                                                              STA00590
C                                                                           STA00600
      COMMON /RAND/NX,NXA,NXO                                               STA00610
CHANGE***     1                                                             STA00620
      REAL*8 ZFAC,ZQ,ZQS                                                    STA00630
      REAL SUM(1),SKEW(1),KURT(1),OSUM(1),OVAR(1)                           STA00640
C                                                                           STA00650
      DIMENSION   REL(30) , COVEC(30) ,  PV(MQ,BUFPIX)                      STA00660
C                                                                           STA00670
      DATA MONTE,AMONTE,PLIM/3,3.,.1/                                       STA00680
C  MONTE---CHECK LIK. RATIO 1/3 OF THE TIME, ELIM. WHEN PROP. LT /.1        STA00690
      INTEGER DISC                                                          STA00700
      XP(DIST)=EXP(-.5*DIST)                                                STA00710
C       HERE ABOVE GDET IS THE SQUARE ROOT OF THE COVARIANCE                STA00720
C            MATRIX, AND FFAC IS A POWER OF PI.                             STA00730
      KROT=KROTIN                                                           STA00740
      NPTSO = 0                                                             STA00750
      NIT = NOCYCL                                                          STA00760
      WRITE (3,9976) NOCYCL                                                 STA00770
9976  FORMAT (' NOCYCL=',I8)                                                STA00780
C                                                                           STA00790
```

```
      RMQ=.666666666667*AMQ                                              STA00800
        KL = LSUBS(KROT)                                                 STA00810
C                                                                        STA00820
       KL=0                                                              STA00830
C                  ***** READ AND PROCESS DATA  NIT  TIMES *****         STA00840
C                                                                        STA00850
      ITER = 0                                                           STA00860
C                                                                        STA00870
  1   ITER = ITER + 1                                                    STA00880
C                                                                        STA00890
C                      *** READ 1 BUFFER OF SCRAMBLED DATA ***           STA00900
C                                                                        STA00910
C  MQ = LENGTH OF ONE VECTOR                                             STA00920
      BUFSIZ = BUFPIX * MQ                                               STA00930
      NBUFS = TOTWRD/BUFSIZ                                              STA00940
      LBUF = MOD( TOTWRD , BUFSIZ )                                      STA00950
      IF( LBUF .GT. 0 )   NBUFS = NBUFS + 1                              STA00960
C  INADDR = 1ST WORD OF ORIG DATA ON FAST STORAGE                        STA00970
      INADDR = SCRAM1                                                    STA00980
      BUFCNT = 0                                                         STA00990
C  TOTWRD = NO. WORDS IN ORIGINAL DATA ON DRUM                           STA01000
C  MQ = LENGTH OF ONE VECTOR                                             STA01010
      TOTPIX = TOTWRD/MQ                                                 STA01020
C                                                                        STA01030
 50   BUFCNT = BUFCNT + 1                                                STA01040
C                                                                        STA01050
      NWORDS = BUFSIZ                                                    STA01060
      IF ( LBUF .GT. 0 .AND. BUFCNT .EQ. NBUFS )  NWORDS = LBUF          STA01070
C                                                                        STA01080
C                                                                        STA01090
      CALL BREAD (INADDR, BV, NWORDS, ISTAT)                             STA01100
 10   IF( ISTAT .GT. 0 )   GO TO 10                                      STA01110
C                                                                        STA01120
      INADDR = INADDR + NWORDS                                           STA01130
      NPIXEL = NWORDS/MQ                                                 STA01140
      NDO = NPIXEL                                                       STA01150
C                                                                        STA01160
C                                                                        STA01170
C       *** INSPECT EACH CLASS AND PROCESS EACH OF THE DATA POINTS  ***  STA01180
      DO 399 IDO=1,NDO                                                   STA01190
C  ** THIS CODE GETS RANDOM NUMBERS. **                                  STA01200
C  GET NEXT POINT IN SEQUENCE                                            STA01210
C                                                                        STA01220
C                                                                        STA01230
C     WE USE MONTE-CARLO TECHNIQUES FOR LOW PROBABILITY CLASSES(P<PLIM)  STA01240
      PCUM(KROT)=0.                                                      STA01250
C                                                                        STA01260
      IF( INDEX(KL) .NE. 0 .AND. KL .NE. 119)                            STA01270
     *    WRITE(6,1000)   IDO , INDEX(KL) , KL                           STA01280
 1000 FORMAT(    3X, '**** WARNING FROM STATIS ****  ON THE ', 2(, I5,   STA01290
     *  2X, 'TIME, INDEX(KL)=' , I5, 3X, ', KL=' , I5      )            STA01300
C                                                                        STA01310
      PRTRCM(KROT)=0.                                                    STA01320
      PPASS(KROT)=1.                                                     STA01330
      ISEC=0                                                             STA01340
      KL=LSUBS(KROT)                                                     STA01350
      KFATH=KROT                                                         STA01360
C   GO DOWN CLUSTER TREE                                                 STA01370
 130  IF(LSUBS(KL).EQ.0) GO TO 131                                       STA01380
C                                                                        STA01390
C  FIND BOTTOM NODE                                                      STA01400
      PCUM(KL)=0.                                                        STA01410
      PRTRCM(KL)=0.                                                      STA01420
      KFATH=KL                                                           STA01430
      KL=LSUBS(KL)                                                       STA01440
      GO TO 130                                                          STA01450
CHANGE***     4                                                          STA01460
C                                                                        STA01470
C  CALC UNWEIGHTED NORMALIZED VECTOR REL                                 STA01480
C    WUSE = CURRENT WEIGHT                                               STA01490
 131  IF(INDEX(KL).LE.0) GO TO 133                                       STA01500
C                                                                        STA01510
C         USE NEW WEIGHTS AND MEANS IF ADJUST HAS BEEN CALLED            STA01520
      CALL CORECT(REL,PV(1,IDO),W(KL),SUM(KL+1))                         STA01530
      WUSE=W(KL)                                                         STA01540
      PROP(KL)=CIN(KL)/(W(KFATH)-CTOT(KL))                               STA01550
      GO TO 134                                                          STA01560
CHANGE***     4.5                                                        STA01570
 133  CALL CORECT(REL,PV(1,IDO),OW(KL),OSUM(KL+1))                       STA01580
```

```
      WUSE=OW(KL)                                                       STA01590
  134 DISS(KL)=DOTSO(REL,VRIN(KL+1))*WUSE                               STA01600
      WDISS = DISS(KL) + DCON(KL)                                       STA01610
      IF(ABS(WDISS).LE. 100.) GO TO 531                                 STA01620
      PCOND(KL)=0.                                                      STA01630
      GO TO 138                                                         STA01640
  531 CONTINUE                                                          STA01650
      Y = -.5*WDISS                                                     STA01660
      XTEMP = EXP(Y)                                                    STA01670
      PCOND(KL)=XTEMP/VOLRT(KL)                                         STA01680
  138 IF(LSUBS(KL).NE.0) PCUM(KL)=PCUM(KL)/PRIRCM(KL)                   STA01690
      SPUSE=SPFAC(KL)/SPCOR                                             STA01700
      IF(SPUSE.GT.XUNFLO) GO TO 231                                     STA01710
      PST(KL)=PROP(KL)*PCOND(KL)                                        STA01720
C                                                                       STA01730
C  SET KL = LAST NODE IN STRING                                         STA01740
      GO TO 239                                                         STA01750
  231 IF(SPUSE.LT.XOVFLO) GO TO 232                                     STA01760
      PST(KL)=PROP(KL)*PCUM(KL)                                         STA01770
      GO TO 239                                                         STA01780
232   CONTINUE                                                          STA01790
      ZZ=EXP(SPUSE)                                                     STA01800
      PST(KL)=PROP(KL)*(PCOND(KL)+ZZ*PCUM(KL))/(1.+ZZ)                  STA01810
  239 PCUM(KFATH)=PCUM(KFATH)+PST(KL)                                   STA01820
      PRIRCM(KFATH)=PRIRCM(KFATH)+PROP(KL)                              STA01830
  139 KL=LINK(KL)                                                       STA01840
      IF(KL)130,149,130                                                 STA01850
C    GO UP TREE                                                         STA01860
  149 KL=KFATH                                                          STA01870
      KFATH=LSUPER(KL)                                                  STA01880
      IF(KL.NE.KROT) GO TO 131                                          STA01890
C  WE NOW HAVE THE RELEVANT CLASSES AND THEIR PROBABILITIES AVAILABLE.   STA01900
C                                                                       STA01910
C  NEXT WE MAKE THE APPROPRIATE INDIVIDUAL FIRST-ORDER STATISTICS ADJ.   STA01920
  150 CONTINUE                                                          STA01930
      PCUM(KROT)=PCUM(KROT)/PRIRCM(KROT)                                STA01940
      IF(PCUM(KROT).NE.0.) GO TO 151                                    STA01950
CHANGE***     5                                                         STA01960
      PRINT 555,IDO,W(KROT),(PV(KPR,IDO),KPR=1,MQ)                      STA01970
  555 FORMAT('0**SUSPECTED BAD DATA POINT--STATIS**IDO=',I5,'   ROOT=', STA01980
     1   F10.2/5X,'VECTOR=',(5F12.6))                                   STA01990
      GO TO 399                                                         STA02000
  151 CONTINUE                                                          STA02010
      KL=LSUBS(KROT)                                                    STA02020
      KFATH=KROT                                                        STA02030
      W(KROT)=W(KROT)+PPASS(KROT)                                       STA02040
      NPTSO=NPTSO+1                                                     STA02050
      KADJ=0                                                            STA02060
  153 CONTINUE                                                          STA02070
      IF(PST(KL).EQ.0.) GO TO 299                                       STA02080
      PPASSK=PPASS(KFATH)                                               STA02090
      P=PST(KL)/(PCUM(KFATH)*PRIRCM(KFATH))*PPASSK                      STA02100
C      KLO=KL                                                           STA02110
  132 IF(P.GE.PLIM)GO TO 140                                            STA02120
      IF(DISC(MONTE).NE.1)GO TO 299                                     STA02130
      PPASSK=PPASSK*AMONTE                                              STA02140
      P=P*AMONTE                                                        STA02150
      GO TO 132                                                         STA02160
CHANGE***     6                                                         STA02170
  140 IF(INDEX(KL).LE.0) GO TO 143                                      STA02180
      CALL CORECT(REL,PV(1,IDO),W(KL),SUM(KL+1))                        STA02190
      GO TO 144                                                         STA02200
CHANGE***     6.5                                                       STA02210
  143 CALL CORECT(REL,PV(1,IDO),OW(KL),OSUM(KL+1))                      STA02220
  144 WO=W(KL)                                                          STA02230
      IF(P.GT.1.001.OR.P.LT.0.)PRINT 672,INDEX(KL),KL,INDEX(KFATH),     STA02240
     1  KFATH,IDO,P,PST(KL),PCUM(KFATH),PRIRCM(KFATH),PPASSK,           STA02250
     2  PROP(KL)                                                        STA02260
  672 FORMAT(' PROB ERROR(STATIS):',2(I3,I7),I6,' P=',E9.4,             STA02270
     1    20X,'FROM',7E9.4)                                            STA02280
      IF (P.GT.1.1) P=.01                                               STA02290
      W(KL)=W(KL)+P                                                     STA02300
      ALOW=P/W(KL)                                                      STA02310
      ALPHA=WO*ALOW                                                     STA02320
C   HERE WE ADJUST SPFAC AND PORAT.                                     STA02330
      IF(LSUBS(KL).EQ.0) GO TO 611                                      STA02340
      ZQ=(PCUM(KL)-PCOND(KL))/(PCUM(KL)+PCOND(KL)+1.E-37)               STA02350
      ZQS=ZQ*ZQ                                                         STA02360
      PORAT(KL)=PORAT(KL)+P*ZQS                                         STA02370
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```
      SPFAC(KL)=SPFAC(KL)+P*ZQ*(2.+ZQS/(1.5-.9*ZQS))                    STA02380
  611 CONTINUE                                                          STA02390
      IF(INDEX(KL).LT.0) GO TO 189                                      STA02400
      VOLIN(KL)=VOLIN(KL)*(1.+ALOW*DISS(KL))                            STA02410
      VOLRT(KL)=.5*(VOLRT(KL)+VOLIN(KL)/VOLRT(KL))                      STA02420
C       HERE WE KEEP VOLRT NEAR SQRT(VOLIN) BY NEWTON'S METHOD.         STA02430
      ZFAC=.5/(1./ALOW+.5)                                              STA02440
      DCON(KL)=DCON(KL)-BMQ*ZFAC*(3.+ZFAC*ZFAC)                         STA02450
C     THE ABOVE APPROXIMATION TO THE LOG IS CORRECTED FOR IN ADJUST     STA02460
C   PROPORTION CALCULATION.                                             STA02470
  190 PROPL=PROP(KL)/PRIRCM(KFATH)                                      STA02480
      IF(PROPL.GT..99999) GO TO 192                                     STA02490
      IF(P.GE.PPASSK*PROPL) GO TO 190                                   STA02500
      CTOT(KL)=CTOT(KL)+P/PROPL                                         STA02510
      GO TO 191                                                         STA02520
  192 CIN(KL)=CIN(KL)+1.                                                STA02530
      GO TO 191                                                         STA02540
  190 CTOT(KL)=CTOT(KL)+(PPASSK-P)/(1.-PROPL)                           STA02550
      CIN(KL)=CIN(KL)+(P-PPASSK*PROPL)/(1.-PROPL)                       STA02560
  191 CONTINUE                                                          STA02570
CHANGE***     7                                                         STA02580
      CALL VPV(SUM(KL+1),P,PV(1,IDO))                                   STA02590
      IF(INDEX(KL).LE.0) GO TO 163                                      STA02600
      CALL VMTV(COVEC,VRIN(KL+1),REL)                                   STA02610
      COFI = -ALPHA/(1.+ ALOW*DISS(KL))                                 STA02620
      CALL MPVS(VRIN(KL+1),COFI,COVEC)                                  STA02630
      GO TO 164                                                         STA02640
  163 CALL MPVS(OVAR(KL+1),ALPHA,REL)                                   STA02650
  164 CONTINUE                                                          STA02660
C  DISS(KL) CONTAINS THE GAUSSIAN DISTANCE OF THE POINT FROM THE CLUSTERSTA02670
C  VRIN IS THE INVERSE COVARIANCE MATRIX   (*****) OVER W(KL)     (**** NSTA02680
C                    (THIS INTRODUCES SEVERAL SCALE FACTORS )           STA02690
C  COVEC IS THE CONTRAVARIANT FORM OF THE RELATIVE DISTANCE REL.         STA02700
C                    COVEC=VRIN*REL                                     STA02710
C   WE NOW HAVE ALL THE LINEAR AND QUADRATIC STATISTICS,AND PROCEED      STA02720
C     TO CALCULATE THE APPROXIMATE 3RD AND 4TH MOMENTS FOR TESTING.      STA02730
C    THESE MOMENTS ARE NOT CALCULATED EXACTLY: THE SQUARED               STA02740
C        DISTANCE OF A POINT FROM THE MEAN ACTUALLY SHOULD               STA02750
C        USE ALL THE DATA IN CALCULATING THE MEAN AND                    STA02760
C        COVARIANCE. WHEREAS WE SUBSTITUTE THE CURRENT                   STA02770
C        VALUES INSTEAD.  THUS THE VALUES CALCULATED DEPEND              STA02780
C        ON THE ORDER THE POINTS ARE READ IN.  THIS IS NOT               STA02790
C          CRITICAL.                                                     STA02800
C                                                                        STA02810
      WDISS=DISS(KL)*P                                                  STA02820
C     IF (INDEX(KL).LT.0) WRITE (3,9980) WDISS,INDEX(KL)                STA02830
9980   FORMAT ('WDISS,KL=',F14.4,I6)                                    STA02840
      CALL VPV(SKEW(KL+1),WDISS,REL)                                    STA02850
      CALL MPVS(KURT(KL+1),WDISS,REL)                                   STA02860
298   CONTINUE                                                          STA02870
C                                                                       STA02880
C   WE NOW ADJUST THE CLASS FOR LARGE-SCALE STATISTICAL EFFECTS.        STA02890
C     ON AN OCCASIONAL BASIS.    THIS INCLUDES NOMINAL NEWTONS          STA02900
C     METHOD CORRECTIONS AND TESTING FOR THE POSSIBILITY              STA02910
C     OF TWO CLUSTERS (USING THE SKEW AND KURT STATISTICS).           STA02920
      IF(W(KL).GT.(WADJ(KL)+.0005).OR.NPTSO.GE.IDADJ(KL)) KADJ=KL       STA02930
C     IF (KL.EQ.145.AND.W(KL) .LT. 200.5 .AND. W(KL) .GT. 199.5)KADJ=KL STA02940
C     IF (W(KL) .GT.WADJ(KL)) WRITE (6,9988) INDEX(KL),W(KL),WADJ(KL)   STA02950
9988  FORMAT (' STATIS KL, W(KL),WADJ(KL)',I8,2E18.10)                 STA02960
C     IF (NPTSO.GE.IDADJ(KL)) WRITE (6,9987) INDEX(KL), NPTSO,IDADJ(KL)STA02970
9987  FORMAT (' STATIS NPTSO,IDADJ(KL)',3I8)                           STA02980
  299 PPASS(KL)=P                                                       STA02990
      IF(LSUBS(KL).EQ.0.OR.PCUM(KL).EQ.0.) GO TO 304                    STA03000
      KFATH=KL                                                          STA03010
      KL=LSUBS(KL)                                                      STA03020
      GO TO 153                                                         STA03030
  304 KL=LINK(KL)                                                       STA03040
  303 IF(KL) 153,305,153                                                STA03050
  305 KL=KFATH                                                          STA03060
      KFATH=LSUPER(KL)                                                  STA03070
      IF(KL.NE.KROT) GO TO 304                                          STA03080
      IF(KADJ.NE.0) CALL ADJUST(KADJ,SUM,SKEW,KURT,OSUM,OVAR)           STA03090
      IF(MOD(NPTSO,TOTPIX).NE.0.OR.MODE.EQ.0) GO TO 309                 STA03100
      NXA=NXO                                                           STA03110
      CALL PRTREE (KROT)                                                STA03120
      CALL CLDUMP(KROT)                                                 STA03130
  309 CONTINUE                                                          STA03140
  647 FORMAT('0LOOP IN STATIS:IDO,W(KROT),KL,SECTION',I5,E11.5,2I5      STA03150
     1    /(1X14I5))                                                   STA03160
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FILE: STATIS FORTRAN A

```
  340 CONTINUE                                                                  STA03170
      IF( BUFCNT .LT. NBUFS )  GO TO 50                                         STA03180
      WRITE  (6,2000) ITER                                                      STA03190
      WRITE (3,2000) ITER                                                       STA03200
2000  FORMAT(' NO OF ITERATIONS THROUGH ALL THE DATA = ',I4)                    STA03210
      IHOLD = PROUT                                                             STA03220
      PROUT = 2                                                                 STA03230
      CALL PRTREE (KROT)                                                        STA03240
      CALL CLDUMP(KROT)                                                         STA03250
      NUFILE = 0                                                                STA03260
      IF (ITER .EQ. NIT) NUFILE = 1                                             STA03270
      CALL CLUSMP (NUFILE)                                                      STA03280
      PROUT = IHOLD                                                             STA03290
      IF ( ITER .LT. NIT)  GO TO 1                                              STA03300
      RETURN                                                                    STA03310
      END                                                                       STA03320
```

FILE: SUBLIM FORTRAN A

```
      SUBROUTINE SUBLIM(KLHED)                                                  SUB00010
C  SUBLIM ELIMINATES THE SUBCLUSTERS OF THE NODE KLHED.                         SUB00020
      DIMENSION NTB(32)                                                         SUB00030
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),             SUB00040
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),                 SUB00050
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),            SUB00060
     3 PORAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),                  SUB00070
     4 OPRIOR(9),ODEN(8)                                                        SUB00080
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                           SUB00090
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))                       SUB00100
      EQUIVALENCE (LINK(31),LSUBS(30))                                          SUB00110
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),                  SUB00120
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),      SUB00130
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),          SUB00140
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),           SUB00150
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)),         SUB00160
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PORAT(13)),       SUB00170
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)),         SUB00180
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),          SUB00190
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),           SUB00200
     9 (LINK(31),GREF(8)),  (LINK(31),NTB(31))                                  SUB00210
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)                 SUB00220
      DIMENSION MXAR(31),LR(3),LV(3)                                            SUB00230
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                                  SUB00240
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)                SUB00250
C                                                                               SUB00260
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,              SUB00270
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,           SUB00280
     2    INDXVL,WFAC,NPTSO,PORATH,SPMVTH,DWFAC,GRACTM,AMOFAC,                  SUB00290
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,HIAS,PJOIN,VRJOIN,WSIM,WDELSM,           SUB00300
     4    BETTER,MODF,CORLEN,SPCOR                                              SUB00310
C                                                                               SUB00320
      COMMON /STPAR/WAIT,CONLV,SKRND,SKCHI,TRRND,TRCHI,URKRND,URKCHI,           SUB00330
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                        SUB00340
      PRINT 713,INDEX(KLHED),SPFAC(KLHED),SBLTH                                 SUB00350
713   FORMAT (/,' ***SUBLIM ',I3,'   SPLITTING',F12.5,' *',F12.5)               SUB00360
      WRITE (3,713) INDEX(KLHED),SPFAC(KLHED),SBLTH                             SUB00370
      KL=KLHED                                                                  SUB00380
      K=LSUBS(KL)                                                               SUB00390
   11 KNX=LINK(K)                                                               SUB00400
      PRINT 714 ,INDEX(K)                                                       SUB00410
      CALL TREREE(K,NINCLS)                                                     SUB00420
  714 FORMAT(I15)                                                               SUB00430
      K=KNX                                                                     SUB00440
      IF(K.NE.0) GO TO 11                                                       SUB00450
      LSUBS(KL)=0                                                               SUB00460
      SPFAC(KL)=-9999.                                                          SUB00470
      PORAT(KL)=0.                                                              SUB00480
      CALL PRTREE (KLHED)                                                       SUB00490
      RETURN                                                                    SUB00500
      END                                                                       SUB00510
```

FILE: SUPSUM FORTRAN A

```
      FUNCTION SUPSUM(A,I,N)                                              SUP00010
      DIMENSION A(N)                                                      SUP00020
      IF (I.LE.2) GO TO 110                                               SUP00030
      CALL ORD1(A,1,I,N)                                                  SUP00040
      IM2=I-2                                                             SUP00050
      DO 100 J=1,IM2                                                      SUP00060
      JP1=J+1                                                             SUP00070
      A(JP1)=A(J) + A(JP1)                                                SUP00080
      JJ=J+2                                                              SUP00090
      IF (ABS(A(JP1)).LE.ABS(A(JJ))) GO TO 100                            SUP00100
      CALL ORD1(A,JP1,I,N)                                                SUP00110
  100 CONTINUE                                                            SUP00120
      II=I-1                                                              SUP00130
  110 SUPSUM=A(I) + A(II)                                                 SUP00140
      RETURN                                                              SUP00150
      END                                                                 SUP00160
```

```
FILE: TEST     FORTRAN  A

      SUBROUTINE TEST (PIX,  NWORDS,LTEST,LSUM)                          TES00010
      COMMON /TESTCM/ ITEST(100),NTEST(100),MTEST(100),ISUM,MSUM,NSUM    TES00020
      REAL PIX                                                           TES00030
      DIMENSION PIX  (1), LTEST(1)                                       TES00040
      DO 10045 I=1,NWORDS                                                TES00050
      IVALUE = PIX  (I)                                                  TES00060
      IF (IVALUE .LT. 1  .OR.  IVALUE .GT. 99) GO TO 10040               TES00070
      LTEST(IVALUE) = LTEST(IVALUE) + 1                                  TES00080
      GO TO 10045                                                        TES00090
10040 LTEST ( 100) = LTEST( 100) + 1                                     TES00100
C                                                                        TES00110
10045 LSUM = LSUM + IVALUE                                               TES00120
      RETURN                                                             TES00130
      END                                                                TES00140
```

```
FILE: TR        FORTRAN  A

      FUNCTION TR(AM,AMET)                                                  TR 00010
C       CALCULATES THE TRACE OF THE MATRIX AM RELATIVE TO THE METRIC AMETR 00020
C                                                                           TR 00030
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,          TR 00040
     1   AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,        TR 00050
     2   INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,               TR 00060
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,        TR 00070
     4   BETTER,MODE,CORLEN,SPCOR                                           TR 00080
      INTEGER MXAR(31),LR(3),LV(3)                                          TR 00090
C                                                                           TR 00100
      REAL AM(475),AMET(475)                                                TR 00110
      REAL*8  DPTR                                                          TR 00120
      DPTR=  AM(1)*AMET(1)*.5                                               TR 00130
      DO 10 I=2,MM                                                          TR 00140
   10 DPTR=DPTR+AM(I)*AMET(I)                                               TR 00150
      DPTR=DPTR+DPTR                                                        TR 00160
C       WE MUST DOUBLE THE OFFDIAGONAL TERMS (SEE COMMENT IN FUNCTION DTR 00170
C       NOW SUBDPTRACT DIAGONALS.                                           TR 00180
      DO 15 I=2,MQ                                                          TR 00190
      MXA=MXAR(I)                                                           TR 00200
   15 DPTR=DPTR-AM(MXA+I)*AMET(MXA+I)                                       TR 00210
      TR = DPTR                                                             TR 00220
      RETURN                                                                TR 00230
      END                                                                   TR 00240
```

FILE: TRFREE FORTRAN A

```
      SUBROUTINE TRFREE(KLHED,LEN)                                      TRF00010
C  THIS ROUTINE FREES THE TREE HEADED BY KLHED.                          TRF00020
C   THE USER ROUTINE MUST INSURE THAT PINTERS TO KLHED,ETC., ARE        TRF00030
C     PROPERLY ADJUSTED.                                                TRF00040
      DIMENSION NTB(32)                                                 TRF00050
      DIMENSION INDEX(27),LSUBS(30),LSUPER(29),IDADJ(28),NSYMB(12),     TRF00060
     1 PCUM(26),PRIRCM(25),CIN(24),CTOT(23),PROP(22),SPFAC(21),         TRF00070
     2 WADJ(20),W(19),OPROP(18),OW(17),VOLIN(16),VOLRT(15),DCON(14),    TRF00080
     3 PQRAT(13),DISS(12),PPASS(12),PST(11),OCIN(10),PCOND(7),          TRF00090
     4 OPRIOR(9),ODEN(8)                                                TRF00100
      DIMENSION VRIN(475),GEN(999),GREF(999),ALINK(1)                   TRF00110
      EQUIVALENCE (LINK(1),ALINK(1)),(LINK(31),INDEX(27))               TRF00120
      EQUIVALENCE (LINK(3),LSUBS(30))                                   TRF00130
      EQUIVALENCE(LINK(31),LSUPER(29)),  (LINK(31),IDADJ(28)),          TRF00140
     1 (LINK(31),NSYMB(12)),  (LINK(31),PCUM(26)),  (LINK(31),PRIRCM(25)),TRF00150
     2 (LINK(31),CIN(24)),  (LINK(31),CTOT(23)),  (LINK(31),PROP(22)),  TRF00160
     3 (LINK(31),SPFAC(21)),  (LINK(31),WADJ(20)),  (LINK(31),W(19)),   TRF00170
     4 (LINK(31),OPROP(18)),  (LINK(31),OW(17)),  (LINK(31),VOLIN(16)), TRF00180
     5 (LINK(31),VOLRT(15)),  (LINK(31),DCON(14)),  (LINK(31),PQRAT(13)),TRF00190
     6 (LINK(31),DISS(12)),  (LINK(31),PPASS(12)),  (LINK(31),PST(11)), TRF00200
     7 (LINK(31),OCIN(10)),  (LINK(31),PCOND(7)),  (LINK(31),VRIN(7)),  TRF00210
     8 (LINK(31),GEN(7)),  (LINK(31),OPRIOR(9)),  (LINK(31),ODEN(8)),   TRF00220
     9 (LINK(31),GREF(8)),  (LINK(31),NTB(3)))                          TRF00230
      COMMON/CLUS/  JUNK(12),NARL,NTOP,NTBSZM,NWANT,LINK(14000)         TRF00240
      DIMENSION MXAR(3),LR(3),LV(3)                                     TRF00250
      EQUIVALENCE (LR(1),LVRIN),(LR(2),LKURT),                          TRF00260
     1    (LR(3),LOVAR),(LV(1),LSUM),(LV(2),LSKEW),(LV(3),LOSUM)        TRF00270
C                                                                       TRF00280
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      TRF00290
     1    AMO,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,   TRF00300
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,          TRF00310
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    TRF00320
     4    BETTER,MODE,CORLEN,SPCOR                                      TRF00330
C                                                                       TRF00340
      COMMON /STPAR/WAIT,CONLV,SKBND,SKCHI,TRBND,TRCHI,URKBND,URKCHI,   TRF00350
     1     PACCEL(2),MACCEL(2),VACCEL(2)                                TRF00360
      IF(KLHED.EQ.0) RETURN                                             TRF00370
      KL=KLHED                                                          TRF00380
    9 KLO=KL                                                            TRF00390
      KL=LSUBS(KL)                                                      TRF00400
      IF(KL.NE.0) GO TO 9                                               TRF00410
      KL=KLO                                                            TRF00420
   11 KLF=LSUPER(KL)                                                    TRF00430
   10 KLK=LINK(KL)                                                      TRF00440
      CALL FREE(KL,LEN)                                                 TRF00450
      IF(KL.EQ.KLHED) GO TO 99                                          TRF00460
      KL=KLK                                                            TRF00470
      IF(KL)9,13,9                                                      TRF00480
   13 KL=KLF                                                            TRF00490
      GO TO 11                                                          TRF00500
   99 KLHED=0                                                           TRF00510
      RETURN                                                            TRF00520
      END                                                               TRF00530
```

FILE: TRIDMX FORTRAN A

```
      SUBROUTINE TRIDMX (N,NM,A,D,B)                                                                  TRI00010
      REAL*8 YTEMP, A(NM,NM), D(NM), B(NM)                                                            TRI00020
      DOUBLE PRECISION SUM,XTEMP                                                                      TRI00030
      DO 10 I = 1,N                                                                                   TRI00040
10     D(I) = A(I,I)                                                                                  TRI00050
      IF (N-2) 60,55,15                                                                               TRI00060
15     DO 46 K = 3,N                                                                                  TRI00070
      KK = K-1                                                                                        TRI00080
      SUM = A(K-1,K-2)*A(K-1,K-2)                                                                     TRI00090
      DO 20 J = K,N                                                                                   TRI00100
20     SUM = SUM + A(J,K-2) * A(J,K-2)                                                                TRI00110
      XTEMP = DSQRT(SUM)                                                                              TRI00120
      YTEMP = XTEMP                                                                                   TRI00130
      B(K-2) = DSIGN(YTEMP, -A(K-1,K-2))                                                              TRI00140
      IF (B(K-2)) 24,46,24                                                                            TRI00150
24     A(K-1,K-2) = DSQRT(0.500 * DABS(A(K-1,K-2) / B(K-2)) + 0.5D0)                                  TRI00160
      DENOM = -2. * A(K-1,K-2) *B(K-2)                                                                TRI00170
      DO 30 I = K,N                                                                                   TRI00180
30    A(I,K-2) = A(I,K-2) /DENOM                                                                      TRI00190
      SCAL = 0.                                                                                       TRI00200
37    DO 36 J = KK,N                                                                                  TRI00210
      B(J) = 0.                                                                                       TRI00220
      IF (J.EQ.KK) GO TO 350                                                                          TRI00230
      DO 349 L = KK,JJ                                                                                TRI00240
349   B(J) = B(J) + A(J,L) * A(L,K-2)                                                                 TRI00250
350   DO 35 L = J,N                                                                                   TRI00260
35    B(J) = B(J) + A(L,J) * A(L,K-2)                                                                 TRI00270
      JJ = J                                                                                          TRI00280
36    SCAL = SCAL + B(J) * A(J,K-2)                                                                   TRI00290
      DO 40 J = KK,N                                                                                  TRI00300
40    B(J) = B(J) - SCAL*A(J,K-2)                                                                     TRI00310
      DO 45 J = KK,N                                                                                  TRI00320
      DO 45 I = J,N                                                                                   TRI00330
45    A(I,J) = A(I,J) - 2.* (A(I,K-2) * B(J) + A(J,K-2) * B(I))                                       TRI00340
46    CONTINUE                                                                                        TRI00350
      DO 50 I = 1,N                                                                                   TRI00360
      T = A(I,I)                                                                                      TRI00370
      A(I,I) = D(I)                                                                                   TRI00380
      J = N-I                                                                                         TRI00390
      IF (N .EQ. I) GO TO 50                                                                          TRI00400
      B(J+1) = B(J)                                                                                   TRI00410
50    D(I) = T                                                                                        TRI00420
55    B(N) = A(N,N-1)                                                                                 TRI00430
60    B(1) = 0.0                                                                                      TRI00440
      RETURN                                                                                          TRI00450
      END                                                                                             TRI00460
```

FILE: TRIMTX FORTRAN A

```
      SUBROUTINE TRIMTX(TRI,SQ)                                          TRI00010
C    THIS ROUTINE TAKES THE LOWER TRIANGLE OF SQ(DIM MQ*MQ) AND PUTS     TRI00020
C       IT INTO SYMMETRIC MATRIX FORM IN TRI.                           TRI00030
C                                                                       TRI00040
      DIMENSION MXAR(31),LR(3),LV(3)                                    TRI00050
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,      TRI00060
     1   AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,    TRI00070
     2   INDXVL,WFAC,NPTSQ,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,           TRI00080
     3    AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    TRI00090
     4   BETTER,MODE,CORLEN,SPCOR                                       TRI00100
C                                                                       TRI00110
      DIMENSION TRI(475),SQ(900)                                        TRI00120
      DO 10 I=1,MQ                                                      TRI00130
      MX=MXAR(I)                                                        TRI00140
      IJ=I                                                              TRI00150
      DO 10 J=1,I                                                       TRI00160
      TRI(MX+J)=SQ(IJ)                                                  TRI00170
   10 IJ=IJ+MQ                                                          TRI00180
      RETURN                                                            TRI00190
      END                                                               TRI00200
```

FILE: UNIF FORTRAN A

```
      FUNCTION UNIF(W)                                                  UNI00010
      COMMON /RAND/NX,IDUM,IDUM1                                        UNI00020
      NX=NRAND(NX)                                                      UNI00030
         XNX = NX                                                       UNI00040
      UNIF = XNX * W / 214748369.                                       UNI00050
      RETURN                                                            UNI00060
      END                                                               UNI00070
```

FILE: VMTV FORTRAN A

```
      SUBROUTINE VMTV(VA,AMET,VB)                                          VMT00010
C       SETS VA=AMET*VB                                                    VMT00020
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,EPS,DELT,         VMT00030
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SALTH,      VMT00040
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,             VMT00050
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,      VMT00060
     4    BETTER,MODE,CORLEN,SPCOR                                         VMT00070
      REAL VA(30),VB(30),AMET(475)                                         VMT00080
       REAL*8 SUM                                                          VMT00090
      LOCA=0                                                               VMT00100
      DO 20 I=1,MQ                                                         VMT00110
      SUM=0.                                                               VMT00120
      DO 10 J=1,I                                                          VMT00130
      LOCA=LOCA+1                                                          VMT00140
   10 SUM=SUM+ AMET(LOCA)*VB(J)                                            VMT00150
      IF(I.EQ.MQ) GO TO 20                                                 VMT00160
      JS=I+1                                                               VMT00170
      LOCH=LOCA+I                                                          VMT00180
      DO 11 J=JS,MQ                                                        VMT00190
      SUM=SUM+AMET(LOCH)*VB(J)                                             VMT00200
   11 LOCH=LOCH+J                                                          VMT00210
   20 VA(I)=SUM                                                            VMT00220
      RETURN                                                               VMT00230
      END                                                                  VMT00240
```

```
FILE: VPV       FORTRAN  A

      SUBROUTINE VPV(VA,FAC,VB)                                          VPV00010
C       SETS VA=VA+FAC*VB                                                VPV00020
C                                                                        VPV00030
      COMMON /MISC/ MQ,MM,LR,LV,NINCLS,MXAR,WTINIT,KROOT,FPS,DELT,       VPV00040
     1    AMQ,ODCON,XOVFLO,XUNFLO,WADJIN,ELIMTH,SEPTH,VFAC,AMM,SBLTH,    VPV00050
     2    INDXVL,WFAC,NPTSO,PQRATH,SPMVTH,DWFAC,GRACTM,AMOFAC,           VPV00060
     3     AMOMIN,AMOMAX,AMORAT,VOLLIM,BIAS,PJOIN,VRJOIN,WSIM,WDELSM,    VPV00070
     4    BETTER,MODE,CORLEN,SPCOR                                       VPV00080
C                                                                        VPV00090
      REAL VA(30),VB(30)                                                 VPV00100
      DO 10 I=1,MQ                                                       VPV00110
   10 VA(I)=VA(I)+VB(I)*FAC                                              VPV00120
      RETURN                                                             VPV00130
      END                                                                VPV00140
```

APPENDIX C

SAMPLE OUTPUT

INPUT SUMMARY

```
PRIN          1,1,1,20
CHAN          1,2,3,4,5,6,7,8
ITER          10
MAP           1,2,3,4,5,6,7,8,9,10
LINE          1-5,26-30
*END
```

INPUT IMAGE DATA TAPE INFORMATION

```
FORMAT                    UNIVERSAL
NO. OF CHANNELS           16
NO. OF PIXELS/LINE        196
FIRST SCAN LINE NO.       1
FIRST PIXEL REFERENCE PT  1
```

```
1                    5          1        1      (  1,   1)  ( 196,   1)  ( 196,  50)  (  1,  50)  (  1,   1)
```


CONFIDENCE LEVELS 8 CHANNELS 3.0000 CHISQUARES0.63360E 050.30619E 040.12582E 05

```
 ROOT  119   FIRST  145
SCGEESMACGEW(KL)*W*ADJ(KL) 0.0    1  0020000099186003  0.20000000000E 03


  ADJUST    1  WEIGHT      200.0  WAS         0.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.36097E 03 0.73510E 09
 STATISTICS: TRACE        -9.9  SKEW       616.0  KURT       2692.6
        TESTS (SPLIT=0): -.12662E 06       -.55079E 04        -.22472E 05
WADJ(KL)*W(KL)*WSIM      420.0      200.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      1.000000       1
IOADJ*NPTSO*INDEX*W*WADJ  9800     200      1       200.00       420.00
STATIS KL* W(KL)*WADJ(KL)          1  0.4209997559E 03  0.*1499975594E 03


  ADJUST    1  WEIGHT      421.0  WAS       200.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.78210E-01 0.57529E 02
 STATISTICS: TRACE      254.9  SKEW       882.2  KURT      22174.6
        TESTS (SPLIT=0): -.55735E 05       -.49507E 04        -.17941E 04
WADJ(KL)*W(KL)*WSIM      462.0      221.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      1.000000       1
IOADJ*NPTSO*INDEX*W*WADJ 10000     421      1       221.00       462.00
STATIS KL* W(KL)*WADJ(KL)          1  0.4619997559E 03  0.4619995117E 03
STATIS KL* W(KL)*WADJ(KL)          1  0.4629997559E 03  0.4619995117E 03


  ADJUST    1  WEIGHT      463.0  WAS       221.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.10269E 00 0.37389E 02
 STATISTICS: TRACE      231.1  SKEW      4294.8  KURT      40508.6
        TESTS (SPLIT=0): -.62300E 05       -.12976E 04        0.17528E 05
WADJ(KL)*W(KL)*WSIM      504.0      242.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      1.000000       1
00-00
01-09
02-45 03-55
***HAVE SPLIT  1 WEIGHT   242.0 SUBS  2  3 ITER  20
KL*INDEX*LSUPER   145     1   119
```

C-2

```
CLUSTER   0 INDEX   1  PROPORTION     1.00000 * PARENT  663.001
 SPLIT-0.1700E 02
WEIGHT      242.000  WAS      221.000     ADJUST      504.000  ID 10221
PROPORTION: PROP 1.00000  CIN  242.00  CTOT  421.00
OLD PROP 1.00000  CIN 242.00  ODEN 242.00  DIFFER   0.0
VOLUME0.31E 22   ROOT0.44E-07   DCON    -1.15

 LOCATION  145  LINK  0    0  SUBS  2 1583  SUPER  0  119  SYMBOL      1
INDEX =      1    SYMBOL =      1

NET PROB******** DIRECT******* CUMS   0.0  *   1.00
                               CUMS.0          * .10000E 01


 MEAN          26.12  27.92  28.33  27.21  21.39  22.32  24.73  24.03

 COVARIANCE    3.21   4.44   3.10   2.62   1.21   2.10   1.03   0.77
       2       4.44   9.41   5.17   4.23   2.45   5.77   2.28   0.60
       3       3.10   5.17   6.64   6.03   0.10   0.17   3.31   3.83
       4       2.62   4.23   6.03   7.70  -1.31  -1.85   3.04   4.76
       5       1.21   2.45   0.10  -1.31   2.86   4.56   0.05  -1.74
       6       2.10   5.77   0.17  -1.85   4.56   9.87  -0.52  -3.95
       7       1.03   2.28   3.31   3.04   0.05  -0.52   3.72   3.91
       8       0.77   0.60   3.83   4.76  -1.74  -3.95   3.91   7.03

 SKEW(*W)     331.6  566.0  111.9  824.1 -403.9-1010.2  670.4 1188.2


CLUSTER   1 INDEX   2  PROPORTION     0.45239 * PARENT  242.000
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 10463
PROPORTION: PROP 0.45239  CIN   36.19  CTOT  162.00
OLD PROP 0.452386  CIN  36.19  ODEN  80.00  DIFFER   0.0
VOLUME0.97E-18   ROOT0.99E-09   DCON     4.74

 LOCATION 1583  LINK  3 1741  SUBS  0    0  SUPER  1  145  SYMBOL      2
INDEX =      2    SYMBOL =      2

NET PROB   0.00  DIRECT   0.00  CUMS   0.00 *   0.00
                              CUMS.10810E-82 * .10810E-82


 MEAN          26.48  29.20  28.58  27.67  21.63  23.12  25.87  24.57

 COVARIANCE    2.74   2.46   1.86   2.25   0.33  -0.38   0.96   1.07
       2       2.46   4.27   2.29   3.08   0.48   0.49   0.82  -0.37
       3       1.86   2.29   4.77   4.91  -0.40  -1.56   2.56   2.93
       4       2.25   3.08   4.91   7.75  -1.89  -3.27   3.25   5.66
       5       0.33   0.48  -0.40  -1.89   2.81   3.80  -1.04  -3.42
       6      -0.38   0.49  -1.56  -3.27   3.80   7.73  -3.96  -8.21
       7       0.96   0.82   2.56   3.25  -1.04  -3.96   4.40   6.82
       8       1.07  -0.37   2.93   5.66  -3.42  -8.21   6.82  13.53

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX   3  PROPORTION     0.54761 * PARENT  242.000
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 10463
PROPORTION: PROP 0.54761  CIN   43.81  CTOT  162.00
OLD PROP 0.547614  CIN  43.81  ODEN  80.00  DIFFER   0.0
VOLUME0.21E-19   ROOT0.14E-09   DCON     4.74

 LOCATION 1741  LINK  0    0  SUBS  0    0  SUPER  1  145  SYMBOL      3
INDEX =      3    SYMBOL =      3
```

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[illegible] =      3     [illegible] =      3
WET FROM   0.00  DIRECT   0.00  CUMS   0.00 *   0.00
                          CUMS.15957E-82 * .1492RE-82


 MEAN          25.43  26.86  24.13  26.83  21.20  21.65  23.75  23.58

 COVARIANCE    3.54   5.35   3.94   2.72   1.67   3.48   1.30   1.04
        2      5.35  11.83   6.80   4.11   3.65   4.27   3.49   1.57
        3      3.94   6.80   8.39   7.04  -0.08   0.64   4.01   4.77
        4      2.72   4.11   7.04   6.91  -1.48  -2.16   3.25   4.73
        5      1.67   3.65  -0.08  -1.48   3.04   5.89   0.17  -1.63
        6      3.48   9.27   0.64  -2.16   5.89  13.28   1.10  -3.09
        7      1.30   3.49   4.01   3.25   0.17   1.10   3.73   2.74
        8      1.04   1.57   4.77   4.73  -1.63  -3.09   2.74   4.21

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ.NPTSO.INDEX.W.WADJ 10221   663     1      242.00      504.00
STATIS KL. W(KL).WADJ(KL)        1  0.5049997559E 03  0.5039997559E 03


  ADJUST   1  WEIGHT      505.0  WAS       242.0   SPFAC-0.12971E 03   CHANGE0.0          0.0          0.11791E 00 0.11121E 02
 STATISTICS: TRACE      -93.6  SKEW      1702.0  KURT      4636.3
        TESTS (SPLIT=0): -.10278E 06      -.36884E 04       -.17514E 05
WADJ(KL).W(KL).WSIM     546.0     263.0     400.0
PROPORTION RELATIVE TO TOP LEVEL =      1.000000       1
IDADJ.NPTSO.INDEX.W.WADJ 10463   926     1      263.00      546.00
STATIS KL. W(KL).WADJ(KL)        3  0.2805700684E 03  0.2800000000E 03


  ADJUST   3  WEIGHT      280.6  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.32375E 00 0.15055E 03
 STATISTICS: TRACE      461.9  SKEW      4102.5  KURT     23243.9
        TESTS (SPLIT=0): 0.86775E 05      -.20127E 04       -.18846E 04
WADJ(KL).W(KL).WSIM     421.1     200.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.630541       3
00-00
01-00
02-37 03-63
      04-31 05-32
***HAVE SPLIT   3 WEIGHT   200.6 SUBS  4  5 ITER  18
KL.INDEX.LSUPER  1741     3   145
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NUMB OF OBSERVED CLUSTERS FROM  3   1741
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CLUSTER    0 INDEX    3  PROPORTION     0.61429 * PARENT  315.000
 SPLIT-0.1700E 02
WEIGHT      200.570  WAS       80.000     ADJUST      421.140  ID 10463
PROPORTION: PROP 0.63054  CIN   156.88  CTOT    59.62
OLD PROP 0.630540  CIN 156.88  ODEN 255.38  DIFFER    0.0
VOLUME0.82E 20   ROOT0.99E-07   DCON    -5.24

 LOCATION 1741  LINK  0     0  SUBS  4 2155  SUPER  1  145  SYMBOL      1
INDEX =      3    SYMBOL =      1

NET PROB******* DIRECT******* CUMS   0.00 *    1.00
                              CUMS.15957E-82 * .10000E 01


 MEAN           26.15  27.35  28.48  26.97  21.43  21.68  24.40  23.84

 COVARIANCE     3.35   5.02   3.51   3.02   1.44   3.10   1.27   1.17
        2       5.02  11.10   6.77   5.60   2.90   7.57   3.60   2.63
        3       3.51   6.77   7.39   6.59   0.66   2.14   4.00   4.56
        4       3.02   5.60   6.59   7.33  -0.53   0.17   3.36   4.59
        5       1.44   2.90   0.66  -0.53   2.71   4.47   0.52  -0.62
        6       3.10   7.57   2.14   0.17   4.47   9.78   1.41  -0.75
        7       1.27   3.60   4.00   3.36   0.52   1.41   3.62   3.17
        8       1.17   2.63   4.56   4.59  -0.62  -0.75   3.17   4.60

 SKEW(*W)      344.5  286.1  393.7  261.2  158.8 -208.8  893.3  501.2


CLUSTER    1 INDEX    4  PROPORTION     0.48676 * PARENT  200.570
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       60.000     ADJUST      280.000  ID 10778
PROPORTION: PROP 0.48676  CIN   38.94  CTOT   120.57
OLD PROP 0.486757  CIN  38.94  ODEN  80.00  DIFFER    0.0
VOLUME0.55E-17   ROOT0.23E-08   DCON     4.74

 LOCATION 2155  LINK  5 2313  SUBS  0     0  SUPER  3 1741  SYMBOL      2
INDEX =      4    SYMBOL =      2

NET PROB    0.0   DIRECT    0.0   CUMS    0.0 *    0.0
                              CUMS.0          * .0


 MEAN           26.51  27.89  28.98  27.25  21.75  22.07  25.42  24.41

 COVARIANCE     3.99   5.71   4.33   3.96   1.35   2.91   1.55   1.55
        2       5.71  12.44   8.30   7.25   2.86   8.09   3.91   3.67
        3       4.33   8.30   9.43   8.94   0.40   2.52   5.00   6.25
        4       3.96   7.25   8.94  10.60  -1.15  -0.21   4.66   6.89
        5       1.35   2.86   0.40  -1.15   3.14   4.97   0.10  -1.15
        6       2.91   8.09   2.52  -0.21   4.97  11.30   0.94  -0.80
        7       1.55   3.91   5.00   4.66   0.10   0.94   4.38   4.32
        8       1.55   3.67   6.25   6.89  -1.15  -0.80   4.32   6.74

 SKEW(*W)        0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER    1 INDEX    5  PROPORTION     0.51324 * PARENT  200.570
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 10778
PROPORTION: PROP 0.51324  CIN   41.06  CTOT   120.57
OLD PROP 0.513242  CIN  41.0   ODEN  80.00  DIFFER    0.0
VOLUME0.11E-23   ROOT0.11E-11   DCON     4.74

