Technical Memorandum

DIGITIZING ZONE MAPS, USING MODIFIED LARSYS PROGRAM

Prepared By

Lockheed Electronics Company, Inc.
Aerospace Systems Division
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Contract NAS 9-12200

For

EARTH OBSERVATIONS DIVISION

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

May 1976

LEC-7498

TECHNICAL REPORT INDEX/ABSTRACT

(See instructions on reverse side.)

1. TITLE AND SUBTITLE OF DOCUMENT

TECHNICAL MEMORANDUM

DIGITIZING ZONE MAPS, USING MODIFIED LARSYS PROGRAM

2. JSC NO.

JSC- 10757

3. CONTRACTOR/ORGANIZATION NAME

Lockheed Electronics Company, Inc.

4. CONTRACT OR GRANT NO.

NAS 9-12200

5. CONTRACTOR/ORIGINATOR DOCUMENT NO.

LEC-7498

6. PUBLICATION DATE (THIS ISSUE)

April 1976

7. SECURITY CLASSIFICATION

Unclassified

8. OPR (OFFICE OF PRIMARY RESPONSIBILITY)

9. LIMITATIONS

GOVERNMENT HAS UNLIMITED RIGHTS [X] YES [ ] NO

IF NO, STATE LIMITATIONS AND AUTHORITY

N/A

10. AUTHOR(S)

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11. DOCUMENT CONTRACT REFERENCES

WORK BREAKDOWN STRUCTURE NO.

N/A

CONTRACT EXHIBIT NO.

N/A

DRL NO. AND REVISION

N/A

DRL LINE ITEM NO.

N/A

12. HARDWARE CONFIGURATION

SYSTEM

N/A

SUBSYSTEM

N/A

MAJOR EQUIPMENT GROUP

N/A

13. ABSTRACT

A method for digitizing zone maps is presented, starting with colored images and producing a final one-channel digitized tape. This method automates the work previously done interactively on the Image-100 and Data Analysis System (DAS) computers of the Johnson Space Center (JSC) Earth Observations Division (EOD). A color-coded map is digitized through color filters on a scanner to form a digital tape in LARSYS-2 or JSC Universal format. The taped image is classified by the EOD LARSYS program on the basis of training fields included in the image. Numerical values are assigned to all pixels in a given class, and the resulting coded zone map is written on a LARSYS or Universal tape. A unique spatial filter option permits zones to be made homogeneous and edges of zones to be abrupt transitions from one zone to the next. A zoom option allows the output image to have arbitrary dimensions in terms of number of lines and number of samples on a line.

14. SUBJECT TERMS

JSC-10757

TECHNICAL MEMORANDUM

DIGITIZING ZONE MAPS, USING MODIFIED LARSYS PROGRAM

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SUMMARY

A method for digitizing zone maps is presented, starting with colored images and producing a final one-channel digitized tape. This method automates the work previously done interactively on the Image-100 and Data Analysis System (DAS) computers of the Johnson Space Center (JSC) Earth Observations Division (EOD). A color-coded map is digitized through color filters on a scanner to form a digital tape, which is then converted to a multichannel LARSYS-2 or JSC Universal formatted tape for input to the EOD-LARSYS system.

The processors STAT, CLASSIFY and a modified DISPLAY processor classify each of the input multichannel pixel values into one of the training zone values or a threshold value. An output tape is then created by the modified DISPLAY processor which is input to the Spatial Filter and Zoom Scanner Data Program (FILZOM).

FILZOM has several options including: (1) to process a specified area of the input image; (2) to filter the specified area up to eight times using an eight-point spatial filtering scheme; (3) to zoom the specified area; (4) to output a multifile LARSYS-2 or Universal formatted tape; and (5) to output a line printer map with overprint capabilities.

Detailed examples are presented for digitizing Crop Moisture Index (CMI) maps and other zonal maps. A list of suitable tempera paint colors used in the preparation of images for a multichannel tape is also included.

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TABLES

FIGURES

1. INTRODUCTION

The need for a general method of digitizing zonal maps is detailed in the previous document of this series (An Interactive Method for Digitizing Crop Moisture Index and Other Maps) (ref. 1). In a few words, the need appeared for digitizing Crop Moisture Index (CMI) maps and other background images for use in the Screwworm Eradication Data System (SEDS). When it appeared that no method was available at JSC, the methods described in these documents were developed.

In essence, the work reported here is an automatization of the interactive procedure described earlier (ref. 1). This procedure bypasses the classification steps performed on the Image-100 computer system and the tape construction steps performed on the DAS. It still requires that an image be colored and digitized to form a multichannel tape. A method now in development promises to bypass these steps by producing a final one-channel tape based on the raw CMI data (ref. 2).

In brief, this procedure consists of the following three steps:

- Preparation of image with zones color coded (as described in ref. 1; optimum set of colors described in section 4 of this document)
- Digitization of colored image (as described in ref. 1; see appendix F for reformatting output tape from scanning densitometer of Photo Technology Laboratories)
- Processing of tape with modified EOD-LARSYS system and the FILZOM program to yield an appropriately coded final tape.

2. THE EOD-LARSYS SYSTEM AND FILZOM

2.1 INTRODUCTION

The fundamental program for classifying scanner data at JSC in June, 1975, was the operating version of the EOD-LARSYS program. This is an elaboration of classification algorithms developed at the Purdue University Laboratory for Applications of Remote Sensing at West Lafayette, Indiana. The original program has been progressively modified at JSC to meet local needs, and is continually being revised.

The program had most of the elements for classifying the type of data produced by the table scanner of the Image-100 computer of NASA's Earth Observations Division. As such, it had the potential of eliminating the extensive interactive processing that was being performed routinely to digitize maps. Although the classification program was adequate, there was no mechanism for preparing arbitrarily-coded tapes with the classification results. Nor were there special "filter" methods needed to ensure that zones were homogeneous and that discrete boundaries of zones were classified properly as abrupt transitions from one homogeneous zone to the next.

To develop these capabilities, modifications were made to the DISPLAY processor of the current EOD-LARSYS system and the program, Spatial Filter and Zoom Scanner Data (FILZOM), was written. The program FILZOM is extensively documented elsewhere (ref. 4), but the chief features of FILZOM are presented here as a guide to the user.

The modified EOD-LARSYS system and FILZOM are contained on one program tape. The programs may be executed consecutively or separately. Information on FILZOM's deck setup can be obtained from reference 4 and appendix C. Later modifications, as well as current tape numbers, may be obtained from the supervisor of the Data Processing Systems Department, Lockheed Electronics Company, Inc. Phone 713-483-3246 (FTS 525-3246).

2.2 THE EOD-LARSYS SYSTEM

The three EOD-LARSYS processors which are used in producing an input tape, INFIZ, for FILZOM are STAT, CLASSIFY, and DISPLAY. The statistical processor, STAT, computes statistical parameters for the training blocks which are defined as colored blocks on the image. The output tape from STAT along with the original multispectral scanner (MSS) image data tape are input to the classification processor, CLASSIFY. Each pixel on the MSS tape is classified into one of the defined zones and a statistical value of the likelihood that the pixel is classified correctly is assigned to each pixel. The output tape from CLASSIFY (MAPTAP) is input to the display processor, DISPLAY. DISPLAY can perform the following options:

- Produce a line printer map
- Produce a classification summary
- Perform thresholding
- Perform four point spatial filtering
- Output a tape in LARSYS-2 or Universal format.

2.3 SPATIAL FILTER AND ZOOM SCANNER DATA (FILZOM)

The program FILZOM performs many functions. The following topics concerning FILZOM are discussed:

- The need for the FILZOM filter
- The FILZOM filter
- The output image
- Other features.

2.3.1 THE NEED FOR THE FILZOM FILTER

The most unique feature of FILZOM is the filter option, which is described in greater detail in a separate memorandum (ref. 5).

At the time this work was undertaken, there was no filter available. By coincidence, a four-neighbor filter was designed and implemented in the DISPLAY processor parallel to our development of the eight-neighbor multi-filter option.

The version of the DISPLAY processor with the four-neighbor filter was, however, used to make the modifications to output an INFIZ tape. This means that the image filtered in DISPLAY may be further filtered in FILZOM. The FILZOM filter has greater capabilities than the four-point spatial filter because it can do fine filtering as well as gross filtering.

A need for the FILZOM filter was caused by two problems. The first problem comes from imperfections in painting and classifying the image. By their nature, zones must be homogeneous, but as a practical problem, misclassifications occur. This filter allows most of the poorly classified pixels within a zone to be replaced by values assigned to their neighbors.

The second need for the filter is caused by the edge problem between zones. An abrupt change of classification over the boundary is needed between two zones. In practice, boundaries are almost always classified as something other than two zones, because pixels between zones are composed of two or more zones, or paints mix, or shadows occur due to change in relief across a border, thus, causing indistinct boundaries.

2.3.2 THE FILZOM FILTER

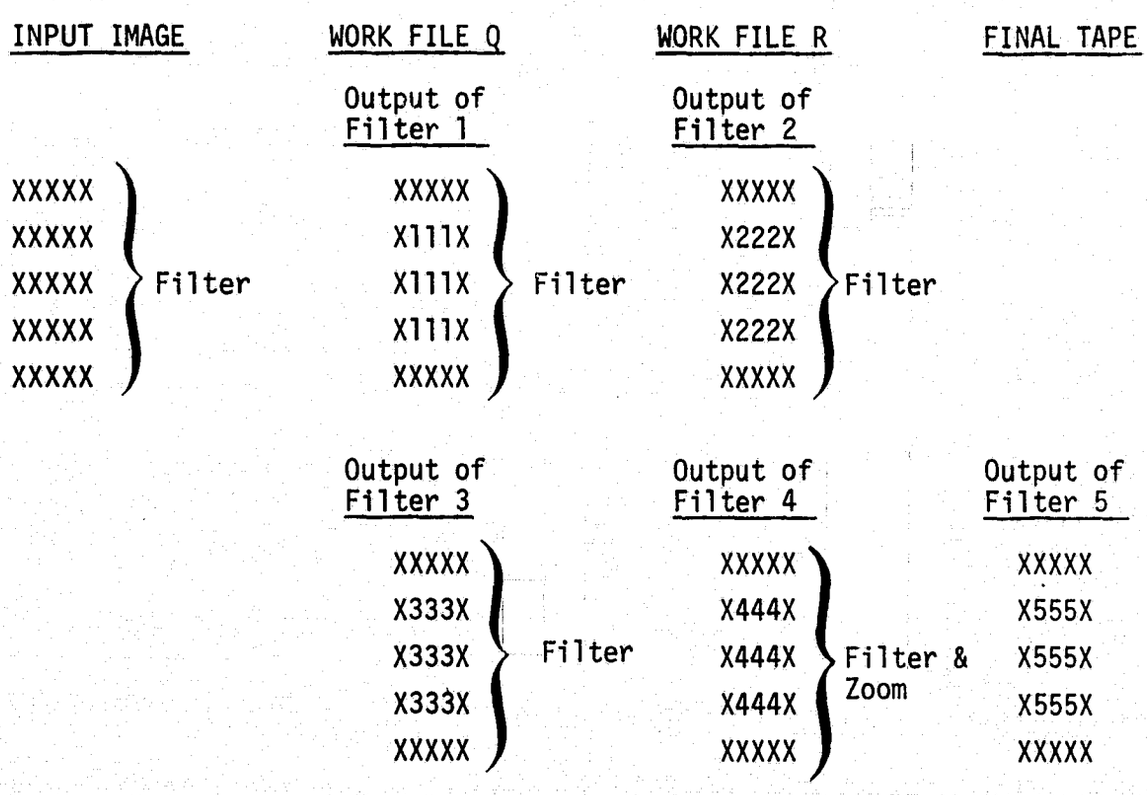
FILZOM filters a specified area of the image output by DISPLAY. The extent of the filtering is determined by the following variables which have default values that can be overridden by input lead cards.

- The number of times the image is filtered — lead card FILTER
- The island test variable — lead card ISLAND
- The hole test variable — lead card HOLE.

A discussion of each of the lead cards and the filter algorithm follows:

2.3.2.1 Filter

FILZOM processes a specified area of the input image. (Refer to FILZOM's Lead Cards, appendix C.) The number of times the specified area is filtered is determined by the variable TIMFIL on the lead card FILTER. The maximum number of times an area can be filtered is arbitrarily set in the program to eight. The example below illustrates a multifilter variable of five. (TIMFIL equals 5.)



where

X are pixels that are not filtered,

and

1 through 5 represents the number of times a pixel is filtered.

In the example, an input scan line is filtered and output on work file Q. Then, the next scan line is filtered and output on work file Q. This procedure continues until all lines in the specific area have been output on work file Q. Work file Q rewinds and becomes the input file and work file R is the output file. The work files R and Q are used simultaneously with one being the input file and the other being the output file, until the last filtering of the image. The output from the last filter is zoomed and written in Universal or LARSYS-2 format on the final output tape.

The border of the image is not filtered. Only the pixels which are surrounded by eight neighboring pixels can be filtered. Two examples are shown below, one is a classified pixel surrounded by eight neighbors, and the other is the order in which the neighboring pixels are examined.

AAB	517
CXB	3X4
CBB	826

The closest neighbors (1, 2, 3, 4) are examined first.

2.3.2.2 ISLAND and HOLE Lead Cards

The difference between a hole and an island in FILZOM is that an island is a classified pixel surrounded by eight pixels, and a hole is an unclassified (thresholded) pixel surrounded by eight neighbors.

The test variables for spatial filtering an island or a hole are input on lead cards ISLAND and HOLE. These test variables specify the number of neighboring pixels that have to be alike before the center pixel (island or hole) is changed. A test variable for a hole and a test variable for an island can vary for each time the image is filtered. Refer to lead cards ISLAND and HOLE in appendix C.

Using the previous image, which is duplicated on the following page, if the island test variable equals three, the following pixels in the image are examined.

ISLAND TEST VALUE = 3	
	ROWS 1 2 3
Line 1	A A B
Line 2	C X B
Line 3	C B B

1) Line 1, Row 2 = A
2) Line 3, Row 2 = B
3) Line 2, Row 1 = C
4) Line 2, Row 3 = B
5) Line 1, Row 1 = A
6) Line 3, Row 3 = B

There are three B pixels, two A pixels and one C pixel. The center pixel is changed to a B. The remaining two pixels (line 1, row 3; line 3, row 1) are not counted.

If the island test value equals five, all eight neighbors are examined but the center pixel remains X, since there are less than five like surrounding pixels.

Shown below is an image with threshold pixels indicated as T's.

A T B
A T T
A T B

If the hole test value equals three, the hole (center threshold pixel) would remain a T. The three closest like pixels are T's.

Since it is often desirable to replace as many of the threshold pixels with a classified value, a negative test value on either the ISLAND or HOLE lead card indicates that only the neighboring classified pixels are counted. In the above example using a hole test value of -3, all eight neighbors are examined. The center pixel becomes an A, since there are three pixels that have an A classification.

2.3.3 THE OUTPUT IMAGE

The specific samples and lines which are output on the final tape are determined by parameters which are default values or are input on lead cards SKIP, ZOOM, and LIMIT. (Refer to FILZOM's lead cards.) A discussion of these lead cards follows.

2.3.3.1 SKIP Lead Card

The SKIP lead card (1) designates the number of scan lines that are skipped on the image output by DISPLAY and (2) designates the number of samples that are skipped on each processed scan line.

Example:

SKIP LINES = 3
SKIP SAMPLES = 2

	SAMPLES 1 2 3 4 5 6	
Line 1	X X X X X X	
Line 2	X X X X X X	Skipped lines
Line 3	X X X X X X	
Line 4	X X X X X X	
Line 5	X X X X X X	Processed Image
Line 6	X X X X X X	
	Skipped samples	

2.3.3.2 ZOOM Lead Card

The ZOOM lead card designates which pixels within the specified area are multiply defined or skipped. In the previous example, the processing area has three lines and four samples. If the zoom sample factor equals 2, each pixel on a scan line is output two times. If the zoom line factor equals 3,

each scan line is output three times. The equation for calculating the number of times a pixel is output on a scan line follows:

$$Z \cdot (N - S) \leq Y + T$$

where

Z = zoom sample factor
N = sample number on a scan line
S = number of samples to skip on a scan line
T = number of times the N pixel value will be output. T is a whole number.
$Y = \sum_{s+1}^{n-1} T$ (sum of previous output pixels)

The same equation is used to determine if a scan line is multiply defined or skipped.

2.3.3.3 LIMIT Lead Card

The LIMIT lead card contains the total number of samples and lines that are output on the final tape. The following formula determines if all the pixels on an image are processed or if fill data is needed.

$$T = L - (P - S) * Z$$

where

L = total number of output samples
P = number of pixels on an input scan line
Z = zoom sample factor
S = number of samples to skip on a scan line
T = the number of output pixels which are skipped or the number of threshold pixel values which are added to the end of an output scan line

2.3.4 OTHER FEATURES

Other features of FILZOM are the varied codes which are assigned to the output pixels, the overprint symbols on the line printer map, and the multiple output files.

On the FILZOM's output tape in LARSYS-2 or Universal format, any code between 1 and 255 may be assigned to a classified zone, a threshold field, an unidentifiable field or an unidentifiable 'other' field. The present logic in the DISPLAY processor assigns codes ranging between zero and the number of subclasses or class +5. (Refer to lead cards CODE, DEFAULT C, and DESIGNATE in appendix C.)

After each filter, the image can be zoomed and output in a LARSYS-2 or Universal tape format. In addition, the image can be represented on a line printer map (refer to lead card FILTER). This means that if the data is filtered three times, there can be three files of the zoomed output image and three line printer maps of the image.

The symbols, on the line printer map which represent the various zones, may be the CMI default overprint symbols, the symbols used in the DISPLAY processor, or the symbols input on lead cards.

3. PREPARING DIGITIZED ZONE MAPS

3.1 INTRODUCTION

The use of EOD-LARSYS and FILZOM greatly simplifies the digitization of zone maps. For brevity, this section will not discuss any matters mentioned in the previous document on the interactive process, since these are not changed here.

3.2 PREPARATION OF THE INPUT TAPE TO EOD-LARSYS

Images may be prepared on the Image-100 table scanner as before. In this case, instructions of the previous document would be followed on scanning devices. Then the memory of the Image-100 would be released to a 9-track tape in LARSYS-2 or Universal format.

The densitometer of the Photo Techniques Laboratory might be used. In this case, the tape conversion program in appendix G would convert the tape format to one compatible with the EOD-LARSYS. This would be a 9-track tape. In general, the initial source of digitized data could be a wide variety of densitometers.

3.3 TAPE ASSIGNMENTS AND DECK SETUPS FOR UNIVAC 1108, EXEC II

In executing EOD-LARSYS and FILZOM several files are used. The logical unit for each file is pre-assigned in the programs. (Refer to table I.) The tapes produced on the building 17 Image-100 computer system are 9-track tapes. This presents a problem, in that the EXEC II 1108 computer system at JSC has only one 9-track tape drive. The input 9-track tape has to be copied onto a 7-track tape. Examples of deck setups along with their appropriate Form 588 are presented in the following pages.

TABLE I. — FILE ASSIGNMENTS FOR PROCESSORS AND FILZOM

Processor	Logical Unit and Internal File Name												
	A (SAVTAP)	B (MAPTAP)	C (DATAPE)	H (BMFILE)	K (HISFIL)	L (TRFORM)	M (ERIPTP)	N (DASTAP)	Unassigned (SCRATCH)	I (INFIZ)	P (SAVEFZ)	R (Work File)	Q (Work File)
$HIST			Tape		FASTRAND								
$GRAYMAP			Tape		FASTRAND								
$STAT	Tape or FASTRAND		Tape										
$ISOCLS	Tape or FASTRAND		Tape				7-track tape	9-track tape	FH432				
$SELECT	Tape or FASTRAND		Tape	Tape or FASTRAND					FH432				
$CLASSIFY	Tape or FASTRAND	Tape or FASTRAND	Tape	Tape or FASTRAND									
$DISPLAY		Tape or FASTRAND						9-track tape	FH432	Tape			
$DATA-TRANSFORMATION	Tape or FASTRAND		Tape	Tape or FASTRAND		Tape							
FILZOM										Tape	Tape 9-track	Tape or FASTRAND	Tape or FASTRAND

Note: It is suggested that the program tape always be assigned to logical unit Z.

Example I. — Run 1 of 2 copies the input 9-track tape onto a 7-track tape. Run 2 of 2 executes LARSAA (processors, $STAT, $CLASSIFY and $DISPLAY) and executes FILZOM.

```
@ RUN
@SARN ASG N=1039
@RS ASG C=V01689
@ ASG L=$UTIL
@ XQT CUR
  IN L
@ XQT TAPACK
REWIND,19
REWIND,3
TAPECOPY,19,1,1,,3
REWIND,19
REWIND,3
$END
@ FIN
```

```
@ RUN
@$ ASG Z=V03345    @ PROGRAM TAPE FOR LARSAA AND FILZOM
@NSR ASG P=SAV    @ OUTPUT FROM FILZOM-----9 TRACK TAPE
@SR ASG B=MAPTAP
@SR ASG I=INFIZ
@SR ASG C=V01689          @  DATAPE
@RW ASG R=WORK1
@RW ASG Q=WORK2
@ ASG H,A
@ COM 03477776
@ XQT CUR
  TRW Z
  IN Z
@ XQT LARSAA
$STAT
COMMENT     AUTOMATIC PREPARATION OF CMI, 4 CHANNELS FROM IMAGE 100
CHANNELS    1,2,3,4
OPTION      MAXCLS = 22
OPTION      COVAR=C
*END*
CLASSNAME -6.5
SUBCLASS  -6.5
-6.5         (1, 1), (  3, 356), ( 23, 356), ( 23, 375), (  3, 375)
CLASSNAME +7.5
SUBCLASS  +7.5
+7.5         (1, 1), (  7, 395), ( 20, 395), ( 20, 415), (  7, 415)
CLASSNAME +6.5
SUBCLASS  +6.5
+6.5         (1, 1), (  7, 440), ( 20, 440), ( 20, 459), (  7, 459)
CLASSNAME +5.5
SUBCLASS  +5.5
+5.5         (1 ,1), (37, 440), ( 51, 440), ( 51, 459), ( 37, 459)
CLASSNAME +4.5
SUBCLASS  +4.5
+4.5         (1, 1), ( 67, 440), (84, 440), ( 84, 459), ( 67, 459)
CLASSNAME +3.5
SUBCLASS  +3.5
+3.5         (1,1), ( 98, 440), (112, 440), (112, 459), ( 98, 459)
CLASSNAME +2.5
SUBCLASS  +2.5
+2.5 C       (1, 1), (128, 440), (142, 440), (142, 459), (128, 459)
CLASSNAME +1.5
```

```
SUBCLASS  +1.5
+1.5 C     (1 ,1), (155, 440), (172, 440), (172, 459), (155, 459)
CLASSNAME +0.75
SUBCLASS  +0.75
+0.75C     (1,1), (185, 440), (202, 440), (202, 459), (185, 459)
CLASSNAME +0.25
SUBCLASS  +0.25
+0.25      (1, 1), (216, 440), (232, 440), (232, 459), (216, 459)
CLASSNAME -0.25
SUBCLASS  -0.25
-0.25      (1, 1), (247, 440), (263, 440), (263, 459), (247, 459)
CLASSNAME -0.75
SUBCLASS  -0.75
-0.75      (1, 1), (277, 440), (293, 440), (293, 459), (277, 459)
CLASSNAME -1.5
SUBCLASS  -1.5
-1.5       (1, 1), (308, 440), (324, 440), (324, 459), (308, 459)
CLASSNAME -2.5
SUBCLASS  -2.5
-2.5       (1, 1),(339, 440), (355, 440), (355, 459), (339, 459)
CLASSNAME -3.5
SUBCLASS  -3.5
-3.5       (1, 1), (368, 440), (384, 440), (384, 459), (368, 459)
CLASSNAME -4.5
SUBCLASS  -4.5
-4.5       (1, 1), (400, 440), (416, 440), (416, 459), (400, 459)
CLASSNAME -5.5
SUBCLASS  -5.5
-5.5       (1, 1), (431, 440), (447, 440), (447, 459), (431, 459)
CLASSNAME WATER
SUBCLASS  WATER
WATER      (1, 1), (465, 440), (495, 440), (495, 459), (465, 459)
$END*
$CLASSIFY
CHANNELS   1,2,3,4
OPTION    STATS
*END*
WHOLE      (1, 1), (1, 1), (512, 1), (512, 512), (1, 512)
$END*
$DISPLAY
COMMENT   CMI 27
SYMBOLS    G,7,6,5,4,3,2,1,0,+,-,A,B,C,D,E,F,J
OPTION    THRESHOLD VALUE
THRESHOLD 17*50.0,500.0
OPTION    FIZKEY
*END*
$END*
$EXIT
@ XQT FILZOM
COMMENT   CMI 27
FILTER        2    MAP  FILES
ISLAND       -3   -3
HOLE         -3   -3
@E PMD
@ FIN
```

INSTRUCTIONS FOR CENTRAL COMPUTER COMPLEX COMPUTER RUNS

(DO NOT FILL IN SHADED AREAS)

PROGRAMMER'S COMMENTS

TAPE 1039 IS 9 TRACK

PROGRAMMER	BADGE NO	BOX NO.	PHONE NO.	DATE	PRIORITY & INITIALS
X	X	X	X	X	

DIVISION CODE	PROG. NO	PROJ. NO.	EST. TIME	MAX. TIME	PAGES OUTPUT	SEQ. NO	
X	X	X	X	X	X	1 of 2	X

OPERATING SYSTEM				TYPE OF RUN			NO. TAPES	NO. FASTR FILES	NO DRUM FILES
1108 EXEC II	X	3200 SCOPE		PROD.	X	TEST			
1108 EXEC VIII		3200 SMARTS		OTHER (EXPLAIN BELOW)			2	1	0
1108 COBOL		3200 OTHER							

