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NASA TECHNICAL MEMORANDUM

NASA TM-78124

(NASA-TM-78124) MULTIPURPOSE INTERACTIVE
NASA INFORMATION SYSTEMS (MINIS) (NASA)
45 p HC A03/MF A01 CACL 05B

N77-28987

Unclas
40707

G3/82

MULTIPURPOSE INTERACTIVE NASA INFORMATION SYSTEM (MINIS)

By Data Systems Laboratory

June 1977

NASA



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1. REPORT NO. NASA TM-78124		2. GOVERNMENT ACCESSION NO.		3. RECIPIENT'S CATALOG NO.	
4. TITLE AND SUBTITLE Multipurpose Interactive NASA Information System (MINIS)				5. REPORT DATE June 1977	
				6. PERFORMING ORGANIZATION CODE	
7. AUTHOR(S)				8. PERFORMING ORGANIZATION REPORT #	
9. PERFORMING ORGANIZATION NAME AND ADDRESS George C. Marshall Space Flight Center Marshall Space Flight Center, Alabama 35812				10. WORK UNIT NO.	
				11. CONTRACT OR GRANT NO.	
12. SPONSORING AGENCY NAME AND ADDRESS National Aeronautics and Space Administration Washington, D. C. 20546				13. TYPE OF REPORT & PERIOD COVERED Technical Memorandum	
				14. SPONSORING AGENCY CODE	
15. SUPPLEMENTARY NOTES Prepared by Data Systems Laboratory, Science and Engineering					
16. ABSTRACT <p>The Multipurpose Interactive NASA Information System (MINIS) was developed to provide remote, interactive information retrieval capability for various types of data bases to be processed on different types of small and medium size computers.</p> <p>This report presents to the layman user an explanation of how to use the system for three different data bases: (1) Landsat Photo Look-Up, (2) Land-Use, and (3) Census/Socio-Economic. Each of the data base elements is shown together with other detailed information that a user would require to contact the system remotely, to transmit inquiries on commands, and to receive the results of the queries or commands.</p>					
17. KEY WORDS			18. DISTRIBUTION STATEMENT Unclassified - Unlimited		
19. SECURITY CLASSIF. (of this report) Unclassified		20. SECURITY CLASSIF. (of this page) Unclassified		21. NO. OF PAGES 45	22. PRICE NTIS

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MULTI PURPOSE INTERACTIVE NASA INFORMATION SYSTEM (MINIS)

SUMMARY

The Multipurpose Interactive NASA Information System (MINIS) was developed to provide remote, interactive information retrieval capability for various types of data bases to be processed on different types of small and medium size computers.

This report presents to the layman user an explanation of how to use the system for three different data bases: (1) Landsat Photo Look-Up, (2) Land-Use, and (3) Census/Socio-Economic. Each of the data base elements is shown together with other detailed information that a user would require to contact the system remotely, to transmit inquiries on commands, and to receive the results of the queries or commands. The user is guided step-by-step through each of the systems. However, the Land-Use System and the Census/Socio-Economic System are mostly combined because they are very similar.

I. INTRODUCTION

The MINIS is a remote, interactive information retrieval system designed to manage various types of data bases on small and medium size computers. The system will accommodate fixed-length records with up to 200 elements of data (fields) and as many individual records as mass storage of the host computer will permit.

The system presently accommodates three types of data bases: (1) Landsat photo-descriptive data look-up (approximately 190 000 records, each containing 28 elements of data); (2) land-use data (approximately 17 000 records, each containing 44 elements of data); and (3) census/socio-economic data (approximately 500 records, each containing 187 elements of data). MINIS is presently operable on two computers: Datacraft 6024/4 and NOVA.

MINIS is a modularly designed system that provides the capability to form sets, to perform mathematical calculations, to define new variables from combinations of data base fields and other variables, and to sum a field or a variable within a set.

The modular structure of MINIS is an efficient means of providing the existing features and functions as well as establishing a base to which additional features and functions may be added relatively easily. Some of the features of most interest to the user are:

1. User defined data base structure
2. User constructed output reports
3. Data base update capability
4. Mathematical calculations and manipulations
5. Save inquiries for re-use on call
6. Save report formats for re-use on call.

II. GENERAL INFORMATION

The MINIS is an interactive, remote, data management and information retrieval system especially developed for data bases on either small or medium size computers. Some of the features are:

Free form — provides the user the ability to create entirely new and different data bases and to have more control of the data base and of the formatting of the resultant output products.

Mathematical calculations — provides the user the ability to add, subtract, multiply, and divide at his discretion to produce the required results.

Batch processing — provides the user the ability to process batches of actions, when the situation warrants, in lieu of single actions or inquiries.

Error correction — provides the user the ability to add or delete individual records and to change any information within these records.

MINIS presently accommodates three different types of data bases: (1) Landsat photo-descriptive data, (2) land-use data, and (3) census/socio-economic data. The system is designed so that it is relatively simple to create other types of data bases and to process them.

III. SYSTEM OPERATING INSTRUCTIONS

Section III gives the instructions that apply to any and all systems. The detailed instructions for each system are discussed in Sections IV and V.

Operating definitions and instructions are as follows:

a. Information is retrieved from the data base in sets as determined by the user.

b. A set is a group of data records that have been lifted or selected from the data base by the first (original) command or inquiry into the system.

c. A command or inquiry is any instruction the user transmits into the system.

d. The user must define (name) each set and subset as required, but must not use: FROM, THRU, IF, THEN or ELSE. These words are reserved for special action by the system. All user-assigned names must always be to the left of the equal (=) character for the first usage, whether to establish a set or a subset. A name must not exceed six characters.

e. A subset is a group of records that have been lifted or selected from the original set.

f. After the original set has been established, constraints may be applied to the subset as required. They may be applied singly, or in multiples (a string) not to exceed 432 characters, including spaces. However, only 71 pairs of characters and spaces may be transmitted on a line, and there must be a colon (:) as the 72nd character. The colon may be used at any position on a line. The colon signals the system that more will follow on the next line.

g. Parentheses may be applied at any time when applying constraints to a subset. The parentheses signal the system to process the enclosed constraints as a single constraint.

h. A constraint is any command applied to the data base, original set, or subset that restricts or eliminates data within a set.

i. Always depress the carriage return (CR) key when the transmission is completed. This signals the system that the command is completed.

j. When the command is accepted, the system will respond with a greater than character (>). This is a prompter advising that the system is ready to accept the next command. The processing may be terminated after any prompter by transmitting QUIT. The system will respond with an R.

k. All alphabetic (A-Z), numeric (0-9), special characters (" , = , + , * , () , . , : , , , %) , and blank are accepted in a set or subset name.

l. In Sections IV and V, in the examples of processing, two abbreviations are used: U to designate the user transmitting and C to designate the system response.

m. Contacting the computer is determined by the requirements of the host computer. (The requirements for the photo-look-up (Landsat) system on the computer NOVA are discussed in Section IV, and the requirements for the land-use/census systems on the computer Datacraft are discussed in Section V.)

n. To execute the system, after making computer connections, the user must transmit MINIS. The system will respond with ENTER DATA BASE NAME (6 CHAR). The user may then transmit:

1. An existing data base name
2. An existing data base name followed by a question mark (?) to modify a data base.
3. A new data base name to create a new data file.¹

1. This should not be attempted without discussion and planning with a knowledgeable programmer.

o. When an existing data base name is transmitted, the system will respond with a prompter and the user may begin transmitting commands.

p. The following are additional features of the system:²

1. Create a new field or data base
2. Modify, delete, replace or list an existing field
3. Prepare special report formats properly headed
4. Save recurring messages, report formats, namelists, commands, etc., for recall as necessary
5. Modify, delete, replace or list these (items mentioned in subpart 4) when required
6. Total the values of a given field for each record in a set.

q. Each host computer has different functions for the control keys. Part m of Section IV explains the functions of the keys on the NOVA; part m of Section V explains the functions of the keys on the Datacraft. The CR key serves the same function on both computers. The user must depress the CR key when each transmission is completed. This signals the system that you have completed that transmission. The system will answer with a prompter.

r. Delimiters are provided within the system to limit the requested search time. This reduces the effort for the manual review of the transmitted information and the computation costs. These delimiters may be applied to a "string" of constraints in any sequence for any subset. These delimiters must be preceded by and followed by a period. The following delimiters are most effective in combining and applying constraints:

1. .AND. — When this is used in applying constraints, the system will search for the information that appears in both of the constraints.
2. .ANDNOT. — When this is used in applying constraints, the system will search for the information that fits the first constraint and does not fit the second.

2. This should not be attempted without discussion and planning with a knowledgeable programmer.

3. .EQ. — This is an abbreviation of "equal to." When used in applying constraints, the system will search for the information that is equal to the constraint following .EQ.

4. .GE. — This is an abbreviation of "greater than or equal to." When used in applying constraints, the system will search for the information that is greater than or equal to the constraint immediately following the .GE.

5. .GT. — This is an abbreviation of "greater than." When used in applying constraints, the system will search for the information greater than the constraint immediately following .GT.

6. .LE. — This is an abbreviation of "less than or equal to." When used in applying constraints, the system will search for the information that is less than or equal to the constraint immediately following the .LE.

7. .LT. — This is an abbreviation of "less than." When used in applying constraints, the system will search for the information that is less than the constraint immediately following .LT.