 LOCATION 2313  LINK  0     0  SUBS  0     0  SUPER  3 1741  SYMBOL      3
INDEX =      5    SYMBOL =      3
```

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 FT PROB   0.0   DIRECT   0.0   CUMS   0.0   *   0.0
                           CUMS.0          * .0

 MEAN          25.80   26.84   28.00   26.71   21.13   21.71   23.64   23.29

 COVARIANCE    1.70    2.89    1.12    0.82    0.85    2.17    0.21    0.19
        2      2.89    5.76    2.03    1.37    1.98    4.92    0.99    0.36
        3      1.12    2.03    1.23    1.00    0.46    1.23    0.51    0.55
        4      0.82    1.37    1.00    1.03    0.08    0.46    0.29    0.55
        5      0.85    1.98    0.46    0.08    1.13    2.36    0.61   -0.06
        6      2.17    4.92    1.23    0.46    2.36    5.40    1.21   -0.08
        7      0.21    0.99    0.51    0.29    0.61    1.21    1.04    0.37
        8      0.19    0.36    0.55    0.55   -0.06   -0.08    0.37    0.54

 SKEW(*W)       0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


 IQADJ.NPTSO.INDEX.W.*ADJ 10463    978      3        200.57        421.14
 STATIS KL. W(KL).*ADJ(KL)          1  0.5*59997559E 03  0.5459995117E 03
 STATIS KL. W(KL).*ADJ(KL)          1  0.5*69997559E 03  0.5*599*5117E 03
 STATIS KL. W(KL).*ADJ(KL)          2  0.28047778328 03  0.28000000000E 03

  ADJUST   2  WEIGHT      280.5  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.82869E 00 0.20831E 03
  STATISTICS: TRACE      111.7  SKE*      6384.2  KURT      19730.3
         TESTS (SPLIT=0): -.1140AE 06      0.26764E 03       -.540*0E 04
WADJ(KL).W(KL).WSIM      421.0      200.5      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.364395        2
00-00
01-00
02-36        03-64
06-18 07-18 04-50 05-14
***HAVE SPLIT   2 WEIGHT    200.5 SUBS  6  7 ITER  26
KL.INDEX.LSUPER  1583      2   145
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C-6

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CLUSTER   0 INDEX   2  PROPORTION     0.37368 W PARENT  547.000
 SPLIT-0.1700E 02
WEIGHT      200.478  WAS       80.000     ADJUST      420.956  ID 10463
PROPORTION: PROP 0.36439  CIN   146.18  CTOT  155.80
OLD PROP 0.364394  CIN 146.18  ODEN 391.20  DIFFER    0.0
VOLUME0.25E 21    ROOT0.27E-06    DCON    -5.24

 LOCATION 1583  LINK  3 1741  SUBS  6 2599  SUPER  1  145  SYMBOL      1
INDEX =       2     SYMBOL =       1

NET PROB******** DIRECT******* CUMS   0.00 *    1.00
                               CUMS.10810E-82 * .10000E 01


 MEAN          26.07   28.04   29.09   28.19   20.86   21.42   25.92   25.71

 COVARIANCE     2.64    3.07    2.59    2.21    0.75    0.34    1.75    1.76
        2       3.07    6.17    3.23    1.87    1.85    3.05    2.04    0.01
        3       2.59    3.23    6.49    6.74   -1.14   -3.40    4.07    5.60
        4       2.21    1.87    6.74    9.41   -2.76   -6.27    4.79    8.52
        5       0.75    1.85   -1.14   -2.76    3.42    5.53   -0.98   -4.10
        6       0.34    3.05   -3.40   -6.27    5.53   11.33   -2.99   -9.09
        7       1.75    2.04    4.07    4.79   -0.98   -2.99    3.86    5.51
        8       1.76    0.01    5.60    8.52   -4.10   -9.09    5.51   11.89

 SKEW(*W)     -345.2-1272.8   834.5   883.6-1156.0-2433.3   190.7  1645.7


CLUSTER   1 INDEX   6  PROPORTION     0.50203 W PARENT  200.478
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 11010
PROPORTION: PROP 0.50203  CIN   40.16  CTOT  120.48
OLD PROP 0.502032  CIN 40.16  ODEN  80.00  DIFFER    0.0
VOLUME0.21E-17    ROOT0.14E-08    DCON     4.74

 LOCATION 2599  LINK  7 2757  SUBS  0     0  SUPER  2 1583  SYMBOL      2
INDEX =       6     SYMBOL =       2

NET PROB    0.0   DIRECT    0.0   CUMS    0.0  *    0.0
                               CUMS.0          * .0


 MEAN          26.41   27.81   30.57   29.95   19.67   18.74   27.06   28.59

 COVARIANCE     2.10    2.53    1.70    0.70    1.40    2.02    0.37   -0.83
        2       2.53    6.88    1.82   -0.90    3.74    7.46    0.27   -4.85
        3       1.70    1.82    6.25    5.95   -1.22   -3.24    2.77    3.82
        4       0.70   -0.90    5.95    8.91   -3.30   -6.97    3.03    6.87
        5       1.40    3.74   -1.22   -3.30    4.83    8.20   -0.53   -5.23
        6       2.02    7.46   -3.24   -6.97    8.20   16.64   -1.62  -10.72
        7       0.37    0.27    2.77    3.03   -0.53   -1.62    1.99    2.29
        8      -0.83   -4.85    3.82    6.87   -5.23  -10.72    2.29    9.38

 SKEW(*W)        0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


CLUSTER   1 INDEX   7  PROPORTION     0.49797 W PARENT  200.478
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 11010
PROPORTION: PROP 0.49797  CIN   39.84  CTOT  120.48
OLD PROP 0.497968  CIN 39.84  ODEN  80.00  DIFFER    0.0
VOLUME0.37E-21    ROOT0.19E-10    DCON     4.74

 LOCATION 2757  LINK  0     0  SUBS  0     0  SUPER  2 1583  SYMBOL      3
INDEX =       7     SYMBOL =       3
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INDEX =      7    STAGE =      3

NET PROB   0.0   DIRECT   0.0   CUMS   0.0  *    0.0
                            CUMS.0          * .0


 MEAN          25.72   26.28   27.59   26.42   22.06   24.13   24.75   22.81

 COVARIANCE    2.58    3.24    2.72    3.53   -0.34   -1.31    3.01    4.52
        2      3.24    5.03    3.76    4.89   -0.80   -1.88    3.84    5.35
        3      2.72    3.76    4.06    5.23   -1.17   -2.63    3.72    5.73
        4      3.53    4.89    5.23    7.23   -1.50   -3.56    4.83    7.75
        5     -0.34   -0.80   -1.17   -1.50    1.18    1.82   -0.97   -1.89
        6     -1.31   -1.88   -2.63   -3.56    1.82    4.11   -2.95   -5.07
        7      3.01    3.84    3.72    4.83   -0.97   -2.95    4.55    6.99
        8      4.52    5.35    5.73    7.75   -1.89   -5.07    6.99   11.47

 SKEW(*W)       0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


IDADJ,NPTSO,INDEX,W,WADJ 10463  1210     2       200.48       420.96
STATIS KL, W(KL),WADJ(KL)        1  0.5479997559E 03  0.5459995117E 03


  ADJUST   1  WEIGHT      548.0  WAS       263.0   SPFAC-0.17890E 02   CHANGE0.0          0.0          0.95733E-01 0.46948E 02
 STATISTICS: TRACE       67.3  SKEW      2801.6  KURT     22457.7
         TESTS (SPLIT=0): -.10329E 06      -.24091E 04       0.10459E 04
WADJ(KL),W(KL),WSIM     590.0     285.0     400.0
PROPORTION RELATIVE TO TOP LEVEL =      1.000000        1
IDADJ,NPTSO,INDEX,W,WADJ 10726  1211     1       285.00       590.00
STATIS KL, W(KL),WADJ(KL)        4  0.2801311035E 03  0.2800000000E 03


  ADJUST   4  WEIGHT      280.1  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.62722E 00 0.76975E 02
 STATISTICS: TRACE     -165.4  SKEW      2323.3  KURT      9515.0
         TESTS (SPLIT=0): -.99312E 05      -.37985E 04       -.15641E 05
WADJ(KL),W(KL),WSIM     420.3     200.1     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.528290        4
IDADJ,NPTSO,INDEX,W,WADJ 10778  1317     4       200.13       420.26
STATIS KL, W(KL),WADJ(KL)        3  0.4211743164E 03  0.4211401367E 03


  ADJUST   3  WEIGHT      421.2  WAS       200.6   SPFAC-0.38454E 02   CHANGE0.0          0.0          0.21119E 00 0.13880E 03
 STATISTICS: TRACE      122.9  SKEW      2983.5  KURT     25467.7
         TESTS (SPLIT=0): -.10569E 06      -.28544E 04       0.14786E 04
WADJ(KL),W(KL),WSIM     461.2     220.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.611724        3
IDADJ,NPTSO,INDEX,W,WADJ 10778  1340     3       220.60       461.21
STATIS KL, W(KL),WADJ(KL)        1  0.5910000000E 03  0.5900000000E 03


  ADJUST   1  WEIGHT      591.0  WAS       285.0   SPFAC 0.28253E 02   CHANGE0.0          0.0          0.68691E-01 0.17485E 02
 STATISTICS: TRACE      152.7  SKEW      2837.3  KURT     16364.0
         TESTS (SPLIT=0): -.81447E 05      -.22259E 04       -.44218E 04
WADJ(KL),W(KL),WSIM     632.0     306.0     400.0
PROPORTION RELATIVE TO TOP LEVEL =      1.000000        1

***SEPERATE   1 SUPER,SUBS   0  2 SPFAC 0.28253E 02
00-00
02-40       03-60
06-29 07-11 04-49 05-07
STATIS KL, W(KL),WADJ(KL)        4  0.4206137695E 03  0.4202622070E 03


  ADJUST   4  WEIGHT      420.6  WAS       200.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.76205E-01 0.35330E 02
 STATISTICS: TRACE      482.1  SKEW      3625.1  KURT    171010.4
         TESTS (SPLIT=0): 0.11159E 06      -.22143E 04       0.14701E 06
WADJ(KL),W(KL),WSIM     461.0     220.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.561499        4
00-00
02-38       03-62
06-30 07-09 04-56       05-06
            08-25 09-31
***HAVE SPLIT   4 WEIGHT    220.5 SUBS   8   9 ITER   41
KL,INDEX,LSUPER  2155     4   1741


NUMB OF OBSERVS (CLUSTERS FROM  4    2155
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CLUSTER 0 INDEX 4 PROPORTION 0.84191 W PARENT 434.382
 SPLIT-0.1700E 02
WEIGHT 220.483 WAS 200.131 ADJUST 460.965 ID 11117
PROPORTION: PROP 0.90449 CIN 212.45 CTOT 182.04
OLD PROP 0.904493 CIN 212.45 ODEN 252.34 DIFFER 0.0
VOLUME0.33E 21 ROOT0.21E-07 DCON -1.19

 LOCATION 2155 LINK 5 2313 SUBS 8 145 SUPER 3 1741 SYMBOL 1
INDEX = 4 SYMBOL = 1

NET PROB 686.98 DIRECT 813.23 CUMS 0.0 * 1.00
                  CUMS.0 * .10000E 01

MEAN	26.38	27.48	28.74	27.08	21.16	21.74	24.58	23.75
COVARIANCE	3.12	4.91	3.36	3.31	1.84	3.29	1.30	1.01
2	4.91	10.24	6.86	6.59	3.17	6.61	2.90	2.25
3	3.36	6.86	8.06	8.33	0.92	1.71	4.16	4.99
4	3.31	6.59	8.33	10.38	0.24	0.10	4.46	6.32
5	1.84	3.17	0.92	0.24	2.73	4.38	0.37	-0.74
6	3.29	6.61	1.71	0.10	4.38	9.27	0.27	-2.24
7	1.30	2.90	4.16	4.46	0.37	0.27	3.33	3.72
8	1.01	2.25	4.99	6.32	-0.74	-2.24	3.72	6.32
SKEW(*W)	661.2	807.9	236.3	-187.1	147.5	597.4	124.0	287.6

CLUSTER 1 INDEX 8 PROPORTION 0.44127 W PARENT 220.483
 SPLIT-0.9999E 04
WEIGHT 80.000 WAS 80.000 ADJUST 280.000 ID 11483
PROPORTION: PROP 0.44127 CIN 35.30 CTOT 140.48
OLD PROP 0.441273 CIN 35.30 ODEN 80.00 DIFFER 0.0
VOLUME0.29E-18 ROOT0.54E-09 DCON 4.74

 LOCATION 145 LINK 9 3043 SUBS 0 0 SUPER 4 2155 SYMBOL 2
INDEX = 8 SYMBOL = 2

NET PROB******* DIRECT******* CUMS******* * 1.00

MEAN	26.44	27.04	26.90	24.80	21.71	23.14	23.42	22.15
COVARIANCE	3.03	3.41	2.19	3.21	0.28	0.93	1.72	3.13
2	3.41	5.52	3.11	4.74	0.24	2.00	1.47	3.21
3	2.19	3.11	3.18	3.96	0.32	1.40	1.58	2.70
4	3.21	4.74	3.96	6.72	0.36	1.25	3.12	5.52
5	0.28	0.24	0.32	0.36	0.70	0.82	-0.06	-0.23
6	0.93	2.00	1.40	1.25	0.82	2.95	-0.70	-1.52
7	1.72	1.47	1.58	3.12	-0.06	-0.70	3.88	6.02
8	3.13	3.21	2.70	5.52	-0.23	-1.52	6.02	11.51
SKEW(*W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CLUSTER 1 INDEX 9 PROPORTION 0.55873 W PARENT 220.483
 SPLIT-0.9999E 04
WEIGHT 80.000 WAS 80.000 ADJUST 280.000 ID 11483
PROPORTION: PROP 0.55873 CIN 44.70 CTOT 140.48
OLD PROP 0.558726 CIN 44.70 ODEN 80.00 DIFFER 0.0
VOLUME0.15E-19 ROOT0.12E-09 DCON 4.74

 LOCATION 3043 LINK 0 0 SUBS 0 0 SUPER 4 2155 SYMBOL 3
INDEX = 9 SYMBOL = 3

NET PROB 0.0 DIRECT 0.0 CUMS 0.0 * 0.0
                  CUMS 0 * 0

C-9

MEAN	26.32	27.82	30.19	28.89	20.72	20.63	25.49	25.01
COVARIANCE 2	3.97	7.23	5.05	4.47	3.65	5.56	2.52	1.49
	7.23	15.99	11.67	9.66	6.73	11.57	5.36	4.14
3	5.05	11.67	14.15	14.19	1.75	2.09	8.07	9.00
4	4.47	9.66	14.19	15.95	0.20	-1.39	7.86	10.48
5	3.65	6.73	1.75	0.20	5.16	8.74	0.63	-1.74
6	5.56	11.57	2.09	-1.39	8.74	17.01	0.90	-4.15
7	2.52	5.36	8.07	7.86	0.63	0.90	4.96	5.20
8	1.49	4.14	9.00	10.48	-1.74	-4.15	5.20	8.06
SKEW(*W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

IDADJ,NPTSO,INDEX,W,WADJ 11117 1683 4 220.48 460.97
STATIS KL, W(KL),WADJ(KL) 3 0.4620122070E 03 0.4612084961E 03

ADJUST 3 WEIGHT 462.0 WAS 220.6 SPFAC-0.21950E 02 CHANGE0.0 0.0 0.51900E-01 0.48628E 02
STATISTICS: TRACE 121.2 SKEW 1285.3 KURT 14506.4
TESTS (SPLIT=0): -.10116E 06 -.43133E 04 -.84997E 04
WADJ(KL),W(KL),WSIM 502.8 241.4 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.616012 3
IDADJ,NPTSO,INDEX,W,WADJ 11140 1732 3 241.41 502.82
STATIS KL, W(KL),WADJ(KL) 6 0.2806679688E 03 0.2800000000E 03

ADJUST 6 WEIGHT 280.7 WAS 80.0 SPFAC-0.99990E 04 CHANGE0.0 0.0 0.32546E 00 0.35004E 03
STATISTICS: TRACE 105.2 SKEW 3945.0 KURT 15011.6
TESTS (SPLIT=0): -.11543E 06 -.21686E 04 -.10111E 05
WADJ(KL),W(KL),WSIM 421.3 200.7 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.316532 6
IDADJ,NPTSO,INDEX,W,WADJ 11010 1766 6 200.67 421.34
STATIS KL, W(KL),WADJ(KL) 2 0.4214631348E 03 0.4209555664E 03

ADJUST 2 WEIGHT 421.5 WAS 200.5 SPFAC-0.77037E 02 CHANGE0.0 0.0 0.20504E 00 0.10214E 03
STATISTICS: TRACE 68.8 SKEW 1983.2 KURT 20324.7
TESTS (SPLIT=0): -.11597E 06 -.38498E 04 -.36448E 04
WADJ(KL),W(KL),WSIM 462.0 221.0 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.392902 2
IDADJ,NPTSO,INDEX,W,WADJ 11010 1769 2 220.99 461.97
STATIS KL, W(KL),WADJ(KL) 4 0.4614072266E 03 0.4609653320E 03

ADJUST 4 WEIGHT 461.4 WAS 220.5 SPFAC-0.16257E 03 CHANGE0.0 0.0 0.65146E-01 0.15963E 02
STATISTICS: TRACE 295.8 SKEW 1626.7 KURT 22842.5
TESTS (SPLIT=0): -.28473E 05 -.39770E 04 -.18458E 03
WADJ(KL),W(KL),WSIM 501.8 240.9 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.563067 4
IDADJ,NPTSO,INDEX,W,WADJ 11483 2091 4 240.92 501.85
STATIS KL, W(KL),WADJ(KL) 3 0.5033339844E 03 0.5028159180E 03

ADJUST 3 WEIGHT 503.3 WAS 241.4 SPFAC-0.18291E 02 CHANGE0.0 0.0 0.56480E-01 0.16596E 02
STATISTICS: TRACE 134.3 SKEW 1207.4 KURT 13193.1
TESTS (SPLIT=0): -.93693E 05 -.41926E 04 -.89965E 04
WADJ(KL),W(KL),WSIM 543.9 261.9 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.601459 3
IDADJ,NPTSO,INDEX,W,WADJ 11532 2171 3 261.93 543.85
STATIS KL, W(KL),WADJ(KL) 9 0.2801301270E 03 0.2800000000E 03

ADJUST 9 WEIGHT 280.1 WAS 80.0 SPFAC-0.99990E 04 CHANGE0.0 0.0 0.37537E 00 0.73317E 03
STATISTICS: TRACE 436.1 SKEW 4505.6 KURT 26647
TESTS (SPLIT=0): 0.63496E 05 -.16163E 04 [illegible]4914E 04
WADJ(KL),W(KL),WSIM 420.3 200.1 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.300271 9
00-00
02-39 03-63
06-31 07-06 04-56 05-04
08-26 09-30
10-15 11-15
***HAVE SPLIT 9 WEIGHT 200.1 SUBS 10 11 ITER 24
KL,INDEX,LSUPER 3043 9 2155
NUMBER OF RECOVERY CLUSTERS FROM [illegible] 30.3

DUMP OF OBSERVED CLUSTERS FROM 9 3043

CLUSTER 0 INDEX 9 PROPORTION 0.52973 W PARENT 369.458
SPLIT-0.1700E 02
WEIGHT 200.130 WAS 80.000 ADJUST 420.260 ID 11483
PROPORTION: PROP 0.53268 CIN 148.63 CTOT 85.67
OLD PROP 0.532877 CIN 148.63 ODEN 280.58 DIFFER 0.0
VOLUME0.52E 20 ROOT0.86E-07 DCON -5.24

LOCATION 3043 LINK 0 0 SUBS 10 3329 SUPER 4 2155 SYMBOL 1
INDEX = 9 SYMBOL = 1

NET PROB******* DIRECT******* CUMS 0.0 * 1.00
CUMS.0 * .10000E 01

MEAN	26.34	27.62	29.10	27.79	20.95	21.24	24.83	24.23
COVARIANCE	2.62	4.51	2.93	2.25	2.06	3.63	1.38	0.66
2	4.51	12.12	6.95	4.97	4.65	9.77	4.25	1.79
3	2.93	6.95	7.82	7.39	1.14	2.28	4.81	5.06
4	2.25	4.97	7.39	8.82	-0.39	-0.82	4.33	6.21
5	2.06	4.65	1.14	-0.39	3.60	6.15	0.78	-1.25
6	3.63	9.77	2.28	-0.82	6.15	12.83	1.53	-2.66
7	1.38	4.25	4.81	4.33	0.78	1.53	3.92	3.64
8	0.66	1.79	5.06	6.21	-1.25	-2.66	3.64	5.96
SKEW(*W)	343.5	204.6	-1178.4	-945.9	474.9	1077.7	-906.7	-943.7

CLUSTER 1 INDEX 10 PROPORTION 0.50423 W PARENT 200.130
SPLIT-0.9999E 04
WEIGHT 80.000 WAS 80.000 ADJUST 280.000 ID 12105
PROPORTION: PROP 0.50423 CIN 40.34 CTOT 120.13
OLD PROP 0.504235 CIN 40.34 ODEN 80.00 DIFFER 0.0
VOLUME0.17E-17 ROOT0.13E-08 DCON 4.74

LOCATION 3329 LINK 11 3487 SUBS 0 0 SUPER 9 3043 SYMBOL 2
INDEX = 10 SYMBOL = 2

NET PROB 0.0 DIRECT 0.0 CUMS 0.0 * 0.0
CUMS.0 * .0

MEAN	26.55	27.75	28.05	26.90	21.35	22.16	24.04	23.39
COVARIANCE	3.40	5.14	1.92	1.27	3.17	5.44	1.11	-0.30
2	5.14	13.43	4.90	2.76	6.76	13.43	4.45	0.05
3	1.92	4.90	4.84	4.25	1.70	2.86	4.47	3.39
4	1.27	2.76	4.25	6.02	0.08	-0.54	3.73	4.62
5	3.17	6.76	1.70	0.08	5.04	8.47	1.46	-1.22
6	5.44	13.43	2.86	-0.54	8.47	17.18	2.45	-3.06
7	1.11	4.45	4.47	3.73	1.46	2.45	5.22	3.94
8	-0.30	0.05	3.39	4.62	-1.22	-3.06	3.94	5.79
SKEW(*W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CLUSTER 1 INDEX 11 PROPORTION 0.49577 W PARENT 200.130
SPLIT-0.9999E 04
WEIGHT 80.000 WAS 80.000 ADJUST 280.000 ID 12105
PROPORTION: PROP 0.49577 CIN 39.66 CTOT 120.13
OLD PROP 0.495765 CIN 39.66 ODEN 80.00 DIFFER 0.0
VOLUME0.52E-24 ROOT0.72E-12 DCON 4.74

LOCATION 3487 LINK 0 0 SUBS 0 0 SUPER 9 3043 SYMBOL 3
INDEX = 11 SYMBOL = 3

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INDEX =     11     SYMBOL =      3
NET PROB   0.0   DIRECT   0.0   CUMS   0.0  *   0.0
                         CUMS.0          * .0

 MEAN          26.13  27.49  30.18  28.70  20.55  20.30  25.63  25.09

 COVARIANCE    0.42   1.03   0.36   0.05   0.61   1.26   0.15  -0.14
        2      1.03   3.70   0.92  -0.35   2.24   4.87   0.50  -0.73
        3      0.36   0.92   1.10   1.03   0.13   0.42   0.69   0.68
        4      0.05  -0.35   1.03   1.65  -0.82  -1.58   0.64   1.25
        5      0.61   2.24   0.13  -0.82   1.71   3.48   0.04  -0.90
        6      1.26   4.87   0.42  -1.58   3.48   7.73   0.18  -1.67
        7      0.15   0.50   0.69   0.64   0.04   0.18   0.54   0.51
        8     -0.14  -0.73   0.68   1.25  -0.90  -1.87   0.51   1.17

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 11483  2305      9      200.13      420.26
STATIS KL, W(KL),WADJ(KL)         8  0.2801440430E 03  0.2800000000E 03

  ADJUST   8  WEIGHT      280.1  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.87035E 00 0.33644E 03
 STATISTICS: TRACE      260.7  SKEW     5921.2  KURT     25762.1
        TESTS (SPLIT=0): -.58712E 05      -.20042E 03      0.60683E 03

CLUSTER 717 INDEX   8  PROPORTION     0.47218 W PARENT  425.000
 SPLIT-0.9999E 04
WEIGHT     280.144  WAS       80.000    ADJUST     280.000  ID 11483
PROPORTION: PROP 0.46973  CIN  186.60  CTOT  27.48
OLD PROP 0.438668  CIN  35.30  ODEN  80.46  DIFFER   0.0
VOLUME0.44E-13   ROOT0.21E-06   DCON   -5.24

 LOCATION  145  LINK  9 3043  SUBS  0    0  SUPER  4 2155  SYMBOL******
INDEX =      8    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.00

 MEAN          26.26  27.36  27.45  25.65  21.81  23.10  23.73  22.54

 COVARIANCE    3.68   4.84   3.59   4.06   0.40   1.53   0.75   1.24
        2      4.84   8.96   5.52   6.68   0.61   3.25   1.08   1.33
        3      3.59   5.52   5.58   5.91   0.19   1.49   1.45   2.11
        4      4.06   6.68   5.91   7.99  -0.01   1.23   1.73   2.95
        5      0.40   0.61   0.19  -0.01   1.14   1.46   0.24   0.05
        6      1.53   3.25   1.49   1.23   1.46   4.01   0.20  -0.48
        7      0.75   1.08   1.45   1.73   0.24   0.20   2.36   2.85
        8      1.24   1.33   2.11   2.95   0.05  -0.48   2.85   5.40

 SKEW(*W)    -408.9  186.1  789.3 1314.5   37.8 -373.6  572.9 1042.0


WADJ(KL),W(KL),WSIM      420.3      200.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =       0.272830        8
00-00
02-38       03-63
06-31 07-06 04-57                    05-04
            08-27       09-30
            12-12 13-15 10-19 11-12
***HAVE SPLIT  8 WEIGHT    200.1 SUBS 12 13 ITER  23
KL,INDEX,LSUPER   145      8  2155


NUMB OF OBSERVED CLUSTERS FROM  8     145
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CLUSTER    0 INDEX    9  PROPORTION     0.47503 W PARENT  425.000
 SPLIT-0.1700E 02
WEIGHT      200.144  WAS       80.000     ADJUST      420.288  ID 11483
PROPORTION: PROP 0.47612  CIN  151.30  CTOT  106.50
OLD PROP 0.476116  CIN 151.30  ODEN 318.50  DIFFER   0.0
VOLUME0.14E 21    ROOT0.21E-06    DCON    -5.24

 LOCATION  145  LINK  9 3043  SUBS 12 3773  SUPER  4 2155  SYMBOL      1
INDEX =       8    SYMBOL =       1

NET PROB******** DIRECT******** CUMS******** *    1.00

 MEAN          26.19  27.50  27.67  26.00  21.85  23.09  23.85  22.69

 COVARIANCE    3.94   5.41   4.14   4.41   0.45   1.77   0.37   0.49
        2      5.41  10.33   6.49   7.46   0.76   3.75   0.93   0.59
        3      4.14   6.49   6.54   6.69   0.15   1.52   1.40   1.87
        4      4.41   7.46   6.69   8.50  -0.15   1.22   1.18   1.93
        5      0.45   0.76   0.15  -0.15   1.31   1.71   0.36   0.16
        6      1.77   3.75   1.52   1.22   1.71   4.43   0.56  -0.07
        7      0.37   0.93   1.40   1.18   0.36   0.56   1.75   1.58
        8      0.49   0.59   1.87   1.93   0.16  -0.07   1.58   2.96

 SKEW(*W)     -408.9  186.1  789.3 1314.5   37.8 -373.6  572.9 1042.0


CLUSTER    1 INDEX   12  PROPORTION     0.44307 W PARENT  200.144
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 12192
PROPORTION: PROP 0.44307  CIN   35.45  CTOT  120.14
OLD PROP 0.443072  CIN  35.45  ODEN  80.00  DIFFER   0.0
VOLUME0.68E-18    ROOT0.83E-09    DCON     4.74

 LOCATION 3773  LINK 13 3931  SUBS  0     0  SUPER  8  145  SYMBOL      2
INDEX =      12    SYMBOL =       2

NET PROB    0.0    DIRECT    0.0    CUMS    0.0  *    0.0
                             CUMS.0           * .0

 MEAN          25.57  27.59  26.18  27.06  22.00  22.82  24.30  23.51

 COVARIANCE    2.27   4.15   2.81   2.35   0.11   1.14   0.42  -0.46
        2      4.15  11.04   5.72   5.82   0.50   3.59   1.20  -0.36
        3      2.81   5.72   7.48   7.36  -0.58  -0.39   2.94   3.37
        4      2.35   5.82   7.36   9.07  -1.42  -1.51   2.96   3.72
        5      0.11   0.50  -0.58  -1.42   1.42   2.08   0.09  -0.71
        6      1.14   3.59  -0.39  -1.51   2.08   4.94  -0.39  -2.19
        7      0.42   1.20   2.94   2.96   0.09  -0.39   3.64   3.92
        8     -0.46  -0.36   3.37   3.72  -0.71  -2.19   3.92   6.06

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER    1 INDEX   13  PROPORTION     0.55693 W PARENT  200.144
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 12192
PROPORTION: PROP 0.55693  CIN   44.55  CTOT  120.14
OLD PROP 0.556928  CIN  44.55  ODEN  80.00  DIFFER   0.0
VOLUME0.29E-23    ROOT0.17E-11    DCON     4.74

 LOCATION 3931  LINK  0     0  SUBS  0     0  SUPER  8  145  SYMBOL      3
INDEX =      13    SYMBOL =       3

NET PROB    0.0    DIRECT    0.0    CUMS    0.0  *    0.0
                             CUMS.0           * .0
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 MEAN          26.68  27.42  27.27  25.15  21.73  23.29  23.49  22.04

 COVARIANCE    7.27   8.29   8.16   8.30   2.03   3.59   0.08   2.59
       2       8.29   9.91   7.22   9.79   2.28   4.19   0.17   2.89
       3       8.16   7.22   5.57   7.42   1.68   2.99   0.22   2.38
       4       8.30   9.79   7.42  10.18   2.23   3.97   0.22   3.16
       5       2.03   2.28   1.68   2.23   0.77   1.21   0.07   0.85
       6       3.59   4.19   2.99   3.97   1.21   2.20   0.09   1.31
       7       0.08   0.17   0.22   0.22   0.07   0.09   0.21   0.23
       8       2.59   2.89   2.38   3.16   0.85   1.31   0.23   1.47

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 11483  2392     8      220.14      420.29
STATIS KL, W(KL),WADJ(KL)        2  0.4620241699E 03  0.4619707031E 03

  ADJUST   2  WEIGHT      462.0  WAS       221.0   SPFAC-0.28160E 02   CHANGE0.0          0.0          0.10568E 00 0.48680E 02
 STATISTICS: TRACE       -10.9  SKEW     3535.4  KURT     14246.7
        TESTS (SPLIT=0): -.11581E 06      -.20671E 04      -.87755E 04

CLUSTER 718 INDEX   2  PROPORTION     0.37819 W PARENT 2401.001
 SPLIT-0.2816E 02
WEIGHT      462.024  WAS      220.985     ADJUST      461.971  ID 11569
PROPORTION: PROP 0.38475  CIN  320.84  CTOT 1567.12
OLD PROP 0.397031  CIN 156.45  ODEN 397.55  DIFFER  11.76
VOLUME0.44E-15   ROOT0.21E-07   DCON   -1.15

 LOCATION 1583  LINK  3 1741  SUBS  6 2599  SUPER  0  119  SYMBOL******
INDEX =       2    SYMBOL = ******

NET PROB  32.19  DIRECT  83.65  CUMS 142.61 *   0.95

 MEAN          26.13  28.11  29.44  28.70  20.42  20.67  26.28  26.66

 COVARIANCE    2.49   2.93   2.16   2.02   0.69   0.61   1.63   2.27
       2       2.93   5.49   2.88   2.03   1.39   2.92   2.07   1.38
       3       2.16   2.88   5.54   5.93  -1.01  -2.66   3.39   5.03
       4       2.02   2.03   5.93   8.41  -2.25  -5.05   4.43   7.73
       5       0.69   1.39  -1.01  -2.25   2.81   4.65  -0.93  -3.16
       6       0.61   2.92  -2.66  -5.05   4.65  10.04  -2.47  -7.24
       7       1.63   2.07   3.39   4.43  -0.93  -2.47   3.80   5.22
       8       2.27   1.38   5.03   7.73  -3.16  -7.24   5.22  10.70

 SKEW(*W)    -653.2 -693.2-1491.2-1425.0  672.3 1594.2-1260.8-1690.7


WADJ(KL),W(KL),WSIM     502.1      241.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.373256       2
IDADJ,NPTSO,INDEX,W,WADJ 11569  2401     2      241.04      502.06
STATIS KL, W(KL),WADJ(KL)        6  0.4213442383E 03  0.4213359375E 03

  ADJUST   6  WEIGHT      421.3  WAS       200.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.82275E-01 0.26393E 02
 STATISTICS: TRACE        -2.7  SKEW     3937.8  KURT     17204.8
        TESTS (SPLIT=0): -.12078E 06      -.18991E 04      -.67806E 04

CLUSTER 719 INDEX   6  PROPORTION     0.84541 W PARENT  242.579
 SPLIT-0.1000E 05
WEIGHT      421.344  WAS      200.668     ADJUST      421.336  ID 11566
PROPORTION: PROP 0.80463  CIN  371.14  CTOT -216.44
OLD PROP 0.820129  CIN 183.34  ODEN 256.73  DIFFER   0.0
VOLUME0.60E-15   ROOT0.24E-07   DCON   -1.18

 LOCATION 2599  LINK  7 2757  SUBS  0    0  SUPER  2 1583  SYMBOL******
INDEX =       6    SYMBOL = ******
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INDEX =      8    SYMBOL = ******
NET PROB******* DIRECT******* CUMS    0.0  *    0.0
                              CUMS.0        * .0


 MEAN          26.19  28.12  29.64  28.92  20.32  20.43  26.36  26.89

 COVARIANCE    2.44   2.94   1.92   1.59   0.96   1.16   1.37   1.70
        2      2.94   5.75   2.73   1.65   1.73   3.70   1.89   0.82
        3      1.92   2.73   5.09   5.27  -0.65  -1.90   3.05   4.20
        4      1.59   1.65   5.27   7.63  -1.91  -4.32   3.97   6.71
        5      0.96   1.73  -0.65  -1.91   2.85   4.63  -0.72  -2.82
        6      1.16   3.70  -1.90  -4.32   4.63  10.00  -1.99  -6.52
        7      1.37   1.89   3.05   3.97  -0.72  -1.99   3.57   4.60
        8      1.70   0.82   4.20   6.71  -2.82  -6.52   4.60   9.53

 SKEW(*W)    -576.7 -566.7-1490.9-1460.0  717.3 1638.0-1187.0-1614.4


WADJ(KL),W(KL),WSIM      461.4      220.7      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.317678       6
IDADJ,NPTSO,INDEX,W,WADJ 11566  2405     6       220.68       461.35
STATIS KL, W(KL),WADJ(KL)        4  0.5020078125E 03  0.5018491211E 03


  ADJUST   4  WEIGHT      502.0  WAS      240.9   SPFAC-0.19139E 01   CHANGE0.0          0.0          0.17983E 00 0.35642E 02
 STATISTICS: TRACE       -67.5  SKEW     1488.4  KURT     12871.7
         TESTS (SPLIT=0): -.10734E 06      -.39191E 04       -.93489E 04
WADJ(KL),W(KL),WSIM      542.2      261.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.599578       4
IDADJ,NPTSO,INDEX,W,WADJ 11891  2508     4       261.08       542.17
STATIS KL, W(KL),WADJ(KL)        3  0.5444680176E 03  0.5438520508E 03


  ADJUST   3  WEIGHT      544.5  WAS      261.9   SPFAC-0.17345E 02   CHANGE0.0          0.0          0.14114E 00 0.24463E 02
 STATISTICS: TRACE        70.9  SKEW     1476.5  KURT     17292.7
         TESTS (SPLIT=0): -.10318E 06      -.37528E 04       -.41959E 04
WADJ(KL),W(KL),WSIM      585.1      282.5      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.660410       3
IDADJ,NPTSO,INDEX,W,WADJ 11971  2593     3       282.54       585.08
STATIS KL, W(KL),WADJ(KL)        4  0.5424111328E 03  0.5421665039E 03


  ADJUST   4  WEIGHT      542.4  WAS      261.1   SPFAC-0.90777E-01   CHANGE0.0          0.0          0.56216E-01 0.17829E 02
 STATISTICS: TRACE       125.7  SKEW      859.9  KURT      7010.6
         TESTS (SPLIT=0): -.92611E 05      -.43788E 04       -.14516E 05
WADJ(KL),W(KL),WSIM      582.7      281.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.621416       4
IDADJ,NPTSO,INDEX,W,WADJ 12308  2934     4       281.33       582.66
STATIS KL, W(KL),WADJ(KL)       12  0.2807910156E 03  0.2800000000E 03


  ADJUST  12  WEIGHT      280.8  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.90426E 00 0.14532E 03
 STATISTICS: TRACE        32.2  SKEW     4425.0  KURT     21438.9
         TESTS (SPLIT=0): -.12543E 06      -.16868E 04       -.36759E 04
WADJ(KL),W(KL),WSIM      421.6      200.8      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.260306      12
IDADJ,NPTSO,INDEX,W,WADJ 12192  2981    12       200.79       421.58
STATIS KL, W(KL),WADJ(KL)        8  0.4206037598E 03  0.4202880859E 03


  ADJUST   8  WEIGHT      420.6  WAS      200.1   SPFAC-0.15526E 03   CHANGE0.0          0.0          0.12539E 00 0.76086E 02
 STATISTICS: TRACE       -94.5  SKEW      871.0  KURT     10799.6
         TESTS (SPLIT=0): -.11192E 06      -.49686E 04       -.13197E 05

CLUSTER 724 INDEX    8  PROPORTION     0.53124 W PARENT  310.400
 SPLIT-0.1553E 03
WEIGHT     420.604  WAS      200.144     ADJUST     420.288  ID 12192
PROPORTION: PROP 0.53247  CIN  300.27  CTOT -253.08
OLD PROP 0.476116  CIN 151.30  ODEN 318.50  DIFFER  51.23
VOLUME0.29E-15    ROCT0.17E-07    DCON    -1.19

 LOCATION  145  LINK  9 3043  SUBS 12 3773  SUPER  4 2155  SYMBOL******
INDEX =      8    SYMBOL = ******

NET PROB******* DIRECT******* CUMS******* *    0.90
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 MEAN          26.00   27.43   27.46   25.60   21.49   23.07   23.83   22.65

 COVARIANCE    3.99    5.31    3.83    4.04    0.47    1.93    0.20    0.37
       2       5.31    9.93    5.86    6.45    0.83    4.01    0.91    0.32
       3       3.83    5.86    5.60    5.49    0.27    1.78    1.09    1.51
       4       4.04    6.45    5.49    7.05   -0.18    1.34    0.57    1.28
       5       0.47    0.83    0.27   -0.18    1.34    1.74    0.58    0.28
       6       1.93    4.01    1.78    1.34    1.74    4.54    0.87    0.21
       7       0.20    0.91    1.09    0.57    0.58    0.87    1.78    1.31
       8       0.37    0.32    1.51    1.28    0.28    0.21    1.31    2.41

 SKEW(*W)    -445.8  -267.3  -464.7  -381.2   -10.2  -267.5  -156.2  -110.9


WADJ(KL),W(KL),*SIM      460.9      220.5      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.335799        8
IDADJ,NPTSO,INDEX,W,WADJ 12192  2990     8       220.46      460.92
STATIS KL, W(KL),WADJ(KL)        10  0.2801511230E 03  0.2800000000E 03


  ADJUST  10  WEIGHT       280.2  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.35788E 00 0.41945E 03
 STATISTICS: TRACE        -85.8  SKEW      2407.4  KURT     10317.6
        TESTS (SPLIT=0): -.11931E 06       -.37142E 04       -.14837E 05
WADJ(KL),W(KL),WSIM      420.3      200.2      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.221478        10
IDADJ,NPTSO,INDEX,W,WADJ 12105  3017    10       200.15      420.30
STATIS KL, W(KL),WADJ(KL)         9  0.4204064941E 03  0.4202602539E 03


  ADJUST   9  WEIGHT       420.4  WAS       200.1   SPFAC-0.66263E 02   CHANGE0.0          0.0          0.19710E 00 0.15387E 03
 STATISTICS: TRACE         62.8  SKEW      1766.4  KURT     11843.2
        TESTS (SPLIT=0): -.11605E 06       -.40755E 04       -.12163E 05
WADJ(KL),W(KL),WSIM      460.6      220.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.262123        9
IDADJ,NPTSO,INDEX,W,WADJ 12105  3059     9       220.28      460.55
STATIS KL, W(KL),WADJ(KL)         3  0.5853510742E 03  0.5850839844E 03


  ADJUST   3  WEIGHT       585.4  WAS       282.5   SPFAC-0.16088E 02   CHANGE0.0          0.0          0.79102E-01 0.25112E 02
 STATISTICS: TRACE         72.0  SKEW       934.3  KURT      9678.9
        TESTS (SPLIT=0): -.10003E 06       -.41500E 04       -.11214E 05
WADJ(KL),W(KL),WSIM      625.6      302.8      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.651138        3
IDADJ,NPTSO,INDEX,W,WADJ 12393  3060     3       302.81      625.62
STATIS KL, W(KL),WADJ(KL)         6  0.4615419922E 03  0.4613525391E 03


  ADJUST   6  WEIGHT       461.5  WAS       220.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.13445E 00 0.13345E 02
 STATISTICS: TRACE        176.8  SKEW      2249.3  KURT     10050.1
        TESTS (SPLIT=0): -.84719E 05       -.33551E 04       -.12980E 05
WADJ(KL),W(KL),WSIM      501.7      240.9      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.320775        6
IDADJ,NPTSO,INDEX,W,WADJ 12205  3107     6       240.87      501.73
STATIS KL, W(KL),WADJ(KL)         2  0.5022648926E 03  0.5020776367E 03


  ADJUST   2  WEIGHT       502.3  WAS       241.0   SPFAC-0.19538E 02   CHANGE0.0          0.0          0.17278E 00 0.12356E 02
 STATISTICS: TRACE        190.4  SKEW      3199.7  KURT     10659.6
        TESTS (SPLIT=0): -.75601E 05       -.22065E 04       -.11556E 05

CLUSTER 729 INDEX    2  PROPORTION     0.36415 W PARENT 3131.001
 SPLIT-0.1954E 02
WEIGHT     502.265  WAS      241.039     ADJUST      502.078  ID 12201
PROPORTION: PROP 0.35985  CIN  366.19  CTOT 2115.16
OLD PROP 0.363328  CIN 164.39  ODEN 456.68  DIFFER   6.64
VOLUME0.46E-15   PCOT0.21E-07   DCON   -1.12

 LOCATION 1583  LINK  3 1741  SUBS  6 2599  SUPER  0  119  SYMBOL******
INDEX =       2    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *    0.93

 MEAN          25.95   27.74   29.36   28.70   20.30   20.58   26.11   26.62

 COVARIANCE    2.27    2.60    2.22    2.04    0.49    0.15    1.54    2.15
       2       2.60    5.09    2.98    1.97    1.19    2.50    1.86    1.30
       3       2.22    2.98    6.31    6.53   -1.44   -3.50    3.52    5.25
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          4     2.04   1.97   6.63   9.08  -2.55  -5.95   4.48   7.67
          5     0.49   1.19  -1.44  -2.55   2.87   4.85  -1.09  -3.17
          6     0.15   2.50  -3.60  -5.95   4.85  10.61  -2.88  -7.43
          7     1.54   1.86   3.52   4.48  -1.09  -2.88   3.72   4.95
          8     2.15   1.30   5.28   7.67  -3.17  -7.43   4.95   9.74

 SKEW(*W)    -208.8-1292.9   73.8  540.5 -969.4-1981.1  232.5 1405.3


WADJ(KL),W(KL),WSIM     542.5     261.2     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.364826        2
IDADJ,NPTSO,INDEX,W,WADJ 12201  3131     2     261.23     542.45
STATIS KL, W(KL),WADJ(KL)        4  0.5827836914E 03  0.5826557617E 03

  ADJUST   4  WEIGHT      582.8  WAS      281.3   SPFAC-0.19446E 02   CHANGE0.0          0.0          0.14017E 00 0.56674E 01
 STATISTICS: TRACE        43.8  SKEW     2324.3  KURT     16054.6
        TESTS (SPLIT=0): -.10348E 06      -.27690E 04      -.48752E 04
WADJ(KL),W(KL),WSIM     622.9     301.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.540840        4
IDADJ,NPTSO,INDEX,W,WADJ 12734  3528     4     301.46     622.91
STATIS KL, W(KL),WADJ(KL)        6  0.5025219727E 03  0.5017314453E 03

  ADJUST   6  WEIGHT      502.5  WAS      240.9   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.14019E 00 0.95282E 02
 STATISTICS: TRACE       -79.5  SKEW     1006.9  KURT     11062.3
        TESTS (SPLIT=0): -.10546E 06      -.43954E 04      -.11137E 05
WADJ(KL),W(KL),WSIM     543.3     261.7     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.388670        6
IDADJ,NPTSO,INDEX,W,WADJ 12907  3673     6     261.66     543.31
STATIS KL, W(KL),WADJ(KL)        3  0.6264250488E 03  0.6256181641E 03

  ADJUST   3  WEIGHT      626.4  WAS      302.8   SPFAC-0.20624E 02   CHANGE0.0          0.0          0.15573E 00 0.13584E 02
 STATISTICS: TRACE        35.1  SKEW     1353.0  KURT     13892.6
        TESTS (SPLIT=0): -.10128E 06      -.34013E 04      -.64656E 04
WADJ(KL),W(KL),WSIM     667.2     323.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.541501        3
IDADJ,NPTSO,INDEX,W,WADJ 12860  3687     3     323.62     667.23
STATIS KL, W(KL),WADJ(KL)        2  0.5425566406E 03  0.5424521484E 03

  ADJUST   2  WEIGHT      542.6  WAS      261.2   SPFAC-0.13985E 02   CHANGE0.0          0.0          0.15694E 00 0.12048E 03
 STATISTICS: TRACE       -79.9  SKEW     1150.7  KURT     11902.4
        TESTS (SPLIT=0): -.10202E 06      -.40880E 04      -.96245E 04
WADJ(KL),W(KL),WSIM     582.7     281.3     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.485038        2
IDADJ,NPTSO,INDEX,W,WADJ 12931  3709     2     281.33     582.66
STATIS KL, W(KL),WADJ(KL)       10  0.4203500977E 03  0.4203022461E 03

  ADJUST  10  WEIGHT      420.4  WAS      200.2   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.18929E 00 0.18971E 03
 STATISTICS: TRACE        29.0  SKEW     1406.5  KURT     16619.8
        TESTS (SPLIT=0): -.12007E 06      -.44364E 04      -.73903E 04
WADJ(KL),W(KL),WSIM     460.4     220.2     400.0
 ALPHA ERROR:PRK,P,CM,W 10.8597E 00.1009E 01.9496E 00.2202E 03
  (ERROR CONT) CIN.4060E 03.1934E 03.2126E 03  W(KF),CTOT,DEN,ODEN.4225E 03**********.4721E 03.2613E 03

CLUSTER 735 INDEX  10  PROPORTION    1.06208 W PARENT  422.499
 SPLIT-0.1000E 05
WEIGHT     220.199  WAS      200.151    ADJUST     460.398  ID 12817
PROPORTION: PROP 1.00856  CIN  405.96  CTOT  -49.57
OLD PROP 0.859061  CIN 193.35  ODEN 261.27  DIFFER   0.0
VOLUME0.14E 21   ROOT0.16E-07   DCON   -1.19

 LOCATION 3329  LINK 11 3487  SUBS  0    0  SUPER  9 3043  SYMBOL******
INDEX =     10    SYMBOL = ******

NET PROB******** DIRECT******** CUMS   0.0  *   0.0
                              CUMS.0        * .0


 MEAN          26.34  27.31  28.15  26.42  21.47  22.12  24.29  23.03

 COVARIANCE    3.83   5.83   5.01   4.59   2.43   3.81   2.42   1.86
        2      5.83  12.37   9.41   8.01   4.58   8.52   4.62   3.21
        3      5.01   9.41   9.88   9.06   2.90   4.87   5.16   4.65
        4      4.59   8.01   9.06  10.12   2.01   2.78   4.71   5.29
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         5     2.43   4.58   2.90   2.01   3.07   4.66   1.68   0.55
         6     3.81   8.52   4.87   2.78   4.66   9.23   2.62   0.34
         7     2.42   4.62   5.16   4.71   1.68   2.62   3.51   2.63
         8     1.46   3.21   4.65   5.29   0.55   0.34   2.83   3.89

 SKEW(*W)    -572.4-1110.3-1058.3-1242.7 -327.7 -234.3 -404.8 -675.4


PROPORTION RELATIVE TO TOP LEVEL =      0.217233        10
IDADJ.NPTSO.INDEX.W.WADJ 12817  3455     10        220.20        460.40
STATIS KL, W(KL).WADJ(KL)        12  0.4222595215E 03  0.4215820313E 03

 ADJUST  12  WEIGHT      422.3  WAS       200.8   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.22081E 00 0.21847E 02
 STATISTICS: TRACE        27.5  SKEW     1872.4  KURT     13158.8
        TESTS (SPLIT=0): -.11982E 06       -.39547E 04       -.10766E 05
WADJ(KL).W(KL).WSIM      462.9      221.5       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.215510        12
IDADJ.NPTSO.INDEX.W.WADJ 12781  3951     12        221.47        462.94
STATIS KL, W(KL).WADJ(KL)         8  0.4613010254E 03  0.4609194336E 03

 ADJUST   8  WEIGHT      461.3  WAS       220.5   SPFAC-0.18144E 02   CHANGE0.0          0.0          0.15966E 00 0.16622E 02
 STATISTICS: TRACE        57.9  SKEW     1651.8  KURT     13033.3
        TESTS (SPLIT=0): -.11262E 06       -.39528E 04       -.99974E 04
WADJ(KL).W(KL).WSIM      501.7      240.8       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.228351         8
IDADJ.NPTSO.INDEX.W.WADJ 12790  3969      8        240.84        501.68
STATIS KL, W(KL).WADJ(KL)         9  0.4607807617E 03  0.4605527344E 03

 ADJUST   9  WEIGHT      460.8  WAS       220.3   SPFAC-0.17488E 02   CHANGE0.0          0.0          0.15876E 00 0.23468E 03
 STATISTICS: TRACE        67.0  SKEW     1074.7  KURT     18975.4
        TESTS (SPLIT=0): -.11156E 06       -.45335E 04       -.40699E 04
WADJ(KL).W(KL).WSIM      501.0      240.5       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.253004         9
IDADJ.NPTSO.INDEX.W.WADJ 12859  4000      9        240.50        501.01
STATIS KL, W(KL).WADJ(KL)         4  0.6234631348E 03  0.6229116211E 03

 ADJUST   4  WEIGHT      623.5  WAS       301.5   SPFAC-0.75970E 01   CHANGE0.0          0.0          0.70578E-01 0.13495E 02
 STATISTICS: TRACE       162.5  SKEW     2118.5  KURT     17159.9
        TESTS (SPLIT=0): -.76316E 05       -.28452E 04       -.32371E 04
WADJ(KL).W(KL).WSIM      664.0      322.0       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.514939         4
IDADJ.NPTSO.INDEX.W.WADJ 13328  4124      4        322.01        664.01
STATIS KL, W(KL).WADJ(KL)         3  0.6674846191E 03  0.6672319336E 03

 ADJUST   3  WEIGHT      667.5  WAS       323.6   SPFAC 0.84793E 01   CHANGE0.0          0.0          0.16797E 00 0.15235E 02
 STATISTICS: TRACE       223.3  SKEW     5630.3  KURT     32911.1
        TESTS (SPLIT=0): -.50342E 05        0.78754E 03       0.13011E 05
WADJ(KL).W(KL).WSIM      707.7      343.9       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.588241         3
IDADJ.NPTSO.INDEX.W.WADJ 13487  4271      3        343.87        707.74
STATIS KL, W(KL).WADJ(KL)         6  0.5441069336E 03  0.5433125000E 03

 ADJUST   6  WEIGHT      544.1  WAS       261.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.81764E-01 0.67534E 02
 STATISTICS: TRACE        36.9  SKEW     1773.6  KURT      8641.7
        TESTS (SPLIT=0): -.10686E 06       -.34564E 04       -.12850E 05
WADJ(KL).W(KL).WSIM      584.9      282.5       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.371000         6
IDADJ.NPTSO.INDEX.W.WADJ 13473  4412      6        282.45        584.90
STATIS KL, W(KL).WADJ(KL)        12  0.4633479004E 03  0.4629370117E 03

 ADJUST  12  WEIGHT      463.3  WAS       221.5   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.27911E 00 0.22027E 02
 STATISTICS: TRACE        82.8  SKEW     4168.6  KURT     24340.5
        TESTS (SPLIT=0): -.10899E 06       -.14251E 04       0.13546E 04
WADJ(KL).W(KL).WSIM      503.8      241.9       400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.323489        12
00-00
02-40       03-51
06-35 07-03 04-59                       05-03
            08-35             09-22
            12-32       13-03 10-22 11-02
            14-14 15-16
***HAVE SPLIT 12 WEIGHT   241.9 SUBS 14 15 ITEM  30
KL.INDEX.LSUPER  3773    12   145

DUMP OF OBSERVED CLUSTERS FROM 12   3773
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CLUSTER   0 INDEX  12  PROPORTION     0.84067 W PARENT  440.200
 SPLIT-0.1700E 02
WEIGHT     241.879  WAS      221.469     ADJUST      503.759  ID 13751
PROPORTION: PROP 0.91414  CIN  222.92  CTOT  215.03
OLD PROP 0.914139  CIN 222.92  ODEN 265.17  DIFFER   0.0
VOLUME0.23E 21    ROOT0.14E-07    DCON    -1.15

 LOCATION 3773  LINK 13 3931  SUBS 14 4217  SUPER  8  145  SYMBOL      1
INDEX =      12     SYMBOL =       1

NET PROB******** DIRECT******** CUMS    0.0  *    1.00
                                CUMS.0          * .10000E 01


 MEAN          25.56  27.13  26.98  25.54  21.90  23.25  23.77  22.57

 COVARIANCE    3.80   5.10   3.89   3.67   0.48   1.31   0.37   0.20
        2      5.10  10.28   5.98   5.81   0.82   4.09   1.33  -0.04
        3      3.89   5.98   5.72   4.89   0.27   1.17   1.05   0.87
        4      3.67   5.81   4.89   5.61  -0.27   0.77   0.41   0.45
        5      0.48   0.82   0.27  -0.27   1.39   1.80   0.71   0.41
        6      1.31   4.09   1.17   0.77   1.80   5.16   1.22   0.39
        7      0.37   1.33   1.05   0.41   0.71   1.22   1.71   0.95
        8      0.20  -0.04   0.87   0.45   0.41   0.39   0.95   1.62

 SKEW(*W)   -1263.0-1644.7-1656.0-1460.5  314.1  453.9  245.1  303.2


CLUSTER   1 INDEX  14  PROPORTION     0.44722 W PARENT  241.879
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 14298
PROPORTION: PROP 0.44722  CIN   35.78  CTOT  161.88
OLD PROP 0.447217  CIN  35.78  ODEN  80.00  DIFFER   0.0
VOLUME0.73E-19    ROOT0.27E-09    DCON     4.74

 LOCATION 4217  LINK 15 4375  SUBS  0     0  SUPER 12 3773  SYMBOL      2
INDEX =      14     SYMBOL =       2

NET PROB    0.0   DIRECT    0.0   CUMS    0.0  *    0.0
                                CUMS.0          * .0


 MEAN          25.20  27.35  26.80  25.28  22.48  25.06  24.42  22.81

 COVARIANCE    2.58   2.88   2.91   2.38   0.01  -0.68   0.15  -0.39
        2      2.88   7.29   3.67   3.85  -0.51   0.60   0.73  -1.42
        3      2.91   3.67   5.65   4.35  -0.81  -2.41   0.83   0.66
        4      2.38   3.85   4.35   5.19  -1.36  -2.36  -0.23  -0.45
        5      0.01  -0.51  -0.81  -1.36   1.51   1.84   0.93   0.93
        6     -0.68   0.60  -2.41  -2.36   1.84   4.44   1.04   0.68
        7      0.15   0.73   0.83  -0.23   0.93   1.04   2.08   1.69
        8     -0.39  -1.42   0.66  -0.45   0.93   0.68   1.69   2.88

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  15  PROPORTION     0.55278 W PARENT  241.879
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 14298
PROPORTION: PROP 0.55278  CIN   44.22  CTOT  161.88
OLD PROP 0.552783  CIN  44.22  ODEN  80.00  DIFFER   0.0
VOLUME0.24E-20    ROOT0.49E-10    DCON     4.74

 LOCATION 4375  LINK  0     0  SUBS  0     0  SUPER 12 3773  SYMBOL      3
INDEX =      15     SYMBOL =       3
```

```
NET PROB    0.0    DIRECT    0.0    CUMS    0.0  *    0.0
                              CUMS.0          * .0

 MEAN          25.86  25.96  27.13  25.74  21.43  21.74  23.25  22.37

 COVARIANCE    4.01   5.90   4.05   4.14   0.82   2.65   0.64   0.48
       2       5.90  10.59   6.83   6.58   1.56   5.64   1.53   0.86
       3       4.05   6.83   4.80   4.61   0.99   3.58   0.98   0.62
       4       4.14   6.58   4.61   5.16   0.82   2.91   0.94   0.82
       5       0.82   1.56   0.99   0.82   1.13   1.39   0.51   0.09
       6       2.65   5.64   3.58   2.91   1.39   4.43   1.03   0.30
       7       0.64   1.53   0.98   0.94   0.51   1.03   1.07   0.33
       8       0.48   0.86   0.62   0.82   0.09   0.30   0.33   0.46

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ.NPTSO.INDEX.W.WADJ 13751  4498    12       241.88       503.76
STATIS KL. W(KL).WADJ(KL)         2  0.5627802734E 03  0.5626611328E 03

  ADJUST   2  WEIGHT      582.8  WAS      281.3   SPFAC-0.15734E 02   CHANGE0.0          0.0          0.95750E-01 0.70357E 02
 STATISTICS: TRACE       67.4  SKEW     2173.0  KURT      6589.4
        TESTS (SPLIT=0): -.10085E 06      -.29204E 04       -.14341E 05
WADJ(KL).W(KL).WSIM      622.9     301.4      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.366720       2
IDADJ.NPTSO.INDEX.W.WADJ 13509  4523     2       391.45       622.90
STATIS KL. W(KL).WADJ(KL)         8  0.5017646484E 03  0.5016826172E 03

  ADJUST   8  WEIGHT      501.8  WAS      240.8   SPFAC-0.14107E 02   CHANGE0.0          0.0          0.31791E 00 0.25014E 02
 STATISTICS: TRACE      156.5  SKEW     5606.0  KURT     30866.8
        TESTS (SPLIT=0): -.87441E 05       0.19710E 03       0.86403E 04
WADJ(KL).W(KL).WSIM      541.8     260.9      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.410260       8
IDADJ.NPTSO.INDEX.W.WADJ 13769  4537     8       260.92       541.85
STATIS KL. W(KL).WADJ(KL)         4  0.6644152832E 03  0.6640146484E 03

  ADJUST   4  WEIGHT      664.4  WAS      322.0   SPFAC-0.11991E 02   CHANGE0.0          0.0          0.23131E 00 0.10065E 02
 STATISTICS: TRACE       33.8  SKEW     4475.7  KURT     24823.9
        TESTS (SPLIT=0): -.99228E 05       -.37470E 03       0.48925E 04
WADJ(KL).W(KL).WSIM      704.8     342.4      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.611943       4
IDADJ.NPTSO.INDEX.W.WADJ 13924  4639     4       342.41       704.82
STATIS KL. W(KL).WADJ(KL)         3  0.7083610840E 03  0.7077373047E 03

  ADJUST   3  WEIGHT      708.4  WAS      343.9   SPFAC-0.20734E 02   CHANGE0.0          0.0          0.60978E-01 0.20964E 02
 STATISTICS: TRACE       41.6  SKEW     1651.8  KURT     12865.1
        TESTS (SPLIT=0): -.96398E 05       -.30902E 04       -.66210E 04

CLUSTER 745 INDEX   3  PROPORTION     0.04866 W PARENT 4794.000
 SPLIT-0.2073E 02
WEIGHT     708.361  WAS     343.869    ADJUST     707.737  ID 14071
PROPORTION: PROP 0.65170  CIN  633.67  CTOT 3822.21
OLD PROP 0.600964  CIN 306.37  ODEN 513.73  DIFFER   8.04
VOLUME0.19E-15   ROOT0.14E-07   DCON   -1.03

 LOCATION 1741  LINK  0    0  SUBS  4 2155  SUPER  0  119  SYMBOL******
INDEX =      3    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.00

 MEAN          25.98  27.47  27.49  25.98  21.84  22.99  23.94  22.75

 COVARIANCE    4.09   5.65   4.36   3.95   1.35   2.55   1.22   0.90
       2       5.65  11.10   7.12   6.45   2.36   6.12   2.65   1.28
       3       4.36   7.12   6.69   5.77   1.40   2.92   2.33   1.88
       4       3.95   6.45   5.77   5.48   0.66   1.89   1.11   1.73
       5       1.35   2.36   1.40   0.66   2.01   2.55   1.23   0.53
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         6     2.55   6.12   2.92   1.89   2.86   6.81   2.04   0.73
         7     1.22   2.65   2.32   1.54   1.23   2.04   2.15   1.26
         8     0.90   1.25   1.88   1.73   0.63   0.73   1.26   1.90

 SKEW(*W)     403.6 1274.6   74.2  -75.6  681.2 1397.6  527.3   83.7


WADJ(KL),W(KL),WSIM     749.0     364.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.669339        3
IDADJ,NPTSO,INDEX,W,WADJ 14071  4794     3      364.49      748.98
STATIS KL, W(KL),WADJ(KL)       10  0.4606749047E 03  0.4603979492E 03

 ADJUST  10  WEIGHT      460.7  WAS      220.2   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.17386E 00 0.11261E 03
 STATISTICS: TRACE        67.0  SKEW     2100.3  KURT      21587.2
        TESTS (SPLIT=0): -.11156E 06      -.35081E 04      -.14594E 04
WADJ(KL),W(KL),WSIM     501.0     240.5     400.0
 ALPHA ERROR:PHK,P,CM,W 10.9962E 00.1039E 01.1062E 0[illegible]2405E 03
  (ERROR CONT) CIN.4470E 03.2126E 03.2344E 03  W(KF),CTOT,DEN,ODEN.4345E 03*********.4487E 03.2230E 03

CLUSTER 747 INDEX  10  PROPORTION    0.97773 W PARENT  434.490
 SPLIT-0.1000E 05
WEIGHT     240.476  WAS      220.199     ADJUST     500.952  ID 13655
PROPORTION: PROP 1.03858  CIN  447.02  CTOT  -14.22
OLD PROP 0.905313  CIN 212.60  ODEN 223.00  DIFFER   0.0
VOLUME0.17E 21    ROOT0.14E-07   DCON   -1.16

 LOCATION 3329  LINK 11 3487  SUBS  0    0  SUPER  9 3043  SYMBOL******
INDEX =     10    SYMBOL = ******

NET PROB******* DIRECT******* CUMS   0.0  *   0.0
                              CUMS.0        * .0


 MEAN          26.68  28.12  28.44  26.75  22.03  22.95  24.48  23.21

 COVARIANCE    4.68   7.01   4.97   4.23   2.92   4.92   2.30   1.67
         2     7.01  13.49   8.94   7.40   5.13   9.92   4.81   3.15
         3     4.97   8.94   7.68   6.60   3.24   5.66   3.94   3.16
         4     4.23   7.40   6.60   7.41   2.13   3.42   3.15   3.51
         5     2.92   5.13   3.24   2.13   3.33   5.17   2.15   1.03
         6     4.92   9.92   5.66   3.42   5.17  10.30   3.69   1.47
         7     2.30   4.81   3.94   3.15   2.15   3.69   2.96   1.97
         8     1.67   3.15   3.16   3.51   1.03   1.47   1.97   2.58

 SKEW(*W)     789.2 1790.0  853.3  852.0  853.4 1475.3  510.7  565.2


PROPORTION RELATIVE TO TOP LEVEL =      0.177288       10
IDADJ,NPTSO,INDEX,W,WADJ 13655  4975    10      240.48      500.95
STATIS KL, W(KL),WADJ(KL)       12  0.5040935059E 03  0.5037587891E 03

 ADJUST  12  WEIGHT      504.1  WAS      241.9   SPFAC-0.75214E 02   CHANGE0.0          0.0          0.29994E-01 0.71578E 01
 STATISTICS: TRACE        55.5  SKEW      580.9  KURT      5546.8
        TESTS (SPLIT=0): -.10860E 06      -.48165E 04      -.16632E 05
WADJ(KL),W(KL),WSIM     544.4     262.2     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.334098       12
IDADJ,NPTSO,INDEX,W,WADJ 14298  5159    12      262.21      544.43
STATIS KL, W(KL),WADJ(KL)        9  0.5016525879E 03  0.5010087891E 03

 ADJUST   9  WEIGHT      501.7  WAS      240.5   SPFAC-0.34281E 02   CHANGE0.0          0.0          0.15108E 00 0.20022E 03
 STATISTICS: TRACE       -20.0  SKEW     1414.7  KURT      9962.1
        TESTS (SPLIT=0): -.11148E 06      -.39922E 04      -.12256E 05
WADJ(KL),W(KL),WSIM     542.3     261.1     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.192098        9
IDADJ,NPTSO,INDEX,W,WADJ 13800  5206     9      261.15      542.30
STATIS KL, W(KL),WADJ(KL)        4  0.7055498047E 03  0.7048159180E 03

 ADJUST   4  WEIGHT      705.5  WAS      342.4   SPFAC 0.23903E 02   CHANGE0.0          0.0          0.73512E-01 0.70788E 01
 STATISTICS: TRACE       194.3  SKEW     1705.2  KURT      18119.1
        TESTS (SPLIT=0): -.60515E 05      -.30431E 04      -.13926E 04
WADJ(KL),W(KL),WSIM     746.3     363.1     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.596107        4
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***SEPERATE   4 SUPER,SUMS   3  8 SPFAC 0.23903E 02
00-00
02-35        03-62
06-32 07-02 08-39                09-21        05-02
            12-34          13-03 10-19 11-01
            14-15 15-20
STATIS KL, W(KL),WADJ(KL)        8  0.5424858398E 03  0.5418466797E 03


 ADJUST   8  WEIGHT      542.5  WAS      260.9   SPFAC-0.15351E 02   CHANGE0.0          0.0          0.23536E-01 0.74539E 01
 STATISTICS: TRACE        31.1  SKEW     399.4  KURT     6169.8
       TESTS (SPLIT=0): -.10824E 06      -.48374E 04      -.15350E 05
WADJ(KL),W(KL),WSIM      563.1     281.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.377685        8
IDADJ,NPTSO,INDEX,W,WADJ 14337  5268        8     281.56      583.13
STATIS KL, W(KL),WADJ(KL)        6  0.5857641602E 03  0.5849013672E 03


 ADJUST   6  WEIGHT      585.8  WAS      282.5   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.77671E-01 0.36456E 02
 STATISTICS: TRACE       134.1  SKEW    1639.3  KURT    15839.9
       TESTS (SPLIT=0): -.87156E 05      -.34416E 04      -.50387E 04
WADJ(KL),W(KL),WSIM      626.6     303.3     400.0
 ALPHA ERROR:PRK,P,CM,W  6.93  E 00.1007E 01.1002E 01.3033E 03
  (ERROR CONT) CIN.5378E 03.2577E 03.2802E 03  W(KF),CTOT,DEN,ODEN.5716E 03*********.5733E 03.2949E 03

CLUSTER 752 INDEX   6  PROPORTION    1.00439 W PARENT  571.620
 SPLIT=0.1000E 05
WEIGHT    303.313  WAS      282.451    ADJUST     626.627  ID 14212
PROPORTION: PROP 1.00653  CIN  537.85  CTOT   -1.63
OLD PROP 0.927190  CIN 257.69  ODEN 294.91  DIFFER   0.0
VOLUME0.12E 22   ROOT0.12E-07   DCON   -1.09

 LOCATION 2599  LINK  7 2757  SUBS  0    0  SUPER  2 1583  SYMBOL******
INDEX =      6    SYMBOL = ******

NET PROB******* DIRECT******* CUMS   0.0  *   0.0
                          CUMS.0         * .0


 MEAN          26.39  28.11  30.54  29.86  19.77  19.35  26.47  27.48

 COVARIANCE    1.40   1.56   0.61   0.27   1.06   1.45   0.49   0.48
        2      1.56   4.02   1.22   0.34   1.98   4.19   0.98  -0.09
        3      0.61   1.22   2.67   2.77   0.59   0.60   1.19   0.82
        4      0.27   0.34   2.77   5.18  -0.49  -1.70   2.06   2.87
        5      1.06   1.98   0.59  -0.49   2.32   3.58   0.08  -1.23
        6      1.45   4.19   0.60  -1.70   3.58   7.63  -0.41  -3.13
        7      0.49   0.98   1.19   2.06   0.08  -0.41   2.35   2.40
        8      0.48  -0.09   0.82   2.87  -1.23  -3.13   2.40   4.99

 SKEW(*W)       96.5  852.8  162.6   57.4  177.6  644.3 -266.1 -280.6


PROPORTION RELATIVE TO TOP LEVEL =      0.329428        6
IDADJ,NPTSO,INDEX,W,WADJ 14212  5270        6     303.31      626.63
STATIS KL, W(KL),WADJ(KL)        2  0.6231044922E 03  0.6228994141E 03


 ADJUST   2  WEIGHT      623.1  WAS      301.4   SPFAC-0.17477E 02   CHANGE0.0          0.0          0.14378E 00 0.51826E 02
 STATISTICS: TRACE        -2.7  SKEW    1814.0  KURT    18792.8
       TESTS (SPLIT=0): -.10275E 06      -.31518E 04      -.16128E 04
WADJ(KL),W(KL),WSIM      663.3     321.7     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.384600        2
IDADJ,NPTSO,INDEX,W,WADJ 14323  5367        2     321.65      663.31
STATIS KL, W(KL),WADJ(KL)        3  0.7499802246E 03  0.7489848633E 03
STATIS KL, W(KL),WADJ(KL)       15  0.2802792969E 03  0.2800000000E 03


 ADJUST  15  WEIGHT      280.3  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.15880E 00 0.51064E 02
 STATISTICS: TRACE       521.8  SKEW    2371.2  KURT    16155.6
       TESTS (SPLIT=0): 0.14560E 06      -.37483E 04      -.89912E 04
WADJ(KL),W(KL),WSIM      420.6     200.3     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.186456       15
00-00
02-39        03-61
06-37 07-02 08-35                09-23        05-02
            12-32          13-02 10-21 11-01
            14-13 15-19
                  15-10 17-09
***HAVE SPLIT IS WEIGHT   200.3 SUBS 16 17 ITER  14
KL,INDEX,LSUPER  4375    15  3773
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DUMP OF OBSERVED CLUSTERS FROM 15   4375

CLUSTER   0 INDEX  15  PROPORTION     0.57485 W PARENT  339.106
 SPLIT-0.1700E 02
WEIGHT      200.279  WAS       80.009     ADJUST      420.559  ID 14298
PROPORTION: PROP 0.58464  CIN  158.04  CTOT   84.18
OLD PROP 0.584641  CIN 158.04  ODEN 274.93  DIFFER   0.0
VOLUME0.12E 20    ROOT0.36E-07    DCON    -5.25

 LOCATION 4375  LINK  0    0  SUBS 16 2155  SUPER 12 3773  SYMBOL      1
INDEX =      15    SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS    0.0  *    1.00
                               CUMS.0          * .10000E 01


 MEAN          26.10  27.70  27.48  26.14  21.61  22.48  23.51  22.43

 COVARIANCE    3.83   5.68   3.52   3.50   1.05   3.22   0.23   0.34
        2      5.68  11.35   6.10   5.88   2.13   6.95   1.13   0.30
        3      3.52   6.10   4.59   4.09   1.24   3.84   0.85   0.78
        4      3.50   5.88   4.09   4.97   0.47   3.03   0.12   0.62
        5      1.05   2.13   1.24   0.47   1.64   2.13   0.91   0.33
        6      3.22   6.95   3.84   3.03   2.13   5.81   1.38   0.58
        7      0.23   1.13   0.85   0.12   0.91   1.38   1.45   0.65
        8      0.34   0.30   0.78   0.62   0.33   0.58   0.65   1.22

 SKEW(*W)     658.0 1417.8  552.0  560.7  449.2 1300.7  358.9  165.4


CLUSTER   1 INDEX  16  PROPORTION     0.52477 W PARENT  200.279
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 15253
PROPORTION: PROP 0.52477  CIN   41.98  CTOT  120.28
OLD PROP 0.524768  CIN  41.98  ODEN  80.00  DIFFER   0.0
VOLUME0.92E-18    ROOT0.96E-09    DCON     4.74

 LOCATION 2155  LINK 17 4661  SUBS  0    0  SUPER 15 4375  SYMBOL      2
INDEX =      16    SYMBOL =       2

NET PROB*******  DIRECT*******  CUMS******* *    1.04

 MEAN          26.71  29.03  28.07  26.71  22.02  23.68  23.83  22.54

 COVARIANCE    4.96   7.26   4.00   4.17   1.40   4.24   0.46   0.72
        2      7.26  14.18   6.88   7.00   2.59   8.78   1.54   0.69
        3      4.00   6.88   5.28   4.90   1.34   4.21   1.16   1.16
        4      4.17   7.00   4.90   6.09   0.62   3.49   0.43   1.14
        5      1.40   2.59   1.34   0.62   2.01   2.73   1.10   0.63
        6      4.24   8.78   4.21   3.49   2.73   7.56   1.76   1.00
        7      0.46   1.54   1.16   0.43   1.10   1.76   1.83   0.93
        8      0.72   0.69   1.16   1.14   0.63   1.00   0.93   1.85

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  17  PROPORTION     0.47523 W PARENT  200.279
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 15253
PROPORTION: PROP 0.47523  CIN   38.02  CTOT  120.28
OLD PROP 0.475232  CIN  38.02  ODEN  80.00  DIFFER   0.0
VOLUME0.29E-25    ROOT0.17E-12    DCON     4.74

 LOCATION 4661  LINK  0    0  SUBS  0    0  SUPER 15 4375  SYMBOL      3
INDEX =      17    SYMBOL =       3
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NET PROB   0.0   DIRECT   0.0   CUMS   0.0  *   0.0
                          CUMS.0          * .0


 MEAN          25.43  26.23  26.44  25.50  21.15  21.16  23.15  22.30

 COVARIANCE    1.66   2.86   1.84   1.68   0.76   1.96   0.19  -0.04
        2      2.86   5.29   3.30   2.94   1.43   3.69   0.46  -0.09
        3      1.84   3.30   2.22   1.95   0.91   2.32   0.31   0.00
        4      1.68   2.94   1.95   1.92   0.70   1.99   0.16  -0.02
        5      0.76   1.43   0.91   0.70   0.55   1.10   0.22   0.01
        6      1.96   3.69   2.32   1.99   1.10   2.76   0.40  -0.02
        7      0.19   0.46   0.31   0.16   0.22   0.40   0.22   0.08
        8     -0.04  -0.09   0.00  -0.02   0.01  -0.02   0.08   0.15

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 14298  5453    15       200.28       420.56
STATIS KL, W(KL),WADJ(KL)        3  0.75096801766E 03  0.74898486336E 03


  ADJUST   3  WEIGHT       751.0  WAS       364.5   SPFAC 0.23476E 02   CHANGE0.0          0.0          0.53573E-01 0.88569E 01
 STATISTICS: TRACE      153.3  SKEW       695.0  KURT     26169.0
        TESTS (SPLIT=0): -.72654E 05      -.39514E 04       0.70756E 04
WADJ(KL),W(KL),WSIM      793.0     386.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.599588        3

***SEPERATE   3 SUPER,SUBS   0  8 SPFAC 0.23476E 02
00-00
08-35                  09-23         05-02 02-40
12-32            13-02 10-21 11-01         06-38 07-02
14-13 15-18
      16-10 17-09
STATIS KL, W(KL),WADJ(KL)       10  0.50103027346E 03  0.50095166026E 03


  ADJUST  10  WEIGHT       501.0  WAS       240.5   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.15261E 00 0.11257E 02
 STATISTICS: TRACE      129.0  SKEW      2069.4  KURT     27112.4
        TESTS (SPLIT=0): -.95359E 05      -.33428E 04       0.48722E 04
WADJ(KL),W(KL),WSIM      541.1     260.6     400.0
 ALPHA ERROR:PRR,P,CM,W 10.9449E 00.1011E 01.9933E 00.2606E 03
  (ERROR CONT) CIN.4882E 03.2344E 03.2538E 03  W(KF),CTOT,DEN,ODEN.4523E 03*********.5166E 03.2655E 03

CLUSTER 756 INDEX  10  PROPORTION     1.01746 W PARENT  452.275
 SPLIT-0.1000E 05
WEIGHT     260.554  WAS      240.476    ADJUST     541.109  ID 14775
PROPORTION: PROP 1.01066  CIN  488.23  CTOT  -64.37
OLD PROP 0.937848  CIN 234.42  ODEN 265.51  DIFFER   0.0
VOLUME0.34E 21   ROOT0.12E-07   DCON   -1.12

 LOCATION 3329  LINK 11 3487  SUBS  0    0  SUPER  9 3043  SYMBOL******
INDEX =     10    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS   0.0  *   0.0
                          CUMS.0          * .0


 MEAN          26.06  26.92  27.57  25.90  21.49  22.22  24.02  22.80

 COVARIANCE    4.33   6.75   4.82   4.33   2.74   4.73   2.30   1.47
        2      6.75  14.03   9.02   7.23   5.28  10.39   4.44   2.35
        3      4.82   9.02   7.72   6.61   3.28   6.09   4.07   2.95
        4      4.33   7.23   6.61   7.81   2.73   4.04   3.72   4.05
        5      2.74   5.28   3.28   2.73   2.96   4.60   1.91   0.90
        6      4.73  10.39   6.09   4.04   4.60   9.55   3.26   0.78
        7      2.30   4.44   4.07   3.72   1.91   3.26   2.99   2.18
        8      1.47   2.35   2.95   4.05   0.90   0.78   2.18   3.30

 SKEW(*W)   -1053.9-2035.1-1575.1-1302.2-1034.5-1297.4 -836.1 -760.5
```

```
PROPORTION RELATIVE TO TOP LEVEL =      0.231140       10
00-00
08-30                    09-24                    05-02 02-43
12-28          13-02 10-23          11-01                06-41 07-02
14-11 15-17              18-12 19-11
      16-12 17-05
***HAVE SPLIT 10 WEIGHT    260.6 SUBS 18 19 ITER  17
KL,INDEX,LSUPER  3329     10  3043
```