INPUT TAPES			WORKING TAPES	OUTPUT TAPES				PERMANENT FASTRAND FILES	
UNIT	REEL NO	FILE NAME		UNIT	REEL NO.	FILE NAME	SAVE		
N	1039			C	V01689	DATAPE		$	
								$	
								$	$ UTIL
								$	
								$	
								$	

4060	REEL NO.	FILE NO.	PUNCHED OUTPUT	REEL NO.	NO. CARDS
16 MM 35 MM					

CAL COMP PLOT	REEL NO.	NO. PLOTS	ACTUAL TIME USAGE
			STOP / START

ABNORMAL STOPS	SYSTEM OPERATOR	SYSTEM NO. / PAGES OUTPUT
EXCESS OUTPUT		
EXCESS TIME		
OTHER (EXPLAIN BELOW)		

OPERATORS COMMENTS:

Example I
Run 1 of 2

ISC FORM 5RRA JUL V MAY 7 ☆ U.S. GOVERNMENT PRINTING OFFICE: 1975— 671 549

INSTRUCTIONS FOR CENTRAL COMPUTER COMPLEX COMPUTER RUNS

(DO NOT FILL IN SHADED AREAS)

PROGRAMMER'S COMMENTS:

TAPE SAVE IS 9 TRACK

PROGRAMMER	BADGE NO	BOX NO.	PHONE NO	DATE	PRIORITY & INITIALS
X	X	X	X	X	

DIVISION CODE	PROG. NO	PROJ. NO	EST. TIME	MAX. TIME	PAGES OUTPUT	REG. NO.
X	X	X	X	X	X	8/3 X

OPERATING SYSTEM				TYPE OF RUN		NO TAPES	NO FASTR FILES	NO DRUM FILES
1108 EXEC II	X	3200 SCOPE		PROD	X	7	2	1
1108 EXEC VIII		3200 SMARTS		TEST				
1108 COBOL		3200 OTHER		OTHER (EXPLAIN BELOW)				

INPUT TAPES			WORKING TAPES	OUTPUT TAPES				PERMANENT FASTRAND FILES	
UNIT	REEL NO.	FILE NAME		UNIT	REEL NO.	FILE NAME	SAVE		
Z	V03345			P		SAVE		$	
C	V01689			B		MAPTAP		$	
				I		INFIZ		$	
				R		WORK1		$	
				Q		WORK2		$	
								$	

4060	REEL NO.	FILE NO.	PUNCHED OUTPUT	REEL NO	NO. CARDS
16 MM 35 MM					

CAL COMP PLOT	REEL NO.	NO. PLOTS	ACTUAL TIME USAGE
			STOP / START

ABNORMAL STOPS	SYSTEM OPERATOR	SYSTEM NO. / PAGES OUTPUT
EXCESS OUTPUT		
EXCESS TIME		
OTHER (EXPLAIN BELOW)		

OPERATORS COMMENTS:

Example I

Run 2 of 2

JSC FORM 5882A (REV MAY 7 ... ☆ U.S. GOVERNMENT PRINTING OFFICE: 1975— 671 549: 2

Example II. — In this deck setup, one run card is used. The input 9-track tape on unit P is copied onto unit C. LARSAA and FILZOM are executed. FILZOM writes over the input data on unit P.

```
@Z RUN
@S ASG Z=V03345     @ PROGRAM TAPE FOR LARSAA AND FILZCM
@SARN ASG P=1039    @ INPUT DATAPE OVERWRITTEN WITH FINAL OUTPUT FROM INFIZ
@SR ASG B=MAPTAP
@SR ASG I=INFIZ
@SR ASG C=DATAPE
@RW ASG R=WORK1
@RW ASG Q=WORK2
@ ASG H,A
@ ASG L=$UTIL
@ COM 03477776
@ XQT CUR
  IN L
@ XQT TAPACK
REWIND,19
REWIND,3
TAPECOPY,19,1,1,,3
REWIND,19
REWIND,3
$END
@ XQT CUR
  TRW Z
  IN Z
@ XQT LARSAA
$STAT
COMMENT     AUTOMATIC PREPARATION OF CMI, 4 CHANNELS FROM IMAGE 10--CMI 27
CHANNELS    1,2,3,4
OPTION      MAXCLS = 22
OPTION      COVAR=C
*END*
CLASSNAME -6.5
SUBCLASS  -6.5
-6.5        (1, 1), (  3, 356), ( 23, 356), ( 23, 375), (  3, 375)
CLASSNAME +7.5
SUBCLASS  +7.5
+7.5        (1, 1), (  7, 395), ( 20, 395), ( 20, 415), (  7, 415)
CLASSNAME +6.5
SUBCLASS  +6.5
+6.5        (1, 1), (  7, 440), ( 20, 440), ( 20, 459), (  7, 459)
CLASSNAME +5.5
SUBCLASS  +5.5
+5.5        (1 ,1), (37, 440), ( 51, 440), ( 51, 459), ( 37, 459)
CLASSNAME +4.5
SUBCLASS  +4.5
+4.5        (1, 1), ( 67, 440), (84, 440), ( 84, 459), ( 67, 459)
CLASSNAME +3.5
SUBCLASS  +3.5
+3.5        (1,1), ( 98, 440), (112, 440), (112, 459), ( 98, 459)
CLASSNAME +2.5
SUBCLASS  +2.5
+2.5 C      (1, 1), (128, 440), (142, 440), (142, 459), (128, 459)
CLASSNAME +1.5
SUBCLASS  +1.5
+1.5 C      (1 ,1), (155, 440), (172, 440), (172, 459), (155, 459)
CLASSNAME +0.75
SUBCLASS  +0.75
+0.75C      (1,1), (185, 440), (202, 440), (202, 459), (185, 459)
CLASSNAME +0.25
SUBCLASS  +0.25
+0.25       (1, 1), (216, 440), (232, 440), (232, 459), (216, 459)
```

```
CLASSNAME -0.25
SUBCLASS  -0.25
-0.25      (1, 1), (247, 440), (263, 440), (263, 459), (247, 459)
CLASSNAME -0.75
SUBCLASS  -0.75
-0.75      (1, 1), (277, 440), (293, 440), (293, 459), (277, 459)
CLASSNAME -1.5
SUBCLASS  -1.5
-1.5       (1, 1), (308, 440), (324, 440), (324, 459), (308, 459)
CLASSNAME -2.5
SUBCLASS  -2.5
-2.5       (1, 1),(339, 440), (355, 440), (355, 459), (339, 459)
CLASSNAME -3.5
SUBCLASS  -3.5
-3.5       (1, 1), (368, 440), (384, 440), (384, 459), (368, 459)
CLASSNAME -4.5
SUBCLASS  -4.5
-4.5       (1, 1), (400, 440), (416, 440), (416, 459), (400, 459)
CLASSNAME -5.5
SUBCLASS  -5.5
-5.5       (1, 1), (431, 440), (447, 440), (447, 459), (431, 459)
CLASSNAME WATER
SUBCLASS  WATER
WATER      (1, 1), (465, 440), (495, 440), (495, 459), (465, 459)
$END*
$CLASSIFY
CHANNELS   1,2,3,4
OPTION     STATS
*END*
WHOLE      (1, 1), (1, 1), (512, 1), (512, 512), (1, 512)
$END*
$DISPLAY
COMMENT    CMI 27
SYMBOLS    G,7,6,5,4,3,2,1,0,+,-,A,B,C,D,E,F,J
OPTION     THRESHOLD VALUE
THRESHOLD 17*50.0,500.0
OPTION     FIZKEY
*END*
$END*
$EXIT
@ XQT FILZOM
COMMENT    CMI 27
FILTER          2     MAP  FILES
ISLAND         -3    -3
HOLE           -3    -3
@E PMD
```

INSTRUCTIONS FOR CENTRAL COMPUTER COMPLEX COMPUTER RUNS

(DO NOT FILL IN SHADED AREAS)

PROGRAMMER'S COMMENTS:

Tape 1039 IS 9 TRACK.

PROGRAMMER	BADGE NO	BOX NO.	PHONE NO.	DATE	PRIORITY & INITIALS
X	X	X	X	X	

DIVISION CODE	PROG. NO.	PROJ. NO.	EST. TIME	MAX. TIME	PAGES OUTPUT	SEG. NO.
X	X	X	X	X	X	

OPERATING SYSTEM				TYPE OF RUN		NO. TAPES	NO. FASTR FILES	NO. DRUM FILES
1108 EXEC II	X	3200 SCOPE		PROD	X	7	3	1
1108 EXEC VIII		3200 SMARTS		TEST				
1108 COBOL		3200 OTHER		OTHER (EXPLAIN BELOW)				

INPUT TAPES UNIT	INPUT TAPES REEL NO.	INPUT TAPES FILE NAME	WORKING TAPES	OUTPUT TAPES UNIT	OUTPUT TAPES REEL NO.	OUTPUT TAPES FILE NAME	OUTPUT TAPES SAVE	PERMANENT FASTRAND FILES
2	V03345			P	1039			$
				B		MAPTAP		$ # UTIL
				I		INFIZ		$
				C		DATAPE		$
				R		WORK1		$
				Q		WORK2		$

4060	REEL NO.	FILE NO.	PUNCHED OUTPUT	REEL NO.	NO. CARDS
18 MM 35 MM					

CAL COMP PLOT	REEL NO.	NO. PLOTS	ACTUAL TIME USAGE
			STOP / START

ABNORMAL STOPS	SYSTEM OPERATOR	SYSTEM NO. / PAGES OUTPUT
EXCESS OUTPUT		
EXCESS TIME		
OTHER (EXPLAIN BELOW)		

OPERATORS COMMENTS:

Example II

Example III. – FILZOM is executed using the saved output tape, INFIZ, from a previous execution of processor $DISPLAY.

```
@ RUN
@RW ASG R=WORK1
@RW ASG Q=WORK2
@SR ASG I=V0I524                @  INFIZ TAPE
@NSR ASG P=SAV    @ OUTPUT FROM FILZOM------9 TRACK TAPE
@S ASG Z=V03345    @ PROGRAM TAPE FOR LAR9AA AND FILZOM
@ XQT CUR
  TRW Z
  IN Z
  TOC
@ XQT FILZOM
SKIP           29
ZOOM           .5    .5
LIMIT         151   220
OUTPUT          L
FILTER          2     MAP  FILES
COMMENT    CMI TEST -------- NO THRESHOLDING HAS BEEN USED
ISLAND          4     5
@E PMD
@ FIN
```

INSTRUCTIONS FOR CENTRAL COMPUTER COMPLEX COMPUTER RUNS

(DO NOT FILL IN SHADED AREAS)

PROGRAMMER'S COMMENTS

TAPE SAVE IS 9 TRACK

PROGRAMMER	BADGE NO	BOX NO.	PHONE NO.	DATE	PRIORITY & INITIALS
X	X	X	X	X	

DIVISION CODE	PROG. NO.	PROJ. NO.	EST. TIME	MAX. TIME	PAGES OUTPUT	SLG. NO.
X	X	X	X	X	X	

OPERATING SYSTEM				TYPE OF RUN		NO TAPES	NO. FASTR FILES	NO DRUM FILES
1108 EXEC II	X	3200 SCOPE		PROD. X	TEST	5	0	1
1108 EXEC VIII		3200 SMARTS		OTHER (EXPLAIN BELOW)				
1108 COBOL		3200 OTHER						

INPUT TAPES			WORKING TAPES	OUTPUT TAPES				PERMANENT FASTRAND FILES
UNIT	REEL NO.	FILE NAME		UNIT	REEL NO.	FILE NAME	SAVE	
2	V0334 5			P		SAVE		$
I	V01524	INFILE		R		WORK1		$
				Q		WORK2		$
								$
								$
								$

4060	REEL NO.	FILE NO.	PUNCHED OUTPUT	REEL NO.	NO. CARDS
16 MM 35 MM					

CAL COMP PLOT	REEL NO.	NO. PLOTS	ACTUAL TIME USAGE
			STOP

ABNORMAL STOPS	SYSTEM OPERATOR	SYSTEM NO.	START
EXCESS OUTPUT		PAGES OUTPUT	
EXCESS TIME			
OTHER (EXPLAIN BELOW)			

OPERATORS COMMENTS)

Example III

4. SELECTION OF COLORS

4.1 INTRODUCTION

Crop Moisture Index maps have been digitized weekly for a year at this writing. The interactive procedure described previously and the automatic procedure described herein were applied to hand-colored images prepared with tempera paints.

For the interactive procedure, the principal requirement for selection of colors was that colors of adjacent zones be very distinct. It was convenient if each zone was classified unambiguously, but this was not necessary. However, in the automatic system described herein, it is vital that colors classify correctly. Major misclassifications will result in major errors on the final digital tapes. For this reason, a modest study of appropriate colors was made. The results are reported in the following sections.

4.2 AVAILABLE SYSTEMS FOR PREPARING COLORED IMAGES

There is a wide variety of coloring systems available for preparation of opaque images. For this purpose, we needed a system that met the following requirements.

1. It would need to be rapid and to be completed in a few hours.
2. It needed to be suitable for a relatively untrained person to do.
3. Color zones needed to be homogeneous with the colors the same over the entire image and not to be glossy.
4. There should be no relief in the surface.
5. Colors needed to be opaque if they were to be used to paint over a figure on paper.
6. Fairly small detail (for example, a millimeter) needed to be easy to color.

7. Boundaries should be abrupt — without transition.

8. Final image size should be about 6 or 8 inches on a side for digitization on the Image-100.

Probably, the best system in the hands of an artist involved opaque acrylic paints, but which are difficult for an untrained person to use. For a trained person, homogeneous colored paper could be the best system. This would be convenient if the image were large enough and were to be reduced photographically. No experiments were made with this system. Preparation of a transparency was also tried using colored film. The edges were not sufficiently precise in our trial cases, and preparation of the colored image was difficult. By far, the best system was one involving the printing of the master image, as illustrated in appendix C, but it is much too slow and expensive for routine use. For operational use in support of the Screw-worm Eradication Project, a system was developed for overpainting paper diagrams with opaque tempera paints. This represented a compromise in all the requirements, but it satisfied the needs of the project.

4.3 AVAILABLE TEMPERA PAINTS

For routine use, it was necessary to use a wide variety of tempera paints. It was quickly found that available paints vary widely in quality. Some would not cover a pencil or xerox image adequately, even though they were classified as opaque paints. Others did not leave uniform colors because of separation of pigments.

On the advice of professionals, only colors of a single quality brand were used. The one most accessible to us were the Rich Art colors shown in table I. These proved to be good colors for this purpose, although undoubtedly other brands of paints would also be useful.

4.4 SELECTION OF COLORS

A brief study was made of the separability of tempera colors. A color table was prepared to include all the colors in our possession. The ISOCLS

TABLE II. —COLORS CONSIDERED IN THIS STUDY

RICH ART POST (TEMPERA) COLOR				RICH GLO FLUORESCENT WATER COLOR	
				Daylight Fluorescent — Glows Under Black Light	
1	White (Spectrum)	*64	Prussian Blue		
14	Poster White	*65	Navy Blue		
18	Gray (Spectrum)	70	Yellow Green (Spectrum)		
20	Black (Spectrum)	71	Emerald Green		
*24	Poster Black	72	Green (Spectrum)		
30	Light Yellow	*73	Dark Green	D14	White
31	Yellow (Spectrum)	*74	Extra Dark Green	D30	Lemon Yellow
32	Dark Yellow	75	Blue Green (Spectrum)	D40	Yellow Orange
40	Yellow Orange (Spectrum)	76	Olive Green	D42	Orange
42	Orange (Spectrum)	*77	Holly Green	D43	Red Orange
43	Red Orange (Spectrum)	*78	Cyprus Green	D51	Red
*44	Flesh	80	Lavender	D52	Cerise Red
50	Blazing (Light) Red	*81	Light Magenta	D62	Blue
51	Vermillon	82	Red Violet (Spectrum)	D72	Green
52	Red (Spectrum)	83	Violet (Spectrum)	*D81	Lt. Magenta (Pink)
53	Crimson Red	84	Blue Violet (Spectrum)	D82	Deep Magenta
*54	Dark Red	90	Yellow Ochre	D83	Violet
56	Brilliant Red	91	Brown (Spectrum)		
*57	Pink	92	Burnt Sienna		
58	Maroon	93	Burnt Umber		
60	Light Blue	*94	Vandyke Brown		
61	Turquoise Blue	*95	Raw Umber		
62	Blue (Spectrum)	*97	Raw Sienna		
63	Ultramarine Blue				

All "Rich Art" Poster (Tempera) Colors and "Rich Glo" Fluorescent colors are listed, but starred colors were not used. Probably the "Rich Glo Acral" fluorescent acrylic poster colors would be identical in color to the fluorescent colors but more convenient to use.

These colors are available from art supply houses or direct from the Rich Art Color Company, 31 West 21st. Street, New York, N.Y., 10010.

No endorsement of Rich Art products is implied. Undoubtedly, other brands would be equally useful to this use. Rich Art colors happened to be the most accessible high quality tempera colors at the time of this investigation.

processor of EOD-LARSYS was used to determine which colors were most easily separable, and the results are shown in tables II and III.

This is only a quick way of determining separability of colors, and its results are only presented as a convenient starting point. This brief study suffered from the following defects:

- Only a single experiment was made.
- Results depend on the filters used, as specified in the table. Other filters might give a different set of colors.
- Lighting of the image was arbitrary. Photofloods were used with varying voltages produced by an autotransformer. Fluorescent lights would probably yield different color sets.
- The experiment was limited to the Image-100 system. The spectra characteristics of its television cameras are not known.

In spite of these defects, these color sets should provide a useful starting point for choosing an optimum set.

4.5 USE OF THE COLOR TABLES

Since a near-infrared channel is sometimes used in addition to three visible colors, two tables were needed. Both are used in the same way, but table II will be used for illustration.

If 23 zones are needed, use all the colors in the 23-zone column. If 22 are needed, remove No. 75 because it is listed as 1 in the elimination order column. If 21 are needed, eliminate color 84. Table II, used in this way, can specify optimum sets for 5 to 23 zones.

Colors in these tables are arranged such that similar colors are adjacent. As a result, this order should be preserved for zones in numerical order. For example, if ten zones are to be coded numerically, 10, 20, 30, etc.,

TABLE III. — TABLE OF BEST COLORS FOR THREE PRIMARY COLOR CHANNELS

23 ZONES		15 ZONES		10 ZONES		5 ZONES
Color	Elimination Order	Color	Elimination Order	Color	Elimination Order	Color
1		1		1		1
D30		D30		D30	3	50
31		31	2	50		63
D43	3	50		blue + 1	4	90
50		42	1	63		20
D51	6	53	5	18	1	
42		blue + 1		70	5	
53		61	3	80	2	
blue + 1		63		90		
61		18		20		
63		70				
18		72	4			
72 + 1	4	80				
70		90				
72		20				
75	1					
82 + 1	8					
80						
84	2					
90						
91	7					
93	5					
20						

These lists are based on LARSYS clustering of hand-painted color tables. Data were read through blue, yellow, and red filters (Wratten filters 98, 50Y, and 25 into three channels of the Image-100. Data was read from the machine in LARSYS-2 format and clustered using the EOD LARSYS program.

The elimination order numbers specify the order of removal of colors. For example, if only thirteen zones are to be distinguished, colors 31 and 42 should be omitted from the 15 zone list of best colors.

TABLE IV. — TABLE OF BEST COLORS FOR FOUR COLOR CHANNELS
(THREE PRIMARY COLORS PLUS NEAR INFRARED)

23 ZONES		15 ZONES		10 ZONES		5 ZONES
Color	Elimination Order	Color	Elimination Order	Color	Elimination Order	Color
1		1		1		1
D30		D30		D30	4	50
31		31	1	50		62 + 1
D43	5	50		62 + 1		90
50		53	2	61	3	20
D51	8	62 + 1		18	2	
42	1	61		72	5	
53		63	4	90		
62 + 1		18		93	1	
61		72		20		
63		75	5			
18		80	3			
72 + 1	7	90				
70	2	93				
72		20				
75						
82 + 1	3					
80						
84	4					
90						
91	6					
93						
20						

These lists were compiled like those on table 2, except that near-infrared radiation, using a Wratten 89B filter, was used as a fourth color channel.

they should be represented respectively, by colors 1, D30, 50, blue plus 1, etc., as shown in the table. Then, if a pixel in zone 30 is not properly classified, it will most likely be misclassified as 20 or 40, not by numbers that are more erroneous.

These color tables are also used for interactive classification schemes, as in reference 1. In such a case, colors should be attenuated in some way such that adjacent zones are unlike colors. In the above example the same ten zones might be coded 1, 18, D30, 70, 50, 80, blue + 1, 90, 63, and 20.

5. REFERENCES

1. Giddings, L. E.; and Thompson, E. J.: An Interactive Method for Digitizing Crop Moisture Index and Other Maps. JSC-09809, LEC-6498 (1975).

2. Giddings, L. E.; and Mejia, Raúl: Preparation of Digital Tapes by Interpolation. JSC-10758, LEC-7499, to be issued in 1976.

3. Minter, Ruth; Gardner, C. T.; Wills, B. E.; and Corbett, B. W.: User Documentation EOD-LARSYS, Earth Observation Divisions Version of the Laboratory for Applications of Remote Sensing System Program Q619, LEC-3984 (1975).

4. Boston, Sydney: User Documentation Spatial Filter and Zoom Scanner Data (FILZOM) Program Q945. JSC 11130. LEC-8097 to be published in 1976.

5. Giddings, L. E.; and Boston, Sydney: The Eight-Neighbor Filter Option of the LSD DISPLAY Processor. JSC-10795. LEC-7619.

APPENDIX A

DIGITIZATION OF A SIMPLE ARTIFICIAL IMAGE

The method described here was designed for use with images such as that shown in figure A-1. This hand-painted image is composed of nine colors, each of which identifies a zone which is to be assigned a given value of crop moisture index. Adjacent colors were chosen for contrast, not for similarity. Therefore, misclassifications will tend to be serious.

Figure A-2 shows the input cards for this case, starting from an output tape from LARSYS "CLASSIFY", and figure A-3 shows the results of the discriminator. Note, again that adjacent zones were chosen for contrast, whereas they would best have been chosen for similarity.

Figure A-3 shows the final result of the classification and assignment of zone values after four applications of a three-neighbor filter. Note that there are a few misclassifications, which are to be expected because of this low quality of illumination used with the Image-100 table scanner.

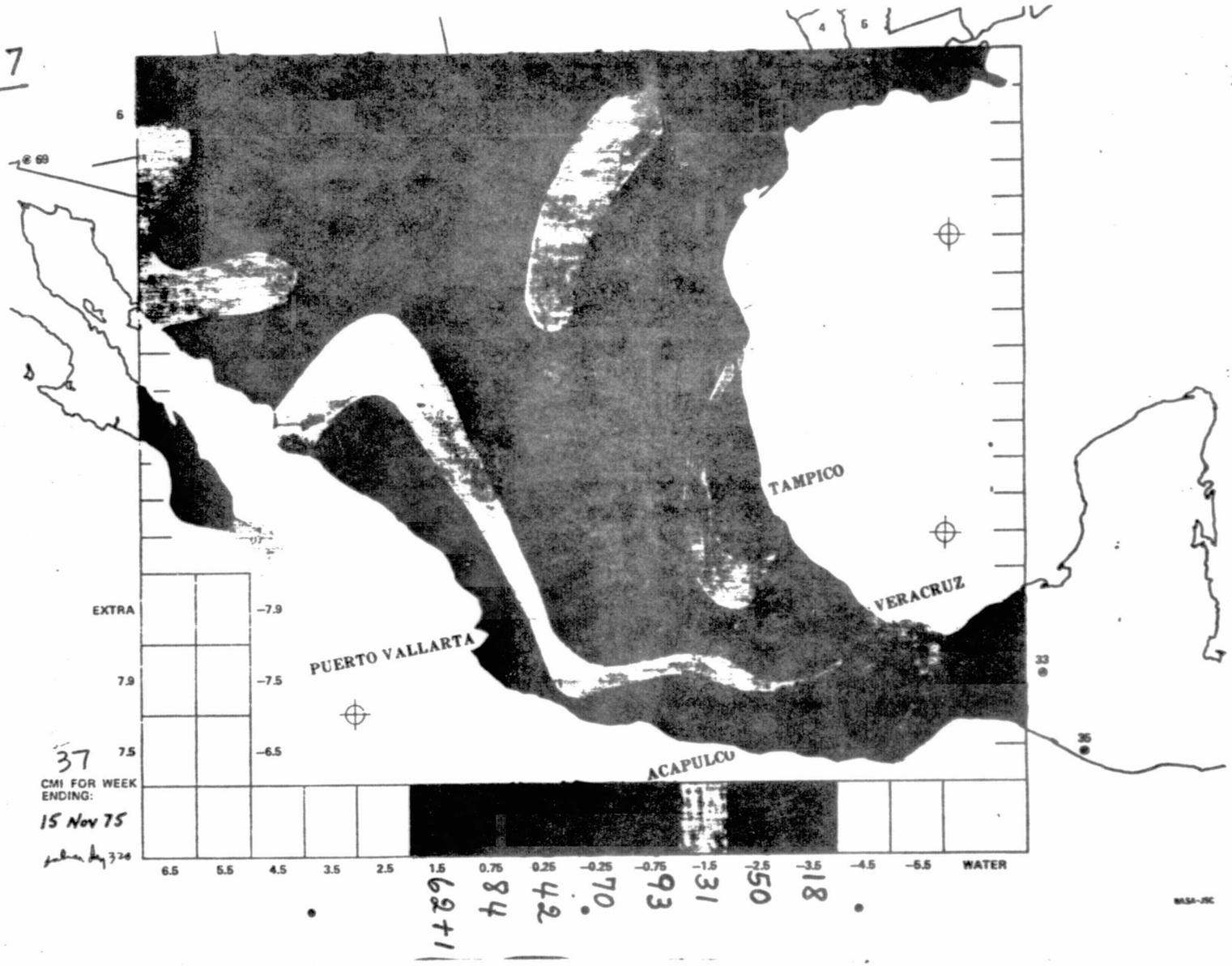


Figure A-1. — Hand-painted color-coded CMI image composed of nine colors.

```
@Z RUN L78385,FD52,H3A,4803D,J999,C,30,99                    BOSTON CMI 37
@NSR ASG P=SAVE    @ OUTPUT FROM FILZOM------9 TRACK TAPE
@SR ASG I=INFIZ       @ CMI INFIZ
@RW ASG R=WORK1
@RW ASG Q=WORK2
@S ASG Z=V00577    @ PROGRAM TAPE FOR LARSAA AND FILZOM
@SR ASG B=V02530    @ CMI MAPTAP
@ XQT CUR
  TRW Z
  IN Z
  TOC
@ XQT LARSAA
$DISPLAY
COMMENT    CMI NO. 37 FOR WEEK ENDING 15 NOV 75  THRESHOLDING
THRESHOLD @*50.0,500.0
OPTION     THRESHOLD VALUE
SYMBOLS     1,2,3,4,5,6,7,8,W,
OPTION     FIZKEY
*END*
$END*
$EXIT
@ XQT FILZOM
OUTPUT          L
FILTER          8     MAP  FILES
COMMENT    CMI NO. 37 FOR WEEK ENDING 15 NOV 75  THRESHOLDING
ISLAND          0    -3    -3    -3    -3    -3    -3    -3
HOLE            0    -3    -3    -3    -3    -3    -3    -3
@E PMD
@ FIN
```

Figure A-2. — Input cards.