8. .NAND. — This is an abbreviation of "not and." When used in applying constraints, the system will search for the information for which the first constraint does not apply or the second constraint does not apply.

9. .NE. — This is an abbreviation of "not equal to." When used in applying constraints, the system will search for the information that is not equal to the constraint following .NE.

10. .NOR. — This is an abbreviation of "not or." When used in applying constraints, the system searches for the information for which the first constraint does not apply and the second constraint does not apply.

11. .NOT. — When this is used in applying constraints, the system will list the opposite of the constraint following .NOT.

12. .OR. — When this is used in applying constraints, the system will search for the information that appears in both constraints, before and after .OR., except duplicate records.

13. .ORNOT. — When this is used in applying constraints, the system will search for the information for which either the first constraint does apply or the second constraint does not apply.

14. .XOR. — This is an abbreviation of "exclusive or." When used in applying constraints, the system will search for the information of both constraints, before and after .XOR., that are not duplicates.

15. FROM THRU — A form of "short hand" to enable you to "bracket" information, as xxxxx FROM xxx THRU xxxx.

s. The on-site user of MINIS has the option of listing the outputs on a line printer if the computer is so equipped. Remote users do not have this option.

t. The system produces several types of messages, depending on the situation. Table 1 gives a list of these messages. The list may be added to, deleted from, or changed to a maximum of messages.

IV. PHOTO-LOOK-UP INSTRUCTIONS

The following detailed instructions apply specifically to the indicated system and are in addition to the general instructions in Section III:

a. The system is a remote, interactive, information retrieval system. The data base contains selected descriptive information of all Landsat images.

b. Information is obtained from the data base when the user transmits either the Observation Identification Number (OBVID) or one of two kinds of sets of geographic coordinates.

c. There are only three commands available to establish an original set; OBVID, AREA, and POINT.

1. The OBVID command requires only the Observation Identification Number of the image, e.g., 1234-56789. The system will automatically locate and list the information.

TABLE 1. MESSAGES

ORIGINAL PAGE IS
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NUMERIC INPUT ERROR,
FIELD DEFINITION SETUP,
ENTER OPERATION TYPE, (ADD, DELETE, EXIT, LIST, MODIFY, OR REPLACE)
OK?

ENTER FIELD ID TO BE DELETED,
WARNING! THIS IS A KEY FIELD, DELETE REFERENCES FIRST
ENTER FIELD ID TO BE REPLACED,
FIELD ID DELETED,
NO SUCH FIELD NAME,
INPUT NEW FIELD LABEL,
FIELD ID CONFLICT,
INPUT FIELD TITLE IF DIFFERENT, BLANK LINE IF SAME,
ENTER DATA TYPE NUMBER, (SEE OPERATORS MANUAL)
ENTER FIELD SIZE IN BITS (IN BYTES IF TEXT DATA)
ENTER FIRST BIT POSITION OF FIELD IN RECORD, (BYTE NO, IF TEXT DATA)
ENTER NO. OF BITS IN SUBFIELD, IF ANY,
ENTER NO. OF REPEATS, IF ANY,
ENTER FIELD NO. OF KEY, IF ANY,
ENTER VALUE OF KEY FOR PRESENCE OF THIS FIELD, (1-15)
ENTER NORMAL OUTPUT FORMAT FIELD WIDTH OR REPEAT COUNT,
ENTER LETTER FOR FORMAT TYPE,
ENTER SIGNIFICANT PLACES OR CHARACTERS PER WORD,
IS THIS THE IDENTIFIER FIELD? (Y OR N)
ENTER FIELD ID TO BE MODIFIED,
FIELD DEFINITION OPERATION COMPLETE,
SAVE FIELD DEFINITION CHANGES? (Y OR N)
ENTER FIELD ID TO BE LISTED, (ALL TO LIST ALL ID#)
FIELD TITLE:
THIS IS THE IDENTIFIER FIELD,
ILLEGAL INPUT,
TOO MANY MESSAGES,
MESSAGE MANAGER, INPUT OPERATION CODE,
ILLEGAL OPERATION, ENTER FIRST LETTER OF ONE OF THE FOLLOWING OPERATIONS: ADD, INSERT, REPLACE, DELETE, EXIT, PACK,
LIST, OR CHANGE,
ENTER MESSAGE NUMBER, IF KNOWN,
ENTER LAST MESSAGE TO LIST,
MESSAGE ALREADY EXISTS FOR THAT NUMBER,
ILLEGAL MESSAGE NUMBER,
ENTER MESSAGE TEXT, INDENT WITH LEADING SPACES, TERMINATE WITH A BLANK LINE,
ALL BLANK IS NOT A MESSAGE,
MESSAGE FILE PACK IS COMPLETE,
LAST MESSAGE NUMBER IS LESS THAN THE FIRST,
ENTER NEW MESSAGE NUMBER,
ENTER CONVERSION CODE, IF ANY,
ILLEGAL SYMBOL
TOO MANY SYMBOLS IN SENTENCE
TOO MANY CHARACTERS IN SENTENCE
SYMBOL TABLE OVERFLOW
CONSTANT TABLE OVERFLOW
ILLEGAL CONSTANT
SYNTAX ERROR
ERROR IN GENERATING EXECUTION STACK
ERROR IN CALL TO OUTPUT,
ERROR IN CALL TO SUBSET,
ENTER FIELD NAME:
FIELD IS NOT INDEXED,
ENTER ACTION (GENERATE, UPDATE, DELETE, NONE):
INPUT ERROR,
ENTER INDEX LEVEL
LEVEL DOES NOT EXIST

TABLE 1. (Concluded)

REAL FIELDS CANNOT BE INDEXED,
 PRECEDING LEVEL DOES NOT EXIST,
 LEVEL ALREADY PRESENT,
 TO ALSO DELETE EXISTING HIGHER LEVELS, ENTER 'PROCEED';
 ENTER NUMBER OF SEGMENTS;
 OTHERWISE, CARRIAGE RETURN,
 ENTER WORK AREA(DISC OR TAPE);
 TO ALSO UPDATE EXISTING HIGHER LEVELS, ENTER 'PROCEED';
 DATA BASE TOO LARGE TO INDEX,
 INDEXED FILE MISSING,
 TOO MANY INDEX FILES,
 EXIT OR CONTINUE;
 ENTER DEVICE NUMBER;
 HORIZONTAL OR VERTICAL LISTING ON VIT
 THIS FIELD IS IN SEQUENTIAL ORDER AND DOES NOT NEED TO BE INDEXED
 IS THIS FIELD SEQUENTIAL ON THE DATA BASE(Y OR N)?
 THIS FIELD IS IN SEQUENTIAL ORDER ON THE DATA BASE
 ADJUST FIRST BIT POSITION FOR SUCCEEDING FIELDS (Y OR N)?
 ENTER LATITUDE;
 ENTER LONGITUDE;
 MONTH IS IMPERATIVE ON THIS DATA BASE,
 ENTER LOWER LATITUDE;
 ENTER UPPER LATITUDE;
 ENTER SMALLER LONGITUDE;
 ENTER LARGER LONGITUDE;
 INTERNAL BUFFER OVERFLOWED, PARTIAL SET FOLLOWS,
 NO PHOTOS FOUND,
 ENTER NAMELIST TITLE;
 TITLE IS USED FOR ANOTHER TYPE TITLE,
 TITLE ALREADY EXISTS,
 TITLE DOES NOT EXIST,
 TITLE FILE FULL,
 ENTER NEW TITLE(LEAVE BLANK TO KEEP SAME TITLE);
 ENTER HEADER TITLE;
 ENTER FORMAT TITLE;
 ENTER SAVE TEXT TITLE;
 ENTER MAGIC WORD
 DO NOT ADJUST UNLESS YOUR DATA BASE HAS NO OVERLAPPING FIELDS AND FIELD NUMBERS CORRESPOND TO THE ORDER OF THE
 FIELDS ON THE DATA BASE RECORDS,
 ENTER THE NUMBER OF BYTES IN THE DATA BASE RECORD(BLANK IF NO CHANGE);
 FIELD DEFINITIONS MUST BE ENTERED BEFORE EXECUTING CREATE,
 DEFAULT OF MANUAL OPERATION(Y OR N)?
 ENTER INPUT INFORMATION CARD(SEE USER'S MANUAL FOR FORMAT).
 PUT INPUT DATA INFORMATION DECK IN CARD READER, WHEN READY, ENTER A CONTROL Wdg.,
 INCORRECT RAW DATA INPUT DEVICE(MUST BE CARDS, TAPE, OR DISC),
 ENTER NO. OF RAW DATA RECORDS;
 PUT OPERATION DECK IN CARD READER, WHEN READY, ENTER A CONTROL Wdg.,
 MORE THAN 500 ELEMENTS,
 ENTER FIELD NAMES TO SORT(BLANK IF NO SORT); SORTS WILL BE DONE IN THE ORDER FIELDS ARE ENTERED, MAXIMUM OF
 FIELDS,
 ENTER FIELD NAME TO MERGE(BLANK IF NO MERGE);
 MORE THAN 300 INTERMEDIATE EQUATIONS,
 FIELD NUMBER GREATER THAN 200,
 MORE THAN 500 QUADS FORMED,
 RAW DATA FILE COULD NOT BE FOUND,
 ENTER NO. OF RECORDS ON DATA BASE FILE(BLANK IF NO CHANGE);

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2. The AREA command requires four coordinates: two latitudes (35N 38N) and two longitudes (97W 101W). These coordinates establish a rectangular area. The system will locate all photo records with the center coordinate (points) within this area, name the set AREASET, and list the information on command.