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DUMP OF OBSERVED CLUSTERS FROM 10   3329

CLUSTER   0 INDEX  10  PROPORTION     0.95765 W PARENT  452.275
 SPLIT-0.1700E 02
WEIGHT     260.554  WAS      240.476     ADJUST      541.109  ID 14775
PROPORTION: PROP 0.95125  CIN  253.82  CTOT  187.23
OLD PROP 0.951253  CIN 253.82  ODEN 265.04  DIFFER   0.0
VOLUME0.34E 21   ROOT0.12E-07   DCON   -1.12

 LOCATION 3329  LINK 11 3487  SUBS 18 1741  SUPER  9 3043  SYMBOL      1
INDEX =     10    SYMBOL =      1

NET PROB******** DIRECT******* CUMS   0.0  *   1.00
                        CUMS.0          * .10000E 01


 MEAN          26.06  26.92  27.57  25.90  21.49  22.22  24.02  22.80

 COVARIANCE    4.33   6.75   4.82   4.33   2.74   4.73   2.30   1.47
        2      6.75  14.03   9.02   7.23   5.28  10.39   4.44   2.35
        3      4.82   9.02   7.72   6.61   3.28   6.09   4.07   2.95
        4      4.33   7.23   6.61   7.81   2.73   4.04   3.72   4.05
        5      2.74   5.28   3.28   2.73   2.96   4.60   1.91   0.90
        6      4.73  10.39   6.09   4.04   4.60   9.55   3.26   0.78
        7      2.30   4.44   4.07   3.72   1.91   3.26   2.99   2.18
        8      1.47   2.35   2.95   4.05   0.90   0.78   2.18   3.30

 SKEW(*W)   -1053.9-2035.1-1575.1-1502.2-1034.5-1297.4 -836.1 -760.6


CLUSTER   1 INDEX  18  PROPORTION     0.50748 W PARENT  260.554
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 15712
PROPORTION: PROP 0.50748  CIN   40.60  CTOT  180.55
OLD PROP 0.507483  CIN  40.60  ODEN  80.00  DIFFER   0.0
VOLUME0.23E-18   ROOT0.48E-09   DCON     4.74

 LOCATION 1741  LINK 19 4947  SUBS  0     0  SUPER 10 3329  SYMBOL      2
INDEX =     18    SYMBOL =      2

NET PROB******** DIRECT******* CUMS******* *   0.98

 MEAN          24.45  23.78  25.48  24.37  20.13  19.87  22.82  22.13

 COVARIANCE    2.98   2.97   3.04   3.81   1.55   1.74   1.26   1.51
        2      2.97   6.66   4.39   3.65   2.58   5.07   1.09   0.48
        3      3.04   4.39   5.83   5.61   1.53   2.47   2.76   2.84
        4      3.81   3.65   5.61   7.71   1.61   1.55   3.24   4.51
        5      1.55   2.58   1.53   1.61   2.17   2.64   0.69   0.04
        6      1.74   5.07   2.47   1.55   2.64   5.66   0.70  -0.91
        7      1.26   1.09   2.76   3.24   0.69   0.70   2.40   2.24
        8      1.51   0.48   2.84   4.51   0.04  -0.91   2.24   4.12

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  19  PROPORTION     0.49252 W PARENT  260.554
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 15712
PROPORTION: PROP 0.49252  CIN   39.40  CTOT  180.55
OLD PROP 0.492517  CIN  39.40  ODEN  80.00  DIFFER   0.0
VOLUME0.37E-21   ROOT0.19E-10   DCON     4.74

 LOCATION 4947  LINK  0     0  SUBS  0     0  SUPER 10 3329  SYMBOL      3
INDEX =     19    SYMBOL =      3

NET PROB    0.0   DIRECT    0.0   CUMS    0.0  *    0.0
                        CUMS.0          * .0
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 MEAN          27.73  30.16  29.72  27.48  22.89  24.65  25.26  23.49

 COVARIANCE    2.06   2.95   1.93   1.65   0.79   1.78   0.37  -0.03
       2       2.95   5.91   3.92   4.04   1.68   3.55   1.63   1.15
       3       1.93   3.92   3.00   3.30   1.11   2.10   1.33   1.16
       4       1.65   4.04   3.30   5.41   1.14   1.05   1.58   2.57
       5       0.79   1.68   1.11   1.14   1.13   1.61   0.65   0.73
       6       1.78   3.55   2.10   1.05   1.61   3.90   0.99   0.17
       7       0.37   1.63   1.33   1.58   0.65   0.99   1.19   1.11
       8      -0.03   1.15   1.16   2.57   0.73   0.17   1.11   2.08

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 14775  5912    10       260.55       541.11
STATIS KL, W(KL),WADJ(KL)        6  0.6273146973E 03  0.6266269531E 03


  ADJUST   5  WEIGHT      627.3  WAS       303.3   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.16206E 00 0.47857E 02
 STATISTICS: TRACE      -160.5  SKEW     1683.4  KURT     12527.5
        TESTS (SPLIT=0): -.76700E 05       -.32686E 04        -.78214E 04
WADJ(KL),W(KL),WSIM     668.0      324.0      400.0
 ALPHA ERROR:PRK,P,CM,W  6.9672E 00.1000E 01.1023E 01.3240E 03
  (ERROR CONT) CIN.5810E 03.2802E 03.3009E 03  W(KF),CTOT,DEN,ODEN.5956E 03*********.6007E 03.2999E 03

CLUSTER 757 INDEX   6  PROPORTION     0.97791 W PARENT  595.554
 SPLIT-0.1000E 05
WEIGHT    324.001  WAS      303.313    ADJUST     668.002  ID 15070
PROPORTION: PROP 1.00022  CIN  581.02  CTOT   -5.15
OLD PROP 0.936130  CIN 280.16  ODEN 299.91  DIFFER   0.0
VOLUME0.58E 21    ROOT0.88E-08   DCON    -1.06

 LOCATION 2599  LINK  7 2757  SUBS  0    0  SUPER  2 1583  SYMBOL******
INDEX =      6    SYMBOL = ******

NET PROB******* DIRECT******* CUMS    0.0  *   0.0
                              CUMS.0        * .0


 MEAN          26.60  28.38  30.83  30.21  19.89  19.31  27.00  27.99

 COVARIANCE    1.34   1.60   0.59   0.46   0.96   1.45   0.71   0.83
       2       1.60   3.93   1.18   0.60   1.67   4.02   1.14   0.61
       3       0.59   1.18   2.07   1.86   0.85   1.39   0.64   0.02
       4       0.46   0.60   1.86   3.61   0.27   0.02   1.36   1.54
       5       0.96   1.67   0.85   0.27   1.61   2.26   0.66  -0.01
       6       1.45   4.02   1.39   0.02   2.26   5.58   0.69  -0.71
       7       0.71   1.14   0.64   1.36   0.66   0.69   2.13   1.92
       8       0.83   0.61   0.02   1.54  -0.01  -0.71   1.92   3.61

 SKEW(*W)      407.9  773.3  427.0  787.2  226.9  228.9 1038.2  913.7


PROPORTION RELATIVE TO TOP LEVEL =     0.397219        6
IDADJ,NPTSO,INDEX,W,WADJ 15070  5984     6       324.00       668.00
STATIS KL, W(KL),WADJ(KL)       14  0.2801054688E 03  0.2800000000E 03


  ADJUST  14  WEIGHT      280.1  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.46713E 00 0.38697E 02
 STATISTICS: TRACE      186.8  SKEW     3785.5  KURT     18066.4
        TESTS (SPLIT=0): -.91810E 05       -.23367E 04        -.70913E 04
WADJ(KL),W(KL),WSIM     420.2      200.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.114280        14
IDADJ,NPTSO,INDEX,W,WADJ 14298  6047    14       200.11       420.21
STATIS KL, W(KL),WADJ(KL)       12  0.5447446289E 03  0.5444282227E 03
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 ADJUST  12  WEIGHT      544.7  WAS      262.2   SPFAC 0.33154E 02   CHANGE0.0          0.0          0.15847E 00 0.58007E 01
 STATISTICS: TRACE       67.8  SKEW     2156.9  KURT     5708.0
        TESTS (SPLIT=0): -.10362E 06      -.30725E 04      -.14781E 05
WADJ(KL),W(KL),WSIM     585.1     282.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.304930      12

***SEPERATE  12 SUPER,SUBS   8 14 SPFAC 0.33154E 02
00-00
08-33                   09-25                   05-02 02-41
14-12 15-19       13-02 10-24       11-01       06-38 07-02
      16-15 17-04       18-12 19-12
STATIS KL, W(KL),WADJ(KL)        8  0.5837644043E 03  0.5831250000E 03


 ADJUST   8  WEIGHT      583.8  WAS      281.6   SPFAC 0.22044E 02   CHANGE0.0          0.0          0.85297E-01 0.47996E 01
 STATISTICS: TRACE       66.2  SKEW     1157.5  KURT     4796.7
        TESTS (SPLIT=0): -.10091E 06      -.39308E 04      -.16112E 05
WADJ(KL),W(KL),WSIM     624.4     302.2     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.331627       8

***SEPERATE   8 SUPER,SUBS   0 14 SPFAC 0.22044E 02
00-00
14-13 15-19       13-02 09-25             05-02 02-40
      16-15 17-04       10-24       11-01       06-37 07-02
                        18-12 19-12
STATIS KL, W(KL),WADJ(KL)        2  0.6642934570E 03  0.6633095703E 03


 ADJUST   2  WEIGHT      664.3  WAS      321.7   SPFAC-0.21242E 02   CHANGE0.0          0.0          0.90895E-01 0.23395E 02
 STATISTICS: TRACE       45.3  SKEW     1413.5  KURT    14659.0
        TESTS (SPLIT=0): -.98294E 05      -.34356E 04      -.52674E 04

CLUSTER 760 INDEX   2  PROPORTION    0.39680 W PARENT 6256.000
 SPLIT-0.2124E 02
WEIGHT     664.293  WAS     321.655    ADJUST     663.310  ID 15167
PROPORTION: PROP 0.39667  CIN  632.25  CTOT 4663.62
OLD PROP 0.395619   CIN 296.75  ODEN 732.36  DIFFER   5.55
VOLUME0.71E-16   ROOT0.84E-08   DCON   -1.05

 LOCATION 1583  LINK  0    0  SUBS  6 2599  SUPER  0  119  SYMBOL******
INDEX =       2    SYMBOL = ******

NET PROB******* DIRECT******* CUMS******* *   0.99

 MEAN          26.52  28.23  30.77  30.14  19.78  19.20  26.81  27.87

 COVARIANCE    1.42   1.59   0.59   0.34   1.01   1.45   0.58   0.65
        2      1.59   3.96   1.15   0.46   1.81   4.03   1.06   0.33
        3      0.59   1.15   2.28   2.19   0.78   1.08   0.79   0.26
        4      0.34   0.46   2.19   4.17   0.05  -0.56   1.55   1.94
        5      1.01   1.81   0.78   0.05   1.84   2.69   0.47  -0.42
        6      1.45   4.03   1.08  -0.56   2.69   6.16   0.33  -1.56
        7      0.58   1.06   0.79   1.55   0.47   0.33   2.18   2.07
        8      0.65   0.33   0.26   1.94  -0.42  -1.56   2.07   4.13

 SKEW(*W)     474.2  434.7  579.8  904.5   19.0   -5.2  715.4  973.2


WADJ(KL),W(KL),WSIM     705.3     342.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.392812       2
IDADJ,NPTSO,INDEX,W,WADJ 15167  6256       2       342.64       705.28
STATIS KL, W(KL),WADJ(KL)        9  0.5430520020E 03  0.5422963867E 03


 ADJUST   9  WEIGHT      543.1  WAS      261.1   SPFAC-0.39492E 02   CHANGE0.0          0.0          0.35866E-01 0.15238E 02
 STATISTICS: TRACE       62.3  SKEW      599.4  KURT    13435.6
        TESTS (SPLIT=0): -.10443E 06      -.46348E 04      -.80731E 04
WADJ(KL),W(KL),WSIM     583.8     281.9     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.277320       9
IDADJ,NPTSO,INDEX,W,WADJ 15006  6285       9       281.90       583.81
STATIS KL, W(KL),WADJ(KL)       16  0.2807144531E 03  0.2800000000E 03
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 ADJUST  16  WEIGHT      280.3  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.33518E 00 0.61021E 02
 STATISTICS: TRACE     -208.8  SKEW     1533.3  KURT     3011.2
        TESTS (SPLIT=0): -.83043E 05      -.45857E 04      -.22133E 05
WADJ(KL),W(KL),WSIM      420.6     200.3     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.160307       16
IDADJ,NPTSO,INDEX,W,WADJ 15253   6429     16     200.31     420.63
STATIS KL, W(KL),WADJ(KL)        15  0.4206726074E 03  0.4205585938E 03

 ADJUST  15  WEIGHT      420.7  WAS      200.3   SPFAC-0.60746E 02   CHANGE0.0          0.0          0.16168E 00 0.23459E 02
 STATISTICS: TRACE       29.6  SKEW     1561.1  KURT     7706.7
        TESTS (SPLIT=0): -.11998E 06      -.42794E 04      -.16293E 05

CLUSTER 763 INDEX  15  PROPORTION     0.19489 W PARENT 6466.000
 SPLIT-0.6075E 02
WEIGHT     420.673  WAS      200.279    ADJUST     420.559  ID 15253
PROPORTION: PROP 0.19073  CIN  329.75  CTOT 4741.54
OLD PROP 0.176340  CIN 158.04  ODEN 911.49  DIFFER  22.06
VOLUME0.39E-16   ROOT0.63E-08   DCON   -1.19

 LOCATION 4375  LINK 13 3931  SUBS 16 2155  SUPER  0  119  SYMBOL******
INDEX =     15    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.90

 MEAN          26.31  27.87  27.69  26.44  21.57  22.50  23.50  22.43

 COVARIANCE    3.61   5.46   3.40   3.29   1.22   3.36   0.33   0.21
        2      5.46  11.42   6.03   5.51   2.44   7.34   1.49   0.10
        3      3.40   6.03   4.69   4.02   1.43   4.17   1.06   0.81
        4      3.29   5.51   4.02   4.80   0.59   3.14   0.16   0.54
        5      1.22   2.44   1.43   0.59   1.80   2.35   0.99   0.30
        6      3.36   7.34   4.17   3.14   2.35   6.13   1.70   0.55
        7      0.33   1.49   1.06   0.16   0.99   1.70   1.62   0.68
        8      0.21   0.10   0.81   0.54   0.30   0.55   0.68   1.26

 SKEW(*W)      532.9  188.2  489.4  739.1  -38.5  -17.4  -64.1   68.0


WADJ(KL),W(KL),WSIM      460.8     220.4     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.210986       15
IDADJ,NPTSO,INDEX,W,WADJ 15253   6468     15     220.39     460.79
STATIS KL, W(KL),WADJ(KL)         6  0.6682470703E 03  0.6680024414E 03

 ADJUST   6  WEIGHT      668.2  WAS      324.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.19637E 00 0.25879E 02
 STATISTICS: TRACE      110.4  SKEW     3985.3  KURT    20956.0
        TESTS (SPLIT=0): -.87986E 05      -.85553E 03       0.10639E 04
WADJ(KL),W(KL),WSIM      708.5     344.2     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.331053        6
00-00
14-15 15-22       13-02 09-24            05-02 02-35
      16-18 17-02       10-24      11-01       06-33      0
                        18-11 19-13            20-16 21-17
***HAVE SPLIT  6 WEIGHT   344.2 SUBS 20 21 ITER  14
KL,INDEX,LSUPER  2599     6  15A3
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DUMP OF OBSERVED CLUSTERS FROM  6   2599

CLUSTER   0 INDEX   6  PROPORTION     0.91170 W PARENT  619.046
 SPLIT-0.1700E 02
WEIGHT      344.246  WAS      324.001    ADJUST      708.492  ID 15784
PROPORTION: PROP 0.95462  CIN  330.13  CTOT  256.94
OLD PROP 0.954619  CIN 330.13  ODEN 362.11  DIFFER   0.0
VOLUME0.11E 22   ROOT0.63E-08   DCON   -1.04

 LOCATION 2599  LINK  7 2757  SUBS 20  145  SUPER  2 1583  SYMBOL      1
INDEX =      6    SYMBOL =      1

NET PROB*******  DIRECT*******  CUMS    0.0  *    1.00
                               CUMS.0         * .10000E 01


 MEAN          26.44  27.78  30.94  30.36  19.55  18.57  26.91  28.16

 COVARIANCE    1.72   1.93   0.58   0.10   1.37   1.98   0.40   0.20
        2      1.93   4.17   0.82   0.05   2.14   4.16   0.82  -0.02
        3      0.58   0.82   1.83   1.80   0.74   0.88   0.64   0.11
        4      0.10   0.05   1.80   3.84   0.14  -0.50   1.48   1.73
        5      1.37   2.14   0.74   0.14   1.85   2.61   0.58  -0.15
        6      1.98   4.16   0.88  -0.50   2.61   5.32   0.46  -1.01
        7      0.40   0.82   0.64   1.48   0.58   0.46   1.99   1.82
        8      0.20  -0.02   0.11   1.73  -0.15  -1.01   1.82   3.69

 SKEW(*W)    -560.7-1541.1  311.1  401.2 -812.0-1821.2 -168.1  600.4


CLUSTER   1 INDEX  20  PROPORTION     0.49010 W PARENT  344.246
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000    ADJUST      280.000  ID 16935
PROPORTION: PROP 0.49010  CIN   39.21  CTOT  264.25
OLD PROP 0.490103  CIN  39.21  ODEN  80.00  DIFFER   0.0
VOLUME0.81E-19   ROOT0.29E-09   DCON    4.74

 LOCATION  145  LINK 21 3773  SUBS  0    0  SUPER  6 2599  SYMBOL      2
INDEX =     20    SYMBOL =      2

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          25.99  26.45  31.43  31.24  18.89  17.08  26.50  28.15

 COVARIANCE    2.39   2.94   0.76   0.03   1.78   2.90   0.17  -0.44
        2      2.94   5.54   1.44   0.71   3.12   5.55   0.83  -0.96
        3      0.76   1.44   2.10   1.77   1.00   1.30   1.06   0.34
        4      0.03   0.71   1.77   3.75   0.15  -0.18   2.19   2.65
        5      1.78   3.12   1.00   0.15   2.14   3.49   0.26  -0.99
        6      2.90   5.55   1.30  -0.18   3.49   7.03   0.14  -2.30
        7      0.17   0.83   1.06   2.19   0.26   0.14   2.01   1.77
        8     -0.44  -0.96   0.34   2.65  -0.99  -2.30   1.77   4.47

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  21  PROPORTION     0.50990 W PARENT  344.246
 SPLIT-0.9999E 04
WEIGHT       89.000  WAS       80.000    ADJUST      280.000  ID 16935
PROPORTION: PROP 0.50990  CIN   40.79  CTOT  264.25
OLD PROP 0.509897  CIN  40.79  ODEN  80.00  DIFFER   0.0
VOLUME0.30E-21   ROOT0.17E-10   DCON    4.74

 LOCATION 3773  LINK  0    0  SUBS  0    0  SUPER  6 2599  SYMBOL      3
INDEX =     21    SYMBOL =      3

NET PROB*******  DIRECT*******  CUMS******* *    1.00
```

```
 MEAN          26.88  29.06  30.47  29.52  20.18  20.00  27.31  28.17

 COVARIANCE    0.80   0.69   0.56   0.32   0.86   0.95   0.47   0.51
       2       0.69   2.00   0.76   0.28   0.96   2.18   0.15   0.15
       3       0.56   0.76   1.24   1.00   0.77   1.28   0.38   0.03
       4       0.32   0.28   1.00   2.27   0.50   0.28   1.06   1.05
       5       0.86   0.96   0.77   0.50   1.44   1.59   0.52   0.33
       6       0.95   2.18   1.28   0.28   1.59   3.14   0.24  -0.35
       7       0.47   0.15   0.38   1.06   0.52   0.24   1.30   1.12
       8       0.51   0.15   0.03   1.05   0.33  -0.35   1.12   1.88

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 15784  7135     6      344.25      708.49
STATIS KL, W(KL),WADJ(KL)       14  0.42056396486E 03  0.42021093756E 03

  ADJUST  14  WEIGHT      420.6  WAS      200.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.10733E 00 0.95050E 02
 STATISTICS: TRACE     -286.5  SKEW      321.6  KURT     10345.9
        TESTS (SPLIT=0): -.38733E 05      -.55181E 04      -.13651E 05
WADJ(KL),W(KL),WSIM      460.9     220.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.186467      14
IDADJ,NPTSO,INDEX,W,WADJ 15847  7137    14      220.46      460.92
STATIS KL, W(KL),WADJ(KL)       10  0.54152246096 03  0.54110888576 03

  ADJUST  10  WEIGHT      541.5  WAS      260.6   SPFAC-0.33366E 02   CHANGE0.0          0.0          0.21473E 00 0.92841E 02
 STATISTICS: TRACE     -152.7  SKEW     1947.5  KURT     10623.6
        TESTS (SPLIT=0): -.85156E 05      -.32940E 04      -.10915E 05
WADJ(KL),W(KL),WSIM      581.9     281.0     400.0
 ALPHA ERROR:PRK,P,CM,W 10.9908E 00.1024E 01.1030E 01.2810E 03
  (ERROR CONT) CIN.5249E 03.2538E 03.2711E 03  W(KF),CTOT,DEN,ODEN.4662E 03*********.5298E 03.2650E 03

CLUSTER 767 INDEX  10  PROPORTION     0.99378 W PARENT  466.211
 SPLIT=0.3337E 02
WEIGHT     280.968  WAS      260.554     ADJUST     581.936  ID 15712
PROPORTION: PROP 1.02392  CIN  524.90  CTOT  -63.58
OLD PROP 0.951253  CIN 253.82  ODEN 265.04  DIFFER  62.82
VOLUME0.16E 21    ROOT0.86E-08    DCON   -1.11

 LOCATION 3329  LINK 11 3487  SUBS 18 1741  SUPER  9 3043  SYMBOL******
INDEX =     10    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.03

 MEAN          26.83  28.53  28.61  26.72  22.06  23.37  24.62  23.29

 COVARIANCE    4.82   8.05   5.35   4.32   3.26   6.10   2.79   1.59
       2       8.05  16.27  10.26   8.05   6.17  12.48   5.86   3.24
       3       5.35  10.26   7.80   6.19   4.10   7.88   4.47   2.80
       4       4.32   8.05   6.19   6.16   3.20   5.84   3.37   2.75
       5       3.26   6.17   4.10   3.20   3.21   5.21   2.58   1.42
       6       6.10  12.48   7.89   5.84   5.21  10.60   4.83   2.49
       7       2.79   5.86   4.47   3.37   2.58   4.83   3.37   1.89
       8       1.59   3.24   2.80   2.75   1.42   2.49   1.89   2.11

 SKEW(*W)     1155.4 2488.4 1564.1 1277.1  809.9 1703.8  762.4  728.6


PROPORTION RELATIVE TO TOP LEVEL =     0.220772      10
IDADJ,NPTSO,INDEX,W,WADJ 15712  7140    10      280.97      581.94
STATIS KL, W(KL),WADJ(KL)        2  0.70596313486 03  0.70527734386 03

  ADJUST   2  WEIGHT      706.0  WAS      342.6   SPFAC-0.29262E 02   CHANGE0.0          0.0          0.86218E-01 0.16819E 02
 STATISTICS: TRACE     -114.5  SKEW     1507.7  KURT     10993.0
        TESTS (SPLIT=0): -.85132E 05      -.32397E 04      -.85152E 04
```

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CLUSTER 767 INDEX   2  PROPORTION     0.34600 * PARENT 7337.000
 SPLIT=0.2926E 02
WEIGHT      705.963   WAS      342.639    ADJUST      705.277  ID 16056
PROPORTION: PROP 0.34441  CIN  697.27  CTOT 5314.34
OLD PROP 0.364920  CIN 335.50  ODEN 913.79  DIFFER    4.04
VOLUME0.34E-16   ROOT0.58E-08   DCON    -1.03

 LOCATION 1583  LINK  0     0  SONS  6 2599  SUPER  0  119  SYMBOL******
INDEX =       2    SYMBOL = ******

NET PROB******* DIRECT******* CUMS******* *    0.97

 MEAN          25.53  28.07  30.87  30.30  19.69  18.90  26.96  28.12

 COVARIANCE    1.52   1.69   0.58   0.30   1.12   1.66   0.52   0.49
        2      1.69   3.85   0.93   0.32   1.79   3.89   0.95   0.30
        3      0.58   0.93   1.96   1.86   0.78   1.08   0.60   0.03
        4      0.30   0.32   1.86   3.75   0.25  -0.17   1.42   1.60
        5      1.12   1.79   0.78   0.25   1.63   2.29   0.62  -0.04
        6      1.66   3.89   1.08  -0.17   2.29   5.18   0.62  -0.74
        7      0.52   0.95   0.60   1.42   0.62   0.62   2.03   1.84
        8      0.49   0.30   0.03   1.60  -0.04  -0.74   1.84   3.55

 SKEW(*W)    -540.4-1161.1  -43.4  128.1 -508.9-1274.9   36.9  413.7


WADJ(KL,*W(KL),*WSIM     746.6      363.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.335812        2
IDADJ,NPTSO,INDEX,W,WADJ 16056  7337     2       363.32       746.65
STATIS KL, W(KL),WADJ(KL)       18  0.28011376956E 03  0.28000000000E 03


  ADJUST  18  WEIGHT      280.1  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.53599E 00 0.13560E 03
 STATISTICS: TRACE       29.5  SKEW      4304.4  KURT      9404.3
        TESTS (SPLIT=0): -.12581E 06      -.18177E 04       -.15753E 05
WADJ(KL),W(KL),WSIM      420.2      200.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.122176       18
IDADJ,NPTSO,INDEX,W,WADJ 15712  7483    18       200.11       420.23
STATIS KL, W(KL),WADJ(KL)       16  0.42136082398E 03  0.42062890636E 03


  ADJUST  16  WEIGHT      421.4  WAS       200.3   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.51371E-01 0.57965E 02
 STATISTICS: TRACE       41.2  SKEW      1350.9  KURT     26875.9
        TESTS (SPLIT=0): -.11899E 06      -.44814E 04       0.29095E 04
WADJ(KL),W(KL),WSIM      462.1      221.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.187774       16
00-00
14-16 15-21             13-02 09-25             05-02 02-35
      16-19       17-02       10-24       11-01       06-33
      22-07 23-11             18-12 19-11             20-16 2
***HAVE SPLIT 16 WEIGHT    221.0 SUBS 22 23 ITER  31
KL,INDEX,LSUPER  2155    16  4375
```