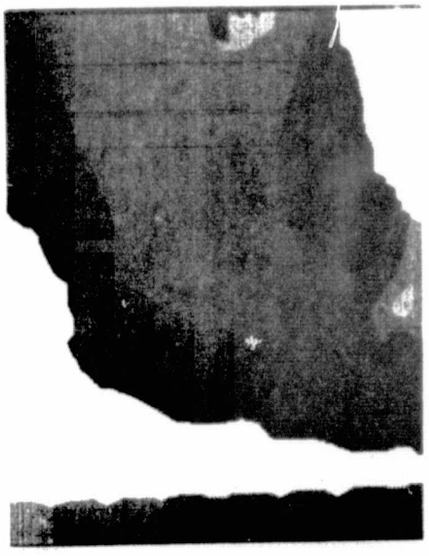


Figure A-3.— Results of the discriminator.

APPENDIX B

DIGITIZATION OF A COMPLEX ARTIFICIAL IMAGE

The quality of zone-discrimination of this method depends very strongly on the homogeneity of illumination of the scanning device. Since illumination for opaque images on the Image-100 is only makeshift, zone discrimination should be expected to be only fair.

Figure B-1 presents an image which is considerably more complex than A-1. There are 17 zones to be discriminated in this figure.

Figure B-2 reproduces the cards used to process this image, starting with a 7-track copy of the 9-track tape produced by the Image-100 computer.

The final zone image (fig. B-3) shows that the discriminator worked quite well. In all cases, misidentifications are serious only because similar colors are not adjacent; for example, three blues are coded as 3.5, -0.75, and -4.5. If similar colors were adjacent, no misidentifications would have been serious.

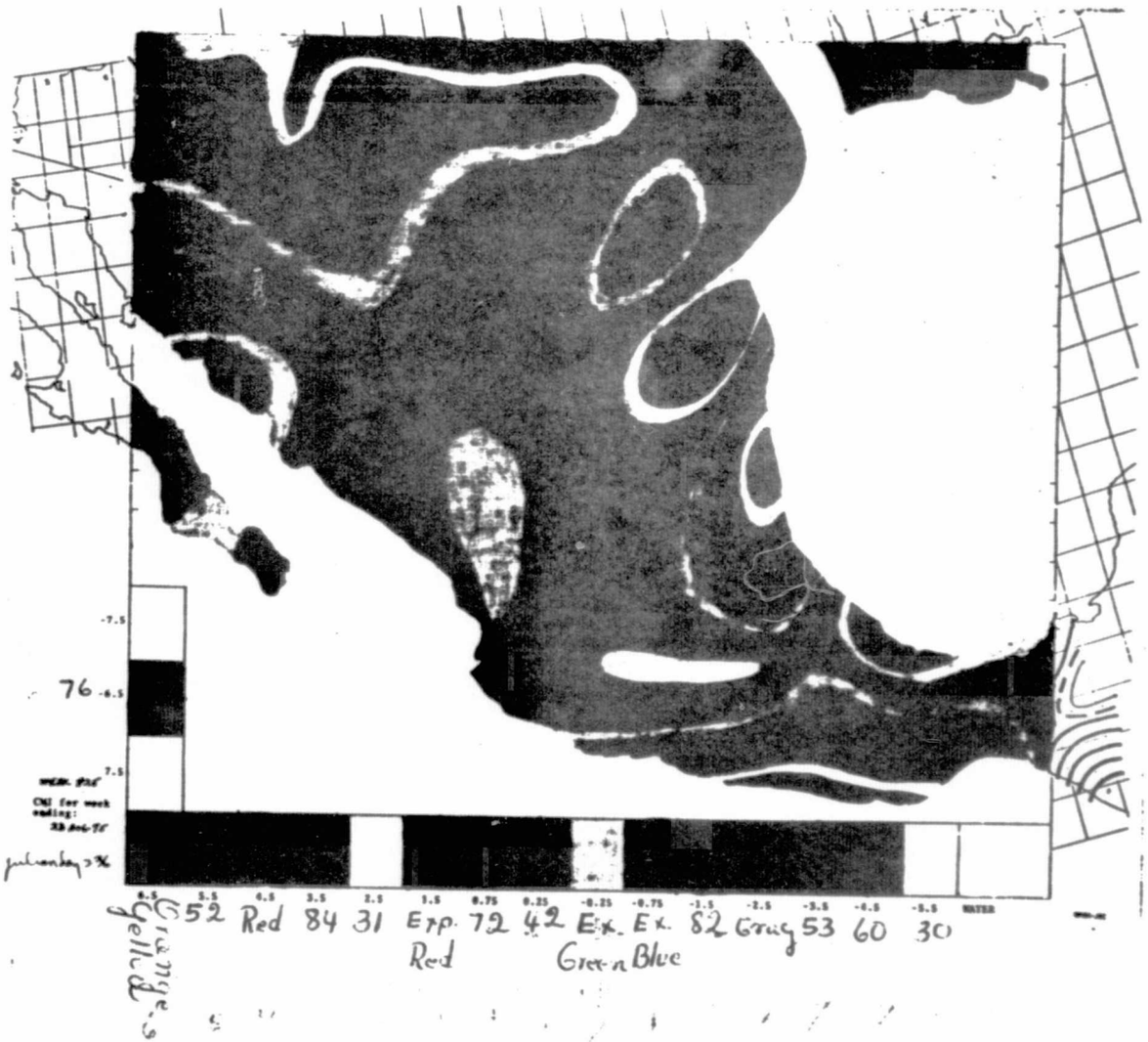


Figure B-1. — Color-coded Crop Moisture Index Map (original in colors).

STARTED PAINTING AT 1 P.M.
FINISHED PAINTING AT 5 P.M.
AUGUST 26/75

```
@Z RUN L78385,FD52,H3A,4803D,J999,C,30,99                    BOSTON CMI 37
@S ASG Z=V03345    @ PROGRAM TAPE FOR LARSAA AND FILZOM
@SR ASG C=V01689
@SR ASG B=X02162
@NSR ASG P=X01741 @ OUTPUT FROM FILZOM-----9 TRACK TAPE
@RW ASG R=WORK1
@RW ASG Q=WORK2
@SR ASG I=X00643
@SR ASG A
* ASG H
@ XQT CUR
  TRW Z
  IN Z
  TOC


@ XQT LARSAA
$STAT
COMMENT     AUTOMATIC PREPARATION OF CMI, 4 CHANNELS FROM IMAGE 100
CHANNELS    1,2,3,4
OPTION      MAXCLS = 22
OPTION      COVAR=C
*END*
CLASSNAME -6.5
SUBCLASS  -6.5
-6.5        (1,1),(13,363),(20,363),(20,377),(13,377)
CLASSNAME +6.5
SUBCLASS  +6.5
+6.5        (1,1),(13,440),(20,440),(20,453),(13,453)
CLASSNAME +5.5
SUBCLASS  +5.5
+5.5        (1,1),(43,440),(51,440),(51,453),(43,453)
CLASSNAME +4.5
SUBCLASS  +4.5
+4.5        (1,1),(73,440),(84,440),(84,453),(73,453)
CLASSNAME +3.5
SUBCLASS  +3.5
+3.5        (1,1),(104,440),(112,440),(112,453),(104,453)
CLASSNAME +2.5
SUBCLASS  +2.5
+2.5        (1,1),(134,440),(142,440),(142,453),(134,453)
CLASSNAME +1.5
SUBCLASS  +1.5
+1.5        (1,1),(161,440),(172,440),(172,453),(161,453)
CLASSNAME +0.75
SUBCLASS  +0.75
+0.75       (1,1),(191,440),(202,440),(202,453),(191,453)
CLASSNAME +0.25
SUBCLASS  +0.25
+0.25       (1,1),(222,440),(232,440),(232,453),(222,453)
CLASSNAME -0.25
SUBCLASS  -0.25
-0.25       (1,1),(253,440),(263,440),(263,453),(253,453)
CLASSNAME -0.75
SUBCLASS  -0.75
-0.75       (1,1),(283,440),(293,440),(293,453),(283,453)
CLASSNAME -1.5
SUBCLASS  -1.5
-1.5        (1,1),(314,440),(324,440),(324,453),(314,453)
```


Figure B-2. — Cards used to process the image in figure B-1.

```
CLASSNAME -2.5
SUBCLASS  -2.5
-2.5       (1,1),(345,440),(355,440),(355,453),(345,453)
CLASSNAME -3.5
SUBCLASS  -3.5
-3.5       (1,1),(374,440),(384,440),(384,453),(374,453)
CLASSNAME -4.5
SUBCLASS  -4.5
-4.5       (1,1),(406,440),(416,440),(416,453),(406,453)
CLASSNAME -5.5
SUBCLASS  -5.5
-5.5       (1,1),(437,440),(447,440),(447,453),(437,453)
CLASSNAME WATER
SUBCLASS  WATER
BLANK      (1,1),(13,323),(20,323),(20,337),(13,337)
PAINT      (1,1),(471,440),(495,440),(495,453),(471,453)
$END*
$CLASSIFY
CHANNELS   1,2,3,4
OPTION     STATS
*END*
WHOLE      (1, 1), (1, 1), (512, 1), (512, 512), (1, 512)
$END*
$DISPLAY
COMMENT    CMI WEEK ENDING 23 AUG 75  NUMBER 25
SYMBOLS    G,6,5,4,3,2,1,0,+,-,A,B,C,D,E,F,J
OPTION     THRESHOLD VALUE
THRESHOLD 16*50.0,500.0
OPTION     FIZKEY
*END*
$END*
$EXIT
@ XQT FILZOM
COMMENT    CMI WEEK ENDING 23 AUG 75  NUMBER 25
FILTER        5    MAP  FILES
ISLAND        0   -3   -3   -3   -3
HOLE          0   -3   -3   -3   -3
OUTPUT        L
@E PMD
@ FIN
```

Figure B-2. — Cards used to process the image in figure B-1. (concluded)

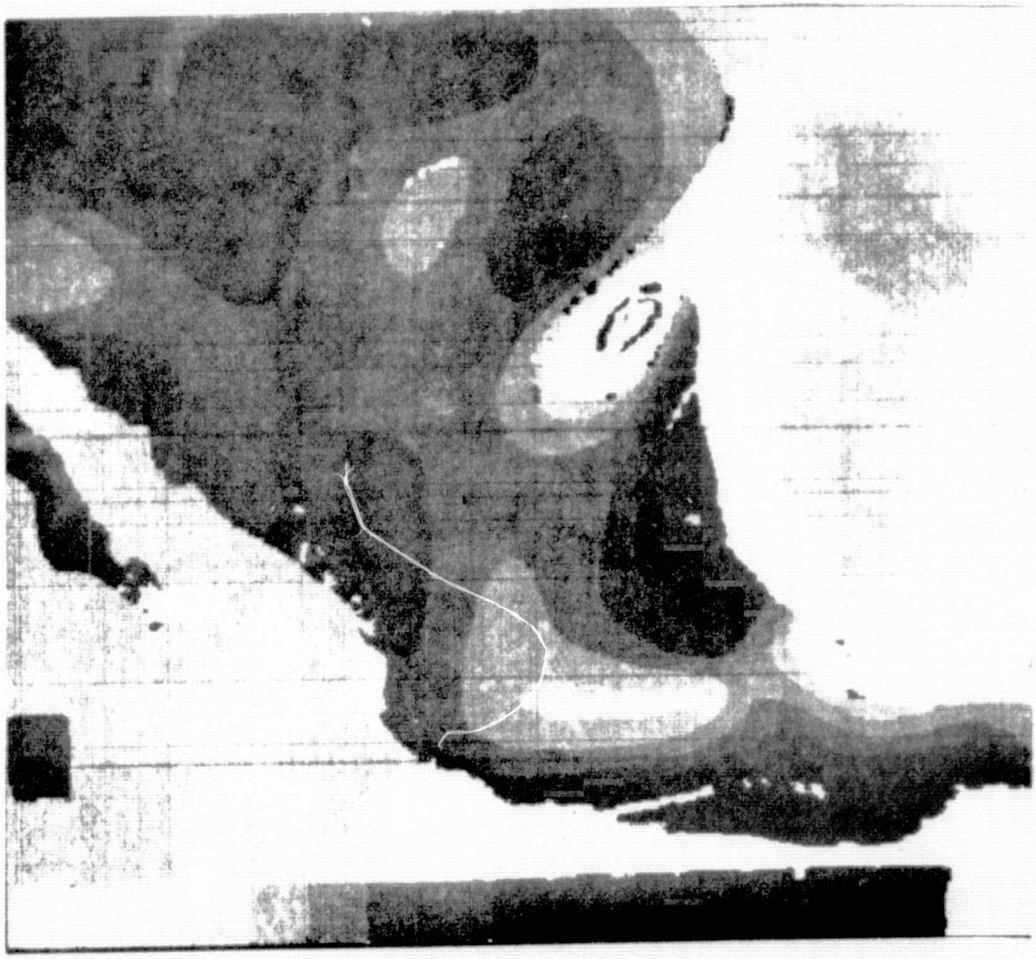


Figure B-3. — Results of the discriminator.

APPENDIX C

ALPHABETICAL LISTING OF LEAD CARDS FOR FILZOM

APPENDIX C

ALPHABETICAL LISTING OF LEAD CARDS FOR FILZOM

*If a NOSEDS lead card is read, check the default values for cards LIMIT, SKIP and ZOOM.

CARD NO. _____

JOB FILZOM

NAME CODE△△△△△△

LEAD CARD SET UP

PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'CODE△△△△△△'.
3-12	11-60	10I5	CODE	Enter a code (right justified) for each sub-
				class starting with subclass one. A maximum of six CODE cards can be read. Each code
				must be unique. Also, a code cannot be smaller than 1 or greater than 255.
				The default code values for the SEDS sub-
				classes together with the appropriate class
				names are shown below:
				SEDS CLASS NAMES — CODE
				-7.9 — 1
				-7.5 — 8
				-6.5 — 24
				-5.5 — 40
				-4.5 — 56
				-3.5 — 72
				-2.5 — 88
				-1.5 — 104
				-0.75 — 116
				-0.25 — 124
				+0.25 — 132
				+0.75 — 140
				+1.5 — 152
				+2.5 — 168
				+3.5 — 184
				+4.5 — 200
				+5.5 — 216
				+6.5 — 232
				+7.5 — 248
				+7.9 — 254
				WATER — 176

COMMENTS Optional card. Default: SEDS codes.

CARD NO. _____

JOB FILZOM

NAME ~~COMMENT~~ COMMENTΔΔΔ

LEAD CARD SET UP

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1,&2	1-10	A6,A4	CARD1 CARD2	Enter 'COMMENTΔΔΔ'.
3-12	11-70	10A6	COMENT	Any 60 characters which are desired for the 3rd line of the page heading

COMMENTS Optional card. Default is 60 blank characters.

CARD NO. _____

JOB FILZOM

NAME DATE△△△△△△

LEAD CARD SET UP PROGRAMMER Boston

DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'DATE△△△△△△!.
3	11÷22	2A6	DATE	Enter any 12 characters

COMMENTS Optional card. Default: current date.

CARD NO. _____

JOB FILZOM

NAME DEBUGΔΔΔΔΔ

LEAD CARD SET UP

PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'DEBUGΔΔΔΔΔ'.
3	11-15	I5	DEBUGF	Enter a "1" (right justified) for debug information. If DEBUGF equals one, the input training fields and test fields are printed.

COMMENTS Optional card. Default is no debug information is printed.

CARD NO. _____

JOB FILZOM

NAME DEFAULTΔCΔ

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'DEFAULTΔCΔ'.
3	11-15	I5	DFTCOD	Enter the default code value (right justified)
				for a pixel that is unclassified. The code
				cannot be equal to a classified pixel code.
				Also, the code cannot be smaller than one or
				greater than 255.

COMMENTS Optional card. The default is SEDS default code 128.

CARD NO.

JOB FILZOM

NAME DEFAULTΔSΔ

LEAD CARD SET UP

PROGRAMMER Boston

DATE

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'DEFAULTΔSΔ'.
3	15	A1	DFTSYM(1)	Enter one of the default symbols for a pixel that is unclassified.
4	20	A1	DFTSYM(2)	Enter the overprint symbol for a pixel that is unclassified.

COMMENTS Optional card. The default values are DFTSYM(1) = 0 and DFTSYM(2) = blank

CARD NO. _____

JOB FILCOM

NAME DESIGNATEΔ

LEAD CARD SET UP

PROGRAMMER BOSTON

DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD 1 CARD 2	Enter 'DESIGNATEΔ'.
3	11-15	I5	DESCOD(1)	Enter a code (right justified) for fields that are designated as 'unidentifiable'. The code must be unique. Refer to lead cards CODE and DEFAULTΔC. Also a code cannot be smaller than 1 or larger than 255.
4	20	A1	DESSYM(1,1)	Enter one of the symbols for a field that is designated as 'unidentifiable'.
5	25	A1	DESSYM(2,1)	Enter the overprint symbol for a field that is designated as 'unidentifiable'.
6	31-35	I5	DESCOD(2)	Enter a code (right justified) for fields that are designated as 'other'.
7	45	A1	DESSYM(1,2)	Enter one of the symbols for a field that is designated as 'other'
8	45	A1	DESSYM(2,2)	Enter the overprint symbol for a code that is designated as 'other'.

COMMENTS Optional card. The default values are DESCOD(1)=255, DESSTM(1,1) =?, DESSYM(2,1)=Δ, DESCOD(2)=2, DESSYM(1,2)=#, DESSYM(2,2)=Δ

CARD NO. _____

JOB FILZOM

NAME FILEΔΔΔΔΔΔ

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'FILEΔΔΔΔ'.
3	11-15	I5	FILE	Enter the file number (right justified) on the input tape that contains the data to be processed.

COMMENTS Optional card. Default: FILE = 1

CARD NO. _____

JOB FILZOM

NAME HED1ΔΔΔΔΔΔ

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'HED1ΔΔΔΔΔΔ'.
3-12	11-70	10A6	HED1	Any 60 characters which are desired for the 1st line of the page heading.

COMMENTS Optional card. Default: LYNDON B. JOHNSON SPACE CENTER.

CARD NO. _____
JOB FILZOM
NAME HED2ΔΔΔΔΔΔ

LEAD CARD SET UP

PAGE NO. 1 OF 1
PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'HED2ΔΔΔΔΔΔ'.
3-12	11-70	10A6	HED2	Any 60 characters which are desired for the 2nd line of the page heading.

COMMENTS Optional card. Default: HOUSTON, TEXAS

CARD NO. _____

JOB FILZOM

NAME HOLEΔΔΔΔΔΔ

LEAD CARD SET UP PAGE NO.___ OF___

PROGRAMMER BOSTON DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'HOLEΔΔΔΔΔΔ'.
3-8	11-35	5I5	HOLTST	For each time the input data is filtered enter HOLTST value (right justified). A positive HOLTST value is the number of classifed or unclassified pixels that have to be equal before the center unclassified pixel is changed. A negative HOLTST value is the number of classified pixels that have to be equal before the center unclassfied pixel is changed to a classified pixel.
				Valid HOLTST values follow:
				3 -3 4 -4 5 -5 6 -6 7 -7 8 -8
				0 - for no filtering

COMMENTS Optional card. For each time the input data is filtered, the default HOLTST value equals 5.

CARD NO. _____

JOB FILZOM

NAME ISLAND

LEAD CARD SET UP PAGE NO.___ OF___

PROGRAMMER BOSTON DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'ISLANDΔΔΔΔΔ'.
3	11-35	5I5	ISLTST	For each time the input data is filtered enter an ISLTST value (right justified). A positive ISLTST value is the number of classified or unclassified pixels that have to be equal before the center classified pixel is changed. A negative ISLTST value is the number of classified pixels that have to be equal before the center classified pixel is changed.
				Valid ISLTST values follow:
				3 -3 4 -4 5 -5 6 -6 7 -7 8 -8 0 for no filtering

COMMENTS Optional card. For each time the input data is filtered, the default ISLTST value equals 5.

CARD NO. _____

JOB FILZOM

NAME FILTER

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'FILTERΔΔΔΔ'.
3	11-15	I5	TIMFIL	Enter the number of times (right justified) the input data will be filtered. The TIMFIL value cannot be larger than 8. The default is TIMFIL = 1.
4	20-22	A3	FILMAP	If a greymap is desired for each time the input data is filtered, enter 'MAP'. The default is a greymap of the last time the data is filtered.
5	25-29	A5	FILFIL	If an output file is desired for each time the data is filtered, enter 'FILES'. The default is only an output file of the last time the data is filtered.

COMMENTS Optional card.

CARD NO. _____

JOB FILZOM

NAME LIMIT

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'LIMITΔΔΔΔΔ'.
3	11-15	I5	LIMLIN	Enter the number of lines (right justified) desired on the output tape. A blank or zero is not allowed. Also LIMLIN cannot be larger than 1,000.
4	16-20	I5	LIMSAM	Enter the number of samples (right justified) per line desired on the output tape. A blank or zero is not allowed. Also LIMSAM cannot be larger than 1,000.

COMMENTS Optional card. The default values are LIMLIN = 550 and LIMSAM = 625.

CARD NO. _____

JOB FILZOM

NAME NOSEDΔΔΔΔ

LEAD CARD SET UP

PROGRAMMER Boston DATE _____

PAGE NO. 1 OF 1

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'NOSEDΔΔΔΔ'. This indicates that the SEDS default symbols and codes will not be used. Refer to lead cards SYMBOL, DEFAULT S, CODE, DEFAULT C and DESIGNATE. If a SYMBOL lead card is not read, the symbols from $DISPLAY will be used for the greymap. If a CODE lead card is not read, the first subclass will have a code value of 1 and the second subclass will have a code value of 2, etc. If a DEFAULTΔS lead card is not read then the threshold symbol from $DISPLAY will be used. If a DEFAULT C lead card is not read then the default code equals the number of subclasses + 1. If a DESIGNATE lead card is not read, the code for a designated 'unidentified' field equals the number of subclasses + 5 and the code for a designated 'other' field equals the number of subclasses +6.

COMMENTS Optional card. Default is SEDS' symbols and codes. Refer to the options on lead cards SYMBOL, DEFAULT S, CODE, DEFAULT C, and DESIGNATE.

CARD
NO. _____

JOB FILZOM

NAME OUTPUTΔΔΔΔ

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'OUTPUTΔΔΔΔ'.
3	15	A1	TAPOUT	Enter a 'L' for LARSYS II format.

COMMENTS Optional card. Default is the Universal format.

CARD NO. _____

JOB FILZOM

NAME SKIPΔΔΔΔΔΔ

LEAD CARD SET UP

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'SKIPΔΔΔΔΔΔ'.
3	11-15	I5	SKPLIN	Enter the number of lines to skip. (right justified).
4	16-20	I5	SKPSAM	Enter the number of samples to skip. (right justified).

COMMENTS Optional card. Default values are SKPLIN = 20 and SKPSAM = 0. If SKIPΔΔΔΔΔΔ is read and the field is blank, the variable will equal zero.

CARD NO. _____

JOB FILZOM

NAME SYMBOLΔΔΔΔ

LEAD CARD SET UP PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'SYMBOLΔΔΔΔ'.
3-62	11-70	60A1	SYM	Enter symbols $S_1, S_2, .. S_n$ to subclasses 1,2..n respectively. If overprinting is desired, then the overprint symbols are entered on a second SYMBOLΔΔΔΔ lead card. Overprinted or non-overprinted symbols may be used in the same greymap, however, each symbol or symbol set for a subclass must be unique. The default SEDS symbols are shown below.

SEDS CLASS NAMES	SYMBOL SETS
-7.9	8/
-7.5	7/
-6.5	6/
-5.5	5/
-4.5	4/
-3.5	3/
-2.5	2/
-1.5	1/
-0.75	1=
-0.25	0/
+0.25	0+
+0.75	1+
+1.5	1Δ
+2.5	2Δ
+3.5	3Δ
+4.5	4Δ
+5.5	5Δ
+6.5	6Δ
+7.5	7Δ
+7.9	8Δ
WATER	ΔΔ

COMMENTS Optional card. If only one SYMBOLΔΔΔΔ card is read the second set will be blanks. The default symbols are the SEDS symbols.

CARD NO. _____

JOB FILZOM

NAME ZOOM

LEAD CARD SET UP

PAGE NO. 1 OF 1

PROGRAMMER Boston DATE _____

FIELD I. D.	CARD COLUMNS	FORMAT	SYMBOLIC NAME	IDENTIFICATION
1&2	1-10	A6,A4	CARD1 CARD2	Enter 'ZOOMΔΔΔΔΔΔ'
3	11-15	F5.0	ZØMLIN	Enter the ZOOM line factor for all output files and greymap. If zero or blank the program calculates ZOMLIN.
4	16-20	F5.0	ZOMSAM	Enter the ZOOM sample factor for all output files and greymap. If zero or blank the program calculates ZOMSAM.

