ATSUKO COMPUTING
INTERNATIONAL

ACI-072087-FR

NEW SPACE SENSOR AND MESOSCALE DATA ANALYSIS

FINAL REPORT

Prepared For:

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

Attention:

AP29-F

Under Contract:

NAS8-36181

Prepared By:

John S. Hickey
President, ACI

Date:

July 20, 1987

PREFACE

This is the Final Report prepared by Atsuko Computing International (ACI), under Contract NAS8-36181, entitled "New Space Sensor and Meso-scale Data Analysis", for the Earth Science & Applications Divison of the Structures and Dynamics Laboratory at the Marshall Space Flight Center. The technical monitor for this contract is Mr. Claude Green.

Prepared by:

John S. Hickey, President
Atsuko Computing International

7-20-87
Date

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1.0 INTRODUCTION

Atsuko Computing International (ACI), is very pleased to submit this Final Report under Contract NAS8-36181, entitled "New Space Sensor and Mesoscale Data Analysis, to the Earth Science & Applications Division (ESAD) of the Structures and Dynamics Laboratory at the Marshall Space Flight Center.

The ESAD is currently involved in the interactive information processing for the Mesoscale Analysis and Space Sensor (MASS) program. Specifically, the ESAD is concerned with the development and implementation of new space-borne remote sensing technology to observe and measure atmospheric processes. These space measurements and conventional observational data are being processed together to gain an improved understanding of the mesoscale structure and dynamical evolution of the atmosphere relative to cloud development and precipitaton processes.

To satisfy the ESAD's vast data processing requirements, a Research Computer System consisting of three primary computers was developed (HP-1000, Harris/6, and Perkin-Elmer 3250) which provides over thirty scientists with a wide range of capabilities for processing and displaying interactively large volumes of remote sensing data. This Research Computer System has now been expanded to include access to a Class 6 super computer via a Local Area Network utilizing Apple III and IBM PC workstations.

ACI personnel have been directly involved in the design, development, and integration of both the software and hardware for the ESAD's Research Computer System. ACI's major effort has been to develop a graphics data analysis system and data base management on the HP-1000 computer and then to extend these capabilities by integration with the other computers using the ESAD's Apple III and IBM PC microcomputer workstations.

The following sequence of tasks have been completed by ACI under this contract (in accordance with Option B-2, Statement of Work dated March 4, 1986) too accomplish the required objectives:

- o - Updated and implemented the required software to modify the existing data base archiving utilities on the ESAD's HP-1000 computer system to provide for additional data type/format archiving and to accommodate larger files on the HP-7933 (400 mb) disc as the data sets were identified and available.

- o - Established the requirements and put into effect the necessary modifications and improvements to the existing Apple III copy and image storage capabilities to incorporate the 5mb file storage devices into the Apple III workstations and enhanced the animation and graphics capabilities to utilize the storage devices.

- o - Extended the Apple III workstation capabilities to include graphics and imaging capabilities in connection with the ESAD's Harris/6 and Perkin-Elmer 3250 computer systems.

- o - Determined the requirements necessary to convert the AVE80 Series HP-1000 programs from Graphics 1000 to Graphics II and developed a Graphics II to Apple III graphics translator library for the AVE80 Series Apple III programs.

- o - Implemented a standardized data file naming convention and formatting structure on the Harris/6 and Perkin-Elmer computers.

- o - Determined the interface requirements and provided the capabilities necessary to establish future required access to the MSFC Class 6 computer network for the ESAD computer system incorporating the "patch panel" communication system developed by ACI.

- o - Continued to update/enhance the 3-D graphics capabilities using the Advanced Graphics Package software for the AVE80 Series programs and implemented on the ESAD's HP-1000 and Apple III computers.

- o - Restructured the existing HP-1000F data base management system and naming convention to utilize the RTE-6 Command Interpreter (CI) file system for the disc structure currently being developed.

- o - Developed the capabilities currently existing on the Apple III workstations for the IBM PC's, so that the IBM PC's can be used in the same capacity as the Apple III's.

- o - Provided system software updates and applications software computer code improvements for the ESAD computer system as required.

- o - Provided software computer code updates and user guidance as to the operations and capabilities developed.

- o - Provided description and operation procedures for computer code developed under this contract (Reference AVE Series Programs User's Reference Manuals Volume I, II, and III dated June 15, 1987).

1.1 OVERVIEW

The remainder of this report documents and summarizes the results of the entire contract work effort, including recommendations and conclusions based on experience and results obtained. In the Appendix of this report, a description of the AVE80 Series Programs along with several ouput examples are provided. A detailed description of the AVE80 Programs, and all computer codes developed under this contract are documented in the "AVE80 Series Programs User's Reference Manual" Volume I, II, and III dated June 15, 1987.

2.0 OVERALL RESULTS

During this research study entitled "New Space Sensor for Mesoscale Data Analysis", ACI has performed all tasks as defined within the contract and details the results of each task in the following subsections.

2.1 DATA BASE ARCHIVING FOR HP-1000 COMPUTER SYSTEM

ACI has been responsible for the development of various software utilities which provide for the archiving of numerous large data sets that have been stored in different formats and file types. ACI has updated these archiving utilities as was required to satisfy the data base archiving needs. The current utility that is being utilized, which seems to best meet all the requirements for archiving all types and sizes of data sets is the "TF" utility program which archives data sets on an individual basis or a disc logical unit basis. Currently, all HP-1000 data sets are being archived on a bi-weekly period, using the HP-1000 1600 bpi magnetic tape drive and seven 9-track tapes to perform a total back-up of all active files.

2.2 5MB DISC STORAGE DEVICE TO ENHANCE APPLE III WORKSTATIONS

ACI established that it was necessary to incorporate to the APPLE III workstations a 5mb storage device to improve the existing imaging and hard copying capability. With the addition of the 5mb storage devices, ACI was able to improve the graphics capabilites and enhance animation and image storage capabilities.

2.3 EXTEND APPLE III WORKSTATION CAPABILTIES WITH HARRIS/6 AND PERKIN-ELMER

ACI designed and developed a "patch panel" for integrating the Apple III workstations with the HP-1000, Harris/6, and Perkin-Elmer 3250 computers. This extended the user's graphics and imaging capabilities via the communication link between the Apple III workstation and the other computers. ACI later provided this same capability by communicating through the Local Area Network which links the Apple III workstations through the BIU's.

2.4 HP-1000 AVE80 PROGRAM GRAPHICS TRANSLATOR TO APPLE III GRAPHICS

ACI developed the AVE80 Series Programs which operate on the HP-1000 computer system utilizing the HP-1000 graphics plotting package. It was required to make the same AVE80 plotting capabilites on the Apple III workstations. ACI thus developed a graphics translator library which allows the AVE80 programs to execute on the APPLE III's and generate the same graphics ouputs. A complete description of the AVE80 programs and the APPLE III graphics library translator is provided in the "AVE80 Series Program User's Reference Manual" Volume I, II, and III dated June 15, 1987.

2.5 STANDARDIZED FILE STRUCTURE AND NAMING CONVENTION

ACI has developed a data base management package to convert various data types into a standard format for storing "random access" data sets on the HP-1000, thus making them readily available to various general purpose plotting and analysis software packages. All data sets have been converted into a predefined format based upon data type and named according to "six character" naming convention. The data is then stored according to it's data type to a specially dedicated area on disc. This file structure and naming convention has proven successfull on the HP-1000 computer system and has been documented (AVE80 Series Program User's Reference Manual). The same naming convention and data structure has been made available for the Harris/6 and Perkin-Elmer 3250 computer systems.

2.6 INTERFACE ESAD'S COMPUTER SYSTEM WITH MSFC'S CLASS 6 COMPUTER

ACI determined the interface requirements for linking the ESAD's computer system with the MSFC's Class 6 computer via the ACI developed "patch panel" and the Local Area Network. Once the MFSC's Class 6 computer became available ACI successfully implemented and tested the computer-to-computer communications bewteen the ESAD's computers and workstations and the Class 6 computer network via the "patch panel" and Local Area Network.

2.7 ENHANCE AVE80 PROGRAM GRAPHICS CAPABILITES

ACI continued to improve the overall graphics capabilites of the AVE80 Series Programs. Both the HP-1000 and the APPLE III AVE80 program graphics were updated and enhanced to provide for faster execution and additional capabilities. Again refer to the "AVE80 Series Program User's Reference Maunal" for a complete detail of the graphics capabilites.

2.8 RTE-6 COMMAND INTERPRETER FOR HP-1000 COMPUTER

Due to the vast amount of data residing on the HP-1000 computer system, it has been necessary to restructure the existing data base management system and naming convention to utilize the HP-1000 RTE-6 Command Interpreter (CI) file system. Under the old "file manager" system, the user was limited to six character file names (16 characters with CI), and could only assign the data files to a specific disc logical unit (CI allows for directories and subdirectories within a logical unit). Currently, only the HP-7933 (400mb) disc has been restructured to utilize the CI file system, while the other discs still remain under the "file manager" format.

2.9 PROVIDE APPLE III CAPABILITIES ON THE IBM PC WORKSTATIONS

ACI developed the APPLE III workstation to provide for numerous capabilities by the user to communicate to the ESAD's computer system (HP-1000, Harris/6, and Perkin-Elmer 3250), and to the MSFC's Class 6 computer via the Local Area Network. After the ESAD acquired several IBM PC's, ACI installed the IBM's and installed or developed software to provide basically the same capabilities that were provided by the APPLE III workstations. The IBM PC workstations can be utilized as stand-alone or as graphics terminals linked to the ESAD computers or the Class 6 computer via the Local Area Network. The IBM's also have Laserjet printing capabilities which provides for enhanced graphics and imaging.

A graphics software package "Reflection 3" was installed on the IBM's by ACI to emulate the HP-1000 graphics package. This allows all the existing HP-1000 grpahics programs including the AVE80 programs to execute on the IBM PC workstations without modifications.

2.10 UPDATE HP-1000 SYSTEM SOFTWARE

ACI has provided system software enhancements and modifications for the HP-1000 computer system as HP updates were made available. In addition, all Operating System and System Generations were performed as the conditions dictated.

2.11 PROVIDE USER UPDATE ASSISTANCE AND GUIDANCE

ACI has assisted the ESAD Scientists in providing software and User guidance as to the operations and capabilities developed by ACI on the ESAD's computers and workstations.

2.12 PROVIDE SUMMARY REPORTS

ACI has provided Monthly summary reports describing the computer codes developed and system improvements/capabilities for the ESAD computer system. In addition ACI has written a three Volume document that details most of the codes developed and implemented by ACI (Reference "AVE80 Series Program User's Reference Manual" dated June 15, 1987).

In summary, the ESAD's system/software developed by ACI provides the research scientist with the following capabilities:

- o - An extensive data base management capability to convert various experiment data types into a standard format for accessing by the general purpose plotting and data analysis packages.

- o - An interactive analysis and display package (AVE80) to graphic-ially display and analyze large volumes of conventional and satel-lite derived meteorological data.

- o - An interactive imaging/color graphics capability utilizing the APPLE III and IBM PC worksations integrated into the ESAD computer system and MSFC's Class 6 computer via the Local Area Network.

- o - Local and remote smart-terminal capability which provides color video, graphics, and Laserjet output.

To meet the growing requirements of the ESAD's computer system and the scientists utilizing the system, ACI believes that the ESAD computer system must continue to be enhanced and updated. ACI recommends the following tasks should be performed to keep the ESAD computer system up to date:

A) Applications Software

- o -- Finalize the existing HP-1000 AVE80 Series Programs as Operational Version 1.0.

- o -- Finalize the existing HP-1000 AVE80 Series Programs User's Manual as Operational Version 1.0.

- o -- Create a developmental version of the HP-1000 AVE80 Series Programs and continue to update and implement the required software changes to provide for processing additional data types and formats, and for providing enhanced graphics capabilities.

- o -- Finalize the developemental HP-1000 AVE80 Series Programs at the end of the Contract Continutation as Operational Version 2.0.

- o -- Update the HP-1000 AVE80 Series Program User's Manual Version 1.0 and Finalize as Operational Version 2.0.

- o -- Study the feasibiliy to transfer the HP-1000 AVE80 Series Programs to EADS or in-house VAX computer system.

B) Data Base Management

- o -- Complete the restructuring of the HP-1000 Disc Lu's, including the reformatting of all HP disc drives to be under the RTE-6 Command Interpreter (CI Volume) file system for all program and data files.

B) Data Base Management

- o -- Complete the restructuring of the HP-1000 Disc Lu's, including the reformatting of all HP disc drives to be under the RTE-6 Command Interpreter (CI Volume) file system for all program and data files.

- o -- Perform feasibility study of utilizing the HP-1000 Image 1000 data base management software package for enhancing the capabilities of handling various data types/formats and to accommodate larger data files on the HP-7933 CI Volume as the data sets are generated.

- o -- Continue to update and implement the required software to provide for data transfer between the HP-1000 and IBM PC's utilizing the XMODEM 1000 and REFLECTION 3 software packages.

- o -- Develop utility software to transfer the AVE80 Series Program data base (Soundings, Single Level, Grids, Images) to the McIDAS MD FILE on EADS or VAX computer.

- o -- Develop interactive uitility software to allow User to reformat a data set into a standard and acceptable format that is directly useable by the Operational AVE80 Series Programs.

- o -- Continue to survey the CS/1000 HP "user programs" for utilities that provide helpful tools in data base management, file manipulation, file archiving and format conversions.

C) System Operations

- o -- Continue to perform HP-1000 System generations as needed to incorporate the latest software revisions and system requirements.

- o -- Continue to update/support the ACI developed "Patch Panel" communication system to provide acess to the ESAD computer network.

- o -- Continue to provide modifications and improvements to the IBM PC workstations with respect to graphics, data storage, data transfer, and hardcopy capabilities.

- o -- Continue to provide support for the BIU data communications capabilities as required between the Workstations and the Host computers.

- o -- Continue to support the EADS computer system via the Local Area Network utilizing the IBM PC workstations.

- o -- Continue to perform Bi-monthly HP-1000 Computer System disc file "backup" for all on-line active data and program files utilizing the "TF" utility and stored on 1600 bpi magnetic tape.

D) ESAD User Assistance

- o -- Provide software updates and user guidance as to the operations and capabilities developed by ACI for the ESAD scientists.
- o -- Provide assistance to ESAD users for learning the operations and capabilities of the AVE80 Series Programs.
- o -- Provide assistance to ESAD users for developing "utility" software that is tailored for ones individual requirements.

E) Documentation

- o -- Provide Monthly Reports describing all work accomplished during the reporting period, including any problems encountered as well as an updated milestone chart to show current status of all tasks.
- o -- Provide documentation for all "utility" software developed and User's Manuals for all "applications" software developed or updated under this Contract.
- o -- Provide a Final Report which provides a summary description of all the tasks performs as well as computer codes developed and modified under this Contract.

APPENDIX A

This Appendix contains a portion of the "AVE80 Series Programs User's Reference Manual, Volume I, dated June 15, 1987. A subset of the first four sections is provided to give an overview of the AVE80 programs developed by ACI and the capabilities that exist. The completed AVE80 User's Manual contains over 1200 pages and contains the source listings of all the AVE80 programs and graphics libraries that were developed by ACI, along with complete data file formats and other utilities required to generate and maintain the various data sets.

ATSUKO COMPUTING
INTERNATIONAL

ACI-870615-R1

June 15, 1987

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

Attention: AP29-F

Subject: Reference Manual prepared for Contract NAS8-36181

Dear Sir:

Atsuko Computing International (ACI) is pleased to submit the enclosed Reference Manual prepared under Contract NAS8-36181 and entitled "AVE80 Series Programs User's Reference Manual."

The enclosed Reference Manual is divided into two (2) volumes, with Volume I describing the overall AVE80 Series Programs capabilities and User interactive operations. Volume II is actually an Appendix with contains the actual source code listings of the AVE80 Series Programs along with the various command files and data files required to operate and maintain the entire package.

If you have any questions concerning this Reference Manual, please contact me at (205) 881-5608 (ACI's Office) or (205) 544-1667 (NASA Work Area).

Sincerely,

ATSUKO COMPUTING INTERNATIONAL

John S. Hickey
President, ACI

jsh/jh

Enclosures: Reference Manual -- Volume I and Volume II

Copies of Enclosure:

AS24-D	(0) + Letter
AT01	(0) + Letter
EM13A-15	(0) + Letter
CC01/Wofford	(0) + Letter
ED44/Claude Green	(1) + Repro Copy
NASA Scientific & Technical Information Facility	(0) + Letter

ATSUKO COMPUTING
INTERNATIONAL

ACI-061587-R1

AVE80 SERIES PROGRAMS

USER'S REFERENCE MANUAL -- VOLUME I

Prepared For:

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

Attention:

AP29-F

Under Contract:

NAS8-36181

Prepared By:

John S. Hickey
President, ACI

Date:

June 15, 1987

PREFACE

This is a Reference Manual entitled "AVE80 Series Programs User's Reference Manual", prepared by Atsuko Computing International (ACI), under Contract NAS8-36181, for the Atmospheric Sciences Division of the Marshall Space Flight Center.

This manual provides the User with a complete description of the AVE80 Series Programs which includes the various graphical outputs generated, the different data types processed, the data file structures and formats, and a step-by-step detailed example of the interactive User operations for executing any of the AVE80 programs.

It is the intent of this document to be the primary reference source for all User's who will be utilizing the interactive AVE80 Series Program via the HP-1000, IBM PC's, and APPLE III computer workstations.

The NASA technical monitor for this Contract is Mr. Claude Green/ED44.

Prepared by:

John S. Hickey, President
Atsuko Computing International

6-15-87
Date

ABSTRACT

This Reference Manual describes the AVE80 Series Programs developed by Atsuko Computing International (ACI), for the Atmospheric Sciences Division at NASA's Marshall Space Flight Center.

The AVE80 Series Programs is an interactive analysis and display software package developed on the ASD's HP-1000 computer system and is written in FORTRAN and utilizes the HP Graphics 1000 plotting library. ACI also made the AVE80 Series Programs operational on the IBM PC's and APPLE III computer workstations via the HP-1000 as host computer.

The AVE80 Series Programs has been successfully implemented and utilizied daily by the atmospheric scientists to graphically display and analyze large volumes of conventional and satellite derived meteorological data. Multiple User's can process simultaneously and interactively various selected data (Soundings, Single Level, Grid, Image) by using the AVE80 Task Scheduler which links numerous software programs allowing each User to share common data and generate both printed and graphical outputs as desired.

Volume I describes the overall AVE80 Series Programs capabilities and User interactive operations. Volume II is actually an Appendix which contains the source code listings of the AVE80 Series Programs along with the various command files and data files required to operate and maintain the entire package.

The Atmospheric Sciences Division at Marshall Space Flight Center has a Data Management and Analysis Display System developed on the HP-1000 computer system by Atsuko Computing International (ACI) which has been successfully implemented and utilized daily by atmospheric scientists to graphically display and analyze large volumes of conventional and satellite derived meteorological data. This software developed by ACI has been incorporated into a series of programs called the AVE80 Series Programs. The AVE80 Series Programs consist of four major divisions of programs which process four various types of atmospheric data (Sounding, Single Level, Grid, and Image), as shown in Figure 1-1.