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DUMP OF OBSERVED CLUSTERS FROM 16   2155

CLUSTER   0 INDEX  16  PROPORTION     0.83605 # PARENT  435.566
 SPLIT-0.1700E 02
#EIGHT      221.046  #AS      200.314     ADJUST      462.093  ID 16229
PROPORTION: PROP 0.90465  CIN  209.21  CTOT  185.33
OLD PROP 0.904649  CIN 209.21  ODEN 250.24  DIFFER   0.0
VOLUME0.16E 20   ROOT0.61E-08   DCON   -1.20

 LOCATION 2155  LINK 17 4661  SUBS 22 5361  SUPER 15 4375  SYMBOL      1
INDEX =     16    SYMBOL =      1

NET PROB******* DIRECT******* CUMS******* *   1.00

 MEAN          26.33  27.63  27.78  26.64  21.43  22.32  23.46  22.60

 COVARIANCE    2.94   4.57   3.03   2.39   1.68   3.55   0.76   0.40
        2      4.57  10.27   5.78   4.23   3.18   7.84   2.37   0.67
        3      3.03   5.78   4.78   3.39   2.05   4.93   1.79   1.32
        4      2.39   4.23   3.39   3.78   0.73   2.96   0.35   0.71
        5      1.68   3.18   2.05   0.73   2.38   3.26   1.42   0.56
        6      3.55   7.84   4.93   2.96   3.26   7.20   2.65   1.10
        7      0.76   2.37   1.79   0.35   1.42   2.65   2.17   0.90
        8      0.40   0.67   1.32   0.71   0.56   1.10   0.90   1.43

 SKEW(*W)     -61.6 -346.1  156.4  -49.0   71.9 -104.4  285.8  579.3


CLUSTER   1 INDEX  22  PROPORTION     0.39377 # PARENT  221.046
 SPLIT-0.9999E 04
#EIGHT       80.000  #AS       80.000     ADJUST      280.000  ID 17300
PROPORTION: PROP 0.39377  CIN   31.50  CTOT  141.05
OLD PROP 0.393771  CIN  31.50  ODEN  80.00  DIFFER   0.0
VOLUME0.22E-20   ROOT0.47E-10   DCON     4.74

 LOCATION 5361  LINK 23 5519  SUBS  0    0  SUPER 16 2155  SYMBOL      2
INDEX =     22    SYMBOL =      2

NET PROB   0.0   DIRECT   0.0   CUMS   0.0  *   0.0
                          CUMS.0          * .0

 MEAN          24.66  23.80  25.71  25.13  20.15  19.33  22.73  22.56

 COVARIANCE    0.80   1.07   1.02   0.92   0.05   0.69   0.37   0.37
        2      1.07   2.35   1.39   1.37   0.15   1.23   0.56   0.12
        3      1.02   1.39   2.12   1.61  -0.05   1.20   1.31   1.44
        4      0.92   1.37   1.61   2.34  -1.02  -0.00   0.19   1.03
        5      0.05   0.15  -0.05  -1.02   1.57   1.21   0.79   0.07
        6      0.69   1.23   1.20  -0.00   1.21   2.36   0.94   0.25
        7      0.37   0.56   1.31   0.19   0.79   0.94   2.76   1.97
        8      0.37   0.12   1.44   1.03   0.07   0.25   1.97   3.87

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  23  PROPORTION     0.60623 # PARENT  221.046
 SPLIT-0.9999E 04
#EIGHT       80.000  #AS       80.000     ADJUST      280.000  ID 17300
PROPORTION: PROP 0.60623  CIN   48.50  CTOT  141.05
OLD PROP 0.606228  CIN  48.50  ODEN  80.00  DIFFER   0.0
VOLUME0.46E-20   ROOT0.68E-10   DCON     4.74

 LOCATION 5519  LINK  0    0  SUBS  0    0  SUPER 16 2155  SYMBOL      3
INDEX =     23    SYMBOL =      3

NET PROB   0.0   DIRECT   0.0   CUMS   0.0  *   0.0
                          CUMS.0          * .0
```

```
 MEAN          27.42  30.12  29.13  27.62  22.26  24.26  23.94  22.63

 COVARIANCE    3.19   4.77   3.17   2.43   2.00   3.80   0.72   0.43
       2       4.77  10.66   6.07   4.21   3.62   6.45   2.54   0.88
       3       3.17   6.07   4.92   3.40   2.50   5.30   1.71   1.29
       4       2.43   4.21   3.40   3.76   1.16   3.26   0.24   0.71
       5       2.00   3.62   2.50   1.16   2.33   3.47   1.49   0.60
       6       3.80   6.45   5.30   3.26   3.47   7.59   2.83   1.25
       7       0.72   2.54   1.71   0.24   1.49   2.83   1.95   0.57
       8       0.43   0.88   1.29   0.71   0.60   1.25   0.57   0.90

 SKEW(*W)        0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 16229  7500    16       221.05       462.09
STATIS KL, W(KL),WADJ(KL)        9  0.5840905762E 03  0.5838076172E 03


  ADJUST   9  WEIGHT      584.1  WAS       281.9   SPFAC-0.33396E 02   CHANGE0.0          0.0          0.57911E-01 0.79322E 01
 STATISTICS: TRACE       -68.6  SKEW     1056.0   KURT      9350.6
        TESTS (SPLIT=0): -.10059E 06      -.40324E 04      -.11559E 05

CLUSTER 770 INDEX   9  PROPORTION     0.24758 W PARENT 7542.000
 SPLIT-0.3340E 02
WEIGHT      584.091  WAS      281.904    ADJUST     583.806  ID 16085
PROPORTION: PROP 0.24899  CIN  432.86  CTOT 5811.08
OLD PROP 0.276041  CIN 207.65  ODEN 783.70  DIFFER  15.99
VOLUME0.52E-16   ROOT0.72E-08   DCON   -1.08

 LOCATION 3043  LINK  5 2313  SUBS 10 3329  SUPER  0  119  SYMBOL******
INDEX =       9    SYMBOL = ******

NET PROB******** DIRECT******** CUMS******** *   0.99

 MEAN          26.52  27.80  28.12  26.32  21.83  22.88  24.36  23.03

 COVARIANCE    4.39   7.15   4.84   4.09   2.96   5.37   2.48   1.43
       2       7.15  14.88   9.41   7.43   5.69  11.39   5.09   2.79
       3       4.84   9.41   7.46   6.37   3.73   7.06   4.20   2.71
       4       4.09   7.43   6.07   6.60   3.02   5.05   3.43   3.15
       5       2.96   5.69   3.73   3.02   3.02   4.86   2.25   1.17
       6       5.37  11.39   7.06   5.05   4.86   9.96   4.08   1.79
       7       2.48   5.09   4.20   3.43   2.25   4.08   3.14   1.92
       8       1.43   2.79   2.71   3.15   1.17   1.79   1.92   2.47

 SKEW(*W)     -100.8  103.9 -420.1 -711.6   35.1  506.9 -299.4 -498.1


WADJ(KL),W(KL),WSIM      624.4      302.2      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.238357        9
IDADJ,NPTSO,INDEX,W,WADJ 16085  7542     9       302.19       624.37
STATIS KL, W(KL),WADJ(KL)       19  0.2802236328E 03  0.2800000000E 03


  ADJUST  19  WEIGHT      280.2  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.23273E 00 0.16265E 03
 STATISTICS: TRACE       373.7  SKEW     1591.2   KURT     18424.3
        TESTS (SPLIT=0): 0.13006E 05      -.45292E 04      -.67260E 04
WADJ(KL),W(KL),WSIM      420.4      200.2      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.111524       19
00-00
14-16 15-21          13-02 00-24                05-02 0
      16-17    17-02       10-23          11-01       0
      22-07 23-11          18-12 19-11                2
                                24-06 25-05

07-02
***HAVE SPLIT 19 WEIGHT   200.2 SUBS 24 25 ITER  13
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DUMP OF OBSERVED CLUSTERS FROM 19   4947

CLUSTER   0 INDEX  19  PROPORTION    0.49493 W PARENT  401.217
 SPLIT-0.1700E 02
WEIGHT     200.224   WAS      80.000     ADJUST     420.447  ID 15712
PROPORTION: PROP 0.48838  CIN  166.68  CTOT   64.45
OLD PROP 0.488378  CIN 166.68  ODEN 336.77  DIFFER   0.0
VOLUME0.73E 14   ROOT0.11E-07   DCON   -5.24

 LOCATION 4947  LINK  0    0  SUBS 24 5805  SUPER 10 3329  SYMBOL     1
INDEX =     19    SYMBOL =      1

NET PROB******* DIRECT******* CUMS   0.0  *   1.00
                         CUMS.0          * .10000E 01


 MEAN          28.02  30.87  30.08  27.67  23.06  25.30  25.61  23.72

 COVARIANCE    2.99   4.36   3.22   2.92   1.81   3.17   1.42   1.04
       2       4.36   8.56   5.94   5.40   2.98   5.98   3.22   2.21
       3       3.22   5.94   5.27   4.73   2.54   4.30   2.94   2.01
       4       2.92   5.40   4.73   5.39   2.42   3.70   2.01   2.51
       5       1.81   2.98   2.54   2.42   1.79   2.38   1.46   1.17
       6       3.17   5.98   4.30   3.70   2.38   4.81   2.40   1.84
       7       1.42   3.22   2.94   2.61   1.46   2.40   2.18   1.39
       8       1.04   2.21   2.01   2.51   1.17   1.64   1.39   1.87

 SKEW(*W)      210.9  640.5  213.5   38.1  163.3  727.2  288.2  203.8


CLUSTER   1 INDEX  24  PROPORTION    0.55726 W PARENT  200.224
 SPLIT-0.9999E 04
WEIGHT      80.000   WAS      80.000     ADJUST     280.000  ID 17347
PROPORTION: PROP 0.55726  CIN   44.58  CTOT  120.22
OLD PROP 0.557260  CIN  44.58  ODEN  80.00  DIFFER   0.0
VOLUME0.54E-19   ROOT0.23E-09   DCON    4.74

 LOCATION 5805  LINK 25 5963  SUBS  0    0  SUPER 19 4947  SYMBOL     2
INDEX =     24    SYMBOL =      2

NET PROB   0.0   DIRECT   0.0   CUMS   0.0  *   0.0
                         CUMS.0          * .0


 MEAN          28.20  31.41  30.29  27.71  23.20  25.90  25.87  23.88

 COVARIANCE    3.53   5.32   3.93   3.66   2.06   3.87   1.73   1.38
       2       5.32  10.90   7.51   7.03   3.51   7.58   4.15   3.01
       3       3.93   7.51   6.90   6.32   3.08   5.31   3.88   2.72
       4       3.66   7.03   6.32   7.27   2.89   4.67   3.49   3.39
       5       2.06   3.51   3.08   2.89   2.18   2.85   1.83   1.42
       6       3.87   7.58   5.31   4.67   2.85   6.15   3.05   2.19
       7       1.73   4.15   3.88   3.49   1.83   3.05   2.89   1.84
       8       1.38   3.01   2.72   3.39   1.42   2.19   1.84   2.43

 SKEW(*W)        0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  25  PROPORTION    0.44274 W PARENT  200.224
 SPLIT-0.9999E 04
WEIGHT      80.000   WAS      80.000     ADJUST     280.000  ID 17347
PROPORTION: PROP 0.44274  CIN   35.42  CTOT  120.22
OLD PROP 0.442740  CIN  35.42  ODEN  80.00  DIFFER   0.0
VOLUME0.12E-25   ROOT0.11E-12   DCON    4.74
```

```
 LOCATION 5953  LINK  0    0  SUBS  0    0  SUPER 19 4947  SYMBOL     3
INDEX =      25     SYMBOL =       3

NET PROM    0.0    DIRECT    0.0    CUMS    0.0  *    0.0
                              CUMS 0.0          * 0.0


 MEAN           27.80   30.19   29.81   27.62   22.88   24.53   25.25   23.51

 COVARIANCE     1.14    1.74    1.24    1.09    0.78    1.28    0.44    0.33
        2       1.74    3.00    2.10    1.75    1.22    2.21    0.80    0.54
        3       1.24    2.10    1.60    1.35    0.91    1.56    0.64    0.44
        4       1.09    1.75    1.35    1.78    1.03    1.24    0.49    0.66
        5       0.78    1.22    0.91    1.03    0.71    0.91    0.34    0.46
        6       1.28    2.21    1.56    1.24    0.91    1.71    0.61    0.38
        7       0.44    0.80    0.64    0.49    0.34    0.61    0.35    0.18
        8       0.33    0.54    0.44    0.86    0.46    0.38    0.18    0.58

 SKEW(*W)        0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


IDADJ.NPTSO.INDEX.W.WADJ 15712  7547    19       200.22       420.45
STATIS KL. W(KL).WADJ(KL)       15  0.4615615234E 03  0.4607866211E 03

  ADJUST  15  WEIGHT      461.6  WAS       220.4   SPFAC-0.22415E 02   CHANGE0.0          0.0          0.27033E-01 0.28713E 02
 STATISTICS: TRACE     -122.9  SKEW      576.2  KURT      4422.8
         TESTS (SPLIT=0): -.10079E 06      -.50249E 04       -.18594E 05
WADJ(KL).W(KL).WSIM     502.3     241.2     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.208206       15
IDADJ.NPTSO.INDEX.W.WADJ 16268  7617    15       241.17       502.34
STATIS KL. W(KL).WADJ(KL)       21  0.2805954590E 03  0.2800000000E 03

  ADJUST  21  WEIGHT      280.6  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.13852E 00 0.15561E 03
 STATISTICS: TRACE      244.3  SKEW      794.3  KURT     2771.7
         TESTS (SPLIT=0): -.66840E 05      -.53204E 04       0.26447E 04
WADJ(KL).W(KL).WSIM     421.2     200.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.209147       21
00-00
14-14 15-20          13-02 09-24                05-02 0
      16-17    17-02       10-23          11-01       0
      22-05 23-12          18-13 19-10                2
                              24-07 25-04
      07-02
27-10
***HAVE SPLIT 21 WEIGHT   200.6 SUBS 26 27 ITER  13
KL.INDEX.LSUPER  3773    21  2599
```

```
DUMP OF OBSERVED CLUSTERS FROM 21   3773

CLUSTER   0 INDEX  21  PROPORTION     0.56169 W PARENT  692.377
 SPLIT-0.1700E 02
WEIGHT      200.595  WAS       80.000     ADJUST      +21.191  ID 16935
PROPORTION: PROP 0.57159  CIN   184.95  CTOT  363.10
OLD PROP 0.571594  CIN 184.95  ODEN 329.27  DIFFER   0.0
VOLUME0.14E 18    ROOT0.63E-08    DCON    -5.24

 LOCATION 3773  LINK  0    0  SUBS 26 6249  SUPER  6 2599  SYMBOL      1
INDEX =      21     SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          26.76  28.83  30.50  29.51  20.29  19.94  27.33  28.14

 COVARIANCE    1.24   1.14   0.70   0.84   0.63   0.77   0.61   1.22
        2      1.14   2.26   1.35   1.24   0.69   2.00   0.49   0.79
        3      0.70   1.35   2.16   1.90   1.13   2.16   0.56  -0.23
        4      0.84   1.24   1.90   3.33   1.11   1.66   1.99   1.09
        5      0.63   0.69   1.13   1.11   1.01   1.07   0.46   0.19
        6      0.77   2.00   2.16   1.66   1.07   2.91   0.24  -0.40
        7      0.61   0.49   0.56   1.99   0.46   0.24   1.98   1.63
        8      1.22   0.79  -0.23   1.09   0.19  -0.40   1.63   2.92

 SKEW(*W)     -158.8 -314.1 -101.3 -274.3   32.1 -165.9 -104.0 -114.8


CLUSTER   1 INDEX  26  PROPORTION     0.53463 W PARENT  200.595
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 17716
PROPORTION: PROP 0.53463  CIN    42.77  CTOT  120.60
OLD PROP 0.534632  CIN  42.77  ODEN  80.00  DIFFER   0.0
VOLUME0.64E-20    ROOT0.80E-10    DCON     4.74

 LOCATION 6249  LINK 27 6407  SUBS  0    0  SUPER 21 3773  SYMBOL      2
INDEX =      26     SYMBOL =       2

NET PROB    0.0    DIRECT    0.0   CUMS    0.0  *    0.0
                             CUMS.0          * .0

 MEAN          26.57  28.44  30.36  29.16  20.32  19.72  27.20  28.03

 COVARIANCE    1.73   1.67   0.56   0.59   0.56   0.94   0.56   1.84
        2      1.67   3.07   1.40   1.08   0.65   2.49   0.43   1.40
        3      0.56   1.40   2.35   2.06   1.19   2.34   0.52  -0.48
        4      0.59   1.08   2.06   3.77   1.20   1.74   2.20   0.87
        5      0.56   0.65   1.19   1.20   1.11   1.06   0.46   0.07
        6      0.94   2.49   2.34   1.74   1.06   3.42   0.18  -0.30
        7      0.56   0.43   0.52   2.20   0.46   0.18   2.24   1.79
        8      1.84   1.40  -0.48   0.87   0.07  -0.30   1.79   3.98

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  27  PROPORTION     0.46537 W PARENT  200.595
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 17716
PROPORTION: PROP 0.46537  CIN    37.23  CTOT  120.60
OLD PROP 0.465367  CIN  37.23  ODEN  80.00  DIFFER   0.0
VOLUME0.15E-25    ROOT0.12E-12    DCON     4.74

 LOCATION 6407  LINK  0    0  SUBS  0    0  SUPER 21 3773  SYMBOL      3
INDEX =      27     SYMBOL =       3

NET PROB    0.0    DIRECT    0.0   CUMS    0.0  *    0.0
```

```
 MEAN          26.97   29.28   30.66   29.92   20.26   20.29   27.47   28.26

 COVARIANCE    0.25    0.37    0.21    0.39    0.26    0.30    0.21    0.34
       2       0.37    1.10    0.64    0.72    0.53    1.15    0.27    0.10
       3       0.21    0.64    0.57    0.46    0.40    0.86   -0.00   -0.21
       4       0.39    0.72    0.46    1.19    0.54    0.59    0.86    0.88
       5       0.26    0.53    0.46    0.54    0.44    0.59    0.18    0.18
       6       0.30    1.15    0.86    0.59    0.59    1.50   -0.11   -0.48
       7       0.21    0.27   -0.00    0.86    0.18   -0.11    1.12    1.17
       8       0.34    0.10   -0.21    0.88    0.18   -0.48    1.17    1.72

 SKEW(*W)       0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


IDADJ,NPTSO,INDEX,W,WADJ 16935  7916     21       200.60       421.19
STATIS KL, W(KL),WADJ(KL)        6  0.7092814941E 03  0.7084916992E 03


 ADJUST   6  WEIGHT      709.3  WAS       344.2   SPFAC 0.16099E 03   CHANGE0.0          0.0          0.13065E 00 0.73061E 01
 STATISTICS: TRACE        30.4  SKEW     2338.0  KURT     12748.6
        TESTS (SPLIT=0): -.97153E 05      -.24015E 04       -.67272E 04
WADJ(KL),W(KL),WSIM      750.1      365.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.365115        6

***SEPERATE   6 SUPER,SUBS   2 20 SPFAC 0.16099E 03
00-00
14-14 15-21          13-02 09-24                05-02 0
      16-18     17-02       10-23           11-01      2
      22-05 23-13           18-13 19-10
                                  24-07 25-04
      07-01
27-09
STATIS KL, W(KL),WADJ(KL)       20  0.2806486816E 03  0.2800000000E 03


 ADJUST  20  WEIGHT      280.6  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.40674E 00 0.81462E 02
 STATISTICS: TRACE       -55.1  SKEW     3540.4  KURT      9163.3
        TESTS (SPLIT=0): -.12347E 06      -.25735E 04       -.15960E 05
WADJ(KL),W(KL),WSIM      421.3      200.6      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.164596       20
IDADJ,NPTSO,INDEX,W,WADJ 16935  8215     20       200.65       421.30
STATIS KL, W(KL),WADJ(KL)        2  0.7475668945E 03  0.7466489258E 03


 ADJUST   2  WEIGHT      747.6  WAS       363.3   SPFAC 0.23512E 03   CHANGE0.0          0.0          0.10416E 00 0.51499E 01
 STATISTICS: TRACE       857.1  SKEW    11454.1  KURT    268014.1
        TESTS (SPLIT=0): 0.63832E 06      0.67985E 04       0.24888E 06
WADJ(KL),W(KL),WSIM      788.5      384.2      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.364029        2

***SEPERATE   2 SUPER,SUBS   0 20 SPFAC 0.23512E 03
00-00
20-17 21-18     07-01 14-16 15-22           13-02 09-22
      26-13 27-07           16-20      17-02      10-21
                            22-04 23-16           18-11 1
                                                        2
      05-02
11-01
STATIS KL, W(KL),WADJ(KL)       10  0.5819895020E 03  0.5819350352E 03


 ADJUST  10  WEIGHT      582.0  WAS       281.0   SPFAC 0.88833E 02   CHANGE0.0          0.0          0.88404E-01 0.34650E 02
 STATISTICS: TRACE       361.9  SKEW     2867.1  KURT     42582.1
        TESTS (SPLIT=0): 0.25542E 05      -.22292E 04       0.21640E 05
WADJ(KL),W(KL),WSIM      622.0      301.0      400.0
 ALPHA ERROR:PRK,P,CM,W 10.9769E 00.1021E 01.1010E 01.3010E 03
  (ERROR CONT) CIN.5633E 03.2711E 03.2922E 03  W(KF),CTOT,DEN,ODEN.4796E 03*********.5766E 03.2905E 03

CLUSTER 778 INDEX  10  PROPORTION     1.01083 W PARENT  479.590
 SPLIT 0.8883E 02
WEIGHT     301.021  WAS       280.968    ADJUST     622.043  ID 16940
PROPORTION: PROP 1.02120  CIN  563.27  CTOT  -96.99
OLD PROP 0.961596  CIN 271.08  ODEN 290.46  DIFFER  44.87
VOLUME0.64E 21   ROOT0.71E-08   DCON   -1.08
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 LOCATION 3329  LINK 11 3487  SUBS 18 1741  SUPER  9 3043  SYMBOL******
INDEX =     10    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******** *   1.01

 MEAN          26.45  27.69  27.92  26.14  21.80  22.86  24.29  22.94

 COVARIANCE    4.22   6.78   4.67   3.94   2.85   4.94   2.34   1.48
        2      6.78  14.49   9.08   7.18   5.26  10.77   4.60   2.83
        3      4.67   9.08   7.49   6.14   3.64   6.55   3.99   2.77
        4      3.94   7.18   6.14   6.60   3.05   4.75   3.35   3.18
        5      2.85   5.26   3.64   3.05   2.87   4.41   2.01   1.16
        6      4.94  10.77   6.55   4.75   4.41   9.29   3.51   1.68
        7      2.34   4.60   3.99   3.35   2.01   3.51   2.80   1.78
        8      1.48   2.83   2.77   3.18   1.16   1.68   1.78   2.45

 SKEW(*W)    -983.6-1646.2-1766.0-1487.9 -447.1 -661.9 -801.8 -930.6


PROPORTION RELATIVE TO TOP LEVEL =      0.210303       10

***SEPERATE  10 SUPER,SUBS   9 18 SPFAC 0.88833E 02
00-00
20-16 21-19       07-01 14-16 15-22                13-02 09-22
      26-14 27-06                 16-20       17-02        18-11 1
                                  22-04 23-16                     2
      05-02
11-01
STATIS KL, W(KL),WADJ(KL)       23  0.2802287598E 03  0.2800000000E 03

 ADJUST  23  WEIGHT      280.2  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.45731E 00 0.19986E 03
 STATISTICS: TRACE      801.2  SKEW     4410.6  KURT    216741.2
       TESTS (SPLIT=0): 0.51523E 06      -.17097E 04       0.19159E 06

CLUSTER 778 INDEX  23  PROPORTION     0.79776 W PARENT  453.709
 SPLIT-0.9999E 04
WEIGHT    280.229   WAS       80.000    ADJUST     280.000  ID 17300
PROPORTION: PROP 0.80167  CIN  222.20  CTOT  176.76
OLD PROP 0.606228  CIN  48.50  ODEN  80.00  DIFFER   0.0
VOLUME0.12E-14   ROOT0.35E-07   DCON   -5.24

 LOCATION 5519  LINK  0    0  SUBS  0    0  SUPER 16 2155  SYMBOL******
INDEX =     23    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS   0.0  *   0.0
                              CUMS.0       * .0


 MEAN          26.96  28.97  28.51  27.12  21.86  23.17  23.72  22.57

 COVARIANCE    3.16   5.14   3.29   2.82   1.41   3.53   0.57   0.11
        2      5.14  12.29   6.68   5.52   2.92   8.54   2.45   0.15
        3      3.29   6.68   5.19   3.86   1.94   5.24   1.75   1.07
        4      2.82   5.52   3.86   4.49   0.71   3.46   0.21   0.18
        5      1.41   2.92   1.94   0.71   2.02   3.05   1.41   0.60
        6      3.53   8.54   5.24   3.46   3.05   7.62   2.85   1.14
        7      0.57   2.45   1.75   0.21   1.41   2.85   2.17   0.86
        8      0.11   0.15   1.07   0.18   0.60   1.14   0.86   1.43

 SKEW(*W)    -1054.3-2369.8-1352.4-1307.2 -290.2-1252.6   -5.1  415.2


WADJ(KL),W(KL),WSIM      420.5      200.2      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.166826       23
00-00
20-16 21-18       07-01 14-16 15-23                13-02 0
      26-14 27-06                 16-21       17-02        1
                                  22-04 23-17
                                        28-09 29-08
      05-02
      11-01
25-02
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DUMP OF OBSERVED CLUSTERS FROM 23   5519

CLUSTER   0 INDEX  23  PROPORTION     0.74693 W PARENT  [illegible]
 SPLIT-0.1700E 02
WEIGHT     200.229  WAS       80.000     ADJUST      420[illegible]  ID 17380
PROPORTION: PROP 0.81273  CIN  173.70  CTOT  221.74
OLD PROP 0.812725  CIN 173.70  ODEN 231.93  DIFFER   0.0
VOLUME0.98E 19   ROOT0.35E-07   DCON    -5.24

 LOCATION 5519  LINK  0    0  SUBS 28 3329  SUPER 16 2155  SYMBOL      1
INDEX =     23    SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS    0.0  *    1.00
                               CUMS.0          * .100000E 01


 MEAN          26.78  28.51  28.26  26.92  21.69  22.74  23.64  22.54

 COVARIANCE    3.15   5.29   3.33   2.98   1.17   3.43   0.52  -0.02
        2      5.29  12.94   6.92   6.04   2.64   8.58   2.42  -0.14
        3      3.33   6.92   5.29   4.04   1.72   5.21   1.76   0.98
        4      2.98   6.04   4.04   4.78   0.54   3.53   0.20  -0.03
        5      1.17   2.64   1.72   0.54   1.90   2.88   1.38   0.60
        6      3.43   8.58   5.21   3.53   2.88   7.63   2.86   1.09
        7      0.52   2.42   1.76   0.20   1.38   2.86   2.25   0.98
        8     -0.02  -0.14   0.98  -0.03   0.60   1.09   0.98   1.64

 SKEW(*W)   -1054.3-2369.8-1352.4-1307.2 -290.2-1252.6   -5.1  415.2


CLUSTER   1 INDEX  28  PROPORTION     0.51622 W PARENT  200.229
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 18258
PROPORTION: PROP 0.51622  CIN   41.30  CTOT  120.23
OLD PROP 0.516222  CIN  41.30  ODEN  80.00  DIFFER   0.0
VOLUME0.49E-18   ROOT0.70E-09   DCON     4.74

 LOCATION 3329  LINK 29 1583  SUBS  0    0  SUPER 23 5519  SYMBOL      2
INDEX =     28    SYMBOL =       2

NET PROB*******  DIRECT*******  CUMS******* *    1.01

 MEAN          25.90  26.49  27.16  25.83  21.38  21.51  23.59  22.83

 COVARIANCE    3.45   5.77   4.09   3.83   0.05   1.96  -0.16  -0.64
        2      5.77  13.96   8.43   7.76   0.14   5.42   1.13  -1.45
        3      4.09   8.43   7.46   5.98  -0.36   2.46   0.92   0.15
        4      3.83   7.76   5.98   6.61  -0.82   1.85  -0.49  -0.86
        5      0.05   0.14  -0.36  -0.82   1.46   2.03   0.85   0.72
        6      1.96   5.42   2.46   1.85   2.03   6.36   1.99   1.05
        7     -0.16   1.13   0.92  -0.49   0.85   1.99   2.19   1.24
        8     -0.64  -1.45   0.15  -0.86   0.72   1.06   1.24   2.38

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  29  PROPORTION     0.48378 W PARENT  200.229
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 18258
PROPORTION: PROP 0.48378  CIN   38.70  CTOT  120.23
OLD PROP 0.483778  CIN  38.70  ODEN  80.00  DIFFER   0.0
VOLUME0.19E-24   ROOT0.44E-12   DCON     4.74

 LOCATION 1583  LINK  0    0  SUBS  0    0  SUPER 23 5519  SYMBOL      3
INDEX =     29    SYMBOL =       3

NET PROB*******  DIRECT*******  CUMS******* *    1.00
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```
 MEAN          27.71   30.67   29.43   28.08   22.02   24.05   23.69   22.24

 COVARIANCE    0.60    0.92    0.62    0.68    0.13    0.57   -0.00   -0.01
        2      0.92    3.18    1.52    1.32    0.25    2.22    0.79   -0.11
        3      0.62    1.52    1.11    1.11    0.15    1.11    0.18    0.19
        4      0.68    1.32    1.11    1.52   -0.02    0.83   -0.24    0.19
        5      0.13    0.25    0.15   -0.02    0.24    0.28    0.16    0.03
        6      0.57    2.22    1.11    0.83    0.28    1.79    0.73    0.07
        7     -0.00    0.79    0.18   -0.24    0.16    0.73    0.71   -0.04
        8     -0.01   -0.11    0.19    0.19    0.03    0.07   -0.04    0.29

 SKEW(*W)       0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


IDADJ,NPTSO,INDEX,W,WADJ 17300  8458     23        200.23        420.46
STATIS KL, W(KL),WADJ(KL)        16  0.4624970703E 03  0.4620927734E 03

  ADJUST  16  WEIGHT       462.5   WAS       221.0    SPFAC-0.47231E 02   CHANGE0.0          0.0          0.64388E-01 0.14789E 03
 STATISTICS: TRACE      1626.3   SKEW      7001.6   KURT     937579.4
        TESTS (SPLIT=0): 0.25291E 07       0.14034E 04        0.91458E 06
WADJ(KL),W(KL),WSIM      502.9      241.5      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.210524      16
IDADJ,NPTSO,INDEX,W,WADJ 17300  8484     16        241.45        502.90
STATIS KL, W(KL),WADJ(KL)        15  0.5028056641E 03  0.5023364258E 03

  ADJUST  15  WEIGHT       502.8   WAS       241.2    SPFAC-0.20658E 02   CHANGE0.0          0.0          0.67628E-01 0.20952E 02
 STATISTICS: TRACE       145.1   SKEW      2499.6   KURT      22324.1
        TESTS (SPLIT=0): -.90734E 05       -.29029E 04        0.12397E 03
WADJ(KL),W(KL),WSIM      543.3      261.6      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.260647      15
IDADJ,NPTSO,INDEX,W,WADJ 17417  8620     15        261.64        543.27
STATIS KL, W(KL),WADJ(KL)        14  0.4617487793E 03  0.4609169922E 03

  ADJUST  14  WEIGHT       461.7   WAS       220.5    SPFAC-0.99999E 04   CHANGE0.0          0.0          0.15049E 00 0.52142E 02
 STATISTICS: TRACE        25.3   SKEW      1483.6   KURT       7529.7
        TESTS (SPLIT=0): -.11524E 06       -.41163E 04        -.15482E 05

CLUSTER 781 INDEX  14  PROPORTION     0.15909 W PARENT 8730.000
 SPLIT-0.1000E 05
WEIGHT     461.749   WAS      220.458     ADJUST      460.917  ID 16937
PROPORTION: PROP 0.15831  CIN  406.00  CTOT 6170.71
OLD PROP 0.183343  CIN 191.28  ODEN1080.36  DIFFER   0.0
VOLUME0.47E-17    ROOT0.22E-08    DCON    -1.16

 LOCATION 4217  LINK 15 4375  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =     14    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS    0.0  *    0.0
                               CUMS.0          * .0


 MEAN          24.68   26.37   25.99   24.45   22.21   24.22   23.79   22.32

 COVARIANCE    1.97    2.13    2.19    2.04    0.43    0.19    1.10    0.87
        2      2.13    4.64    3.44    3.32   -0.27    0.31    1.56    0.67
        3      2.19    3.44    4.11    3.61   -0.05   -0.31    1.39    1.17
        4      2.04    3.32    3.61    4.86   -0.32   -0.06    1.31    1.61
        5      0.43   -0.27   -0.05   -0.32    0.91    0.32    0.39    0.42
        6      0.19    0.31   -0.31   -0.08    0.32    0.85    0.36    0.32
        7      1.10    1.56    1.39    1.31    0.39    0.36    1.30    0.86
        8      0.87    0.67    1.17    1.61    0.42    0.32    0.86    1.76

 SKEW(*W)    -208.3    92.5   141.4  -230.1  -205.4  -347.3  -251.2  -594.8
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WADJ(KL),W(KL),WSIM      502.6      241.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.147853      14
IDADJ,NPTSO,INDEX,**,WADJ 16937  4730     14        241.29       502.58
STATIS KL, W(KL),*ADJ(KL)        9  0.6244877930E 03  0.6243735352E 03


 ADJUST   9  WEIGHT      624.5  WAS       302.2   SPFAC 0.11524E 03   CHANGE0.0          0.0          0.49947E-01 0.50374E 01
 STATISTICS: TRACE       257.9  SKEW      807.4   KURT    20519.0
        TESTS (SPLIT=0): -.361R0E 05      -.41545E 04      0.12912E 03

CLUSTER 782 INDEX   9  PROPORTION     0.21613 W PARENT 9057.000
 SPLIT 0.1152E 03
WEIGHT     624.4MP  WAS      302.187    ADJUST     624.374  ID 17342
PROPORTION: PROP 0.21709  CIN  471.40  CTOT 6889.07
OLD PROP 0.231295  CIN 225.21  ODEN 971.25  DIFFER  45.84
VOLUME0.41E-16   ROOT0.64E-08   DCON   -1.06

 LOCATION 3043  LINK  5 2313  SUBS 18 1741  SUPER  0  119  SYMBOL******
INDEX =      9    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.01

 MEAN          26.73  26.24  28.31  26.44  21.99  23.21  24.50  23.12

 COVARIANCE    4.33   7.01   4.74   3.84   3.03   5.33   2.41   1.36
        2      7.01  14.47   9.06   7.03   5.51  11.02   4.79   2.72
        3      4.74   9.06   7.33   5.86   3.77   6.83   4.01   2.57
        4      3.84   7.03   5.86   6.14   3.05   4.94   3.24   2.87
        5      3.03   5.51   3.77   3.05   3.01   4.64   2.13   1.19
        6      5.33  11.02   6.83   4.94   4.64   9.46   3.78   1.83
        7      2.41   4.79   4.01   3.24   2.13   3.78   2.85   1.70
        8      1.36   2.72   2.57   2.87   1.19   1.83   1.70   2.20

 SKEW(*W)      73.9  331.2 -208.3   -7.6  161.9  147.5   62.1  121.1


WADJ(KL),W(KL),WSIM      664.6      322.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.207158       9

***SEPERATE   9 SUPER,SUBS   0 18 SPFAC 0.11524E 03
00-00
18-10 19-10       11-01 20-16 21-17       07-01 14-15 15-26
      24-09 25-02                 26-15 27-05       16-24
                                                    22-04 2
                                                          2
      13-02 05-02
17-02
STATIS KL, W(KL),WADJ(KL)       26  0.2804680176E 03  0.2800000000E 03


 ADJUST  26  WEIGHT      280.5  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.41094E 00 0.14323E 03
 STATISTICS: TRACE      1255.0  SKEW    16023.8  KURT   340984.3
        TESTS (SPLIT=0): 0.14485E 07      0.99071E 04      0.31585E 06

CLUSTER 783 INDEX  26  PROPORTION     0.79407 W PARENT  394.691
 SPLIT-0.9999E 04
WEIGHT     280.468  WAS      80.000    ADJUST     280.000  ID 17716
PROPORTION: PROP 0.90247  CIN  224.60  CTOT  145.72
OLD PROP 0.534632  CIN  42.77  ODEN  80.00  DIFFER   0.0
VOLUME0.32E-14   ROOT0.57E-07   DCON   -5.23

 LOCATION 6249  LINK 27 6407  SUBS  0    0  SUPER 21 3773  SYMBOL******
INDEX =     26    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS   0.0  *   0.0
                              CUMS.0        * .0


 MEAN          26.58  26.47  30.48  29.62  20.05  19.46  27.18  28.35

 COVARIANCE    1.73   1.76   0.77   0.51   0.96   1.48   0.51   0.85
        2      1.76   3.74   1.68   1.00   1.37   3.50   0.65   0.32
        3      0.77   1.68   3.01   2.99   1.21   2.25   0.86   0.14
        4      0.51   1.00   2.99   5.42   0.70   0.91   2.42   2.22
```

```
         5     0.96   1.57   1.21   0.70   1.58   2.11   0.40  -0.55
         6     1.46   3.50   2.25   0.91   2.11   4.95   0.25  -1.40
         7     0.51   0.65   0.86   2.42   0.40   0.25   2.32   1.92
         8     0.85   0.32   0.14   2.22  -0.55  -1.40   1.92   4.15

 SKEW(*W)    -999.9-1369.6  315.3 1982.3 -835.3-1497.9 -269.0  792.3


*ADJ(KL),*W(KL),*SIM      420.9      200.5      400.0
 ALPHA ERROR:PRK,P,CM,* 26.0025E 00.1076E 01.1137E 01.2005E 03
  (ERROR CONT) CIN.2246E 03.4277E 02.1818E 03  *(KF),CTOT,DEN,ODEN.3947E 03.1457E 03.2490E 03.8009E 02

CLUSTER 784 INDEX  26  PROPORTION     0.94682 * PARENT  394.691
 SPLIT-0.9999E 04
WEIGHT     200.468  WAS       80.000     ADJUST     420.936  ID 17716
PROPORTION: PROP 1.07607  CIN  224.60  CTOT  145.72
OLD PROP 0.534632  CIN  42.77  ODEN  80.00  DIFFER   0.0
VOLUME0.24E 20    ROOT0.57E-07   DCON   -5.23

 LOCATION 6249  LINK 27 6497  SUBS  0    0  SUPER 21 3773  SYMBOL******
INDEX =     26    SYMBOL = ******

NET PROB******** DIRECT******** CUMS    0.0  *    0.0
                          CUMS,0          * .0


 MEAN          26.58  28.48  30.53  29.80  19.94  19.35  27.17  28.48

 COVARIANCE    1.72   1.80   0.85   0.48   1.12   1.69   0.49   0.46
         2     1.80   4.00   1.80   0.97   1.66   3.91   0.74  -0.11
         3     0.85   1.80   3.28   3.36   1.21   2.21   1.00   0.39
         4     0.48   0.97   3.36   6.06   0.50   0.58   2.51   2.77
         5     1.12   1.66   1.21   0.50   1.76   2.52   0.38  -0.79
         6     1.69   3.91   2.21   0.58   2.52   5.56   0.27  -1.83
         7     0.49   0.74   1.00   2.51   0.38   0.27   2.35   1.98
         8     0.46  -0.11   0.39   2.77  -0.79  -1.83   1.98   4.22

 SKEW(*W)    -999.9-1369.6  315.3 1982.3 -835.3-1497.9 -269.0  792.3


PROPORTION RELATIVE TO TOP LEVEL =      0.142678       26
00-00
18-10 19-10       11-01 20-16 21-18                  07-01 14-14 1
      24-09 25-02                 26-14       27-04              1
                                  30-06 31-08                    2

            13-02 05-02
      17-02
29-03
***HAVE SPLIT 26 WEIGHT   200.5 SUBS 30 31 ITER  60
KL,INDEX,LSUPER  6249    26  3773
```

```
DUMP OF OBSERVED CLUSTERS FROM 26   6249

CLUSTER   0 INDEX  26  PROPORTION     0.69870 * PARENT  394.691
 SPLIT-0.1700E 02
WEIGHT      200.468  WAS       80.000     ADJUST     420.936  ID 17716
PROPORTION: PROP 0.79407  CIN  181.83  CTOT  134.45
OLD PROP 0.794072  CIN 181.83  ODEN 260.24  DIFFER   0.0
VOLUME0.24E 20   ROOT0.57E-07   DCON   -5.23

 LOCATION 6249  LINK 27 6407  SUBS 30 3043  SUPER 21 3773  SYMBOL      1
INDEX =      26     SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS    0.0  *    1.00
                               CUMS.0         * .10000E 01


 MEAN          26.58  28.48  30.63  29.80  19.94  19.35  27.17  28.48

 COVARIANCE    1.72   1.80   0.85   0.48   1.12   1.69   0.49   0.46
        2      1.80   4.00   1.80   0.97   1.66   3.91   0.74  -0.11
        3      0.85   1.80   3.24   3.36   1.21   2.21   1.00   0.39
        4      0.48   0.97   3.36   6.08   0.50   0.58   2.51   2.77
        5      1.12   1.66   1.21   0.50   1.76   2.52   0.38  -0.79
        6      1.69   3.91   2.21   0.58   2.52   5.56   0.27  -1.83
        7      0.49   0.74   1.00   2.51   0.38   0.27   2.35   1.98
        8      0.46  -0.11   0.39   2.77  -0.79  -1.83   1.98   4.22

 SKEW(*W)    -999.9-1369.6  315.3 1982.3 -835.3-1497.9 -269.0  792.3


CLUSTER   1 INDEX  30  PROPORTION     0.45039 W PARENT  200.468
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST     280.000  ID 19016
PROPORTION: PROP 0.45039  CIN   36.03  CTOT  120.47
OLD PROP 0.450393  CIN  36.03  ODEN  80.00  DIFFER   0.0
VOLUME0.39E-17   ROOT0.20E-08   DCON    4.74

 LOCATION 3043  LINK 31 2599  SUBS  0    0  SUPER 26 6249  SYMBOL      2
INDEX =      30     SYMBOL =       2

NET PROB*******  DIRECT*******  CUMS*******  *    1.01

 MEAN          25.89  27.84  30.30  29.94  19.20  18.50  26.36  28.49

 COVARIANCE    3.27   3.60   1.52   0.20   1.58   2.32   0.47  -0.10
        2      3.60   7.25   3.25   1.18   2.98   5.66   1.68  -0.97
        3      1.52   3.25   5.92   7.32  -0.16  -0.29   1.94   3.33
        4      0.20   1.18   7.32  14.47  -2.69  -5.29   2.96   8.83
        5      1.58   2.98  -0.16  -2.69   3.19   5.11  -0.89  -3.92
        6      2.32   5.66  -0.29  -5.29   5.11  10.25  -1.10  -7.04
        7      0.47   1.68   1.94   2.96  -0.89  -1.10   2.35   3.25
        8     -0.10  -0.97   3.33   8.83  -3.92  -7.04   3.25   9.95

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  31  PROPORTION     0.54961 W PARENT  200.468
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST     280.000  ID 19016
PROPORTION: PROP 0.54961  CIN   43.97  CTOT  120.47
OLD PROP 0.549607  CIN  43.97  ODEN  80.00  DIFFER   0.0
VOLUME0.74E-22   ROOT0.86E-11   DCON    4.74

 LOCATION 2599  LINK  0    0  SUBS  0    0  SUPER 26 6249  SYMBOL      3
INDEX =      31     SYMBOL =       3

NET PROB*******  DIRECT*******  CUMS*******  *    0.99
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```
 MEAN          27.14  29.01  30.72  29.69  20.55  20.05  27.83  28.48

 COVARIANCE    0.97   0.57   1.64   2.17   1.33   1.20   1.49   0.81
       2       0.57   1.89   1.45   0.46   0.64   2.45  -0.50  -0.75
       3       1.64   1.45   4.94   3.55   3.03   3.62   3.78   1.18
       4       2.17   0.46   6.55   9.20   4.28   3.22   8.84   4.01
       5       1.33   0.64   3.03   4.28   2.30   2.02   2.91   1.18
       6       1.20   2.45   3.62   3.22   2.02   4.23   1.05  -0.58
       7       1.49  -0.50   3.78   8.84   2.91   1.05   7.45   3.79
       8       0.81  -0.75   1.18   4.01   1.18  -0.58   3.79   2.76

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 17716  9216     26      200.47      420.94
STATIS KL, W(KL),WADJ(KL)       21  0.42136767588E 03  0.42119091808E 03


 ADJUST  21  WEIGHT      421.4  WAS       200.6   SPFAC-0.21717E 03   CHANGE0.0          0.0          0.96415E-01 0.48968E 02
 STATISTICS: TRACE       103.8  SKEW     1096.9  KURT     10794.3
        TESTS (SPLIT=0): -.10999E 06      -.47389E 04      -.13186E 05

CLUSTER 784 INDEX  21  PROPORTION     0.18597 W PARENT 9302.000
 SPLIT-0.2172E 03
WEIGHT     421.368  WAS      200.595    ADJUST     421.191  ID 17716
PROPORTION: PROP 0.18483  CIN  403.27  CTOT 7124.56
OLD PROP 0.202454  CIN 184.95  ODEN 929.65  DIFFEN  76.74
VOLUME0.54E-18   ROOT0.74E-09   DCON   -1.18

 LOCATION 3773  LINK  7 2757  SUBS 26 6249  SUPER  0  119  SYMBOL******
INDEX =     21    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.93

 MEAN          26.86  28.98  30.51  29.50  20.28  19.99  27.29  28.21

 COVARIANCE    1.20   1.12   0.83   0.94   0.65   0.89   0.56   1.07
       2       1.12   2.48   1.65   1.59   0.81   2.35   0.59   0.73
       3       0.83   1.65   2.56   2.25   1.36   2.60   0.67  -0.27
       4       0.94   1.59   2.25   3.70   1.27   2.08   2.22   1.22
       5       0.65   0.81   1.36   1.27   1.08   1.32   0.45   0.05
       6       0.89   2.35   2.60   2.08   1.32   3.41   0.35  -0.48
       7       0.56   0.59   0.67   2.22   0.45   0.35   2.18   1.78
       8       1.07   0.73  -0.27   1.22   0.05  -0.48   1.78   3.12

 SKEW(*W)      292.3  461.9   13.8   33.4  -88.7  125.8    0.0  452.5


WADJ(KL),W(KL),WSIM      461.5      220.8      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.177807      21

***SUB ELIM  21   SPLITTING  -217.17242 *  -150.00000
            26
            27

00-00
18-11 19-10       11-01 20-16 21-18 07-01 14-15 15-25
      24-09 25-02                             16-23
                                              22-03 23-19
                                                    28-16 2

13-02 05-02
IDADJ,NPTSO,INDEX,W,WADJ 17716  9302     21      220.77      461.54
STATIS KL, W(KL),WADJ(KL)       18  0.42067187508E 03  0.42022753918E 03


 ADJUST  18  WEIGHT      420.7  WAS       200.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.33908E-01 0.31881E 02
 STATISTICS: TRACE         8.9  SKEW     1252.4  KURT      6301.7
        TESTS (SPLIT=0): -.12074E 06      -.45860E 04      -.17690E 05
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CLUSTER 785 INDEX  18  PROPORTION     0.10450 * PARENT 9388.000
 SPLIT=0.1000E 05
WEIGHT      420.672  WAS      200.114     ADJUST      420.228  ID 17283
PROPORTION: PROP 0.10522  CIN  363.34  CTOT 5442.85
OLD PROP 0.10527I  CIN 172.80  ODEN 1644.89  DIFFER   0.0
VOLUME0.44E-15   ROOT0.66E-08   DCON   -1.20

 LOCATION 1741  LINK 19 4947  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =     18    SYMBOL = ******

NET PROB******** DIRECT******* CUMS******* *   0.98

 MEAN          25.35  25.56  26.60  25.29  20.95  21.15  23.37  22.48

 COVARIANCE    2.13   2.72   1.74   1.82   1.11   1.82   0.48   0.17
        2      2.72   6.69   3.40   2.90   2.29   5.21   0.85   0.18
        3      1.74   3.40   3.54   3.21   1.05   2.33   1.46   1.35
        4      1.82   2.90   3.21   4.38   0.88   1.40   1.35   1.94
        5      1.11   2.29   1.05   0.88   1.59   2.47   0.53  -0.06
        6      1.82   5.21   2.33   1.40   2.47   5.84   0.96  -0.31
        7      0.48   0.85   1.46   1.35   0.53   0.96   1.49   0.99
        8      0.17   0.18   1.35   1.94  -0.06  -0.31   0.99   2.03

 SKEW(*W)     285.9  746.3   14.2 -183.0  534.6  995.2   85.4 -329.4


WADJ(KL).W(KL).WSIM      461.1      220.6      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.107399      18
IDADJ.NPTSO.INDEX.WADJ 17283  9388    18      220.56      461.12
STATIS KL. W(KL).WADJ(KL)       28  0.28010131B4E 03  0.28000000000E 03

 ADJUST  28  WEIGHT      280.1  WAS       80.0   SPEAC-0.99990E 04   CHANGEG.0          0.0          0.46581E 00 0.70128E 03
 STATISTICS: TRACE        35.9  SKEW     2232.3  KURT     52738.3
        TESTS (SPLIT=0): -.12540E 06      -.38900E 04       0.27580E 05

CLUSTER 786 INDEX  28  PROPORTION     0.83451 * PARENT  407.832
 SPLIT=0.9999E 04
WEIGHT      280.101  WAS       80.000     ADJUST      280.000  ID 18258
PROPORTION: PROP 0.84307  CIN  230.76  CTOT  134.16
OLD PROP 0.516222  CIN  41.30  ODEN  80.00  DIFFER   0.0
VOLUME0.53E-14   ROOT0.73E-07   DCON   -5.24

 LOCATION 3329  LINK 29 1583  SUBS  0    0  SUPER 23 5519  SYMBOL******
INDEX =     28    SYMBOL = ******

NET PROB******** DIRECT******* CUMS******* *   1.01

 MEAN          26.38  27.85  27.44  26.49  21.70  22.55  23.83  22.78

 COVARIANCE    3.45   5.19   3.56   3.16   0.89   2.78   0.02  -0.35
        2      5.19  11.79   6.64   5.62   1.86   6.74   1.59  -0.69
        3      3.56   6.64   5.76   4.35   0.99   3.97   1.26   0.69
        4      3.16   5.62   4.35   4.77   0.04   2.50  -0.08  -0.23
        5      0.89   1.86   0.99   0.04   1.90   2.58   1.12   0.53
        6      2.78   6.74   3.97   2.50   2.58   6.52   2.30   0.88
        7      0.02   1.59   1.26  -0.08   1.12   2.30   2.20   1.14
        8     -0.35  -0.69   0.69  -0.23   0.53   0.88   1.14   1.90