COMMENTS ~~Optional cards. The default values are ZOMLIN = 1.25 and~~ ZOMSAM = 1.25.

APPENDIX D

PROGRAM LISTING

AND

PROGRAM PRINTER OUTPUT

PROGRAM LISTING

```
OR,* FILZOR/NO945A,FILZOR,FILZOR                                    08 APR 76          11:23:34
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:23:34

   MAIN PROGRAM

   STORAGE USED: CODE(1) 007573; DATA(0) 016627; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   FIZ     000434
    0004   DRUM    000046
    0005   INFIZ1  000015
    0006   COMSAR  015560
    0007   UNTIFZ  003216
    0010   GLOBAL  000076
    0011   DISPL   001370

   EXTERNAL REFERENCES (BLOCK, NAME)

    0012   RESET
    0013   RREAD
    0014   FSBSFL
    0015   TDATE
    0016   RDCOD$
    0017   FIZWRF
    0020   WRTFLD
    0021   FIZSON
    0022   RIBIT
    0023   RWCOD$
    0024   FIZTHD
    0025   FIZFLT
    0026   FIZWRT
    0027   RWRITE
    0030   FIZRA$
    0031   CLOCK
    0032   CMERR
    0033   RREW$
    0034   RWDU$
    0035   RIOZ$
    0036   RRDU$
    0037   RIOI$
    0040   RWEF$
    0041   RSTOP$

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0000   014175 10F      0000   014326 100F      0001   000474 1000G     0001   000530 1020G     0001   000020 1040L
    0000   014330 105F     0001   000144 1050L     0001   000631 1056G     0000   014334 106F      0001   000247 1060L
    0001   000637 1063G    0001   000645 1070G     0001   000272 1070L     0001   000651 1074G     0001   000307 1075L
    0001   000327 1080L    0000   014347 110F      0001   000674 1106G     0001   000703 1114G     0001   000742 1137G
    0001   000747 1143G    0001   000775 1156G     0001   001006 1166G     0000   014361 120F      0001   001043 1207G
    0001   001050 1213G    0001   001107 1234G     0001   001132 1247G     0001   001155 1260G     0001   001171 1270G
    0001   001224 1307G    0001   001263 1330G     0001   001271 1335G     0001   001275 1341G     0001   001337 1363G
    0001   001345 1370G    0001   001351 1374G     0000   014363 140F      0001   001504 1444G     0001   001510 1450G
    0001   001516 1455G    0001   001530 1466G     0001   001534 1472G     0001   001561 1505G     0001   001604 1517G
    0001   001627 1531G    0001   001652 1543G     0001   001730 1574G     0000   014365 160F      0001   002142 1663G
    0000   014413 170F     0000   014466 180F      0000   014476 181F      0000   014507 182F      0000   014520 183F
    0000   014543 190F     0000   014531 191F      0000   014556 200F      0001   000402 2000L     0001   000422 2006L
    0001   000451 2020L    0001   000501 2040L     0001   000535 2060L     0001   002653 2067G     0001   000621 2070L
    0001   000656 2080L    0001   000721 2085L     0001   000726 2090L     0000   014572 210F      0001   000757 2100L
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0001  001022 2105L   0000  014601 211F    0001  001027 2110L   0001  002721 2112G   0001  001060 2120L
0001  002735 2123G   0001  002760 2135G   0001  001114 2140L   0001  003040 2154G   0001  003045 2160G
0001  001136 2160L   0001  001176 2180L   0000  014606 220F    0001  001231 2200L   0001  003106 2202G
0001  003113 2210G   0001  003126 2217G   0001  001305 2220L   0001  003134 2225G   0001  001361 2225L
0001  001471 2230L   0001  003150 2236G   0001  001543 2240L   0001  003161 2245G   0001  001566 2260L
0001  001611 2280L   0000  014616 230F    0001  001634 2300L   0001  001657 2310L   0001  003305 2315G
0001  001671 2315L   0001  003331 2331G   0001  003342 2336G   0001  001735 2350L   0001  001745 2360L
0001  003423 2365G   0001  001764 2365L   0001  002001 2370L   0001  002027 2375L   0001  003443 2377G
0000  014657 240F    0001  003571 2435G   0001  002045 2440L   0001  003600 2441G   0001  002065 2445L
0001  003642 2462G   0001  003645 2465G   0001  002116 2465L   0000  014704 250F    0001  002160 2500L
0001  003730 2514G   0001  003753 2526G   0001  002353 2540L   0001  004002 2543G   0001  004017 2554G
0001  002403 2560L   0000  014730 260F    0001  004317 2647G   0000  014772 265F    0001  004331 2655G
0000  015000 270F    0001  004530 2722G   0001  004645 2736G   0001  005062 2764G   0000  015043 280F
0000  014177 30F     0000  015077 300F    0001  005177 3000G   0000  015117 302F    0001  002453 3020L
0001  005336 3021G   0000  015125 303F    0001  002515 3040L   0001  002566 3060L   0001  005474 3065G
0001  002637 3080L   0000  015133 310F    0001  005577 3117G   0001  005614 3127G   0000  015216 315F
0000  015237 317F    0000  015260 320F    0001  006011 3204G   0000  015303 322F    0001  006101 3226G
0001  006131 3242G   0000  015325 330F    0001  006311 3301G   0000  015332 331F    0000  015343 332F
0000  015371 333F    0001  006415 3332G   0000  015431 335F    0000  015464 340F    0000  015563 342F
0000  015570 345F    0001  007047 3450G   0001  007114 3466G   0000  015573 350F    0001  007135 3500G
0001  007221 3526G   0001  007226 3534G   0000  015574 360F    0001  007421 3640G   0000  015642 365F
0001  007470 3672G   0001  007513 3705G   0000  015652 400F    0001  002660 4000L   0001  002727 4040L
0000  015665 405F    0001  002744 4050L   0001  003064 4088L   0000  015674 410F    0001  003066 4100L
0000  015713 415F    0000  015757 416F    0001  003121 4160L   0000  016022 420F    0001  003171 4300L
0001  003356 4360L   0001  003363 4380L   0000  016035 440F    0001  003435 4400L   0001  003440 4450L
0001  003464 4460L   0001  003555 4480L   0001  003610 4500L   0001  003660 4530L   0001  003662 4535L
0001  003664 4536L   0001  003764 4540L   0001  004006 4560L   0000  016057 460F    0001  004024 4600L
0000  016063 465F    0000  014236 50F     0000  016066 500F    0000  016077 510F    0000  016101 515F
0000  016102 520F    0001  000031 546G    0000  016121 580F    0000  016130 585F    0000  014252 60F
0001  004444 6040L   0001  000237 632G    0001  000262 647G    0001  000302 663G    0001  000322 676G
0000  014266 70F     0001  004771 7080L   0001  000360 716G    0001  005325 7200L   0001  005355 7205L
0001  005401 7215L   0001  005503 7220L   0001  005604 7250L   0001  000372 727G    0001  005677 7280L
0001  005764 7300L   0001  006012 7320L   0001  006144 7368L   0001  006166 7370L   0001  006242 7380L
0001  006267 7420L   0001  000417 743G    0001  006316 7460L   0001  006335 7480L   0001  006366 7485L
0001  006403 7490L   0000  014301 75F     0001  006426 7500L   0001  000431 751G    0001  006441 7511L
0001  006466 7515L   0001  006534 7520L   0001  000444 762G    0000  014313 80F     0001  006553 8000L
0001  006636 8040L   0001  006722 8050L   0001  007153 8070L   0001  007171 8075L   0001  007231 8120L
0001  007275 8300L   0001  007310 8980L   0000  014324 90F     0000  016134 900F    0001  007350 9000L
0001  007405 9010L   0001  007426 9030L   0001  007437 9040L   0001  007452 9045L   0000  016156 905F
0001  007453 9050L   0001  007476 9060L   0001  007524 9070L   0001  007534 9075L   0001  007542 9080L
0001  007551 9090L   0000  016202 910F    0000  016221 915F    0000  016243 920F    0000  016277 925F
0000  016355 930F    0000  016410 940F    0000  016442 950F    0000  016471 990F    0011  001342 ACROP
0004 I 000042 ALADD   0011  001351 ANALYS  0011  001343 AOTHER  0005 I 000000 ARFIZ1  0000 I 014140 ARNAME
0000 I 000242 ARRAY   0003 I 000375 ASAM    0000 I 014136 ASAMF   0003 I 000374 ASAM1   0007 I 003215 ATFILE
0011  001344 ATOTAL   0000 I 014173 BADREC  0000 I 014146 BFILE   0000 I 014044 BLANK   0011  000570 BMCOMB
0011  000571 BMFEAT   0010  000055 BNFILE  0011  000567 BNFLG   0010  000056 BNKEY   0006 I 015554 BUFPT
0011  001354 CAMS     0000 I 014077 CARD1   0000 I 014100 CARD2   0011  000000 CATFLG  0011  000001 CATNAM
0011 I 000572 CDATE   0000 I 014115 CHECK   0000 I 014123 CR      0011 I 000076 CLSNAM  0011  000460 CLSSUB
0003 I 000206 CODE    0004 I 000001 COLADD  0004 I 000013 COLINC  0003 I 000356 COMENT  0011 R 001075 COM
0000 I 014072 CRDCT   0011  001341 CROP    0011  001366 CRPKEY  0007 I 000021 CTFILE  0000 I 014107 CTRECD
0000 I 014032 CTSED   0003  000400 CTSEDS  0000 I 014045 DASM    0010  000053 DATAPE  0003 I 000354 DATE
0010  000071 DATFIL   0000 I 014147 DDMMYY  0003 I 000370 DEBUGF  0000 I 014026 DESCOD  0011 I 001336 DESKEY
0003 I 000431 DESN01  0003 I 000432 DESN02  0011 I 001340 DESOTH  0000 I 014022 DESSYM  0011 I 001337 DESUBI
0003 I 000315 DFTCOD  0003 I 000320 DFTPT   0003 I 000316 DFTSYM  0000 I 014144 DMMED   0000 I 014141 DMMST
0010  000067 DRMDS    0004 I 000031 DRMMRT  0010  000066 DRUMAD  0005 I 000001 DSPYDT  0005 I 000003 DSPYTM
0011 I 000000 DUMDIS  0010 I 000000 DUMGLO  0000 I 014035 DUMMY   0003 I 000433 DUPNO   0000 I 014040 DUPSYM
0000 I 014172 ELATIM  0000 I 014163 ELINE   0011  000564 EMPTRS  0000 I 014126 ENDFLD  0003 I 000401 EOFHIT
0010  000062 ERIPTP   0010  000063 ERPKEY  0000 I 014075 ERRCOD  0000 I 014073 ERROR   0000 I 014117 ERRSED
0000 I 014103 ERRTST  0003 I 000377 ESAM    0000 I 014137 ESAMF   0003 I 000376 ESAM1   0011  001175 FETVC2
0011 I 000575 FIELD2  0011 I 000600 FIELD3  0000 I 014034 FILE    0000 I 014106 FILFIL  0000 I 014105 FILMAP
0011 I 001334 FILTER  0010 I 000075 FIZFIL  0010  000074 FIZKEY  0005 I 000000 FIZNAM  0010  000073 FIZUNT
0005  000004 FLDESC   0011 I 001171 FLDKEY  0011 I 000574 FLDSV2  0011 I 000577 FLDSV3  0004 I 000032 FOR
0000 I 014145 FTT     0010 I 000000 HEAD    0003 I 000327 HED1    0003 I 000341 HED2    0011  001001 HIGH
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0010   000057 HISFIL    0010   000060 HISKEY    0006 I 011634 HOLARR    0007 I 003203 HOLECH    0004 I 000027 HOLLIN
0000 I 014142 HOLMAP    0007 I 000032 HOLTST    0004 I 000030 HOLWRD    0000 I 014101 I         0004 I 000000 IBADDR
0000 I 000000 ICARD     0000 I 014062 IDBUG     0000 I 014060 IDCOD     0000 I 014067 IDCOM     0000 I 014066 IDDAT
0000 I 014061 IDDC      0000 I 014074 IDDES     0000 I 014052 IDDS      0000 I 014063 IDFIL     0000 I 014071 IDFIT
0000 I 014121 IDFTPT    0000 I 014064 IDHED1    0000 I 014065 IDHED2    0000 I 014056 IDHOL     0000 I 014055 IDISL
0000 I 014054 IDLIN     0000 I 014050 IDOP      0000 I 014070 IDSEDS    0000 I 014057 IDSKP     0000 I 014051 IDSYM
0000 I 014053 IDZON     0000 I 014112 IHR       0005 I 000010 ILINED    0005 I 000011 ILINIC    0005 I 000007 ILINST
0000 I 014113 IMIN      0005 I 000006 INLINE    0005 I 000005 INPTS     0006 I 001750 IR        0000 I 000106 IRSTAT
0000 I 000112 IRWRDS    0005 I 000013 ISAMED    0005 I 000014 ISAMIC    0005 I 000012 ISAMST    0000 I 014117 ISEC
0000 I 014161 ISKWR     0007 I 003173 ISLDCM    0007 I 000022 ISLTST    0000 I 014152 I1        0000 I 014153 I2
0000 I 014111 I3        0000 I 014102 J         0000 I 014122 JDFTPT    0006 I 015556 JSTAT     0000 I 014127 J1
0000 I 014130 J2        0000 I 014131 J3        0000 I 014132 J4        0000 I 014104 K         0011   001237 KATNO
0000 I 014157 KEYFIL    0003 I 000371 LIMHIT    0003 I 000325 LIMLIN    0003 I 000326 LIMSAM    0000 I 014154 LINE
0000 I 014160 LINECT    0000 I 014042 LININC    0003 I 000373 LMPSAM    0007 I 000000 MAP       0011   001335 MAPFMT
0010   000052 MAPTAP    0010   000064 MAPUNT    0000 I 014047 MAXCRD    0000 I 014135 MAXSAM    0011 I 001367 MFILE
0011   001333 MOCAT     0011 I 001236 MOCLSZ    0004 I 000025 MOCOL     0004 I 000026 MOCOMR    0011   001174 MOFET2
0010   000065 MOFILE    0011 I 001172 MOFLDZ    0011 I 001173 MOFLD3    0011   000554 MOMAP     0011 I 001233 MOSUBZ
0011   000536 MOSUB3    0011   001234 MOTRFD    0000 I 014174 MUMMRS    0000 I 014143 MWDS      0007 I 000010 OTFILE
0003 I 000353 OTLINE    0003 I 000312 OTUNT     0000 I 014150 OUTFAS    0000 I 014076 OUTLNP    0010   000070 PAGSIZ
0011   000557 PCFDKY    0011   000602 PCTID3    0007 I 000043 PERCNT    0011   000566 PLTKEY    0003 I 000372 PROSAM
0000 I 014120 PT        0006 I 001750 PTSYM     0004 I 000043 REALIN    0000 I 014134 SAMDFT    0000 I 014041 SAMINC
0000 I 014156 SAMPLE    0006 I 000000 SAMSOM    0000 I 014043 SAMSTR    0010   000054 SAVTAP    0000 I 014033 SEDKEY
0003 I 000402 SEDNAM    0011   001345 SITE      0000 I 014110 SKFILE    0003 I 000313 SKPLIN    0003 I 000314 SKPSAM
0000 I 014151 SKP3      0000 I 014162 SLINE     0010   000072 STAFIL    0011   000563 STATKY    0011   000364 SUBCAT
0011 I 000173 SUBNAM    0011   000270 SUBNO     0000 I 014155 SV        0003 I 000000 SYM       0006 I 011634 SYMCHK
0011 I 000677 SYMMTX    0004 I 000044 SYMPAG    0003 I 000311 TAPOUT    0007 I 003214 TMOLCH    0011 R 000603 THRES
0011 I 000562 THRSKY    0011   000565 THRSVA    0007 I 000020 TIMFIL    0004 I 000045 TIMREA    0007 I 003213 TISLCH
0000 I 014116 TOPPAG    0007 I 000042 TOTPCT    0000 I 014124 TOTTRN    0000 I 014125 TOTTST    0011 I 001235 TOTVTZ
0011 I 000555 TOTVT3    0010   000061 TRFORM    0011   000561 TRNKEY    0003 I 000427 TRNNO     0000 I 014036 TRNSYM
0011 I 000560 TSTKEY    0003 I 000430 TSTNO     0000 I 014037 TSTSYM    0000 I 014133 TSTWRD    0006   015555 UNTFAS
0000 I 014030 UNTFA1    0000 I 014031 UNTFA2    0000 I 014046 UNTFIZ    0011 I 000576 VERTX2    0011 I 000601 VERTX3
0007 D 001073 ZCMI      0000 D 000170 ZDUMY     0000 D 014170 ZHOL      0003 D 000321 ZOMLIN    0003 D 000323 ZOMSAM
0007 D 001113 ZPC       0000 D 000116 ZSED      0000 D 014166 ZTOCMI    0000 D 014164 ZTOTPC
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00100      1*      C     PROGRAM FILZOM
00100      2*      C
00100      3*      C
00100      4*      C
00100      5*      C
00101      6*            IMPLICIT INTEGER (A-Y)
00103      7*            INCLUDE FIZCOM,LIST
00104      7*            IMPLICIT DOUBLE PRECISION (Z)
00105      7*            REAL COM,THRES                                          *BEM
00105      7*      C
00105      7*      C                 PARAMETERS
00105      7*      C
00106      7*            PARAMETER PAGCOL = 10, PAGSYM = 110, PARSAM = 1000, PARLIN = 1000
00107      7*            PARAMETER PAGHRD = 19, PSCLAD = 61, ISUBCL = PSCLAD - 1
00110      7*            PARAMETER PSEDS = 21, POUTLN = PSCLAD+6, PSYM = 2*POUTLN,
00110      7*           *          PSAMPS= PARSAM + 5, PARFIL = 8                 *BEM
00110      7*      C                                                            **-1
00110      7*      C                 COMMON BLOCKS
00110      7*      C
00111      7*            COMMON /FIZ/ SYM(POUTLN,2), CODE(POUTLN), TAPOUT, OTUNT, SKPLIN,
00111      7*           *             SKPSAM, DFTCOD, DFTSYM(2), DFTPT, ZOMLIN, ZOMSAM,
00111      7*           *             LIMLIN , LIMSAM, HED1(10), HED2(10), OTLINE, DATE(2),
00111      7*           *             COMENT(10),DEBUGF,LIMHIT,PROSAM,LMPSAM,
00111      7*           *             ASAM1, ASAM, ESAM1, ESAM, CTSEDS, EOFMIT,
00111      7*           *          SEDNAM(PSEDS),TRNNO,TSTNO,DESN01,DESN02,DUPNO
00112      7*            COMMON /DRUM/ IBADDR, COLADD(PAGCOL), COLINC(PAGCOL), NOCOL,
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00112    7*          *             NOCOMR, NOLLIN, NOLNRD, ORNWRT,
00112    7*          *              FOR(8), ALADD, REALIN, SYMPAG, TIMREA
00113    7*           COMMON /INFIZ1/ FIZNAM, DSPVOT(2), DSPYTM, FLDESC, INPTS, INLINE,
00113    7*          *                ILINST, ILINED, ILINIC, ISAMST, ISAMED, ISAMIC
00114    7*           COMMON /CONSAM/ SAMSOW(PARSAM),IR(PSAMPS,4),HOLARR(PARSAM,2),
00114    7*          *                BUFPT, UBTFAS, JSTAT(2)
00115    7*           COMMON/UBTIFZ/  MAP(PARFIL), OTFILE(PARFIL), TIMFIL,
00115    7*          *                CTFILE, ISLTST(PARFIL), HOLTST(PARFIL), TOTPCT,
00115    7*          *                PERCNT(POUTLN,PARFIL),ZCNI(PARFIL),
00115    7*          *                ZPC(POUTLN,PARFIL), ISLOCH(PARFIL),
00115    7*          *                HOLECH(PARFIL), TISLCH, THOLCH
00115    7*          *                ,ATFILE                                          *NEW
00116    7*           END
00117    8*           INCLUDE COMBK6,LIST
00120    8*           COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00120    8*          *             MISFIL,MISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
00120    8*          *              BRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL
00120    8*          *              ,FIZUNT,FIZKEY,FIZFIL                          FILZOM
00121    8*           END
00122    9*           INCLUDE CMBK10,LIST
00123    9*           COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
00123    9*          *             SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00123    9*          *             PCFDKY,TSTKEY,TRNKEY,THRSKY,STATKY,EMPTRS,THRSVA,
00123    9*          *             PLTKEY,BNFLG,BNCOMB,BNFEAT,CDATE(2),
00123    9*          *             FLDSV2,FIELD2,VERTX2,FLDSV3,FIELD3,VERTX3,PCTID3,
00123    9*          *             THRES(60),SYMNTX(66),HIGH(60),CON(60)
00123    9*          *             ,FLDKEY,NOFLD2,NOFLD3,NOFET2,FETVC2(30)
00123    9*          *             ,NOSUB2,NOTRFD,TOTVT2,NOCLS2
00123    9*          *             ,RATNO(60),NOCAT,FILTER,RAPFRT
00123    9*          *             ,DESKEY,DESUNI,DESOTH,CROP ,ACROP,AOTHER,ATOTAL
00123    9*          *             ,SITE(4),ANALYS(3),CANS(10),CRPKEY
00123    9*          *             ,NFILE                                          ,FILZOM
00124    9*           END
00125   10*           DIMENSION ICARD(79), IRSTAT(4), IRWRDS(4)
00126   11*           PARAMETER PARDIS=760, PARGLO=62, PARARF=13
00127   12*           DIMENSION DUMDIS(PARDIS), DUMGLO(PARGLO), ARFIZ1(PARARF)
00130   13*           DIMENSION PTSYM(POUTLN), SYMCHK(POUTLN,2)
00131   14*           DIMENSION ZSED(PSEDS), ZDUMY(PSEDS)
00132   15*           PARAMETER PARARR = 6000
00133   16*           DIMENSION ARRAY (PARARR)
00134   17*           DIMENSION DESSYM(2,2),DESCOD(2)
00134   18*     C
00134   19*     C                   EQUIVALENCE STATEMENTS
00134   20*     C
00135   21*           EQUIVALENCE (PTSYM(1),IR(1,1)), (HOLARR(1),SYMCHK(1,1))
00136   22*           EQUIVALENCE (DUMDIS(1),CATFLG), (DUMGLO(1),HEAD(1))
00137   23*           EQUIVALENCE (ARFIZ1(1),FIZNAM)
00137   24*     C
00137   25*     C                   DATA STATEMENTS
00137   26*     C
00140   27*           DATA SEDNAM( 1)/6H-7.0  /, SEDNAM( 2)/6H-7.5  /,
00140   28*          *     SEDNAM( 3)/6H-6.5  /, SEDNAM( 4)/6H-5.5  /,
00140   29*          *     SEDNAM( 5)/6H-4.5  /, SEDNAM( 6)/6H-3.5  /,
00140   30*          *     SEDNAM( 7)/6H-2.5  /, SEDNAM( 8)/6H-1.5  /,
00140   31*          *     SEDNAM( 9)/6H-0.75 /, SEDNAM(10)/6H-0.25 /,
00140   32*          *     SEDNAM(11)/6H+0.25 /, SEDNAM(12)/6H+0.75 /,
00140   33*          *     SEDNAM(13)/6H+1.5  /, SEDNAM(14)/6H+2.5  /,
00140   34*          *     SEDNAM(15)/6H+3.5  /, SEDNAM(16)/6H+4.5  /,
00140   35*          *     SEDNAM(17)/6H+5.5  /, SEDNAM(18)/6H+6.5  /,
00140   36*          *     SEDNAM(19)/6H+7.5  /, SEDNAM(20)/6H+7.9  /,
00140   37*          *     SEDNAM(21)/6HWATER /
00166   38*           DATA TAPOUT/1/, OTUNT/19/, SKPLIN/20/, SKPSAM/0/, UBTFA1/20/,
00166   39*          *     UBTFA2/21/, HOLTST/PARFIL*5/, ISLTST/PARFIL*5/, DFTCOD/128/,
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00166    40*          *     DFTSYM(1)/1H0/, DFTSYM(2)/1H /, MAP/PARFIL*1/,
00166    41*          *     DTFILE/PARFIL*1/,TIMFIL/1/,CTFILE/0/,
00166    42*          *       ZONLIB/1.2500/,ZONSAN/1.2500/,LIMLIB/550/,LIMSAN/625/,
00166    43*          *     DEBUGF/0/, LIMHIT/0/, CTSED/21/, SEDKEY/1/
00166    44*          *    .FILE/1/
00217    45*           DATA DUMMY/0/
00221    46*           DATA TRBSYM/'*'/, TSTSYM/'*'/, DUPSYM/'$'/
00225    47*           DATA SANINC/1/, LIMINC/1/, SAMSTR/1/
00231    48*           DATA BLANK/6H      /, DASH/6H------/
00234    49*           DATA SYM/PSYM*6H      /
00236    50*           DATA SYM(1,1)/1H8/, SYM(1,2)/1H//, SYM(2,1)/1H7/, SYM(2,2)/1H//,
00236    51*          *     SYM(3,1)/1H6/, SYM(3,2)/1H//, SYM(4,1)/1H5/, SYM(4,2)/1H//,
00236    52*          *     SYM(5,1)/1H4/, SYM(5,2)/1H//, SYM(6,1)/1H3/, SYM(6,2)/1H//,
00236    53*          *     SYM(7,1)/1H2/, SYM(7,2)/1H//, SYM(8,1)/1H1/, SYM(8,2)/1H//,
00236    54*          *     SYM(9,1)/1H1/, SYM(9,2)/1H=/,
00236    55*          *     SYM(10,1)/1H0/, SYM(10,2)/1H//
00263    56*           DATA SYM(11,1)/1H0/, SYM(11,2)/1H+/,
00263    57*          *     SYM(12,1)/1H1/, SYM(12,2)/1H+/,
00263    58*          *     SYM(13,1)/1H1/, SYM(13,2)/1H /,
00263    59*          *     SYM(14,1)/1H2/, SYM(14,2)/1H /,
00263    60*          *     SYM(15,1)/1H3/, SYM(15,2)/1H /,
00263    61*          *     SYM(16,1)/1H4/, SYM(16,2)/1H /,
00263    62*          *     SYM(17,1)/1H5/, SYM(17,2)/1H /,
00263    63*          *     SYM(18,1)/1H6/, SYM(18,2)/1H /,
00263    64*          *     SYM(19,1)/1H7/, SYM(19,2)/1H /,
00263    65*          *     SYM(20,1)/1H8/, SYM(20,2)/1H /,
00263    66*          *     SYM(21,1)/1H /, SYM(21,2)/1H /,
00312    67*           DATA CODE(1)/  1/, CODE(2)/  8/, CODE(3)/ 24/, CODE(4)/ 40/,
00312    68*          *     CODE(5)/ 56/, CODE(6)/ 72/, CODE(7)/ 88/, CODE(8)/104/,
00312    69*          *     CODE(9)/116/, CODE(10)/124/
00325    70*           DATA CODE(11)/132/, CODE(12)/140/, CODE(13)/152/, CODE(14)/168/,
00325    71*          *     CODE(15)/184/, CODE(16)/200/, CODE(17)/216/, CODE(18)/232/,
00325    72*          *     CODE(19)/248/, CODE(20)/254/, CODE(21)/176/
00341    73*           DATA UBTFIZ/11/
00343    74*           DATA DESSYM(1,1)/1H7/, DESSYM(2,1)/1H /, DESCOD(1)/255/,
00343    75*          *     DESSYM(1,2)/1H0/, DESSYM(2,2)/1H /, DESCOD(2)/2  /
00352    76*           DATA MAXCRD/27/, IDOP/0/, IDSYM/0/, IDDS/0/, IDZOM/0/, IDLIM/0/,
00352    77*          *     IDISL/0/, IDMOL/0/, IDSKP/0/, IDCOD/0/, IDDC/0/, IDBUG/0/,
00352    78*          *     IDFIL/0/, IDHED1/0/, IDHED2/0/, IDDAT/0/, IDCOM/0/,
00352    79*          *     IDSEDS/0/,IDFIT/0/,CRDCT/0/,ERROR/0/,IDDES/0/
00352    80*          *      ,CTFILE/0/
00402    81*           DATA HED1/6H      , 6H      , 6H   LYB, 6HDOB B., 6H JOHBS,
00402    82*          *          6HOB SPA, 6HCE CEB, 6HTER   , 6H      , 6H       /
00404    83*           DATA HED2/6H      , 6H      , 6H      , 6H     N, 6HOUSTOB,
00404    84*          *          6H, TEXA, 6HS     , 6H      , 6H      , 6H       /
00406    85*           DATA COMENT/10*6H      /, ERRCOD/99999/, EOFHIT/0/
00412    86*           DATA OUTLBP /POUTLB/
00414    87*           DATA DATE(1)/6H      /, DATE(2)/6H      /
00414    88*     C
00414    89*     C                FORMAT STATEMENTS
00414    90*     C
00417    91*          10 FORMAT (A6,A4,70A1)
00420    92*          30 FORMAT (1H1,38X,'CHECK LEAD CARDS FOR PROGRAM FILZOM',/,
00420    93*          *         39X,35('*'),/,/,/,T50,9('0'),10('1'),10('2'),10('3'),
00420    94*          *         10('4'),10('5'),10('6'),10('7'),'8',/,T50,8('1234567890')
00420    95*          *         ,/)
00421    96*          50 FORMAT (2X,'***ERROR*** CARD IDENTIFICATION',T50,A6,A4,70A1,
00421    97*          *         /,T50,A6,A4,/)