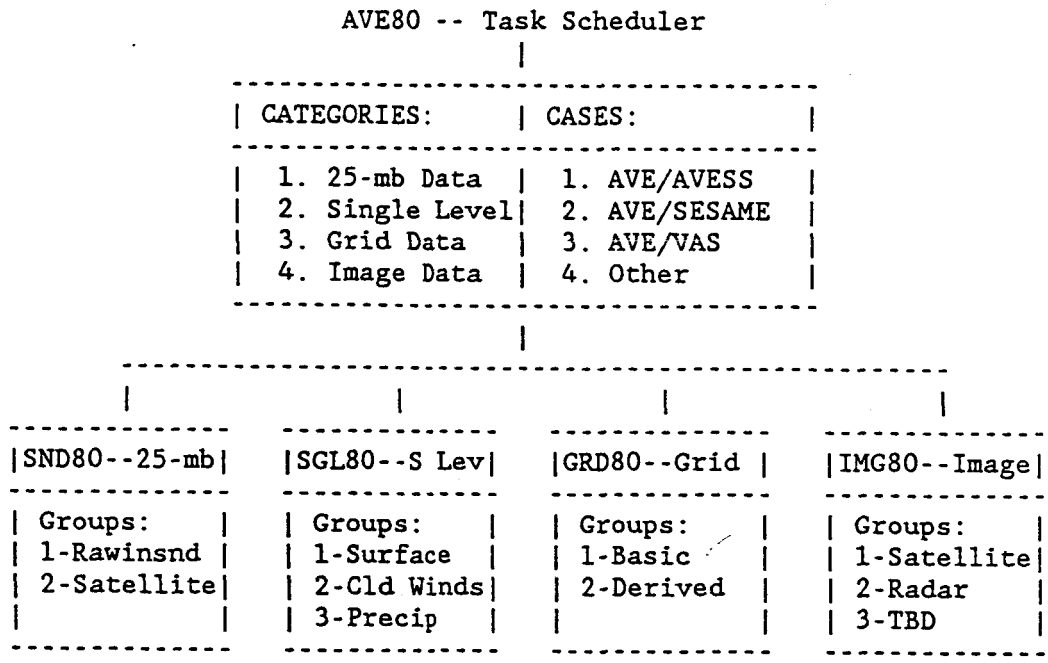


Figure 1-1 AVE80 Task Scheduler

The AVE80 Series Programs link over 30 software programs together allowing each to share common data and User inputs and to process in a multi-user environment simultaneously. The AVE80 programs (see Figure 1-2) allow the user to display atmospheric data in various forms such as station and parameter base map plots, Skew T plots, vertical profile of selected parameters, displayed grids, contoured grids, images, parameter value printouts, and etc. The User selects the desired data parameters such as data type, set, category, group, and data base. Further the User must select output type, output device, time period, pressure level, batch or non-batch mode, station number. latitude, longitude, and several additional options depending on the output desired.

Output devices available to the User include: HP plotters, HP graphics terminals, IBM PC AT/XT graphics terminal, Laserjet printer, Apple III graphics monitors, and Apple Silentype printer, and HP lineprinter/plotter.

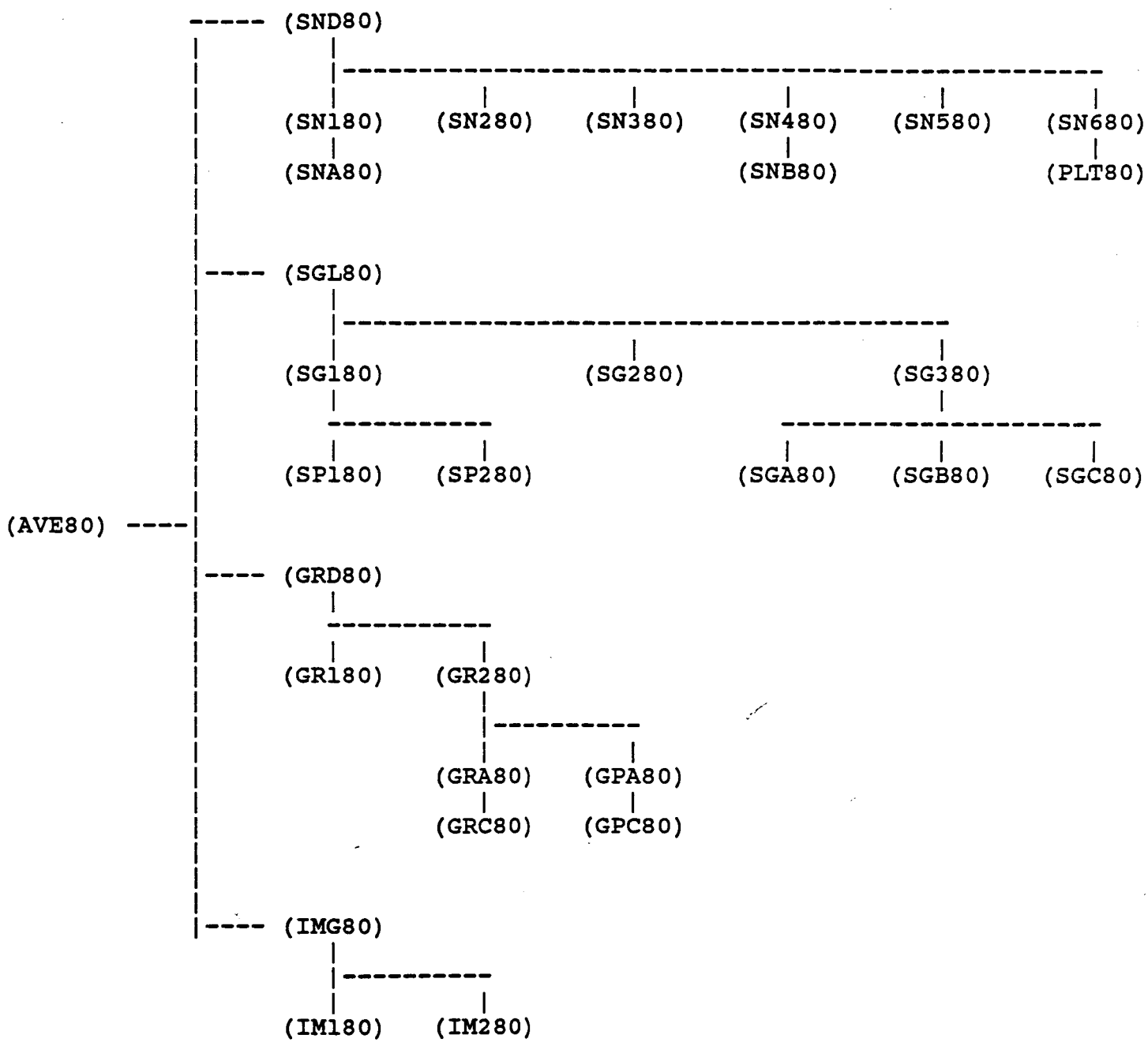


Figure 1-2 AVE80 Program Modules

The HP-1000 data management software converts various meteorological experiment data into a standard format, thus making the data readily accessible to the AVE80 Series Programs. The four specific data types currently processed utilizing the AVE80 programs are listed below:

1) Soundings (Rawinsonde/Satellite)

2) Single Level (Surface, Cloud Winds, LLP, Precipitation, etc.)

3) Grids (from 1 and 2 above)

4) Images (Satellite, Radar)

All data sets are initially converted into a "standard" dormat and a "random access" disk file created and named according to a defined data file naming convention. The data is stored on the HP-7933 400MB disk which has been structured to provide simple file management. Each data set type is assigned to a specific logical unit:

1) Logical Unit#40 -- 200 MB for Image Data

2) Logical Unit#41 -- 100 MB for Grid Data

3) Logical Unit#42 -- 50 MB for Single Level Data

4) Logical Unit#43 -- 50 MB for Sounding Data

The AVE80 Series Programs expect the specific data types to exist on the assigned disk, along with a documentation file which describes the data base (number of times, stations, parameters, etc.) and a latitude/longitude file which provides the information for graphically plotting the station location, thus allowing for faster access while minimizing data housekeeping/archiving functions.

The four data types each have a dedicated "directory file" that contains the file names and parameter information for indexing into the "random access" data base. The number of stations, time periods, and data parameters are all provided in the directory file. The directory contains all data sets currently existing on-line or archived. Only the frequently accessed data files are kept on-line on disk while the others are archived bi-monthly.

In summary the HP-1000 data base management provides numerous utility programs which provide for the following with respect to the AVE80 Series Programs:

-- Convert/create random access data sets

-- Create/update directory files

-- Create documentation files

-- Create latitude/longitude files

-- Archive/restore data sets.

1.1 OVERVIEW

The remainder of this Reference Manual details four major areas with regards to the AVE80 Series Program. The following provides a brief overview of what is contained in each of the following Sections:

Section 2.0 -- AVE80 SERIES PROGRAMS GRAPHICAL OUTPUTS

- o -- AVE80 Graphical Outputs
  - -- Soundings
  - -- Single Level
  - -- Grids
  - -- Images

Section 3.0 -- DATA BASE AND FILE MANAGEMENT

- o -- Data Types and File Naming
- o -- Date Structure and Format
- o -- Data Base Directory Files
- o -- Data Base Documentation Files
- o -- Date Base Latitude/Longitude Files

Section 4.0 -- AVE80 SERIES PROGRAMS OPERATIONS

- o -- AVE80 Interactive Software
- o -- Operational Procedures

Section 5.0 -- UTILITIES AND COMMAND FILES

- o -- Special AVE80 software utility programs
- o -- Special AVE80 libraries
- o -- Special AVE80 compile/link command files

VOLUME II -- AVE80 SERIES PROGRAMS REFERENCE MANUAL

Appendix -- Source Code Listings & Data Files

The AVE80 Series Programs is comprised of over thirty programs linked together by a task scheduler to provide the User with a sophisticated means for processing the four data types and generating various graphical outputs. A detailed functional flowchart (see Figure 2-1) shows the relationship of the different programs with respect to the data types and output types.

The User's interactive inputs are passed from one program to another via a common data file. The four data type may be accessed randomly by multiple User's at the same time. Outputs are then generated based upon User inputs and device/output selection parameters.

In this section examples of various outputs generated by the AVE80 Series Programs are presented. The following graphical outputs are included:

- SND80 Programs (Sounding Data)
  - Skew T Plot
  - Parameter Value Plot
  - Parameter Vector Plot
  - Parameter Profile
  - Print Sounding Data
  - 25-mb Station Base Map Plot
- SGL80 Programs (Single Level Data)
  - Station Base Map Plot
  - Station Parameter Printout
  - Station Parameter Plot
- GRD80 Programs (Grid Data)
  - Printed Grid Data
  - Contoured Grid Data Plot
- IMG80 Programs (Image Data)
  - Display Image Data
  - Print Image Data

In the remainder of this Section each of the AVE80 Series Programs described above are further defined with respect to logical flow, data types, data sets, inputs, and outputs. Actual output samples are provided that were generated on the IBM PC with Laserjet printer.

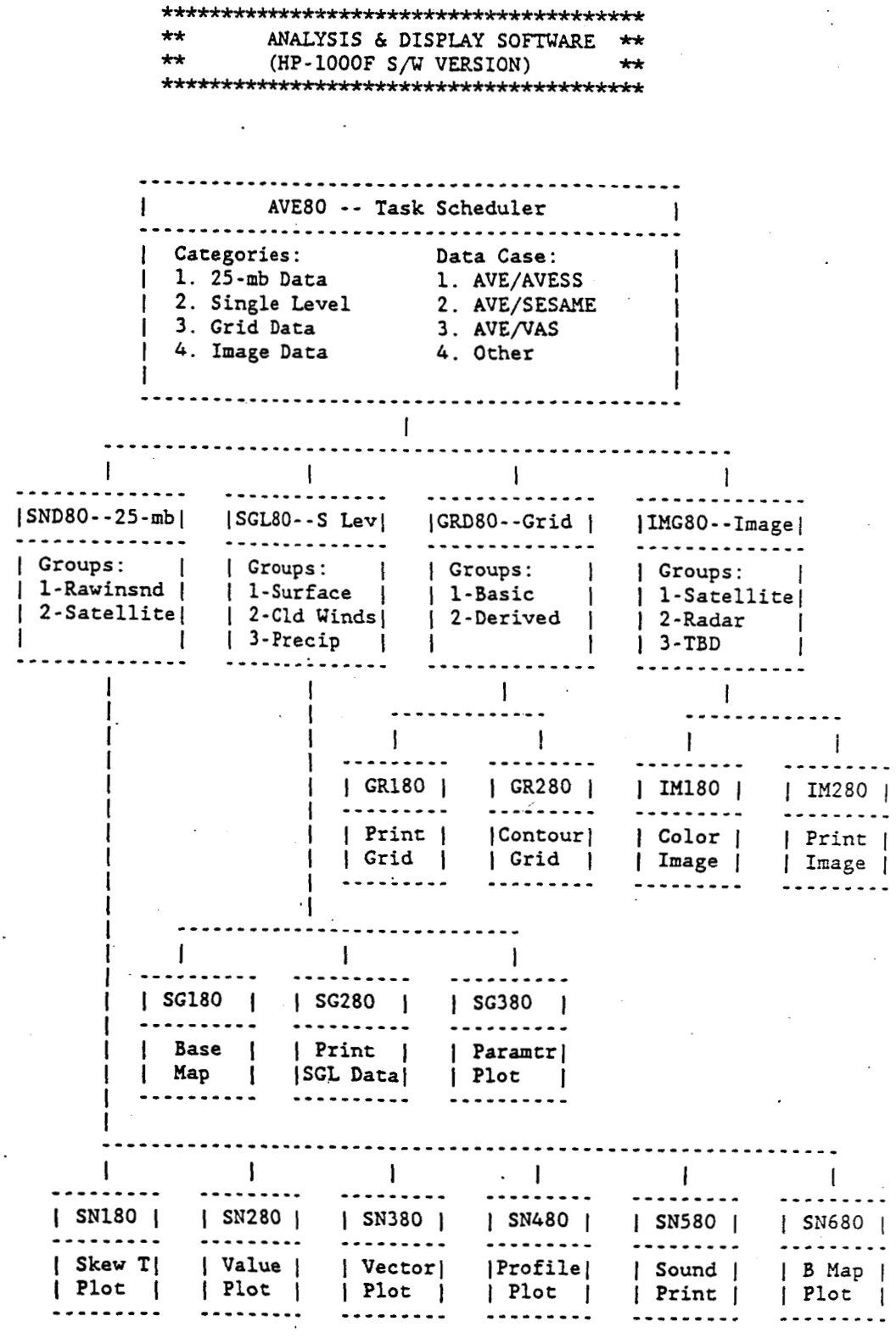


Figure 2-1 — AVE80 Flow Diagram

Below is a Logical Flow Diagram of the "AVE80" Task Scheduler along with the associated input/outputs:

```
      PROGRAM AVE80   ("AVE S/W" TASK SCHEDULER) HP-1000F VERSION
C*****************************************************************
C**                                                             **
C** DESCRIPTION:  Program 'AVE80' schedules the following AVE   **
C**               programs according to the "user selected"     **
C**               "data type" to be processed:                  **
C**                                                             **
C** LOGICAL FLOW:                 ------------                  **
C**                               |  AVE80   |                  **
C**                               ------------                  **
C**                                    |                        **
C**                    ---------------------------------        **
C**                    |          |          |          |       **
C**                  SND80      SGL80      GRD80      IMG80     **
C**                 (25-mb)    (S Lev)    (Grid )    (Image)   **
C**                                                             **
C** DATA Type:    Description                                   **
C**               -------------------------                     **
C**                1.    25-mb Data                             **
C**                2.    Single Level Data                      **
C**                3.    Grid Data                              **
C**                4.    Image Data                             **
C**                                                             **
C** DATA SETS:    Description                                   **
C**               -------------------------                     **
C**                1. AVE/AVESS                                 **
C**                2. AVE/SESAME                                **
C**                3. AVE/VAS                                   **
C**                4. OTHER                                     **
C**                                                             **
C** INPUTS:       Data Type (1-4)                               **
C**               Data Set  (1-4)                               **
C**                                                             **
C** OUTPUTS:      Generated from the Scheduled Programs:        **
C**                 o -- Skew T Profile Plot                    **
C**                 o -- Parameter Value Plot                   **
C**                 o -- Parameter Profile Plot                 **
C**                 o -- Wind Vector Plot                       **
C**                 o -- Wind Profile Plot                      **
C**                 o -- Wind Barb Plot                         **
C**                 o -- Printed Contour Profile                **
C**                 o -- Contour Plot                           **
C**                 o -- Printed Grid Profile                   **
C**                 o -- Color Image Display                    **
C**                 o -- Shaded Printed Image                   **
C**                                                             **
C*****************************************************************
```

In the remainder of this section detailed examples generated by the "SND80", "SGL80","GRD80", and "IMG80" programs are provided.