 SKEW(*W)     854.0 1974.4 1267.9  969.7  590.4 1567.1  474.4   46.5


WADJ(KL).W(KL).WSIM      420.2      200.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.159788      28
00-00
19-11 19-10       11-01 20-16 21-19 07-01 14-14 15-24
      24-09 25-02                               16-22
                                                22-03 23-19
                                                      28-16
                                                      32-07 3

      13-02 05-02
17-02
***HAVE SPLIT 28 WEIGHT   200.1 SUBS 32 33 ITER  29
KL.INDEX.LSUPER  3329    28  5519
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DUMP OF OBSERVED CLUSTERS FROM 28   3329

CLUSTER   0 INDEX  28  PROPORTION     0.74559 W PARENT  407.832
 SPLIT-0.1700E 02
WEIGHT      200.101  WAS       80.000     ADJUST      420.203  ID 19258
PROPORTION: PROP 0.85405  CIN  189.47  CTOT  153.72
OLD PROP 0.854050  CIN 189.47  ODEN 254.11  DIFFER   0.0
VOLUME0.91E 19    ROOT0.73E-07   DCON   -5.24

 LOCATION 3329  LINK 29 1583  SUBS 32 6407  SUPER 23 5519  SYMBOL      1
INDEX =      28    SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          26.57  28.39  28.25  26.75  21.82  22.97  23.92  22.76

 COVARIANCE    3.45   4.96   3.35   2.89   1.23   3.11   0.10  -0.24
        2      4.96  10.92   5.92   4.76   2.55   7.26   1.77  -0.39
        3      3.35   5.92   5.07   3.70   1.53   4.57   1.39   0.90
        4      2.89   4.76   3.70   4.03   0.38   2.76   0.08   0.03
        5      1.23   2.55   1.53   0.38   2.08   2.81   1.22   0.45
        6      3.11   7.26   4.57   2.76   2.81   6.58   2.43   0.80
        7      0.10   1.77   1.39   0.06   1.22   2.43   2.21   1.10
        8     -0.24  -0.39   0.90   0.03   0.45   0.80   1.10   1.71

 SKEW(*W)     854.0 1974.4 1267.9  969.7  590.4 1567.1  474.4   46.5


CLUSTER   1 INDEX  32  PROPORTION     0.41854 W PARENT  200.101
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 19202
PROPORTION: PROP 0.41854  CIN   33.48  CTOT  120.10
OLD PROP 0.418542  CIN  33.48  ODEN  80.00  DIFFER   0.0
VOLUME0.25E-21    ROOT0.16E-10   DCON     4.74

 LOCATION 6407  LINK 33 6249  SUBS  0     0  SUPER 28 3329  SYMBOL      2
INDEX =      32    SYMBOL =       2

NET PROB    0.34  DIRECT    1.72  CUMS    0.0  *    0.0
                            CUMS.0           * .0

 MEAN          27.80  32.05  29.94  28.19  22.77  25.78  24.96  22.78

 COVARIANCE    2.12   2.19   2.01   1.09   1.18   1.70   0.80   0.21
        2      2.19   3.49   2.34   1.40   1.66   2.53   1.09  -0.17
        3      2.01   2.34   3.83   2.67   1.18   2.12   2.10   1.85
        4      1.09   1.40   2.67   2.27   0.40   0.86   1.55   1.71
        5      1.18   1.66   1.18   0.40   1.35   1.64   0.57  -0.41
        6      1.70   2.53   2.12   0.86   1.64   3.52   0.69  -0.45
        7      0.80   1.09   2.10   1.55   0.57   0.69   1.60   1.51
        8      0.21  -0.17   1.85   1.71  -0.41  -0.45   1.51   2.50

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX  33  PROPORTION     0.58146 W PARENT  200.101
 SPLIT-0.9999E 04
WEIGHT       80.000  WAS       80.000     ADJUST      280.000  ID 19202
PROPORTION: PROP 0.58146  CIN   46.52  CTOT  120.10
OLD PROP 0.581458  CIN  46.52  ODEN  80.00  DIFFER   0.0
VOLUME0.20E-20    ROOT0.44E-10   DCON     4.74

 LOCATION 6249  LINK  0     0  SUBS  0     0  SUPER 28 3329  SYMBOL      3
INDEX =      33    SYMBOL =       3

NET PROB*******  DIRECT*******  CUMS******* *    1.00
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```
 MEAN          25.49  25.76  27.04  25.71  21.14  20.95  23.18  22.75

 COVARIANCE    2.84   4.12   2.54   2.38   0.54   1.54  -0.76  -0.31
       2       3.12   5.93   3.47   2.65   0.59   2.66  -0.19  -0.43
       3       2.54   3.47   3.91   2.69   0.76   2.67   0.33   0.74
       4       2.38   2.65   2.69   3.32  -0.33   1.05  -1.01  -0.32
       5       0.54   0.59   0.76  -0.33   1.71   1.64   0.82   0.66
       6       1.54   2.66   2.67   1.05   1.64   3.02   1.20   1.08
       7      -0.76  -0.19   0.33  -1.01   0.82   1.20   1.73   1.02
       8      -0.31  -0.43   0.73  -0.32   0.66   1.08   1.02   1.54

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ.NPTSO.INDEX.*.**ADJ 18258  9402    24       200.10       420.20
STATIS KL. W(KL).*ADJ(KL)       24  0.28019726566E 03  0.28000000000E 03


  ADJUST  24  WEIGHT      280.2  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.30577E 00 0.14559E 03
 STATISTICS: TRACE      -144.9  SKEW      1681.8  KURT      3205.0
        TESTS (SPLIT=0): -.19567E 06       -.44391E 04       -.21947E 05
WADJ(KL).W(KL).WSIM      420.4      200.2      400.0
 ALPHA ERROR:PRR.P.C4.W 24.8690F 00.1003E 01.1033E 01.2002E 03
  (ERROR CONT) CIN.2315E 03.445BE 02.2870E 03  W(FF).CTOT.ODEN.ODEN.4040E 03.1370E 03.2664E 03.8000E 02

CLUSTER 788 INDEX  24  PROPORTION     0.07045 * PARENT  404.022
 SPLIT-0.9999E 04
WEIGHT     200.147  WAS        80.000    ADJUST     420.395  ID 17347
PROPORTION: PROP 1.00295  CIN  231.53  CTOT  137.62
OLD PROP 0.55/260  CIN  44.58  ODEN  80.00  DIFFEN  0.0
VOLUME0.11E 19   ROOT0.20E-07   DCON   -5.24

 LOCATION 5805  LINK 25 5963  SUBS  0     SUPER 19 4947  SYMBOL******
INDEX =     24    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS
                      CUMS.0


 MEAN          28.04  30.87  29.83  27.52  22.98  25.19  25.43  23.72

 COVARIANCE    2.94   3.75   3.02   2.58   1.93   2.92   1.32   0.70
       2       3.75   7.23   5.04   4.50   2.55   5.12   2.71   1.52
       3       3.02   5.04   5.20   4.30   2.69   3.81   2.81   1.49
       4       2.58   4.50   4.30   4.95   2.45   3.24   2.40   2.11
       5       1.93   2.55   2.69   2.45   2.13   2.22   1.45   0.98
       6       2.92   5.12   3.81   3.24   2.22   4.21   2.05   1.18
       7       1.32   2.71   2.81   2.40   1.45   2.05   1.97   1.06
       8       0.70   1.52   1.49   2.11   0.98   1.18   1.06   1.55

 SKEW(*W)    -266.3 -768.8 -619.2 -317.6 -232.4 -851.2 -459.4 -232.1


PROPORTION RELATIVE TO TOP LEVEL =     0.083426       24
IDADJ.NPTSO.INDEX.*.*ADJ 17347  9466    24       200.20       420.39
STATIS KL. W(KL).*ADJ(KL)       23  0.42052978526E 03  0.42045751956E 03


  ADJUST  23  WEIGHT      420.5  WAS       200.2   SPFAC-0.12430E 03   CHANGE0.0          0.0          0.63149E-01 0.15405E 03
 STATISTICS: TRACE       -83.1  SKEW       995.3  KURT      6820.8
        TESTS (SPLIT=0): -.11394E 05       -.46443E 04       -.17184E 05
WADJ(KL).W(KL).WSIM      460.6      220.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.144254       23
IDADJ.NPTSO.INDEX.*.*ADJ 18258  9511    23       220.30       460.60
STATIS KL. W(KL).*ADJ(KL)       20  0.42212035136E 03  0.42129736336E 03
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 ADJUST  20  WEIGHT      422.1  WAS      200.6   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.31013E 00 0.36877E 02
 STATISTICS: TRACE      -317.5  SKEW     1442.0  KURT      9649.8
        TESTS (SPLIT=0): -.19741E 05      -.43549E 04       -.14295E 05
WADJ(KL),W(KL),WSIM      462.9     221.5     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.167391      20
IDADJ,NPTSO,INDEX,W,WADJ 18015  9605     20       221.47       462.94
STATIS KL, W(KL),WADJ(KL)       19  0.42104296R8E 03  0.42044726S6E 03

 ADJUST  19  WEIGHT      421.0  WAS      200.2   SPFAC-0.43027E 02   CHANGE0.0          0.0          0.77030E-01 0.86493E 02
 STATISTICS: TRACE       346.6  SKEW     1112.6  KURT      9469.5
        TESTS (SPLIT=0): -.11955E 06      -.47223E 04       -.14509E 05

CLUSTER 790 INDEX  19  PROPORTION     0.09852 W PARENT 9646.000
 SPLIT-0.4303E 02
WEIGHT     421.043   WAS      200.224     ADJUST     420.447   ID 17347
PROPORTION: PROP 0.09845   CIN  363.06   CTOT 5967.77
OLD PROP 0.095809   CIN 166.68   ODEN1716.65   DIFFER  16.70
VOLUME0.23E-17    ROOT0.15E-08    DCON    -1.19

 LOCATION 4947  LINK 11 3487  SUBS 24 5905  SUPER  0  119  SYMBOL******
INDEX =     19    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *    0.98

 MEAN          28.08  30.94  30.01  27.65  23.05  25.29  25.55  23.74

 COVARIANCE    2.74   3.71   2.89   2.58   1.75   2.77   1.26   0.81
        2      3.71   7.28   5.11   4.70   2.58   5.05   2.75   1.79
        3      2.89   5.11   4.99   4.37   2.50   3.73   2.75   1.70
        4      2.58   4.70   4.37   5.10   2.38   3.27   2.46   2.31
        5      1.75   2.58   2.50   2.38   1.90   2.13   1.39   1.06
        6      2.77   5.05   3.73   3.27   2.13   4.07   2.04   1.34
        7      1.26   2.75   2.75   2.46   1.39   2.04   1.99   1.20
        8      0.81   1.79   1.70   2.31   1.06   1.34   1.20   1.70

 SKEW(*W)     -23.6 -196.1 -543.4 -342.7 -201.2 -312.4 -306.8  -79.9


WADJ(KL),W(KL),WSIM      461.6     220.8     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.100002      19
IDADJ,NPTSO,INDEX,W,WADJ 17347  9646     19       220.82       461.64
STATIS KL, W(KL),WADJ(KL)       16  0.50301586916 03  0.50290136726 03

 ADJUST  16  WEIGHT      503.0  WAS      241.5   SPFAC-0.13023E 02   CHANGE0.0          0.0          0.24377E-01 0.25828E 02
 STATISTICS: TRACE       436.6  SKEW     2940.6  KURT    160946.1
        TESTS (SPLIT=0): 0.78822E 05      -.24625E 04       0.13874E 06
WADJ(KL),W(KL),WSIM      543.1     261.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.207584      15
IDADJ,NPTSO,INDEX,W,WADJ 18284  9759     16       261.57       543.13
NO OF ITERATIONS THROUGH ALL THE DATA =     1
00-00
18-13 19-10       11-01 20-16 21-21 07-01 14-13 15-22
      24-08 25-01                               16-20
                                                22-03 23-16
                                                      28-13
                                                      32-05 3

      13-02 05-02
17-01
KL,INDEX,LSUPER    119     0******
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DUMP OF OBSERVED CLUSTERS FROM  0     119

CLUSTER    0 INDEX    0  PROPORTION     0.0      * PARENT 9800.000
 SPLIT 0.1000E 06
WEIGHT     9800.000  WAS         0.001     ADJUST         0.0     ID9999999
PROPORTION: PROP 1.000000  CIN     0.00  CTOT     0.0
OLD PROP 1.000000  CIN    0.00  ODEN    0.00  DIFFER    0.0
VOLUME0.0      ROOT0.0        DCON      0.0
INDEX =       0     SYMBOL =        0

NET PROB    0.0   DIRECT    0.0   CUMS******** *    1.00

CLUSTER    1 INDEX   18  PROPORTION     0.12548 * PARENT 9800.000
 SPLIT-0.1000E 05
WEIGHT      305.013  WAS       220.558     ADJUST      461.116  ID 19188
PROPORTION: PROP 0.12554  CIN  269.77  CTOT 7658.16
OLD PROP 0.106937  CIN 190.53  ODEN1799.82  DIFFER    0.0
VOLUME0.11E-17    ROOT0.11E-08    DCON      2.07

 LOCATION 1741  LINK 19 4947  SUBS  0     0  SUPER  0  119  SYMBOL      1
INDEX =      18     SYMBOL =        1

NET PROB******  DIRECT*******  CUMS******** *    0.98

 MEAN          25.33  25.48  26.52  25.16  20.92  21.19  23.37  22.36

 COVARIANCE    2.02   2.40   1.54   1.55   1.01   1.63   0.38  -0.07
        2      2.40   5.85   2.88   2.27   2.02   4.69   0.44  -0.38
        3      1.54   2.88   3.26   2.98   0.85   2.01   1.32   1.08
        4      1.55   2.27   2.98   4.27   0.86   1.11   1.49   1.93
        5      1.01   2.02   0.85   0.86   1.58   2.27   0.39  -0.09
        6      1.63   4.69   2.01   1.11   2.27   5.57   0.62  -0.69
        7      0.38   0.44   1.32   1.49   0.39   0.62   1.43   1.01
        8     -0.07  -0.38   1.08   1.93  -0.09  -0.69   1.01   2.05

 SKEW(*W)     -114.4  -90.5 -170.8 -407.5 -149.8  165.5 -129.0 -358.2


CLUSTER    1 INDEX  19  PROPORTION     0.09689 * PARENT 9800.000
 SPLIT-0.1928E 02
WEIGHT      229.851  WAS       220.819     ADJUST      461.639  ID 19446
PROPORTION: PROP 0.09693  CIN  204.86  CTOT 7685.57
OLD PROP 0.100002  CIN 196.38  ODEN1966.00  DIFFER    0.23
VOLUME0.61E-20    ROOT0.78E-10    DCON      4.42

 LOCATION 4947  LINK 11 3487  SUBS 24 5805  SUPER  0  119  SYMBOL      2
INDEX =      19     SYMBOL =        2

NET PROB    0.11  DIRECT    1.12  CUMS   11.73 *    0.98

 MEAN          28.16  31.05  29.99  27.68  23.06  25.32  25.52  23.76

 COVARIANCE    2.47   3.07   2.54   2.24   1.66   2.37   1.09   0.60
        2      3.07   6.08   4.28   4.03   2.16   4.16   2.31   1.41
        3      2.54   4.28   4.65   3.99   2.43   3.16   2.53   1.41
        4      2.24   4.03   3.99   4.79   2.31   2.85   2.29   2.11
        5      1.66   2.16   2.43   2.31   1.97   1.88   1.32   0.95
        6      2.37   4.16   3.16   2.85   1.88   3.36   1.69   1.05
        7      1.09   2.31   2.53   2.29   1.32   1.69   1.79   1.03
        8      0.60   1.41   1.41   2.11   0.95   1.05   1.03   1.54

 SKEW(*W)      42.9   80.0   47.8   65.2   19.2   46.0   17.8   17.7
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CLUSTER   2 INDEX  24  PROPORTION     0.84653 W PARENT  229.851
 SPLIT-0.1000E 05
WEIGHT      225.941   WAS      200.197    ADJUST      420.395  ID 19266
PROPORTION: PROP 0.83150  CIN  212.18  CTOT  -25.32
OLD PROP 0.840552  CIN 186.95  ODEN 229.78  DIFFER   0.0
VOLUME0.22E-19   ROOT0.15E-09   DCON     3.77

 LOCATION 5805  LINK 25 5963  SUBS  0     0  SUPER 19 4947  SYMBOL      3
INDEX =      24    SYMBOL =       3

NET PROB   11.48   DIRECT  13.81  CUMS    0.0  *    0.0
                           CUMS.0          * .0


 MEAN          28.06  30.98  29.65  27.58  22.98  25.20  25.44  23.73

 COVARIANCE    2.76   3.57   2.87   2.49   1.84   2.78   1.28   0.71
       2       3.57   7.05   4.98   4.50   2.50   4.95   2.68   1.61
       3       2.87   4.98   5.06   4.30   2.65   3.68   2.79   1.57
       4       2.49   4.50   4.30   5.06   2.46   3.24   2.48   2.23
       5       1.84   2.50   2.65   2.46   2.11   2.18   1.46   1.03
       6       2.78   4.95   3.68   3.24   2.18   4.06   2.02   1.24
       7       1.28   2.68   2.79   2.48   1.46   2.02   1.99   1.15
       8       0.71   1.61   1.57   2.23   1.03   1.24   1.15   1.63

 SKEW(*W)        2.0  -40.5    2.6   51.7  -36.6  -37.2   -3.2  -15.9


CLUSTER   2 INDEX  25  PROPORTION     0.15047 W PARENT  229.851
 SPLIT-0.9999E 04
WEIGHT       93.251  WAS       80.000    ADJUST      280.000  ID 17347
PROPORTION: PROP 0.14727  CIN   44.54  CTOT  -72.61
OLD PROP 0.428393  CIN  35.42  ODEN  82.68  DIFFER   0.0
VOLUME0.88E-25   ROOT0.30E-12   DCON     3.52

 LOCATION 5963  LINK  0    0  SUBS  0     0  SUPER 19 4947  SYMBOL      4
INDEX =      25    SYMBOL =       4

NET PROB    0.0   DIRECT   0.0   CUMS    0.0  *    0.0
                           CUMS.0          * .0


 MEAN          27.85  30.27  29.87  27.65  22.92  24.60  25.31  23.52

 COVARIANCE    1.83   1.78   1.28   1.05   0.80   1.33   0.86   0.31
       2       1.78   3.09   2.19   1.75   1.26   2.29   0.86   0.55
       3       1.28   2.19   1.71   1.38   0.96   1.62    .69   0.45
       4       1.08   1.75   1.38   1.77   1.02   1.22   0.53   0.84
       5       0.80   1.26   0.96   1.02   0.73   0.95   0.36   0.46
       6       1.33   2.29   1.62   1.22   0.95   1.78   0.64   0.36
       7       0.46   0.86   0.69   0.53   0.36   0.54   0.40   0.21
       8       0.31   0.57   0.45   0.84   0.44   0.36   0.21   0.58

 SKEW(*W)       58.0   89.8   76.4   19.3   46.4   72.5   31.0    7.4


CLUSTER   1 INDEX  11  PROPORTION     0.00605 W PARENT 9800.000
 SPLIT-0.9999E 04
WEIGHT      101.759  WAS       80.000    ADJUST      280.000  ID 12105
PROPORTION: PROP 0.00606  CIN   56.40  CTOT  484.39
OLD PROP 0.084166  CIN  39.66  ODEN 471.23  DIFFER   0.0
VOLUME0.11E-22   ROOT0.34E-11   DCON     2.82

 LOCATION 3487  LINK 20  145  SUBS  0     0  SUPER  0  119  SYMBOL      5
INDEX =      11    SYMBOL =       5

NET PROB    0.0   DIRECT   0.0   CUMS    0.0  *    0.0
                           CUMS.0          * .0
```

MEAN	26.22	27.73	30.25	28.71	20.67	20.53	25.55	25.03
COVARIANCE	0.49	1.17	0.36	0.04	0.71	1.42	0.17	-0.18
2	1.17	4.11	0.92	-0.50	2.58	5.46	0.52	-0.94
3	0.36	0.92	1.26	1.24	0.05	0.22	0.77	0.84
4	0.04	-0.50	1.24	2.04	-1.08	-2.10	0.75	1.58
5	0.71	2.58	0.05	-1.08	2.06	4.10	0.02	-1.16
6	1.42	5.46	0.22	-2.10	4.10	8.85	0.10	-2.38
7	0.17	0.52	0.77	0.75	0.02	0.10	0.60	0.60
8	-0.18	-0.94	0.84	1.58	-1.16	-2.38	0.60	1.48
SKEW(*W)	111.6	295.6	110.9	30.0	137.5	246.6	61.9	-47.9

CLUSTER 1 INDEX 20 PROPORTION 0.16369 * PARENT 9800.000
SPLIT-0.1000E 05
WEIGHT 249.429 WAS 221.472 ADJUST 452.943 ID 19405
PROPORTION: PROP 0.16376 CIN 247.11 CTOT 8290.04
OLD PROP 0.167203 CIN 219.17 ODEN1314.96 DIFFER 0.0
VOLUME0.25E-20 ROOT0.50E-10 DCON 3.79

LOCATION 145 LINK 21 3773 SUBS 0 0 SUPER 0 119 SYMBOL 6
INDEX = 20 SYMBOL = 6

NET PROB 0.00 DIRECT 0.00 CUMS******* * 1.00

MEAN	25.76	26.60	31.00	31.21	18.66	17.04	26.34	27.95
COVARIANCE	1.18	0.75	0.46	0.30	0.61	0.65	-0.32	-0.70
2	0.75	2.21	0.89	0.82	1.07	1.55	-0.01	-1.01
3	0.46	0.89	1.33	1.23	0.68	0.34	0.79	0.39
4	0.30	0.82	1.23	2.56	0.64	0.11	1.15	1.92
5	0.81	1.07	0.68	0.64	1.01	0.80	-0.00	-0.45
6	0.65	1.55	0.34	0.11	0.80	1.55	-0.42	-1.27
7	-0.32	-0.01	0.79	1.15	-0.00	-0.42	1.39	1.54
8	-0.70	-1.01	0.39	1.92	-0.45	-1.27	1.54	3.66
SKEW(*W)	-6.8	4.9	17.9	23.8	21.2	9.9	26.3	18.7

CLUSTER 1 INDEX 21 PROPORTION 0.20940 W PARENT 9800.000
SPLIT-0.1000E 05
WEIGHT 363.817 WAS 220.772 ADJUST 461.544 ID 19102
PROPORTION: PROP 0.20949 CIN 360.88 CTOT 8076.38
OLD PROP 0.175264 CIN 218.31 ODEN1225.69 DIFFER 0.0
VOLUME0.43E-19 ROOT0.29E-09 DCON 0.76

LOCATION 3773 LINK 7 2757 SUBS 0 0 SUPER 0 119 SYMBOL 7
INDEX = 21 SYMBOL = 7

NET PROB 0.0 DIRECT 0.0 CUMS******* * 0.93

MEAN	26.96	29.10	30.66	29.52	20.37	20.18	27.20	28.11
COVARIANCE	1.26	1.13	0.88	0.97	0.71	0.94	0.48	1.08
2	1.13	2.63	1.67	1.70	0.84	2.45	0.59	0.81
3	0.88	1.67	2.63	2.24	1.45	2.70	0.58	-0.34
4	0.97	1.70	2.24	3.50	1.27	2.17	2.04	1.21
5	0.71	0.84	1.45	1.27	1.14	1.42	0.32	-0.05
6	0.94	2.45	2.70	2.17	1.42	3.56	0.29	-0.57
7	0.48	0.59	0.58	2.04	0.32	0.29	2.04	1.76

	1.08	0.81	-0.34	1.21	-0.05	-0.57	1.76	3.38
SKEW(*W)	155.5	-36.7	490.5	154.0	341.4	466.3	-162.8	-441.8

CLUSTER 1 INDEX 7 PROPORTION 0.01301 * PARENT 9800.000
SPLIT-0.9999E 04
WEIGHT 198.712 WAS 80.000 ADJUST 280.000 ID 11010
PROPORTION: PROP 0.01301 CIN 130.46 CTOT -226.71
OLD PROP 0.107749 CIN 39.84 ODEN 369.72 DIFFER 0.0
VOLUME0.37E-17 ROOT0.19E-08 DCON -2.52

LOCATION 2757 LINK 14 4217 SUBS 0 0 SUPER 0 119 SYMBOL 8
INDEX = 7 SYMBOL = 8

NET PROB 0.00 DIRECT 0.00 CUMS 0.0 * 0.0
CUMS.0 * .0

MEAN	25.64	27.92	27.55	26.52	21.72	23.45	25.06	23.71
COVARIANCE	2.54	2.91	2.94	3.73	-0.48	-1.64	2.85	4.52
2	2.91	4.49	3.77	4.58	-0.67	-1.70	3.34	4.59
3	2.94	3.77	4.84	5.78	-1.23	-3.12	3.91	6.15
4	3.73	4.58	5.78	7.75	-1.89	-4.19	5.08	8.48
5	-0.48	-0.67	-1.23	-1.89	1.23	2.05	-1.20	-2.45
6	-1.64	-1.70	-3.12	-4.19	2.05	4.76	-3.38	-6.24
7	2.85	3.34	3.91	5.08	-1.20	-3.38	4.44	7.16
8	4.52	4.59	6.15	8.48	-2.45	-6.24	7.16	12.62
SKEW(*W)	-52.2	-514.7	-77.7	193.3	-468.9	-956.4	434.5	1378.0

CLUSTER 1 INDEX 14 PROPORTION 0.12925 * PARENT 9800.000
SPLIT-0.1000E 05
WEIGHT 348.760 WAS 241.290 ADJUST 502.581 ID 18530
PROPORTION: PROP 0.12932 CIN 309.26 CTOT 7407.46
OLD PROP 0.149140 CIN 214.72 ODEN1413.74 DIFFER 0.0
VOLUME0.19E-18 ROOT0.43E-09 DCON 1.80

LOCATION 4217 LINK 15 4375 SUBS 0 0 SUPER 0 119 SYMBOL 9
INDEX = 14 SYMBOL = 9

NET PROB 8.02 DIRECT 61.99 CUMS 0.0 * 0.0
CUMS.0 * .0

MEAN	24.60	26.25	25.89	24.27	22.09	24.04	23.60	21.99
COVARIANCE	1.70	1.58	1.70	1.70	0.49	0.16	0.91	0.77
2	1.58	3.54	2.63	2.75	-0.07	0.32	1.28	0.59
3	1.70	2.63	3.45	3.10	0.11	-0.27	1.22	1.10
4	1.70	2.75	3.10	4.56	-0.11	0.05	1.31	1.83
5	0.49	-0.07	0.11	-0.11	0.91	0.32	0.44	0.44
6	0.16	0.32	-0.27	0.05	0.32	0.80	0.35	0.33
7	0.91	1.28	1.22	1.31	0.44	0.35	1.22	0.88
8	0.77	0.59	1.10	1.83	0.44	0.33	0.88	1.92
SKEW(*W)	6.2	-118.4	-296.4	-442.2	-146.3	-159.7	-372.4	-492.1

```
CLUSTER   1 INDEX  15  PROPORTION    0.22150 * PARENT 4800.000
 SPLIT-0.1960E 02
WEIGHT     495.145  WAS      261.637     ADJUST      543.275  ID 19420
PROPORTION: PROP 0.22151  CIN  408.46  CTOT 7955.60
OLD PROP 0.267747  CIN 219.13  ODEN 843.53  DIFFER  15.48
VOLUME0.58E-17   ROOT0.24E-04   DCON   -0.35

 LOCATION 4375  LINK 14 3931  SUBS 16 2155  SUPER  0  14  SYMBOL    10
INDEX =     15    SYMBOL =     10

NET PROB   1.75  DIRECT   7.91  CUMS1294.80 *   0.96

 MEAN          25.47  28.02  28.07  26.66  21.63  22.54  23.74  22.67

 COVARIANCE    3.15   5.02   3.15   2.75   1.24   3.23   0.27  -0.12
        2      5.02  11.56   6.15   5.09   2.67   7.66   1.87  -0.25
        3      3.15   6.15   4.80   3.56   1.67   4.77   1.43   0.91
        4      2.75   5.09   3.56   4.04   0.45   3.02   0.04   0.03
        5      1.24   2.67   1.67   0.48   1.47   2.79   1.27   0.51
        6      3.23   7.66   4.77   3.02   2.79   6.65   2.46   0.93
        7      0.27   1.87   1.43   0.04   1.27   2.46   2.14   1.04
        8     -0.12  -0.25   0.91   0.03   0.51   0.93   1.04   1.66

 SKEW(*W)     451.6 1057.4  758.9  460.4  538.3 1048.1  514.7  161.3


CLUSTER   2 INDEX  16  PROPORTION    0.93233 * PARENT  495.145
 SPLIT-0.1687E 02
WEIGHT     269.618  WAS      261.565     ADJUST      543.130  ID 19559
PROPORTION: PROP 0.89725  CIN  342.11  CTOT  225.31
OLD PROP 0.934411  CIN 234.69  ODEN 262.41  DIFFER   0.13
VOLUME0.12E-18   ROOT0.34E-09   DCON    4.50

 LOCATION 2155  LINK 17 4661  SUBS 22 5361  SUPER 15 4375  SYMBOL    11
INDEX =     16    SYMBOL =     11

NET PROB1246.08  DIRECT1388.78  CUMS  53.60 *   0.94

 MEAN          26.51  28.16  28.15  26.67  21.72  22.75  23.83  22.71

 COVARIANCE    3.43   5.18   3.43   2.96   1.28   3.11   0.22  -0.19
        2      5.18  11.11   6.14   4.97   2.61   7.06   1.65  -0.34
        3      3.43   6.14   5.11   3.87   1.54   4.38   1.37   0.87
        4      2.96   4.97   3.87   4.21   0.47   2.68   0.18   0.14
        5      1.28   2.61   1.54   0.47   1.98   2.69   1.09   0.30
        6      3.11   7.06   4.38   2.68   2.69   6.24   2.11   0.58
        7      0.22   1.65   1.37   0.18   1.09   2.11   2.03   1.01
        8     -0.19  -0.34   0.87   0.14   0.30   0.58   1.01   1.67

 SKEW(*W)       9.1   52.7   38.0   25.7   24.6   13.5   -5.1  -28.8


CLUSTER   3 INDEX  22  PROPORTION    0.13858 * PARENT  269.618
 SPLIT-0.9999E 04
WEIGHT     140.297  WAS       80.000     ADJUST      280.000  ID 17300
PROPORTION: PROP 0.13074  CIN   73.33  CTOT -291.27
OLD PROP 0.334580  CIN  31.50  ODEN  94.15  DIFFER   0.0
VOLUME0.78E-18   ROOT0.88E-09   DCON    0.25

 LOCATION 5361  LINK 23 5519  SUBS  0    0  SUPER 16 2155  SYMBOL    12
INDEX =     22    SYMBOL =     12

NET PROB   0.03  DIRECT   0.23  CUMS   0.0  *   0.0
                              CUMS.0        * .0


 MEAN          24.84  24.17  25.98  25.24  20.36  19.75  23.04  22.73
```

COVARIANCE	0.98	1.38	1.20	1.00	0.32	1.01	0.54	0.60
2	1.38	3.00	1.89	1.63	0.65	1.97	1.03	0.81
3	1.20	1.89	2.60	1.97	0.39	1.59	1.06	1.98
4	1.00	1.63	1.97	2.65	-0.64	0.18	0.47	1.41
5	0.32	0.65	0.39	-0.64	1.62	1.60	1.08	0.48
6	1.01	1.97	1.59	0.18	1.60	3.29	1.45	0.82
7	0.54	1.03	1.06	0.47	1.08	1.45	2.77	2.16
8	0.60	0.81	1.98	1.41	0.48	0.82	2.16	3.19
SKEW(*W)	419.6	1047.3	563.3	293.6	382.4	1044.3	571.1	554.8

CLUSTER 3 INDEX 23 PROPORTION 0.86142 W PARENT 269.618
SPLIT-0.2047E 02
WEIGHT 255.478 WAS 220.301 ADJUST 660.602 ID 19311
PROPORTION: PROP 0.81266 CIN 209.18 CTOT 12.22
OLD PROP 0.871292 CIN 182.46 ODEN 227.11 DIFFER 1.35
VOLUME0.14E-18 ROOT0.37E-09 DCON 3.56

LOCATION 5519 LINK 0 0 SUBS 28 3329 SUPER 16 2155 SYMBOL 13
INDEX = 23 SYMBOL = 13

NET PROB 50.53 DIRECT 62.18 CUMS1934.50 * 0.92

MEAN	26.65	28.54	28.37	26.84	21.84	23.02	23.93	22.72
COVARIANCE	3.33	4.85	3.19	2.76	1.18	2.97	0.05	-0.28
2	4.85	10.42	5.65	4.59	2.38	6.68	1.51	-0.43
3	3.19	5.65	4.71	3.50	1.41	4.24	1.19	0.74
4	2.76	4.59	3.50	3.91	0.33	2.60	-0.04	0.01
5	1.18	2.38	1.41	0.33	1.98	2.57	1.09	0.37
6	2.97	6.68	4.24	2.60	2.57	5.89	2.17	0.74
7	0.05	1.51	1.19	-0.04	1.09	2.17	2.05	0.96
8	-0.28	-0.43	0.74	0.01	0.37	0.74	0.96	1.51
SKEW(*W)	4.1	-5.3	47.8	-3.5	-34.4	-61.0	10.4	-37.0

CLUSTER 4 INDEX 28 PROPORTION 0.85286 W PARENT 255.478
SPLIT-0.6615E 02
WEIGHT 247.545 WAS 200.101 ADJUST 420.203 ID 19202
PROPORTION: PROP 0.78343 CIN 232.36 CTOT -41.12
OLD PROP 0.854050 CIN 189.47 ODEN 254.11 DIFFER 20.71
VOLUME0.55E-18 ROOT0.74E-09 DCON 3.04

LOCATION 3329 LINK 29 1583 SUBS 32 6407 SUPER 23 5519 SYMBOL 14
INDEX = 28 SYMBOL = 14

NET PROB1777.03 DIRECT2268.26 CUMS 0.16 * 1.01

MEAN	26.57	28.39	28.26	26.72	21.81	22.95	23.93	22.72
COVARIANCE	3.49	5.21	3.43	2.93	1.32	3.24	0.21	-0.22
2	5.21	11.36	6.22	5.00	2.67	7.39	1.81	-0.36
3	3.43	6.22	5.18	3.87	1.59	4.57	1.48	0.88
4	2.93	5.00	3.87	4.20	0.46	2.81	0.23	0.15
5	1.32	2.67	1.59	0.46	2.09	2.79	1.18	0.37
6	3.24	7.39	4.57	2.81	2.79	6.52	2.29	0.65
7	0.21	1.81	1.48	0.23	1.18	2.29	2.19	1.08
8	-0.22	-0.36	0.88	0.15	0.37	0.65	1.08	1.65

```
 SKEW(*W)     -205.6 -338.9 -404.7 -445.5 -157.3  -16.0 -204.5 -216.6


CLUSTER   5 INDEX  32  PROPORTION     0.35471 W PARENT  247.545
 SPLIT-0.9999E 04
WEIGHT       92.317  WAS        80.000     ADJUST      280.000  ID 19202
PROPORTION: PROP 0.45870  CIN    44.43  CTOT  123.67
OLD PROP 0.413542  CIN  33.48  ODEN  80.00  DIFFER    0.0
VOLUME0.29E-20    ROOT0.54E-10    DCON      3.60

 LOCATION 6407  LINK 33 6249  SUBS  0     0  SUPER 28 3329  SYMBOL     15
INDEX =      32     SYMBOL =      15

NET PROB    0.0    DIRECT    0.0    CUMS    0.0  *    0.0
                              CUMS.0          * .0


 MEAN          27.75  31.90  29.47  28.10  22.68  25.04  24.89  22.75

 COVARIANCE    2.19   2.50   2.26   1.38   1.16   1.70   0.92   0.29
        2      2.50   4.29   3.03   2.11   1.71   2.65   1.45   0.09
        3      2.26   3.03   4.36   3.22   1.25   2.18   2.37   1.99
        4      1.38   2.11   3.22   2.83   0.50   0.98   1.81   1.83
        5      1.16   1.71   1.25   0.50   1.38   1.61   0.64  -0.30
        6      1.70   2.65   2.18   0.98   1.61   3.43   0.77  -0.35
        7      0.92   1.45   2.37   1.81   0.64   0.77   1.78   1.60
        8      0.29   0.09   1.99   1.83  -0.30  -0.35   1.60   2.48

 SKEW(*W)     -225.8 -476.5 -384.9 -355.8 -246.3 -306.3 -227.3 -128.9


CLUSTER   5 INDEX  33  PROPORTION     0.64529 W PARENT  247.545
 SPLIT-0.9999E 04
WEIGHT      116.537  WAS        80.000     ADJUST      280.000  ID 19202
PROPORTION: PROP 0.65256  CIN    81.44  CTOT  122.74
OLD PROP 0.581458  CIN  46.52  ODEN  80.00  DIFFER    0.0
VOLUME0.26E-18    ROOT0.51E-09    DCON      1.74

 LOCATION 6249  LINK  0     0  SUBS  0     0  SUPER 28 3329  SYMBOL     16
INDEX =      33     SYMBOL =      16

NET PROB    0.16  DIRECT    0.25  CUMS******* *    1.00

 MEAN          25.86  26.29  27.30  25.87  21.29  21.34  23.37  22.69

 COVARIANCE    3.18   4.14   2.88   2.49   1.03   2.38  -0.39  -0.39
        2      4.14   7.70   4.63   3.50   1.86   4.61   0.36  -0.65
        3      2.88   4.63   4.20   3.01   1.17   3.42   0.61   0.50
        4      2.49   3.50   3.01   3.60   0.04   1.72  -0.66  -0.23
        5      1.03   1.86   1.17   0.04   1.98   2.23   0.93   0.41
        6      2.38   4.61   3.42   1.72   2.23   4.29   1.47   0.66
        7     -0.39   0.36   0.61  -0.66   0.93   1.47   1.79   0.86
        8     -0.39  -0.65   0.50  -0.23   0.41   0.66   0.86   1.39

 SKEW(*W)      361.1 1044.0  521.4  368.9  342.0  809.5  288.0  -68.8


CLUSTER   4 INDEX  29  PROPORTION     0.14714 W PARENT  255.478
 SPLIT-0.9999E 04
WEIGHT       93.401  WAS        80.000     ADJUST      280.000  ID 18258
PROPORTION: PROP 0.13516  CIN    48.57  CTOT -103.87
OLD PROP 0.422342  CIN  38.70  ODEN  91.64  DIFFER    0.0
VOLUME0.15E-23    ROOT0.12E-11    DCON      3.51
```

```
 LOCATION 1583  LINK  0     0  SUBS  0     0  SUPER 23 5519  SYMBOL    17
INDEX =     29    SYMBOL =     17

NET PROB    0.0   DIRECT    0.0   CUMS******* *    1.00

 MEAN          27.72  30.68  29.48  28.11  22.05  24.08  23.70  22.28

 COVARIANCE    0.64   0.98   0.69   0.77   0.13   0.58  -0.03  -0.00
        2      0.98   3.18   1.55   1.42   0.22   2.10   0.70  -0.13
        3      0.69   1.55   1.22   1.24   0.16   1.12   0.14   0.24
        4      0.77   1.42   1.24   1.67  -0.01   0.88  -0.29   0.21
        5      0.13   0.22   0.16  -0.01   0.27   0.27   0.14   0.06
        6      0.58   2.10   1.12   0.88   0.27   1.68   0.65   0.11
        7     -0.03   0.70   0.14  -0.29   0.14   0.65   0.72  -0.03
        8     -0.00  -0.13   0.24   0.21   0.06   0.11  -0.03   0.35

 SKEW(*W)       18.4   28.4   71.7   52.2   36.9   46.9   18.0   44.1


CLUSTER   2 INDEX  17  PROPORTION     0.06767 W PARENT  495.145
 SPLIT-0.9999E 04
WEIGHT     125.991  WAS       80.000    ADJUST     280.000  ID 15253
PROPORTION: PROP 0.06513  CIN   75.04  CTOT -657.01
OLD PROP 0.341336  CIN  38.02  ODEN 111.38  DIFFER   0.0
VOLUME0.69E-23   ROOT0.26E-11   DCON     1.12
 LOCATION 4661  LINK  0     0  SUBS  0     0  SUPER 15 4375  SYMBOL    18
INDEX =     17    SYMBOL =     18

NET PROB    0.0   DIRECT    0.0   CUMS    0.0  *    0.0
                          CUMS.0          * .0

 MEAN          25.59  26.53  27.01  25.68  21.20  21.33  23.22  22.31

 COVARIANCE    2.06   3.68   2.30   2.11   1.08   2.58   0.34  -0.06
        2      3.68   7.06   4.27   3.87   2.07   4.99   0.76  -0.13
        3      2.30   4.27   2.81   2.48   1.29   3.05   0.46   0.00
        4      2.11   3.87   2.48   2.47   1.01   2.68   0.32  -0.04
        5      1.08   2.07   1.29   1.01   0.84   1.60   0.35   0.00
        6      2.58   4.99   3.05   2.68   1.60   3.75   0.63  -0.04
        7      0.34   0.76   0.46   0.32   0.35   0.63   0.30   0.10
        8     -0.06  -0.13   0.00  -0.04   0.00  -0.04   0.10   0.19

 SKEW(*W)      209.7  399.0  235.1  247.4   54.7  207.8   74.6   23.8


CLUSTER   1 INDEX  13  PROPORTION     0.01652 W PARENT 9800.000
 SPLIT-0.9999E 04
WEIGHT     193.100  WAS       80.000    ADJUST     280.000  ID 12192
PROPORTION: PROP 0.01653  CIN  136.42  CTOT 1546.74
OLD PROP 0.117525  CIN  44.55  ODEN 379.10  DIFFER   0.0
VOLUME0.80E-19   ROOT0.28E-09   DCON    -2.29
 LOCATION 3931  LINK  5 2313  SUBS  0     0  SUPER  0  119  SYMBOL    19
INDEX =     13    SYMBOL =     19

NET PROB    0.00  DIRECT    0.00  CUMS    0.0  *    0.0
                          CUMS.0          * .0

 MEAN          26.51  27.53  27.38  25.28  21.80  23.50  23.52  21.93

 COVARIANCE    5.65   6.56   4.94   6.58   1.49   2.64   0.01   1.84
        2      6.56   8.43   6.22   8.28   1.80   3.44   0.17   2.05
```

3	4.94	6.22	5.02	6.46	1.35	2.46	0.28	1.78
4	6.58	8.24	6.46	8.83	1.74	3.16	0.25	2.38
5	1.46	1.80	1.35	1.74	0.68	1.00	0.10	0.59
6	2.64	3.44	2.46	3.16	1.00	1.95	0.15	0.84
7	0.01	0.17	0.28	0.25	0.30	0.15	0.33	0.27
8	1.84	2.05	1.78	2.38	0.59	0.84	0.27	1.32
SKEW(*8)	-15.6	435.9	251.8	318.1	114.0	458.5	-37.4	-174.7

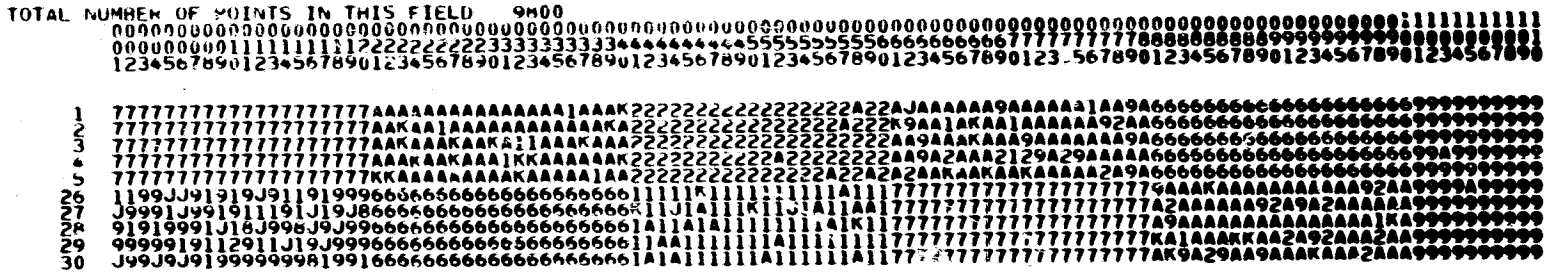
CLUSTER 1 INDEX 5 PROPORTION 0.01820 * PARENT 9800.000
SPLIT=0.9999E 04
WEIGHT 225.751 WAS 50.000 ADJUST 280.000 ID 10778
PROPORTION: PROP 0.01821 CIN 167.36 CTOT 610.04
OLD PROP 0.199378 CIN 41.06 ODEN 205.94 DIFFER 0.0
VOLUME0.39E-19 ROOT0.20E-09 DCON -3.53

LOCATION 2313 LINK 0 0 SUBS 0 0 SUPER 0 319 SYMBOL 20
INDEX = 5 SYMBOL = 20

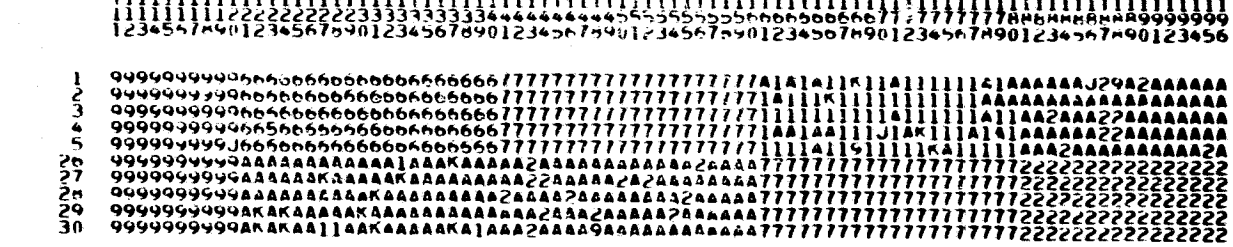
NET PROB 0.00 DIRECT 0.02 CUMS 0.0 * 0.0
CUMS.0 * .0

MEAN	25.59	26.41	27.68	26.45	21.09	21.56	23.43	23.17
COVARIANCE 1	1.91	3.31	1.38	1.01	0.98	2.41	0.32	0.26
2	3.31	6.98	2.74	1.86	2.25	5.63	1.32	0.58
3	1.38	2.74	1.51	1.10	0.78	1.94	0.64	0.53
4	1.01	1.86	1.10	1.10	0.31	1.02	0.29	0.47
5	0.98	2.25	0.78	0.31	1.13	2.31	0.72	0.10
6	2.41	5.63	1.94	1.02	2.31	5.41	1.49	0.29
7	0.32	1.32	0.64	0.29	0.72	1.49	1.11	0.35
8	0.26	0.58	0.53	0.47	0.10	0.29	0.35	0.48
SKEW(*8)	-329.9	-788.9	-470.8	-371.0	-125.4	-421.6	-50.8	-137.0

LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS



TOTAL NUMBER OF POINTS IN THIS FIELD 9400



POINTS PER CLUSTER IN THIS FIELD

CLUSTER	SYMBOL	POINTS
1	1	194
2	2	214
3	3	0
4	4	0
5	5	1
6	6	299
7	7	400
8	8	4
9	9	272
10	A	507
11	B	0
12	C	0
13	D	0
14	E	0
15	F	0
16	G	0
17	H	0
18	I	0
19	J	22
20	K	47

Iterations 2 - 9 removed.

TOTAL NUMBER OF POINTS = 9800

CLUSTER	SYMBOL	POINTS IN CLUSTER
1	1	142
2	2	212
3	3	300
4	4	409
5	5	192
6	6	345
7	7	3
8	8	7
9	9	8
10	A	9
11	B	108
12	C	220

STATIS NL= *(KL)=*ADJ(KL) 103 0.4630810547E 03 0.4629140625E 03

ADJUST 103 *EIGHT 463.1 *AS 221.5 SPFAC-0.99999E 04 CHANGE0.0 0.0 0.17917E 00 0.10556E 03
STATISTICS: TRACE -25.4 SKE* 1011.1 KURT 11535.8
TESTS (SPLIT=0): -.11516E 06 -.45852E 04 -.11361E 05

CLUSTER1009 INDEX 103 PROPORTION 0.29521 * PARENT 3795.749
SPLIT-0.1000E 05
WEIGHT 463.081 WAS 221.457 ADJUST 462.914 ID 85723
PROPORTION: PROP 0.29608 CIN 430.13 CTOT 2295.71
OLD PROP 0.295595 CIN 196.25 OPEN 900.46 DIFFER 0.0
VOLUME0.30E-17 ROOT0.17E-08 DCON -1.15

LOCATION 5903 LINK101 6407 SUBS 0 0 SUPER-15 4375 SYMBOL******
INDEX = 103 SYMBOL = ******

NET PROB******* DIRECT******* CUMS 0.0 * 0.0
CUMS.0 * .0

MEAN	27.12	28.74	30.28	30.24	20.05	19.08	28.09	29.74
COVARIANCE	1.52	1.71	0.89	0.51	1.06	1.70	0.57	0.65
2	1.71	3.37	1.34	1.01	1.33	3.18	1.00	0.72
3	0.89	1.34	2.52	2.73	1.23	2.02	1.08	0.57
4	0.51	1.01	2.73	4.32	1.05	1.78	1.85	1.12
5	1.05	1.33	1.23	1.05	1.46	1.77	0.79	0.21
6	1.70	3.18	2.02	1.78	1.77	3.81	1.26	0.32
7	0.57	1.00	1.08	1.85	0.79	1.26	1.72	0.81
8	0.65	0.72	0.57	1.12	0.21	0.32	0.81	1.65
SKEW(*W)	-30.5	173.5	-363.1	-675.2	-54.4	155.3	-149.3	-160.8

WADJ(KL)=*(KL)=*SIM 503.2 241.6 400.0
PROPORTION RELATIVE TO TOP LEVEL = 0.075509 103
IDADJ,NPTSO,INDEX=*=WADJ 85723 78539 103 241.62 503.25
STATIS NPTSO,IDADJ(KL) -20 79043 79043

ADJUST -20 *EIGHT 3003.9 WAS 1502.0 SPFAC-0.99999E 04 CHANGE0.0 0.0 0.10097E-07 0.46423E-07
STATISTICS: TRACE -84.3 SKE* 75.8 KURT 1490.2
TESTS (SPLIT=0): -.64693E 05 -.33939E 04 -.12767E 05

CLUSTER1010 INDEX -20 PROPORTION 0.15282 * PARENT79043.000
SPLIT-0.1000E 05
WEIGHT 3003.945 WAS 1501.971 ADJUST 3005.123 ID 79043
PROPORTION: PROP 0.15306 CIN 3003.58 CTOT59426.95
OLD PROP 0.153065 CIN1501.79 OPEN9811.43 DIFFER 0.0
VOLUME0.48E-21 ROOT0.22E-10 DCON 4.74

LOCATION 145 LINK-21 3773 SUBS 0 0 SUPER 0 119 SYMBOL******
INDEX = -20 SYMBOL = ******