00422    98*          60 FORMAT (2X,'***ERROR***  DUPLICATE CARD ID.',T50,A6,A4,70A1,/,
00422    99*          *         T50,A6,A4,/)
00423   100*          70 FORMAT (2X,'***ERROR***  ERROR IN CODE(S)',T50,A6,A4,70A1,/,
00423   101*          *         T60,70A1,/)
00426   102*          75 FORMAT (2X,'***ERROR***  BAD REREAD FORMAT',T50,A6,A4,70A1,/,/)
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00425    103*       80 FORMAT (2X,'***GOOD ***  INPUT CARD',T50,A6,A4,70A1,/,/)
00426    104*       90 FORMAT (10X,2F5.0)
00427    105*      100 FORMAT (10X,10I5)
00430    106*      105 FORMAT (10X,I5,4X,A3,2X,A5)
00431    107*      106 FORMAT (2X,'***ERROR***  ERROR IN CODE(S)',T50,A6,A4,70A1,/,
00431    108*     *        T60,5A5,/)
00432    109*      110 FORMAT (2X'***VARIABLES CHECKED LATER***',T50,A6,A4,70A1,/,/)
00433    110*      120 FORMAT (10X,10I5)
00434    111*      140 FORMAT (10X,10A6)
00435    112*      160 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'TOO MANY LEAD CARDS ',
00435    113*     *        'HAVE BEEN READ.',/,T20,'NO MORE LEAD CARDS WILL BE ',
00435    114*     *        'READ.',/)
00436    115*      170 FORMAT (/,/,/,T40,'SUMMARY OF INPUT TAPE',/,T40,21('-'),/,/,/,
00436    116*     *        T25,'INFIZ INPUT ON LOGICAL UNIT ',I2,'.',/,/,
00436    117*     *       T25,'INFIZ FILE',I2,' GENERATED ON ',2A6,' AT ',
00436    118*     *       A2,':',A2,':',A2,
00436    119*     *        ' WILL BE PROCESSED.',/,/,/,
00436    120*     *        T25,'SUMMARY OF INPUT SCANNER DATA:',/)
00437    121*      180 FORMAT (T29,'NO THRESHOLDING HAS BEEN APPLIED.',/)
00440    122*      181 FORMAT (T29,'CHI SQUARE THRESHOLDING HAS BEEN APPLIED.',/)
00441    123*      182 FORMAT (T29,'EMPIRICAL THRESHOLDING HAS BEEN APPLIED.',/)
00442    124*      183 FORMAT (T29,'USER-INPUT THRESHOLDING HAS BEEN APPLIED.',/)
00443    125*      191 FORMAT (T29,'PROCESSOR DISPLAY APPLIED SPATIAL FILTERING.',/)
00444    126*      190 FORMAT (T29,'PROCESSOR DISPLAY DID NOT APPLY SPATIAL FILTERING.'
00444    127*     *        ,/)
00445    128*      200 FORMAT (T29,'DATA CLASSIFIED FOR MAPTAP FILE ',I1,' ON ',A6,A4,
00445    129*     *        '.',/)
00446    130*      210 FORMAT (T29,'NUMBER OF INPUT LINES =',I5,'.')
00447    131*      211 FORMAT (1H+,T15,'***ERROR***')
00450    132*      220 FORMAT (/,T29,'NUMBER OF INPUT SAMPLES =',I5,'.')
00451    133*      230 FORMAT (/,T29,'NUMBER OF CLASSES = ',I2,'.',/,/,
00451    134*     *        T29,'NUMBER OF SUBCLASSES = ',I2,'.',/,/,
00451    135*     *        T29,'NUMBER OF TRAINING FIELDS = ',I2,'.',/,
00451    136*     *       /,T29,'NUMBER OF TEST OR DESIGNATE FIELDS =',I3,'.')
00452    137*      240 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'NUMBER OF SAMPLES ',
00452    138*     *        'TO SKIP =',I5,/,T20,'NUMBER OF SAMPLES ON INPUT TAPE =',
00452    139*     *        I5)
00453    140*      250 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'NUMBER OF LINES TO ',
00453    141*     *        'SKIP =',I5,/,T20,'NUMBER OF LINES ON INPUT TAPE =',
00453    142*     *        I5)
00454    143*      260 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'ERROR CODES ARE ',
00454    144*     *       'LESS THAN 1 OR GREATER THAN 255 OR',/,T20,'THE CODES',
00454    145*     *       ' ARE NOT UNIQUE.',/,/,T25,'SUBCLASS',T35,'CODE',
00454    146*     *       /,T25,8('-'),T35,'----',/)
00455    147*      265 FORMAT (T20,I2,'.',T26,A6,T35,I4,T40,A6)
00456    148*      270 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'ZOOM LINE FACTOR = ',
00456    149*     *        F10.3,/,T20,'THE SKIP LINE VARIABLE IS IN ERROR OR ',
00456    150*     *       /,T20,'THE ZOOM LEAD CARD IS IN ERROR OR',
00456    151*     *       /,T20,'THE LIMITS LINE VARIABLE IS IN ERROR.')
00457    152*      280 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'ZOOM SAMPLE FACTOR =',
00457    153*     *        F10.3,/,T20,'THE SKIP SAMPLE VARIABLE IS IN ERROR OR ',
00457    154*     *        /,T20,'THE LIMITS SAMPLE VARIABLE IS IN ERROR.')
00460    155*      300 FORMAT (/,/,/,T40,'PROCESSING FOR FILZOM',/,T40,21('-'),/,/,
00460    156*     *        T25,'TAPE OUTPUT ON LOGICAL UNIT',I3)
00461    157*      302 FORMAT (1H+,T56,'-- UNIVERSAL FORMAT.',/)
00462    158*      303 FORMAT (1H+,T56,'-- LARSYS II FORMAT.',/)
00463    159*      310 FORMAT (T25,'ON INPUT TAPE BEFORE PROCESSING BEGINS ',I4,
00463    160*     *        ' LINES WILL BE SKIPPED.',/,/,T25,'ON EACH LINE ',
00463    161*     *        'OF THE INPUT TAPE ',I4,' SAMPLES WILL BE SKIPPED.',
00463    162*     *        /,/,T25,'ZOOM LINE FACTOR = ',F10.3,/,/,T25,
00463    163*     *       'ZOOM SAMPLE FACTOR =',F10.3,/,/,T25,
00463    164*     *       'LINE LIMIT =',I10,/,/,T25,'SAMPLE LIMIT =',I10,/)
00464    165*      315 FORMAT (T25,'INPUT LINES',I5,' TO',I5,' WILL NOT BE PROCESSED ',
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00464   166*        *       'DUE TO THE ZOOM LINE FACTOR.',/)
00465   167*     317 FORMAT (T25,'OUTPUT LINES ',I5,' TO ',I5,' WILL BE DEFAULT ',
00465   168*        *       'VALUES DUE TO THE ZOOM LINE FACTOR.',/)
00466   169*     320 FORMAT (T25, 'ON EACH INPUT LINE, SAMPLES',I5,' TO ',I5,
00466   170*        *        ' WILL NOT BE PROCESSED DUE TO THE ZOOM SAMPLE FACTOR.',
00466   171*        *        /)
00467   172*     322 FORMAT (T25,'OUTPUT SAMPLE ',I5,' TO ',I5,' WILL BE DEFAULT ',
00467   173*        *       'VALUES DUE TO THE ZOOM SAMPLE FACTOR.',/)
00470   174*     330 FORMAT (T25,'ISLAND TEST = ',10I5)
00471   175*     331 FORMAT (/,T25,'UNCLASSIFIED PIXEL TEST (HOLE) = ',10I5)
00472   176*     332 FORMAT (/,T25,'DEFAULT CODE FOR UNCLASSIFIED PIXELS =',T66,I3,/,/
00472   177*        *       ,T25,'DEFAULT SYMBOL FOR UNCLASSIFIED PIXELS =',T66,A1,
00472   178*        *        /,1H+,T66,A1)
00473   179*     333 FORMAT (/,T25,'DESIGNATED CODES:',T50,'UNIDENTIFIED =',T65,I3,
00473   180*        *       T75,'OTHER =',T85,I4,/,/,T25,'DESIGNATED SYMBOLS:',
00473   181*        *       T50,'UNIDENTIFIED = ',T65,A1,T75,'OTHER =',T85,A1,/,1H+,
00473   182*        *       T65,A1,T85,A1)
00474   183*     335 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'A GROUP CARD SHOULD ',
00474   184*        *       'HAVE BEEN USED IN SCLASSIFY TO GROUP THE TWO OR MORE',
00474   185*        *       ' DIFFERENT SUBCLASSES IN A CLASS.',/)
00475   186*     340 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'SOME OF THE INPUT SEQ '
00475   187*        *       ,'CLASS NAMES ARE NOT VALID.',/,T20,'RERUN THE JOB USING',
00475   188*        *       ,' A NOSEDS LEAD CARD, A SYMBOL LEAD CARD, A CODE LEAD '
00475   189*        *       'CARD.',/,T20,'A DEFAULT S LEAD CARD, A DEFAULT C ',
00475   190*        *       'LEAD CARD AND A DESIGNATE ',
00475   191*        *       'LEAD CARD.'/,T20,'THE CLASS NAMES IN ERROR ARE MARKED.',
00475   192*        *       /,/,T50,'CLASS NAMES',/,T50,'------------',/,)
00476   193*     342 FORMAT (T50,I2,'.',2X,A6,5X,A6)
00477   194*     345 FORMAT (T49,A6,1X,A6)
00500   195*     350 FORMAT (I6)
00501   196*     360 FORMAT (/,T8,'***ERROR*** FILZOM',/,T20,'SOME OF THE SYMBOLS ',
00501   197*        *       'ARE NOT UNIQUE.',/,T20,'CORRECT THE SYMBOL LEAD CARDS ',
00501   198*        *       'AND/OR DEFAULT S LEAD CARD.',
00501   199*        *       /,/,T50,'SUBCLASS NAME',T70,'SYMBOL',/,T50,10('-'),
00501   200*        *       T70,6('-'),/)
00502   201*     365 FORMAT (T49,I2,'.',2X,A6,T73,A1,/,1H+,T73,A1,T76,A6)
00503   202*     400 FORMAT (/,/,/,T40,'SUMMARY OF OUTPUT FOR FILZOM',/,
00503   203*        *       T40,28('*'),/,/)
00504   204*     405 FORMAT (T25,'OUTPUT FILE',I2,' ON UNIT',I3)
00505   205*     410 FORMAT (T25,'NUMBER OF RECORDS THAT HAVE BEEN READ FROM ',
00505   206*        *       'LOGICAL UNIT',I3,'=',I5,'.')
00506   207*     415 FORMAT (T25,'NUMBER OF UNCLASSIFIED PIXELS THAT HAVE BEEN ',
00506   208*        *       'RECLASSIFIED DUE TO THE HOLE TEST (',I2,') FOR FILTER',
00506   209*        *       I2,' = ',I6,'.',/, T25, 'TOTAL NUMBER OF HOLE PIXELS THAT',
00506   210*        *       ' HAVE BEEN RECLASSIFIED ',I6,'.')
00507   211*     416 FORMAT (T25,'NUMBER OF ISLAND PIXELS THAT HAVE BEEN ',
00507   212*        *       'RECLASSIFIED DUE TO THE ISLAND(',I2,') FOR FILTER',
00507   213*        *       I2,' = :I6,'.',/,T25,'TOTAL NUMBER OF ISLAND PIXELS THAT',
00507   214*        *       ' HAVE BEEN RECLASSIFIED =',I6,'.')
00510   215*     420 FORMAT (T25,'TOTAL NUMBER OF ZOOMED OUTPUT POINTS = ',I6,'.',/,/)
00511   216*     440 FORMAT (T55,'PERCENT TABLE',/,T55,13('-'),/,/,T37,
00511   217*        *       'SUBCLASS NAME',T57,'TOTAL POINTS',T74,'PERCENTAGES',/)
00512   218*     460 FORMAT (T41,A6,T59,I6,T78,F5.2)
00513   219*     465 FORMAT (10X,I5,15X,I5)
00514   220*     500 FORMAT (/,/,T20,'TIME FOR FILZOM =',F6.3,' MINUTES.')
00515   221*     510 FORMAT (1X,F5.0)
00516   222*     515 FORMAT (F6.0)
00517   223*     520 FORMAT (/,/,T25,'FOR FILTER ',I1,' THE AVERAGE CNT FOR ALL ',
00517   224*        *       'LAND PIXELS IS ',F7.3,'.')
00520   225*     580 FORMAT (1H1,10X,'DATA IN ARRAY ',A6,/,/,/)
00521   226*     585 FORMAT (10(4X,I3,'= ',1X,I3))
00522   227*     900 FORMAT (/,T8,'***ERROR*** FILZOM',/, T20, 'RECORD ',I4,
00522   228*        *       'ON FILE',I3,' ON LOGICAL UNIT',I3,' HAS AN EOF.')
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00523    229•      905 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'LOGICAL UNIT',I3,
00523    230•         •        ' HAS A ',
00523    231•         •        'PARITY ERROR ON FILE ',I2, 'ON RECORD',I4,'.')
00524    232•      910 FORMAT (/,T8,'THE PREVIOUSLY MARKED ERROR(S) CAUSED THE PROGRAM',
00524    233•         •        ' TO ERROR EXIT.',/,/,/,/,/)
00525    234•      915 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'ERROR IN SUBROUTINE ',
00525    235•         •       'FIZSUM.',/,T20,'CALL A PROGRAMMER.',/)
00526    236•      920 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'INFIZ ON LOGICAL UNIT',
00526    237•         •        I3,' IS NOT IN THE CORRECT FORMAT.',/,T20,'A LISTING',
00526    238•         •        ' OF THE PHYSICAL RECORD FOLLOWS:',/, 5(5X,013))
00527    239•      925 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'FLDKEY IN COMMON ',
00527    240•         •        'BLOCK DISPL = ',I5,' .',/,T20,'FLDKEY MUST EQUAL 1 ',
00527    241•         •        'WHICH INDICATES GROUND TRUTH FIELDS ARE ASSOCIATED',
00527    242•         •        ' TO SUBCLASSES.',/,T20,'GIVE  ALL GROUND TRUTH FIELDS ',
00527    243•         •        'SUBCLASS NAMES AND RERUN THOSE JOBS.')
00530    244•      930 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'FILE NUMBER ON ',
00530    245•         •        'INFIZ TAPE =',I2,'.',/,T20,'THE DESIRED FILE ',
00530    246•         •        'NUMBER  = ',I2,'.',/,T20,'CALL A PROGRAMMER.')
00531    247•      940 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'ON RECORD',I5,' OF ',
00531    248•         •        'FILE ',I2,',',I5,' WORDS WERE READ.',/,T20,'THERE ARE',
00531    249•         •        I5,' PIXELS ON A LINE.')
00532    250•      950 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,
00532    251•         •        'ERROR CONDITION ON ATTEMPT TO POSITION INFIZ OVER',
00532    252•         •        I3,' FILES.',/,T20,'FSBSFL STATUS CODE =',I4)
00533    253•      999 FORMAT (/,T8,'***ERROR*** FILZON',/,T20,'TAPE UNIT ',I2,
00533    254•         •        ' HAS A WRITE ERROR FOR RECORD ',I4,' FILE ',I1,'.')
00533    255•      C
00533    256•      C*************************************************************************
00533    257•      C                    READ AND PRINT LEAD CARDS
00533    258•      C*************************************************************************
00533    259•      C
00534    260•           CALL RESET
00535    261•           REWIND UNTFIZ
00536    262•           REWIND OTUNT
00537    263•           WRITE (6,30)
00541    264•       1040 CONTINUE
00542    265•           READ (5,10,END=2360) CARD1, CARD2, ICARD
00552    266•           CRDCT = CRDCT + 1
00553    267•           IF (CRDCT .GT. MAXCRD)  GO TO 2350
00555    268•           IF (CARD2 .NE. BLANK)  GO TO 1050
00557    269•           IF (CARD1 .EQ. 6HOUTPUT )  GO TO 1080
00561    270•           IF (CARD1 .EQ. 6HSYMBOL )  GO TO 2000
00563    271•           IF (CARD1 .EQ. 6HZOOM   )  GO TO 2040
00565    272•           IF (CARD1 .EQ. 6HLIMIT  )  GO TO 2060
00567    273•           IF (CARD1 .EQ. 6HISLAND )  GO TO 2080
00571    274•           IF (CARD1 .EQ. 6HHOLE   )  GO TO 2100
00573    275•           IF (CARD1 .EQ. 6HSKIP   )  GO TO 2120
00575    276•           IF (CARD1 .EQ. 6HCODE   )  GO TO 2140
00577    277•           IF (CARD1 .EQ. 6HDEBUG  )  GO TO 2200
00601    278•           IF (CARD1 .EQ. 6HFILE   )  GO TO 2220
00603    279•           IF (CARD1 .EQ. 6HFILTER )  GO TO 2225
00605    280•           IF (CARD1 .EQ. 6HHED1   )  GO TO 2240
00607    281•           IF (CARD1 .EQ. 6HHED2   )  GO TO 2260
00611    282•           IF (CARD1 .EQ. 6HDATE   )  GO TO 2280
00613    283•           IF (CARD1 .EQ. 6HNOSEDS )  GO TO 2310
00615    284•       1050 IF (CARD1 .EQ. 6HCOMMEN .AND. CARD2 .EQ. 4HT    )  GO TO 2300
00617    285•           IF (CARD1 .EQ. 6HDEFAUL .AND. CARD2 .EQ. 4HT S  )  GO TO 2020
00621    286•           IF (CARD1 .EQ. 6HDEFAUL .AND. CARD2 .EQ. 4HT C  )  GO TO 2180
00623    287•           IF (CARD1 .EQ. 6HDESIGN .AND. CARD2 .EQ. 4HATE  )  GO TO 2315
00625    288•           ERROR = ERROR + 1
00626    289•           WRITE (6,50) CARD1, CARD2, ICARD, DASH, DASH          0 BAD IDENTIFICATION
00640    290•           GO TO 1040
00641    291•       1060 CONTINUE
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00642   292*          ERROR = ERROR + 1
00643   293*          WRITE (6,60) CARD1, CARD2, ICARD, DASH, DASH          0 DUPLICATE ID.
00655   294*          GO TO 1040
00656   295*     1070 CONTINUE
00657   296*          WRITE (6,80) CARD1,CARD2,ICARD                        0 GOOD LEAD CARD
00667   297*          GO TO 1040
00670   298*     1075 CONTINUE
00671   299*          ERROR = ERROR + 1
00672   300*          WRITE (6,75) CARD1, CARD2, ICARD                      0 FORMAT REREAD
00702   301*          GO TO 1040
00702   302*     C*******************
00702   303*     C      LEAD CARD OUTPUT
00702   304*     C*******************
00703   305*     1080 IDOP = IDOP + 1
00704   306*          IF (IDOP .GT. 1)  GO TO 1060
00706   307*          IF (ICARD(5) .EQ. 1HL) TAPOUT = 2
00710   308*          IF (ICARD(5) .EQ. 1HL) GO TO 1070
00712   309*          WRITE (6,70) CARD1, CARD2, ICARD, BLANK, BLANK, BLANK, BLANK,
00712   310*         *DASH, (BLANK, I = 6, 70)
00733   311*          ERROR = ERROR + 1
00734   312*          GO TO 1040
00734   313*     C*******************
00734   314*     C      LEAD CARD SYMBOL
00734   315*     C*******************
00735   316*     2000 IDSYM = IDSYM + 1
00736   317*          IF (IDSYM .GT. 2)  GO TO 1060
00740   318*          IF (IDSYM .EQ. 2)  GO TO 2006
00742   319*          DO 2005 I = 1, ISUBCL
00745   320*             SYM(I,2) = BLANK
00746   321*     2005 CONTINUE
00750   322*     2006 DO 2010  I = 1,ISUBCL
00753   323*              SYM(I,IDSYM) = ICARD(I)
00754   324*     2010 CONTINUE
00756   325*          WRITE (6,110) CARD1,CARD2, ICARD
00766   326*          GO TO 1040
00766   327*     C*******************
00766   328*     C      LEAD CARD DEFAULT B
00766   329*     C*******************
00767   330*     2020 IDDS = IDDS + 1
00770   331*          IF (IDDS .GT. 1) GO TO 1060
00772   332*          DFTSYM(1) = ICARD(5)
00773   333*          DFTSYM(2) = ICARD(10)
00774   334*          WRITE (6,110) CARD1,CARD2, ICARD
01006   335*          GO TO 1040
01006   336*     C*******************
01006   337*     C      LEAD CARD ZOOM
01006   338*     C*******************
01005   339*     2040 IDZOM = IDZOM + 1
01006   340*          IF (IDZOM .GT. 1) GO TO 1060
01010   341*          READ (30,90, ERR = 1075) ZOMLIN, ZOMSAM
01014   342*          WRITE (6,110) CARD1, CARD2, (ICARD(I),I=1,70)
01024   343*          GO TO 1040
01027   344*     C*******************
01024   345*     C      LEAD CARD LIMIT
01024   346*     C*******************
01025   347*     2060 IDLIM = IDLIM + 1
01026   348*          IF (IDLIM .GT. 1)  GO TO 1060
01030   349*          READ (30, 100, ERR=1075) LIMLIN, LIMSAM
01034   350*          ARRAY(1) = BLANK
01035   351*          ARRAY(2) = BLANK
01036   352*          IF (LIMSAM .LE. 0)  ARRAY(1) = DASH
01040   353*          IF (LIMLIN .LE. 0)  ARRAY(2) = DASH
01042   354*          IF (LIMSAM .GT. PARSAM)  ARRAY(1) = DASH
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01044    355*           IF (LIMLIN .GT. PARLIN)  ARRAY(2) = DASH
01046    356*           IF (ARRAY(1) .EQ. DASH)  GO TO 2070
01050    357*           IF (ARRAY(2) .EQ. BLANK)  GO TO 1070
01052    358*      2070 WRITE (6,70) CARD1,CARD2,ICARD,BLANK,(ARRAY(J),J=1,6),
01052    359*          *BLANK,(ARRAY(2),J=1,4),(BLANK,J=1,60)
01180    360*           GO TO 1040
01180    361*     C*******************
01180    362*     C     LEAD CARD ISLAND
01180    363*     C*******************
01181    364*      2080 IDISL = IDISL + 1
01182    365*           IF (IDISL .GT. 1)  GO TO 1060
01184    366*           READ (30, 120, ERR = 1075) ISLTST
01112    367*           ERRTST = 0
01113    368*           DO 2090 I = 1,PARFIL
01116    369*              ARRAY(I) = BLANK
01117    370*              IF (ISLTST(I) .EQ. 0)  GO TO 2090
01121    371*              IF (IABS(ISLTST(I)) .LT. 3)  GO TO 2085
01123    372*              IF (IABS(ISLTST(I)) .LE. 8)  GO TO 2090
01125    373*      2085    ERRTST = ERRTST + 1
01126    374*              ARRAY(I) = DASH
01127    375*      2090 CONTINUE
01131    376*           IF (ERRTST .EQ. 0)  GO TO 1070
01133    377*           WRITE (6,106) CARD1,CARD2, ICARD, (ARRAY(I), I = 1,PARFIL)
01147    378*           ERROR = ERROR + 1
01150    379*           GO TO 1040
01150    380*     C*******************
01150    381*     C     LEAD CARD HOLE
01150    382*     C*******************
01151    383*      2100 IDHOL = IDHOL + 1
01152    384*           IF (IDHOL .GT. 1)  GO TO 1060
01154    385*           READ (30, 120, ERR = 1075) HOLTST
01162    386*           ERRTST = 0
01163    387*           DO 2110 I = 1,PARFIL
01166    388*              ARRAY(I) = BLANK
01167    389*              IF (HOLTST(I) .EQ. 0)  GO TO 2110
01171    390*              IF (IABS(HOLTST(I)) .LT. 3)  GO TO 2105
01173    391*              IF (IABS(HOLTST(I)) .LE. 8)  GO TO 2110
01175    392*      2105    ERRTST = ERRTST + 1
01176    393*              ARRAY(I) = DASH
01177    394*      2110 CONTINUE
01201    395*           IF (ERRTST .EQ. 0)  GO TO 1070
01203    396*           WRITE (6,106) CARD1, CARD2, ICARD,(ARRAY(I),I=1,PARFIL)
01217    397*           ERROR = ERROR +1
01220    398*           GO TO 1040
01220    399*     C*******************
01220    400*     C     LEAD CARD SKIP
01220    401*     C*******************
01221    402*      2120 IDSKP = IDSKP + 1
01222    403*           IF (IDSKP .GT. 1)  GO TO 1060
01224    404*           READ (30,100, ERR = 1075) SKPLIN, SKPSAM
01230    405*           WRITE (6,110) CARD1, CARD2, ICARD
01240    406*           GO TO 1040
01240    407*     C*******************
01240    408*     C     LEAD CARD CODE
01240    409*     C*******************
01241    410*      2140 IDCOD = IDCOD + 1
01242    411*           IF (IDCOD .GT. 6)  GO TO 1060
01244    412*           IF (IDCOD .GT. 1)  GO TO 2160
01246    413*           DO 2150 I = 1, ISUBCL
01251    414*              CODE(I) = 0
01252    415*      2150 CONTINUE
01254    416*      2160 J = (IDCOD - 1) * 10 + 1
01255    417*           K = J + 10 -1
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01256    418*          READ (30,120,ERR= 1075) (CODE(I), I = J, K)
01264    419*          WRITE (6,110) CARD1, CARD2, ICARD
01274    420*          GO TO 1040
01274    421*     C**********************
01274    422*     C     LEAD CARD DEFAULT C
01274    423*     C**********************
01275    424*      2180 IDDC = IDDC + 1
01276    425*          IF (IDDC .GT. 1)  GO TO 1060
01300    426*          READ (30,100, ERR=1075) DFTCOD
01303    427*          WRITE (6,110) CARD1, CARD2, ICARD
01313    428*          GO TO 1040
01313    429*     C**********************
01313    430*     C     LEAD CARD DEBUG
01313    431*     C**********************
01314    432*      2200 IDBUG = IDBUG + 1
01315    433*          IF (IDBUG .GT. 1)  GO TO 1060
01317    434*          READ (30,100, ERR=1075) DEBUGF
01322    435*          IF (DEBUGF .EQ. 1)  GO TO 1070
01324    436*          WRITE (6,70) CARD1, CARD2, ICARD, BLANK, (DASH, I = 1, 4),
01324    437*         *(BLANK, I = 6,70)
01345    438*          ERROR = ERROR + 1
01346    439*          GO TO 1040
01346    440*     C**********************
01346    441*     C     LEAD CARD FILE
01346    442*     C**********************
01347    443*      2220 IDFIL = IDFIL + 1
01350    444*          IF (IDFIL .GT. 1)  GO TO 1060
01352    445*          READ (30,100, ERR=1075) FILE
01355    446*          IF (FILE .GT. 0)  GO TO 1070
01357    447*          WRITE (6,70) CARD1, CARD2, ICARD, BLANK, (DASH, I = 1, 4),
01357    448*         *(BLANK,I=6,70)
01400    449*          ERROR = ERROR + 1
01401    450*          GO TO 1040
01401    451*     C**********************
01401    452*     C     LEAD CARD FILTER
01401    453*     C**********************
01402    454*      2225 IDFIT = IDFIT + 1
01403    455*          IF (IDFIT .GT. 1)  GO TO 1060
01405    456*          READ (30,105, ERR=1075) TINFIL, FILMAP, FILFIL
01412    457*          ARRAY (1) = BLANK
01413    458*          IF (TINFIL .GT. PARFIL) ARRAY(1) = DASH
01415    459*          IF (TINFIL .LT. 1)  ARRAY(1) = DASH
01417    460*          ARRAY (2) = DASH
01420    461*          IF (FILMAP .EQ. BLANK) ARRAY(2) = BLANK
01422    462*          IF (FILMAP .EQ. 6HMAP    )  ARRAY(2) = BLANK
01424    463*          ARRAY(3) = DASH
01425    464*          IF (FILFIL .EQ. BLANK)  ARRAY(3) = BLANK
01427    465*          IF (FILFIL .EQ. 6HFILE$ )  ARRAY(3) = BLANK
01431    466*          IF (ARRAY(1) .EQ. DASH)  GO TO 2230
01433    467*          IF (ARRAY(2) .EQ. DASH)  GO TO 2230
01435    468*          IF (ARRAY(3) .EQ. BLANK)  GO TO 1070
01437    469*      2230 ERROR = ERROR + 1
01440    470*          WRITE (6,70) CARD1, CARD2, ICARD,(BLANK,I=1,4),ARRAY(1),
01440    471*         *(BLANK,I = 1,4),ARRAY(2),ARRAY(2),ARRAY(2),BLANK,BLANK,
01440    472*         *(ARRAY(3),I = 1,5),(BLANK,I = 20,70)
01476    473*          IDFIL = 999
01477    474*          GO TO 1040
01477    475*     C**********************
01477    476*     C     LEAD CARD HED1
01477    477*     C**********************
01500    478*      2240 IDHED1 = IDHED1 + 1
01501    479*          IF (IDHED1 .GT. 1)  GO TO 1060
01503    480*          READ (30,140, ERR=1075) HED1
```