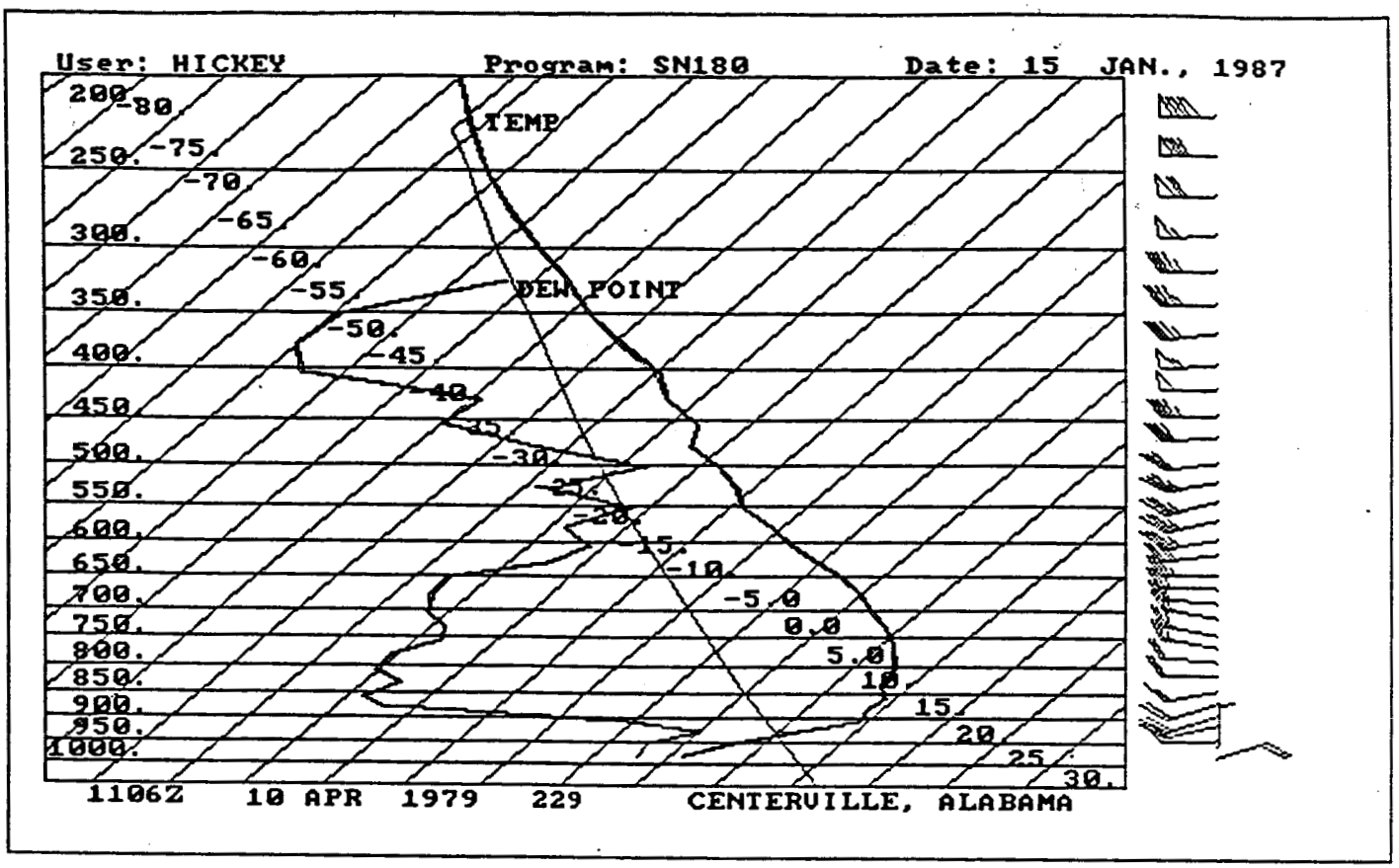


Figure 2-2. Skew T Plot from SN180 Program

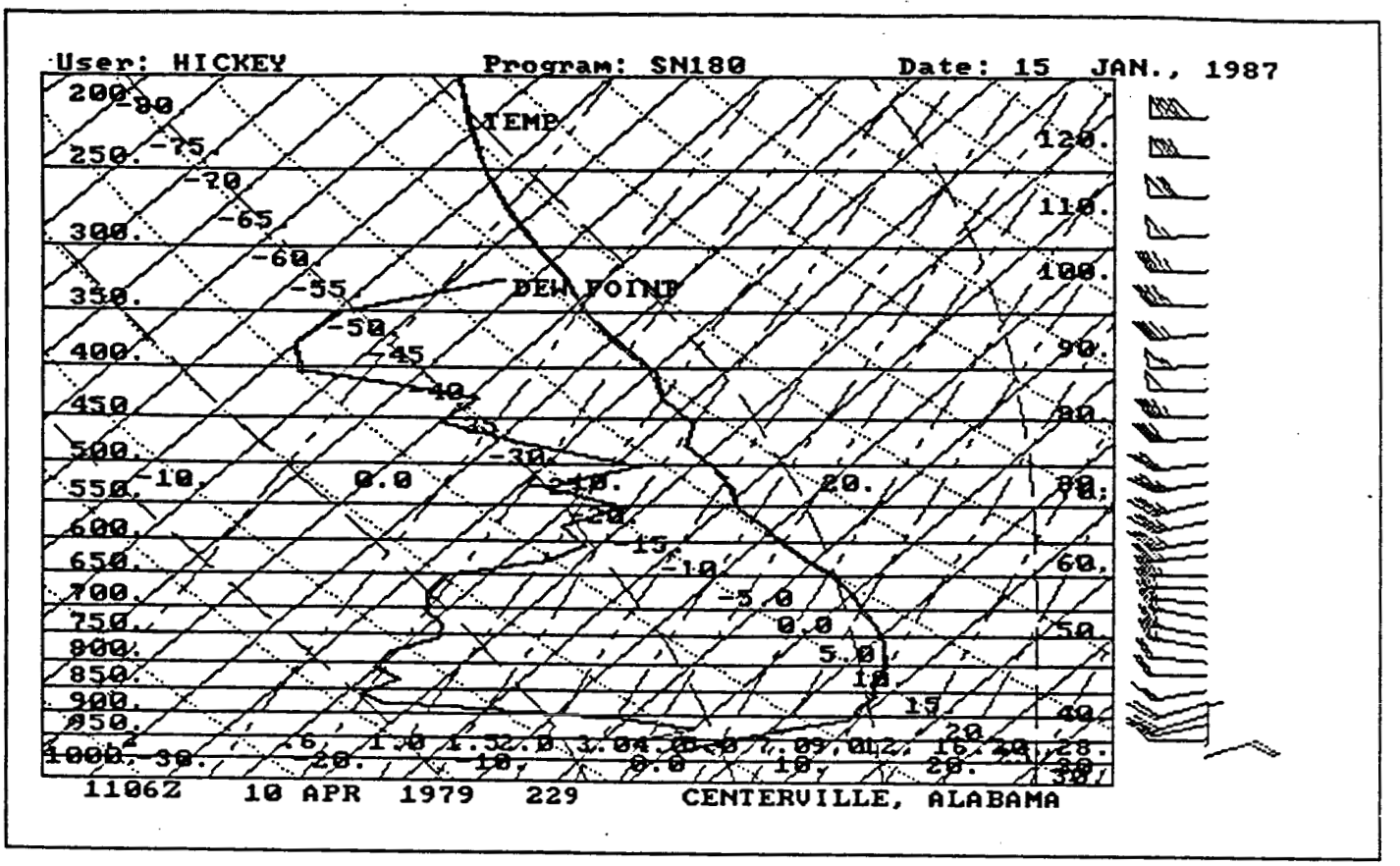


Figure 2-3. Skew T Plot from SN180 Program

ORIGINAL PAGE IS
OF POOR QUALITY

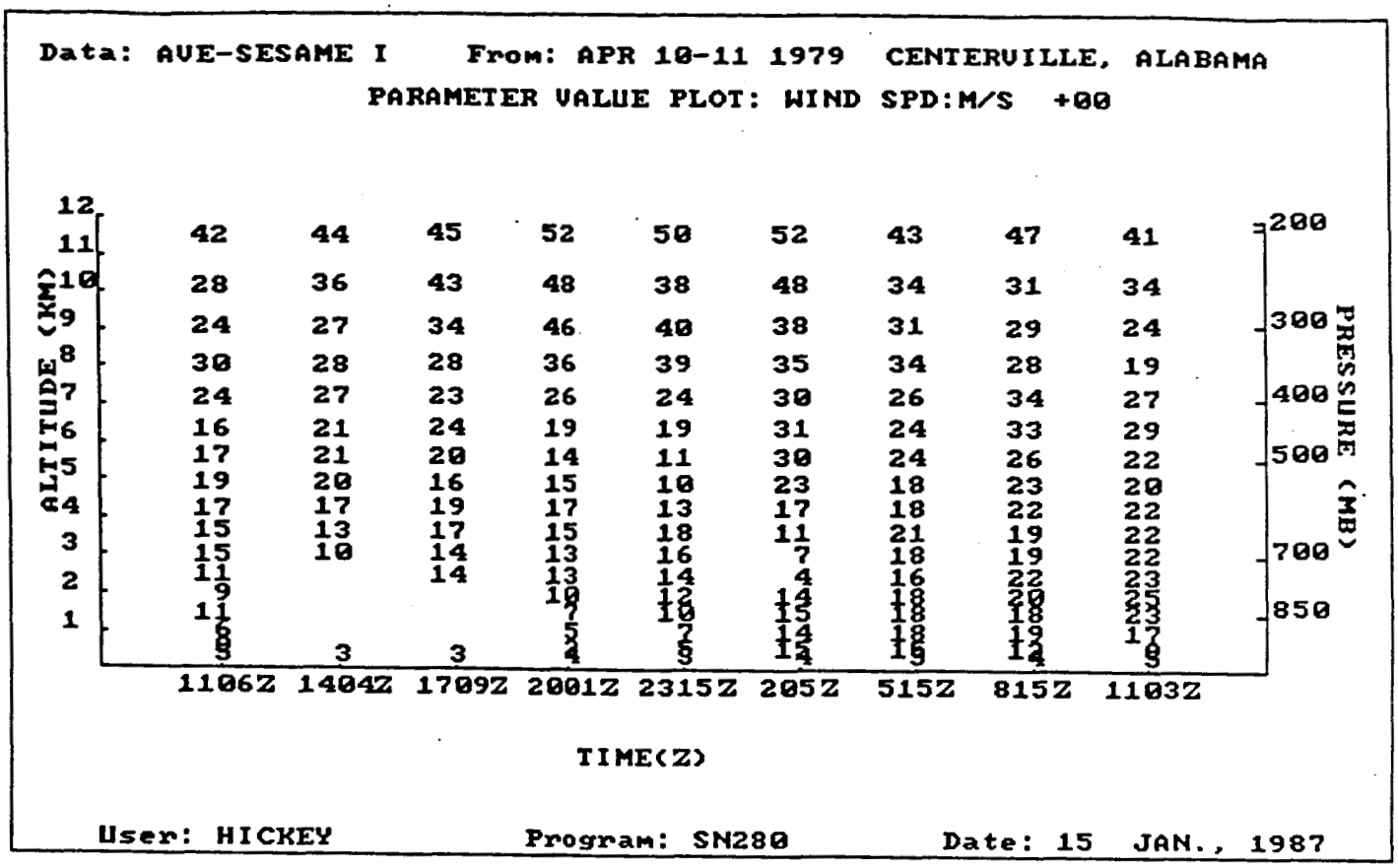


Figure 2-4. Parameter Value Plot from SN280 Program

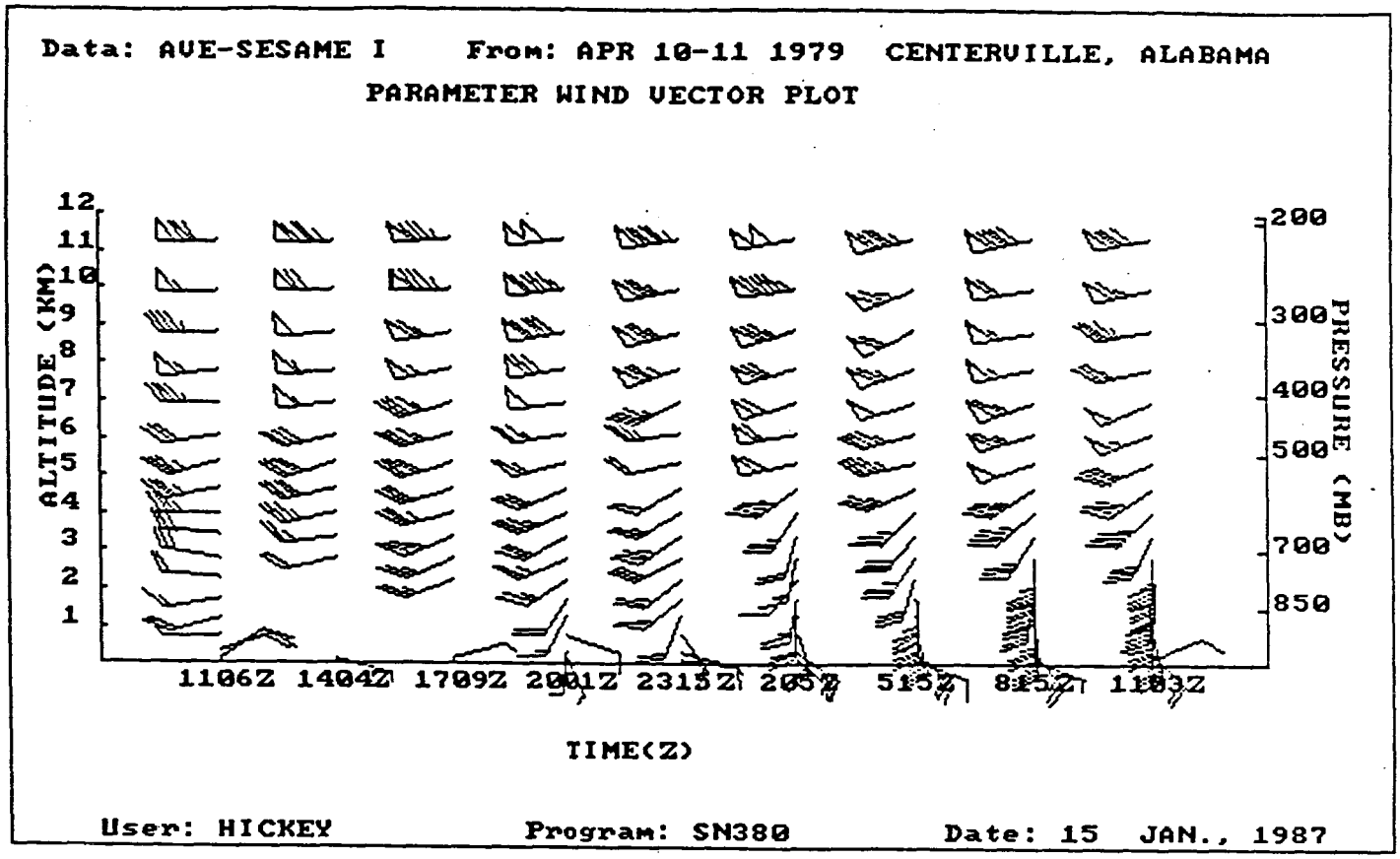


Figure 2-5. Parameter Wind Vector Plot from SN380 Program (Barb)