3. The POINT command requires only one latitude (40S) and one longitude (85E). The system locates all photo records that cover the coordinate area, names the set POINTSET, and lists the information on command.

4. The system will request the coordinates in a predetermined sequence: i.e. ,

POINT — ENTER LATITUDE

ENTER LONGITUDE

AREA — ENTER LOWER LATITUDE

ENTER UPPER LATITUDE

ENTER SMALLER LONGITUDE

ENTER LARGER LONGITUDE

Commands transmitted after either of these form subsets.

d. There are four programmed commands that may be transmitted when necessary:

1. INSERT(LIST) — Signals the system to list immediately the information which results from the SETOUT command in a standard predetermined format which is shown in subpart 6 of part o.

2. INSERTL(LIST) — Signals the system to respond with:

C - :

C - : THE SET TO BE OUTPUT SHOULD BE NAMED SETOUT
OUTPUT (SETOUT, IDSMER, HEDMER, FORMER)

After this response, the system will list the information (part e) in the standard format as shown in subpart 1 of part o.

3. OUTPUT — Signals the system to list the set and the information enclosed in parenthesis that follow OUTPUT. This command must be used to obtain information that is not standard, i. e., OUTPUT (SET1, SAT, DSC, HHMMS). See the explanation in part f.

4. SETOUT — Signals the system that you are ready for the results of your commands, i. e., SETOUT=POINTSET.

e. The standard information that will be listed (referenced in subpart 1 of part d) are:

Observation identification number

Orbit number

MSS roll number

MSS position number 1-4

Latitude

Longitude

Cloud cover (percent)

Microfilm roll number (browse file)

Microfilm position number (browse file)

Date (image taken)

f. Occasionally the previous information in part e may not be required. In that event, transmit the abbreviated names of the required information. These names are listed in part 1, e. g., OUTPUT (SAT, DSL, HHMMS, M1QUAL). This command will list the Observation Identification Number (SAT, DSL, HHMMS) and the resolution quality of the MSS-camera-position-1 image.

g. The Observation Identification Number is composed of: satellite number (1st character), days since launch (2-4 characters), hours (5-6 characters), minutes (7-8 characters) and seconds (9th character). The seconds represent tens of seconds.

h. Landsat-1 has returned images greatly in excess of the expected production, forcing an additional reference number to represent these images. The data base will reflect 1 and 5 for Landsat-1, and will reflect 2 for Landsat-2 images.

i. The system will accept coordinates in degrees, degrees and minutes, and tenths of degrees. The degrees and minutes may be separated by blank, comma, N, S, E, W, or D. North may be specified as N, +, or blank; South as S or - (minus); East as E or - (minus); and West as W or blank.

j. When ready for the system to list the results of the commands, transmit SETOUT = (whatever). The system will respond with SET NAMED SETOUT HAS XX MEMBERS. The X's represent the actual number.

k. Cloud cover is always regarded as percent.

l. The information in the data base is listed in Table 2. When information other than that shown in part e is required, transmit the abbreviation corresponding to the required information as shown in Table 2.

m. The control characters are functions of the NOVA computer and may vary on other computers:

1. Control A — When transmitting and, for any reason, needing to go back to the system starting point, depress the Control key and the letter A simultaneously. The system will respond with an R; you then transmit MINIS.

2. Shift L — When an error is made in transmitting a line, depress the Shift key and the letter L simultaneously. The system will answer with a back-slash (/); you then retransmit the command (line).

3. Rub-out — When an error is made in transmitting characters, depress the Rub-out key for each character back to the last correct character. The system will respond with a backarrow (←); you then retransmit the correct characters to the end of the command.

4. Colon — The colon (:) signals the system that the line of transmission ended and that the context will continue on the next line. The system will respond with a > on the next line. Continue transmitting the command. Only 71 pairs of characters and spaces can be typed on a line. The 72nd character position is reserved for the colon unless this position completes the command. A colon may be transmitted at any position on a line.

TABLE 2. DATA BASE FIELD NAMES FOR PHOTO-LOOK-UP SYSTEM

Field Names	Explanation
SAT	SATELLITE NUMBER
DSL	DAYS SINCE LAUNCH
HHMMS	HOURS MINUTES SECONDS
ORBNUM	ORBIT NUMBER
LAT	LATITUDE IN DEGREES, MINUTES, SECONDS
LON	LONGITUDE IN DEGREES, MINUTES
DATE	DATE OF OBSERVATION
CC	CLOUD COVER
ARCHVAL	ARCHIVAL ROLL NUMBER
M1POSN	MSS 1 POSITION NUMBER
M2POSN	MSS 2 POSITION NUMBER
M3POSN	MSS 3 POSITION NUMBER
M4POSN	MSS 4 POSITION NUMBER
MFROLL	MICROFILM ROLL NUMBER (MSS)
MFPOSN	MICROFILM POSITION NUMBER
REGION	BLOCK INDICATOR
RBVID	STATION ID-RBV
MSSID	STATION ID-MSS
RBMODE	TRANSMISSION MODE-RBV
MSMODE	TRANSMISSION MODE-MSS
R1QUAL	QUALITY RBV BAND 1
R2QUAL	QUALITY RBV BAND 2

TABLE 2. (Concluded)

Field Names	Explanation
R3QUAL	QUALITY RBV BAND 3
M1QUAL	QUALITY MSS BAND 1
M2QUAL	QUALITY MSS BAND 2
M3QUAL	QUALITY MSS BAND 3
M4QUAL	QUALITY MSS BAND 4
M5QUAL	QUALITY MSS BAND 5

n. System contact is determined by the requirements of the host computer. The following procedures are required by NOVA computers and are shown for instruction only. (Note: Always depress the Carriage Return key (CR) after each transmission.)

U - MINIS

C - ENTER DATA BASE NAME (6 CHAR.)

U - LANDSAT

C - >(prompter).

o. At this point the system is ready to accept the original information command on the same line as the prompter. (Note: There are only three information commands the system will accept: OBVID, AREA, POINT.)

1. OBVID — This command will direct the system to produce the standard information for the OBVID that is transmitted. The input dialog is:

C - >

U - OBVID(XXXX,XXXXX)

(Note: The X's are the actual OBVID number.)

Example:

>OBVID(1079,15015)

OBSRV'N-ID	ORB	ROLL.POS 1-4	LAT	LONG	CC	MFR /POSN	MODAYR
1079-15015	1100	9004, 35, 73,111,149	76N38	37W38	70	20005/	988101072

2. AREA — This command will direct the system to locate all coordinates in the rectangular area within the four input coordinates. An input dialog is:

```
C - >
U - AREA ( same line as prompter)
C - ENTER LOWER LATITUDE:
U - 30 10 N
C - ENTER UPPER LATITUDE:
U - 35 N
S - ENTER SMALLER LONGITUDE:
U - 85 E
C - ENTER LARGER LONGITUDE:
U - 88 30 E
C - SET NAMED AREASET HAS 74 MEMBERS.
```

Example:

```
>AREA
  ENTER LOWER LATITUDE:
30 10N
  ENTER UPPER LATITUDE:
35N
  ENTER SMALLER LONGITUDE:
85E
  ENTER LARGER LONGITUDE:
88 30E
SET NAMED AREASET HAS 74 MEMBERS.
```

3. POINT — This command will direct the system to locate all of the coordinates that are the same as the input coordinates. The input format is:

```
C - >
U - POINT (same line as prompter)
C - ENTER LATITUDE:
U - 28 45 N
```

C - ENTER LONGITUDE:

U - 81 15 W

C - SET NAMED POINTSET HAS 11 MEMBERS.

Example:

>POINT

ENTER LATITUDE:

28 45N

ENTER LONGITUDE:

81 15W

SET NAMED POINTSET HAS 11 MEMBERS.

4. Information by Satellite — Occasionally the user may have a requirement for coordinate information for a particular satellite (1, 2, or 5). In this event, the dialog may be:

C - >

U - SET1=AREASET.AND.SAT.EQ.X

(Note: The X designates the satellite number 1, 2, or 5.)

Example:

>SET1=AREASET.AND.SAT.EQ.2

5. Constraints — Constraints are used to 'weed out' or by-pass unnecessary, unsatisfactory, or unwanted information. They may be applied after any prompter from the system. The original command for information (OBVID, AREA, POINT) is a constraint to the data base. All other constraints are applied to the original set.

The system will recognize latitude and longitude, cloud cover, orbit number, OBVID, days since launch, and photo date as constraints.

For further explanation refer to the AREA example. We will apply constraints to the original set. The dialog may be:

(a) Constraint A:

C - >

U - SET1=AREASET.AND.CC.LT.50

C - SET NAMED SET1 HAS 58 MEMBERS.

Example:

```
>SET1=AREASET,AND,CC.LT.50
  SET NAMED SET1      HAS      58 MEMBERS
```

(b) Constraint B:

C ->

U - SET2=SET1.AND.DATE.GT.9;30;72

C - SET NAMED SET2 HAS 39 MEMBERS

Example:

```
>SET2=SET1.AND.DATE.GT.9;30;72
  SET NAMED SET2      HAS      39 MEMBERS
```

(c) Constraint C:

C ->

U - SET3=SET2.AND.DATE.LT.1;1;73

C - SET NAMED SET3 HAS 20 MEMBERS.