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01511    482*C*****************
01511    483*C     LEAD CARD HED2
01511    484*C*****************
01512    485*  2260 IDHED2 = IDHED2 + 1
01513    486*       IF (IDHED2 .GT. 1)  GO TO    0
01515    487*       READ (30,140, ERR=1075) HED.
01523    488*       GO TO 1070
01523    489*C*****************
01523    490*C     LEAD CARD DATE
01523    491*C*****************
01524    492*  2280 IDDAT = IDDAT + 1
01525    493*       IF (IDDAT .GT. 1)  GO TO 1060
01527    494*       READ (30,140, ERR=1075) DATE
01535    495*       GO TO 1070
01535    496*C*****************
01535    497*C     LEAD CARD COMMENT
01535    498*C*****************
01536    499*  2300 IDCOM = IDCOM + 1
01537    500*       IF (IDCOM .GT. 1)  GO TO 1060
01541    501*       READ (30,140, ERR=1075) COMENT
01547    502*       GO TO 1070
01547    503*C*****************
01547    504*C     LEAD CARD SEDS
01547    505*C*****************
01550    506*  2310 IDSEDS = IDSEDS + 1
01551    507*       IF (IDSEDS .GT. 1)  GO TO 1060
01553    508*       SEDKEY = 2
01554    509*       GO TO 1070
01554    510*C*****************
01554    511*C     LEAD CARD DESIGNATE
01554    512*C*****************
01555    513*  2315 IDDES = IDDES + 1
01556    514*       IF (IDDES .GT. 1)  GO T  1060
01560    515*       READ (30,443,ERR=1075) DESCOD(1),DESCOD(2)
01564    516*       DESSYM(1,1) = ICARD(10)
01565    517*       DESSYM(2,1) = ICARD(15)
01566    518*       DESSYM(1,2) = ICARD(30)
01567    519*       DESSYM(2,2) = ICARD(35)
01570    520*       WRITE (6,110) CARD1, CARD2, ICARD
01600    521*       GO TO 1040
01600    522*C*****************
01600    523*C     TOO MANY LEAD CARDS HAVE BEEN READ
01600    524*C*****************
01600    525*C
01601    526*  2350 CONTINUE
01602    527*       ERROR = ERROR + 1
01603    528*       WRITE (6,160)                                  0 TOO MANY LEAD CARDS
01603    529*C
01603    530*C*******************************************************************************
01603    531*C                    1.  VALIDATE FIRST RECORD ON IBFIZ TAPE.
01603    532*C                    2.  SKIP THE NECESSARY FILES IF FILE IS GREATER THAN 1. THEN
01603    533*C                        READ RECORD 1 OF THE FILE THAT IS GOING TO BE PROCESSED
01603    534*C
01603    535*C*******************************************************************************
01603    536*C
01605    537*  2360 CONTINUE
01606    538*       IF (FILE .LT. 1)  GO TO 9090
01610    539*       CTRECO = 1
01611    540*       SKFILE = 0
01612    541*       I3 = 1
01613    542*       IRSTAT(I3) = 0
01614    543*       IF (FILE .GT. 1)  GO TO 2375
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                544*      2365 CALL MREAD (UNTFIZ, 1, ARFIZ1, PARARF, IRSTAT(I3), IRWRDS(I3))
                545*      2370 IF (IRSTAT(I3) .EQ. 1)  GO TO 2370
                546*           IF (IRSTAT(I3) .GT. 1)  GO TO 9000
                547*           IF (FIZNAM .NE. 6HINFIZ  )  GO TO 9010
                548*           IF (FILE .EQ. 1)  GO TO 2440
                549*           IF (SKFILE .GT. 0)  GO TO 2440
                550*      2375 CONTINUE
                551*           SKFILE = FILE - 1
                552*           CALL FSBSFL (UNTFIZ,SKFILE,IRSTAT(I3))
                553*           IF (IRSTAT(I3) .NE. 0)  GO TO 9030
                554*           GO TO 2365
                555*      C
                556*      C*****************************************************************************
                557*      C                    READ RECORD FROM INFIZ AND STORE DATA IN COMMON BLOCK GLOBAL
                558*      C*****************************************************************************
                559*      C
                560*       2440 CONTINUE
                561*           CTRECD = CTRECD + 1
                562*           CALL MREAD (UNTFIZ, 1, DUMGLO, PARGLO, IRSTAT(I3), IRWRDS(I3))
                563*       2445 IF (IRSTAT(I3) .EQ. 1)  GO TO 2445
                564*           IF (IRSTAT(I3) .GT. 1)  GO TO 9000
                565*      C
                566*      C*****************************************************************************
                567*      C                    READ RECORD FROM INFIZ AND STORE DATA IN COMMON BLOCK DISPLY
                568*      C*****************************************************************************
                569*      C
                570*       2460 CONTINUE
                571*           CTRECD = CTRECD + 1
                572*           CALL MREAD (UNTFIZ, 1, DUMDIS, PARDIS, IRSTAT(I3), IRWRDS(I3))
                573*       2465 IF (IRSTAT(I3) .EQ. 1)  GO TO 2465
                574*           IF (IRSTAT(I3) .GT. 1)  GO TO 9000
                575*           IF (FIZFIL .NE. FILE)  GO TO 9070
                576*           IF (FLDKEY .NE. 1)  GO TO 9080
                577*      C
                578*      C*****************************************************************************
                579*      C                    PREPARE HEADING FOR PRINTER OUTPUT AND PRINT SUMMARY OF INFIZ
                580*      C*****************************************************************************
                581*      C
                582*       2470 CONTINUE
                583*           DO 2480 I = 1,10
                584*              HEAD(I+ 2) = HED1(I)
                585*              HEAD(I+19) = HED2(I)
                586*              HEAD(I+31) = COMENT(I)
                587*       2480 CONTINUE
                588*           IF (IDDAT .GT. 0)  GO TO 2500
                589*           CALL TDATE (DATE)
                590*       2500 HEAD(15) = DATE(1)
                591*           HEAD(16) = DATE(2)
                592*           WRITE (6,HEAD)
                593*           FLD(0,12,IHR) = FLD(0,12,DSPYTM)
                594*           FLD(0,12,IMIN) = FLD(12,12,DSPYTM)
                595*           FLD(0,12,ISEC) = FLD(24,12,DSPYTM)
                596*           WRITE (6,170) UNTFIZ, FILE, DSPYDT(1), DSPYDT(2),IHR, IMIN, ISEC
                597*           IF (THRSKY .EQ. 0) WRITE (6,180)
                598*           IF (THRSKY .EQ. 1) WRITE (6,181)
                599*           IF (THRSKY .EQ. 2) WRITE (6,182)
                600*           IF (THRSKY .EQ. 3) WRITE (6,183)
                601*           IF (FILTER .EQ. 0) WRITE (6,190)
                602*           IF (FILTER .EQ. 1) WRITE (6,191)
                603*           WRITE (6,200) NFILE,CDATE(1),CDATE(2)
                604*           CHECK = ((ILINED-ILINST)+ILINIC)/ILINIC
                605*           WRITE (6,210) INLINE
                606*           IF (CHECK .EQ. INLINE)  GO TO 2540
```