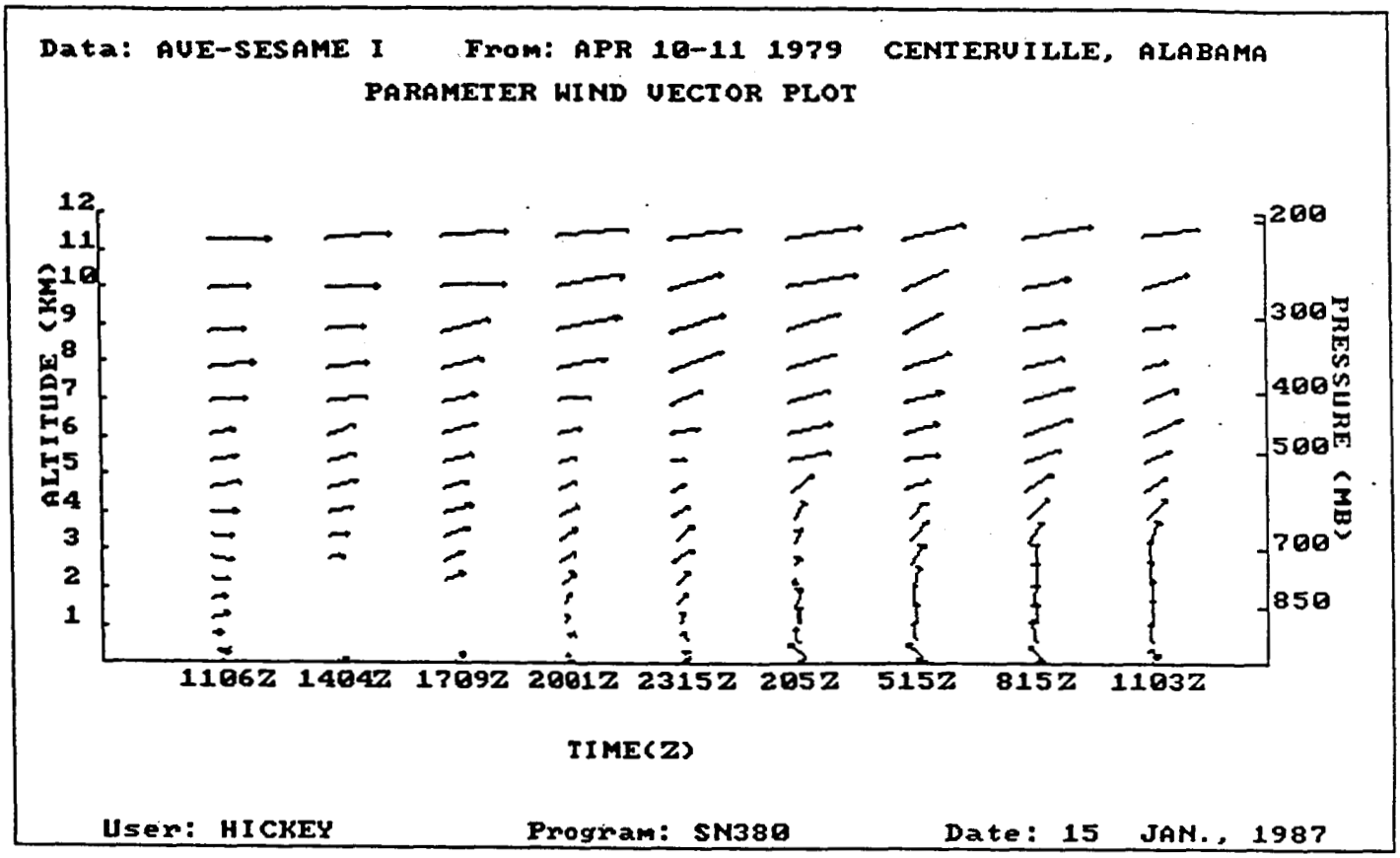


Figure 2-6. Parameter Wind Vector Plot from SN380 Program

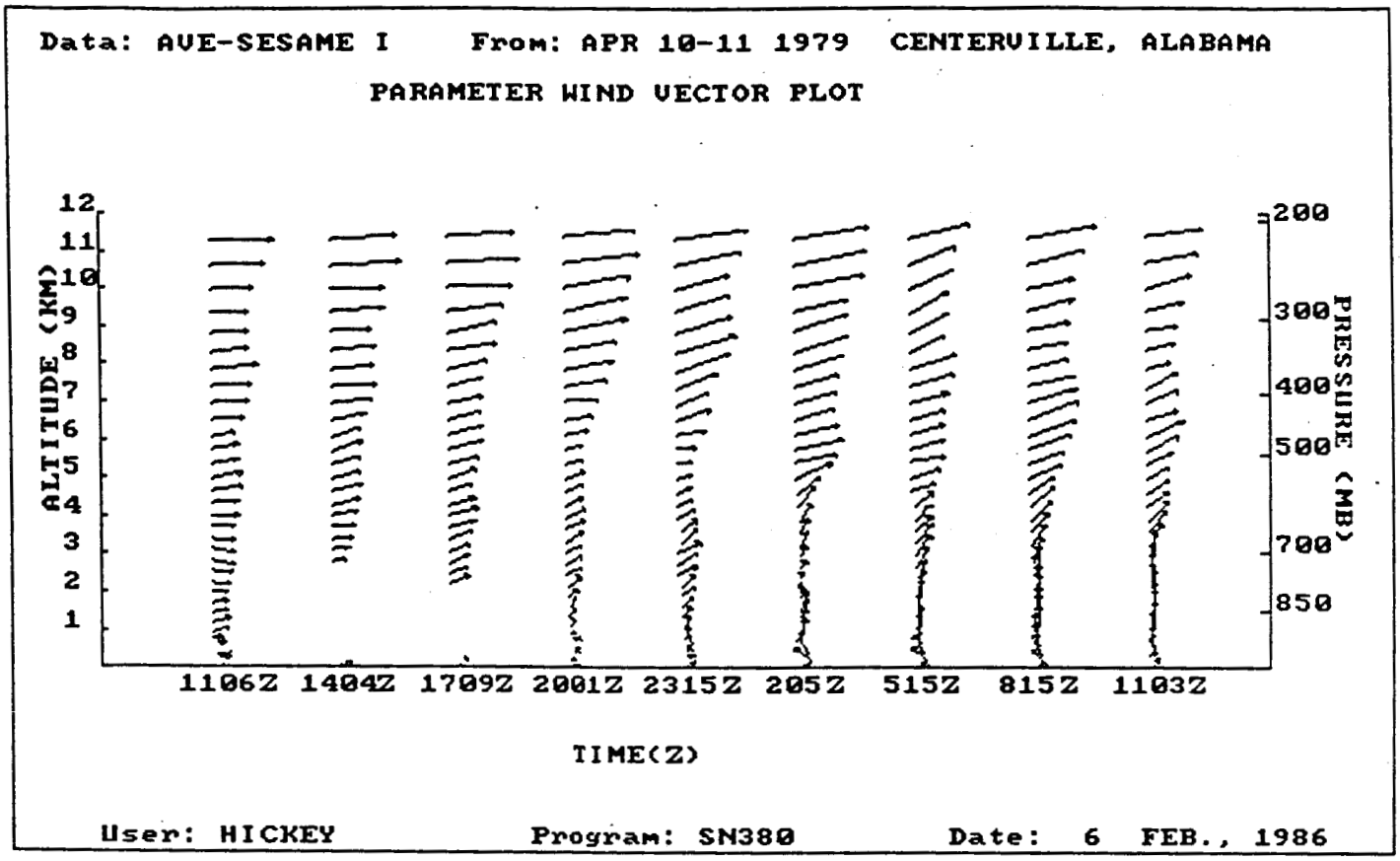


Figure 2-7. Parameter Wind Vector Plot from SN380 Program

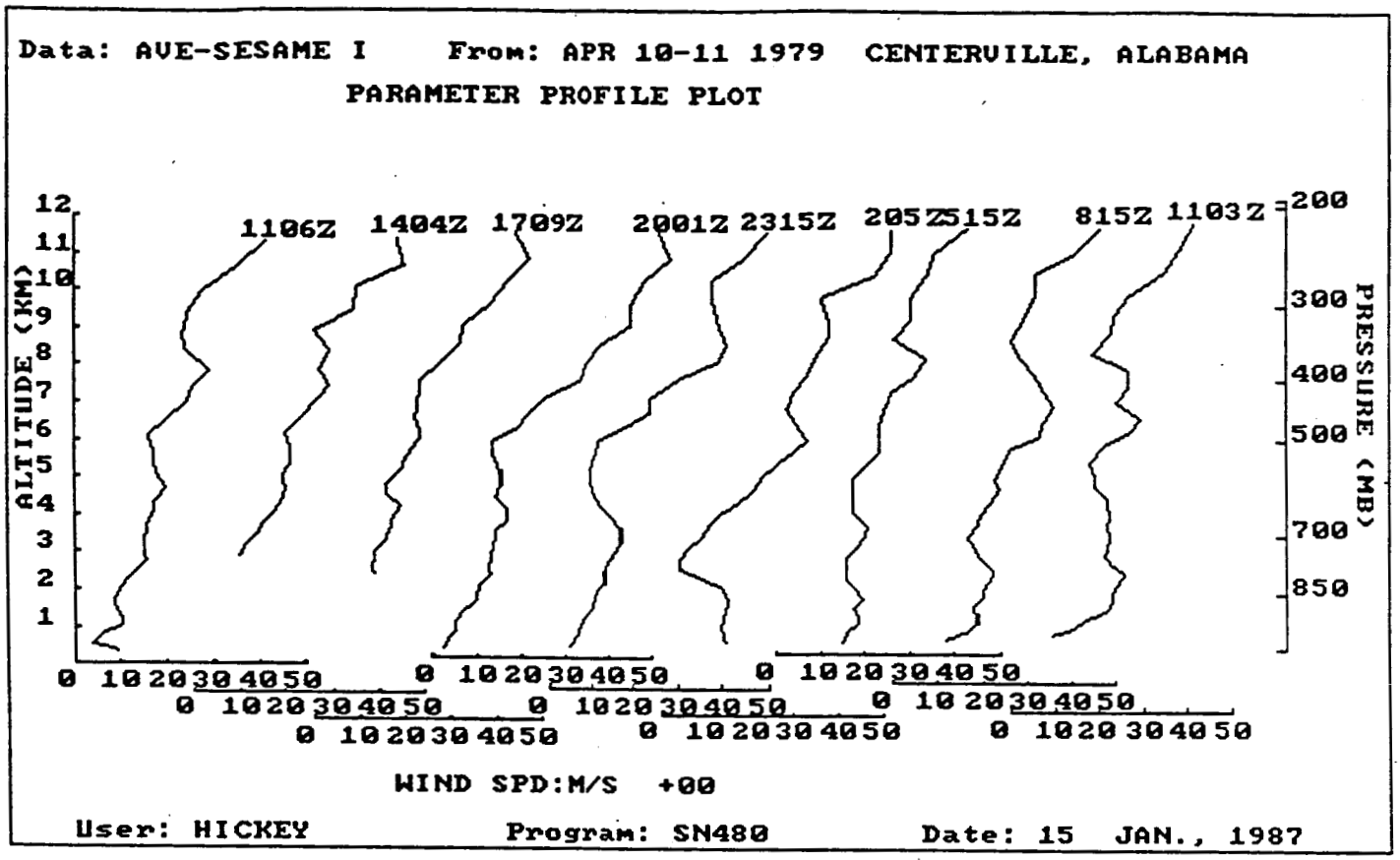


Figure 2-8. Parameter Profile Plot from SN480 Program

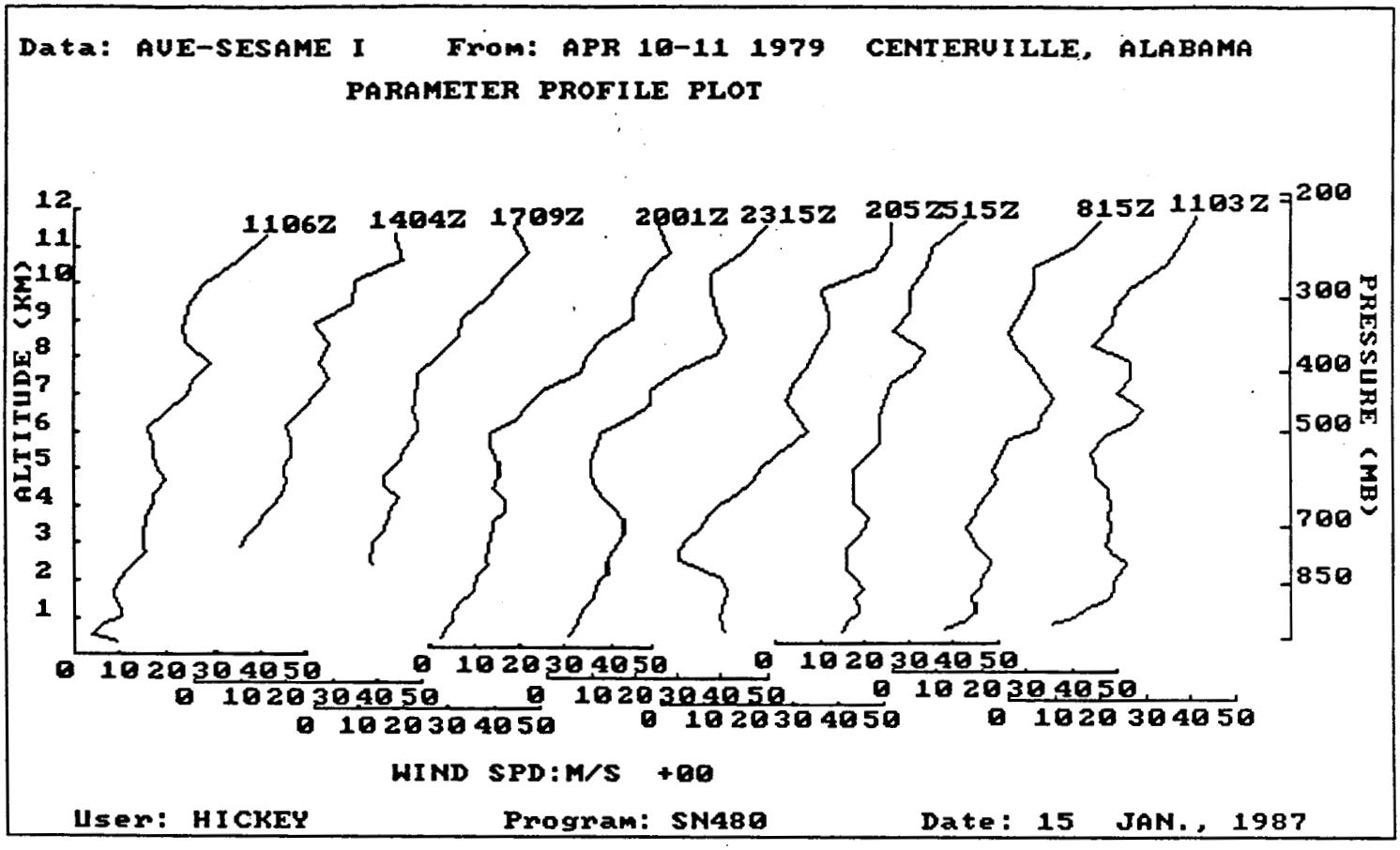


Figure 2-8. Parameter Profile Plot from SN480 Program

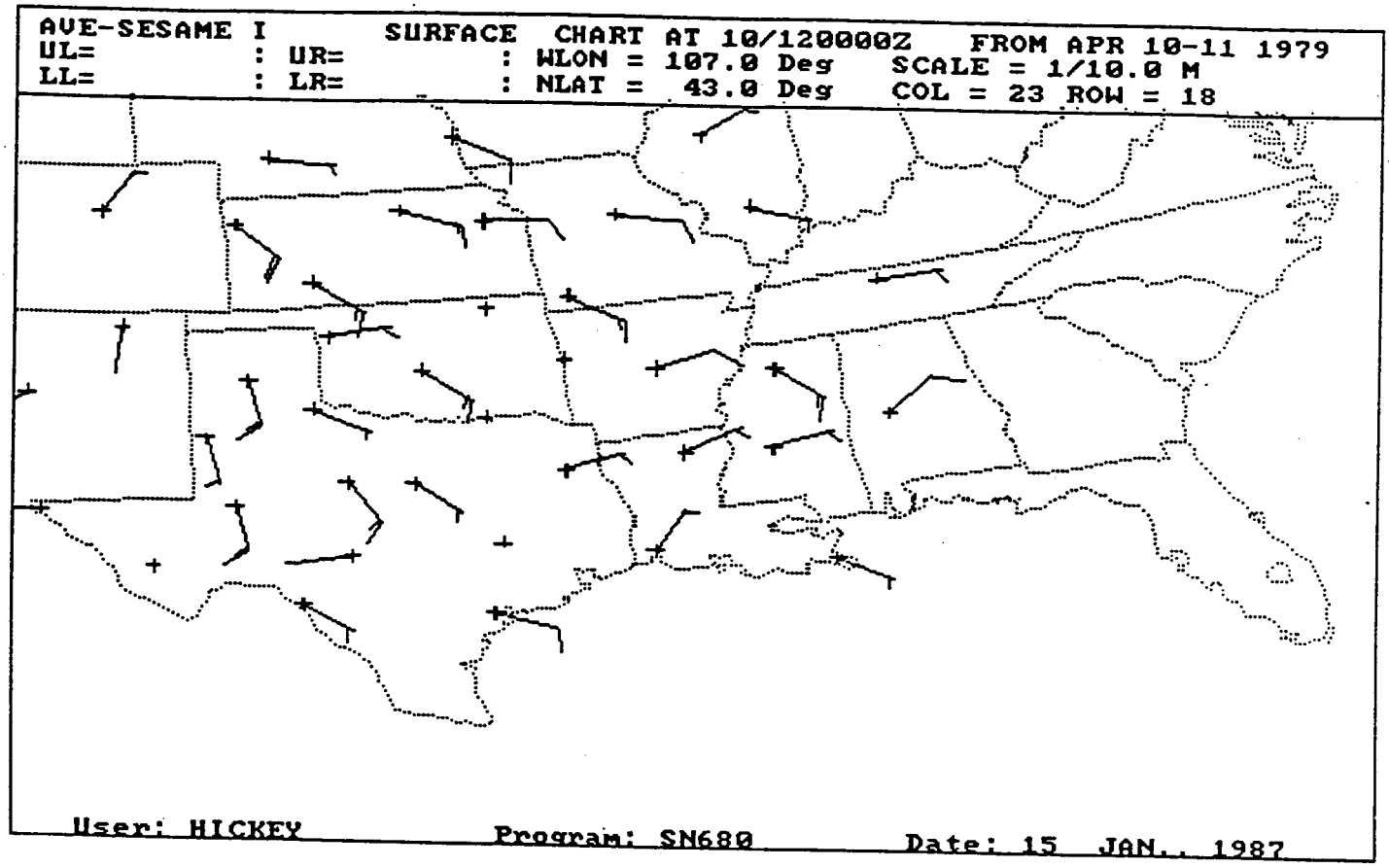


Figure 2-9. Wind Vector Base Map Plot from SN680 Program (Barb)

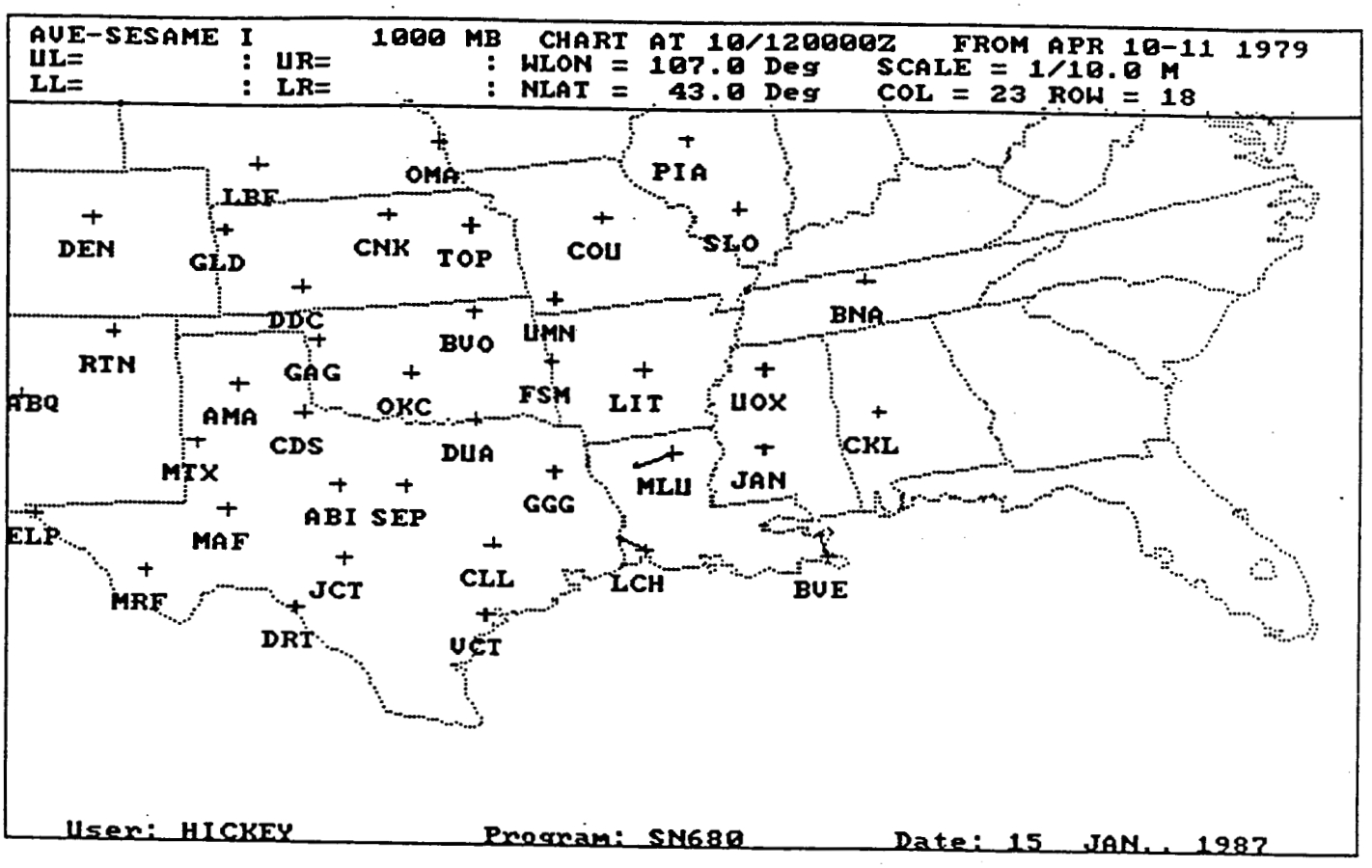


Figure 2-10. Station Base Map Plot from SN680 Program

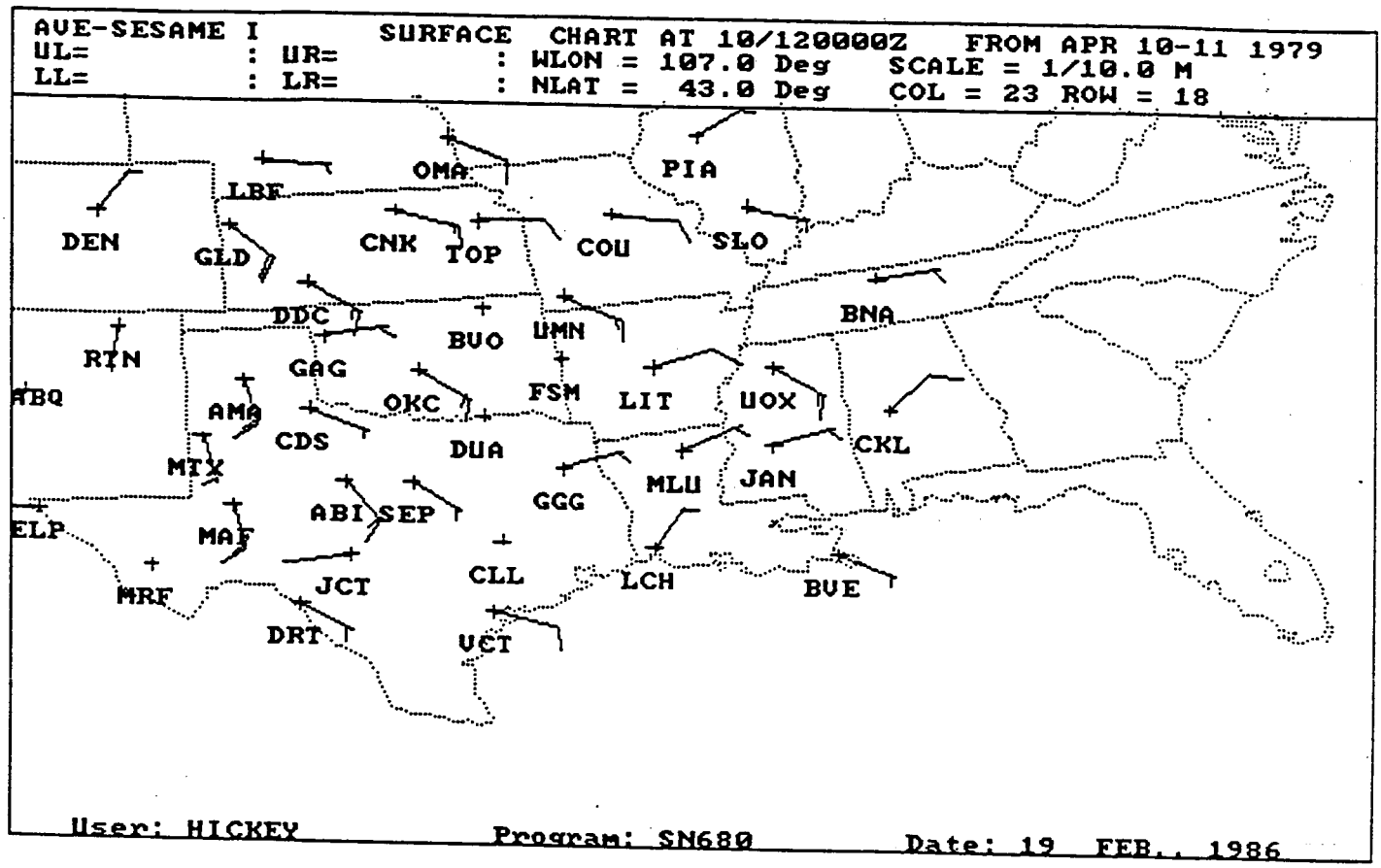


Figure 2-11. Wind Vector/Station Base Map Plot from SN680 Program

The following details the "SGL80" programs which operate on the HP-1000 computer using the HP Graphics 1000 plot package and on the IBM PC AT/XT using the Reflections software package and the HP as the host computer. Below is a logical flow diagram along with the required inputs and available outputs.

```
      PROGRAM SGL80  ("AVE S/W" SINGLE LEVEL DATA PROGRAM) HP-1000F VERSION
C**********************************************************************
C**                                                                   **
C** DESCRIPTION:  Program 'SGL80' processes a user selected           **
C**               Surface, Cloud Wind, or Precipitation data          **
C**               group and generates a Single Level Station          **
C**               and Base Map plot.                                  **
C**                                                                   **
C** LOGICAL FLOW:                 ------------                        **
C**                               |   SGL80   |                       **
C**                               ------------                        **
C**                                     |                             **
C**                 ----------------------------------------          **
C**                 |                   |                   |       **
C**               SG180               SG280               SG380     **
C**              (B MAP)             (PRINT)             (PLOT)     **
C**                                                                   **
C** DATA GROUPS:  1. Surface                                          **
C**               2. Cloud Winds                                      **
C**               3. Precipitation                                    **
C**                                                                   **
C** INPUTS:       Array   Filenn  Description                         **
C**               ------  ------  ------------------------            **
C**               IQFIL   ?SGL80  SGL80 Question File                 **
C**               IDFIL   *SGLDR  Directory File                      **
C**               IRFIL   RMRS11  Random Access Data File             **
C**               IBFIL   RMLS11  Random Lat/Lon Data File            **
C**               ISFIL   SMDS11  Documentation File                  **
C**               IMFIL   SMLS11  Sequential Lat/Lon File             **
C**                                                                   **
C** OUTPUTS:      1.  Plot   --  Station & Base Map     (SG180)       **
C**               2.  Print  --  Station Parameters     (SG280)       **
C**               3.  Plot   --  Station Parameters     (SG380)       **
C**                                                                   **
C**********************************************************************
C
```

In the following pages examples generated on the IBM PC AT laserjet printer are provided.