Example:

```
>SET3=SET2,AND,DATE.LT.1;1;73
  SET NAMED SET3      HAS      20 MEMBERS
```

(d) Constraints combined: The system is designed so that constraints may be combined in lieu of separately as previously shown. The following example reflects the dialog of combining constraints.

Example:

```
>SET1=AREASET,AND,CC.LT.50,AND,((DATE.GT.11;30;72;
>.AND,DATE.LT.1;1;73),OR,(DATE FROM 3;01;73 ;
>THRU 3;31;73))
  SET NAMED SET1      HAS      10 MEMBERS
```

6. Output Request (List) — At any time after the original set has been established, AREA or POINT, the user may have the information listed. There are four commands as explained in part d. The following are examples of each of these commands.

(a) SETOUT:

```
>SETOUT=SET1
  SET NAMED SETOUT   HAS      58 MEMBERS
```

(b) INSERT(LIST):

```
>INSERT(LIST)
```

OBSRV'N-ID	ORB	ROLL.POS 1-4	LAT	LONG	CC MFR /POSN	MODAYR
1084-15445	1170	9201.112,135,158,181	30N17	85W13	40 10004/	657101572
1085-15494	1184	9303. 77,110,143,176	33N11	85W47	30 10004/	694101672
1085-15501	1184	9303. 78,111,144,177	31N46	86W13	0 10004/	695101672
1085-15503	1184	9303. 79,112,145,178	30N20	86W37	0 10004/	696101672
1086-15550	1198	9305.174,197,220,243	34N34	86W49	40 10004/	731101772

(c) INSERTL(LIST):

```
>INSERTL(LIST)
```

```
:
: THE SET TO BE OUTPUT SHOULD BE NAMED 'SETOUT'
: OUTPUT(SETOUT,IDSMEP,HEDMER,FORMER)
```

OBSRV'N-ID	ORB	ROLL.POS 1-4	LAT	LONG	CC MFR /POSN	MODAYR
1084-15445	1170	9201.112,135,158,181	30N17	85W13	40 10004/	657101572
1085-15494	1184	9303. 77,110,143,176	33N11	85W47	30 10004/	694101672
1085-15501	1184	9303. 78,111,144,177	31N46	86W13	0 10004/	695101672
1085-15503	1184	9303. 79,112,145,178	30N20	86W37	0 10004/	696101672
1086-15550	1198	9305.174,197,220,243	34N34	86W49	40 10004/	731101772
1086-15553	1198	9305.175,198,221,244	33N09	87W15	30 10004/	732101772

(d) OUTPUT:

(1) Selected Information:

```
>OUTPUT(SETOUT,SAT,DA_SL,HHMS,CC,MFROLL,;
>MFPOSN,M1QUAL,M2QUAL)
```

SAT	DSL	HOURS	MINU	CC	MICROFILM	MICROFILM	M1QUAL	M2QUAL
		TES	SECOND	ROLL	NUMBE	POSITION		
1	084		15445	40	10004	657	2	2
1	085		15494	30	10004	694	2	2
1	085		15501	0	10004	695	2	2
1	085		15503	0	10004	696	4	4
1	086		15550	40	10004	731	2	2

(2) All Information:

>OUTPUT (SETOUT, ALL)

S	D	H	U	L	LON	PHRUM	DATE	C	ARCHVAL	M	M	M						
A	S	M	R	A				C		1	2	3						
T	L	M	B	T						P	P	P						
		M	N							O	O	O						
		S	U							S	S	S						
			M							N	N	N						
1	084	15445	1170	30N17	85W13		0 10-15-72	40	9201.	112	135	158						
1	085	15494	1184	33N11	85W47		0 10-16-72	30	9303.	77	110	143						
1	085	15501	1184	31N46	86W13		0 10-16-72	0	9303.	78	111	144						
	m	MFROLL		M	R	R	M	R	M	R	R	M	M	M	M	S		
	4			F	E	B	S	B	S	1	2	3	1	2	3	4	5	A
	P			F	G	V	S	M	M	Q	Q	Q	Q	Q	Q	Q	Q	T
	D			U	I	I	I	O	O	U	U	U	U	U	U	U	U	2
	S			S	O	D	D	D	D	A	A	A	A	A	A	A	A	B
	N			N	N			E	E	L	L	L	L	L	L	L	L	
	181	10004	657	1	0	2	0	1	0	0	0	2	2	2	4	0	1	
	176	10004	694	1	0	2	0	1	0	0	0	2	2	2	2	0	1	
	177	10004	695	1	0	2	0	1	0	0	0	2	2	2	2	0	1	

7. Terminate — Dialog may be terminated after any system prompter by transmitting QUIT. The system responds with an R.

8. Errors — Occasionally mistakes will be made during transmission. The system provides three methods to correct them:

(a) Character Error: When an erroneous character is transmitted, depress the Rub-out key for each character and space through the incorrect characters. The system will respond with a backslash, dash, backarrow, etc. depending on the terminal device. Continue transmitting on the same line for each backslash, dash, etc. See subpart 3 of part m for Rub-out key explanation.

(b) Line Error: When an error is made in transmitting a line and before the CR key is depressed, depress the Shift key and the letter L simultaneously. The system will answer with a backslash, dash, backarrow, etc. depending on the terminal device. Continue transmitting on the same line. See subpart 2 of part m for Shift L key explanation.

(c) Statement Error: Occasionally it may be necessary to return to the system starting point. In this event one must depress the Control key and the letter A simultaneously. The system will respond with an R; then one must transmit MINIS.

V. LAND-USE/CENSUS INSTRUCTIONS

These detailed instructions are in addition to the system Operating Instructions in Section III. The two systems, Land-Use and Census, are combined because they are basically similar in structure and in operation.

Instructions are as follows:

a. The systems are remote, interactive, information retrieval systems with mathematical calculation and manipulation capability.

b. The data bases contain coded alphabetic and numeric data for:

1. Land-use and natural resources inventory for each UTM cell.

2. Census/socio-economic information, such as, population, education, income, avocation, etc., for each district enumerated in the census.

c. Information is obtained from the data base by field name (see part j) and by the set names which the user assigns to establish sets and subsets.

d. The system is constructed so that any area (state, county, city, region, etc.) may have created either or both of the data bases described in part b from the data that are available from the records for that area.

e. The information shown in the following parts are for instruction purposes only. They are actual inquiries into the Land-use and Census Systems of the Tennessee State Planning Office.

f. Control Characters:

1. Control G — When incorrect data are transmitted that cannot be interpreted, the system will respond with IRL-XXX (X being the incorrect data). In this event, depress and hold the Control key and type G. The system will

respond with ENTER ID CODE. The Control G combination may also be used to "reinitialize" the system (i. e., to return it to a new beginning) after the STOP response.

2. Control S — At any time you desire to cease transmitting, depress the Control key and type S. This action will force the system to respond with a \$. You type GO and the program will be restarted. The system will respond with ENTER DATA BASE NAME (6 CHAR). This allows you to escape from MINIS and return without reinitializing the system.

3. Control U — In the event you type a complete line erroneously, depress the Control key and type U. This will delete the complete line. The system will respond with an @. You begin typing as if starting in Column 1.

4. Carriage Return — At the completion of each of your instructions you must depress the Carriage Return key. This signals the system that you have completed that transmission. The system will reply with a ding sound and a response to your transmittal.

5. Rubout — This key when depressed will delete the last character typed. The system responds with a backslash (/). Additional depressions of this key will delete each character one-by-one to the start of the line.

g. Mathematical/Arithmetic Functions:

1. The arithmetic operators follow the normal order of precedence (exponentiation before multiplication, or division before addition or subtraction), except when grouped with parentheses. Parenthetical expressions are always evaluated beginning with the innermost set of parentheses. At any level of evaluation, operations of the same order of precedence are evaluated from right to left. Thus $A + B + C$ is equivalent to $A + (B + C)$.

The arithmetic operators are listed below, along with their meanings and numbers indicating their order of precedence.

**	Exponentiation	1
*	Multiplication	2
/	Division	2
+	Addition	3
-	Subtraction	3

Examples:

(a) SET1=HOUSES.GT.2*(5+3)

This function forms the set of records from the data base for which the field HOUSES contain a number greater than 16.

(b) PPLPSM=PPL2HS*HOUSES*2.6

PPLPSM was first defined as the product of the two fields PPL2HS and HOUSES and the constant 2.6. Any time PPLPSM is referred to in later commands, the number of people per square mile in a cell will be calculated by multiplying the number of people per household times the number of households in a square meter cell times 2.6.

2. The system is capable of assigning weight factors to each cell in a previously established set. The user assigns point values (+ or -) to the required constraints. The system will add or subtract these values for the presence or absence of selected attributes.

Examples:

(Note: The > is a prompter from the system; the user transmits all other information.)

(a) >POINTS=0

>IF GWQUAL.EQ.1 THEN POINTS=POINTS+10

(b) >IF LANFIL.EQ.'S' THEN POINTS=POINTS+10 ELSE
POINTS=POINTS-10

h. Several names have been preprogrammed to perform predetermined functions when transmitted:

1. SUMSET — Directs the system to add the values and to list automatically the results of the names enclosed in parentheses; i.e., SUMSET=(XXXXXX.AND.XXXXXX). The X's designate the set or field names.