```
01752    607*          ERROR = ERROR + 1
01753    608*          WRITE (6,211)
01755    609*       2540 CHECK = ((ISAMED-ISAMST)+ISAMIC)/ISAMIC
01756    610*          WRITE (6,220) INPTS
01761    611*          IF (CHECK .EQ. INPTS)  GO TO 2560
01763    612*          ERROR = ERROR + 1
01764    613*          WRITE (6,211)
01766    614*       2560 WRITE (6,230) NOCLS2, NOSUB2, NOFLD2, NOFLD3
01766    615*       C
01766    616*       C*****************************************************************************
01766    617*       C                    VALIDATE LEAD CARDS THAT WERE NOT VALIDATED WHEN READ.
01766    618*       C                    PERFORM THE NECCESSARY CALCULATIONS PERTAINING TO THE
01766    619*       C                    LEAD CARDS.
01766    620*       C*****************************************************************************
01766    621*       C
01774    622*        3060 CONTINUE
01774    623*       C******************
01774    624*       C     LEAD CARD SKIP
01774    625*       C******************
01775    626*          TOPPAG = 0
01776    627*          IF (SKPSAM .LT. INPTS .AND. SKPSAM .GE. 0)  GO TO 3020
02000    628*          ERROR = ERROR +1
02001    629*          TOPPAG= 1
02002    630*          WRITE (6,HEAD)
02004    631*          WRITE (6,240) SKPSAM, INPTS
02010    632*       3020 IF (SKPLIN .LT. INLINE .AND. SKPSAM .GE. 0)  GO TO 3040
02012    633*          IF (TOPPAG .LT. 1)  WRITE (6,HEAD)
02015    634*          TOPPAG = 1
02016    635*          ERROR = ERROR + 1
02017    636*          WRITE (2,250) SKPLIN,INLINE
02017    637*       C******************
02017    638*       C     CHECK ZOOM FACTORS
02017    639*       C******************
02023    640*        3040 CONTINUE
02023    641*       C     **************
02023    642*       C     CALCULATE ZOOM LINE FACTORS
02023    643*       C     **************
02023    644*       C
02024    645*          IF (ZOMLIN .GT. 0)  GO TO 3060
02026    646*          ZOMLIN = FLOAT(LINLIN) / FLOAT(INLINE-SKPLIN)
02027    647*          ZOMLIN = ZOMLIN + .00001
02030    648*          IF (ZOMLIN .GT. 0)  GO TO 3060
02032    649*          IF (TOPPAG .LT. 1) WRITE (6,HEAD)
02035    650*          TOPPAG = 1
02036    651*          ERROR = ERROR + 1
02037    652*          WRITE (6,270) ZOMLIN
02037    653*       C     **************
02037    654*       C     ZOOM SAMPLE FACTOR
02037    655*       C     **************
02042    656*        3060 CONTINUE
02043    657*          IF (ZOMSAM .GT. 0) GO TO 3080
02045    658*          ZOMSAM = FLOAT(LINSAM) / FLOAT(INPTS-SKPSAM)
02046    659*          ZOMSAM = ZOMSAM +  .00001
02047    660*          IF (ZOMSAM .GT. 0) GO TO 3080
02051    661*          IF (TOPPAG .LT. 1) WRITE (6,HEAD)
02054    662*          TOPPAG = 1
02055    663*          ERROR = ERROR + 1
02056    664*          WRITE (6,280) ZOMSAM
02056    665*       C******************
02056    666*       C      LEAD CARD SEDS
02056    667*       C******************
02061    668*        3080 CONTINUE
02062    669*          IF (SEDKEY .EQ. 1)  GO TO 4040
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02064   670*           IF (IDSYM  .GT. 0)  GO TO 4000
02066   671*           DO 3090 I = 1, NOSUB2
02071   672*              SYM(I,1) = SYMNTX(I)
02072   673*              SYM(I,2)  = BLANK
02073   674*      3090 CONTINUE
02075   675*      4000 IF (IDDS .EQ. 0)  DFTSYM(1) = SYMNTX(NOSUB2 + 1)
02077   676*           IF (IDDS .EQ. 0)  DFTSYM(2) = BLANK
02101   677*           IF (IDDC .EQ. 0)  DFTCOD = NOSUB2 + 1
02103   678*           IF (IDDES .EQ. 0)  DESCOD(1) = DESUNI
02105   679*           IF (IDDES .EQ. 0)  DESCOD(2) = DESOTH
02107   680*           IF (IDCOD .GT. 0)  GO TO 4300
02111   681*           DO 4010 I = 1, NOSUB2
02114   682*              CODE(I) = I
02115   683*      4010 CONTINUE
02117   684*           GO TO 4300
02117   685*     C     ***************
02117   686*     C     VALIDATE SEDS CLASS NAMES WITH THE CLASS NAMES ON THE INFIZ TAPE.
02117   687*     C     IF THE INPUT CLASS NAMES AGREE WITH THE SEDS NAMES, THE DEFAULT SYM
02117   688*     C     ARRAY AND THE DEFALUT CODE ARRAY WILL BE PUT IN THE SAME ORDER AS THE
02117   689*     C     INPUT CLASS NAMES.
02117   690*     C     ***************
02120   691*      4040 CONTINUE
02121   692*           CHECK = 1
02122   693*           DO 4050 I = 2, NOSUB2
02125   694*             IF (SUBNAM(I) .EQ. SUBNAM(I-1))  GO TO 4050
02127   695*             CHECK = CHECK + 1
02130   696*      4050 CONTINUE
02132   697*           IF (CHECK .NE. NOCLS2) GO TO 9050
02134   698*           DO 4070 I = 1,PSEDS
02137   699*              IF (SEDNAM(I) .GT. 6H*       )  DECODE (6,510,SEDNAM(I)) ZSED(I)
02143   700*              IF (SEDNAM(I) .LT. 6H*       .AND. SEDNAM(I) .NE. 6HWATER )
02143   701*          *   DECODE (6,515,SEDNAM(I)) ZSED(I)
02147   702*              IF (SEDNAM(I) .EQ. 6HWATER ) ZSED(I) = 0.0
02151   703*      4070 CONTINUE
02153   704*           DO 4100 I = 1, NOCLS2
02156   705*              ARRAY(I) = BLANK
02157   706*              DO 4060 J=1,CTSED
02162   707*                 IF (SEDNAM(J) .EQ. CLSNAM(I))  GO TO 4080
02164   708*      4060    CONTINUE
02166   709*              ARRAY(I) = 6HERROR
02167   710*              ERROR = ERROR + 1
02170   711*              ERRSED = ERRCOD
02171   712*              GO TO 4100
02172   713*      4080    PTSYM(I) = J
02173   714*      4100 CONTINUE
02175   715*           IF (ERRSED .EQ. ERRCOD)  GO TO 9060
02175   716*     C     ***************
02175   717*     C     ARRANGE SEDS CODES IN THE ORDER OF THE SED INPUT CLASS NAMES
02175   718*     C     ON INFIZ TAPE
02175   719*     C     ***************
02177   720*           IF (IDCOD .GT. 0)  GO TO 4160
02201   721*           DO 4120 I = 1,CTSED
02204   722*              HOLARR(I,1) = CODE(I)
02205   723*      4120 CONTINUE
02207   724*           DO 4140 I = 1, NOCLS2
02212   725*              PT = PTSYM(I)
02213   726*              CODE(I) = HOLARR(PT,1)
02214   727*      4140 CONTINUE
02216   728*      4160 DO 4165 I = 1, NOCLS2
02221   729*              ZDUMY(I) = ZSED(I)
02222   730*      4165 CONTINUE
02224   731*           DO 4170 I = 1,NOCLS2
02227   732*              PT = PTSYM(I)
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                  ZSED(I) = ZDUMY(PT)
 4170 CONTINUE
      IF (IDSYM .GT. 0)  GO TO 4300
C     ***************
C     ARRANGE SEDS SYMBOLS IN THE ORDER OF THE SED INPUT CLASSES.
C     ***************
      DO 4180 I = 1, CTSED
         SYMCHK(I,1) = SYM(I,1)
         SYMCHK(I,2) = SYM(I,2)
 4180 CONTINUE
      DO 4200 I = 1, NOCLS2
         PT = PTSYM(I)
         SYM(I,1) = SYMCHK(PT,1)
         SYM(I,2) = SYMCHK(PT,2)
 4200 CONTINUE
C*******************
C     PLACE DEFAULT SYMBOLS AND BORDER SYMBOLS IN ARRAY SYM
C     PLACE DEFAULT CODE IN ARRAY CODE
C*******************
 4300 CONTINUE
      DFTPT = NOSUB2+1
      TRNNO = DFTPT + 1
      TSTNO = DFTPT + 2
      DESNO1 = DFTPT + 4
      SUBNAM(TRNNO) = 6HTRNFLD
      SUBNAM(TSTNO) = 6HTSTFLD
      DUPNO = TSTNO + 1
      SUBNAM(TSTNO+1) = 6HDUPFLD
      DESNO2 = DFTPT + 5
      CODE(DFTPT) =  DFTCOD
      SYM(DFTPT,1) = DFTSYM(1)
      SYM(DFTPT,2) = DFTSYM(2)
      SYM(DFTPT+1,1) = TRNSYM
      SYM(DFTPT+1,2) = BLANK
      SYM(DFTPT+2,1) = TSTSYM
      SYM(DFTPT+2,2) = BLANK
      SYM(DFTPT+3,1) = DUPSYM
      SYM(DFTPT+4,1) = DESSYM(1,1)
      SYM(DFTPT+4,2) = DESSYM(2,1)
      SYM(DFTPT+5,1) = DESSYM(1,2)
      SYM(DFTPT+5,2) = DESSYM(2,2)
      CODE(DFTPT+4) = DESCOD(1)
      CODE(DFTPT+5) = DESCOD(2)
      SUBNAM(DESNO1) = 6HUNIDEN
      SUBNAM(DESNO2) = 6HOTHER
      CLSNAM(NOCLS2+1) = 6HHOLE
      SUBNAM(DFTPT) = 6HHOLE
C*******************
C     LEAD CARDS SYMBOL AND DEFAULT $
C*******************
 4310 CONTINUE
C     ***************
C     REARRANGE THE TWO SYMBOLS FOR EASY VALIDATION
C     ***************
      IDFTPT = DFTPT + 5
      IF (DESKEY .EQ. 0)  IDFTPT = IDFTPT -2
      DO 4320 I = 1, IDFTPT
         SYMCHK(I,1) = BLANK
         SYMCHK(I,2) = BLANK
         FLD (0, 6, SYMCHK(I,1)) = FLD (0, 6, SYM(I,1))
         FLD (6, 6, SYMCHK(I,2)) = FLD (0, 6, SYM(I,1))
         FLD (0, 6, SYMCHK(I,1)) = FLD (0, 6, SYM(I,2))
         FLD (6, 6, SYMCHK(I,2)) = FLD (0, 6, SYM(I,2))
```

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02325   796*      4320 CONTINUE
02325   797*      C     **************
02325   798*      C     CHECK THE UNIQUENESS OF EACH PAIR OF SYMBOLS FOR A CODE.
02325   799*      C     **************
02327   800*           JDFTPT = IDFTPT - 1
02330   801*           DO 4380 I = 1, JDFTPT
02333   802*              K = I + 1
02334   803*              ARRAY(I) = BLANK
02335   804*              DO 4340 J = K, IDFTPT
02340   805*                 IF(SYMCHK(I,1) .EQ. SYMCHK(J,1))  GO TO 4360
02342   806*                 IF(SYMCHK(I,1) .EQ. SYMCHK(J,2))  GO TO 4360
02344   807*      4340       CONTINUE
02346   808*                 GO TO 4380
02347   809*      4360       ARRAY(J) = 6HERROR
02350   810*                 IDSYM = ERRCOD
02351   811*      4380 CONTINUE
02353   812*           IF (IDSYM .LT. ERRCOD)  GO TO 4400
02355   813*           IF (TOPPAG .LT. 1)  WRITE (6,HEAD)
02360   814*           ERROR = ERROR + 1
02361   815*           WRITE (6,360)
02363   816*           WRITE (6,365) (I,SUBNAM(I),SYM(I,1),SYM(I,2),ARRAY(I),
02363   817*          +I=1,IDFTPT)
02363   818*      C*******************
02363   819*      C     CODE LEAD CARDS------CODE, DEFAULT C, DESIG. C
02363   820*      C*******************
02375   821*      4400 CONTINUE
02375   822*      C     **************
02375   823*      C     ARE THE CODES VALID
02375   824*      C     **************
02376   825*           DO 4460 I = 1, DFTPT
02401   826*              ARRAY(I) = BLANK
02402   827*              IF (CODE(I) .LT. 1)  GO TO 4450
02404   828*              IF (CODE(I) .GT. 255)  GO TO 4450
02406   829*              GO TO 4460
02407   830*      4450    ARRAY(I) = 6HERROR
02410   831*              IDCOD = ERRCOD
02411   832*      4460 CONTINUE
02413   833*           IF (DESKEY .EQ. 0)  GO TO 4480
02415   834*           ARRAY(DESNO1) = BLANK
02416   835*           ARRAY(DESNO2) = BLANK
02417   836*           IF (CODE(DESNO1) .LT. 1)  ARRAY(DESNO1) = 6HERROR
02421   837*           IF (CODE(DESNO1) .GT. 255)  ARRAY(DESNO1) = 6HERROR
02423   838*           IF (CODE(DESNO2) .LT. 1)  ARRAY(DESNO2) = 6HERROR
02425   839*           IF (CODE(DESNO2) .GT. 255)  ARRAY(DESNO2) = 6HERROR
02427   840*           IF (ARRAY(DESNO1) .EQ. 6HERROR )  IDCOD = IDCOD + 1
02431   841*           IF (ARRAY(DESNO2) .EQ. 6HERROR )IDCOD = IDCOD + 1
02431   842*      C     **************
02431   843*      C     CHECK TO INSURE THAT EACH CODE IS UNIQUE
02431   844*      C     **************
02433   845*      4480 CONTINUE
02434   846*           DO 4520 I = 1, NOSUB2
02437   847*              K = I + 1
02440   848*              DO 4520 J = K, DFTPT
02443   849*                 IF (CODE(I) .NE. CODE(J))  GO TO 4500
02445   850*                 ARRAY(J) = 6HERROR
02446   851*                 IDCOD = ERRCOD
02447   852*      4500       CONTINUE
02450   853*      4520 CONTINUE
02453   854*           IF (DESKEY .EQ. 0)  GO TO 4536
02455   855*           IF (CODE(DESNO1) .EQ. CODE(DESNO2)) ARRAY(DESNO2) = 6HERROR
02457   856*           IF (ARRAY(DESNO2) .EQ. 6HERROR )  IDCOD = IDCOD + 1
02461   857*           DO 4535 I = DESNO1,DESNO2
02464   858*              DO 4530 J = 1,DFTPT
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02467    859*                IF (CODE(I) .NE. CODE(J))  GO TO 4530
02471    860*                ARRAY(I) = 6HERROR
02472    861*                IDCOD = IDCOD + 1
02473    862*                GO TO 4535
02474    863*     4530     CONTINUE
02476    864*     4535 CONTINUE
02500    865*     4536 CONTINUE
02501    866*          IF (IDCOD .LT. ERRCOD)  GO TO 4540
02503    867*          IF (TOPPAG .LT. 1) WRITE (6,HEAD)
02506    868*          TOPPAG = 1
02507    869*          ERROR = ERROR + 1
02510    870*          WRITE (6,260)
02512    871*          WRITE (6,265) (I, SUBNAM(I), CODE(I), ARRAY(I), I = 1,DFTPT)
02523    872*          IF (DESKEY .EQ. 1)
02523    873*         *WRITE (6,265) (I,SUBNAM(I),CODE(I),ARRAY(I),I=DESN01,DESN02)
02523    874*     C    ***************
02523    875*     C    CHECK FLAGS FOR PRINTING GRAYMAP FOR EACH TIME DATA IS FILTERED.
02523    876*     C    CHECK FLAGS FOR OUTPUTTING A FILE FOR EACH TIME THE DATA IS FILTERED.
02523    877*     C    ***************
02535    878*     4540 CONTINUE
02536    879*          IF (IDFIL .GT. 1)  GO TO 4600
02540    880*          IF (FILMAP .EQ. 6HMAP    )  GO TO 4560
02542    881*          DO 4550 I = 1,TIMFIL
02545    882*             MAP(I) = 0
02546    883*     4550 CONTINUE
02550    884*          MAP(TIMFIL) = 1
02551    885*     4560 IF (FILFIL .EQ. 6HFILES  )  GO TO 4600
02553    886*          DO 4580 I = 1,TIMFIL
02556    887*             OTFILE(I) = 0
02557    888*     4580 CONTINUE
02561    889*          OTFILE(TIMFIL) = 1
02562    890*          GO TO 4600
02562    891*     C
02562    892*     C*************************************************************************
02562    893*     C    IF NO ERRORS HAVE OCCURRED THE SUMMARY FOR LEAD CARDS AND THE
02562    894*     C    CALCULATIONS MADE FROM THE LEADS CARDS ARE PRINTED.
02562    895*     C*************************************************************************
02562    896*     C
02563    897*     4600 CONTINUE
02564    898*          IF (ERROR .GT. 0)  GO TO 9090
02566    899*          WRITE (6,HEAD)
02570    900*          WRITE (6,300) OTUNT
02573    901*          IF (TAPOUT .EQ. 1)  WRITE (6,302)                    @ UNIVERSAL FORMAT
02576    902*          IF (TAPOUT .EQ. 2)  WRITE (6,303)                    @ LARSYS II FORMAT
02601    903*          WRITE (6,310) SKPLIN, SKPSAM, ZOMLIN, ZOMSAM, LIMLIN, LIMSAM
02611    904*          CHECK = (FLOAT(LIMLIN)/ZOMLIN) + SKPLIN
02612    905*          CK = CHECK + 1
02613    906*          IF (CHECK .LT. INLINE)  WRITE (6,315) CK,INLINE
02620    907*          CHECK = (FLOAT(LIMSAM)/ZOMSAM) + SKPSAM
02621    908*          CK = CHECK + 1
02622    909*          IF (CHECK .LT. INPTS) WRITE (6,320) CK,INPTS
02627    910*          CHECK =  FLOAT (INLINE - SKPLIN) * ZOMLIN
02630    911*          CK = CHECK + 1
02631    912*          IF (CHECK .LT. LIMLIN)  WRITE (6,317) CK,LIMLIN
02636    913*          CHECK = FLOAT (INPTS - SKPSAM) * ZOMSAM
02637    914*          CK = CHECK + 1
02640    915*          IF (CHECK .LT. LIMSAM)  WRITE (6,322) CK, LIMSAM
02645    916*          WRITE (6,330) (ISLTST(I), I = 1,TIMFIL)
02653    917*          WRITE (6,331) (HOLTST(I), I = 1, TIMFIL)
02661    918*          WRITE (6,332) CODE(DFTPT), SYM(DFTPT,1), SYM(DFTPT,2)
02666    919*          IF (DESKEY .EQ. 1)  WRITE (6,333) DESCOD(1),DESCOD(2),
02666    920*         *DESSYM(1,1),DESSYM(1,2),DESSYM(2,1),DESSYM(2,2)
02666    921*     C
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02666   922*     C**********************************************************************
02666   923*     C
02666   924*     C     THE RECTANGULAR VERTICES WHICH OUTLINE A FIELD ARE STORED AS FOLLOWS:
02666   925*     C     LINE MIN.,  LINE MAX.,  SAMPLE MIN.,  SAMPLE MAX.,  AND THEN A POINTER
02666   926*     C     WHICH  POINTS TO THE ACTUAL VERTICES.
02666   927*     C
02666   928*     C     THE ACTUAL FIELD OUTLINE IS STORED AS FOLLOWS:
02666   929*     C     SAMPLE, LINE ETC.
02666   930*     C
02666   931*     C     TRAINING FIELD DATA, TEST FIELDS, OR DESIGNATE FIELDS ARE
02666   932*     C     ALL STORED THE SAME WAY.
02666   933*     C
02666   934*     C**********************************************************************
02666   935*     C
02666   936*     C
02666   937*     C*******************
02666   938*     C     CALCULATE ADDRESSES FOR TRAINING FIELDS AND TEST OR DESIGNATE FIELDS.
02666   939*     C*******************
02677   940*           FLDSV2 = 1
02700   941*           FIELD2 = (4 * NOFLD2) + 1
02701   942*           VERTX2 = (4 * NOFLD2) + (5 * NOFLD2) + 1
02702   943*           TOTTRN = (4 * NOFLD2) + (5 * NOFLD2) + (2 * TOTVT2)
02703   944*           FLDSV3 = TOTTRN + 1
02704   945*           FIELD3 = (4 * NOFLD3) + TOTTRN + 1
02705   946*           VERTX3 = (4 * NOFLD3) + (5 * NOFLD3) + TOTTRN + 1
02706   947*           TOTTST = (4 * NOFLD3) + (5 * NOFLD3) + (2 * TOTVT3) + TOTTRN
02706   948*     C*******************
02706   949*     C     READ TRAINING FIELDS
02706   950*     C*******************
02707   951*      6020 CONTINUE
02710   952*           CTRECD = CTRECD + 1
02711   953*           CALL MREAD (UNITFIZ, 1, ARRAY(FLDSV2), TOTTRN, IRSTAT(I3),
02711   954*          *IRWROS(I3))
02712   955*      6040 IF (IRSTAT(I3) .EQ. 1)  GO TO 6040
02714   956*           IF (IRSTAT(I3) .GT. 1)  GO TO 9000
02716   957*           IF (DEBUGF .EQ. 1)  CALL FIZWRF (ARRAY(FLDSV2), ARRAY(VERTX2),
02716   958*          *NOFLD2, 1, CLSNAM, SUBNAM, CODE, SYM, DFTPT, OUTLUP, SYMRTX)
02716   959*     C*******************
02716   960*     C     ZOOM RECTANGULAR VERTICES FOR THE TRAINING FIELDS
02716   961*     C*******************
02720   962*           ENDFLD = VERTX2 - 1
02721   963*           DO 6080 J1= FIELD2, ENDFLD, 5
02724   964*              J2 = J1 + 1
02725   965*              J3 = J1 + 2
02726   966*              J4 = J1 + 3
02727   967*              ARRAY(J1) = FLOAT ((ARRAY(J1) / ILINIC) - SKPLIN) * ZOMLIN
02730   968*              ARRAY(J2) = FLOAT ((ARRAY(J2) / ILINIC) - SKPLIN) * ZOMLIN
02731   969*              ARRAY(J3) = FLOAT ((ARRAY(J3) / ISAMIC) - SKPSAM) * ZOMSAM
02732   970*              ARRAY(J4) = FLOAT ((ARRAY(J4) / ISAMIC) - SKPSAM) * ZOMSAM
02733   971*      6080 CONTINUE
02733   972*     C*******************
02733   973*     C     ZOOM ACTUAL TRAINING FIELDS
02733   974*     C*******************
02735   975*           DO 7000 I = VERTX2, TOTTRN, 2
02740   976*              J = I + 1
02741   977*              ARRAY(I) = FLOAT ((ARRAY(I) / ISAMIC) - SKPSAM) * ZOMSAM
02742   978*              ARRAY(J) = FLOAT ((ARRAY(J) / ILINIC) - SKPLIN) * ZOMLIN
02743   979*      7000 CONTINUE
02745   980*           CALL FIZWRF (ARRAY(FLDSV2), ARRAY(VERTX2), NOFLD2, 3, CLSNAM,
02745   981*          *SUBNAM, CODE, SYM, DFTPT, OUTLUP, SYMRTX)
02745   982*     C*******************
02745   983*     C     READ TEST FIELDS OR DESIGNATE FIELDS
02745   984*     C*******************
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02746   985*      7060 CONTINUE
02747   986*           IF (TSTKEY .EQ. 0 .AND. DESKEY .EQ. 0)  GO TO 7200
02751   987*           TSTWRD = TOTTST - TOTTRN
02752   988*           CTRECD = CTRECD + 1
02753   989*           CALL MREAD (UBTFIZ, 1, ARRAY(FLDSV3), TSTWRD, IRSTAT(I3),
02753   990*          *IRWRDS(I3))
02754   991*      7080 IF (IRSTAT(I3) .EQ. 1)  GO TO 7080
02756   992*           IF (IRSTAT(I3) .GT. 1)  GO TO 9000
02760   993*           IF (DEBUGF .EQ. 1 .AND. TSTKEY .EQ. 1)
02760   994*          *CALL FIZWRF (ARRAY(FLDSV3),ARRAY(VERTX3),NOFLD3,2,
02760   995*          *CLSNAM,SUBNAM,CODE,SYM,DFTPT,OUTLNP,$YMRTX)
02760   996*     C******************
02760   997*     C     ZOOM RECTANGULAR VERTICES FOR TEST FIELDS OR DESIGNATE FIELDS
02760   998*     C******************
02762   999*           ENDFLD = VERTX3 - 1
02763  1000*           DO 7100 J1 = FIELD3, ENDFLD, 5
02766  1001*              J2 = J1 + 1
02767  1002*              J3 = J1 + 2
02770  1003*              J4 = J1 + 3
02771  1004*              ARRAY(J1) = FLOAT ((ARRAY(J1) / ILINIC) - SKPLIN) * ZOMLIN
02772  1005*              ARRAY(J2) = FLOAT ((ARRAY(J2) / ILINIC) - SKPLIN) * ZOMLIN
02773  1006*              ARRAY(J3) = FLOAT ((ARRAY(J3) / ISAMIC) - SKPSAM) * ZOMSAM
02774  1007*              ARRAY(J4) = FLOAT ((ARRAY(J4) / ISAMIC) - SKPSAM) * ZOMSAM
02775  1008*      7100 CONTINUE
02775  1009*     C******************
02775  1010*     C     ZOOM ACTUAL TEST FIELDS
02775  1011*     C******************
02777  1012*           DO 7120 I = VERTX3, TOTTST, 2
03002  1013*              J = I + 1
03003  1014*              ARRAY(I) = FLOAT ((ARRAY(I) / ISAMIC) - SKPSAM) * ZOMSAM
03004  1015*              ARRAY(J) = FLOAT ((ARRAY(J) /ILINIC) - SKPLIN) * ZOMLIN
03005  1016*      7120 CONTINUE
03007  1017*           IF (DESKEY .EQ. 1)  CALL MRTFLD (ARRAY(FLDSV3), ARRAY(VERTX3),
03007  1018*          *NOFLD3,3,CLSNAM,SUBNAM)
03011  1019*           IF (TSTKEY .EQ. 1)  CALL FIZWRF (ARRAY(FLDSV3),ARRAY(VERTX3),
03011  1020*          *NOFLD3,4,CLSNAM,SUBNAM,CODE,SYM,DFTPT,OUTLNP,$YMRTX)
03011  1021*     C
03011  1022*     C*****************************************************************************
03011  1023*     C                    CALCULATE HOW MANY TIMES A PIXEL WILL BE WRITTEN ON TAPE.
03011  1024*     C*****************************************************************************
03011  1025*     C
03013  1026*      7200 CONTINUE
03014  1027*           ASAM = SKPSAM + 1
03015  1028*           SAMDFT = 0
03016  1029*           J = 0
03017  1030*           MAXSAM = 0
03020  1031*           DO 7210 I = ASAM, INPTS
03023  1032*              J = J + 1
03024  1033*              CALL FIZSOM (J,MAXSAM,ZOMSAM,$AMSOM(J),LIMSAM,$7205)
03025  1034*      7205    MAXSAM= MAXSAM+ $AMSOM(J)
03026  1035*              IF (MAXSAM .EQ. LIMSAM)  GO TO 7215
03030  1036*      7210 CONTINUE
03032  1037*           I = INPTS
03033  1038*           J = INPTS + 1
03034  1039*           SAMDFT = LIMSAM - MAXSAM
03035  1040*           $AMSOM(J) = SAMDFT
03036  1041*           MAXSAM = $AMSOM(J) + MAXSAM
03037  1042*      7215 PROSAM = J
03040  1043*           ESAM = I
03041  1044*           ASAM1 = ASAM
03042  1045*           IF (ASAM .EQ. 1)  ASAM1 = 2
03044  1046*           ASAMF = ASAM
03045  1047*           IF (ASAM .GT. 1)  ASAMF = ASAM-1
```

```
03047  1048*          ESAM1 = I
03050  1049*          IF (ESAM .EQ. INPTS)  ESAM1 = INPTS - 1
03052  1050*          ESAMF = ESAM + 1
03053  1051*          IF (ESAM .EQ. INPTS)  ESAMF = INPTS
03055  1052*          IF (DEBUGF .EQ. 0)  GO TO 7220
03057  1053*          ARNAME = 6HSAMSOM
03060  1054*          WRITE (6,580) ARNAME
03063  1055*          WRITE (6,585) (I, SAMSOM(I), I = 1,PROSAM)
03063  1056*     C
03063  1057*     C*****************************************************************************
03063  1058*     C                    CALCULATE VARIABLES FOR WRITING ON THE DRUM
03063  1059*     C*****************************************************************************
03063  1060*     C
03072  1061*      7220 CONTINUE
03073  1062*          DRMST = TOTTST + 1
03074  1063*          NOCOL = LIMSAM / PAGSYM
03075  1064*          IF (MOD(LIMSAM,PAGSYM) .NE. 0)  NOCOL = NOCOL + 1
03077  1065*          NOCOWR = PAGSYM/6
03100  1066*          IF (MOD(PAGSYM,6) .NE. 0)  NOCOWR = NOCOWR + 1
03102  1067*          HOLMAP = PARARR - TOTTST
03103  1068*          HOLLIN =(HOLMAP / (NOCOWR * NOCOL +2))
03104  1069*          IF (HOLLIN .LT. 1)  GO TO 9045
03106  1070*          HOLWRD =  HOLLIN * NOCOWR + 2
03107  1071*          CALL RINIT (IBADDR, WNDS)
03110  1072*          COLINC(1) = IBADDR
03111  1073*          COLADD(1) = IBADDR
03112  1074*          ALADD = NOCOWR* LIMLIN + 2
03113  1075*          DRMWRT = 0
03114  1076*          IF (NOCOL .EQ. 1)  GO TO 7250
03116  1077*          DO 7230 I = 2, NOCOL
03121  1078*             COLADD(I) = COLADD(I-1) + ALADD
03122  1079*             COLINC(I) = COLADD(I)
03123  1080*      7230 CONTINUE
03125  1081*      7250 DRMED = DRMST + (HOLWRD * NOCOL)
03126  1082*          DO 7260 I = DRMST, DRMED
03131  1083*             ARRAY(I) = BLANK
03132  1084*      7260 CONTINUE
03134  1085*          SYMPAG = PAGSYM
03135  1086*          REALIN = HOLMAP/(NOCOWR+4)
03136  1087*          TIMREA = LIMLIN / REALIN
03137  1088*          IF (MOD(LIMLIN,REALIN) .NE. 0)  TIMREA = TIMREA + 1
03141  1089*          LMPSAM = MOD(LIMSAM,6) + LIMSAM
03142  1090*          FOR(1) = 6H(1X,I5
03143  1091*          FOR(2) = 6H,2X,T9
03144  1092*          FOR(3) = 1H,
03145  1093*          ENCODE (6,350,FTT) NOCOWR
03150  1094*          FOR(4) = FTT
03151  1095*          FOR(5) = 6HA6,/,1
03152  1096*          FOR(6) = 6HH*,T9,
03153  1097*          FOR(7) = FOR(4)
03154  1098*          FOR(8) = 3HA6)
03154  1099*     C
03154  1100*     C*****************************************************************************
03154  1101*     C
03154  1102*     C                    ------------------------------------------
03154  1103*     C                    COUNTER FOR THE LOOP TO FILTER THE INPUT FIELD
03154  1104*     C                    FROM INFIZ AND THE FASTRAN OR TAPE UNITS.
03154  1105*     C                    ------------------------------------------
03154  1106*     C
03154  1107*     C*****************************************************************************
03154  1108*     C
03155  1109*      7280 CONTINUE
03156  1110*          BUFPT = 1
```

```
03157  1111*          CTFILE = CTFILE + 1
03160  1112*          IF (HOLTST(CTFILE) .NE. 0 .AND. ISLTST(CTFILE) .NE. 0)
03160  1113*         *ATFILE = ATFILE + 1
03162  1114*          IF (OTFILE(CTFILE) .NE. 0) BFILE = BFILE + 1
03164  1115*          IF (OTFILE(CTFILE) .EQ. 1)
03164  1116*         *CALL FIZTHD (LIMSAM, TAPOUT, OTUNT, DDMMYY, SEDKEY)
03166  1117*          IF (CTFILE .EQ. TIMFIL)  GO TO 7300
03170  1118*          OUTFAS = UNTFA1
03171  1119*          IF (MOD(CTFILE,2) .EQ. 0)  OUTFAS = UNTFA2
03171  1120*     C
03171  1121*     C
03171  1122*     C**************************************************************************
03171  1123*     C                  SKIP THE NUMBER OF SKIP LINES + 3 LINES
03171  1124*     C**************************************************************************
03171  1125*     C
03171  1126*     C
03173  1127*      7300 CONTINUE
03174  1128*          SKP3 = SKPLIN + 3
03175  1129*          I1 = 2
03176  1130*          I2 = 3
03177  1131*          I3 = 4
03200  1132*          J  = 1
03201  1133*          IRWRDS(I3) = INPTS
03202  1134*          IRSTAT(I3) = 0
03203  1135*          DO 7340 LINE = 1, SKP3
03206  1136*      7320    IF (IRSTAT(I3) .EQ. 1)  GO TO 7320
03210  1137*              IF (IRSTAT(I3) .GT. 1)  GO TO 9000
03212  1138*              IF (IRWRDS(I3) .NE. INPTS)  GO TO 9060
03214  1139*              CALL MREAD (UNTFIZ, 1, IR(1,J), INPTS, IRSTAT(J), IRWRDS(J))
03215  1140*              CTRECD = CTRECD + 1
03216  1141*              SV = I1
03217  1142*              I1 = I2
03220  1143*              I2 = I3
03221  1144*              I3 = J
03222  1145*              J  = SV
03223  1146*      7340 CONTINUE
03225  1147*          DO 7360 SAMPLE = ASAMF,ESAMF
03230  1148*             IF ( IR(SAMPLE,I1) .LT. 1)  IR(SAMPLE,I1) = DFTPT
03232  1149*             IF (IR(SAMPLE,I2) .LT. 1)  IR(SAMPLE,I2) = DFTPT
03234  1150*      7360 CONTINUE
03236  1151*          KEYFIL = 0
03237  1152*          IF (SKP3 .EQ. 3)  GO TO 7368
03241  1153*          DO 7365 SAMPLE = ASAMF,ESAMF
03244  1154*             IF (IR(SAMPLE,J) .LT. 1)  IR(SAMPLE,J) = DFTPT
03246  1155*      7365 CONTINUE
03250  1156*          KEYFIL = 1
03251  1157*      7368 CALL FIZFLT (I1,KEYFIL,J,I2)
03252  1158*          OTLINE = 0
03253  1159*          LINECT = 1
03254  1160*          CALL FIZSOM (LINECT, OTLINE, ZONLIN, ISKWR, LINLIN, 57370)
03255  1161*          GO TO 9075
03256  1162*      7370 CONTINUE
03257  1163*          CALL FIZWRT (I1,ISKWR,59090,ARRAY(FLDSV2), ARRAY(FIELD2),
03257  1164*         *ARRAY(VERTX2), ARRAY(FLDSV3), ARRAY(FIELD3), ARRAY(VERTX3),
03257  1165*         *ARRAY(DRMST),J)
03260  1166*          IF (CTFILE .GE. TIMFIL)  GO TO 7420
03262  1167*          REWIND OUTFAS
03263  1168*          JSTAT(1) = 0
03264  1169*          JSTAT(2) = 0
03265  1170*      7380 IF (JSTAT(BUFPT) .EQ. 1)  GO TO 7380
03267  1171*          IF (JSTAT(BUFPT)) 7400,7400,7380
03272  1172*      7400 CALL MWRITE (OUTFAS,1,HOLARR(1,BUFPT),PROSAM,JSTAT(BUFPT))
03273  1173*      7420 BUFPT = 3 - BUFPT
```

```
03273  1174*      C
03273  1175*      C*************************************************************************
03273  1176*      C                    MAIN PROCESSING DO-LOOP
03273  1177*      C*************************************************************************
03273  1178*      C
03274  1179*            KEYFIL = 1
03275  1180*            SLINE = SKP3 + 1
03276  1181*            LIMMIT = 0
03277  1182*            ELINE = INLINE + 2
03300  1183*            DO 7600 LINE = SLINE, ELINE
03303  1184*               IF (LIMMIT + EOFMIT)  7460, 7460, 8000
03306  1185*     7460      IF (IRSTAT(I3) .EQ. 1)  GO TO 7460
03310  1186*               IF (IRSTAT(I3) .EQ. 0)  GO TO 7480
03312  1187*               IF (IRSTAT(I3) .EQ. 3)  GO TO 9000
03314  1188*               EOFMIT = 1
03315  1189*               KEYFIL = 0
03316  1190*               GO TO 7485
03317  1191*     7480      IF (IRWRDS(I3) .NE. INPTS)  GO TO 9040
03321  1192*               CALL MREAD (UNTFIZ, 1, IR(1,J), INPTS, IRSTAT(J), IRWRDS(J))
03322  1193*               CTRECD = CTRECD + 1
03322  1194*      C        ***********
03322  1195*      C        DETERMINES THE NUMBER OF TIMES THE LINE WILL BE WRITTEN ON THE OUTPUT
03322  1196*      C        ***********
03323  1197*     7485      CONTINUE
03324  1198*               LINECT = LINECT + 1
03325  1199*               CALL FIZSOM (LINECT, OTLINE, ZOMLIN, ISKNR, LIMLIN, $7490)
03326  1200*               LIMMIT = 1
03327  1201*     7490      IF (KEYFIL .LT. 1)  GO TO 7500
03331  1202*               DO 7495 SAMPLE = ASAMF,ESAMF
03334  1203*                  IF (IR(SAMPLE,I3) .LT. 1)  IR(SAMPLE,I3) = DFTPT
03336  1204*     7495      CONTINUE
03336  1205*      C        ***********
03336  1206*      C        FILTERS THE SCAN LINE BY USING THE HOLE AND ISLAND VALUES.
03336  1207*      C        ***********
03340  1208*     7500      CALL FIZFLT (I2,KEYFIL,I1,I3)
03340  1209*      C        ***********
03340  1210*      C        STORES FILTERED INPUT DATA ON FASTRAN OR TAPE FILE
03340  1211*      C        ***********
03341  1212*               IF (CTFILE .GE. TIMFIL)  GO TO 7515
03343  1213*     7511      IF (JSTAT(BUFPT) .EQ. 1)  GO TO 7511
03345  1214*               IF (JSTAT(BUFPT)) 7512,7512,8980
03350  1215*     7512      CALL MWRITE (OUTFAS,1,HOLARR(1,BUFPT),PROSAM,JSTAT(BUFPT))
03351  1216*     7515      IF (ISKNR .LT. 1)  GO TO 7520
03351  1217*      C        ***********
03351  1218*      C        ZOOMS THE SCAN LINE.  COUNTES THE NUMBER OF PIXELS IN EACH CLASS
03351  1219*      C        WRITES THE LINE  ON THE OUTPUT TAPE ISKNR TIMES AND
03351  1220*      C        WRITES THE DATA FOR THE GRAYMAP ON THE DRUM.
03351  1221*      C        ***********
03353  1222*               CALL FIZWRT (I2,ISKNR,$9090,ARRAY(FLDSV2), ARRAY(FIELD2),
03353  1223*           *   ARRAY(VERTX2), ARRAY(FLDSV3), ARRAY(FIELD3), ARRAY(VERTX3),
03353  1224*           *   ARRAY(DRNST),I1)
03354  1225*     7520      SV = I1
03355  1226*               BUFPT = 3- BUFPT
03356  1227*               I1 = I2
03357  1228*               I2 = I3
03360  1229*               I3 = J
03361  1230*               J  = SV
03362  1231*     7600 CONTINUE
03364  1232*     8000 CONTINUE
03365  1233*          IF (LIMMIT .GT. 0)  GO TO 8040
03367  1234*          ISKNR = LIMLIN - OTLINE
03370  1235*          KEYFIL = -1
03371  1236*          LIMMIT = 1
```

```
03372   1237•          CALL FIZFLT (12, KEYFIL, DUMMY,DUMMY)
03373   1238•          CALL FIZWRT (12,ISKWR,$9090, ARRAY(FLDSV2), ARRAY(FIELD2),
03373   1239•         +ARRAY(VERTX2), ARRAY(FLDSV3), ARRAY(FIELD3), ARRAY(VERTX3),
03373   1240•         +ARRAY(DRWST),I1)
03373   1241•     C*****************************************************************************
03373   1242•     C                    OUTPUT SUMMARY FOR FILZON
03373   1243•     C*****************************************************************************
03374   1244•      8040 CONTINUE
03375   1245•           THOLCH = THOLCH + HOLECH(CTFILE)
03376   1246•           TISLCH = TISLCH + ISLOCH(CTFILE)
03377   1247•           TOTPCT = LINSAM + LINLIN
03400   1248•           ZTOTPC = FLOAT(TOTPCT) * .01
03401   1249•           WRITE (6,HEAD)
03403   1250•           WRITE (6,400)
03405   1251•           IF (OTFILE(CTFILE) .EQ. 0)  GO TO 8050
03407   1252•           WRITE (6,405) BFILE,OTUNT
03413   1253•           IF (TAPOUT .EQ. 1)  WRITE (6,302)
03416   1254•           IF (TAPOUT .EQ. 2)  WRITE (6,303)
03421   1255•      8050 CONTINUE
03422   1256•           WRITE (6,410) UNTFIZ, CTRECD
03426   1257•           WRITE (6,415)HOLTST(CTFILE),ATFILE,HOLECH(CTFILE),THOLCH
03434   1258•           WRITE (6,416)ISLTST(CTFILE),ATFILE,ISLOCH(CTFILE),TISLCH
03442   1259•           WRITE (6,420) TOTPCT
03445   1260•           WRITE (6,440)
03447   1261•           DO 8060 I = 1,DFTPT
03452   1262•              ZPC(I,CTFILE) = FLOAT(PERCNT(I,CTFILE)) /ZTOTPC
03453   1263•              WRITE (6,460) SUBNAM(I), PERCNT(I,CTFILE), ZPC(I,CTFILE)
03460   1264•      8060 CONTINUE
03462   1265•           ZPC(DESNO1,CTFILE) = FLOAT(PERCNT(DESNO1,CTFILE))/ZTOTPC
03463   1266•           ZPC(DESNO2,CTFILE) = FLOAT(PERCNT(DESNO2,CTFILE))/ZTOTPC
03464   1267•           WRITE (6,460) (SUBNAM(I),PERCNT(I,CTFILE),ZPC(I,CTFILE),
03464   1268•          +I = DESNO1,DESNO2)
03474   1269•           IF (SEDKEY .NE. 1)  GO TO 8075
03476   1270•           ZTOCMI = 0.0
03477   1271•           DO 8070 I = 1,NOSUBZ
03502   1272•              IF (SUBNAM(I) .EQ. 6HWATER  )  GO TO 8070
03504   1273•              ZHOL = FLOAT(PERCNT(I,CTFILE))
03505   1274•              ZTOCMI = ZHOL + ZTOCMI
03506   1275•              ZCMI(CTFILE) = ZCMI(CTFILE) + (ZHOL * ZSED(I))
03507   1276•      8070 CONTINUE
03511   1277•           ZCMI(CTFILE) = ZCMI(CTFILE) / ZTOCMI
03512   1278•           WRITE (6,520)ATFILE,ZCMI(CTFILE)
03516   1279•      8075 CONTINUE
03517   1280•           IF (MAP(CTFILE) .EQ. 0)  GO TO 8120
03521   1281•           CALL FIZMAP (ARRAY(DRWST), $9090)
03522   1282•           IF (CTFILE .GE. TIMFIL)  GO TO 8300
03524   1283•           DRWWRT = 0
03525   1284•           DO 8090 I = DRWST,DRWED
03530   1285•              ARRAY(I) = BLANK
03531   1286•      8090 CONTINUE
03533   1287•           DO 8100 I = 1,NOCOL
03536   1288•              COLINC(I) = COLADD(I)
03537   1289•      8100 CONTINUE
03541   1290•      8120 CONTINUE
03542   1291•           IF (JSTAT(1) .NE. 0)  GO TO  8980
03544   1292•           IF (JSTAT(2) .NE. 0)  GO TO  8980
03546   1293•           END FILE OUTFAS
03547   1294•           INPTS = PROSAM
03550   1295•           CTRECD = 0
03551   1296•           FILE  = 1
03552   1297•           INLINE = INLINE - SKPLIN
03553   1298•           SKPLIN = 0
03554   1299•           SKPSAM = 0
```