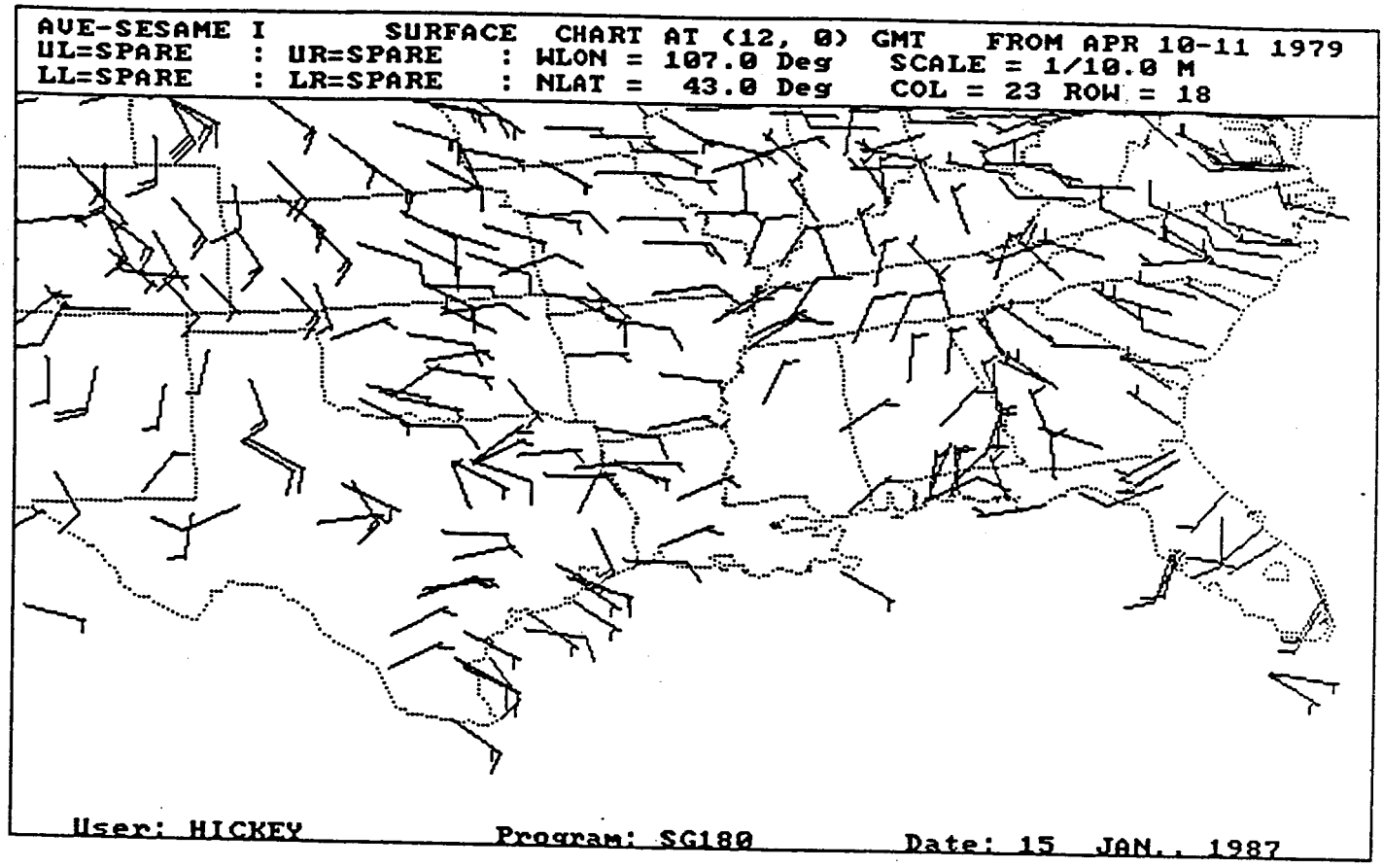


Figure 2-12. Station Wind Barb Base Map Plot from SG180 Program

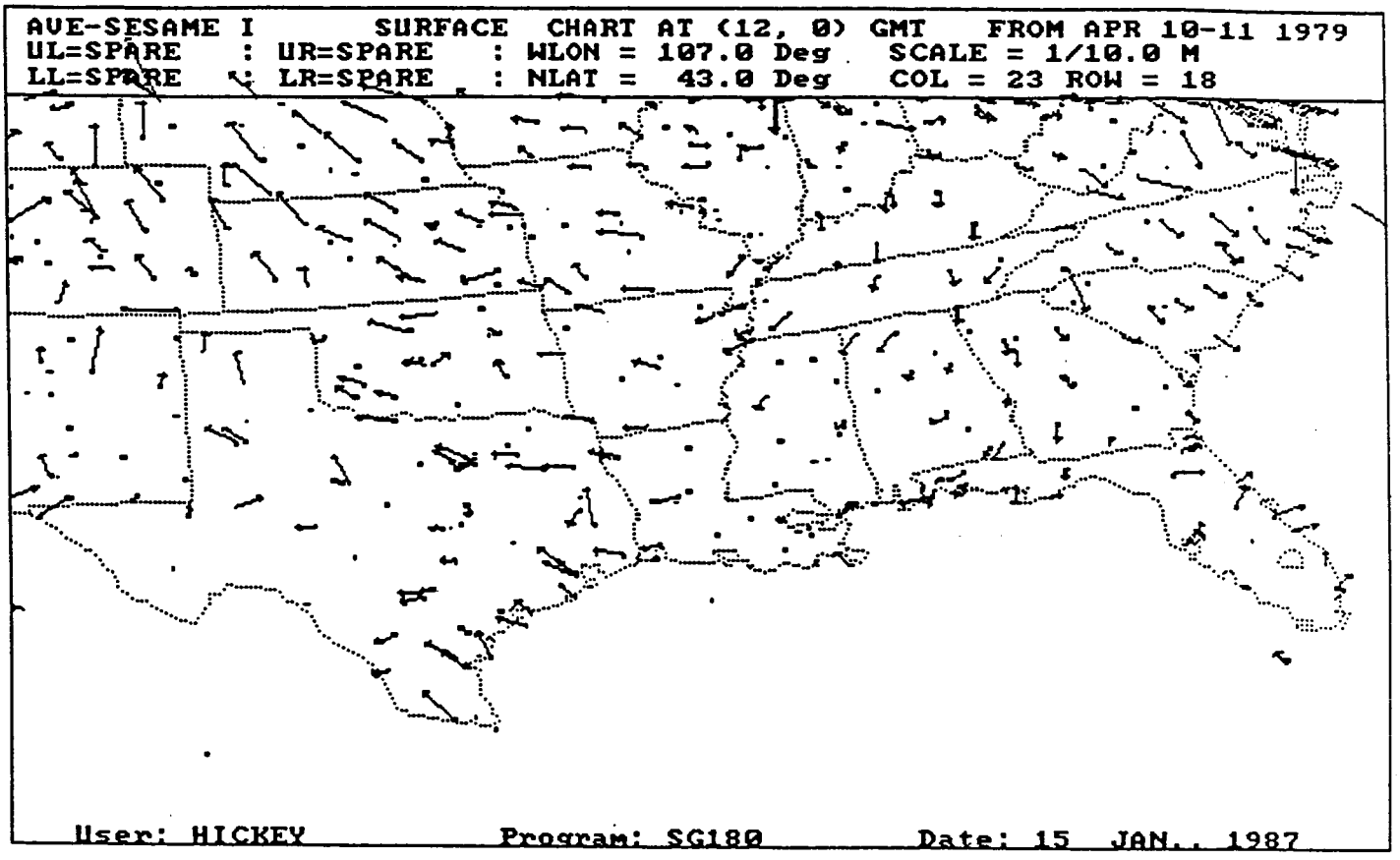


Figure 2-13. Station Wind Vector Base Map Plot from SG180 Program

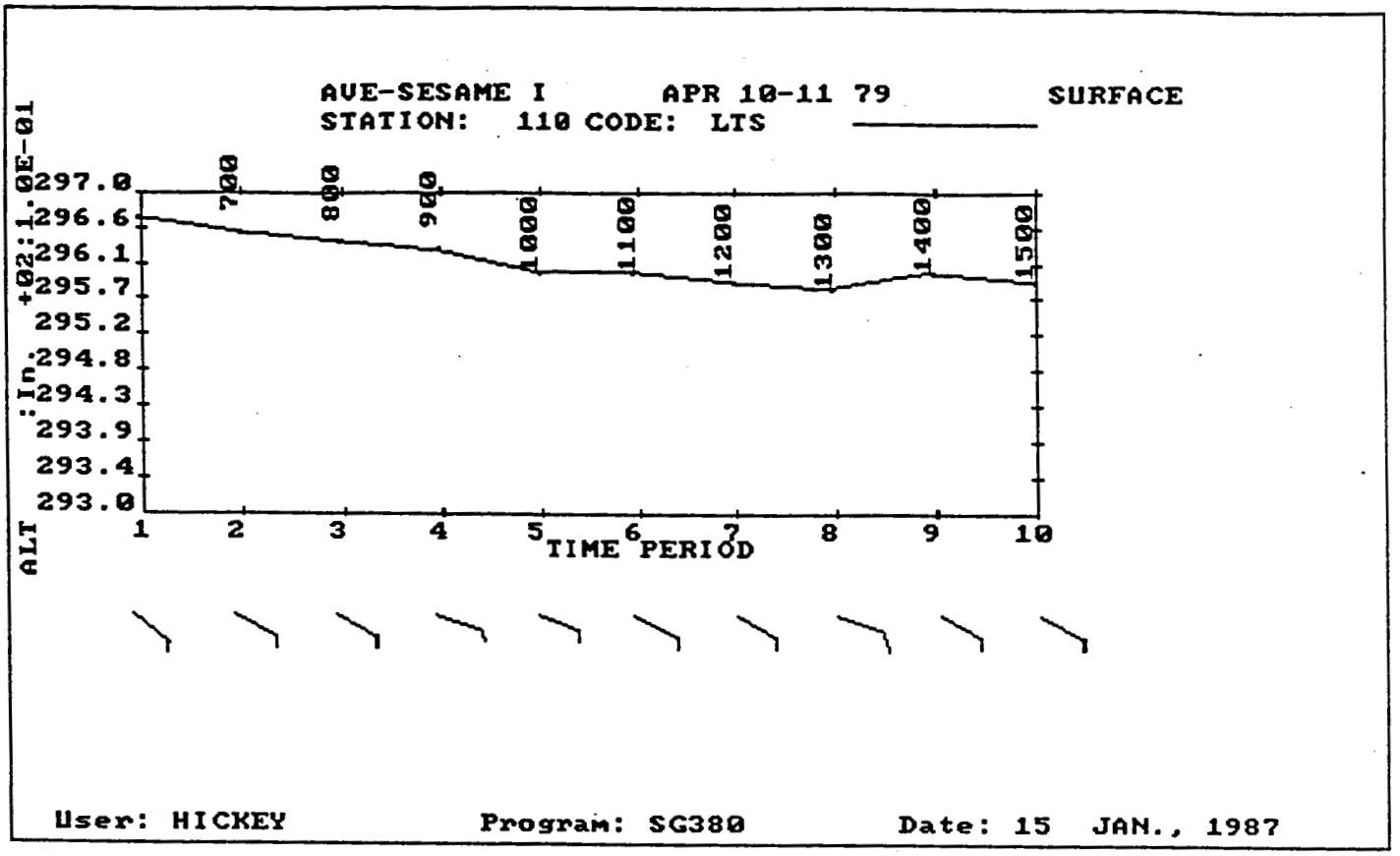


Figure 2-14. Station Parameter Plot form SG380 Program

The following details the "GRD80" programs which operate on the HP-1000 computer using the HP Graphics 1000 plot package and on the IBM PC AT/XT using the Reflections software package and the HP as the host computer. Below is a logical flow diagram along with the required inputs and available outputs.

```
      PROGRAM GRD80  ("AVE S/W" GRID DATA PROGRAM) HP-1000F VERSION
C**********************************************************************
C**                                                                   **
C** DESCRIPTION:  Program 'GRD80' processes a user selected           **
C**               Basic or Derived data group and generates a         **
C**               printed output.                                     **
C**                                                                   **
C**                                                                   **
C** LOGICAL FLOW:                 ------------                        **
C**                               |   GRD80   |                       **
C**                               ------------                        **
C**                                     |                             **
C**                           ------------------------                **
C**                           |                       |               **
C**                         GR180                   GR280             **
C**                        (Print)                 (Plot)             **
C**                                                                   **
C** DATA GROUPS:  1. Basic                                            **
C**               2. Derived                                          **
C**                                                                   **
C** INPUTS:       Array   Filenn  Description                         **
C**               ------  ------  ------------------------            **
C**               IQFIL   ?GRD80  GRD80 Question File                 **
C**               IDFIL   *GRDDR  Directory File                      **
C**               IRFIL   RGBS11  Random Access Data File             **
C**               IBFIL   RGLS11  Random Lat/Lon Data File            **
C**               ISFIL   SGDS11  Seq. Documentation File             **
C**               IMFIL   SGLS11  Sequential Lat/Lon File             **
C**                                                                   **
C** OUTPUTS:      1.  PRINT   -- GRID Data              (GR180)       **
C**               2.  PLOT    -- Contour GRID Data      (GR280)       **
C**                                                                   **
C**********************************************************************
```

In the following pages examples generated on the IBM PC AT Laserjet printer are provided as well as HP printer outputs.