2. CNGTAX — Directs the system to compute the change in tax rate from 1973 to 1974.

i. The system will produce a standard format product. If a nonstandard format is required (see part p of Section III), the user must transmit the data base names of the information required, i. e. ,

U — OUTPUT(CROWDED, CELLID, COUNTY, SLOPE, RODFIL, TRAZON)

The following fields are output for each cell in the set CROWDED. (See part l for an example.)

CELLID - UTM cell designator

COUNTY - County Code

SLOPE - Soil Slope

RODFIL - Roadfill Source

(TRAZON) - Transportation Area Zone

j. Table 3 gives in separate parts the data base field names which are peculiar to the Land-Use System and the Census/Socio-Economic System. (Note: The 'w' shown in the Field Name column represents a % sign.)

k. To contact the system (log-on) is determined by the requirements of the host computer. The following procedures are required by the Datacraft 6024 computer and are shown for instruction only.

When contact is made with the Datacraft the computer will:

C - \$

U - EXEC OLDMAN

C - ENTER DATA BASE NAME (6 CHAR)

U - LNDUSE (or CENSUS)

C - >(prompter)

Example:

```
$EXEC OLDMAN
ENTER DATA BASE NAME (6 CHAR)
LNDUSE
```

TABLE 3. DATA BASE FIELD NAMES FOR LAND-USE/ CENSUS
SOCIO-ECONOMIC SYSTEMS

Land-Use System FIELD NAME	FIELD TITLE
ZONEV0	UTM ZONE NUMBER,
CELLID	UTM CELL DESIGNATOR,
HOUSES	NUMBER OF OCCUPIED HOUSEHOLDS,
PPL2HS	PEOPLE PER HOUSEHOLD,
COUNTY	COUNTY CODE,
DEVDIS	DEVELOPMENT DISTRICT,
SMSA	STANDARD METROPOLITAN STATISTICAL AREA,
CONG	TENNESSEE CONGRESSIONAL DISTRICT,
CENSJS	CENSUS COUNTY DISTRICT,
SOIL	SOIL ASSOCIATION GROUP,
RIVER	RIVER BASIN CODE,
BASIN	RIVER BASIN CODE, (TOGETHER WITH RIVER)
SCHOOL	EDUCATIONAL FACILITY,
OWNER	OWNERSHIP,
LANUS1	PRIMARY LAND USE OF CELL,
LANUS2	SECONDARY LAND USE,
SLOPE	SOIL SLOPE,
DEPTH	DEPTH TO BEDROCK,
PERME	PERMEABILITY,
AASHJ	ENGINEERING CLASS,
SEPTIC	SEPTIC TANK LIMITS,
LANDFIL	LANDFILL LIMITS,
TOPSOIL	TOPSOIL SOURCE,
ROADFIL	ROADFILL SOURCE,
SWQUAL	GROUND WATER QUALITY,
SWQUAN	GROUND WATER QUANTITY,
SWQUAN	SURFACE WATER QUANTITY,
FLD100	100 YEAR PROBABILITY OF FLOOD,
SWQUAL	SURFACE WATER QUALITY PROBLEMS,
CENWAT	CENTRAL WATER SYSTEM AVAILABLE,
CENSEW	CENTRAL SEWER SYSTEM AVAILABLE,
AIRPRT	AIRPORT,
ECOGEO	ECONOMIC GEOLOGY,
HISITE	HISTORIC SITES PRESENT,
NATURL	NATURAL AREAS PRESENT,
GEOCAR	GEOLOGICAL CHARACTERISTICS,
ROADS	ROAD CHARACTERISTICS,,
KARST	KARST FEATURES PRESENT,
EASTIN	EASTING,
NORTHIN	NORTHING,
URBZON	URBAN AREA ZONE
TRAZON	TRANSPORTATION AREA ZONE
SLOPEX	SLOPE MULTIPLIER

TABLE 3. (Continued)

Census/Socio-Economic System

FIELD NAME	FIELD TITLE
POR70	1970 TOTAL POPULATION
SQMI LE	NUMBER OF SQUARE MILES
PPSQM	POPULATION PER SQUARE MILE
PAG04	POPULATION AGE 0 TO 4 YEARS
VPAG04	PERCENT POPULATION AGE 0 TO 4 YEARS
PAG514	POPULATION AGE 5 TO 14 YEARS
VPAG514	PERCENT POPULATION AGE 5 TO 14 YEARS
PA1524	POPULATION AGE 15 TO 24 YEARS
JPA1524	PERCENT POPULATION AGE 15 TO 24 YEARS
PA2534	POPULATION AGE 25 TO 34 YEARS
JPA2534	PERCENT POPULATION AGE 25 TO 34 YEARS
PA3544	POPULATION AGE 35 TO 44 YEARS
JPA3544	PERCENT POPULATION AGE 35 TO 44 YEARS
PA4564	POPULATION AGE 45 TO 64 YEARS
JPA4564	PERCENT POPULATION 45 TO 64 YEARS
PA65UP	POPULATION AGE 65 YEARS AND OVER
JPA65UP	PERCENT POPULATION 65 YEARS AND OVER
PAGALL	POPULATION ALL AGES
PWHITE	WHITE POPULATION
JPWHITE	PERCENT WHITE POPULATION
PNONW	NONWHITE POPULATION
JPNONW	PERCENT NONWHITE POPULATION
PMALE	MALE POPULATION
JPMALE	PERCENT MALE POPULATION
PFEMAL	FEMALE POPULATION
JPFEMAL	PERCENT FEMALE POPULATION
FAMILYS	TOTAL NUMBER OF FAMILIES
FAVINC	MEDIAN FAMILY INCOME
FP00R	FAMILIES BELOW POVERTY LEVEL
JFP00R	PERCENT FAMILIES BELOW POVERTY LEVEL
F03999	FAMILIES WITH INCOME \$0 TO 3999
JF03999	PERCENT FAMILIES WITH INCOME \$0 TO 3999
F45999	FAMILIES WITH INCOME \$4000 TO 6999
JF45999	PERCENT FAMILIES WITH INCOME \$4000 TO 6999
F79999	FAMILIES WITH INCOME \$7000 TO 9999
JF79999	PERCENT FAMILIES WITH INCOME \$7000 TO 9999
F10149	FAMILIES WITH INCOME \$10000 TO 14999
JF10149	PERCENT FAMILIES WITH INCOME \$10000 TO 14999
F12249	FAMILIES WITH INCOME \$15000 TO 24999
JF15249	PERCENT FAMILIES WITH INCOME \$15000 TO 24999
F25UP	FAMILIES WITH INCOME \$25000 AND OVER
JF25UP	PERCENT FAMILIES WITH INCOME \$25000 AND OVER

TABLE 3. (Continued)

NFAHLYS	TOTAL NUMBER OF NEGRO FAMILIES
NFAVIN	MEDIAN NEGRO FAMILY INCOME
NFP09R	NEGRO FAMILIES BELOW POVERTY LEVEL
/NFP09R	PERCENT NEGRO FAMILIES BELOW POVERTY LEVEL
LABOR	TOTAL LABOR FORCE
CIVLAB	CIVILIAN LABOR FORCE
NUMEMP	EMPLOYMENT NUMBER
UNEMP	NUMBER UNEMPLOYED
/UNEMP	PERCENT UNEMPLOYED
EMPAGR	NUMBER EMPLOYED IN AGRICULTURE
/EMPAGR	PERCENT EMPLOYED IN AGRICULTURE
EMPMAN	NUMBER EMPLOYED IN MANUFACTURING
/EMPMAN	PERCENT EMPLOYED IN MANUFACTURING
EMPNMN	NUMBER EMPLOYED IN NONMANUFACTURING
/EMPNMN	PERCENT EMPLOYED IN NONMANUFACTURING
NLAB9R	TOTAL NEGRO LABOR FORCE
NCVLAB	NEGRO CIVILIAN LABOR FORCE
NNJEMP	NEGRO EMPLOYMENT NUMBER
NUNEMP	NEGRO NUMBER UNEMPLOYED
/NUNEMP	PERCENT NEGRO UNEMPLOYED
AGFFIM	NO. EMPLOYED BY AGRICULTURE, FORESTRY, FISHERIES, M
/AGFFIM	PERCENT EMPLOYED BY AGRICULTURE, FORESTRY, FISHERIE
MANFCT	NUMBER EMPLOYED BY MANUFACTURING
/MANFCT	PERCENT EMPLOYED BY MANUFACTURING
CONSTR	NUMBER EMPLOYED BY CONSTRUCTION
/CONSTR	PERCENT EMPLOYED BY CONSTRUCTION
TRCMUT	NUMBER EMPLOYED BY TRANSPORTATION, COMMUNICATIONS, UT
/TRCMUT	PERCENT EMPLOYED BY TRANSPORTATION, COMMUNICATIONS,
TRADE	NUMBER EMPLOYED BY TRADE
/TRADE	PERCENT EMPLOYED BY TRADE
AVAIL1	THIS FIELD NUMBER IS AVAILABLE FOR A NEW FIELD
AVAIL2	THIS FIELD IS AVAILABLE FOR A NEW FIELD
FIINRE	NUMBER EMPLOYED BY FINANCE, INSURANCE, REAL ESTATE
/FIINRE	PERCENT EMPLOYED BY FINANCE, INSURANCE, REAL ESTATE
SERVIC	NUMBER EMPLOYED BY SERVICE INDUSTRIES
/SERVIC	PERCENT EMPLOYED BY SERVICE INDUSTRIES
EDUCAT	NUMBER EMPLOYED BY EDUCATION
/EDUCAT	PERCENT EMPLOYED BY EDUCATION
PUBADM	NUMBER EMPLOYED BY PUBLIC ADMINISTRATION
/PUBADM	PERCENT EMPLOYED BY PUBLIC ADMINISTRATION
PA25UP	POPULATION 25 YEARS AND OVER
AVGSCH	MEDIAN SCHOOL YEARS COMPLETED
N0YRS	NO SCHOOL YEARS COMPLETED
/N0YRS	PERCENT NO SCHOOL YEARS COMPLETED
YRS17	1 TO 7 YEARS OF SCHOOL COMPLETED
/YRS17	PERCENT 1 TO 7 YEARS OF SCHOOL COMPLETED
YRS8	8 YEARS OF SCHOOL COMPLETED
/YRS8	PERCENT 8 YEARS OF SCHOOL COMPLETED
YRS911	HIGH SCHOOL, 1 TO 3 YEARS COMPLETED