```
NET PROB******* DIRECT******* CUMS******* *   1.00

 MEAN          25.78  26.57  30.97  31.17  18.66  17.04  25.33  27.91

 COVARIANCE     1.15   0.78   0.52   0.38   0.82   0.65  -0.32  -0.71
        2       0.78   2.05   0.57   0.83   0.95   1.35  -0.06  -1.02
        3       0.52   0.87   1.37   1.09   0.70   0.33   0.77   0.21
        4       0.38   0.83   1.09   2.15   0.62   0.19   0.99   1.57
        5       0.82   0.95   0.70   0.62   0.96   0.68  -0.03  -0.50
        6       0.65   1.36   0.33   0.19   0.68   1.33  -0.48  -1.25
        7      -0.32  -0.06   0.77   0.99  -0.03  -0.48   1.33   1.35
        8      -0.71  -1.02   0.21   1.57  -0.50  -1.25   1.35   3.44

 SKEW(*W)      -95.8  -35.3  145.0   80.8 -116.1  -61.1  190.5  279.7


WADJ(KL)*W(KL)*WSIM     3905.1     1502.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.152909      -20
IDADJ*NPTSO*INDEX*W*WADJ 79043 79043   -20      1501.97      3905.13
STATIS NPTSO*IDADJ(KL)     -14   79311   79311


  ADJUST -14  WEIGHT      2096.7  WAS      1059.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.39057E-03 0.52030E-01
 STATISTICS: TRACE       -76.1  SKEW       143.5  KURT      1939.3
        TESTS (SPLIT=0): -.69771E 05      -.35077E 04      -.13065E 05

CLUSTER1011 INDEX -14  PROPORTION     0.10752 W PARENT79311.000
 SPLIT-0.1000E 05
WEIGHT    2096.747  WAS    1059.715    ADJUST    2755.259  ID 79311
PROPORTION: PROP 0.10770  CIN 2034.94  CTOT60242.75
OLD PROP 0.107701  CIN1026.65  ODEN9528.85  DIFFER   0.0
VOLUME0.47E-21   ROOT0.22E-10   DCON     4.74

 LOCATION 4217  LINK-15 4375  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =     -14     SYMBOL = ******

NET PROB******* DIRECT******* CUMS******* *   1.02

 MEAN          24.38  25.70  25.54  24.14  22.19  24.16  23.61  22.20

 COVARIANCE     1.30   0.87   1.17   1.23   0.31  -0.05   0.63   0.26
        2       0.87   2.17   1.51   1.87  -0.43  -0.08   0.72  -0.05
        3       1.17   1.51   2.61   2.33  -0.35  -0.83   0.41   0.05
        4       1.23   1.87   2.33   3.90  -0.50  -0.38   0.60   0.75
        5       0.31  -0.43  -0.35  -0.50   0.75   0.27   0.19   0.17
        6      -0.05  -0.08  -0.83  -0.38   0.27   0.83   0.22   0.22
        7       0.63   0.72   0.41   0.60   0.19   0.22   0.67   0.14
        8       0.26  -0.05   0.05   0.75   0.17   0.22   0.14   0.69

 SKEW(*W)      -281.8 -463.5 -503.8 -537.2   -2.1   92.9 -139.0  -20.0


WADJ(KL)*W(KL)*WSIM     2701.5     1039.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.105735      -14
IDADJ*NPTSO*INDEX*W*WADJ 79311 79311   -14      1039.03      2701.48
STATIS NPTSO*IDADJ(KL)     -21   79419   79419


  ADJUST -21  WEIGHT      3995.3  WAS      1997.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.10023E-06 0.42022E-04
 STATISTICS: TRACE       -12.9  SKEW       376.0  KURT      2333.6
        TESTS (SPLIT=0): -.69538E 05      -.29925E 04      -.11508E 05

CLUSTER1012 INDEX -21  PROPORTION     0.20344 W PARENT79419.000
 SPLIT-0.1000E 05
WEIGHT    3995.311  WAS    1997.693    ADJUST    5194.000  ID 79419
PROPORTION: PROP 0.20334  CIN 3994.51  CTOT59764.61
OLD PROP 0.203339  CIN1997.24  ODEN9835.71  DIFFER   0.0
VOLUME0.14E-20   ROOT0.38E-10   DCON     4.74

 LOCATION 3773  LINK-14 4217  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =     -21     SYMBOL = ******
```

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NET PROB******** DIRECT******* CUMS******* *   0.94

 MEAN          27.48  24.05  30.65  29.50  20.45  20.21  27.25  28.09

 COVARIANCE    1.64   1.15   0.88   0.98   0.53   0.44   0.53   1.13
       2       1.15   2.59   1.62   1.61   0.74   2.36   0.58   0.76
       3       0.88   1.62   2.45   2.06   1.33   2.58   0.51  -0.38
       4       0.98   1.61   2.06   3.26   1.14   2.01   1.88   1.11
       5       0.53   0.74   1.33   1.14   1.08   1.26   0.31  -0.03
       6       0.44   2.36   2.58   2.01   1.26   3.48   0.21  -0.69
       7       0.53   0.58   0.51   1.88   0.31   0.21   1.92   1.73
       8       1.13   0.76  -0.38   1.11  -0.03  -0.69   1.73   3.31

 SKEW(*W)     420.5  514.9  359.5  345.0 -124.9  192.7  423.3  656.8


*ADJ(KL)*W(KL)*SIM    5193.8    1997.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.203499      -21
IDADJ.NPTSO.INDEX*W*WADJ 79419 79419   -21      1997.67     5193.80
STATIS NPTSO.IDADJ(KL)      -15   79479   79479

  ADJUST -15  WEIGHT     4035.2  WAS     2049.5   SPFAC-0.98670E 03   CHANGE0.0          0.0          0.15673E-01 0.13081E 02
 STATISTICS: TRACE      -210.5  SKEW     2857.0  KURT     30371.5
        TESTS (SPLIT=0): -.25438E 05      -.51328E 03      0.16522E 05

CLUSTER1013 INDEX -15  PROPORTION     0.20757 # PARENT79479.000
 SPLIT-0.9867E 03
WEIGHT    4035.163  WAS     2049.470    ADJUST    5328.617  ID 79479
PROPORTION: PROP 0.20752  CIN 3615.43  CTOT61898.48
OLD PROP 0.207521  CIN1814.76  CDEN8652.25  DIFFER 312.38
VOLUME0.20E-14   RMOT0.14E-09   DCON     4.74

 LOCATION 4375  LINK 13 3931  SUBS102 5361  SUPER  0  119  SYMBOL******
INDEX =    -15    SYMBOL = ******

NET PROB******** DIRECT******* CUMS******* *   1.08

 MEAN          26.96  29.51  28.79  27.15  22.19  23.94  24.22  22.88

 COVARIANCE    2.58   3.13   2.33   2.08   0.69   1.74  -0.19  -0.20
       2       3.13   6.05   3.62   3.05   0.85   3.14   0.39  -0.62
       3       2.33   3.62   3.51   2.59   0.73   2.44   0.75   0.65
       4       2.08   3.05   2.59   3.17  -0.20   1.23  -0.44  -0.18
       5       0.69   0.85   0.73  -0.20   1.53   1.41   0.82   0.43
       6       1.74   3.14   2.44   1.23   1.41   3.01   1.19   0.61
       7      -0.19   0.39   0.75  -0.44   0.82   1.19   1.77   1.10
       8      -0.20  -0.62   0.65  -0.18   0.43   0.61   1.10   1.86

 SKEW(*W)     1721.4 3607.1 2128.9 1820.4 1438.4 3146.9 1524.0  648.0


WADJ(KL)*W(KL)*WSIM    5162.8    1985.7     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.202917      -15

***SUB ELIM -15   SPLITTING  -986.70093 *  -150.00000
           102
           103
           101
            99
00-00
18-10 19-09 20-15 21-20 14-11 15-20 13-05 05-09
IDADJ.NPTSO.INDEX*W*WADJ 79479 79479   -15      1985.69     5162.80
STATIS KL, W(KL)*WADJ(KL)        5  0.7738543934E 03  0.7737944336E 03

  ADJUST    5  WEIGHT      773.9  WAS      376.9   SPFAC-0.95999E 04   CHANGE0.0          0.0          0.63577E-01 0.35465E 01
 STATISTICS: TRACE       20.6  SKEW     1805.6  KURT     5121.5
        TESTS (SPLIT=0): -.94549E 05      -.27990E 04      -.13801E 05
```

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CLUSTER1014 INDEX    5  PROPORTION     0.08855 * PARENT40250.000
 SPLIT=-0.1000E 05
WEIGHT     773.855   WAS      370.847    ADJUST     773.794   ID 85623
PROPORTION: PROP 0.08631  CIN  743.62  CTOT7172.25
OLD PROP 0.086631  CIN  742.99  ODEN8144.79  DIFFER   0.0
VOLUME0.11E-16   POOT0.33E-04   DCON    -1.01

 LOCATION 2313  LINK  0    0  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =      5    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS    0.0  *    0.0
                              CUMS.0          * .0


 MEAN          24.79  23.96  26.01  25.03  20.35  19.32  22.76  22.46

 COVARIANCE    1.45   0.96   0.63   0.89   0.09   0.22  -0.82  -0.11
       2       0.96   1.89   0.83   0.77   0.10   0.86  -0.24  -0.00
       3       0.69   0.63   1.55   1.29   0.17   0.56  -0.06   0.91
       4       0.86   0.77   1.29   2.36  -0.49   0.16  -0.62   0.55
       5       0.09   0.10   0.17  -0.49   0.62   0.31   0.39   0.20
       6       0.22   0.86   0.56   0.16   0.31   0.94   0.46   0.42
       7      -0.82  -0.24  -0.06  -0.62   0.39   0.46   1.30   0.50
       8      -0.11  -0.00   0.91   0.55   0.20   0.42   0.50   1.10

 SKEW(*W)      566.5  447.6  949.3  514.7  293.5  430.4  -53.6  555.2


WADJ(KL),W(KL),WSIM     813.9      397.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.089702          5
IDADJ,NPTSO,INDEX,W,WADJ 85623 A0250      5      396.96      813.92
STATIS NPTSO,IDADJ(KL)      -18    81288    81288

  ADJUST -18  WEIGHT     1941.1  WAS       969.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.19196E-03 0.66025E 00
 STATISTICS: TRACE       -63.7  SKEW        41.3  KURT      1808.6
        TESTS (SPLIT=0): -.72340E 05       -.36507E 04       -.13363E 05

CLUSTER1015 INDEX -18  PROPORTION     0.09862 * PARENT81288.000
 SPLIT=-0.1000E 05
WEIGHT    1941.062  WAS      969.150    ADJUST    2519.768  ID 81288
PROPORTION: PROP 0.09917  CIN 1827.66  CTOT62845.29
OLD PROP 0.099170  CIN 909.95  ODEN9208.33  DIFFER   0.0
VOLUME0.76E-21   POOT0.27E-10   DCON     4.74

 LOCATION 1741  LINK-19 4947  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =    -18    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.98

 MEAN          25.56  25.61  26.85  25.68  20.78  20.87  23.34  22.53

 COVARIANCE    1.91   2.46   1.52   1.37   1.22   2.30   0.50  -0.51
       2       2.46   5.59   3.02   2.44   2.09   4.82   0.31  -0.78
       3       1.52   3.02   2.89   2.34   1.31   3.22   1.16   0.31
       4       1.37   2.44   2.34   3.18   1.66   2.75   1.40   1.03
       5       1.22   2.09   1.31   1.66   1.39   1.97   0.49   0.11
       6       2.30   4.82   3.22   2.75   1.97   4.73   0.86  -0.28
       7       0.50   0.31   1.16   1.40   0.49   0.86   1.27   0.78
       8      -0.51  -0.78   0.31   1.03   0.11  -0.28   0.78   1.49

 SKEW(*W)       75.4  171.4   66.7  -23.4  -21.9  131.2    7.4  -22.1


WADJ(KL),W(KL),WSIM     2527.0      971.9      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.098612          -18
IDADJ,NPTSO,INDEX,W,WADJ 81288 A1288    -18       971.91      2526.97
STATIS KL, W(KL),WADJ(KL)       5  0.81400970801E 03  0.81392236336E 03
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 ADJUST   5  WEIGHT      514.0  WAS       467.0   SPFAC=0.99999E 04   CHANGE0.0          0.0          0.42974E-01 0.41113E 01
STATISTICS: TRACE        23.2  SKEW      734.2  KURT      507b.0
        TESTS (SPLIT=0): -.432b7E 05       -.3796IE 04       -.1353ME 05

CLUSTER1016 INDEX   5  PROPORTION     0.04941 * PARENT=4456.000
 SPLIT=0.1000E 05
WEIGHT     513.007  WAS      396.961    ADJUST     513.922  ID 90050
PROPORTION: PROP 0.04973  CIN  753.04  CTOT7b111.63
OLD PROP 0.049149  CIN 380.63  ODEN4278.09  DIFFER   0.0
VOLUME0.12E-18   ROOT0.35E-09   DCON   -1.00

 LOCATION 2313  LINK  0     0  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =      5     SYMBOL = ******

NET PROB******* DIRECT******* CUMS    0.0  *    0.0
                              CUMS.0          * .0


 MEAN          24.78  23.96  26.04  25.00  20.38  19.35  22.79  22.08

 COVARIANCE    1.49   0.98   0.72   0.91   0.06   0.23  -0.85  -0.12
        2      0.98   1.97   0.65   0.82   0.07   0.89  -0.26  -0.02

        3      0.72   0.65   1.55   1.31   0.14   0.57  -0.08   0.87

        4      0.91   0.82   1.31   2.43  -0.53   0.19  -0.84   0.52

        5      0.06   0.07   0.14  -0.53   0.63   0.30   0.41   0.20

        6      0.23   0.89   0.57   0.19   0.30   0.95   0.44   0.41

        7     -0.85  -0.26  -0.08  -0.84   0.41   0.44   1.31   0.51

        8     -0.12  -0.02   0.87   0.52   0.20   0.41   0.51   1.08

 SKEW(*W)     -441.2 -503.4 -598.7 -558.0 -110.6 -284.6  169.1 -286.6


WADJ(KL)*W(KL)*SIN    1084.3     417.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.098629       5
IDADJ,NPTSO,INDEX,*,WADJ 96050 84456     5      417.05     1084.32
STATIS KL, W(KL),WADJ(KL)       13  0.65371655276 03  0.65332373056 03


 ADJUST  13  WEIGHT      653.7  WAS       316.7   SPFAC=0.99999E 04   CHANGE0.0          0.0          0.21484E-01 0.44006E 01
STATISTICS: TRACE        -8.0  SKEW      318.4  KURT     2489.6
        TESTS (SPLIT=0): -.100R9E 06       -.456b4E 04       -.17559E 05

CLUSTER1017 INDEX  13  PROPORTION     0.04808 * PARENT=5488.000
 SPLIT=0.1000E 05
WEIGHT     653.717  WAS      316.662    ADJUST     653.324  ID 88060
PROPORTION: PROP 0.04815  CIN  636.43  CTOT72283.00
OLD PROP 0.050328  CIN 309.14  ODEN6132.54  DIFFER   0.0
VOLUME0.12E-18   ROOT0.35E-09   DCON   -1.05

 LOCATION 3931  LINK  5 2313  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =     13     SYMBOL = ******

NET PROB******* DIRECT******* CUMS******* *    0.73

 MEAN          24.38  25.46  25.12  22.81  21.55  23.49  23.03  20.84

 COVARIANCE    0.75   0.26   0.36   0.40   0.40   0.10   0.01   0.38
        2      0.26   1.95   0.85   0.89   0.94   1.57   0.27  -0.37

        3      0.36   0.85   2.00   1.55   0.45   0.31   1.28   0.64

        4      0.40   0.89   1.55   2.62   0.22   0.52   1.14   1.27

        5      0.40   0.94   0.45   0.22   0.86   0.77   0.03  -0.23

        6      0.10   1.57   0.31   0.52   0.77   1.71  -0.10  -0.57

        7      0.01   0.27   1.28   1.14   0.03  -0.10   1.23   0.57

        8      0.38  -0.37   0.64   1.27  -0.23  -0.57   0.57   1.42

 SKEW(*W)     -77.4   45.7   65.8  170.5  -83.4  103.4  -16.5  124.6
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#ADJ(KL),#(KL),#SIM      694.1      337.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.046288      13
IDADJ,NPTSO,INDEX,#,#ADJ 86060 86813     13      337.05      694.11
STATIS NPTSO,IDADJ(KL)      -19    86813    86813


 ADJUST -19  WEIGHT      1807.8  WAS       905.5   SPEAC-0.99999E 04   CHANGE0.0          0.0          0.77647E-04 0.17727E 00
 STATISTICS: TRACE       -52.0   SKEW      149.8   KURT      1704.9
        TESTS (SPLIT=0): -.74701E 05       -.35909E 04       -.13666E 05

CLUSTER1018 INDEX -19  PROPORTION     0.09175 # PARENT86813.000
 SPLIT-0.1000E 05
WEIGHT     1807.833  WAS      905.593     ADJUST     2354.540  ID 86813
PROPORTION: PROP 0.09183  CIN 1737.30  CIOT47839.81
OLD PROP 0.091834  CIN 876.64  ODEN9496.59  DIFFER   0.0
VOLUME0.92E-21    ROOT0.30E-10    DCON     4.74

 LOCATION 4947  LINK-20  145  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =     -19     SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *    0.97

 MEAN          28.40   31.68   30.49   28.17   23.27   25.70   25.90   24.06

 COVARIANCE    2.14    2.31    2.02    1.80    1.52    2.03    0.90    0.56
        2      2.31    4.73    3.52    3.22    1.94    3.56    2.03    1.25
        3      2.02    3.52    4.37    3.52    2.28    2.76    2.57    1.31
        4      1.80    3.22    3.52    4.24    2.18    2.51    2.15    1.99
        5      1.52    1.94    2.28    2.18    1.71    1.66    1.26    0.87
        6      2.03    3.56    2.76    2.51    1.66    3.01    1.5*    0.93
        7      0.90    2.03    2.57    2.15    1.26    1.51    1.84    0.87
        8      0.56    1.25    1.31    1.99    0.87    0.93    0.87    1.33

 SKEW(*W)    -239.6  -567.6  -491.7  -436.4  -223.2  -518.3  -277.9   -96.3


#ADJ(KL),#(KL),#SIM     2345.8      902.2      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.091403      -19
IDADJ,NPTSO,INDEX,#,#ADJ 86813 86813    -19      902.24      2345.83
NO OF ITERATIONS THROUGH ALL THE DATA =     9
00-00
18-10 19-09 20-15 21-20 14-11 15-20 13-05 05-10
KL,INDEX,LSUPER    119      0******
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NUMB OF OBSERVED CLUSTERS FROM  0     119

CLUSTER    0 INDEX    0  PROPORTION     0.0      * PARENT##200.000
 SPLIT 0.1000E 06
#EIGHT    ##200.000  #AS         0.001     ADJUST         0.0     ID999999
PROPORTION: PROP 1.00000  CIN      0.00  CTOT      0.0
OLD PROP 1.000000  CIN    0.00  ODEN    0.00  DIFFER    0.0
VOLUME0.0          ROOT0.0          DCON      0.0
INDEX =       0     SYMBOL =        0

NET PROB    0.0   DIRECT    0.0   CUMS******* *    1.00

CLUSTER    1 INDEX -18  PROPORTION     0.09869 * PARENT##200.000
 SPLIT-0.1000E 05
#EIGHT     1724.332  #AS       971.912     ADJUST     2526.971  ID 910##
PROPORTION: PROP 0.09845  CIN 1631.98  CTOT72263.81
OLD PROP 0.098452  CIN 917.71  ODEN9374.93  DIFFER    0.0
VOLUME0.73E-21    ROOT0.27E-10    DCON      4.74

 LOCATION 1741  LINK-19 4947  SUBS  0     0  SUPER  0  119  SYMBOL      1
INDEX =     -18     SYMBOL =        1

NET PROB******* DIRECT******* CUMS******* *    0.98

 MEAN          25.55  25.60  26.84  25.67  20.78  20.65  23.33  22.53

 COVARIANCE    1.96   2.41   1.50   1.35   1.20   2.27   0.51  -0.50
        2      2.41   5.47   2.98   2.38   2.04   4.72   0.32  -0.77
        3      1.50   2.98   2.89   2.32   1.29   3.19   1.17   0.31
        4      1.35   2.38   2.32   3.15   1.64   2.71   1.40   1.04
        5      1.20   2.04   1.29   1.64   1.37   1.93   0.49   0.11
        6      2.27   4.72   3.19   2.71   1.93   4.64   0.87  -0.27
        7      0.51   0.32   1.17   1.40   0.49   0.87   1.27   0.78
        8     -0.50  -0.77   0.31   1.04   0.11  -0.27   0.78   1.49

 SKEW(*W)       92.6  458.5 -111.5  -19.4  184.9  158.3 -270.4  -67.2


CLUSTER    1 INDEX -19  PROPORTION     0.09162 W PARENT##200.000
 SPLIT-0.1000E 05
#EIGHT     1021.492  #AS       902.241     ADJUST     2365.825  ID 96613
PROPORTION: PROP 0.09140  CIN  980.87  CTOT77377.63
OLD PROP 0.091403  CIN 866.66  ODEN9486.86  DIFFER    0.0
VOLUME0.93E-21    ROOT0.31E-10    DCON      4.74

 LOCATION 4947  LINK-20  145  SUBS  0     0  SUPER  0  119  SYMBOL      2
INDEX =     -19     SYMBOL =        2

NET PROB    0.00  DIRECT    0.00  CUMS******* *    0.97

 MEAN          28.40  31.64  30.46  28.15  23.26  25.68  25.88  24.05

 COVARIANCE    2.19   2.35   2.04   1.82   1.53   2.07   0.91   0.57
        2      2.35   4.81   3.56   3.27   1.96   3.63   2.06   1.26
        3      2.04   3.56   4.40   3.55   2.30   2.79   2.59   1.32
        4      1.82   3.27   3.55   4.27   2.20   2.55   2.17   2.01
        5      1.53   1.96   2.30   2.20   1.72   1.68   1.27   0.87
        6      2.07   3.63   2.79   2.55   1.68   3.07   1.53   0.94
        7      0.91   2.06   2.59   2.17   1.27   1.53   1.85   0.87
        8      0.57   1.26   1.32   2.01   0.87   0.94   0.87   1.34

 SKEW(*W)    -125.2 -530.0 -450.0 -351.6 -131.7 -423.5 -250.4 -212.8


CLUSTER    1 INDEX -20  PROPORTION     0.15252 W PARENT##200.000
 SPLIT-0.1000E 05
#EIGHT     2926.271  #AS      1501.974     ADJUST     3905.132  ID 8##43
PROPORTION: PROP 0.15215  CIN 2925.58  CTOT69124.94
OLD PROP 0.152155  CIN1501.79  ODEN9847.07  DIFFER    0.0
VOLUME0.48E-21    ROOT0.22E-10    DCON      4.74
```

```
 LOCATION  145  LINK-21 3773  SUBS  0    0  SUPER  0  119  SYMBOL      3
INDEX =    -20     SYMBOL =       3

NET PROB    0.00   DIRECT    0.00   CUMS******* *    1.00

 MEAN          25.78  26.56  30.98  31.18  18.66  17.04  26.33  27.91

 COVARIANCE    1.16   0.78   0.52   0.38   0.82   0.65  -0.32  -0.71
        2      0.78   2.05   0.87   0.83   0.96   1.36  -0.06  -1.02
        3      0.52   0.87   1.37   1.09   0.70   0.33   0.77   0.21
        4      0.38   0.83   1.09   2.16   0.62   0.19   0.79   1.57
        5      0.82   0.96   0.70   0.62   0.96   0.68  -0.03  -0.50
        6      0.65   1.36   0.33   0.19   0.68   1.33  -0.48  -1.25
        7     -0.32  -0.06   0.77   0.99  -0.03  -0.48   1.33   1.35
        8     -0.71  -1.02   0.21   1.57  -0.50  -1.25   1.35   3.44

 SKEW(*W)    -132.6  -22.7  119.8   11.7 -170.5  -53.7  207.5  342.8


CLUSTER   1 INDEX -21  PROPORTION     0.20282 W PARENT88200.000
 SPLIT-0.1000E 05
WEIGHT    3858.278  WAS    1997.618   ADJUST    5193.805  ID 89219
PROPORTION: PROP 0.20234  CIN 3857.60  CTOT69521.50
OLD PROP 0.202339  CIN1997.27  ODEN9866.87  DIFFER   0.0
VOLUME0.14E-20   ROOT0.38E-10   DCON     4.74

 LOCATION 3773  LINK-14 4217  SUBS  0    0  SUPER  0  119  SYMBOL      4
INDEX =    -21     SYMBOL =       4

NET PROB    0.0    DIRECT    0.0    CUMS******* *    0.93

 MEAN          26.90  29.06  30.67  29.60  20.36  20.20  27.26  28.10

 COVARIANCE    1.24   1.15   0.80   0.90   0.63   0.84   0.53   1.13
        2      1.15   2.59   1.62   1.61   0.74   2.36   0.58   0.76
        3      0.80   1.62   2.49   2.06   1.33   2.58   0.51  -0.38
        4      0.90   1.61   2.06   3.26   1.14   2.01   1.89   1.11
        5      0.63   0.74   1.33   1.14   1.08   1.26   0.31  -0.03
        6      0.84   2.36   2.58   2.01   1.26   3.48   0.21  -0.69
        7      0.53   0.58   0.51   1.89   0.31   0.21   1.92   1.73
        8      1.13   0.76  -0.38   1.11  -0.03  -0.69   1.73   3.31

 SKEW(*W)     395.8  276.2    5.1  109.6 -268.1 -140.0  315.2  764.5


CLUSTER   1 INDEX -14  PROPORTION     0.10543 W PARENT88200.000
 SPLIT-0.1000E 05
WEIGHT    1909.920  WAS    1039.031   ADJUST    2701.481  ID 89111
PROPORTION: PROP 0.10518  CIN 1853.78  CTOT69919.50
OLD PROP 0.105176  CIN1008.29  ODEN9583.22  DIFFER   0.0
VOLUME0.42E-21   ROOT0.21E-10   DCON     4.74

 LOCATION 4217  LINK-15 4375  SUBS  0    0  SUPER  0  119  SYMBOL      5
INDEX =    -14     SYMBOL =       5

NET PROB    0.00   DIRECT    0.00   CUMS******* *    1.02

 MEAN          24.37  25.67  25.53  24.11  22.19  24.16  23.60  22.21

 COVARIANCE    1.30   0.87   1.17   1.24   0.31  -0.05   0.63   0.27
        2      0.87   2.14   1.49   1.85  -0.43  -0.08   0.71  -0.05
        3      1.17   1.49   2.61   2.33  -0.35  -0.84   0.40   0.05
        4      1.24   1.85   2.33   3.91  -0.50  -0.39   0.59   0.75
```

5	0.41	-0.43	-0.35	-0.50	0.75	0.27	0.19	0.17
6	-0.35	-0.05	-0.84	-0.39	0.27	0.84	0.23	0.22
7	0.04	0.71	0.40	0.59	0.19	0.23	0.67	0.14
8	0.27	-0.05	0.05	0.75	0.17	0.22	0.14	0.68
SKEW(*w)	-204.4	-610.2	-433.0	-762.4	33.9	-116.2	-300.9	-110.3

CLUSTER 1 INDEX -15 PROPORTION 0.20101 * PARENT=R200.000
SPLIT-0.1000E 05
WEIGHT 3648.154 WAS 1985.693 ADJUST 5162.797 ID 59279
PROPORTION: PROP 0.20953 CIN 3335.08 CTOT71120.31
OLD PROP 0.20933 CIN1400.68 ODEN6924.79 DIFFER 0.0
VOLUME0.14E-19 ROOT0.12E-09 DCON 4.74

LOCATION 4375 LINK 13 3931 SUBS 0 0 SUPER 0 119 SYMBOL 6
INDEX = -15 SYMBOL = 6

NET PROB 0.64 DIRECT 3.17 CUMS******* * 1.58

MEAN	27.05	29.70	28.90	27.23	22.26	24.09	24.27	22.88
COVARIANCE	2.43	2.73	2.12	1.91	0.53	1.38	-0.29	-0.24
2	2.73	5.08	3.10	2.64	0.46	2.27	0.12	-0.74
3	2.12	3.10	3.23	2.36	0.52	1.95	0.61	0.59
4	1.91	2.64	2.36	2.98	-0.37	0.84	-0.55	-0.24
5	0.53	0.46	0.52	-0.37	1.40	1.09	0.72	0.40
6	1.38	2.27	1.95	0.84	1.09	2.27	0.96	0.52
7	-0.29	0.12	0.61	-0.55	0.72	0.96	1.70	1.08
8	-0.24	-0.74	0.59	-0.24	0.40	0.52	1.08	1.88
SKEW(*w)	1817.8	2727.9	2010.1	1908.4	979.0	2137.3	1049.3	230.1

CLUSTER 1 INDEX 13 PROPORTION 0.05121 * PARENT=R200.000
SPLIT-0.1000E 05
WEIGHT 509.608 WAS 337.055 ADJUST 594.109 ID 95288
PROPORTION: PROP 0.05109 CIN 495.44 CTOT79500.56
OLD PROP 0.046263 CIN 327.29 ODEN7072.56 DIFFER 0.0
VOLUME0.11E-19 ROOT0.10E-09 DCON 1.44

LOCATION 3931 LINK 5 2313 SUBS 0 0 SUPER 0 119 SYMBOL 7
INDEX = 13 SYMBOL = 7

NET PROB 0.0 DIRECT 0.0 CUMS******* * 0.73

MEAN	24.39	25.44	25.11	22.62	21.55	23.49	23.01	20.85
COVARIANCE	0.75	0.27	0.37	0.42	0.39	0.09	0.02	0.38
2	0.27	1.93	0.82	0.86	0.94	1.54	0.22	-0.36
3	0.37	0.82	1.96	1.56	0.43	0.27	1.24	0.67
4	0.42	0.86	1.56	2.65	0.20	0.48	1.14	1.31
5	0.39	0.94	0.43	0.20	0.87	0.76	0.01	-0.24
6	0.09	1.54	0.27	0.48	0.76	1.69	-0.15	-0.57
7	0.02	0.22	1.24	1.14	0.01	-0.15	1.22	0.61
8	0.38	-0.36	0.67	1.31	-0.24	-0.57	0.61	1.42
SKEW(*w)	70.4	72.1	-256.9	-172.9	196.7	117.5	-246.3	-264.3

```
CLUSTER    1 INDEX    5  PROPORTION     0.09670 * PARENT=8200.000
 SPLIT=0.10000E 05
*EIGHT      772.318  *45      *17.045     ADJUST     10R*.319  ID 94256
PROPORTION: PROP 0.09647  CIN  743.31  CTOT=8093.75
OLD PROP 0.09*602  CIN 402.41  OBEN=394.92  DIFFER    0.0
VOLUME0.54E-14    *OOT0.23E-09    OCON    -0.18

 LOCATION 2313  LINK  0     0  SUBS  0     0  SUPER  0  119  SYMBOL      8
INDEX =       5     SYMBOL =        8

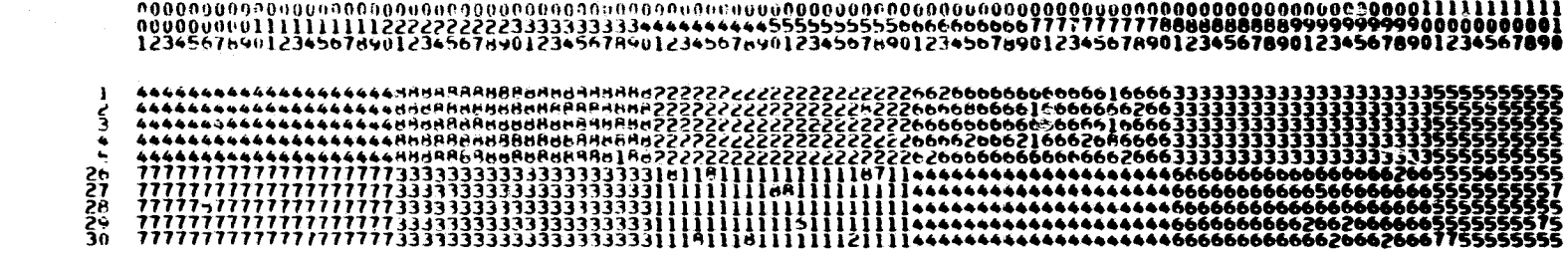
NET PROB    0.08  DIRECT    0.79  CUMS    0.0  *    0.0
                              CUMS.0          * .0


 MEAN           24.76   23.99   25.98   25.01   20.33   19.34   22.78   22.44

 COVARIANCE      1.45    0.96    0.68    0.90    0.07    0.20   -0.83   -0.12
        2        0.96    2.01    0.65    0.82    0.07    0.91   -0.22   -0.00
        3        0.68    0.65    1.48    1.27    0.14    0.55   -0.08    0.84
        4        0.90    0.82    1.27    2.44   -0.52    0.16   -0.87    0.51
        5        0.07    0.07    0.14   -0.52    0.63    0.29    0.41    0.19
        6        0.20    0.91    0.55    0.16    0.29    0.95    0.46    0.40
        7       -0.83   -0.22   -0.08   -0.87    0.41    0.46    1.31    0.47
        8       -0.12   -0.00    0.84    0.51    0.19    0.40    0.47    1.03

 SKEW(*W)       502.5   713.4   394.6   915.3   -93.7   261.2  -322.8   197.6
```

TOTAL NUMBER OF POINTS IN THIS FIELD = 9800



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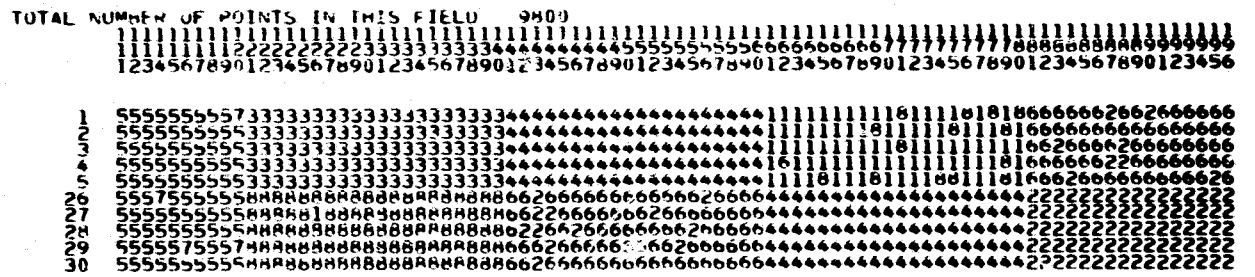
HOUSTON, TEXAS



POINTS PER CLUSTER IN THIS FIELD

CLUSTER	SYMBOL	POINTS
1	1	181
2	2	212
3	3	300
4	4	400
5	5	193
6	6	344
7	7	108
8	8	222

```
TOTAL NUMBER OF POINTS = 9400

CLUSTER     SYMBOL     POINTS IN CLUSTER
    1           1              181
    2           2              212
    3           3              300
    4           *              400
    5           5              193
    6           6              344
    7           7              105
    8           8              225
STATIS NPTSO.IDADJ(KL)      -20    88843    88843


 ADJUST -20  WEIGHT      3004.3  WAS      1502.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.11081E-05 0.68392E-04
 STATISTICS: TRACE       -78.3  SKEW       75.1  KURT      1518.8
        TESTS (SPLIT=0): -.65663E 05      -.33945E 04      -.12738E 05

CLUSTER1019 INDEX -20  PROPORTION     0.15231 W PARENT88843.000
 SPLIT-0.1000E 05
WEIGHT    3004.271  WAS    1501.974    ADJUST    3905.132  ID 88843
PROPORTION: PROP 0.15215  CIN 3003.58  CTOT69124.94
OLD PROP 0.152155  CIN1501.79  ODEN9887.07  DIFFER   0.0
VOLUME0.48E-21   ROOT0.22E-10   DCON     4.74

 LOCATION  145  LINK-21 3773  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =    -20    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.00

 MEAN          25.78  26.57  30.97  31.17  18.66  17.04  26.33  27.91

 COVARIANCE    1.16   0.78   0.52   0.38   0.82   0.65  -0.32  -0.71
        2      0.78   2.05   0.87   0.83   0.96   1.36  -0.06  -1.02
        3      0.52   0.87   1.37   1.09   0.70   0.33   0.77   0.21
        4      0.38   0.83   1.09   2.16   0.62   0.19   0.99   1.57
        5      0.82   0.96   0.70   0.62   0.96   0.68  -0.03  -0.50
        6      0.65   1.36   0.33   0.19   0.68   1.33  -0.48  -1.25
        7     -0.32  -0.06   0.77   0.99  -0.03  -0.48   1.33   1.35
        8     -0.71  -1.02   0.21   1.57  -0.50  -1.25   1.35   3.44

 SKEW(*W)     -105.5  -32.3  135.7   64.6 -111.8  -54.3  199.6  273.6


WADJ(KL),W(KL),WSIM     3906.0     1502.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.152828      -20
IDADJ,NPTSO,INDEX,*,WADJ 88843 8F*=3    -20      1502.30      3905.97
STATIS NPTSO.IDADJ(KL)      -14    89111    89111


 ADJUST -14  WEIGHT      2065.7  WAS      1039.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.22477E-03 0.38727E-01
 STATISTICS: TRACE       -43.6  SKEW       149.3  KURT      1701.1
        TESTS (SPLIT=0): -.73804E 05      -.35091E 04      -.13332E 05

CLUSTER1020 INDEX -14  PROPORTION     0.10505 W PARENT89111.000
 SPLIT-0.1000E 05
WEIGHT    2065.686  WAS    1039.031    ADJUST    2701.481  ID 89111
PROPORTION: PROP 0.10522  CIN 2006.52  CTOT69954.00
OLD PROP 0.105222  CIN1008.29  ODEN9579.00  DIFFER   0.0
VOLUME0.42E-21   ROOT0.21E-10   DCON     4.74

 LOCATION 4217  LINK-15 4375  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =    -14    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.02

 MEAN          24.37  25.68  25.53  24.12  22.19  24.16  23.60  22.21

 COVARIANCE    1.30   0.57   1.17   1.24   0.31  -0.05   0.63   0.27
        2      0.87   2.14   1.48   1.85  -0.43  -0.08   0.71  -0.05
```

```
        3     1.17   1.49   2.61   2.33  -0.35  -0.84   0.40   0.05
        4     1.24   1.45   2.33   3.91  -0.50  -0.39   0.59   0.75
        5     0.41  -0.43  -0.35  -0.50   0.75   0.27   0.19   0.17
        6    -0.05  -0.08  -0.84  -0.39   0.27   0.84   0.23   0.22
        7     0.63   0.71   0.40   0.59   0.19   0.23   0.67   0.14
        8     0.27  -0.05   0.05   0.75   0.17   0.22   0.14   0.66

 SKEW(*W)    -273.7 -462.9 -472.2 -551.8  -12.0   76.0 -157.1  -71.1


WADJ(KL),W(KL),WSIM    2669.3    1026.7     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.104158      -14
IDADJ,NPTSO,INDEX,W,WADJ 89111 89111   -14     1026.65     2669.30
STATIS NPTSO,IDADJ(KL)     -21   89219   89219

  ADJUST -21  WEIGHT     3995.3  WAS     1997.6   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.38446E-07 0.32369E-06
 STATISTICS: TRACE      -12.1  SKEW      377.8  KURT     2313.7
        TESTS (SPLIT=0): -.69556E 05     -.29906E 04     -.11528E 05

CLUSTER1021 INDEX -21  PROPORTION    0.20240 W PARENT89219.000
 SPLIT-0.1000E 05
WEIGHT    3995.275  WAS    1997.618    ADJUST    5193.805  ID 89219
PROPORTION: PROP 0.20231  CIN 3994.60  CTOT69518.06
OLD PROP 0.202305  CIN1997.27  ODEN9864.51  DIFFER   0.0
VOLUME0.14E-20   ROOT0.38E-10   DCON     4.74

 LOCATION 3773  LINK-14 4217  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =    -21    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.93

 MEAN          26.90  29.06  30.68  29.60  20.36  20.21  27.26  28.09

 COVARIANCE    1.24   1.15   0.80   0.90   0.63   0.84   0.53   1.13
        2      1.15   2.59   1.62   1.61   0.74   2.36   0.58   0.76
        3      0.80   1.62   2.49   2.06   1.33   2.58   0.51  -0.38
        4      0.90   1.61   2.06   3.26   1.14   2.01   1.89   1.11
        5      0.63   0.74   1.33   1.14   1.08   1.26   0.31  -0.03
        6      0.84   2.36   2.58   2.01   1.26   3.48   0.21  -0.69
        7      0.53   0.58   0.51   1.89   0.31   0.21   1.92   1.73
        8      1.13   0.76  -0.38   1.11  -0.03  -0.69   1.73   3.31

 SKEW(*W)     421.0  516.2  363.8  397.3 -125.0  199.4  421.5  652.6


WADJ(KL),W(KL),WSIM    5193.9    1997.7     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.203060      -21
IDADJ,NPTSO,INDEX,W,WADJ 89219 89219   -21     1997.66     5193.91
STATIS NPTSO,IDADJ(KL)     -15   89279   89279

  ADJUST -15  WEIGHT     3925.1  WAS     1985.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.83207E-02 0.35927E 01
 STATISTICS: TRACE      -160.1  SKEW     2165.9  KURT    18790.9
        TESTS (SPLIT=0): -.44275E 05     -.12118E 04      0.49112E 04

CLUSTER1022 INDEX -15  PROPORTION    0.20049 W PARENT89279.000
 SPLIT-0.1000E 05
WEIGHT    3925.103  WAS    1985.693    ADJUST    5162.797  ID 89279
PROPORTION: PROP 0.20042  CIN 3594.36  CTOT71191.88
OLD PROP 0.200425  CIN1800.68  ODEN8929.62  DIFFER   0.0
VOLUME0.34E-19   ROOT0.12E-09   DCON     4.74

 LOCATION 4375  LINK 13 3931  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =    -15    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.08

 MEAN          27.03  29.66  28.98  27.22  22.26  24.04  24.27  22.89
```

COVARIANCE	2.43	2.73	2.12	1.91	0.53	1.38	-0.29	-0.24
2	2.73	5.08	3.10	2.64	0.46	2.27	0.12	-0.74
3	2.12	3.10	3.23	2.36	0.52	1.95	0.61	0.59
4	1.91	2.64	2.36	2.98	-0.37	0.84	-0.55	-0.24
5	0.53	0.46	0.52	-0.37	1.40	1.09	0.72	0.40
6	1.38	2.27	1.95	0.84	1.09	2.27	0.96	0.52
7	-0.29	0.12	0.61	-0.55	0.72	0.96	1.70	1.08
8	-0.24	-0.74	0.59	-0.24	0.40	0.52	1.08	1.08
SKEW(*W)	1378.7	2563.7	1590.1	1341.5	1056.2	2199.6	1191.8	500.9

```
*ADJ(KL)*W(KL)**SIM     5042.5     1939.4      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.196833      -15
14-10 19-09 20-15 21-20 14-10 15-20        13-05 05-10
                                    0C-10
***HAVE SPLIT-15 WEIGHT  1939.4 SUMS104105 ITER  12
KL.INDEX.LSUPER  .375   -15   119
```

```
DUMP OF OBSERVED CLUSTERS FROM=15   4375

CLUSTER   0 INDEX =15  PROPORTION     0.19740 * PARENT=9279.000
 SPLIT=0.1700E 02
WEIGHT    1939.410  WAS     1985.693    ADJUST    5042.465  ID 89279
PROPORTION: PROP 0.19683  CIN 1793.68  CTOT 30210.88
OLD PROP 0.196833  CIN1793.68  ODEN9068.06  DIFFER    0.0
VOLUME0.10E 27   ROOT0.12E-09   DCON     4.74

 LOCATION 4375  LINK 13 3931  SUBS104 6249  SUPER  0  119  SYMBOL      1
INDEX =    -15    SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          27.06  29.75  28.92  27.24  22.28  24.14  24.29  22.90

 COVARIANCE    2.25   2.45   1.96   1.78   0.42   1.15  -0.35  -0.25
       2       2.45   4.47   2.75   2.39   0.22   1.77  -0.03  -0.77
       3       1.96   2.75   3.00   2.21   0.37   1.65   0.51   0.55
       4       1.78   2.39   2.21   2.84  -0.45   0.64  -0.60  -0.26
       5       0.42   0.22   0.37  -0.45   1.30   0.89   0.65   0.38
       6       1.15   1.77   1.65   0.64   0.89   1.83   0.81   0.47
       7      -0.35  -0.03   0.51  -0.60   0.65   0.81   1.63   1.05
       8      -0.25  -0.77   0.55  -0.26   0.38   0.47   1.05   1.85

 SKEW(*W)    1378.7 2563.7 1590.1 1341.5 1056.2 2199.6 1191.8  500.9


CLUSTER   1 INDEX 104  PROPORTION     0.49557 * PARENT 1939.410
 SPLIT=0.9999E 04
WEIGHT      80.000  WAS      80.000    ADJUST     280.000  ID 99079
PROPORTION: PROP 0.49557  CIN   39.65  CTOT 1859.41
OLD PROP 0.495573  CIN  39.65  ODEN  80.00  DIFFER    0.0
VOLUME0.:0E-19   ROOT0.10E-09   DCON     4.74

 LOCATION 6249  LINK105 6407  SUBS  0    0  SUPER-15 4375  SYMBOL      2
INDEX =    104    SYMBOL =       2

NET PROB*******  DIRECT*******  CUMS******* *    0.88

 MEAN          28.00  31.26  29.98  28.15  22.79  24.86  24.43  22.61

 COVARIANCE    1.95   1.84   1.61   1.47   0.16   0.98  -0.42   0.10
       2       1.84   3.57   1.98   1.76  -0.27   1.39  -0.23  -0.53
       3       1.61   1.98   2.73   1.95   0.15   1.55   0.51   1.08
       4       1.47   1.76   1.95   2.63  -0.69   0.57  -0.67   0.10
       5       0.16  -0.27   0.15  -0.69   1.25   0.75   0.75   0.65
       6       0.98   1.39   1.55   0.57   0.75   1.83   0.78   0.74
       7      -0.42  -0.23   0.51  -0.67   0.75   0.78   1.80   1.23
       8       0.10  -0.53   1.08   0.10   0.65   0.74   1.23   2.21

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   2 INDEX 105  PROPORTION     0.50443 * PARENT 1939.410
 SPLIT=0.9999E 04
WEIGHT      80.000  WAS      80.000    ADJUST     280.000  ID 99079
PROPORTION: PROP 0.50443  CIN   40.35  CTOT 1859.41
OLD PROP 0.504427  CIN  40.35  ODEN  80.00  DIFFER    0.0
VOLUME0.13E-20   ROOT0.36E-10   DCON     4.74

 LOCATION 6407  LINK  0    0  SUBS  0    0  SUPER-15 4375  SYMBOL      3
INDEX =    105    SYMBOL =       3

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          26.13  28.26  27.88  26.35  21.79  23.44  24.15  23.17
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```
 COVARIANCE    1.68    1.39    1.13    1.14   -0.01    0.53   -0.59   -0.27
        2      1.39    2.60    1.73    1.41   -0.33    0.91   -0.02   -0.09

        3      1.13    1.73    2.04    1.41   -0.25    0.92    0.28    0.37

        4      1.14    1.41    1.41    2.33   -1.01   -0.13   -0.83   -0.24

        5     -0.01   -0.33   -0.25   -1.01    1.13    0.65    0.46    0.16

        6      0.53    0.91    0.92   -0.13    0.65    1.44    0.85    0.61

        7     -0.59   -0.02    0.28   -0.83    0.46    0.85    1.61    0.79

        8     -0.27   -0.09    0.37   -0.24    0.16    0.61    0.79    0.92

 SKEW(*W)       0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


IOADJ.NPTSO.INDEX.**.*ADJ 89279 89279   -15      1939.41      5042.46
STATIS KL. W(KL).*ADJ(KL)      104  0.28040490527E 03  0.28000000000E 03


  ADJUST 104  WEIGHT      280.4  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.21359E 01 0.99152E 03
 STATISTICS: TRACE       662.6  SKEW    33363.5  KURT     73927.8
        TESTS (SPLIT=0): 0.31244E 06       0.27246E 05       0.48789E 05
*ADJ(KL).W(KL).*SIM     420.8      200.4      400.0
 ALPHA ERROR:PHK.P.CM.*104.1496E 01.2753E 01.2029E 01.2004E 03
  (ERROR CONT) CIN.2170E 03.3965E 02.1774E 03  P(KF).CTOT.DEN.ODEN.2037E 04.1892E 04.1444E 03.8000E 02

CLUSTER1024 INDEX 104  PROPORTION    1.35662 W PARENT 2036.930
 SPLIT-0.9999E 04
WEIGHT     200.404  WAS       80.000    ADJUST     420.808  ID 99079
PROPORTION: PROP 2.75263  CIN  217.03  CTOT 1892.49
OLD PROP 0.495573  CIN  39.65  ODEN  80.00  DIFFER   0.0
VOLUME0.32E 21   ROOT0.23E-06   DCON   -5.23

 LOCATION 6249  LINKLVS 6407  SUBS  0    0  SUPER-15 4375  SYMBOL******
INDEX =    104    SYMBOL = ******

NET PROB******* DIRECT******* CUMS******* *   0.88

 MEAN          27.18  29.12  30.37  29.98  20.45  20.27  26.94  27.86

 COVARIANCE    2.51   3.64   0.71  -0.41   2.59   4.60  -0.93  -2.80
        2      3.64   7.69   0.99  -1.36   4.59   9.75  -2.29  -7.07

        3      0.71   0.99   2.57   2.81   0.31   0.47   1.19   1.29

        4     -0.41  -1.36   2.81   5.69  -2.26  -4.22   3.47   6.42

        5      2.59   4.59   0.31  -2.26   5.09   8.49  -2.82  -7.51

        6      4.60   9.75   0.47  -4.22   8.49  16.96  -5.92 -14.89

        7     -0.93  -2.29   1.19   3.47  -2.82  -5.92   5.76   9.26

        8     -2.80  -7.07   1.29   6.42  -7.51 -14.89   9.26  19.22

 SKEW(*W)   -1416.9-3711.2 1133.9 3727.0-4096.4-8986.0 4222.8 9130.4


PROPORTION RELATIVE TO TOP LEVEL =     0.145067     104
18-10 19-09 20-15 21-20 14-10 15-20          13-05 05-10
                                        00-05
***HAVE SPLIT104 WEIGHT   200.4 SUBS106107 ITER  56
KL.INDEX.LSUPER  6249   104  4375
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DUMP OF OBSERVED CLUSTERS FROM104   6249

CLUSTER   0 INDEX 104  PROPORTION     0.36328 W PARENT 2036.930
 SPLIT-0.1760E 02
WEIGHT      200.404  WAS       80.000     ADJUST      420.808  ID 99079
PROPORTION: PROP 0.73711  CIN  177.38  CTOT 1568.65
OLD PROP 0.737106  CIN 177.38  ODEN 468.28  DIFFER   0.0
VOLUME0.32E 21   ROOT0.23E-06   DCON   -5.23

 LOCATION 6249  LINK105 6407  SUBS106 5963  SUPER-15 4375  SYMBOL      1
INDEX =    104    SYMBOL =       1

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          27.18  29.12  30.37  29.98  20.45  20.27  26.94  27.86