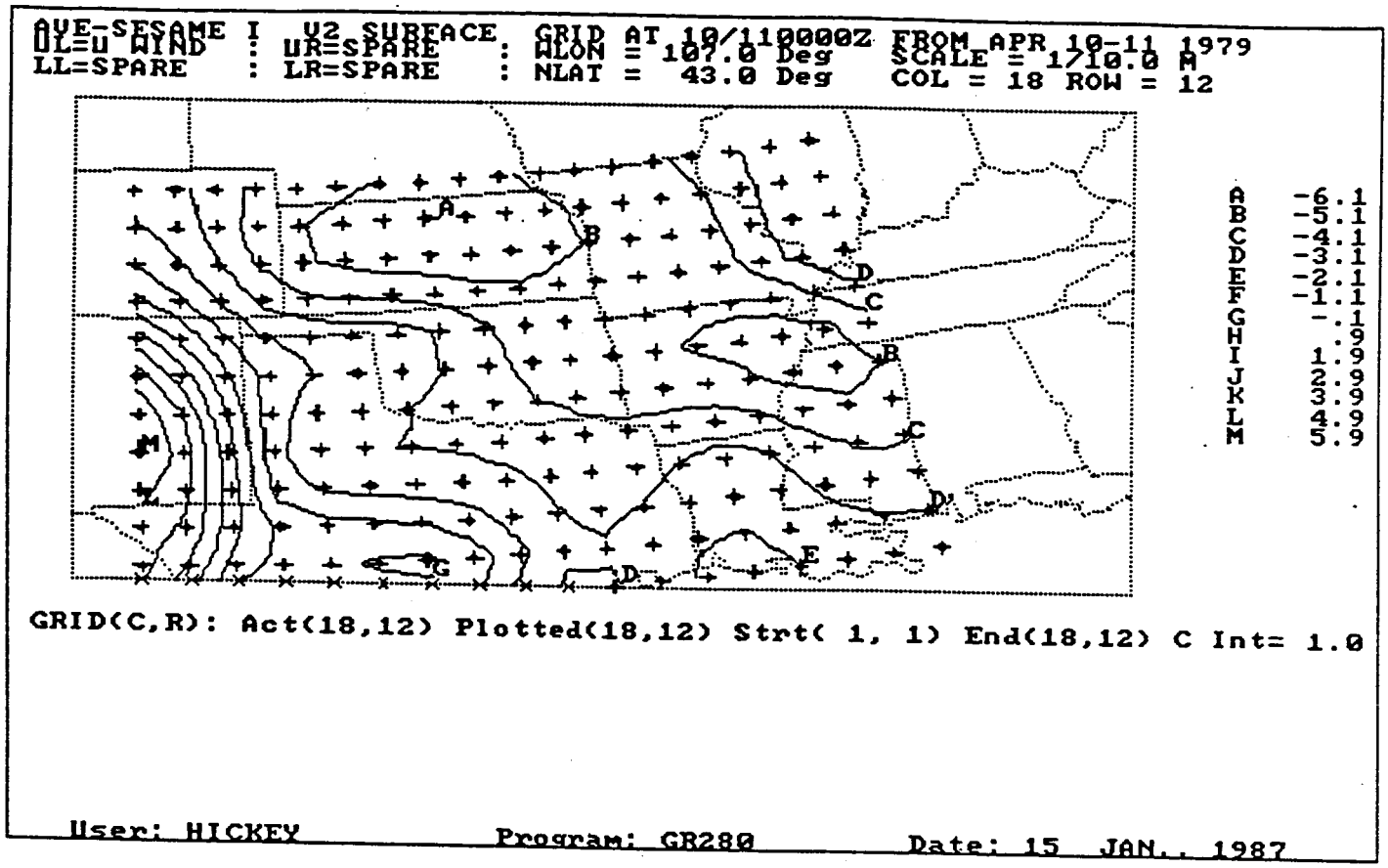


Figure 2-15. Contoured Grid Plot from GR280 Program

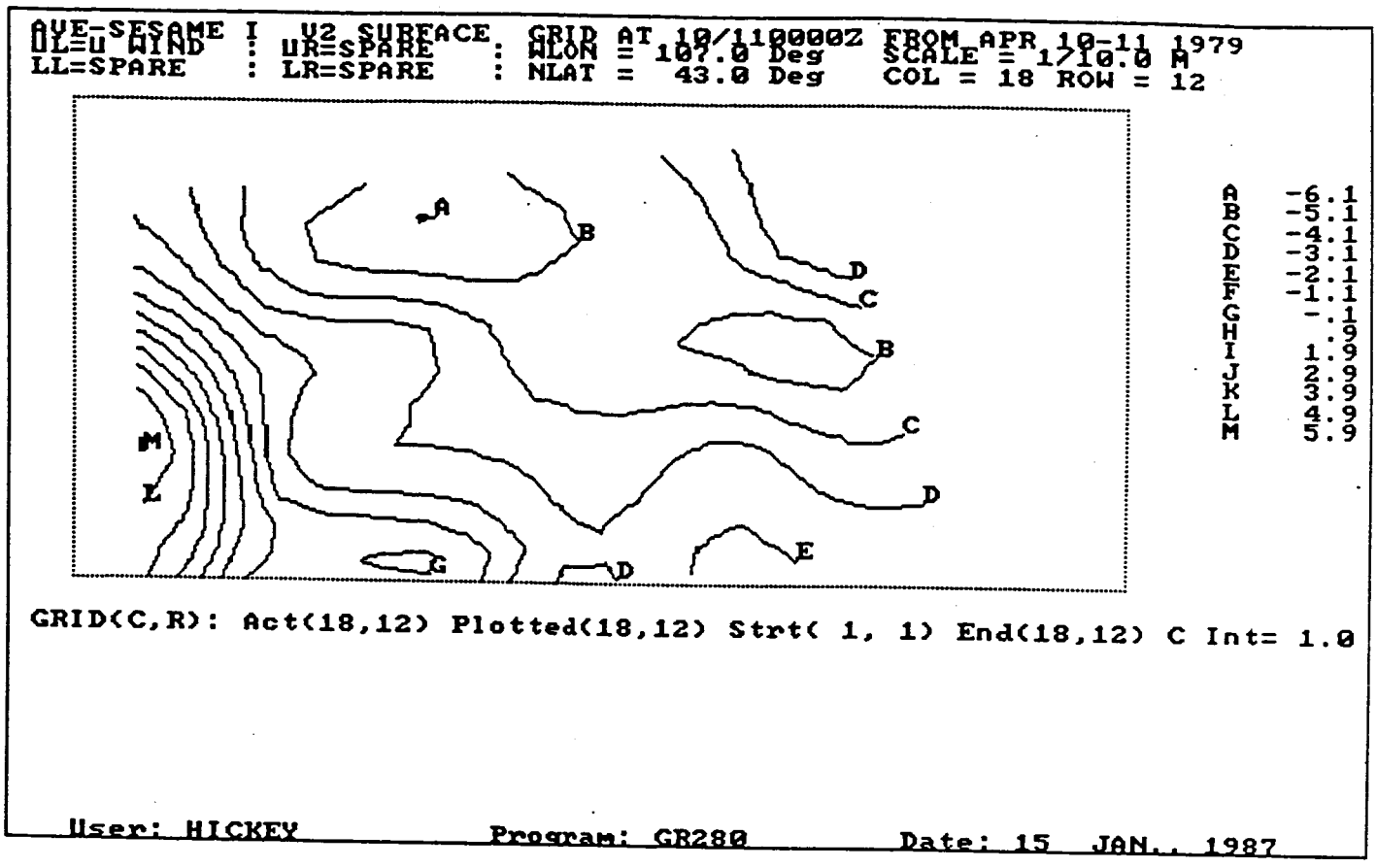


Figure 2-16. Contoured Plot from GR280 Program

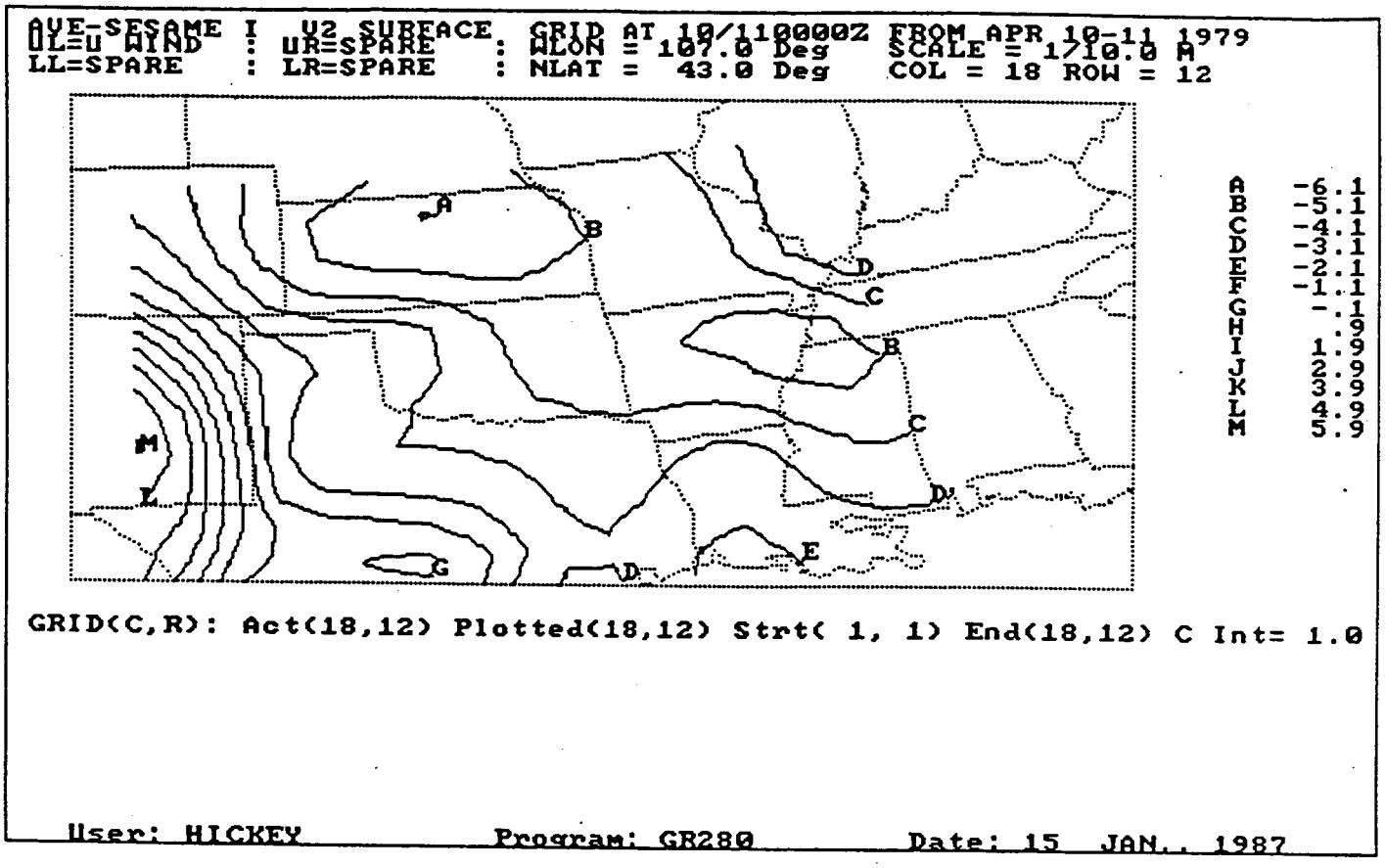
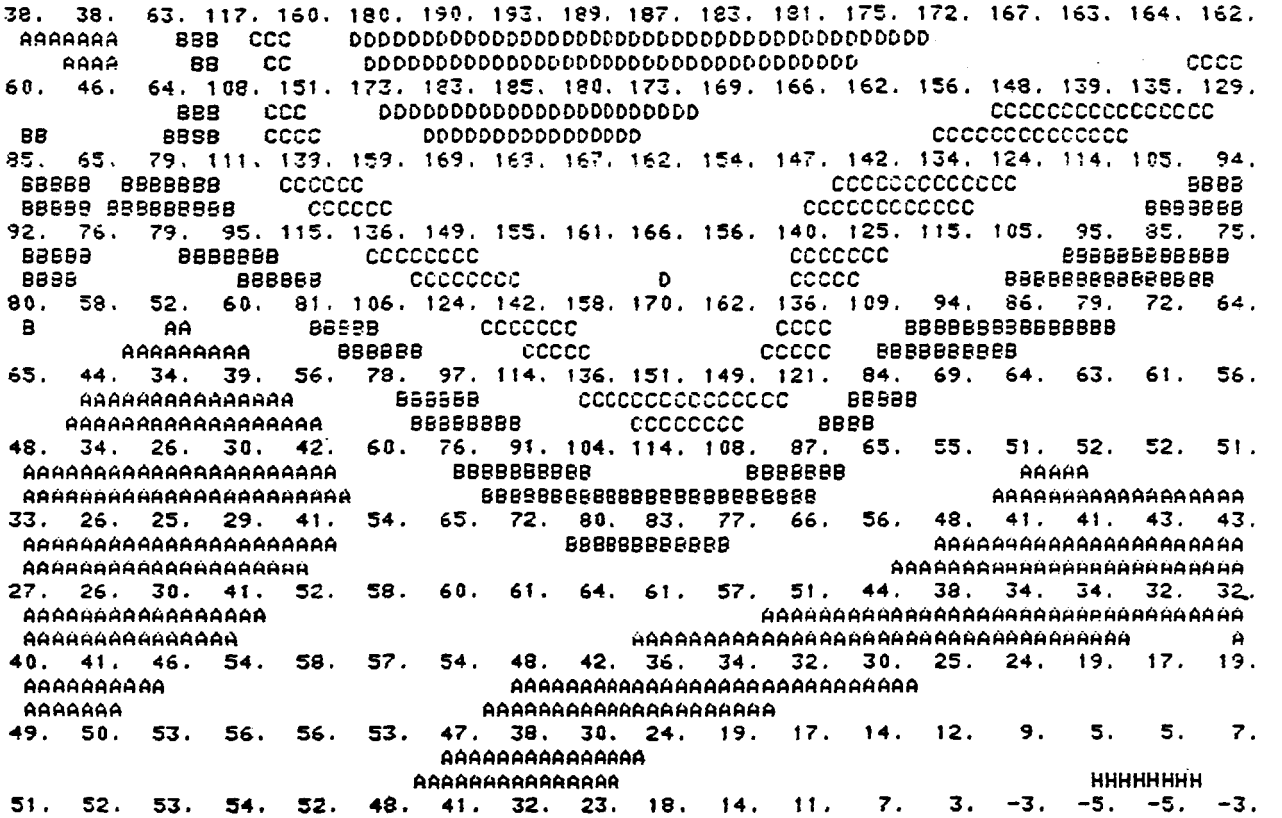


Figure 2-17. Contoured Base Map Plot from GR280 Program

```
                                                                (TIM= 1,PRM= 3,LEV= 1)
RGRS12: AVE-SESAME I  V2 SURFACE   TEMP     :Deg C+00:1.0E+01 :  GRID at 10/110000Z  From APR 10-11 ,197
```




```
Actual GRID Size: (18,12)  Printed GRID Size: (18,12)  Start=( 1, 1)  End=(18,12)  Scale:1.0E+01
```

Figure 2-19 Printed Contoured Grid from GR180 Program

The following details the "IMG80" programs which operate on the HP-1000 computer using the HP Graphics 1000 plot package and on the IBM PC AT/XT using the Reflections software package and the HP as the host computer. Below is a logical flow diagram along with the required inputs and available outputs.

```
      PROGRAM IMG80  ("AVE S/W" IMAGE PROGRAM) HP-1000F
C*********************************************************************
C**                                                                 **
C** DESCRIPTION:  Program 'IMG80' processes a user selected         **
C**               Satellite or Radar data group and generates       **
C**               a color Image Display.                            **
C**                                                                 **
C**                                                                 **
C** LOGICAL FLOW:                 ------------                      **
C**                               |   IMG80   |                     **
C**                               ------------                      **
C**                                     |                           **
C**                          ------------------------               **
C**                          |                      |               **
C**                        IM180                  IMG280            **
C**                       (Image)                (Print)            **
C**                                                                 **
C** DATA GROUPS:  1. Satellite                                      **
C**               2. Radar                                          **
C**               3. TBD                                            **
C**                                                                 **
C** INPUTS:       Array   Filenn  Description                       **
C**               ------  ------  ------------------------          **
C**               IQFIL   ?IMG80  IMG80 Question File               **
C**               IDFIL   *IMGDR  Directory File                    **
C**               IRFIL   RIGA41  Random Access Data File           **
C**               ISFIL   SIQA42  Seq. Documentation File           **
C**                                                                 **
C** OUTPUTS:      1.  DISPLAY -- Color Image (BARCO)     (IM180)    **
C**                           -- B/W Image (APPLE)                  **
C**               2.  PRINT   -- Image                   (IM280)    **
C**                                                                 **
C*********************************************************************
```

In the following pages examples generated on the IBM PC AT Laserjet printer are provided as well as printouts from the HP looo system.

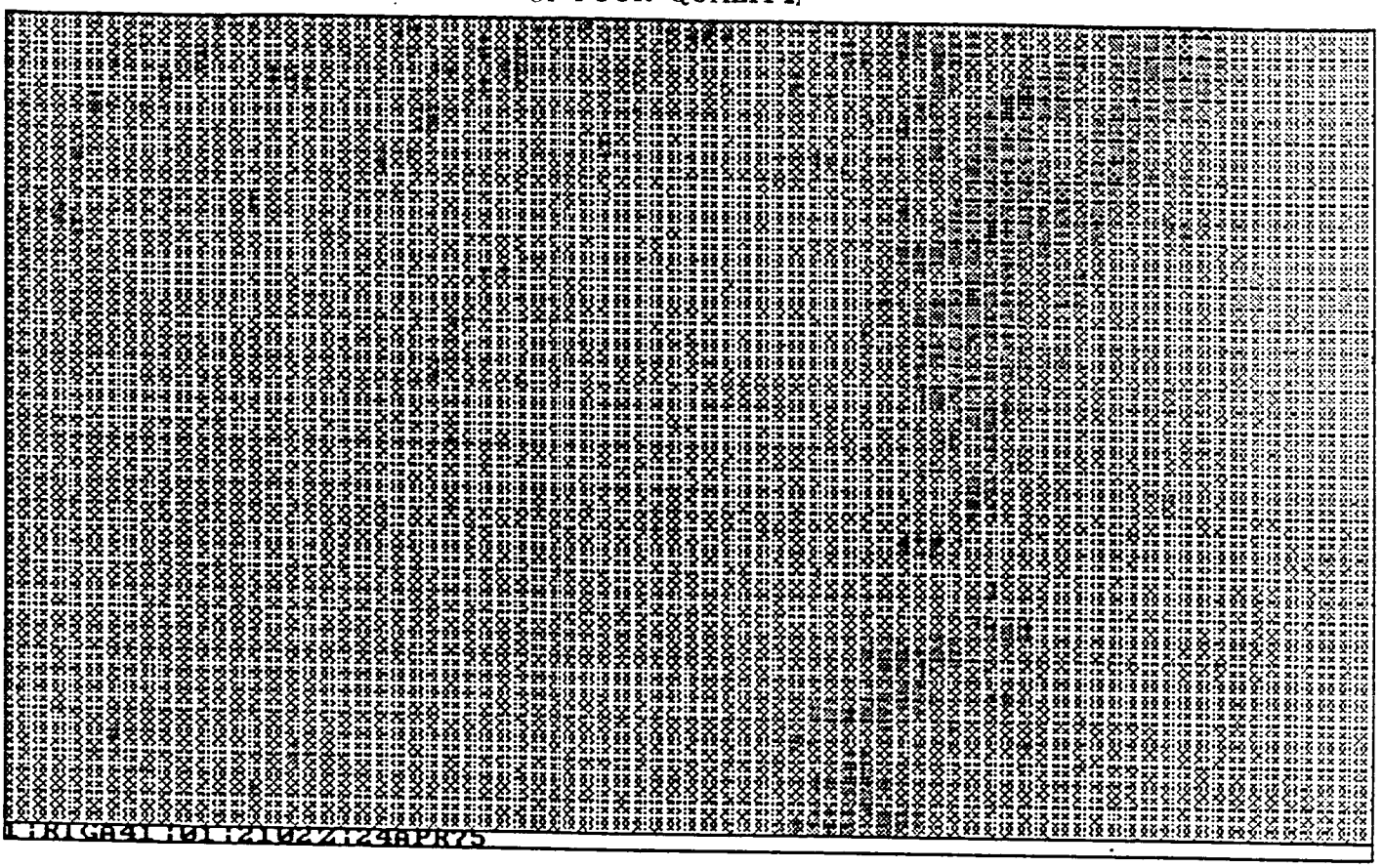


Figure 2-20. Displayed Image from IM180 Program

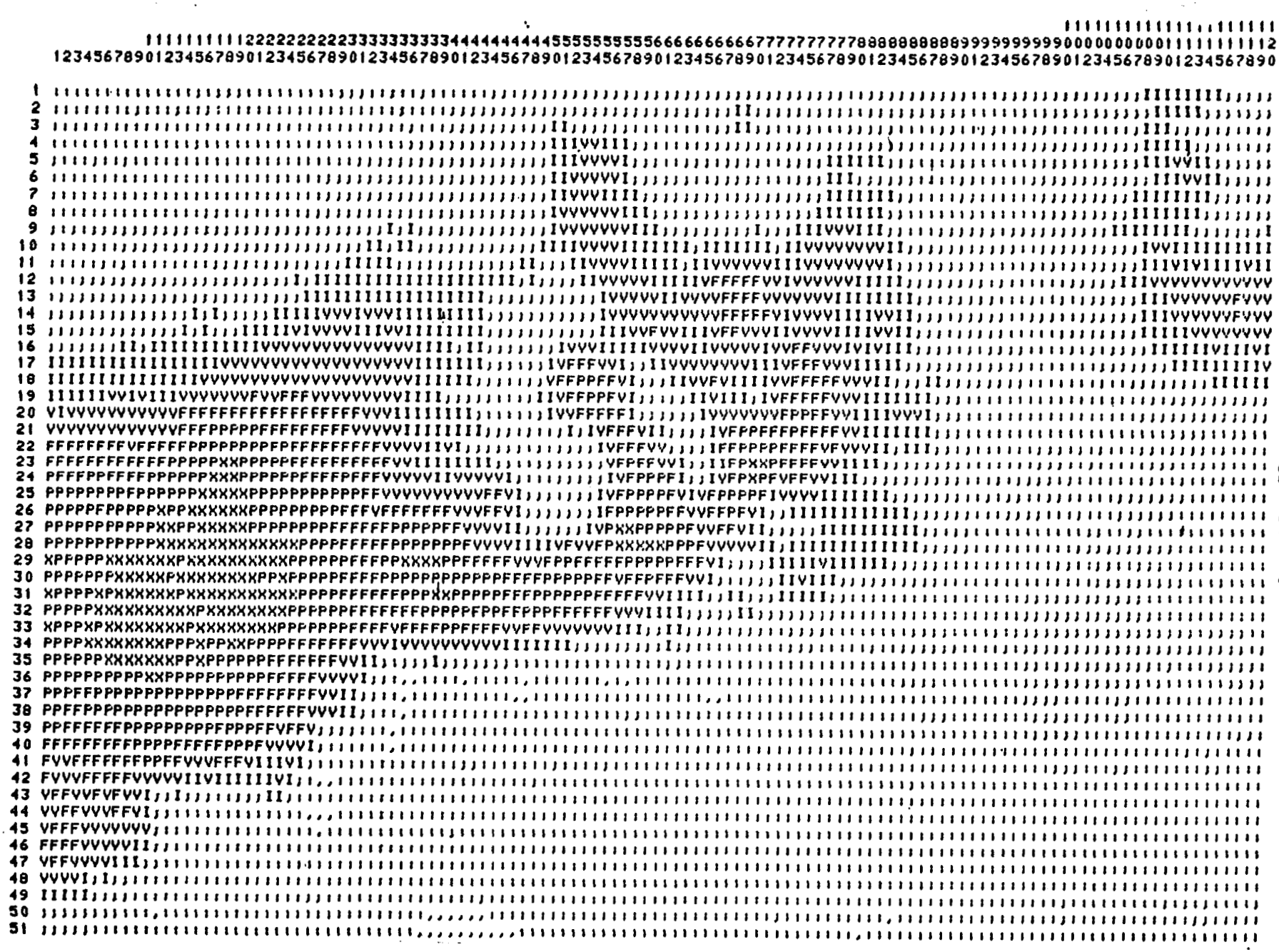


Figure 2-21. Printed 'Shaded' Image from IM280 Program

ORIGINAL PAGE IS
OF POOR QUALITY

Print Option: 3 File Name: RIGA41 Ti[illegible]iod: 1 Channel: 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	92	88	88	92	92	88	88	92	92	92	92	88	88	92	96	92	96	100	96	88	88	88	88	92	92	92	92	92	96	96	96	92	92	96	92	92	96	92	92	92
2	92	92	92	92	92	92	92	92	96	92	88	92	96	92	92	96	92	88	88	88	84	84	88	88	88	92	92	92	92	92	92	92	92	92	96	92	92	92	92	96
3	92	92	88	84	88	88	88	88	88	88	88	88	92	88	88	88	88	88	88	88	88	88	88	88	92	88	92	88	92	92	92	88	88	96	88	88	96	88	92	96
4	92	92	92	92	92	92	88	92	92	92	88	92	88	88	100	88	88	88	88	88	88	92	88	92	92	88	88	92	88	88	92	92	92	92	92	92	92	104	104	104
5	96	88	88	88	96	88	88	96	92	88	84	88	92	92	88	88	88	88	88	92	92	84	88	88	88	92	88	92	92	88	92	92	88	92	100	100	100	100	96	100
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15	100	104	104	104	108	108	104	104	104	104	104	108	108	112	108	116	108	108	108	112	116	116	120	120	128	124	128	128	128	128	124	124	124	128	126	124	120	124	116	116
16	108	104	104	104	108	108	108	108	112	112	108	112	112	112	112	112	112	116	116	120	120	124	128	128	128	132	136	136	132	132	132	136	132	132	132	132	128	120	116	116
17	116	116	112	112	116	116	120	120	116	116	112	112	120	120	120	124	124	128	128	132	132	132	132	132	132	136	136	136	136	136	136	136	132	132	132	132	128	124	120	120
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29	180	172	164	160	172	168	176	176	180	176	180	180	176	172	176	188	184	184	184	180	176	176	176	184	180	172	168	164	164	164	164	156	152	156	164	172	180	184	180	168
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42	144	140	140	140	144	148	148	144	144	140	140	136	136	136	124	124	128	120	112	116	116	116	124	128	120	108	92	76	76	84	84	80	84	92	88	88	88	88	92	92
43	140	144	144	140	140	144	140	148	140	136	124	108	108	112	100	104	100	92	88	96	96	100	116	120	104	88	84	80	80	80	84	88	88	88	88	92	92	88	84	84
44	140	140	144	148	136	140	140	152	144	136	124	104	100	92	92	88	84	80	80	84	88	88	84	84	88	80	72	76	76	88	88	92	88	84	88	88	92	92	88	88
45	140	144	148	148	140	136	140	140	140	132	128	104	92	84	92	84	80	84	84	80	88	92	84	84	88	88	80	76	84	84	84	84	84	92	92	84	88	84	88	92
46	144	148	148	148	140	136	140	140	136	124	112	104	96	92	92	88	88	84	88	88	88	92	92	88	88	88	84	84	84	84	88	88	88	88	88	88	88	88	88	88
47	136	144	144	140	136	128	136	120	116	112	100	96	84	84	84	88	84	84	88	92	92	88	88	88	88	92	92	88	88	88	88	84	84	88	92	86	84	84	84	
48	128	132	128	128	124	108	112	108	100	92	88	84	84	80	84	84	88	88	92	88	84	92	84	84	88	84	88	88	92	92	88	92	96	96	92	88	88	84	88	92
49	116	116	124	120	112	104	104	104	96	92	80	80	80	84	80	84	88	88	84	88	88	80	88	88	80	88	92	88	88	88	88	92	88	88	92	80	92	92	88	80
50	108	108	108	104	104	100	100	100	92	92	88	76	80	88	88	80	88	88	80	88	88	88	88	92	88	88	92	80	88	88	92	86	92	92	88	80	76	72		
51	100	100	100	104	96	92	88	92	88	88	88	84	88	88	84	88	84	88	88	84	80	88	88	88	88	88	84	84	88	88	88	80	88	88	88	80	80	72	72	68

Figure 2-22. Printed 'Value' Image from IM280 Program

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OF POOR QUALITY

Figure 2-23. Printed 'HEX Value' Image from EM280 Program

3.0 DATA BASE & FILE MANAGEMENT

ACI has developed a Data Base Management package to convert various experiment data into a standard format for storing in "random access" disc files, thus making the data readily accessible to the Analysis and Display Software (AVE80 Series) and other general purpose plotting and analysis software.