TABLE 3. (Continued)

JYRS911	PERCENT HIGH SCHOOL, 1 TO 3 YEARS COMPLETED
YRS12	HIGH SCHOOL, 4 YEARS COMPLETED
JYRS12	PERCENT HIGH SCHOOL, 4 YEARS COMPLETED
YRS1315	COLLEGE, 1 TO 3 YEARS COMPLETED
JYRS1315	PERCENT COLLEGE, 1 TO 3 YEARS COMPLETED
YRS15	COLLEGE, 4 YEARS OR MORE COMPLETED
JYRS16	PERCENT COLLEGE, 4 YEARS OR MORE COMPLETED
NP25JP	NEGRO POPULATION 25 YEARS AND OVER
NAVSCH	NEGRO MEDIAN SCHOOL YEARS COMPLETED
NN0YRS	NEGRO NO SCHOOL YEARS COMPLETED
JNN0YRS	PERCENT NEGRO NO SCHOOL YEARS COMPLETED
HOUSES	TOTAL HOUSING UNITS
UNIT1	ONE UNIT STRUCTURES
JUNIT1	PERCENT ONE UNIT STRUCTURES
UNITS	TWO UNITS OR MORE
JUNITS	PERCENT TWO UNITS OR MORE
MOBILE	MOBILE HOMES
JMOBILE	PERCENT MOBILE HOMES
OCCUPD	TOTAL OCCUPIED UNITS
OWNOCC	OWNER OCCUPIED UNITS
JOWNOCC	PERCENT OWNER OCCUPIED UNITS
RENOCC	RENTER OCCUPIED UNITS
JRENOCC	PERCENT RENTER OCCUPIED UNITS
NOPLJM	UNITS LACKING PLUMBING FACILITIES
JNOPLJM	PERCENT UNITS LACKING PLUMBING FACILITIES
CROWDD	OVERCROWDED UNITS
JCROWDD	PERCENT OVERCROWDED UNITS
AVGVAL	MEDIAN HOUSE VALUE
AVRENT	MEDIAN CONTRACT RENT
NNPLJM	NEGRO UNITS LACKING PLUMBING FACILITIES
JNNPLJM	PERCENT NEGRO UNITS LACKING PLUMBING FACILITIES
NCROWD	NEGRO OVERCROWDED UNITS
JNCROWD	PERCENT NEGRO OVERCROWDED UNITS
NAVVAL	NEGRO MEDIAN HOUSE VALUE
NAVRNT	NEGRO MEDIAN CONTRACT RENT
SOILA	MAJOR SOIL ASSOCIATIONS CAT, A
JSOILA	PERCENT SOIL CATEGORY A
SOILB	MAJOR SOIL ASSOCIATIONS CAT, B
JSOILB	PERCENT SOIL CATEGORY B
SOILC	MAJOR SOIL ASSOCIATIONS CAT, C
JSOILC	PERCENT SOIL CATEGORY C
JSTEEP	PERCENT OF LAND WITH EXCESSIVE SLOPE
-LANDJ1	MAJOR LAND USES CAT, 1
JLANDU1	PERCENT LANDUSE CATEGORY 1
-LANDJ2	MAJOR LAND USE CAT, 2
JLANDU2	PERCENT LAND USE CATEGORY 2
-LANDJ3	MAJOR LAND USE CAT, 3
JLANDU3	PERCENT LAND USE CATEGORY 3
CP0P70	1970 COUNTY POPULATION
CP0P60	1960 COUNTY POPULATION

TABLE 3. (Concluded)

CHANGE	COUNTY POPULATION CHANGE SINCE 1960
VCHANGE	PERCENT COUNTY POPULATION CHANGE SINCE 1960
NATCVG	NATURAL POPULATION CHANGES
MIGRAT	MIGRATION POPULATION CHANGES
EPDP73	ESTIMATED 1973 COUNTY POPULATION
EPDP80	ESTIMATED 1980 COUNTY POPULATION
EPDP90	ESTIMATED 1990 COUNTY POPULATION
CLABJR	COUNTY TOTAL CIVILIAN WORK FORCE
CUNEMP	COUNTY UNEMPLOYMENT
VCUNEMP	PERCENT COUNTY UNEMPLOYMENT
CEMP4N	COUNTY MANUFACTURING EMPLOYMENT
VCEMP4N	PERCENT COUNTY MANUFACTURING EMPLOYMENT
CEMP4M	COUNTY NONMANUFACTURING EMPLOYMENT
VCEMP4M	PERCENT COUNTY NONMANUFACTURING EMPLOYMENT
CSFEMP	COUNTY SELF-EMPLOYED
VCSEMP	PERCENT COUNTY SELF-EMPLOYED
CFARM	COUNTY FARM EMPLOYMENT
VCFARM	PERCENT COUNTY FARM EMPLOYMENT
VFARMLND	PERCENT OF TOTAL LAND IN FARM ACERAGE
FARMS	TOTAL NUMBER OF FARMS
AVSIZE	AVERAGE FARM SIZE IN ACRES
VALPR0	TOTAL MARKET VALUE OF AGR., PRO, SOLD/100000
VALACR	AVERAGE MARKET VALUE PER ACRE
COMMIN	COUNTY COMMUTER POPULATION GAIN
COM0JT	COUNTY COMMUTER POPULATION LOSS
COMNET	COUNTY COMMUTER POPULATION NET GAIN OR LOSS
CNTY1	MAJOR COUNTY COMPOSING NET NO. 1
NCNTY1	NUMBER COMMUTING COUNTY 1
CNTY2	MAJOR COUNTY COMPOSING NET NO. 2
NCNTY2	NUMBER COMMUTING COUNTY 2
CNTY3	MAJOR COUNTY COMPOSING NET NO. 3
NCNTY3	NUMBER COMMUTING COUNTY 3
CNTY4	MAJOR COUNTY COMPOSING NET NO. 4
NCNTY4	NUMBER COMMUTING COUNTY 4
TAXR73	1973 COUNTY TAX RATE
ASSVAL	TOTAL ASSESSED COUNTY PROPERTY VALUE/1000000
ACTVAL	ESTIMATED ACTUAL COUNTY PROPERTY VALUE/1000000
SCH03L	COUNTY ELEMENTARY AND SECONDARY SCHOOLS
SRHIGH	COUNTY HIGH SCHOOLS
ADA	COUNTY AVERAGE DAILY ATTENDANCE
EXPPJP	COUNTY EXPENDITURES PER PUPIL IN A.D.A.
ENUDIS	ENUMERATION DISTRICT
CITY	CITY
CCDIV	COUNTY CENSUS DIVISION
COUNTY	COUNTY
TAXR74	1974 COUNTY TAX RATE

1. From this point the user must assign names to the sets and subsets as necessary. The transmittals are on the same line as the prompter.

1. Land-Use System — To better illustrate the operation of this system it is assumed that the user has the following request for information:

- What is the population per square mile?
- How many UTM cells has a population per square mile from 75 through 100?
- List the cells, county, people per household, number of occupied households, and population per square mile.
- Is sufficient water available in quality and quantity, and is a school in the cell?
- What is the condition of the cells for landfills and septic tanks?
- List the results.
- What are the total points and the number of occupied households?
- List all data for county 189.

The following is a step by step dialog and explanation of this request.

(a) What is the population per square mile?

U - PPLPSM=PPL2HS*HOUSES*2.6

The system will compute the population per square mile (PPLPSM, user assigned set name) from the people per household (PPL2HS, from the data base), the number of occupied households (HOUSES, from the data base), and a constant 2.6 (1 sq. km cell * 2.6 sq. km per sq. mile).

(b) How many UTM cells have a population per square mile from 75 through 100?

U - CROWDED=PPLSPSM FROM 75 THRU 100

The system will locate and count the data and will automatically print the results. CROWDED is a user-assigned subset name; PPLPSM is the name the user assigned to the original set.

C - SET NAMED CROWDED HAS 28 MEMBERS.

(c) List the UTM cells (CELLID), county (COUNTY), people per household (PPL2HS), number of occupied households (HOUSES), and population per square mile (PPLPSM) of the subset named CROWDED. (Names in parenthesis are data base field names, except PPLPSM).