 COVARIANCE    2.51   3.64   0.71  -0.41   2.59   4.60  -0.93  -2.60
        2      3.64   7.69   0.99  -1.36   4.59   9.75  -2.29  -7.07
        3      0.71   0.99   2.57   2.81   0.31   0.47   1.19   1.29
        4     -0.41  -1.36   2.81   5.69  -2.26  -4.22   3.47   6.42
        5      2.59   4.59   0.31  -2.26   5.09   8.49  -2.82  -7.51
        6      4.60   9.75   0.47  -4.22   8.49  16.96  -5.92 -14.89
        7     -0.93  -2.29   1.19   3.47  -2.82  -5.92   5.76   9.26
        8     -2.80  -7.07   1.29   6.42  -7.51 -14.89   9.26  19.22

 SKEW(*W)   -1416.9-3711.2 1133.9 3727.0-4096.4-8086.0 4222.8 9130.4


CLUSTER   1 INDEX 106  PROPORTION     0.40579 W PARENT  200.404
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 99916
PROPORTION: PROP 0.40579  CIN   32.46  CTOT  120.40
OLD PROP 0.405794  CIN  32.46  ODEN  80.00  DIFFER   0.0
VOLUME0.12E-16   ROOT0.35E-08   DCON     4.74

 LOCATION 5963  LINK107 5361  SUBS  0     0  SUPER104 6249  SYMBOL      2
INDEX =    106    SYMBOL =       2

NET PROB   0.00  DIRECT   0.00  CUMS   0.0  *    0.0
                          CUMS.0          * .0

 MEAN          26.03  26.36  30.98  32.53  17.38  14.26  30.04  34.53

 COVARIANCE    4.88   7.38   0.60  -1.68   6.01   9.26  -1.69  -6.24
        2      7.38  15.20  -0.56  -6.05  11.28  21.62  -6.35 -17.88
        3      0.60  -0.56   5.25   6.82   0.11  -3.12   3.86   4.89
        4     -1.68  -6.05   6.82  13.58  -5.76 -13.97   9.52  17.48
        5      6.01  11.28   0.11  -5.76  11.72  19.61  -6.58 -17.78
        6      9.26  21.62  -3.12 -13.97  19.61  38.32 -14.70 -36.56
        7     -1.69  -6.35   3.86   9.52  -6.58 -14.70  11.64  20.64
        8     -6.24 -17.88   4.89  17.48 -17.78 -36.55  20.64  44.09

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX 107  PROPORTION     0.59421 W PARENT  200.404
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID 99916
PROPORTION: PROP 0.59421  CIN   47.54  CTOT  120.40
OLD PROP 0.594206  CIN  47.54  ODEN  80.00  DIFFER   0.0
VOLUME0.27E-22   ROOT0.52E-11   DCON     4.74

 LOCATION 5361  LINK   0     0  SUBS  0     0  SUPER104 6249  SYMBOL      3
INDEX =    107    SYMBOL =       3

NET PROB*******  DIRECT*******  CUMS******* *    1.01
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```
MEAN          27.47  31.00  29.45  28.24  22.55  24.36  24.83  23.31

COVARIANCE    2.18   2.45   2.22   1.09   1.21   4.09  -1.26  -1.34
       2      2.45   3.30   2.18   0.84   1.65   5.22  -1.84  -2.66
       3      2.22   2.18   2.93   1.95   0.79   3.62  -0.83  -0.21
       4      1.09   0.84   1.95   2.07  -0.31   0.79   0.10   1.21
       5      1.21   1.65   0.79  -0.31   1.50   3.37  -1.17  -2.16
       6      4.09   5.22   3.62   0.79   3.37   9.63  -3.35  -4.97
       7     -1.26  -1.84  -0.83   0.10  -1.17  -3.35   1.84   2.78
       8     -1.34  -2.66  -0.21   1.21  -2.16  -4.97   2.78   5.34

SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ.NPTSO.INDEX.*.*WADJ 99079 90116   104       200.40       420.81
STATIS KL. W(KL).*ADJ(KL)      105  0.280300293DE 03  0.28000000000E 03


 ADJUST 105  WEIGHT      280.3  WAS        80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.63105E 00 0.10585E 03
 STATISTICS: TRACE       200.9  SKEW      4184.8  KURT     11719.9
        TESTS (SPLIT=0): -.86250E 05      -.19505E 04       -.13426E 05
WADJ(KL).W(KL).*SIM     420.6      200.3      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.12451R       105
IDADJ.NPTSO.INDEX.*.*WADJ 99079 90765   105       200.30       420.60
STATIS KL. W(KL).*WADJ(KL)       5  0.108485R643E 04  0.10843190926 04


 ADJUST   5  WEIGHT     1084.9  WAS       417.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.42747E-01 0.23476E 01
 STATISTICS: TRACE       -39.4  SKEW     1649.6  KURT     4075.0
        TESTS (SPLIT=0): -.80785E 05      -.23293E 04       -.12275E 05

CLUSTER1025 INDEX   5  PROPORTION     0.10157 W PARENT90913.000
 SPLIT-0.1000E 05
WEIGHT    1084.859  WAS      417.046    ADJUST    1084.319  ID 94256
PROPORTION: PROP 0.10157  CIN 1045.91  CTOT80614.31
OLD PROP 0.099033  CIN 402.41  ODEN4077.08  DIFFER    0.0
VOLUME0.85E-18   ROOTU.92E-09   DCON   -2.90

 LOCATION 2313  LINK  0    0  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =      5    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS    0.0  *    0.0
                              CUMS.0          * .0


 MEAN          24.79  23.99  26.04  25.03  20.34  19.35  22.76  22.47

 COVARIANCE    1.47   0.98   0.72   0.92   0.06   0.23  -0.83  -0.11
       2       0.98   1.98   0.66   0.85   0.07   0.90  -0.25  -0.00
       3       0.72   0.66   1.55   1.31   0.16   0.57  -0.09   0.88
       4       0.92   0.85   1.31   2.49  -0.54   0.18  -0.89   0.52
       5       0.06   0.07   0.16  -0.54   0.64   0.31   0.43   0.21
       6       0.23   0.90   0.57   0.18   0.31   0.96   0.44   0.41
       7      -0.83  -0.25  -0.09  -0.89   0.43   0.44   1.32   0.49
       8      -0.11  -0.00   0.88   0.52   0.21   0.41   0.49   1.08

 SKEW(*W)      892.1  835.7 1030.3 1180.7  -35.2  396.9 -584.0  497.6


WADJ(KL).W(KL).*SIM    1736.3     667.8      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.103388         5
IDADJ.NPTSO.INDEX.*.*WADJ 94256 90913     5       667.81       1736.31
STATIS NPTSO.IDADJ(KL)      -18   91088   91088


 ADJUST -18  WEIGHT     1944.9  WAS       971.9   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.1841 E-04 0.38889E 00
 STATISTICS: TRACE       -55.2  SKEW       88.1  KURT     1675.5
        TESTS (SPLIT=0): -.73335E 05      -.36032E 04       -.13293E 05
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CLUSTER1026 INDEX -14  PROPORTION    0.09854 * PARENT91088.000
 SPLIT=0.1000E 05
WEIGHT    1944.915  WAS      971.912    ADJUST    2526.871  ID 91088
PROPORTION: PROP 0.09869  CIN 1435.66  CTOT72464.05
OLD PROP 0.098689  CIN 917.71  ODEN9352.44  DIFFER    0.0
VOLUME0.73E-21   WOOT0.27E-10   DCON     4.74

 LOCATION 1741  LINK-14 4947  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =    -14    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *    0.98

 MEAN          25.56  25.60  26.85  25.68  20.78  20.85  23.34  22.53

 COVARIANCE    1.90   2.41   1.50   1.35   1.20   2.27   0.51  -0.50
        2      2.41   5.47   2.98   2.38   2.04   4.72   0.32  -0.77
        3      1.50   2.98   2.88   2.32   1.29   3.19   1.17   0.31
        4      1.35   2.38   2.32   3.15   1.64   2.71   1.40   1.04
        5      1.20   2.04   1.29   1.64   1.37   1.93   0.49   0.11
        6      2.27   4.72   3.19   2.71   1.93   4.64   0.87  -0.27
        7      0.51   0.32   1.17   1.40   0.49   0.87   1.27   0.78
        8     -0.50  -0.77   0.31   1.04   0.11  -0.27   0.78   1.49

 SKEW(*W)      187.7  395.8  145.7   43.7   59.0  333.5  -36.5  -59.4


WADJ(KL),W(KL),WSIM     2529.8      973.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.098826      -18
IDADJ,NPTSO,INDEX,W,WADJ 91088 91088    -18       973.00      2529.81
STATIS KL, W(KL),WADJ(KL)      106  0.28072436652E 03  0.28000000000E 03

  ADJUST 106  WEIGHT      280.7  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.14920E 01 0.58148E 04
 STATISTICS: TRACE      101.3  SKEW      8532.4  KURT     46734.5
       TESTS (SPLIT=0): -.11622E 06      0.24196E 04      0.21616E 05
WADJ(KL),W(KL),WSIM      421.4      200.7      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.075181      106
18-10 19-09 20-15 21-20 14-10 15-20                13-05 0
                                                   00-14
***HAVE SPLIT106 WEIGHT   200.7 SUBS108109 ITER  39
KL,INDEX,LSUPER  5963   106  6249
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SUMP OF OBSERVED CLUSTERS FROM106   5963

CLUSTER   0 INDEX 106  PROPORTION     0.69110 * PARENT  408.911
 SPLIT-0.1700E 02
WEIGHT     200.724  *AS       80.000     ADJUST      421.449  ID 99916
PROPORTION: PROP 0.692342  CIN  192.31  CTOT  130.65
OLD PROP 0.823416  CIN 192.31  ODEN 278.26  DIFFER   0.0
VOLUME0.45E 21   ROOT0.47E-06   DCON   -5.24

 LOCATION 5963  LINK107 5361  SUBS108 3487  SUPER104 6249  SYMBOL      1
INDEX =    106    SYMBOL =      1

NET PROB*******  DIRECT*******  CUMS   0.0  *   1.00
                               CUMS.0          * .10000E 01


 MEAN          26.45  27.82  30.27  30.30  19.57  18.54  27.19  28.75

 COVARIANCE    2.30   2.71   0.64   0.13   2.10   2.89  -0.02  -0.91
        2      2.71   6.01   0.84  -0.53   3.75   7.24  -0.72  -3.67
        3      0.64   0.84   3.28   3.98   0.16  -0.30   1.84   2.20
        4      0.13  -0.53   3.98   7.00  -1.63  -3.63   3.75   6.42
        5      2.10   3.75   0.16  -1.63   4.20   6.60  -1.81  -5.40
        6      2.89   7.24  -0.30  -3.63   6.60  13.11  -4.11 -11.06
        7     -0.02  -0.72   1.84   3.75  -1.81  -4.11   5.35   7.77
        8     -0.91  -3.87   2.20   6.42  -5.40 -11.06   7.77  15.82

 SKEW(*W)      182.5  855.2-1059.3-2544.6 2095.1 3985.9-2824.3-5532.3


CLUSTER   1 INDEX 108  PROPORTION     0.39927 * PARENT  200.724
 SPLIT-0.9999E 04
WEIGHT      80.000  *AS       80.000     ADJUST      280.000  ID101367
PROPORTION: PROP 0.39927  CIN   31.94  CTOT  120.72
OLD PROP 0.394267  CIN  31.94  ODEN  80.00  DIFFER   0.0
VOLUME0.97E-19   ROOT0.31E-09   DCON    4.74

 LOCATION 3487  LINK109 2155  SUBS   0     0  SUPER106 5963  SYMBOL      2
INDEX =    108    SYMBOL =      2

NET PROB*******  DIRECT*******  CUMS******* *   1.00

 MEAN          27.63  29.64  29.01  27.94  21.75  22.26  25.94  25.73

 COVARIANCE    2.88   3.39   2.88   3.69   0.19   0.77   0.90   0.99
        2      3.39   6.35   3.42   3.82   1.41   4.21  -0.34  -1.18
        3      2.88   3.42   5.87   8.79  -2.04  -2.90   5.01   7.88
        4      3.69   3.82   8.79  15.49  -4.48  -7.45   9.52  15.15
        5      0.19   1.41  -2.04  -4.48   3.28   6.48  -4.58  -7.95
        6      0.77   4.21  -2.90  -7.45   6.48  13.93  -8.83 -15.30
        7      0.90  -0.34   5.01   9.52  -4.58  -8.83   8.72  14.15
        8      0.99  -1.18   7.88  15.15  -7.95 -15.30  14.15  23.65

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX 109  PROPORTION     0.60073 * PARENT  200.724
 SPLIT-0.9999E 04
WEIGHT      80.000  *AS       80.000     ADJUST      280.000  ID101367
PROPORTION: PROP 0.60073  CIN   48.06  CTOT  120.72
OLD PROP 0.600733  CIN  48.06  ODEN  80.00  DIFFER   0.0
VOLUME0.18E-19   ROOT0.14E-09   DCON    4.74

 LOCATION 2155  LINK   0     0  SUBS   0     0  SUPER106 5963  SYMBOL      3
INDEX =    109    SYMBOL =      3

NET PROB*******  DIRECT*******  CUMS******* *   0.98
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```
 MEAN          25.66  26.60  31.10  31.07  18.11  16.07  24.02  30.76

 COVARIANCE    1.98   2.07   0.08  -0.32   2.10   2.03   0.64   0.34
       2       2.07   5.01   0.02  -1.12   3.68   6.38  -0.07  -3.30
       3       0.08   0.02   2.67   3.08   0.93   0.09   1.03   0.35
       4      -0.32  -1.12   3.08   5.07  -0.31  -2.01   2.10   3.55
       5       2.10   3.68   0.93  -0.31   3.88   5.01  -0.06  -2.97
       6       2.03   6.38   0.09  -2.01   5.01   9.33  -1.04  -6.84
       7       0.64  -0.07   1.03   2.10  -0.06  -1.04   3.89   4.51
       8       0.34  -3.30   0.35   3.55  -2.97  -6.84   4.51  10.89

 SKEW(*W)        0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ,NPTSO,INDEX,W,WADJ 99916 91567   104       200.72       421.45
STATIS KL, W(KL),WADJ(KL)      104  0.42129394536 03  0.42084810556 03

  ADJUST 104  WEIGHT      421.3  WAS      200.4   SPFAC-0.16317E 03   CHANGE0.0          0.0          0.24596E 00 0.38661E 03
 STATISTICS: TRACE       213.7  SKEW     3994.7  KURT     71080.8
       TESTS (SPLIT=0): -.75048E 05      -.18396E 04       0.47106E 05
WADJ(KL),W(KL),WSIM      461.3    220.9      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.093809      104
IDADJ,NPTSO,INDEX,W,WADJ 99916 91635   104       220.89       461.78
STATIS KL, W(KL),WADJ(KL)      13  0.69508056646 03  0.69410937506 03

  ADJUST  13  WEIGHT      695.1  WAS      337.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.29297E-01 0.20097E 01
 STATISTICS: TRACE       -13.5  SKEW      726.1  KURT      2690.9
       TESTS (SPLIT=0): -.98572E 05      -.40463E 04       -.16920E 05

CLUSTER1029 INDEX  13  PROPORTION     0.05054 W PARENT92003.000
 SPLIT-0.1000E 05
WEIGHT      695.081  WAS      337.055    ADJUST     694.109  ID 95288
PROPORTION: PROP 0.05035  CIN  674.62  CTOT78623.94
OLD PROP 0.046290  CIN 327.29  ODEN7068.50  DIFFER   0.0
VOLUME0.13E-18   ROOT0.35E-09   DCON   -1.04

 LOCATION 3931  LINK  5 2313  SUBS  0    0  SUPER  0  119  SYMBOL******
INDEX =     13    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS*******  *   0.73

 MEAN          24.41  25.41  25.11  22.81  21.54  23.47  23.02  20.87

 COVARIANCE    0.75   0.24   0.36   0.42   0.38   0.06   0.02   0.40
       2       0.24   1.93   0.80   0.84   0.92   1.54   0.20  -0.37
       3       0.36   0.80   1.91   1.54   0.43   0.26   1.21   0.66
       4       0.42   0.84   1.54   2.64   0.20   0.48   1.13   1.30
       5       0.38   0.92   0.43   0.20   0.84   0.73   0.02  -0.23
       6       0.06   1.54   0.26   0.48   0.73   1.69  -0.15  -0.57
       7       0.02   0.20   1.21   1.13   0.02  -0.15   1.20   0.60
       8       0.40  -0.37   0.66   1.30  -0.23  -0.57   0.60   1.40

 SKEW(*W)      158.9  -32.3 -321.6 -140.3  159.6  101.1 -268.2 -171.1


WADJ(KL),W(KL),WSIM      736.1    358.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.054991      13
IDADJ,NPTSO,INDEX,W,WADJ 95288 92003    13       358.03       736.05
STATIS KL, W(KL),WADJ(KL)      105  0.42102221686 03  0.42060058596 03

  ADJUST 105  WEIGHT      421.0  WAS      200.3   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.19712E 00 0.27803E 02
 STATISTICS: TRACE       155.6  SKEW     2956.7  KURT      6507.5
       TESTS (SPLIT=0): -.96550E 05      -.28796E 04       -.17476E 05
WADJ(KL),W(KL),WSIM      461.4    220.7      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.125962      105
IDADJ,NPTSO,INDEX,W,WADJ100565 92113   105       220.72       461.44
STATIS KL, W(KL),WADJ(KL)      105  0.46186010746 03  0.46144384776 03
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 ADJUST 105  WEIGHT      461.9  WAS       220.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.19401E 00 0.40127E 02
 STATISTICS: TRACE        70.7  SKEW     2658.1   KURT     18405.7
       TESTS (SPLIT=0): -.11091E 06      -.29433E 04      -.42121E 04

CLUSTER1031 INDEX 105  PROPORTION     0.67124 * PARENT 2667.184
 SPLIT-0.1000E 05
WEIGHT     461.460  WAS      220.722    ADJUST     461.444  ID101913
PROPORTION: PROP 0.71246  CIN  451.03  CTOT 2034.50
OLD PROP 0.642943  CIN 210.95  ODEN 393.85  DIFFER   0.0
VOLUME0.38E-17   ROOT0.20E-08   DCON   -1.15

 LOCATION 6407  LINK  0    0  SUBS  0    0  SUPER-15 4375  SYMBOL******
INDEX =    105    SYMBOL = ******

NET PROB******** DIRECT******** CUMS******** *   1.00

 MEAN          27.06  29.77  28.05  27.26  22.33  24.20  24.30  22.90

 COVARIANCE    2.54   2.59   2.18   1.95   0.46   1.19  -0.48  -0.23
       2       2.59   4.46   2.96   2.56   0.19   1.79  -0.12  -0.74

       3       2.18   2.96   3.29   2.35   0.44   1.78   0.47   0.62

       4       1.95   2.56   2.35   2.89  -0.37   0.75  -0.66  -0.29

       5       0.46   0.19   0.44  -0.37   1.29   0.84   0.66   0.40

       6       1.19   1.79   1.78   0.75   0.84   1.85   0.82   0.51

       7      -0.48  -0.12   0.47  -0.66   0.66   0.82   1.70   1.08

       8      -0.23  -0.74   0.62  -0.29   0.40   0.51   1.08   1.94

 SKEW(*W)     -957.8 -915.1 -874.9 -621.8 -588.4 -484.7   34.8  189.1


WADJ(KL).W(KL).WSIM      502.3      241.1      400.0
 ALPHA ERROR:PRK,P,CM,W105.7125E 00.1005E 01.1061E 01.2411E 03
   (ERROR CONT) CIN.4510E 03.2109E 03.2401E 03  W(KF).CTOT.DEN.ODEN.2667E 04.2034E 04.6327E 03.3938E 03

CLUSTER1032 INDEX 105  PROPORTION     0.94705 * PARENT 2667.184
 SPLIT-0.1000E 05
WEIGHT     241.138  WAS      220.722    ADJUST     502.276  ID101913
PROPORTION: PROP 1.00521  CIN  451.03  CTOT 2034.50
OLD PROP 0.642943  CIN 210.95  ODEN 393.85  DIFFER   0.0
VOLUME0.51E 19   ROOT0.20E-08   DCON   -1.15

 LOCATION 6407  LINK  0    0  SUBS  0    0  SUPER-15 4375  SYMBOL******
INDEX =    105    SYMBOL = ******

NET PROB******** DIRECT******** CUMS******** *   1.00

 MEAN          26.82  29.51  28.74  27.10  22.20  24.08  24.31  23.01

 COVARIANCE    2.33   2.41   1.97   1.72   0.50   1.09  -0.43  -0.19
       2       2.41   4.33   2.65   2.32   0.25   1.74  -0.19  -0.91

       3       1.97   2.65   2.96   1.97   0.61   1.67   0.52   0.63

       4       1.72   2.32   1.97   2.52  -0.34   0.59  -0.63  -0.41

       5       0.50   0.25   0.61  -0.34   1.43   0.94   0.81   0.54

       6       1.09   1.74   1.67   0.59   0.94   1.86   0.86   0.47

       7      -0.43  -0.19   0.52  -0.63   0.81   0.86   1.72   1.15

       8      -0.19  -0.91   0.63  -0.41   0.54   0.47   1.15   2.17

 SKEW(*W)     -957.8 -915.1 -874.9 -621.8 -588.4 -484.7   34.8  189.1


PROPORTION RELATIVE TO TOP LEVEL =     0.131505      105
IDADJ.NPTSO.INDEX.W.WADJ101913 93023   105      241.14      502.28
STATIS KL, W(KL).WADJ(KL)      106  0.42178076I7E 03  0.42144873O5E 03


 ADJUST 106  WEIGHT      421.8  WAS       200.7   SPFAC-0.14450E 03   CHANGE0.0          0.0          0.12906E 00 0.38050E 03
 STATISTICS: TRACE      -191.7  SKEW     1401.3   KURT     17573.1
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        TESTS (SPLIT=0): -.83952E 05      -.44308E 04      -.63928E 04

CLUSTER1032 INDEX 105  PROPORTION     0.87599 W PARENT  433.675
 SPLIT-0.1445E 03
WEIGHT     421.781  WAS      200.724     ADJUST     421.449  ID101367
PROPORTION: PROP 0.82019  CIN  400.09  CTOT  -53.91
OLD PROP 0.823416  CIN 192.31  ODEN 278.25  DIFFER  59.15
VOLUME0.56E-15   ROOT0.24E-07   DCON   -1.18

 LOCATION 5963  LINK107 5361  SUBS108 3487  SUPER104 6249  SYMBOL******
INDEX =    106    SYMBOL = ******

NET PROB4907.46  DIRECT5983.32  CUMS 895.84 *   1.01

 MEAN          26.51  27.87  30.38  30.42  19.54  18.35  27.39  29.13

 COVARIANCE    2.05   2.42   0.51   0.04   1.74   2.40   0.21  -0.32
        2      2.42   5.16   0.73  -0.27   2.84   5.47   0.21  -1.87
        3      0.51   0.73   2.96   3.39   0.46   0.21   1.24   1.15
        4      0.04  -0.27   3.39   5.88  -0.67  -1.81   2.40   3.71
        5      1.74   2.84   0.46  -0.67   3.02   4.36  -0.55  -2.78
        6      2.40   5.47   0.21  -1.81   4.36   8.65  -1.54  -5.71
        7      0.21   0.21   1.24   2.40  -0.55  -1.54   3.61   4.37
        8     -0.32  -1.87   1.15   3.71  -2.78  -5.71   4.37   8.97

 SKEW(*W)       71.1  123.8  306.3  261.6 -115.6 -563.1  115.5  486.5


WADJ(KL),W(KL),WSIM      462.1      221.1      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.062450      106
IDADJ,NPTSO,INDEX,W,WADJ101367 93398    106        221.06        462.11
STATIS KL, W(KL),WADJ(KL)      104  0.46267480047E 03  0.46177978S2E 03


  ADJUST 104  WEIGHT      462.7  WAS      220.9   SPFAC-0.66024E 02   CHANGE0.0          0.0          0.22135E 00 0.13598E 03
 STATISTICS: TRACE     -146.9  SKEW     2311.8  KURT     18086.9
        TESTS (SPLIT=0): -.94178E 05      -.32629E 04      -.49029E 04
WADJ(KL),W(KL),WSIM      503.6      241.8      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.089152      104
IDADJ,NPTSO,INDEX,W,WADJ101435 93587    104        241.78        503.57
STATIS KL, W(KL),WADJ(KL)      109  0.28051953I3E 03  0.2800000000E 03

  ADJUST 109  WEIGHT      280.5  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.94272E 00 0.19656E 03
 STATISTIC  TRACE      507.0  SKEW     7564.6  KURT     38797.2
        TESTS (SPLIT=0): 0.13054E 06      0.14487E 04      0.13666E 05

CLUSTER1034 INDEX 109  PROPORTION     0.69045 W PARENT  278.408
 SPLIT-0.9999E 04
WEIGHT     280.520  WAS       80.000     ADJUST     280.000  ID101367
PROPORTION: PROP 0.70007  CIN  205.38  CTOT  -14.55
OLD PROP 0.600733  CIN  48.06  ODEN  80.00  DIFFER   0.0
VOLUME0.60E-14   ROOT0.77E-07   DCON   -5.24

 LOCATION 2155  LINK  0    0  SUBS  0    0  SUPER106 5963  SYMBOL******
INDEX =    109    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.98

 MEAN          26.21  27.36  30.76  31.12  18.99  17.35  27.60  29.84

 COVARIANCE    1.96   2.19   0.08  -0.43   1.84   2.13   0.39  -0.00
        2      2.19   4.67   0.09  -0.86   2.74   4.79   0.59  -1.38
        3      0.08   0.09   2.63   2.92   0.67   0.07   0.80   0.19
        4     -0.43  -0.86   2.92   4.91  -0.28  -1.36   1.17   1.91
        5      1.84   2.74   0.67  -0.28   2.86   3.46   0.26  -1.45
        6      2.13   4.79   0.07  -1.36   3.46   6.24   0.11  -2.96
        7      0.39   0.59   0.80   1.17   0.26   0.11   2.44   2.15
        8     -0.00  -1.38   0.19   1.91  -1.45  -2.96   2.15   5.27
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 SKEW(*W)     1007.4 1438.2 -377.1-1017.5 1600.7 2229.6 -900.3-1892.1


*ADJ(KL)*W(KL)**SIX      421.0      200.5      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.044285      109
14-10 19-09 20-15 21-20 14-10 15-20                          1
                                                        00-11
***HAVE SPLIT109 WEIGHT   200.5 SUBS110111 ITER  32
KL,INDEX,LSUPER  2155   109  5963
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DUMP OF OBSERVED CLUSTERS FROM109   2155

CLUSTER   0 INDEX 109  PROPORTION     0.66476 W PARENT  278.408
 SPLIT-0.1700E 02
WEIGHT     200.520  WAS       80.000     ADJUST      421.039  ID101367
PROPORTION: PROP 0.70182  CIN  157.32  CTOT   42.45
OLD PROP 0.701823  CIN 157.32  ODEN 235.94  DIFFER   0.0
VOLUME0.27E 20   ROOT0.77E-07   DCON   -5.24

 LOCATION 2155  LINK  0    0  SUBS110 2599  SUPER106 5963  SYMBOL      1
INDEX =    109    SYMBOL =       1

NET PROB********  DIRECT********  CUMS********  *    1.00

 MEAN          26.43  27.67  30.42  30.83  19.34  17.86  27.43  29.48

 COVARIANCE    1.95   2.23   0.08  -0.47   1.73   2.17   0.29  -0.14
        2      2.23   4.53   0.12  -0.76   2.37   4.16   0.85  -0.61
        3      0.08   0.12   2.62   2.85   0.56   0.06   0.70   0.12
        4     -0.47  -0.76   2.85   4.84  -0.27  -1.10   0.79   1.26
        5      1.73   2.37   0.56  -0.27   2.46   2.85   0.39  -0.85
        6      2.17   4.16   0.06  -1.10   2.85   5.01   0.58  -1.41
        7      0.29   0.85   0.76   0.79   0.39   0.58   1.86   1.20
        8     -0.14  -0.61   0.12   1.26  -0.85  -1.41   1.20   3.03

 SKEW(*W)     1007.4 1438.2 -377.1-1017.5 1600.7 2229.8 -900.3-1892.1


CLUSTER   1 INDEX 110  PROPORTION     0.47131 W PARENT  200.520
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID103541
PROPORTION: PROP 0.47131  CIN   37.70  CTOT   120.52
OLD PROP 0.471309  CIN  37.70  ODEN  80.00  DIFFER   0.0
VOLUME0.14E-17   ROOT0.12E-08   DCON     4.74

 LOCATION 2599  LINK111 3043  SUBS  0    0  SUPER109 2155  SYMBOL      2
INDEX =    110    SYMBOL =       2

NET PROB********  DIRECT********  CUMS********  *    1.02

 MEAN          27.24  28.81  30.11  29.79  20.51  19.57  26.71  28.05

 COVARIANCE    2.48   2.35   1.29   0.98   2.26   2.81  -0.22  -0.55
        2      2.35   4.88   2.22   1.43   3.14   5.13   0.17  -1.74
        3      1.29   2.22   3.70   3.12   2.18   2.33   0.97  -0.65
        4      0.98   1.43   3.12   4.51   1.19   0.74   1.34   1.27
        5      2.26   3.14   2.18   1.19   3.92   4.70  -0.34  -2.40
        6      2.81   5.13   2.33   0.74   4.70   7.35  -0.26  -3.30
        7     -0.22   0.17   0.97   1.34  -0.34  -0.26   2.15   2.06
        8     -0.55  -1.74  -0.65   1.27  -2.40  -3.30   2.06   5.62

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX 111  PROPORTION     0.52869 W PARENT  200.520
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000     ADJUST      280.000  ID103541
PROPORTION: PROP 0.52869  CIN   42.30  CTOT   120.52
OLD PROP 0.528691  CIN  42.30  ODEN  80.00  DIFFER   0.0
VOLUME0.28E 25   ROOT0.17E-12   DCON     4.74

 LOCATION 3043  LINK  0    0  SUBS  0    0  SUPER109 2155  SYMBOL      3
INDEX =    111    SYMBOL =       3

NET PROB1606.57  DIRECT   0.00  CUMS4456.65 *    1.00

 MEAN          25.72  26.65  31.07  31.75  18.29  15.35  26.08  30.74
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 COVARIANCE    0.27    0.33   -0.02   -0.12    0.27    0.36   -0.00   -0.10
       2       0.33    0.66    0.01   -0.10    0.39    0.68    0.13   -0.18

       3      -0.02    0.01    0.36    0.45    0.03   -0.01    0.20    0.09

       4      -0.12   -0.10    0.45    0.80   -0.10   -0.17    0.33    0.29

       5       0.27    0.39    0.03   -0.10    0.39    0.49    0.01   -0.22

       6       0.36    0.68   -0.01   -0.17    0.49    0.85    0.08   -0.33

       7      -0.00    0.13    0.20    0.33    0.01    0.08    0.45    0.25

       8      -0.10   -0.18    0.09    0.29   -0.22   -0.33    0.25    0.50

 SKEW(*W)        0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0


IDADJ,NPTSO,INDEX,W,WADJ101367 93741   109       200.52        421.04
STATIS KL, W(KL),WADJ(KL)      105  0.50311984082E 03  0.50227636?2E 03


  ADJUST 105  WEIGHT       503.1  WAS       241.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.16565E 00 0.53736E 01
 STATISTICS: TRACE        15.4  SKEW      1937.3  KURT     10699.3
       TESTS (SPLIT=0): -.11149E 06      -.34621E 04       -.11488E 05
WADJ(KL),W(KL),WSIM      544.0      262.0      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.133016      105
IDADJ,NPTSO,INDEX,W,WADJ102823 94536   105       201.98        543.96
STATIS KL, W(KL),WADJ(KL)      106  0.46211494?2E 03  0.46211279?0E 03


  ADJUST 106  WEIGHT       462.1  WAS       221.1   SPFAC-0.41879E 02   CHANGE0.0          0.0          0.36369E-01 0.93996E 01
 STATISTICS: TRACE       518.2  SKEW      3816.6  KURT    237173.8
       TESTS (SPLIT=0): 0.15256E 06      -.17857E 04       0.21415E 06
WADJ(KL),W(KL),WSIM      502.1      241.1      400.0
 ALPHA ERROR:PRK,P,CM,W106.8985F 00.1001E 01.9754E 00.2911E 03
  (ERROR CONT) CIN.4368E 03.2078E 03.2290E 03  W(KF),CTOT,DEN,ODEN.4548E 03**********.4860E 03.2573E 03

CLUSTER1037 INDEX 106  PROPORTION     1.02660 W PARENT  454.784
 SPLIT-0.4188E 02
WEIGHT      241.059  WAS      221.056    ADJUST      502.117  ID103198
PROPORTION: PROP 1.00138  CIN  436.78  CTOT  -31.22
OLD PROP 0.895277  CIN 207.78  ODEN 257.33  DIFFER  27.44
VOLUME0.74E 20   ROOT0.84E-08   DCON   -1.14

 LOCATION 5963  LINK107 5361  SUBS108 3487  SUPER104 6249  SYMBOL******
INDEX =    106    SYMBOL = ******

NET PROB******** DIRECT******** CUMS******** *   0.98

 MEAN          26.72   28.09   30.59   30.72   19.68   18.40   27.76   29.53

 COVARIANCE    2.04    2.33    0.49    0.01    1.51    2.23    0.84    0.59
       2       2.33    4.26    0.74    0.28    1.97    3.88    1.48    0.65

       3       0.49    0.74    2.38    2.64    0.55    0.71    0.88    0.60

       4       0.01    0.28    2.64    4.64    0.22    0.24    1.47    1.47

       5       1.51    1.97    0.55    0.22    1.90    2.31    0.87    0.09

       6       2.23    3.88    0.71    0.24    2.31    4.41    1.37    0.19

       7       0.84    1.48    0.88    1.47    0.87    1.37    2.21    1.41

       8       0.59    0.65    0.60    1.47    0.09    0.19    1.41    2.54

 SKEW(*W)     -126.8   114.9    51.0   106.5   627.3   571.2  -280.5  -992.2


PROPORTION RELATIVE TO TOP LEVEL =      0.062017      106
IDADJ,NPTSO,INDEX,W,WADJ103198 95153   106       241.06        502.12
STATIS KL, W(KL),WADJ(KL)      104  0.50378442?8E 03  0.50356982?2E 03


  ADJUST 104  WEIGHT       503.8  WAS       241.8   SPFAC-0.21176E 02   CHANGE0.0          0.0          0.25796E-01 0.48214E 01
 STATISTICS: TRACE        36.8  SKEW      1216.5  KURT     13801.2
       TESTS (SPLIT=0): -.11037E 06      -.41828E 04       -.83857E 04

CLUSTER1037 INDEX 104  PROPORTION     0.37007 W PARENT 3112.554
 SPLIT-0.2115E 02
WEIGHT      503.784  WAS      241.785    ADJUST      503.570  ID103387
PROPORTION: PROP 0.37227  CIN  503.14  CTOT  1763.70
OLD PROP 0.335059  CIN 241.14  ODEN 925.97  DIFFER   3.03
VOLUME0.42E-16   ROOT0.65E-08   DCON   -1.12
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 LOCATION 6249  LINK105 6407  SUBS106 5963  SUPER-15 4375  SYMBOL******
INDEX =    104    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.03

 MEAN          26.44  27.99  30.53  30.59  19.58  18.26  27.67  29.53

 COVARIANCE    1.97   2.28   0.42  -0.02   1.47   2.16   0.61   0.42
        2      2.28   4.29   0.69   0.18   1.94   3.84   1.26   0.63
        3      0.42   0.69   2.44   2.67   0.70   0.79   0.73   0.33
        4     -0.02   0.18   2.67   4.66   0.30   0.22   1.27   1.21
        5      1.47   1.94   0.70   0.30   1.81   2.19   0.79   0.03
        6      2.16   3.84   0.79   0.22   2.19   4.33   1.18  -0.00
        7      0.61   1.26   0.73   1.27   0.79   1.18   1.98   1.16
        8      0.42   0.63   0.33   1.21   0.03  -0.00   1.16   2.24

 SKEW(*W)    -165.3 -166.4  671.6  539.4   29.7  -52.6 -122.0 -383.2


WADJ(KL),W(KL),WSIM     544.0     262.0     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.096854     104
IDADJ,NPTSO,INDEX,W,WADJ103387 95425   104       262.00       544.00
STATIS KL, W(KL),WADJ(KL)      110  0.2806721191E 03  0.2800000000E 03

  ADJUST 110  WEIGHT      280.7  WAS       80.0   SPFAC-0.99990E 04   CHANGE0.0          0.0          0.11474E 01 0.14248E 03
 STATISTICS: TRACE      -205.8  SKEW      4446.9  KURT      9273.1
        TESTS (SPLIT=0): -.84156E 05      -.16667E 04      -.16849E 05
WADJ(KL),W(KL),WSIM     421.3     200.7     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.049776     110
IDADJ,NPTSO,INDEX,W,WADJ103541 95627   110       200.67       421.34
STATIS KL, W(KL),WADJ(KL)      109  0.4210900879E 03  0.4210390625E 03

  ADJUST 109  WEIGHT      421.1  WAS      200.5   SPFAC-0.13897E 03   CHANGE0.0          0.0          0.67557E-01 0.32749E 02
 STATISTICS: TRACE       -90.1  SKEW       941.2  KURT      9938.9
        TESTS (SPLIT=0): -.11270E 06      -.48971E 04      -.14052E 05
WADJ(KL),W(KL),WSIM     461.1     220.6     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.063434     109
IDADJ,NPTSO,INDEX,W,WADJ103541 95711   109       220.57       461.14
STATIS KL, W(KL),WADJ(KL)      105  0.5440771484E 03  0.5439604492E 03

  ADJUST 105  WEIGHT      544.1  WAS      262.0   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.45016E-01 0.65914E 01
 STATISTICS: TRACE       120.6  SKEW       437.8  KURT      7562.1
        TESTS (SPLIT=0): -.93738E 05      -.47949E 04      -.13941E 05
WADJ(KL),W(KL),WSIM     584.2     282.1     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.122833     105
IDADJ,NPTSO,INDEX,W,WADJ104336 96139   105       282.10       584.19
STATIS NPTSO,IDADJ(KL)         -19   96613   96613

  ADJUST -19  WEIGHT     1805.7  WAS      902.2   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.83932E-04 0.31131E 00
 STATISTICS: TRACE       -44.4  SKEW       175.1  KURT      1683.0
        TESTS (SPLIT=0): -.75416E 05      -.35645E 04      -.13684E 05

CLUSTER1041 INDEX -19  PROPORTION    0.09146 W PARENT96613.000
 SPLIT-0.1000E 05
WEIGHT    1805.740  WAS      902.241    ADJUST    2345.825  ID 96613
PROPORTION: PROP 0.09137  CIN 1733.54  CTOT7689.56
OLD PROP 0.091374  CIN 866.66  ODEN9489.83  DIFFER   0.0
VOLUME0.93E-21   ROOT0.31E-10   DCON     4.74

 LOCATION 4947  LINK-20  145  SUBS  0     0  SUPER  0  119  SYMBOL******
INDEX =    -19    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.97

 MEAN          26.40  31.66  30.48  28.16  23.25  25.69  25.89  24.06

 COVARIANCE    2.15   2.35   2.04   1.82   1.53   2.07   0.91   0.57
        2      2.35   4.81   3.56   3.27   1.96   3.63   2.06   1.26
        3      2.04   3.56   4.40   3.55   2.30   2.79   2.59   1.32
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          4      1.42    3.27    3.55    4.27    2.20    2.55    2.17    2.01
          5      1.53    1.95    2.36    2.20    1.72    1.68    1.27    0.87
          6      2.07    3.63    2.74    2.55    1.68    3.07    1.53    0.94
          7      0.91    2.05    2.59    2.17    1.27    1.53    1.85    0.87
          8      0.57    1.26    1.32    2.01    0.87    0.94    0.87    1.34

 SKEW(*W)     -353.1 -784.5 -615.8 -573.5 -327.0 -649.5 -326.3 -168.2


*ADJ(KL)*W(KL)*WSIM     2349.1      903.5      400.0
PROPORTION RELATIVE TO TOP LEVEL =      0.091929      -19
IDADJ*NPTSO*INDEX***WADJ 96613 96613   -19       903.50      2349.10
STATIS KL* W(KL)**ADJ(KL)      106  0.50238403328 03  0.50211718758 03


  ADJUST 106  WEIGHT      502.4  WAS      241.1   SPFAC-0.26519E 02   CHANGE0.0          0.0          0.71402E-01 0.86839E 01
 STATISTICS: TRACE      860.1  SKEW    11134.0  KURT    300413.6
        TESTS (SPLIT=0): 0.62786E 06      0.57327E 04      0.27820E 06
*ADJ(KL)*W(KL)*WSIM      542.7      261.3      400.0
 ALPHA ERROR:PRK*P*CM*W106.9749E 00.1005E 01.1051E 01.2613E 03
  (ERROR CONT) CIN.4784E 03.2290E 03.2494E 03  W(KF)*CTOT*DEN*ODEN.4740E 03**********.4906E 03.2425E 03

CLUSTER1043 INDEX 106  PROPORTION     0.95660 W PARENT  473.999
 SPLIT-0.2652E 02
WEIGHT     261.325  WAS      241.059     ADJUST      542.651  ID104953
PROPORTION: PROP 1.00495  CIN  478.37  CTOT  -10.64
OLD PROP 0.921125  CIN 228.99  ODEN 242.49  DIFFER  27.02
VOLUME0.21E 21   PDOT0.80E-08   DCON   -1.12

 LOCATION 5964  LINK107 5361  SUBS108 3487  SUPER104 6249  SYMBOL******
INDEX =    106    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.00

 MEAN          26.47  27.80  30.31  30.40  19.49  18.22  27.59  29.41


 COVARIANCE    2.05   2.32   0.48  -0.05   1.53   2.20   0.55   0.33
        2      2.32   4.40   0.87   0.29   1.96   3.90   1.32   0.57

        3      0.48   0.87   2.86   3.30   0.58   0.84   1.37   1.10

        4     -0.05   0.29   3.30   5.62   0.25   0.34   1.97   1.96

        5      1.53   1.96   0.58   0.25   1.92   2.34   0.73  -0.12

        6      2.20   3.90   0.84   0.34   2.34   4.51   1.15  -0.13

        7      0.55   1.32   1.37   1.97   0.73   1.15   2.33   1.52

        8      0.33   0.57   1.10   1.96  -0.12  -0.13   1.52   2.70

 SKEW(*W)     -914.[illegible]333.5-1292.4-1129.2 -343.2 -146.6-1640.8-1516.9


PROPORTION RELATIVE TO TOP LEVEL =      0.057266      106
IDADJ*NPTSO*INDEX*W*WADJ104953 96962   106       261.33      542.65
STATIS KL* W(KL)*WADJ(KL)      105  0.58507177738 03  0.58419384778 03


  ADJUST 105  WEIGHT      585.1  WAS      282.1   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.72382E-01 0.99553E 04
 STATISTICS: TRACE       55.3  SKEW      930.0  KURT      9045.5
        TESTS (SPLIT=0): -.10213E 06     -.41831E 04      -.11842E 05
*ADJ(KL)*W(KL)*WSIM      625.9      303.0      400.0
 ALPHA ERROR:PRK*P*CM*W105.6357E 00.1017E 01.1031E 01.3030E 03
  (ERROR CONT) CIN.5851E 03.2621E 03.3030E 03  W(KF)*CTOT*DEN*ODEN.3504E 04.2584E 04.9197E 03.6217E 03

CLUSTER1044 INDEX 105  PROPORTION     0.98625 W PARENT 3503.984
 SPLIT-0.1000E 05
WEIGHT     302.475  WAS      282.047     ADJUST      625.950  ID105939
PROPORTION: PROP 1.01668  CIN  585.07  CTOT  2584.24
OLD PROP 0.826970  CIN 282.10  ODEN 621.74  DIFFER    0.0
VOLUME0.31E 20   PDOT0.19E-08   DCON   -1.09

 LOCATION 6407  LINK   0     0  SUBS   0     0  SUPER-15 4375  SYMBOL******
INDEX =    105    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.00
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 MEAN          26.92   29.58   28.61   27.09   22.33   24.17   24.42   23.04

 COVARIANCE    2.31    2.57    2.03    1.78    0.35    1.10   -0.30   -0.22
       2       2.57    4.77    2.74    2.54    0.01    1.57   -0.21   -1.06
       3       2.03    2.74    3.08    2.22    0.29    1.61    0.49    0.63
       4       1.78    2.54    2.22    2.95   -0.69    0.49   -0.63   -0.36
       5       0.35    0.01    0.29   -0.69    1.42    0.92    0.68    0.50
       6       1.10    1.57    1.61    0.49    0.92    1.77    0.79    0.61
       7      -0.30   -0.21    0.49   -0.63    0.68    0.79    1.54    1.14
       8      -0.22   -1.06    0.63   -0.36    0.50    0.61    1.14    2.16

 SKEW(*W)    -657.0  -598.9  -499.7  -661.7   102.0  -105.9   340.5   234.5


PROPORTION RELATIVE TO TOP LEVEL =     0.120869      105
IDADJ.NPTSO.INDEX.W.WADJ105939 97359    105          302.97          625.95
STATIS KL. W(KL).WADJ(KL)      104  0.5439992676E 03  0.5439990234E 03
STATIS KL. W(KL).WADJ(KL)      104  0.5449992676E 03  0.5439990234E 03

  ADJUST 104  WEIGHT      545.0  WAS      262.0   SPFAC-0.33381E 02   CHANGE0.0          0.0          0.48269E-01 0.10029E 02
 STATISTICS: TRACE      184.6  SKEW     1411.3  KURT    10892.0
        TESTS (SPLIT=0): -.74075E 05      -.38145E 04       -.10582E 05

CLUSTER1044 INDEX 104  PROPORTION     0.39073 # PARENT 3515.201
 SPLIT-0.3338E 02
WEIGHT     544.999  WAS      262.000     ADJUST     543.999  ID105225
PROPORTION: PROP 0.38924  CIN  545.00  CTOT 2117.61
OLD PROP 0.347054  CIN 262.00  ODEN 946.09  DIFFER   7.56
VOLUME0.35E-16   ROOT0.59E-08   DCON   -1.11

 LOCATION 6249  LINK105 6407  SUBS106 5963  SUPER-15 4375  SYMBOL******
INDEX =    104    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   0.98

 MEAN          26.58   27.93   30.47   30.57   19.56   19.27   27.72   29.53

 COVARIANCE    2.03    2.30    0.46   -0.04    1.55    2.27    0.65    0.35
       2       2.30    4.30    0.76    0.24    2.02    3.95    1.30    0.47
       3       0.46    0.76    2.55    2.86    0.73    0.96    0.91    0.99
       4      -0.04    0.24    2.86    4.97    0.40    0.49    1.53    1.40
       5       1.55    2.02    0.73    0.40    1.88    2.30    0.91    0.10
       6       2.27    3.95    0.96    0.49    2.30    4.43    1.36    0.19
       7       0.65    1.30    0.91    1.53    0.91    1.36    2.00    1.12
       8       0.35    0.47    0.49    1.40    0.10    0.19    1.12    2.12

 SKEW(*W)    -707.8  -817.2   -89.8   216.4  -763.3  -804.6  -384.2  -188.5


WADJ(KL).W(KL).WSIM     586.0     283.0     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.099573      04
IDADJ.NPTSO.INDEX.W.WADJ105225 97440    104          283.00          586.00
STATIS KL. W(KL).WADJ(KL)      110  0.4214108887E 03  0.4213442383E 03

  ADJUST 110  WEIGHT      421.4  WAS      200.7   SPFAC-0.99999E 04   CHANGE0.0          0.0          0.70680E-01 0.21856E 02
 STATISTICS: TRACE     2135.1  SKEW    45057.7  KURT  1380654.0
        TESTS (SPLIT=0): 0.44377E 07       0.39222E 05       0.13567E 07

CLUSTER1045 INDEX 110  PROPORTION     0.90068 # PARENT  423.035
 SPLIT-0.1000E 05
WEIGHT     421.411  WAS      200.672     ADJUST     421.344  ID105427
PROPORTION: PROP 0.87427  CIN  406.35  CTOT  -41.82
OLD PROP 0.846000  CIN 193.75  ODEN 261.31  DIFFER   0.0
VOLUME0.18E-15   ROOT0.14E-07   DCON   -1.18

 LOCATION 2599  LINK111 3043  SUBS   0     0  SUPER109 2155  SYMBOL******
INDEX =    110    SYMBOL = ******

NET PROB*******  DIRECT*******  CUMS******* *   1.02
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 MEAN          26.36  27.67  30.45  30.58  19.48  14.15  27.56  29.33

 COVARIANCE    2.06   2.22   0.25  -0.16   1.51   1.97   0.41   0.02
        2      2.22   4.21   0.32  -0.13   1.94   3.53   0.92  -0.21
        3      0.25   0.32   2.64   3.09   0.29  -0.07   1.05   0.84
        4     -0.16  -0.13   3.09   5.40  -0.30  -0.86   1.45   1.94
        5      1.51   1.94   0.29  -0.30   2.35   2.78   0.63  -0.62
        6      1.97   3.53  -0.07  -0.86   2.78   4.79   0.72  -1.15
        7      0.41   0.92   1.05   1.45   0.63   0.72   2.28   1.62
        8      0.02  -0.21   0.84   1.94  -0.62  -1.15   1.62   3.28

 SKEW(*W)    -593.5  -13.5-1863.4-2912.2 1970.3 3527.9-1939.1-4209.2


*ADJ(KL)*W(KL)*SIM      461.5      220.7      400.0
 ALPHA ERROR*PRA,P,CM*W110,8743E 00.1044E 01.9707E 00.2207E 03
  (ERROR CONT) CIN.4064E 03.1938E 03.2126E 03  W(KF),CTOT,DEN,ODEN.4230E 03**********.4649E 03.2613E 03

CLUSTER1046 INDEX 110  PROPORTION     1.07601 * PARENT  423.035
 SPLIT-0.1000E 05
WEIGHT     220.739  *AS     200.672     ADJUST     461.478  ID105427
PROPORTION: PROP 1.04446  CIN  406.35  CTOT  -41.62
OLD PROP 0.446000  CIN 193.75  ODEN 261.31  DIFFER    0.0
VOLUME0.25E 21    ROOT0.14E-07    DCON    -1.18

 LOCATION 2599  LINK111 3043  SUBS  0     0  SUPER109 2155  SYMBOL******
INDEX =    110     SYMBOL = ******

NET PRO********  DIRECT*******  CUMS******* *    1.02

 MEAN          26.31  27.66  30.34  30.49  19.51  18.25  27.50  29.23

 COVARIANCE    2.00   2.09   0.38   0.05   1.30   1.61   0.40   0.11
        2      2.09   4.08   0.61   0.22   1.69   3.10   0.91  -0.08
        3      0.38   0.61   2.89   3.55   0.08  -0.19   1.27   1.27
        4      0.05   0.22   3.55   6.25  -0.65  -1.26   1.58   2.45
        5      1.30   1.69   0.08  -0.65   2.45   2.88   0.63  -0.78
        6      1.61   3.10  -0.19  -1.26   2.88   4.87   0.62  -1.45
        7      0.40   0.91   1.27   1.58   0.63   0.62   2.48   1.94
        8      0.11  -0.08   1.27   2.45  -0.78  -1.45   1.94   3.86