The four specific data types currently processed utilizing the MASS data base management software are:

1) -- Sounding Data
2) -- Single Level Data
3) -- Grid Data
4) -- Image Data

All data sets are initially converted into a standard format and a "random access" disc file created and named accordingly to a defined MASS Data File naming convention as shown on Page 3-2.

All data sets can be accessed by the Analysis and Display (AVE80 Series) programs via retrieving information from a data base Directory File.

The data base Directory File contains the "random access" data file name, Lat@Lon File names, Documentation File name, along with the associated parameter indexes.

ACI has structured the MASS HP-7925 120mb disc to store the four data types and provide for simple file management. Each data set type is assigned to a specific LU as follows:

LU#44 -- Assigned only for Image Data
LU#45 -- Assigned only for Sounding Data
LU#46 -- Assigned only for Single Level Data
LU#47 -- Assigned only for Grid Data
LU#48 - Assigned only for Temporary Data

The AVE80 Series code expects the specific data type to be already existing on the appropriate LU, thus allows for faster accessing and minimizes the data housekeeping/archieving functions.

ACI has developed numerous utility programs which are included in the Data Base Management package to provide functions such as:

- o -- Create Random Access Data Base
- o -- Create Documentation File
- o -- Create Latitude/Longitude File
- o -- Archive/Restore Data Base

3.1 DATA TYPES & FILE NAMING CONVENTION

ACI has developed the MASS Analysis and Display Software to process four types of experiment data:

1) -- Sounding Data
2) -- Single Level Data
3) -- Grid Data
4) -- Image Data

A standard file naming convention has been adopted for these data types as shown below:

MASS Data File Naming Convention

(Six character format)

File Name:	X1	X2	X3	XX4	X5

Where:

X1 = 'R' for Random Access Data Set
= 'S' for Sequential Access Data Set

X2 = 'I' for Image Data
= 'G' for Grid Data
= 'M' for 25-mb Data
= 'S' for Single Level Data

X3 = 'R' for Rawinsonde Data
= 'T' for TIROS OS Sounding Data
= 'A' for TIROS AVHRR Image Data
= 'V' for GOES VAS Sounding Data
= 'G' for GOES VISSR Image Data
= 'S' for Surface-ground Data
= 'C' for Cloud Motion Data
= 'P' for Precipitation Data
= 'M' for MDR Data
= 'N' for NOAA Satellite Data
= 'X' for Digitized Radar Data
= 'D' for Documentation Data (Raw)
= 'L' for Latitude/Long Data (Raw)
= 'Q" for Documentation Data (Sat)
= 'Z' for Latitude/Long Data (Sat)
= ' ' others determined as needed

XX4 = 'An' for AVE/AVESS Group
= 'Sn' for AVE/SESAME Group
= 'Vn' for AVE/VAS Group
= 'On' for Other Group (undefined)
Note: n = 1-9 for Numbering Data Types

X5 = 'n' for Data File Version
Note: n = 1-9,A-Z Data Version Numbers

Example: File Name = RMRS11

Implies: R - Random Data Set
M - 25-mb Sounding Data
R - Rawinsonde Data
S1 - AVE/SESAME I Data Group
1 - Version 1

3.2 DATA STRUCTURE & FORMAT

The four data types each have a dedicated Directory File that contains the file names and parameter information for indexing into the "random access" data base. The number of stations, time periods, and data parameters are all provided in the Directory File.

A description of the Directory File structure and format is given below:

#n	R-Data	R-L/L	PR	STA	TM	S-Docu	S-L/L	Group	(Typ)	Time Per.	YR
01	RMRA41	RMLA41	16	042	09	SMDA41	SMLA41	AVE IV	Raw	APR 24-25	75

Where:
- #n -- Indicates entry number from 1 to 30 entries
- R-Data -- Random Access Data File Name
- R-L/L -- Random Access Lat/Lon File Name
- PR -- Indicates Number of Data Parameters
- STA -- Indicates number of Stations
- TM -- Indicates NUmber of Time Periods
- S-Docu -- Sequential Documentation File Name
- S-L/L -- Sequential Lat/Lon File Name
- Group -- Indicates 1 of 4 Data Groups (AVE,SESAME,VAS,OTH)
- (Typ) -- Indicates Data Type (Raw,Sat,Radr,Cld,Bas,Derv,Etc.)
- Time P -- Indicates Time & Date of Data Base

The Directory File parameters (time periods, stations) are used to compute the indexing scheme used to access various data records in the "random access" data base. An example Directory File for each of the four data types is shown in Section 3.3.

3.3 DIRECTORY FILES

Associated with the MASS Analysis and Display Software, four Directory Files exist, one for each data type:

1) *IMGDR -- Directory File for Image Data on LU#44
2) *SNNDR -- Directory File for Sounding Data on LU#45
3) *SGLDR -- Directory File for Single Level Data on LU#46
4) *GRDDR -- Directory File for Grid Data on LU#47

The Directory Files are each in a fixed format and entries are indexed according to four defined data cases:

1) -- AVE/AVESS
2) -- AVE/SESAME
3) -- AVE/VAS
4) -- Other

Each entry contains the "random access" data file and Lat/Lon File names, the Documentation File name, along with the number of data parameters, time periods, and number of stations. An actual example of each of the four Directory Files is shown on the following pages.

EXAMPLE of Sounding Directory File: *SNDDR

```
0001  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/AVESS  (Raw) Time Per. YR
0002  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0003  01 RMRA41 RMLA41 16 042 09 SMDA41 SMLA41 AVE IV           APR 24-25 75
0004  02 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0005  30
0006  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/SESAME (Raw) Time Per. YR
0007  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0008  01 RMRS11 RMLS11 16 039 09 SMDS11 SMLS11 AVE-SESAME I     APR 10-11 79
0009  02*RMRS21 RMLS21 16 040 09 SMDS21 SMLS21 AVE-SESAME II    APR 19-20 79
0010  30
0011  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/VAS    (Raw) Time Per. YR
0012  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0013  01*RMRV11 RMLV11 16 012 03 SMDV11 SMLV11 AVE-VAS I        FEB 06-07 82
0014  02 RMRV21 RMLV21 16 037 08 SMDV21 SMLV21 AVE-VAS II       MAR 06-07 82
0015  30
0016  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  OTHER      (Raw) Time Per. YR
0017  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0018  01 RGRV22 RDATA1 16 526 01 SMQS11 SDATA1 BOB'S LITEN1     DATE      YR
0019  02 RGRV22 RDATA2 16 494 01 SMQS11 SDATA2 BOB'S LITEN2     DATE      YR
0020  30
0021  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/AVESS  (Sat) Time Per. YR
0022  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0023  01 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0024  02 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0025  30
0026  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/SESAME (Sat) Time Per. YR
0027  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0028  01*RMTS11 RMZS11 16 113 01 SMQS11 SMZS11 TIROS-N OS UWRES APR 10     79
0029  02 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0030  30
0031  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/VAS    (Sat) Time Per. YR
0032  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0033  01*RMVV21 RMZV21 16 168 05 SMQV21 SMZV21 GOES-E VAS BAD R MAR 06-07 82
0034  02 RMVV22 RMZV22 16 207 08 SMQV22 SMZV22 GOES-E VAS OPER  MAR 06-07 82
0035  30
0036  #n R-Data R-L/L  PR STA TM S-Docu S-L/L  OTHER      (Sat) Time Per. YR
0037  -- ------ ------ -- --- -- ------ ------ ---------------- --------- --
0038  01 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0039  02 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0040  30 ------ ------ -- --- -- ------ ------ ---------------- --------- --
0041  99 End of Directory File
```

3.4 DOCUMENTATION FILES

Another file is the Documentation File which details the contents of each "random access" data base, thus for each "data base" there exists an associated "Documentation File". The Documentation File contains the following information:

- o -- Detailed Station Names
- o -- Specific Time/Date Information
- o -- All available Pressure Levels
- o -- All defined Data Parameters and Data Units
- o -- Comment Information

An example of a Documentation File for each of the four types of data is given in the following pages.

Note that the formats are fixed and must adhere to that shown in the examples and defined below:

LINE#	FORMAT	DESCRIPTION
1-23	Free	Displayed to Terminal Only
24	Fixed	Starting Index for Time Periods
25-35	Fixed	Labels for Plotting and Questions
36	Fixed	Starting Index for Pressure Levels
37-47	Fixed	Labels for Plotting and Questions
48	Fixed	Starting Index for Parameter VAlues
49-59	Fixed	Labels for Plotting and Questions
60	Fixed	Starting Index for Documenation Page
61-83	Free	Displayed to Terminal Only

```
SMDV31 T=00004 IS ON CR00045 USING 00034 BLKS R=0000

0001   The Rawinsonde Stations participating in the (AVE-VAS III) Experiment are:
0002   01- Crowell          ,TX    15+ Boothville       ,LA    29+ Albequerque     ,NM
0003   02- Henrietta        ,TX    16+ Jackson          ,LA    30+ Winslow         ,AZ
0004   03- Durant           ,OK    17+ Lake Charles     ,LA    31+ Salem           ,IL
0005   04- Throckmorton     ,TX    18+ Longview         ,TX    32+ Dodge City      ,KS
0006   05- Denton           ,TX    19+ Victoria         ,TX    33+ Topeka          ,KS
0007   06- Abilene          ,TX    20+ Stephenville     ,TX    34+ Denver          ,CO
0008   07- Ennis            ,TX    21+ Del Rio          ,TX    35+ Grand Junction  ,CO
0009   08- Brownwood        ,TX    22+ Midland          ,TX    36+ Peoria          ,IL
0010   09- Hewitt           ,TX    23+ El Paso          ,TX    37+ Omaha           ,NE
0011   10- Menard           ,TX    24+ Tucson           ,AZ    38+ North Platte    ,NE
0012   11- Burnet           ,TX    25+ Little Rock      ,AR    39  xxxxxxxxxxxxxxx,xx
0013   12- College Station,TX      26+ Monett           ,MO    40  xxxxxxxxxxxxxxx,xx
0014   13- Fort Sill        ,OK    27+ Oklahoma City    ,OK    41  xxxxxxxxxxxxxxx,xx
0015   14- Post             ,TX    28+ Amarillo         ,TX    42  xxxxxxxxxxxxxxx,xx
0016   Note:  (-) Special Network (SN), (+) National Weather Service (NWS)
0017
0018   Eight Soundings were taken at each of the above Stations:
0019    1--1200GMT 3/27/82      2--1500GMT 3/27/82      3--1800GMT 3/27/82
0020    4--2100GMT 3/27/82      5--0000GMT 3/28/82      6--0300GMT 3/28/82
0021    7--0600GMT 3/28/82      8--1200GMT 3/28/82
0022
0023
0024   TIMES: nn-dd/hhmmssZ nn-dd/hhmmssZ nn-dd/hhmmssZ nn-dd/hhmmssZ nn-dd/hhmmssZ
0025          01-27/120000Z 02-27/150000Z 03-27/180000Z 04-27/210000Z 05-28/000000Z
0026          06-28/030000Z 07-28/060000Z 08-28/120000Z 09-99/999999Z 10-99/999999Z
0027          11-99/999999Z 12-99/999999Z 13-99/999999Z 14-99/999999Z 15-99/999999Z
0028          16-99/999999Z 17-99/999999Z 18-99/999999Z 19-99/999999Z 20-99/999999Z
0029          21-99/999999Z 22-99/999999Z 23-99/999999Z 24-99/999999Z 25-99/999999Z
0030          26-99/999999Z 27-99/999999Z 28-99/999999Z 29-99/999999Z 30-99/999999Z
0031          31-99/999999Z 32-99/999999Z 33-99/999999Z 34-99/999999Z 35-99/999999Z
0032          36-99/999999Z 37-99/999999Z 38-99/999999Z 39-99/999999Z 40-99/999999Z
0033          41-99/999999Z 42-99/999999Z 43-99/999999Z 44-99/999999Z 45-99/999999Z
0034          46-99/999999Z 47-99/999999Z 48-99/999999Z 49-99/999999Z 50-99/999999Z
0035
0036   LEVEL:  nn-aaaaaaaa:  nn-aaaaaaaa:  nn-aaaaaaaa:  nn-aaaaaaaa:  nn-aaaaaaaa:
0037            01-SURFACE :  02-1000 MB :  03- 975 MB :  04- 950 MB :  05- 925 MB :
0038            06- 900 MB :  07- 875 MB :  08- 850 MB :  09- 825 MB :  10- 800 MB :
0039            11- 775 MB :  12- 750 MB :  13- 725 MB :  14- 700 MB :  15- 675 MB :
0040            16- 650 MB :  17- 625 MB :  18- 600 MB :  19- 575 MB :  20- 550 MB :
0041            21- 525 MB :  22- 500 MB :  23- 475 MB :  24- 450 MB :  25- 425 MB :
0042            26- 400 MB :  27- 375 MB :  28- 350 MB :  29- 325 MB :  30- 300 MB :
0043            31- 275 MB :  32- 250 MB :  33- 225 MB :  34- 200 MB :  35- 175 MB :
0044            36- 150 MB :  37- 125 MB :  38- 100 MB :  39- 075 MB :  40- 050 MB :
0045            41- 025 MB :  42-9999 MB :  43-9999 MB :  44-9999 MB :  45-9999 MB :
0046            46-9999 MB :  47-9999 MB :  48-9999 MB :  49-9999 MB :  50-9999 MB :
0047
```

```
0048  PARAM:  nn=aaaaaaaa:aaaaaaaa:n.nE+nn :        nn=aaaaaaaa:aaaaaaaa:n.nE+nn :
0049          01=TIME     :Min.  +00:1.0E+00 :        02=CONTACT  :      +00:1.0E+00 :
0050          03=HEIGHT   :GPM   +00:1.0E+00 :        04=PRESSURE :MB    +00:1.0E+00 :
0051          05=TEMP     :Deg C+00:1.0E+00 :        06=DEW PT   :Deg C+00:1.0E+00 :
0052          07=WIND DIR :Deg   +00:1.0E+00 :        08=WIND SPD :M/S   +00:1.0E+00 :
0053          09=U-COMP   :M/S   +00:1.0E+00 :        10=V-COMP   :M/S   +00:1.0E+00 :
0054          11=POT TEMP :Deg K+00:1.0E+00 :        12=E POT T  :Deg K+00:1.0E+00 :
0055          13=MX RATIO :GM/Kg+00:1.0E+00 :        14=REL HUM  :%     +00:1.0E+00 :
0056          15=BAL RNGE :KM    +00:1.0E+00 :        16=BAL AZ   :Deg   +00:1.0E+00 :
0057          17=         :          :          :        18=         :          :          :
0058          19=         :          :          :        20=         :          :          :
0059
0060  USER:   *** USER DATA-SET DOCUMENTATION PAGE FOR CRT DISPLAY (23 LINES) ***
0061    01:   Raw 25-mb Data From Tape_____________________________________________:
0062    02:   _____________________________________________________________________:
0063    03:   _____________________________________________________________________:
0064    04:   _____________________________________________________________________:
0065    05:   _____________________________________________________________________:
0066    06:   _____________________________________________________________________:
0067    07:   _____________________________________________________________________:
0068    08:   _____________________________________________________________________:
0069    09:   _____________________________________________________________________:
0070    10:   _____________________________________________________________________:
0071    11:   _____________________________________________________________________:
0072    12:   _____________________________________________________________________:
0073    13:   _____________________________________________________________________:
0074    14:   _____________________________________________________________________:
0075    15:   _____________________________________________________________________:
0076    16:   _____________________________________________________________________:
0077    17:   _____________________________________________________________________:
0078    18:   _____________________________________________________________________:
0079    19:   _____________________________________________________________________:
0080    20:   _____________________________________________________________________:
0081    21:   _____________________________________________________________________:
0082    22:   _____________________________________________________________________:
0083    23:   _____________________________________________________________________:
0084  ** END-OF-DATA
```

3.5 LAT/LON FILES

Also associated with the Directory File and Documentation File is the Lat/Lon File. This file contains for each station in the data base a specific latitude and longitude. The Analysis and Display Software uses the Lat/Lon File to plot data on a Base Map at the actual station or recording location.

A standard format has been defined for all Lat/Lon files and is shown below:

```
**********************************************************
**                                                      **
** Subject:     Standard Format for Lat/Lon Files       **
**                                                      **
** Remarks:     The following format should be used     **
**              in creating all AVE-type lat/lon files  **
**              to be used by the MASS Analysis and     **
**              Display Software.                       **
**                                                      **
** Format:      WRITE(n,n) STAT#,LAT,LON,TPER,STID      **
**              FORMAT(I4,2X,F5.2,2X,F6.2,2X,I2,2X,A4)  **
**                                                      **
**              Where:  STAT# -- I4   Station Number    **
**                      LAT   -- F5.2 Latitude          **
**                      LON   -- F6.2 Longitude         **
**                      TPER  -- I2   Time Period       **
**                      STID  -- A4   Station Id        **
**********************************************************
C
O
L
1
nnnnbbxx.xxbbxxx.xxbbnnbbaaaa
0001   32.50  101.82   01   CKL
0002   33.50  100.85   01   BVE
0003   32.45   99.75   01   JAN
0004   25.60   89.50   01   LCH
0005   27.80   90.35   01   GGG
```

Although the format is fixed and the Lat/Lon values are required the User may choose other parameters in place of the STAT#, TPER, or STID. In addition, it should be notes the Image Data does not require Lat/Lon Files.