U - OUTPUT(CROWDED, CELLID, COUNTY, PPL2HS, HOUSES, PPLPSM)

Example:

```
>PPLPSM=PPL2HS*HOUSES*2.6
>CROWDED=PPLPSM FROM 75 THRU 100
  SET NAMED CROWDED HAS      28 MEMBERS
>OUTPUT(CROWDED,CELLID,COUNTY,PPL2HS,HOUSES,PPLPSM)
```

The system will respond as follows:

UTM CELL DESIGN ATOR.	COUNTY CODE	PEOPLE PER HOUSEHOLD.	NUMBER OF OCCUPIED H OUSEHOLDS.	PPLPSM
SER9138	111	3.10	11	88.6600
SER9139	111	3.20	11	85.8000
SER9238	111	3.10	11	88.6600
SER9536	111	3.00	11	85.8000
SER9932	111	3.00	12	93.6000
SER8412	159	3.10	11	88.6600
SER8912	159	3.10	10	80.6200
SER9116	159	2.90	12	90.4800
SER9215	159	2.90	11	82.9400
SER9721	159	2.90	12	90.4800
SER9820	159	2.90	10	75.4000
SER9821	159	2.90	11	82.9400
SER9822	159	2.90	13	98.0200
SER9924	159	2.90	11	82.9400
SER6127	165	3.10	11	88.6600
SER6237	165	3.10	10	80.6200
SER6326	165	3.10	11	88.6600
SER7327	169	3.10	11	88.6600
SER7425	169	3.10	10	80.6200
SER7725	169	3.10	10	80.6000
SF03764	175	3.20	12	99.8400
SF03565	185	3.10	11	88.6600
SF03668	185	3.10	11	88.6600
SF04264	185	3.40	9	79.5600
SER6013	189	3.20	11	91.5200
SER6517	189	3.20	10	83.2000
SER7214	189	3.20	10	83.2000
SER7712	189	3.20	12	99.5400

(d) Is sufficient water available (quality and quantity) in the CROWDED cells, and is there a school in each cell?

```
C ->
U - POINTS=0
C ->
U - IF GWQUAL.EQ.1 THEN POINTS=POINTS+10
C ->
U - IF GWQUAN.EQ.1 THEN POINTS=POINTS+15
C ->
U - IF SWQUAN.EQ.2 THEN POINTS=POINTS+20
C ->
U - IF SCHOOL.NE. THEN POINTS=POINTS+5
```

This dialog establishes a weighting criteria. The user named a subset POINTS. When the criteria of the IF commands are met, the designated points are added to POINTS; otherwise, no points are added. GWQUAL (ground water quality), GWQUAN (ground water quantity), SWQUAN (surface water quantity), and SCHOOL (education facility) are taken from the data base.

Example:

```
>POINTS=0
>IF GWQUAL.EQ.1 THEN POINTS=POINTS+10
>IF GWQUAN.EQ.1 THEN POINTS=POINTS+15
>IF SWQUAN.EQ.2 THEN POINTS=POINTS+20
>IF SCHOOL.NE.' ' THEN POINTS=POINTS+5
```

(e) What is the condition of the cells for landfills and septic tanks? List the results of the above constraints.

```
C ->
U - IF LANFIL.EQ.'S' THEN POINTS=POINTS+10
  ELSE POINTS=POINTS-10
C ->
U - IF SEPTIC.EQ.'S' THEN POINTS=POINTS+15
  ELSE POINTS=POINTS-10.
```

This dialog is similar to part (d) except, when the IF command constraints are not met, points are subtracted from POINTS as designated by the command. Land-fill limits (LANFIL) and septic tank limits (SEPTIC) are taken from the data base.

To have the information listed, the user will:

C ->

U - OUTPUT (CROWDED, CELLID, COUNTY, GWQUAL, GWQUAN, SWQUAN, SCHOOL, LANFIL, SEPTIC, POINTS)

Example:

```
>POINTS=0
>IF LANFIL .EQ. 'S' THEN POINTS=POINTS+10
>IF SEPTIC .EQ. 'S' THEN POINTS=POINTS+15 ELSE POINTS=POINTS-10
>OUTPUT (CROWDED,CELLID,COUNTY,GWQUAL,GWQUAN,SWQUAN,
        SCHOOL,
>LANFIL, SEPTIC, POINTS)
```

The results of the subset named OUTPUT applied to the original set CROWDED would be:

ITEM SIGNATOR.	CELL CODE.	DE	COUNTY	G	G	S	S	L	S	POINTS
				V	V	V	C	A	E	
				Q	Q	Q	X	N	P	
				U	U	U	O	F	T	
				A	A	A	O	I	I	
				L	N	N	L	L	C	
SER9138	111	2	2	3				M	M	-20.0000
SER9139	111	2	2	3				M	M	-20.0000
SER9238	111	2	2	3				M	M	-20.0000
SER9536	111	3	2	3				M	M	-20.0000
SER9932	111	3	2	3				M	M	-20.0000
SER8412	159	3	2	6				B	B	-20.0000
SER8912	159	3	2	6				B	B	-20.0000
SER9116	159	3	2	3				B	B	-20.0000
SER9215	159	3	2	3				B	B	-20.0000
SER9721	159	3	2	2				B	B	0.0000
SER9820	159	3	2	2				B	B	0.0000
SER9821	159	3	2	2				B	B	0.0000
SER9822	159	3	2	2				M	M	0.0000
SER9924	159	3	2	2				M	M	10.0000
SER6127	165	3	2	3				M	S	5.0000
SER6237	165	3	3	3				M	M	-20.0000
SER6326	165	3	2	3				B	B	-20.0000
SER7327	169	3	2	3				B	B	-20.0000
SER7425	169	3	2	6				B	B	-20.0000
SER7725	169	3	2	3				M	M	-20.0000
SF03764	175	1	2	3				S	M	10.0000
SF03565	185	2	1	3				S	M	15.0000
SF03668	185	2	2	3				S	S	25.0000
SF04264	185	1	2	3				S	M	10.0000
SER6013	189	3	1	6				B	B	-5.0000
SER6517	189	3	1	6				B	B	-5.0000
SER7214	189	3	2	6				B	B	-20.0000
SER7712	189	3	2	6				B	B	-20.0000

(f) What are the total points accumulated and the numbers of occupied households? List all data for county 189.

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```
C - >
U - SUMPTS=SUMSET(CROWDED, POINTS)
C - SUMPTS= -265.0000
C - >
U - SUMHOU=SUMSET(CROWDED, HOUSES)
C - SUMHOU= 306,0000
C - >
U - SET189=CROWDED.AND. COUNTY=189
C - SET NAMED SET189 HAS 4 MEMBERS
C - >
U - OUTPUT(SET189, ALL)
```

This dialog utilizes the SUMSET feature. SUMPTS (user assigned), SUMSET is preprogrammed to add the results of subset POINTS in the original set CROWDED and automatically to list the results, SUMHOU (user assigned), same as above SUMSET, except that SUMHOU adds the occupied households (HOUSES). SET189 (user assigned) is subset name for the information requested in the original set CROWDED for county 189. OUTPUT all data in the data base for county 189.

Example:

```
*S MPTS=SUMSET(CROWDED,POINTS)
SUMPTS = -265.0000
*SUMHOU=SUMSET(CROWDED,HOUSES)
SUMHOU = 306.0000
>SET189=CROWDED.AND. COUNTY.EQ.189
SET NAMED SET189 HAS 4 MEMBERS
>OUTPUT(SET189,ALL)
Z UTH CEL H P C D S C C S R B S O L L S D P A S L T R
O L DESIG O P O E M O E O I A C W A A L E E A E A O O
N NATOR. U L U V S N N I V S H N N N O P R S P N P D
E S 2 N D A G S L E I O E U U P T M H T F S F
N E H T I U R N O R S S E H E O I I O I
O S S Y S S L I 2 C L L L

16 SER6813 11 3.28 189 4 5 4 27 VL 5 K 18 21 21 A D T D B B G F
16 SER6517 18 3.28 189 4 5 4 27 TH 5 K 44 21 31 C S M G B B P D
16 SER7214 18 3.28 189 4 5 4 27 TH 5 K 18 63 95 C S M G B B P D
16 SER7712 12 3.28 189 4 5 4 27 TH 8 18 21 33 C S S G B B P D

S S F S C C A E R W G R K E N U T S
V V V L V E E I C I A E O A A O R R L
Q Q Q D Q N N R O S T O A R S R B A O
U U U I U V S P G I U C D S T T Z Z P
A A A 8 A A E R E T R A S T I H O O R
L N N 8 L T V T O E L R N N H N X

3 1 6 F 0 T F 0 8 QA D F 68 13 8
3 1 6 F 0 T F 0 8 OL D F 65 17 8
3 2 6 F 0 T F 0 8 OL D T 72 14 8
3 2 6 F 0 T F 0 8 OC D T 77 12 8
```

2. Census/Socio-Economic Systems -- The operation of the Census System is the same as the Land-Use System except that the data base field names are different. A detailed explanation is not given, but an example is given. An extra feature is utilized, definition of a variable named CNGTAX (preprogrammed). This name will automatically compute the tax rate change from 1973 to 1974, utilizing the data base TAX73 and TAX74 fields.

Example:

```
>CNGTAX=TAXR73-TAXR74
>OUTPUT (CTY21,CNGTAX,TAXR73,TAXR74)
```

CNGTAX 1973 COUNTY TAX RATE 1974 COUNTY TAX RATE

-45	3.70	4.15
-45	3.70	4.15
-45	3.70	4.15
-45	3.70	4.15
-45	3.70	4.15

m. Errors

1. Character Error -- When an erroneous character is transmitted, depress the Rubout key for each character and space through the incorrect character. The system will respond with a backslash, dash, backarrow, etc. depending on the terminal device. Continue transmitting on the same line, beginning with the incorrect character. See f of Section V for Rubout key explanation.

Example:

```
>IF GWQUAL.EQ.1 THHE EN POINTS=POINTS+10
```

2. Line Error -- When an error is made in transmitting a complete line and before the CR key is depressed, depress the Control key and the letter U simultaneously. The system will respond with an asterisk. Continue transmitting on the same line as if beginning in column 1. See part f of Section V for the explanation of Control U.

Example:

```
>CTY21=@CTY21=COUNTY .EQ. 21
```

3. Statement Error — Occasionally it may be necessary to return to the starting point. In this event, depress the Control key and the letter S simultaneously. The system will respond with a \$. You then transmit GO. The system will respond with ENTER DATA BASE NAME (6 CHAR).

Example:

```
>IF %FEMAL .GT. 50 THEN POINTS=POINTS+5
ENTER DATA BASE NAME (6 CHAR)      $GO
```

n. Land-Use Output Examples

1.

ENTER THE DATE IN MMDDYY FORMAT

082675

ENTER THE COUNTY NO. RIGHT-JUSTIFIED IN 3 POSITIONS

165

IF A YEAR OTHER THAN 1980 IS DESIRED, ENTER THE YEAR IN 4 POSITIONS AND ENTER THE POPULATION RIGHT JUSTIFIED IN 6 POSITIONS, ELSE HIT (CR)

TO PRINT THE ACCEPTABLE CELLS ENTER AN A

TO PRINT THE UNACCEPTABLE CELLS ENTER A B

TO PRINT BOTH ENTER A C

C

UTM INFO	LAND USE	OWNER	FLOOD & SOIL
16SER5718	63 *	44 *	TC
16CLR5723	21	44 *	MY
16SER5819	21	44 *	TC
16SER5822	31	44 *	TC
16SER5823	21	44 *	MY
16SER5824	21	44 *	MY
16SER5826	21	44 *	MY
16SER5827	21	44 *	MY
16SER5919	21	44 *	TC
16SER5923	21	44 *	MY
16SER5924	21	44 *	MY
16SER5925	63 *	44 *	MY
16SER6019	21	44 *	TC
16SER6020	63 *	10	MY
16SER6025	21	44 *	MY
16SER6119	33	44 *	TC
16SER6210	21	44 *	TC
16SER6211	21	44 *	

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2.

>SET=COUNTY ,EQ. 169 ,AND. EASTIN FROM 79 THRU 92 ,AND. NORTHIN
>FROM 25 THRU 32
SET NAMED SET HAS 74 MEMBERS

>OUTPUT (SET, CELLID, LANUS1, LANUS2, OWNER, CENMAT, CENSEM, ROADS)

UTR LATOR.	CELL DESIGNATOR.	PRIMARY LAND USE F CELL.	SECONDARY LAND USE F.	OWNER SHI	CENTRAL MATER SYSTEM AVAILAB LE.	CENTRAL SEWER SYSTEM AVAILAB LE.	ROAD CHARACTER ISTICS.	CH
	SER7925	21	21	10	F	F		D
	SER7926	21	31	10	T	T		D
	SER7927	21	31	10	T	T		D
	SER7928	21	31	10	F	T		D
	SER7929	21	31	10	F	F		D
	SER7930	21	21	10	F	F		D
	SER7931	21	21	10	F	F		E
	SER7932	21	21	10	F	F		D
	SER8025	21	21	10	F	F		D
	SER8026	21	21	10	F	F		H
	SER8027	31	21	10	T	T		D
	SER8028	31	21	10	F	T		D
	SER8029	21	31	10	F	T		D
	SER8030	21	31	10	F	T		D
	SER8031	21	31	10	F	F		D
	SER8032	21	31	10	F	F		D
	SER8125	21	33	10	F	F		D
	SER8126	21	31	10	F	F		H
	SER8127	27	31	10	F	F		D
	SER8128	21	21	10	F	F		D
	SER8129	21	31	10	F	T		D
	SER8130	21	31	10	F	T		D

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o. Census Output Examples

1. County Poverty Information

>BLACK=PNONW + FPOOR
 >BLPRT=BLACK + COUNTY .EQ. 169
 >SET NAMED BLPRT HAS 3 MEMBERS

OUTPUT (BLPRT, FPOOR, PNONW, UNEMP, EMPAGE)

FAMILIES BELOW POVERTY LEVEL	NONWHITE POPULATION	NUMBER UNEMPLOYED	NUMBER EMPLOYED IN AGRICULTURE
31	13	12	0
16	6	0	04
4	0	0	0

OUTPUT (BLPRT, FPOOR, PNONW, UNEMP, ENUDIS)

FAMILIES BELOW POVERTY LEVEL	NONWHITE POPULATION	NUMBER UNEMPLOYED	ENUMERATION DISTRICT
31	13	12	0037
16	6	0	0008
4	0	0	0056

>TROUSDALE COUNTY

>BLACK=PNONW
 >BLKTR=BLACK + COUNTY .EQ. 169
 >SET NAMED BLKTR HAS 3 MEMBERS

OUTPUT (BLKTR, ENUDIS, FPOOR, PNONW, NUMEMP)

ENUMERATION DISTRICT	FAMILIES BELOW POVERTY LEVEL	NONWHITE POPULATION	EMPLOYMENT NUMBER
0081	60	55	422
0047	28	4	290
0003	48	1	279

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2. Mobile Home Data

>SET=%MOBILE.GT.15

SET NAMED SET HAS 25 MEMBERS

>OUTPUT (SET, COUNTY, ENUDIS, POP70, %MOBILE, MOBILE, HOUSES)

COUNTY	ENUMERATION	1970 TOTAL	PERCENT MOB	MOBILE HOM	TOTAL HOUS
21	0007	1681	16.6	82	494
21	0009	1066	17.2	57	332
21	0012	706	18.4	34	185
41	0004	90	64.3	153	238
41	0009	1070	19.6	109	555
41	0011	689	16.9	89	527
85	0006	664	21.7	44	203
125	0044	2029	15.7	65	413
147	0010	953	17.8	149	838
149	0029	1004	23.5	81	344
149	0047	306	26.6	29	109
149	0019	1189	21.9	93	425
149	0004	2825	16.1	137	853
149	0011	539	53.0	114	215
161	0013	547	39.5	68	172
161	0014	870	16.1	50	310
161	0008	40	20.0	5	25
161	0009	942	16.3	66	404
165	0056	86	19.4	6	31
165	0029	336	18.7	20	107
165	0030	507	27.9	50	179

3. Population Data

(a)

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ENUDIS .CO. '0001'
SET NAMED SET HAS 11 MEMBERS
>OUTPUT (SET, COUNTY, %CHANGE, NATCHG, MICHG)

COUNTY	PERCENT COUNTY PO PULATION CHANGE S INCE 1960	NATURAL POPULATIO N CHANGES	MIGRATION POPULAT ION CHANGES
21	40.0	956	2815
41	0.0	0	0
83	22.1	300	751
85	17.8	959	1090
125	12.	6259	317
147	0.5	2296	529
149	13.5	9330	-2270
165	55.4	4743	15324
169	4.9	293	-52
187	36.2	2713	1441
189	33.7	2645	6086

(b)

CENSUS

>CTY21=COUNTY .EQ. 21

SET NAMED CTY21 HAS 14 MEMBERS

>POINTS=0

>IF %PNONW .LT. 20 THEN POINTS=POINTS+1

>IF %PNONW .LT. 20 THEN POINTS=POINTS+2

>IF %PFEMAL .GT. 50 THEN POINTS=POINTS+5 ELSE POINTS=POINTS-5

>IF %F15249 .GT. 40 THEN POINTS=POINTS+3

>IF FAVINC .GT. 10000 THEN POINTS=POINTS+4

>IF NFAVIN .GT. 10000 THEN POINTS=POINTS+6

>IF %UNEMP .LT. 5 THEN POINTS=POINTS+7

>IF AVGSCH .GT. 8 THEN POINTS=POINTS+8 ELSE POINTS=POINTS:

>5

>IF %UNITS .GT. 10 THEN POINTS=POINTS-5

>IF %NOPLUM .GT. 2 THEN POINTS=POINTS-10

>OUTPUT (CTY21,COUNTY,ENUDIS,PNONW,%PNONW,%PFEMAL,%F15249,%UNEMP)

COUNTY	ENUMERATI	NONWHITE PERCENT	N PERCENT	F PERCENT	F PERCENT	U
CT	N	POPULATIO	ONWHITE P	EMALE POP	AMILIES W	NEMPLOYED
		OPULATION	ULATION	ITH INCOM		
				E \$15000		

21	0006	83	9.9	50.4	9.9	0.0
21	0007	0	0.0	48.5	4.7	3.1
21	0008	0	0.0	52.6	7.3	2.0
21	0009	0	0.0	47.7	4.6	2.4
21	0014	111	7.7	50.8	8.4	.8

APPROVAL

MULTI PURPOSE INTERACTIVE NASA INFORMATION SYSTEM (MINIS)

By Data Systems Laboratory

The information in this report has been reviewed for security classification. Review of any information concerning Department of Defense or Atomic Energy Commission programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

This document has also been reviewed and approved for technical accuracy.



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