 SKEW(*W)    -593.5  -13.5-1863.4-2912.2 1970.3 3527.9-1939.1-4209.2


PROPORTION RELATIVE TO TOP LEVEL =      0.052716      110
18-10 19-09 20-15 21-20 14-10 15-20
                                                        0
05-10
***HAVE SPLIT110 WEIGHT    22[illegible]7 SUBS112113 ITER  71
KL,INDEX,LSUPER  2599   110    55
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DUMP OF OBSERVED CLUSTERS FROM110   2599

CLUSTER   0 INDEX 110  PROPORTION     0.92784 W PARENT  423.035
 SPLIT-0.1700E 02
WEIGHT     220.739  WAS      200.672    ADJUST      461.478  ID105427
PROPORTION: PROP 0.900868  CIN  212.60  CTOT  193.92
OLD PROP 0.900681  CIN 212.60  ODEN 229.12  DIFFER   0.0
VOLUME0.25E 21   ROOT0.14E-07   DCON   -1.18

 LOCATION 2599  LINK111 3043  SUBS112 8319  SUPER109 2155  SYMBOL      1
INDEX =    110    SYMBOL =      1

NET PROB*******  DIRECT*******  CUMS******* *    1.00

 MEAN          26.31  27.66  30.34  30.49  19.51  18.25  27.50  29.23

 COVARIANCE    2.00   2.09   0.36   0.05   1.30   1.61   0.40   0.11
       2       2.09   4.08   0.61   0.22   1.69   3.10   0.91  -0.08
       3       0.36   0.61   2.89   3.55   0.08  -0.19   1.27   1.27
       4       0.05   0.22   3.55   6.25  -0.65  -1.26   1.58   2.45
       5       1.30   1.69   0.08  -0.65   2.45   2.88   0.63  -0.78
       6       1.61   3.10  -0.19  -1.26   2.88   4.87   0.62  -1.45
       7       0.40   0.91   1.27   1.58   0.63   0.62   2.48   1.94
       8       0.11  -0.08   1.27   2.45  -0.78  -1.45   1.94   3.86

 SKEW(*W)     -593.5  -13.5-1863.4-2912.2 1970.3 3527.9-1939.1-4209.2


CLUSTER   1 INDEX 112  PROPORTION     0.29225 W PARENT  220.739
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000    ADJUST      280.000  ID107254
PROPORTION: PROP 0.29225  CIN   23.38  CTOT  140.74
OLD PROP 0.292250  CIN  23.38  ODEN  80.00  DIFFER   0.0
VOLUME0.27E-16   ROOT0.52E-08   DCON     4.74

 LOCATION 8319  LINK113 1583  SUBS  0    0  SUPER110 2599  SYMBOL      2
INDEX =    112    SYMBOL =      2

NET PROB    0.0   DIRECT    0.0   CUMS******* *    1.00

 MEAN          25.14  26.33  30.15  30.36  19.52  18.41  26.09  27.52

 COVARIANCE    2.46   2.91   1.69   3.13  -0.55  -0.49  -1.25  -0.34
       2       2.91   7.07   2.24   3.78  -0.12   2.36  -2.56  -3.37
       3       1.69   2.24   7.19   9.19  -3.39  -4.99   4.22   7.47
       4       3.13   3.78   9.19  16.24  -7.04 -10.08   4.06  10.56
       5      -0.55  -0.12  -3.39  -7.04   6.69   8.99  -1.32  -6.55
       6      -0.49   2.36  -4.99 -10.08   8.99  14.92  -3.68 -12.00
       7      -1.25  -2.56   4.22   4.06  -1.32  -3.68   6.83   9.16
       8      -0.34  -3.37   7.47  10.56  -6.55 -12.00   9.16  18.25

 SKEW(*W)       0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


CLUSTER   1 INDEX 113  PROPORTION     0.70775 W PARENT  220.739
 SPLIT-0.9999E 04
WEIGHT      80.000  WAS       80.000    ADJUST      280.000  ID107254
PROPORTION: PROP 0.70775  CIN   56.62  CTOT  140.74
OLD PROP 0.707750  CIN  56.62  ODEN  80.00  DIFFER   0.0
VOLUME0.31E-21   ROOT0.18E-10   DCON     4.74

 LOCATION 1583  LINK  0    0  SUBS  0    0  SUPER110 2599  SYMBOL      3
INDEX =    113    SYMBOL =      3

NET PROB    0.0   DIRECT    0.0   CUMS    0.00 *    1.02

 MEAN          26.79  28.21  30.41  30.54  19.51  18.19  28.09  29.94
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COVARIANCE   2.15   2.51  -0.02  -0.75   1.92   2.16   1.12   0.25
         2   2.51   3.58  -0.27  -0.74   2.25   3.18   1.80   0.80

         3  -0.02  -0.27   2.07   3.06   0.50  -0.04   0.66   0.42

         4  -0.75  -0.74   3.06   5.62   0.15  -0.32   1.13   1.22

         5   1.92   2.25   0.50   0.15   2.12   2.27   1.24   0.25

         6   2.15   3.18  -0.04  -0.32   2.27   3.22   1.79   0.51

         7   1.12   1.80   0.66   1.13   1.24   1.79   1.93   0.87

         8   0.25   0.80   0.42   1.22   0.25   0.51   0.87   1.31

SKEW(*a)        0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0


IDADJ.NPTSO.INDEX.**.*ADJ105427 87454   110       220.74       461.48
STATIS KL. W(KL).*WADJ(KL)      109  0.4614345703E 03  0.4611411133E 03


  ADJUST 109  *FINAL      461.4   WAS      220.6   SPEAC-0.7621ME 02   CHANGE0.0          0.0          0.20385E-01 0.52208E 01
 STATISTICS: TRACE        89.0   ****      586.1   KURT      8372.4
         TESTS (SPLIT=0): -.1UM05E 06      -.501B2E 04       -.14657E 05
WADJ(KL).W(KL)..STM      501.7     240.9     400.0
PROPORTION RELATIVE TO TOP LEVEL =     0.067471      109
IDADJ.NPTSO.INDEX...WADJ105511 87660   109       240.86       501.73
NO OF ITERATIONS THROUGH ALL THE DATA =   10
1R-10 19-09 20-15 21-20 14-10 15-20
                                                      0

05-10
KL.INDEX.LSUPER   119     0******
```

```
DUMP OF OBSERVED CLUSTERS FROM  0    119

CLUSTER   0 INDEX   0  PROPORTION     0.0      * PARENT98000.000
 SPLIT 0.1000E 05
WEIGHT   98000.000  WAS          0.001     ADJUST          0.0     ID999999
PROPORTION: PROP 1.00000  CIN     0.00  CTOT     0.0
OLD PROP 1.000000  CIN   0.00  ODEN   0.00  DIFFER    0.0
VOLUME0.0         ROOT0.0          DCON     6.0
INDEX =      0    SYMBOL =        0

NET PROB    0.0   DIRECT    0.0   CUMS******* *    1.00

CLUSTER   1 INDEX -18  PROPORTION     0.098877 * PARENT98000.000
 SPLIT-0.1000E 05
WEIGHT    1729.045  WAS      973.003     ADJUST     2529.807  ID100888
PROPORTION: PROP 0.09879  CIN 1435.52  CTOT2145.31
OLD PROP 0.098777  CIN 917.94  ODEN9310.03  DIFFER    0.0
VOLUME0.72E-21    ROOT0.27E-10    DCON     4.74

 LOCATION 1741  LINK-19 4947  SUBS  0     0  SUPER  0  119  SYMBOL      1
INDEX =    -18    SYMBOL =       1

NET PROB******* DIRECT******* CUMS******* *    0.94

 MEAN          25.56  25.60  26.84  25.67  20.78  20.85  23.33  22.53

 COVARIANCE    1.88   2.38   1.49   1.33   1.19   2.24   0.50  -0.50
        2      2.38   5.38   2.94   2.34   2.01   4.64   0.32  -0.77
        3      1.49   2.94   2.87   2.31   1.28   3.16   1.16   0.32
        4      1.33   2.34   2.31   3.13   1.62   2.67   1.40   1.04
        5      1.19   2.01   1.28   1.62   1.38   1.90   0.49   0.11
        6      2.24   4.64   3.16   2.67   1.90   4.58   0.86  -0.26
        7      0.50   0.32   1.16   1.40   0.49   0.86   1.27   0.78
        8     -0.50  -0.77   0.32   1.04   0.11  -0.26   0.78   1.49

 SKEW(*W)      89.4  421.2 -141.0  -44.0  201.9   90.4 -280.7 -119.0


CLUSTER   1 INDEX -19  PROPORTION     0.09202 * PARENT98000.000
 SPLIT-0.1000E 05
WEIGHT    1023.042  WAS      903.500     ADJUST     2349.098  ID106413
PROPORTION: PROP 0.09193  CIN  981.30  CTOT87239.25
OLD PROP 0.091929  CIN 866.88  ODEN9426.10  DIFFER    0.0
VOLUME0.95E-21    ROOT0.31E-10    DCON     4.74

 LOCATION 4947  LINK-20  145  SUBS  0     0  SUPER  0  119  SYMBOL      2
INDEX =    -19    SYMBOL =       2

NET PROB    0.00  DIRECT    0.00  CUMS******* *    0.97

 MEAN          28.39  31.63  30.45  28.14  23.26  25.67  25.88  24.05

 COVARIANCE    2.18   2.41   2.07   1.86   1.55   2.11   0.93   0.58
        2      2.41   4.93   3.62   3.34   2.00   3.73   2.09   1.29
        3      2.07   3.62   4.43   3.59   2.32   2.85   2.61   1.34
        4      1.86   3.34   3.59   4.31   2.22   2.61   2.19   2.02
        5      1.55   2.00   2.32   2.22   1.73   1.71   1.29   0.88
        6      2.11   3.73   2.85   2.61   1.[illegible]   3.15   1.56   0.97
        7      0.93   2.09   2.61   2.19   1.29   1.56   1.86   0.88
        8      0.58   1.29   1.34   2.02   0.88   0.97   0.88   1.34

 SKEW(*W)    -102.1 -521.1 -430.9 -346.8 -110.9 -400.9 -251.2 -216.1


CLUSTER   1 INDEX -20  PROPORTION     0.15292 * PARENT98000.000
 SPLIT-0.1000E 05
WEIGHT    2926.279  WAS     1502.296     ADJUST     3905.970  ID 98643
PROPORTION: PROP 0.15277  CIN 2925.60  CTOT79012.00
OLD PROP 0.152773  CIN1501.79  ODEN9825.83  DIFFER    0.0
VOLUME0.49E-21    ROOT0.22E-10    DCON     4.74
```

```
 LOCATION  145  LINK=21 3773  SUBS  0    0  SUPER  0  119  SYMBOL      3
INDEX =    -20     SYMBOL =       3

NET PROB    0.00  DIRECT    0.00  CUMS******** *    1.00

 MEAN          25.73  28.58  30.98  31.18  18.66  17.04  26.33  27.91

 COVARIANCE    1.15   0.75   0.52   0.38   0.82   0.65  -0.32  -0.71
        2      0.75   2.05   0.87   0.83   0.96   1.36  -0.06  -1.02

        3      0.52   0.87   1.37   1.09   0.70   0.33   0.76   0.21

        4      0.38   0.83   1.09   2.16   0.62   0.19   0.99   1.57

        5      0.82   0.96   0.70   0.62   0.96   0.68  -0.03  -0.50

        6      0.65   1.36   0.33   0.19   0.68   1.33  -0.48  -1.25

        7     -0.32  -0.06   0.76   0.99  -0.03  -0.48   1.33   1.35

        8     -0.71  -1.02   0.21   1.57  -0.50  -1.25   1.35   3.44

 SKEW(**)     -119.1  -25.1  133.4   35.0 -176.1  -72.7  196.2  352.2


CLUSTER   1 INDEX -21  PROPORTION     0.20338 * PARENT98000.000
 SPLIT-0.1000E 05
WEIGHT    3958.493  *AS     1997.658     ADJUST     5193.906  ID 99019
PROPORTION: PROP 0.20319  CIN 3857.70  CTOT79381.25
OLD PROP 0.203187  CIN1997.33  ODEN9833.63  DIFFER    0.0
VOLUME0.14E-20    ROOT0.38E-10    DCON     4.74

 LOCATION 3773  LINK-14 4217  SUBS  0    0  SUPER  0  119  SYMBOL      4
INDEX =    -21     SYMBOL =       4

NET PROB    0.0   DIRECT    0.0   CUMS******* *    0.93

 MEAN          26.90  29.06  30.67  29.60  20.36  20.20  27.26  28.10

 COVARIANCE    1.24   1.15   0.86   0.90   0.63   0.84   0.53   1.13
        2      1.15   2.59   1.62   1.61   0.74   2.36   0.58   0.76

        3      0.86   1.62   2.48   2.06   1.33   2.58   0.51  -0.38

        4      0.90   1.61   2.06   3.26   1.14   2.01   1.89   1.11

        5      0.63   0.74   1.33   1.14   1.08   1.26   0.31  -0.03

        6      0.84   2.36   2.58   2.01   1.26   3.48   0.21  -0.69

        7      0.53   0.58   0.51   1.89   0.31   0.21   1.92   1.73

        8      1.13   0.76  -0.38   1.11  -0.03  -0.69   1.73   3.31

 SKEW(**)     340.4  273.9    9.4  111.9 -269.3 -141.1  313.3  758.5


CLUSTER   1 INDEX -14  PROPORTION     0.10428 * PARENT98000.000
 SPLIT-0.1000E 05
WEIGHT    1992.477  *AS     1026.654     ADJUST     2664.300  ID 98411
PROPORTION: PROP 0.10418  CIN 1938.81  CTOT79742.63
OLD PROP 0.104184  CIN 998.23  ODEN9587.20  DIFFER    0.0
VOLUME0.41E-21    ROOT0.20E-10    DCON     4.74

 LOCATION 4217  LINK-15 4375  SUBS  0    0  SUPER  0  119  SYMBOL      5
INDEX =    -14     SYMBOL =       5

NET PROB    0.00  DIRECT    0.00  CUMS******* *    1.02

 MEAN          24.37  25.66  25.52  24.10  22.20  24.16  23.59  22.21

 COVARIANCE    1.30   0.86   1.15   1.24   0.31  -0.05   0.63   0.27
        2      0.85   2.12   1.43   1.85  -0.43  -0.08   0.71  -0.04

        3      1.15   1.48   2.63   2.34  -0.35  -0.85   0.40   0.05

        4      1.24   1.85   2.34   3.93  -0.50  -0.34   0.59   0.76
```

5	0.31	-0.43	-0.35	-0.50	0.75	0.27	0.19	0.17
6	-0.05	-0.08	-0.85	-0.39	0.27	0.84	0.23	0.22
7	0.63	0.71	0.40	0.59	0.19	0.23	0.67	0.14
8	0.27	-0.04	0.05	0.76	0.17	0.22	0.14	0.68
SKEW(*W)	-144.9	-481.9	-315.4	-645.5	24.4	-163.4	-266.9	-90.2

CLUSTER 1 INDEX -15 PROPORTION 0.19618 W PARENT94000.000
SPLIT-0.6538E 03
WEIGHT 3578.443 WAS 1939.410 ADJUST 5042.465 ID 99079
PROPORTION: PROP 0.19599 CIN 3317.39 CTOT80715.75
OLD PROP 0.195993 CIN1793.68 ODEN9106.97 DIFFER 211.52
VOLUME0.11E-19 ROOT0.10E-09 DCON 4.74

LOCATION 4375 LINK 13 3931 SUBS104 6249 SUPER 0 119 SYMBOL 6
INDEX = -15 SYMBOL = 6

NET PROB 0.08 DIRECT 0.42 CUMS 0.02 * 1.04

MEAN	27.10	29.80	28.96	27.28	22.30	24.18	24.30	22.89
COVARIANCE	2.33	2.51	2.00	1.82	0.43	1.17	-0.36	-0.26
2	2.51	4.58	2.82	2.45	0.23	1.81	-0.03	-0.79
3	2.00	2.82	3.07	2.26	0.38	1.69	0.52	0.56
4	1.82	2.45	2.26	2.91	-0.46	0.66	-0.61	-0.27
5	0.43	0.23	0.38	-0.46	1.33	0.91	0.66	0.39
6	1.17	1.81	1.69	0.66	0.91	1.87	0.83	0.48
7	-0.36	-0.03	0.52	-0.61	0.66	0.83	1.67	1.08
8	-0.26	-0.79	0.56	-0.27	0.39	0.48	1.08	1.89
SKEW(*W)	1525.1	2006.7	1707.5	1691.7	623.4	1466.3	866.0	178.0

CLUSTER 2 INDEX 104 PROPORTION 0.48353 W PARENT 3578.443
SPLIT-0.3431E 02
WEIGHT 379.000 WAS 283.000 ADJUST 586.000 ID107240
PROPORTION: PROP 0.50501 CIN 379.00 CTOT 2827.96
OLD PROP 0.508046 CIN 283.00 ODEN 687.24 DIFFER 3.27
VOLUME0.97E-18 ROOT0.99E-09 DCON 2.41

LOCATION 6249 LINK105 6407 SUBS106 5963 SUPER-15 4375 SYMBOL 7
INDEX = 104 SYMBOL = 7

NET PROB 0.00 DIRECT 0.00 CUMS 11.24 * 0.99

MEAN	26.55	27.87	30.41	30.54	19.49	18.20	27.71	29.60
COVARIANCE	1.99	2.28	0.42	-0.12	1.53	2.22	0.54	0.30
2	2.28	4.47	0.74	0.05	2.12	4.03	1.19	0.34
3	0.42	0.74	2.61	2.95	0.71	1.00	0.90	0.50
4	-0.12	0.05	2.95	4.99	0.35	0.41	1.39	1.31
5	1.53	2.12	0.71	0.35	1.88	2.33	0.85	0.04
6	2.22	4.03	1.00	0.41	2.33	4.41	1.31	0.11
7	0.54	1.19	0.90	1.39	0.85	1.31	1.87	0.92
8	0.30	0.34	0.50	1.31	0.04	0.11	0.92	1.92
SKEW(*W)	209.8	-7.4	171.2	125.7	-34.2	-71.4	-108.0	231.3

```
CLUSTER   3 INDEX 106  PROPORTION     0.93365 * PARENT  379.000
 SPLIT-0.7925E 01
WEIGHT      426.206  WAS      261.325     ADJUST      542.651  ID10?762
PROPORTION: PROP 0.92641  CIN  407.04  CTOT  -60.37
OLD PROP 0.92?042  CIN 249.38  ODEN 282.29  DIFFER  12.60
VOLUME0.92E-17   ROOT0.30E-08   DCON     0.80

 LOCATION 5963  LINK107 5361  SUBS108 3487  SUPER104 6249  SYMBOL      8
INDEX =    105    SYMBOL =       8

NET PROB  11.15  DIRECT   0.21  CUMS******* *   0.44

 MEAN          26.55  27.85  30.39  30.46  19.52  18.23  27.63  29.52

 COVARIANCE    2.04   2.34   0.46  -0.06   1.53   2.24   0.57   0.38
       2       2.34   4.50   0.79   0.16   2.06   3.98   1.23   0.50
       3       0.46   0.79   2.79   3.14   0.61   0.81   1.13   0.84
       4      -0.06   0.16   3.14   5.21   0.23   0.25   1.63   1.84
       5       1.53   2.06   0.61   0.23   1.91   2.38   0.73  -0.07
       6       2.24   3.98   0.81   0.25   2.38   4.53   1.11  -0.07
       7       0.57   1.23   1.13   1.63   0.73   1.11   2.11   1.31
       8       0.38   0.50   0.84   1.64  -0.07  -0.07   1.31   2.44

 SKEW(*W)     165.3   11.7  214.2  104.8   47.0  115.2 -231.1  -55.2


CLUSTER   4 INDEX 108  PROPORTION     0.20498 * PARENT  426.206
 SPLIT-0.9999E 04
WEIGHT      279.099  WAS       80.000     ADJUST      280.000  ID101367
PROPORTION: PROP 0.19329  CIN  162.93  CTOT -414.75
OLD PROP 0.324585  CIN  31.94  ODEN  98.41  DIFFER   0.0
VOLUME0.17E-13   ROOT0.13E-06   DCON    -5.23

 LOCATION 3487  LINK109 2155  SUBS  0     0  SUPER106 5963  SYMBOL      9
INDEX =    108    SYMBOL =       9

NET PROB******* DIRECT******* CUMS******* *   1.00

 MEAN          27.40  29.22  29.73  29.14  20.81  20.48  27.26  28.16

 COVARIANCE    2.20   2.72   2.18   2.41   0.45   1.39   0.67   1.22
       2       2.72   5.21   3.17   3.34   1.15   3.94   0.44   0.48
       3       2.18   3.17   4.56   5.67  -0.28   0.48   3.23   4.62
       4       2.41   3.34   5.67   9.75  -1.37  -1.57   5.97   8.07
       5       0.45   1.15  -0.28  -1.37   2.32   4.13  -1.68  -3.53
       6       1.39   3.94   0.48  -1.57   4.13   9.27  -3.27  -6.62
       7       0.67   0.44   3.23   5.97  -1.68  -3.27   5.74   7.88
       8       1.22   0.48   4.62   8.07  -3.53  -6.62   7.88  13.07

 SKEW(*W)    -662.4 -711.6   26.2  268.2 -678.2-1323.4  117.8  936.0


CLUSTER   4 INDEX 109  PROPORTION     0.79502 * PARENT  426.206
 SPLIT-0.4450E 02
WEIGHT      279.099  WAS      240.964     ADJUST      501.728  ID107460
PROPORTION: PROP 0.74967  CIN  263.84  CTOT  156.30
OLD PROP 0.802744  CIN 174.07  ODEN 238.38  DIFFER   6.79
VOLUME0.19E-18   ROOT0.44E-09   DCON     3.56

 LOCATION 2155  LINK   0     0  SUBS110 2599  SUPER106 5963  SYMBOL     10
INDEX =    109    SYMBOL =      10

NET PROB   0.00  DIRECT   0.00  CUMS  24.24 *   1.03

 MEAN          26.39  27.61  30.50  30.72  19.38  17.95  27.62  29.59

 COVARIANCE    1.62   1.94   0.14  -0.40   1.50   1.90   0.43   0.02
       2       1.94   3.93   0.30  -0.33   2.02   3.43   1.11   0.05
```

3	0.14	0.30	2.24	2.71	0.50	0.38	0.78	0.37
4	-0.48	-0.33	2.71	4.74	0.11	-0.19	1.09	1.23
5	1.50	2.02	0.50	0.11	1.49	2.14	0.81	-0.07
6	1.48	3.43	0.38	-0.19	2.14	3.68	1.15	-0.13
7	0.43	1.11	0.78	1.09	0.81	1.15	1.81	0.63
8	0.02	0.05	0.37	1.23	-0.07	-0.13	0.83	1.87
SKEW(*W)	104.4	40.2	115.3	46.2	87.7	35.0	-7.9	76.9

CLUSTER 5 INDEX 110 PROPORTION 0.90904 # PARENT 279.093
SPLIT-0.4239E 02
WEIGHT 293.905 WAS 220.739 ADJUST 461.476 ID107254
PROPORTION: PROP 0.93512 CIN 241.11 CTOT -21.52
OLD PROP 0.900881 CIN 212.60 ODEN 229.12 DIFFER 29.14
VOLUME0.67E-17 ROOT0.26E-08 DCON 2.46

LOCATION 2599 LINK111 3043 SUBS112 8319 SUPER109 2155 SYMBOL 11
INDEX = 110 SYMBOL = 11

NET PROB 24.94 DIRECT 26.67 CUMS******* * 1.00

MEAN	26.37	27.63	30.35	30.49	19.49	18.15	27.52	29.33
COVARIANCE	1.96	2.10	0.33	0.00	1.32	1.64	0.43	0.23
2	2.10	4.22	0.50	0.07	1.81	3.23	0.93	0.01
3	0.33	0.50	2.75	3.31	0.15	-0.14	1.14	1.11
4	0.00	0.07	3.31	5.72	-0.48	-1.07	1.42	2.15
5	1.32	1.81	0.15	-0.48	2.28	2.70	0.62	-0.58
6	1.64	3.23	-0.14	-1.07	2.70	4.60	0.67	-1.17
7	0.43	0.93	1.14	1.42	0.62	0.67	2.32	1.70
8	0.23	0.01	1.11	2.15	-0.58	-1.17	1.70	3.47
SKEW(*W)	90.2	-100.5	-38.5	-90.3	-48.4	-117.6	-33.4	133.1

CLUSTER 6 INDEX 112 PROPORTION 0.28345 W PARENT 293.905
SPLIT-0.9999E 04
WEIGHT 100.109 WAS 80.000 ADJUST 280.000 ID107254
PROPORTION: PROP 0.28309 CIN 41.15 CTOT 148.53
OLD PROP 0.292250 CIN 23.38 ODEN 80.00 DIFFER 0.0
VOLUME0.12E-15 ROOT0.11E-07 DCON 2.96

LOCATION 8319 LINK113 1583 SUBS 0 0 SUPER110 2599 SYMBOL 12
INDEX = 112 SYMBOL = 12

NET PROB******* DIRECT******* CUMS******* * 1.00

MEAN	25.24	26.21	30.27	30.56	19.31	18.04	26.25	27.95
COVARIANCE	2.27	2.60	1.52	2.69	-0.37	-0.34	-0.97	-0.10
2	2.60	6.70	1.99	3.15	0.42	2.71	-2.12	-3.04
3	1.52	1.99	6.46	8.06	-2.70	-4.20	3.90	6.49
4	2.69	3.15	8.06	14.04	-5.69	-8.47	3.77	9.20
5	-0.37	0.42	-2.70	-5.69	5.79	7.87	-1.19	-5.71
6	-0.34	2.71	-4.20	-8.47	7.87	13.24	-3.34	-10.62
7	-0.97	-2.12	3.90	3.77	-1.19	-3.34	6.07	8.00
8	-0.10	-3.04	6.49	9.20	-5.71	-10.62	8.00	16.06
SKEW(*W)	125.6	29.9	64.8	17.1	-91.3	-152.8	111.5	264.4

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CLUSTER   6 INDEX 113  PROPORTION     0.71655 * PARENT  293.905
 SPLIT-0.9999E 04
WEIGHT      132.853  WAS       80.000     ADJUST      280.000  ID107254
PROPORTION: PROP 0.71565  CIN   103.72  CTOT  148.97
OLD PROP 0.707750  CIN   56.62  ODEN   80.00  DIFFER    0.0
VOLUME0.13E-16    ROOT0.36E-09    DCON      0.71

 LOCATION 1583  LINK  0     0  SUBS  0     0  SUPER110 2599  SYMBOL     13
INDEX =    113     SYMBOL =      13

NET PROB    0.0    DIRECT    0.0    CUMS    0.00 *    1.02

 MEAN          26.43  28.22  30.35  30.39  19.61  18.24  27.98  29.82

 COVARIANCE    1.93   2.10   0.05  -0.47   1.63   1.87   0.84   0.46
        2      2.11   3.31  -0.16  -0.52   1.88   2.88   1.37   0.76
        3      0.05  -0.16   1.99   2.75   0.48   0.10   0.51   0.34
        4     -0.47  -0.52   2.75   4.85   0.16  -0.16   1.04   1.10
        5      1.63   1.88   0.48   0.16   1.87   2.00   0.92   0.24
        6      1.87   2.88   0.10  -0.2    2.00   3.01   1.44   0.47
        7      0.84   1.37   0.51   1.04   0.92   1.44   1.70   0.78
        8      0.46   0.76   0.34   1.10   0.24   0.47   0.78   1.46

 SKEW(*W)      115.6   59.5 -113.2 -199.7  142.1  173.1  -66.2  -46.5


CLUSTER   5 INDEX 111  PROPORTION     0.09096 * PARENT  279.093
 SPLIT-0.9999E 04
WEIGHT       95.974  WAS       80.000     ADJUST      280.000  ID103541
PROPORTION: PROP 0.09357  CIN   54.07  CTOT -298.71
OLD PROP 0.477371  CIN   42.30  ODEN   88.60  DIFFER    0.0
VOLUME0.40E-24    ROOT0.64E-12    DCON      3.29

 LOCATION 3043  LINK  0     0  SUBS  0     0  SUPER109 2155  SYMBOL     14
INDEX =    111     SYMBOL =      14

NET PROB    0.0    DIRECT    0.0    CUMS4456.65 *    1.00

 MEAN          25.66  26.59  31.12  31.61  18.29  18.34  28.03  30.69

 COVARIANCE    0.37   0.44  -0.04  -0.15   0.36   0.44   0.01  -0.12
        2      0.44   0.81  -0.02  -0.17   0.46   0.79   0.16  -0.20
        3     -0.04  -0.02   0.41   0.52   0.02  -0.05   0.19   0.11
        4     -0.15  -0.17   0.52   0.94  -0.13  -0.25   0.32   0.36
        5      0.36   0.46   0.02  -0.13   0.44   0.55   0.01  -0.24
        6      0.44   0.79  -0.05  -0.25   0.55   0.95   0.10  -0.37
        7      0.01   0.16   0.19   0.32   0.01   0.10   0.48   0.29
        8     -0.12  -0.20   0.11   0.36  -0.24  -0.37   0.29   0.58

 SKEW(*W)      -76.2  -67.1   59.5   61.2    9.0   -2.9  -58.5  -67.2


CLUSTER   3 INDEX 107  PROPORTION     0.06635 * PARENT  379.000
 SPLIT-0.9999E 04
WEIGHT      125.163  WAS       80.000     ADJUST      280.000  ID 99916
PROPORTION: PROP 0.06584  CIN   83.49  CTOT -889.07
OLD PROP 0.438941  CIN   47.54  ODEN  108.30  DIFFER    0.0
VOLUME0.14E-16    ROOT0.38E-09    DCON      1.18

 LOCATION 5361  LINK  0     0  SUBS  0     0  SUPER104 6249  SYMBOL     15
INDEX =    107     SYMBOL =      15

NET PROB    0.00  DIRECT    0.00  CUMS******* *    1.01
```

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```
MEAN          27.47  30.15  29.69  28.05  22.37  23.70  25.41  24.27

COVARIANCE    2.35   3.34   2.35   1.65   0.55   3.26  -1.56  -1.68
       2      3.34   5.23   2.70   2.15   0.93   4.57  -2.62  -3.65
       3      2.35   2.70   3.13   2.73   0.67   2.25  -0.41   0.37
       4      1.65   2.15   2.73   4.01  -1.54  -0.95   0.35   2.00
       5      0.55   0.93   0.67  -1.54   2.09   3.93  -1.32  -2.78
       6      3.25   4.57   2.25  -0.95   3.93   9.85  -3.48  -0.50
       7     -1.55  -2.62  -0.41   0.35  -1.32  -3.48   3.17   0.78
       8     -1.67  -3.65   0.37   2.00  -2.78  -0.50   0.78   8.57

SKEW(*4)   -1535.0-2191.1-1345.0-1454.0  179.4 -567.4  548.1  722.6


CLUSTER   2 INDEX 105  PROPORTION    0.51647 * PARENT 3578.443
 SPLIT-0.1000E 05
WEIGHT     378.605   #AS      302.975    ADJUST     525.950  ID107159
PROPORTION: PROP 0.53940  CIN  378.60  CTOT 2876.54
OLD PROP 0.494860  CIN 302.97  ODEN 624.82  DIFFER   0.0
VOLUME0.54E-19   ROOT0.23E-09   DCON     2.95

 LOCATION 4487  LINK  0    0  SUBS  0    0  SUPER-15 4375  SYMBOL    16
INDEX =    105    SYMBOL =     16

NET PROB   0.02  DIRECT   0.03  CUMS******* *   1.00

 MEAN          27.07  29.79  28.96  27.20  22.39  24.27  24.43  22.96

 COVARIANCE    2.36   2.64   2.12   1.84   0.38   1.18  -0.28  -0.25
       2       2.64   4.88   2.86   2.62   0.04   1.66  -0.16  -1.02
       3       2.12   2.86   3.19   2.34   0.31   1.67   0.50   0.58
       4       1.84   2.62   2.34   3.00  -0.60   0.60  -0.57  -0.31
       5       0.38   0.04   0.31  -0.60   1.34   0.87   0.61   0.42
       6       1.18   1.66   1.67   0.60   0.87   1.74   0.74   0.53
       7      -0.28  -0.16   0.50  -0.57   0.61   0.74   1.50   1.09
       8      -0.25  -1.02   0.58  -0.31   0.42   0.53   1.09   2.02

 SKEW(*4)      415.2  529.1  390.5  263.9  205.2  231.4    3.4 -218.6


CLUSTER   1 INDEX  13  PROPORTION    0.05370 * PARENT98000.000
 SPLIT-0.1000E 05
WEIGHT     671.384   #AS      358.026    ADJUST     736.052  ID101803
PROPORTION: PROP 0.05364  CIN  651.41  CTOT85856.00
OLD PROP 0.055013  CIN 347.33  ODEN6319.24  DIFFER   0.0
VOLUME0.61E-19   ROOT0.25E-09   DCON    -0.28

 LOCATION 3931  LINK  5 2313  SUBS  0    0  SUPER  0  119  SYMBOL    17
INDEX =     13    SYMBOL =     17

NET PROB   0.0   DIRECT   0.0   CUMS******* *   0.73

 MEAN          24.41  25.43  25.09  22.81  21.57  23.48  23.00  20.94

 COVARIANCE    0.76   0.30   0.38   0.43   0.41   0.11   0.02   0.37
       2       0.30   1.94   0.84   0.89   0.94   1.55   0.22  -0.35
       3       0.38   0.84   1.92   1.55   0.44   0.30   1.19   0.64
       4       0.43   0.89   1.55   2.67   0.21   0.51   1.09   1.31
       5       0.41   0.94   0.44   0.21   0.87   0.76   0.01  -0.24
       6       0.11   1.55   0.30   0.51   0.76   1.68  -0.13  -0.56
       7       0.02   0.22   1.19   1.09   0.01  -0.13   1.15   0.58
       8       0.37  -0.35   0.64   1.31  -1.24  -0.56   0.58   1.43
```

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```
 SKEW(%)     -124.9   358.3   -5.9    43.5   149.5   219.2  -378.7 -186.9


CLUSTER  1 INDEX   5  PROPORTION    0.04865 * PARENTY=606.000
 SPLIT=0.10000E 05
WEIGHT    1340.858   445      867.813     ADJUST    1736.413  ID100713
PROPORTION: PROP 0.04856  CIN 1291.93  CTOTAL=1.00
OLD PROP 0.10348  CIN 644.50  QUEN6260.56  DIFFER    0.0
VOLUME0.11E-15   ROOT0.33E-09   DCON   -0.33

 LOCATION 2313  LINK  0     0  SONS  0     0  SUPER  0  119  SYMBOL    18
INDEX =      5    SYMBOL =     18

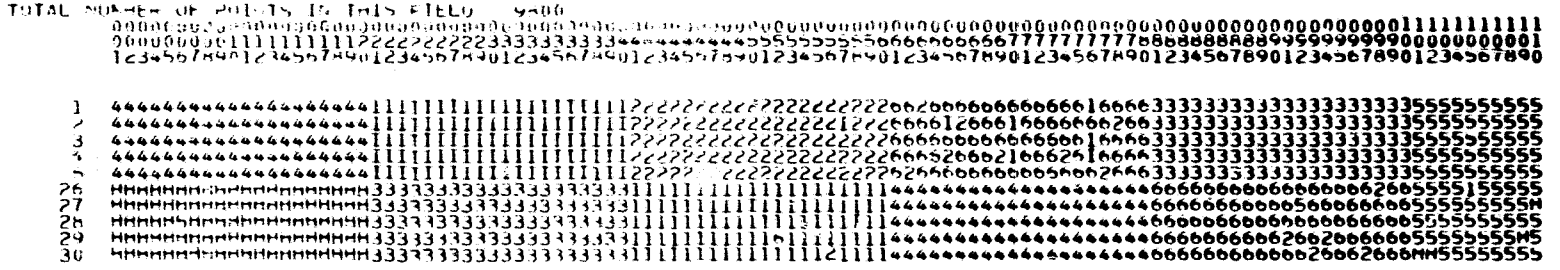
NET PROB    0.05  DIRECT    0.44  CUMS    0.0   *    0.0
                            CUMS.0              *  .0

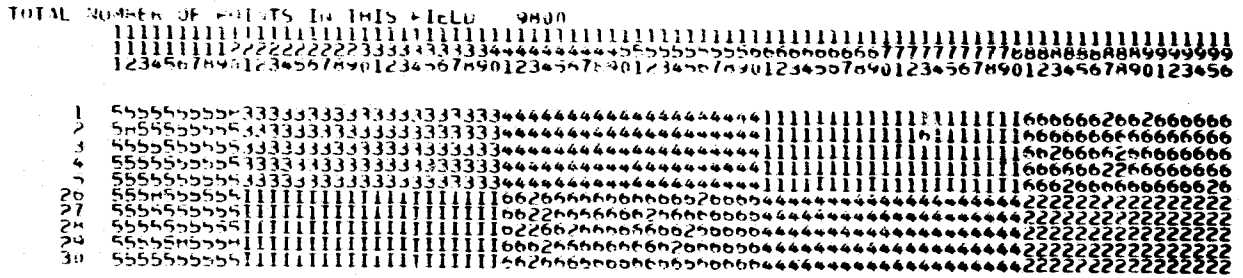

MEAN          24.52   24.06   26.04   25.09   20.33   19.38   22.74   22.47

COVARIANCE    1.50    1.01    0.71    0.91    0.10    0.23   -0.63   -0.12
        2     1.01    2.04    0.70    0.87    0.11    0.94   -0.23    0.02
        3     0.71    0.70    1.53    1.29    0.15    0.58   -0.07    0.86
        4     0.91    0.87    1.29    2.42   -0.50    0.19   -0.87    0.51
        5     0.10    0.11    0.15   -0.50    0.63    0.32    0.41    0.20
        6     0.23    0.94    0.58    0.19    0.32    0.99    0.98    0.42
        7    -0.63   -0.23   -0.07   -0.87    0.41    0.48    1.32    0.49
        8    -0.12    0.02    0.86    0.51    0.20    0.42    0.49    1.06

SKEW(%)      -65.1   218.5  -348.4    83.2    64.2    93.8   210.3  -118.9
```

LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS





POINTS PER CLUSTER IN THIS FIELD

CLUSTER	SYMBOL	POINTS
1	1	182
2	2	213
3	3	300
4	4	400
5	5	192
6	6	342
7	7	0
8	8	0
9	9	0
10	A	0
11	B	0
12	C	0
13	D	0
14	E	0
15	F	0
16	G	0
17	H	108
18	I	223

HOUSTON, TEXAS

TOTAL NUMBER OF POINTS = 9500

CLUSTER	SYMBOL	POINTS IN CLUSTER
1	1	162
2	2	213
3	3	300
4	4	408
5	5	193
6	6	342
7	7	[illegible]
8	8	[illegible]
9	9	[illegible]
10	A	[illegible]
11	B	[illegible]
12	C	[illegible]
13	D	[illegible]
14	E	[illegible]
15	F	[illegible]
16	G	[illegible]
17	H	104
18	I	223

```
TOTAL NUMBER OF POINTS IN THIS FIELD    9800
         0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001
         0000000001111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990
         1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

  1      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222662666666666666661666633333333335555555555
  2      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222I222666612666166666662663333333333335555555555
  3      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222665666666666666166663333333333335555555555
  4      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222666526662166626166663333333333335555555555
  5      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222626666666666666626663333333333335555555555
  6      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222I656666666666666626663333333333335555555555
  7      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222I66666666662266666666333333333355H5555555
  8      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222666666666666616166663333333333555555555H
  9      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222666666662666666161663333333333335555555555
 10      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266626666666666616656I3333333335555555H55
 11      44444444444444444444IIIIIIIIIIIIII2IIIII2222222222222222222266I626666666656666663333333333335555H55555
 12      44444444444444444444IIIIIIIIIIIIIIIIIIII222222222222222222226H626616666661266666333333333355555H5H55
 13      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266666666666666661663333333333335H5555H555
 14      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222666566666666666666663333333333335555555555
 15      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222I22222222222266662666666665666663333333333335555555555
 16      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222262266666266666665663333333333335555555555
 17      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266626666666666566662333333333355555555H5
 18      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266166666666I66666663333333333335555H5555H
 19      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266666666H6H6666666663333333333335555555555
 20      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266I1666666626666626633333333333H5555555H5
 21      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222666666666666266666663333333333355H5555555
 22      44444444444444444444IIIIIIIIIIIIIIIIIIII2222222222222222222266666666H666666666663333333333355555555H5
 23      44444444444444444444IIIIIIIIIIIIIIIIIIII22222222222222222222666666666666666266663333333333355H5555555
 24      44444444444444444444IIIIIIIIIIIIIIIIIIII222222222222222222226I6666666I666I666666333333333333H555555555
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 41      HHHHHHHHHHHHHHHHHHHH3333333333333333333311111111111111111111444444444444444466666666666666I66555H555
 42      HHHHHHHHHHHHH5HHHHHH3333333333333333333311111111111121111111444444444444444466H666666662H655555H5555
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 44      5HHHHHHHHHHHHHHHHHHH33333333333333333333111111111111111111114444444444444444666666I66626665555555565
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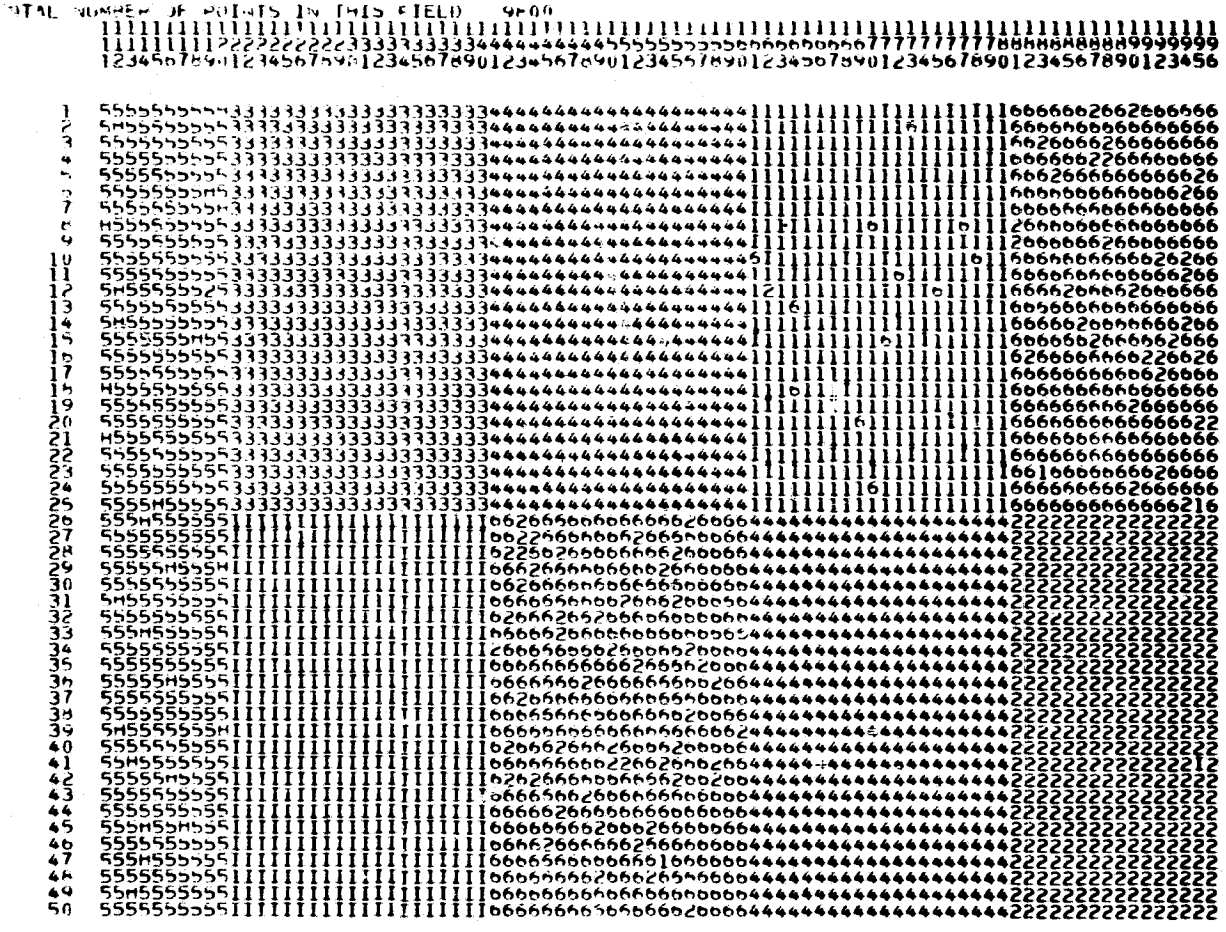

POINTS PER CLUSTER IN THIS FIELD

CLUSTER	SYMBOL	POINTS
1	1	874
2	2	1045
3	3	1500
4	4	2000
5	5	953
6	6	1718
7	7	0
8	8	0
9	9	0
10	A	0
11	B	0
12	C	0
13	D	0
14	E	0
15	F	0
16	G	0
17	H	562
18	I	1145

APPENDIX D

UTILITY ROUTINES

D.1 MATHEMATICAL SUBROUTINES

Subroutine Name and Calling Sequence	Description
AMSQ(AM,AMET)	Calculates the trace of the of the square of the matrix AM, relative to the metric AMET.
CORRECT(REL,PV,P,S)	Subtracts S(I)/P from PV(I) to create (REL(I).
DENCAL(KL,RATIO,OLW)	Adjusts the denominator offset and proportion of KL.
DMINV(A,B,C,VOL)	Calculates A equal to the inverse of C and VOL equal to the determinant of C. B is used as temporary storage.
DOTSQ(V,AMET)	Calculates the inner product V.V relative to the metric AMET.
DSQMTX(SQ,AM)	Expands MATRIX AM from triangular form and makes and MQ*MQ square symmetric matrix in SQ(MQ,MQ).
DTRMTX*8(TRI,SQ)	Puts the lower triangle of SQ(MS,MQ) into symmetric matrix form in TRI.
EIGROT(LP,NM,R,E,V)	Generates an Eigenrotation of an LP*LP submatrix of the array R. The Eigenvalues are returned in E and this Eigenvector matrix is in V(NM*NM), where the second index runs over Eigenvectors and the first within them. Subroutines TRIDMX, EIGVAL and EIGVEC are used.

Subroutine Name and Calling Sequence	Description
EIGVAL(LP,E,A,B,W,F)	Calculates the Eigenvalues in descending absolute order. Array A(LP) gives the diagonal elements of the tridiagonal matrix. Array B is a vector of LP elements. W and F are temporary storage.
EIGVEC(LP,NM,R,A,B,E,V,P,Q)	Calculates the Eigenvectors for the matrix R(LP) with maximum dimension NM. Array A holds the tridiagonalized R; Array B holds the off-diagonal elements of tri-diagonalized R; E are the Eigenvector of R; V holds the Eigenvectors stored columnwise and P and Q are temporary storage.
MINV(A,B,C)	Creates matrix A as product of matrices B and C.
MPVS(AM,C,V)	Creates tensor product in AM(AM=AM+V*V*C).
MTVEC(U,A,V)	Creates double precision product of vector V and array A in array U.
MVEC(U,A,V)	Creates product of vector V and array A in array U.
NRAND(NX)	Creates positive integer between 0 and
ORD1(A,I1,I2,N)	Sorts the characters in array A(I1) through A(I2).
SQMTX(SQ,AM)	Expands the matrix AM from triangular form and makes an MQ*MQ square symmetric matrix in SQ(MQ,MQ) TR(AM,AMET) calculates the trace of matrix AM relative to the metric AMET.
TRIDMX(N,NM,A,D,B)	Tridiagonalizes a real symmetric matrix.

D.1 MATHEMATICAL SUBROUTINES (CONT.)

Subroutine Name and Calling Sequence	Description
TRIMTX(TRI,SQ)	Takes the lower triangle of SQ(MQ,MQ) and puts it into symmetrix matrix form in TRI.
VMTV(VA,AMET,VB)	Calculates array VA equal to matrix AMET times array VB..matrix A is stored in lower triangular form.
VPV(VA,FAC,VB)	Calculates array VA equal to the sum of array VA and the product of array VB and constant FAC.

D.2 MATHEMATICAL FUNCTIONS

Function Name and Calling Sequence	Description
APRIOR	Forms sum of BIAS and product of VFAC*AMQ.
DAMSQ*8(AM,AMET)	Calculates the trace of the square of the matrix AM, relative to the metric AMET.
DISC(N)	Calculates an integer between 0 and N.
UNIF(W)	Calculates a floating point number between 0 and W.

D.3 EOD LARSYS ROUTINES

Subroutine Name and Calling Arguments	Description
BNI4AI(IFLD,INCHR,IBN)	Converts the internal binary number IBN to the first INCHR characters of the array IFLD.
FDLINT(FIELD,NPTS,FL,YLINE,NSAMP,JJ)	Returns the number of samples, NSAMP, contained in the field of the given scan line YLINE. Array FL of length JJ contains the ordered pixel intercepts. Array FIELD contains the field table entered by the user; NPTS is the number of points in this field table.
FLDINT(FLDINF,FETVEC,NOFEAT)	Unpacks the pixel from the data header according to the rectangular field description in FLDINE using the channel array FETVEC for NOFEAT channels. Data stored in LARSYS common block /TAPERD/.
FSFMFL(UNIT,FILE,ISAT)	Positions file on unit UNIT at file FILE. Returns status in ISTAT.
LAREAD(FLDNAM,VERTCS,FLDINF,NC)	Reads NC field definition card images to determine the field name FLDNAM, the array field vertices VERTCS, and the array of field information FLDINF.
LINERD(IDATA,ENDTAP)	Unpacks information from the data tape into array IDATA.
NUMBER(CARD,COL,NUMVEC,NOW)	The numbers in array CARD starting at column COL are stored in array NUMVEC. The routine is terminated by the first non-blank, non-numeric, non-comma character.
NXTCHR(CARD,COL)	The next non-blank character in card CARD beginning at column COL is returned as a function. Pointer COL is updated to point to the character following the returned character.

D.3 EOD LARSYS ROUTINES (CONT.)

Subroutine Name and Calling Arguments	Description
RWRITE(BEGADD,WHERE,TOTWDS,STATUS)	Simulates the random read of a work file. BEGADD is the address in the file; data is read into array WHERE; user specifies number of words to be read in TOTWDS; and STATUS is a dummy variable.
RWRITE(BEGADD,WHERE,TOTWDS,STATUS)	Simulates the random write of a work file. BEGADD is the address in the file; data is written from array WHERE; user specifies number of words to be written in TOTWDS; and STATUS is a dummy variable.
TAPHDR(DATAPE,IFILE)	Reads the header record of file IFILE from file DATAPE into common block/TAPERD/.
WRTHED(NCHAN,FEAT,NSAMP,FRMAT,IUNIT)	Writes the header record for the data tape IUNIT. The NCHAN channels in array FEAT are written on unit IUNIT. The number of samples per channel is in NSAMP; FRMAT contains the format.
WRTLN(IDATA,LSTLIN)	Writes the data from array IDATA. Status for the last record is in LSTLIN.

D.4 UTILITY ROUTINES

Subroutine or Function Name and Calling Arguments	Description
*LLFREE(KLHED,LEN)	Frees the storage in the LINK array used by cluster KLDHED of length LEN and all of its subclusters.
CMERR	Writes error message and terminates the program.
FREE(LOCATE,LENGTH)	Frees the storage in LINK array with index LOCATE of length LENGTH.
MORSTR(LENGTH	Function that gets the index for a block of storage in LINK array and makes that storage unavailable.