EXAMPLE of LAT/LON File Formats

SMLV31 T=00004 IS ON CR00045 USING 00006 BLKS

0001	0001	33.98	99.71	01	CRO
0002	0002	33.93	98.22	01	HEN
0003	0003	33.94	96.40	01	DUA
0004	0004	33.19	99.18	01	TRK
0005	0005	33.20	97.19	01	DTN
0006	0006	32.43	99.69	01	ABI
0007	0007	32.33	96.66	01	ENN
0008	0008	31.71	99.10	01	BWD
0009	0009	31.48	97.20	01	HEW
0010	0010	30.94	99.81	01	MEN
0011	0011	30.74	98.23	01	BUR
0012	0012	30.64	96.47	01	CLL
0013	0013	34.67	98.41	01	FSI
0014	0014	33.19	101.39	01	POS
0015	0015	29.33	89.41	01	BVE
0016	0016	32.33	90.08	01	JAN
0017	0017	30.08	93.18	01	LCH
0018	0018	32.40	94.80	01	GGG
0019	0019	28.83	96.92	01	VCT
0020	0020	32.33	98.25	01	SEP
0021	0021	29.33	100.92	01	DRT
0022	0022	31.93	102.19	01	MAF
0023	0023	31.90	106.40	01	ELP
0024	0024	32.13	110.96	01	TUS
0025	0025	34.78	92.24	01	LIT
0026	0026	36.90	93.91	01	UMN
0027	0027	35.30	97.70	01	OKC
0028	0028	35.24	101.69	01	AMA
0029	0029	35.00	106.70	01	ABQ
0030	0030	35.05	110.76	01	INW
0031	0031	38.66	88.98	01	SLO
0032	0032	37.76	99.98	01	DDC
0033	0033	39.07	95.62	01	TOP
0034	0034	39.80	104.90	01	DEN
0035	0035	39.10	108.53	01	GJT
0036	0036	40.67	89.68	01	PIA
0037	0037	41.36	96.01	01	OMA
0038	0038	41.14	100.68	01	LBF

SMZV22 T=00004 IS ON CR00045 USING 00221 BLKS

0001	0001	43.06	102.60	01	1100
0002	0002	42.95	100.73	01	1100
0003	0003	42.84	98.91	01	1100
0004	0004	42.74	97.13	01	1100
0005	0005	42.66	95.40	01	1100
0006	0006	42.58	93.70	01	1100
0007	0007	42.16	103.92	01	1100
0008	0008	42.04	102.04	01	1100
0009	0009	41.93	100.22	01	1100
0010	0010	41.83	98.44	01	1100
0011	0011	41.74	96.71	01	1100
0012	0012	41.27	105.24	01	1100
0013	0013	41.15	103.35	01	1100
0014	0014	41.04	101.52	01	1100
0015	0015	40.94	99.75	01	1100
0016	0016	40.84	98.01	01	1100
0017	0017	40.76	96.32	01	1100
0018	0018	40.68	94.66	01	1100
0019	0019	40.62	109.56	01	1100
0020	0020	40.28	104.67	01	1100
0021	0021	40.17	102.83	01	1100
0022	0022	40.06	101.05	01	1100
0023	0023	39.88	97.62	01	1100
0024	0024	39.80	95.96	01	1100
0025	0025	39.70	109.91	01	1100
0026	0026	39.32	104.14	01	1100
0027	0027	39.21	102.35	01	1100
0028	0028	39.11	100.61	01	1100
0029	0029	39.02	98.91	01	1100
0030	0030	38.94	97.25	01	1100
0031	0031	38.86	95.62	01	1100
0032	0032	38.80	110.27	01	1100
0033	0033	38.43	104.55	01	1100
0034	0034	38.32	102.77	01	1100
0035	0035	38.22	101.04	01	1100
0036	0036	38.13	99.36	01	1100
0037	0037	38.05	97.71	01	1100
0038	0038	37.85	109.65	01	1100

4.0 AVE80 SERIES PROGRAMS OPERATIONS

The AVE80 Series Programs run on the HP-1000 using Graphics 1000 plot library, or run on the IBM PC AT/XT with the Reflection software package to emulate an HP graphics terminal. In addition, there exists an other version of the AVE80 programs which run on the APPLE III computers. The APPLE III version is now non-supportive and non-updated and therefore will not be discussed in the remainder of this section.

To operate the AVE80 Series Programs the User simply runs the AVE80 task scheduler "command file" program from the File Manger Mode:

Example To Run AVE80 "Command File" ::*AVE80::26

A detailed discussion of the command files used by the AVE80 programs is given in Section 5, with a complete listing of all command files provided in Volume II.

The AVE80 task scheduler will ask the user if the HP-1000 graphics software or the IBM PC Reflection software is being used. Then the User must decide which of the four data types is to be processed. Once the User selects the desired data type, the task scheduler will load the appropriate programs needed to process the slected data type, (loading all AVE80 Series programs requires to much space in the loader area).

The AVE80 Series Programs will then prompt the user for various interactive inputs for qualifying the desired data options. The User may choose to process data on an individual single case basis or select a batch mode where one can set up start/stop boundaries to process multiple data cases (production mode of operation).

Finally the User must select the graphical output type and the output device to display the data. Upon completion, the User can at that time modify the inputs and continue processing or simply terminate, at which time the task scheduler removes all programs from the loader area and releases all devices and data sets.

In the following sections a detailed example is provided for the User to follow in order to become familiar with Operating the AVE80 Series Programs. In most cases there is a "default" value in which the User simply presses "Return" to go to the next question. Sections 4-1 through 4-5 provide an actual execution of the AVE80 programs with each question and answer that is seen on the terminal. The User should be able to walk through the Examples provided in Sections 4-6 through 4-18, and then have a comphrehensive understanding on the overall Operational Procedures.

Below is a Logical Flow Diagram of the "AVE80" Interactive Task Scheduler along with the associated input/outputs:

```
FTN4X,L
PROGRAM AVE80   ("AVE S/W" TASK SCHEDULER) HP-1000F VERSION
C*****************************************************************
C**                                                             **
C** DESCRIPTION:  Program 'AVE80' schedules the following AVE   **
C**               programs according to the "user selected"     **
C**               "data type" to be processed:                  **
C**                                                             **
C** LOGICAL FLOW:                 ------------                  **
C**                               |   AVE80   |                 **
C**                               ------------                  **
C**                                     |                       **
C**                     ---------------------------------       **
C**                      |          |          |          |      **
C**                    SND80      SGL80      GRD80      IMG80    **
C**                   (25-mb)    (S Lev)    (Grid )    (Image)  **
C**                                                             **
C** DATA Type:    Description                                   **
C**               ------------------------                      **
C**                1.    25-mb Data                             **
C**                2.    Single Level Data                      **
C**                3.    Grid Data                              **
C**                4.    Image Data                             **
C**                                                             **
C** DATA SETS:    Description                                   **
C**               ------------------------                      **
C**                1. AVE/AVESS                                 **
C**                2. AVE/SESAME                                **
C**                3. AVE/VAS                                   **
C**                4. OTHER                                     **
C**                                                             **
C** INPUTS:       Data Type (1-4)                               **
C**               Data Set  (1-4)                               **
C**                                                             **
C** OUTPUTS:      Generated from the Scheduled Programs:        **
C**                 o -- Skew T Profile Plot                    **
C**                 o -- Parameter Value Plot                   **
C**                 o -- Parameter Profile Plot                 **
C**                 o -- Wind Vector Plot                       **
C**                 o -- Wind Profile Plot                      **
C**                 o -- Wind Barb Plot                         **
C**                 o -- Printed Contour Profile                **
C**                 o -- Contour Plot                           **
C**                 o -- Printed Grid Profile                   **
C**                 o -- Color Image Display                    **
C**                 o -- Shaded Printed Image                   **
C**                                                             **
C*****************************************************************
```

4.2 SOUNDING DATA SOFTWARE -- "SND80" (HP-1000F VERSION)

This section details the "SND80" Sounding Data Software. This program operates on the HP-1000F Computer and generates graphical outputs to HP devices utilizing HP "Graphics 1000" Software Package. Below is a logical flow diagram of the "SND80" program along with the required input files and available outputs.

```
      FTN4X,L
      PROGRAM SND80  ("AVE S/W" SOUNDING DATA PROGRAM) HP-1000F VERSION
C*****************************************************************
C**                                                             **
C** DESCRIPTION:  Program 'SND80' processes a user selected     **
C**               25-mb Rawinsonde or Satellite data group      **
C**               and generates various printed and plotted     **
C**               outputs:                                      **
C**                                                             **
C** LOGICAL FLOW:                -------------                  **
C**                             |   SND80    |                  **
C**                              -------------                  **
C**                                    |                        **
C**                 ---------------------------------------     **
C**                 |      |      |      |      |      |      **
C**               SN180  SN280  SN380  SN480  SN580  SN680 **
C**              (SkewT) (Value) (Vectr) (Profl) (Sound) (B Map)**
C**                                                             **
C** DATA GROUPS:  1. Rawinsonde                                 **
C**               2. Satellite                                  **
C**                                                             **
C** INPUTS:       Array   Filenn  Description                   **
C**               ------  ------  ------------------------      **
C**               IQFIL   ?SND80  SND80 Question File           **
C**               IDFIL   *SNDDR  Directory File                **
C**               IRFIL   RMRS11  Random Access Data File       **
C**               IBFIL   RMLS11  Random Lat/Lon Data File      **
C**               ISFIL   SMDS11  Seq. Documentation File       **
C**               IMFIL   SMLS11  Sequential Lat/Lon File       **
C**                                                             **
C** OUTPUTS:      1. Plot  --  Skew T                   (SN180) **
C**               2. Plot  --  Parameter Values         (SN280) **
C**               3. Plot  --  Parameter Vectors        (SN380) **
C**               4. Plot  --  Parameter Profiles       (SN480) **
C**               5. Print --  Sounding Data            (SN580) **
C**               6. Plot  --  25-mb Station/Base Map   (SN680) **
C**                                                             **
C*****************************************************************
```

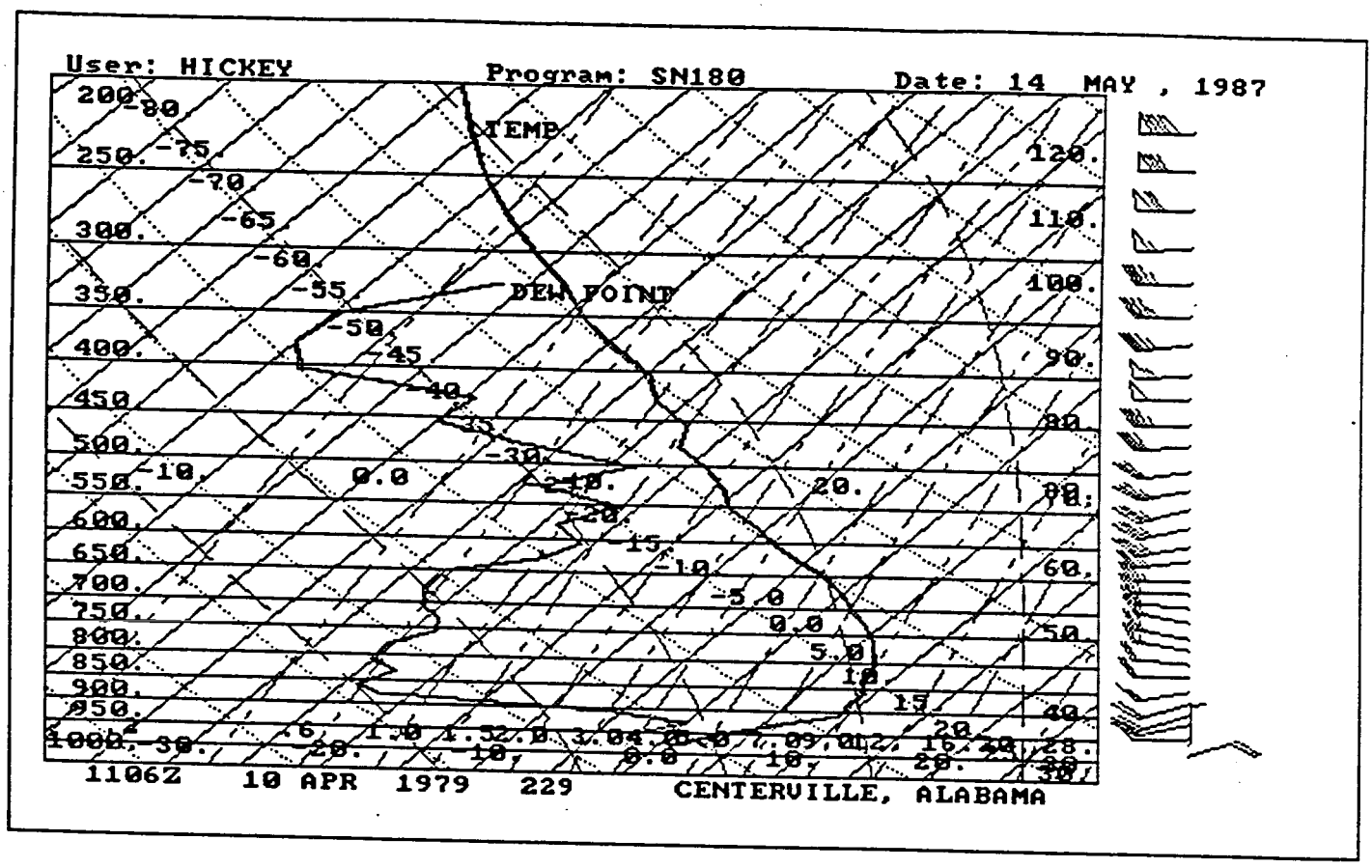
In the remainder of this section detailed examples generated by the "SND80" software along with complete "Operational Procedures" are provided.

```
::*AVE80::26

                    AVE80 -- Graphics S/W Loader
                                 |
                      ------------------------
                      | Graphics Device Mode? |
                      ------------------------
                                 |
           ----------------------------------------
           |                                      |
  ---------------------------------    ---------------------------------
  | 1-  HP-1000 Graphics S/W      |    | 2-  IBM PC/AT Graphics S/W    |
  ---------------------------------    ---------------------------------

 :PA,,ENTER Desired Graphics Mode? (TR,,1  or  TR,,2 )
:TR,,2

                 AVE80 -- ID Segment Loader
                           |
                  ------------------------
                  |   Basic Data Types:   |
                  ------------------------
                  |  1- Sounding Data     |
                  |  2- Single Level Data |
                  |  3- Grid Data         |
                  |  4- Image Data        |
                  ------------------------

 :PA,,ENTER Desired Data Type?(TR,,1 or TR,,2 or TR,,3 or TR,,4)
:TR,,1

                         The AVE80 Series
                   Interactive Graphics Package

                                By
                  ATSUKO COMPUTING INTERNATIONAL
                      (Revision:  05/05/87)

    AVE80 Series Programs -- Using HP-1000 & IBM PC/AT Graphics

 -------------------------------------------------------------
  Helpful Instructions for Running the AVE80 Interactive Programs
 -------------------------------------------------------------
  A) To Use the Default Values for any Question, simply hit Return.
  B) To Quit or Restart, Answer '999' for any Numeric Question.
 -------------------------------------------------------------

 PLEASE WAIT  SOUNDING PROGRAMS  ARE BEING LOADED!!

ENTER To Proceed Enter (P): P

                      AVE80 -- Task Scheduler
                                 |
                       ------------------
                       | PROJECT DATA SETS |
```

```
                    --------------------
                    |   1- AVE/AVESS     |
                    |   2- AVE/SESAME    |
                    |   3- AVE/VAS       |
                    |   4- Other         |
                    --------------------

ENTER Desired Data Set? (1 to 4) (Default=2): 2
                              |
                     ---------------
                     |SOUNDING DATA |
                     ---------------
                     | Categories:  |
                     | 1-Rawinsonde |
                     | 2-Satellite  |
                     |              |
                     ---------------

ENTER Desired Data Category? (1 to 2) (Default=1): 1

#n R-Data R-L/L  PR STA TM S-Docu S-L/L  AVE/SESAME (Raw) Time Per. YR .
-- ------ ------ -- --- -- ------ ------ --------------- --------- -- .
01 RMRS11 RMLS11 16 039 09 SMDS11 SMLS11 AVE-SESAME I     APR 10-11 79 .
02 RMRS21 RMLS21 16 040 09 SMDS21 SMLS21 AVE-SESAME II    APR 19-20 79 .
03*RMRS31 RMLS31 16 041 09 SMDS31 SMLS31 AVE-SESAME III   APR 25-26 79 .
04 RMRS41 RMLS41 16 042 09 SMDS41 SMLS41 AVE-SESAME IV    MAY 09-10 79 .
05 RMRS51 RMLS51 16 042 09 SMDS51 SMLS51 AVE-SESAME V     MAY 20-21 79 .
06*RMRS61 RMLS61 16 038 09 SMDS61 SMLS61 AVE-SESAME VI    JUN 07-08 79 .
07 RMRS12 RMLS11 16 039 09 SMDS12 SMLS11 ADJ SESAME I GJ  APR 10-11 79 .
08 RMRS52 RMLS51 16 042 10 SMDS52 SMLS51 ADJ SES V (SLU)  MAY 20-21 79 .

ENTER Desired Data Base? (1 to  8) (Default=1): 1

ENTER Display Documentation Page? (Y/N) (Default=N): N


*****************************************************************
*****    SND80 SERIES  --   SOUNDING GRAPHICS  PACKAGE    *****
*****************************************************************


Available Output Types:
 1-  Plot  -- Skew T Profiles                    (SN180)
 2-  Plot  -- Parameter Values                   (SN280)
 3-  Plot  -- Parameter Vectors                  (SN380)
 4-  Plot  -- Parameter Profiles                 (SN480)
 5-  Print -- Sounding Data                      (SN580)
 6-  Plot  -- Base Map Sounding Data             (SN680)


 ENTER Desired Output Type? (1 to 6) (Default=1): 1

 Available Output Devices:
  1-  IBM Graphics Terminal
  2-  HP 2623A Graphics Terminal
  3-  4-Pen Plotter     (LU#20)
  4-  8-Pen Plotter     (LU#18)


 ENTER Desired Device Type? (1 to 4) (Default=1): 1
```

```
ENTER Multiple Plots Desired (Batch Mode)? (Y/N) (Default=N): N
The Rawinsonde Stations participating in the (AVE-SESAME I) Experiment are:
01+ Centerville     ,AL    15+ Amarillo        ,TX    29- Concordia       ,KS
02+ Boothville      ,LA    16+ Albuquerque     ,NM    30- Durant          ,OK
03+ Jackson         ,MS    17+ Salem           ,IL    31- Fort Smith      ,AR
04+ Lake Charles    ,LA    18+ Dodge City      ,KS    32- Gage            ,OK
05+ Longview        ,TX    19+ Topeka          ,KS    33- Goodland        ,TX
06+ Victoria        ,TX    20+ Denver          ,CO    34- Junction        ,TX
07+ Stephenville    ,TX    21+ Peoria          ,IL    35- Monroe          ,LA
08+ Del Rio         ,TX    22+ Omaha           ,NE    36- Marfa           ,TX
09+ Midland         ,TX    23+ North Platte    ,NE    37- Morton          ,TX
10+ El Paso         ,TX    24- Abilene         ,TX    38- Raton           ,NM
11+ Nashville       ,TN    25- Bartlesville    ,OK    39- Oxford          ,MS
12+ Little Rock     ,AR    26- Columbia        ,MO    40  xxxxxxxxxxxxxxx,xx
13+ Monett          ,MO    27- Childress       ,TX    41  xxxxxxxxxxxxxxx,xx
14+ Oklahoma City   ,OK    28- College Station,TX     42  xxxxxxxxxxxxxxx,xx
Note:  (-) Special Network (SN), (+) National Weather Service (NWS)

Nine Soundings were taken at each of the above Stations:
 1--1200GMT 4/10/79     4--2100GMT 4/10/79     7--0600GMT 4/11/79
 2--1500GMT 4/10/79     5--0000GMT 4/11/79     8--0900GMT 4/11/79
 3--1800GMT 4/10/79     6--0300GMT 4/11/79     9--1200GMT 4/11/79


ENTER Print Detailed Station List To LU #6? (Y/N) (Default=N): N

ENTER Station Number & Time? (n,n) (Default= 1,1): 1,1

ENTER Use Default Color & Linestyle? (Y/N) (Default=Y): Y

ENTER Select Time & Date Label Positions? (Y/N) (Default=N): N

ENTER Wind Barbs Desired? (Y/N) (Default=Y): Y

ENTER Wind Barb Interval? (1-25mb,2-50mb,3-100mb) (Default=1): 1

ENTER Draw SKEW T Chart? (Y/N) (Default=Y): Y



ENTER Default SKEW T Chart Desired? (Y/N) (Default=Y): Y
```

ENTER Hard Copy of Plot Desired? (Y/N) (Default=N): Y



ORIGINAL PAGE IS
OF POOR QUALITY

```
S

ENTER Another SKEW T Plot Desired? (Y/N) (Default=N):



ENTER Continue AVE/SESAME Data Sets? (Y/N) (Default=N): N


ENTER Another Data Set or Category? (Y/N) (Default=N): N

 PLEASE WAIT  SOUNDING PROGRAMS  ARE BEING UNLOADED!!


 :PA,,ENTER Another Data Type Desired? (TR,,Y or TR,,N)
:TR,,N

 :*
 :* AVE80 Series Programs Completed!!!
 :*
 ::
```