C-2

```
03555   1300*           EOFHIT = 0
03556   1301*           LIMHIT = 0
03557   1302*           ASAMF = 1
03560   1303*           ESAMF = 1
03561   1304*           ASAM = 1
03562   1305*           ASAM1 = 2
03563   1306*           ESAM = PROSAM
03564   1307*           ESAM1 = PROSAM - 1
03565   1308*           UNTFIZ = OUTFAS
03566   1309*           REWIND UNTFIZ
03567   1310*           GO TO 7280
03570   1311*      8300 CONTINUE
03571   1312*           CALL CLOCK (ELATIM)
03572   1313*           WRITE (6,500) ELATIM
03575   1314*           STOP
03575   1315*     C*****************************************************************************
03575   1316*     C                  FATAL ERROR WRITE STATEMENTS AND ERROR EXIT
03575   1317*     C*****************************************************************************
03576   1318*      8980 CONTINUE
03577   1319*           BADREC = LINECT -2
03600   1320*           IF (JSTAT(BUFPT) .EQ. 2)  WRITE (6,900) BADREC, CTFILE, OUTFAS
03606   1321*           IF (JSTAT(BUFPT) .EQ. 3)  WRITE (6,990) OUTFAS, BADREC, CTFILE
03614   1322*           GO TO 9090
03615   1323*      9000 CONTINUE
03616   1324*           IF (IRSTAT(I3) .EQ. 2)  WRITE (6,990) CTRECD, FILE, UNTFIZ
03624   1325*           IF (IRSTAT(I3) .EQ. 3)  WRITE (6,905) UNTFIZ, FILE, CTRECD
03632   1326*           GO TO 9090
03633   1327*      9010 CONTINUE
03634   1328*           BUMWRS = IRWRDS(I3)
03635   1329*           WRITE (6,920) UNTFIZ, (ARFIZ1(I), I = 1,BUMWRS)
03644   1330*           GO TO 9090
03645   1331*      9030 CONTINUE
03646   1332*           WRITE (6,950) SKFILE,IRSTAT(I3)
03652   1333*           GO TO 9090
03653   1334*      9040 CONTINUE
03654   1335*           WRITE (6,940) CTRECD, FILE, IRWRDS(I3), INPTS
03662   1336*           GO TO 9090
03663   1337*      9045 CONTINUE
03664   1338*           GO TO 9090
03665   1339*      9050 CONTINUE
03666   1340*           WRITE (6,335)
03670   1341*           WRITE (6,345) (ARRAY(I), CLSNAM(I), I = 1, NOCLS2)
03677   1342*           GO TO 9090
03700   1343*      9060 CONTINUE
03701   1344*           WRITE (6,340)
03703   1345*           WRITE (6,342) (I, CLSNAM(I), ARRAY(I), I = 1,NOCLS2)
03713   1346*           GO TO 9090
03714   1347*      9070 CONTINUE
03715   1348*           WRITE (6,930) FIZFIL, FILE
03721   1349*           GO TO 9090
03722   1350*      9075 CONTINUE
03723   1351*           WRITE (6,915)
03725   1352*           GO TO 9090
03726   1353*      9080 CONTINUE
03727   1354*           WRITE (6,925) FLDKEY
03732   1355*           GO TO 9090
03733   1356*      9090 CONTINUE
03734   1357*           CALL CLOCK (ELATIM)
03735   1358*           WRITE (6,500) ELATIM
03740   1359*           WRITE (6,910)
03742   1360*           CALL CMERR
03743   1361*           END
```

END OF COMPILATION: NO DIAGNOSTICS. 08 APR 76 11:23:49 0 03012014 14 1361 (DELETED)
FELZOM SYMBOLIC

```
@L PDP,* COMBK6,COMBK6                                                    08 APR 76          11:23:49
PDP  @L1  2403 0010
THIS PROC ELEMENT PROCESSED ON 08 APR 76 AT 11:23:49

000001      PROC ORIGIN 1     ENTRY POINT 1    COMBK6*   FCOPY
000002                                              COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
000003                                             *            MISFIL,MISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
000004                                             *             BRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL
000005                                             *            ,FIZUNT,FIZKEY,FIZFIL                              FILZOM
000006                                              END
000007      PROC ORIGIN 2     ENTRY POINT 2    COMBK6*   FCOPY
000008                                           C*
000009                                           C*    GLOBAL COMMON IS USED IN EVERY PROCESSOR. IT IS ALWAYS IN CORE.
000010                                           C*    ALL PARAMETERS ARE INITIALIZED IN THE MONITOR ROUTINE OR BLKCOM
000011                                           C*    EXCEPT AS NOTED BELOW
000012                                           C*    DEFINITIONS
000013                                           C*        HEAD   - STANDARD HEADING PRINTED ON MOST OUTPUT PAGES.
000014                                           C*        MAPTAP - FORTRAN UNIT NUMBER ON WHICH THE MAPTAP FILE IS
000015                                           C*                 WRITTEN (=2)
000016                                           C*        DATAPE - UNIT NO. FOR THE IMAGE DATA TAPE (=3)
000017                                           C*        SAVTAP - UNIT NO. ON WHICH THE STATISTICS FILE IS WRITTEN (=1)
000018                                           C*        BMFILE - UNIT NO. ON WHICH THE B-MATRIX FILE IS WRITTEN (=10)
000019                                           C*        BMKEY - TRIGGER INDICATING THAT THE B-MATRIX FILE HAS BEEN
000020                                           C*                 WRITTEN. CAN BE SET IN SELECT CLASSIFY OR DATA-TR.
000021                                           C*        MISFIL - UNIT NO. ON WHICH THE HISTOGRAM FILE IS WRITTEN (=13)
000022                                           C*        MISKEY - TRIGGER INDICATING THE HISTOGRAM FILE HAS BEEN
000023                                           C*                 WRITTEN. SET IN HIST PROCESSOR.
000024                                           C*        TRFORM - UNIT NO. ON WHICH THE TRANSFORMED IMAGE IS WRITTEN BY
000025                                           C*                 THE DATA-TRANSFORMATION PROCESSOR. (=14)
000026                                           C*        ERIPTP - UNIT NO. ON WHICH THE ISOCLS PROCESSOR WRITES
000027                                           C*                 CLUSTER STATISTICS FOR THE ERIPS SYSTEM. (=15)
000028                                           C*        ERPKEY - TRIGGER INDICATING THAT THE ERIPS INTERFACE TAPE
000029                                           C*                 HAS BEEN WRITTEN.
```

```
000030                          C*      MAPUNT - UNIT NO. ON WHICH THE ISOCLS OR DISPLAY PROCESSOR
000031                          C*               WRITES THE CLUSTERED OR CLASSIFIED DATA
000032                          C*              TO BE DISPLAYED ON THE PHIS DAS
000033                          C*      NOFILE - NO. OF FILES WRITTEN ON UNIT 16 (MAP OUTPUT TAPE)
000034                          C*               BY DISPLAY AND/OR ISOCLS
000035                          C*               SET EITHER IN ISOCLS OR DISPLAY.
000036                          C*      DRUMAD - BEGINNING ADDRESS FOR THE RANDOM ACCESS HIGH SPEED
000037                          C*               DRUM FILE. THIS FILE IS USED AS A SCRATCH FILE IN
000038                          C*               SEVERAL PROCESSORS. REFERENCES TO SYSTEM ROUTINES
000039                          C*               'RREAD' AND 'RWRITE' ACCESS THIS FILE.
000040                          C*      DRWDS  - NO. OF WORDS AVAILABLE ON THE RANDOM ACCESS FILE.
000041                          C*      PAGSIZ - NO. OF LINES AVAILABLE FOR PRINTING ON A PAGE.
000042                          C*      DATFIL - NO. OF E-O-F'S TO BE READ OVER BY TAPERD ROUTINE IN
000043                          C*               ORDER TO POSITION THE DATA TAPE TO DESIRED FILE
000044                          C*      STAFIL - NO. OF E-O-F'S TO SKIP OVER TO POSITION STAT FILE')
000045                          C*      FIZUNT - LOGICAL UNIT ON WHICH THE FILES FOR PROGRAM FILZON     FILZON
000046                          C*               ARE WRITTEN                                            FILZON
000047                          C*      FIZKEY - TRIGGER TO WRITE A FILE FOR INPUT TO FILZON.          FILZON
000048                          C*               0 = DO NOT WRITE A FILE                               FILZON
000049                          C*               1 = WRITE A FILE                                      FILZON
000050                          C*      FIZFIL - TOTAL NUMBER OF FILES THAT ARE WRITTEN ON FIZUNT.     FILZON
000051                          C*
000052                                  END
   CORBK6          PROCEDURE              14 JAN 76  16:24:02   0  01447740   14    52  (DELETED)
                                                                1  01451270   12     1
```

```
8L PDP,• CMBK10,CMBK10                                                    08 APR 76          11:24:15
PDP  8L1  2403 0010
THIS PROC ELEMENT PROCESSED ON 08 APR 76 AT 11:24:16

000001      PROC ORIGIN 1     ENTRY POINT 1    CMBK10•    FCOPY
000002                                          COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
000003                                         •            SUBCAT(60),CLSSUB(60),NONAP,TOTVT3,NOSUB3,
000004                                         •            PCFDKY,TSTKEY,TRBKEY,THRSKY,STATKY,EMPTRS,THRSVA,
000005                                         •            PLTKEY,BMFLG,BMCOMB,BMFEAT,CDATE(2),
000006                                         •            FLDSV2,FIELD2,VERTX2,FLDSV3,FIELD3,VERTX3,PCTID3,
000007                                         •            THRES(60),SYMMTX(66),HIGH(60),CON(60)
000008                                         •            ,FLDKEY,NOFLD2,NOFLD3,NOFET2,FETVC2(30)
000009                                         •            ,NOSUB2,NOTRFD,TOTVT2,NOCLS2
000010                                         •            ,NATNO(60),NOCAT,FILTER,MAPFMT
000011                                         •            ,DESKEY,DESUBI,DESOTH,CROP ,ACROP,AOTHER,ATOTAL
000012                                         •            ,SITE(4),ANALYS(3),CANS(10),CRPKEY
000013                                         •            ,NFILE                                              FILZOM
000014                                          END
000015      PROC ORIGIN 2     ENTRY POINT 2    CONT10•  FCOPY
000016                                         C•
000017                                         C•   COMMON BLOCK DISPL IS USED ONLY IN THE DISPLAY PROCESSOR
000018                                         C•
000019                                         C•
000020                                         C•   DEFINITIONS
000021                                         C•
000022                                         C•     CATFLG - FLAG INDICATING WHETHER OR NOT CATEGORY PERFORMANCE
000023                                         C•              REPORTS MUST BE GENERATED.
000024                                         C•     CATNAM - NAMES OF CATEGORIES. READ FROM MAPTAP.
000025                                         C•     CLSNAM - NAMES OF CLASSES. READ FROM MAPTAP.
000026                                         C•     SUBNAM - NAMES OF SUBCLASSES. READ FROM MAPTAP.
000027                                         C•     SUBCAT - SUBCLASS-CATEGORY CORRESPONDENCE VECTOR
000028                                         C•              (SUBCAT(I)=N  MEANS SUBCLASS I BELONGS TO CATEGORY N)
000029                                         C•     CLSSUB - SUBCLASS-CLASS CORRESPONDENCE VECTOR.
```

```
000030          C*              (CLSSUB(I)=M  MEANS SUBCLASS I BELONGS TO CLASS M)
000031          C*      NOMAP   - TRIGGER INDICATING WHETHER OR NOT A MAP IS TO BE PRINTED
000032          C*      TOTVTS  - TOTAL NO. OF VERTICES IN INPUT TEST FIELDS.
000033          C*      NOSUBS  - NO. OF SUBCLASSES USED IN CLASSIFY PLUS ONE,FOR THE
000034          C*              THRESHOLD CLASS.
000035          C*      PCFGKY  - KEY INDICATING WHETHER OR NOT GROUND TRUTH PERFORMANCE
000036          C*              REPORTS ARE TO BE PRINTED ON A PER FIELD BASIS.
000037          C*      TSTKEY  - KEY INDICATING WHETHER OR NOT TEST FIELDS WERE INPUT.
000038          C*      TRNKEY  - KEY INDICATING WHETHER OR NOT TRAINING FIELDS ARE TO
000039          C*              BE OUTLINED.
000040          C*      THRSKY  - THRESHOLD KEY
000041          C*              =1 APPLY CHI-SQUARE THRESHOLDS
000042          C*              =2 APPLY EMPIRICAL  THRESHOLDS
000043          C*              =3 APPLY USER-INPUT THRESHOLDS
000044          C*              =0 NO THRESHOLDING
000045          C*      STATKY  - KEY FOR PRINTING STATS FROM MAPTAP
000046          C*      EMPTRS  - EMPIRICAL THRESHOLDING FLAG
000047          C*      THRSVA  - USER-INPUT THRESHOLD VALUE FLAG
000048          C*      PLTKEY  - FLAG FOR PRINTING CUMMULATIVE HISTOGRAMS OF QUADRATIC
000049          C*              FORM.
000050          C*      BMFLG   - FLAG INDICATING WHETHER OR NOT A B-MATRIX WAS
000051          C*              APPLIED IN CLASSIFY.
000052          C*      BMCONS  - NO. OF LINEAR COMBINATIONS IN B-MATRIX
000053          C*      BMFEAT  - NO. OF CHANNELS USED IN COMPUTING B-MATRIX
000054          C*      CDATE   - DATE OF CLASSIFICATION
000055          C*      FLDSVZ  - ADDRESS IN 'ARRAY' FOR TRAINING FIELD INFORMATION.
000056          C*              FOR EACH TRAINING FIED 4 PIECES OF INFORMATION ARE
000057          C*              STORED - 1=FIELD NAME
000058          C*                       2=CLASS NO.
000059          C*                       3=SUBCLASS NO.
000060          C*                       4=NO. OF VERTICES
000061          C*      FIELD2  - ADDRESS IN 'ARRAY' FOR RECTANGULAR AREA SURROUNDING
```

```
000062                C•              EACH TRAINING FIELD. FOR EACH TRAINING FIELD 5 PIECES
000063                C•              OF INFORMATION ARE STORED.
000064                C•                      1=LINE START
000065                C•                      2=LINE END
000066                C•                      3=SAMPLE START
000067                C•                      4=SAMPLE END
000068                C•                      5=POINTER INTO VERTEX ARRAY FOR VERTICES
000069                C•                        OF THIS FIELD.
000070                C•      VERTX2 - ADRESS IN 'ARRAY' FOR TRAINING FIELD VERTICES.
000071                C•      FLDSV3 - SAME AS FLDSV2 FOR TEST FIELDS
000072                C•      FIELD3 - SAME AS FIELD2 FOR TEST FIELDS
000073                C•      VERTX3 - SAME AS VERTX2 FOR TEST FIELDS
000074                C•      PCTID3 - ADDRESS IN'ARRAY' FOR PERFORMANCE TABLE.
000075                C•      THRES  - THRESHOLD VALUES
000076                C•      SYMBTX - SYMBOLS FOR EACH SUBCLASS, PLUS THRESHOLD SYMBOL
000077                C•               AND OUTLINE SYMBOLS.
000078                C•      HIGH   - THRESHOLD REJECTION PERCENTAGE - EMPIRICAL OPTION
000079                C•      CON    - CONSTANT FACTOR FROM PROBABILITY DENSITY FUNCTION
000080                C•               FROM CLASSIFY. ONE FOR EACH SUBCLASS.
000081                C•      FLDKEY - KEY INDICATING WHETHER GROUND TRUTH FIELDS ARE
000082                C•               ASSOCIATED WITH CLASSES OR SUBCLASSES.
000083                C•      NOFLD2 - NO. OF TRAINING FIELDS
000084                C•      NOFLD3 - NO. OF TEST FIELDS
000085                C•      NOFET2 - NO. OF CHANNELS USED IN CLASSIFICATION.
000086                C•      FETVC2 - CHANNELS USED IN CLASSIFICATION.
000087                C•      NOSUB2 - NO. OF SUBCLASSES USED IN CLASSIFICATION.
000088                C•      NOTRFD - NO. OF GROUND TRUTH FIELDS FOR WHICH PERFORMANCE
000089                C•               TABLES WILL BE MADE. EQUALS NOFLD3 OR NOFLD2.
000090                C•      TOTVT2 - TOTAL NO. OF VERTICES FOR TRAINING FIELDS.
000091                C•      NOCLS2 - NO. OF CLASSES USED IN CLASSIFICATION.
000092                C•      KATNO  - CLASS - CATEGORY CORRESPONDENCE VECTOR
000093                C•               (KATNO(I)=M  MEANS CLASS I IS IN CATEGORY M)
```

```
000094                C*     NOCAT  - NO. OF CATEGORIES.
000095                C*     FILTER - FLAG FOR SPATIAL FILTERING OPTION.
000096                C*   MAPFRT - FORMAT FOR OUTPUT MAP TAPE
000097                C*     DESKEY - KEY INDICATING WHETHER OR NOT DESIGNATED FIELDS WERE INPUT
000098                C*     DESUBI - NO. FOR DESIGNATED UNIDENTIABLE  (NOSUB2+5)
000099                C*     DESOTH - NO. FOR DESIGNATED OTHER  (NOSUB2+6)
000100                C*     CROP   - NAME OF CROP FOR WHICH INTENSIVE TEST SITE SUMMARY
000101                C*              REPORT IS TO BE PRINTED, CROP IS TO BE COMPARED WITH OTHER
000102                C*     ACROP  - ACRES OF 'CROP'  - USER INPUT
000103                C*     AOTHER - ACRES OF 'OTHER' - USER INPUT
000104                C*     ATOTAL - TOTAL ACRES IN CLASSIFIED SEGMENT
000105                C*     SITE   - NAME OF SITE (CLASSIFIED SEGMENT)
000106                C*     ANALYS - NAME OF ANALYST PERFORMING STUDY
000107                C*     CARS   - NAME OF PROCEDURE CONFIGURATION USED IN STUDY
000108                C*     CRPKEY - KEY FOR GENERATING INTENSIVE TEST SITE SUMMARY REPORT
000109                C*     NFILE - MAPTAP FILE NUMBER FOR SDISPLAY RUN                    FILZOR
000110                C*
000111                C*
000112                      END
    CHBK10          PROCEDURE                14 JAN 76  16:24:04   0  01453654    14   112  (DELETED)
                                                                   1  01454714    12     1
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```
BL PDP,* FIZPDP,FIZPDP                                                    08 APR 76          11:24:42
PDP  BL1  2403 8010
THIS PROC ELEMENT PROCESSED ON 08 APR 76 AT 11:24:42

000001       PROC ORIGIN 1     ENTRY POINT 1     FIZCON* FCOPY
000002                               IMPLICIT DOUBLE PRECISION (Z)
000003                               REAL CON,THRES
000004                          C
000005                          C                 PARAMETERS
000006                          C
000007                               PARAMETER PAGCOL = 10, PAGSYM = 110, PARSAM = 1000, PARLIN = 1000
000008                               PARAMETER PAGWRD = 19, PSCLAD = 61, ISUBCL = PSCLAD - 1
000009                               PARAMETER PSEDS = 21, POUTLN = PSCLAD+6, PSYM = 2*POUTLN,
000010                              *          PSAMPS= PARSAM + 5, PARFIL = 8
000011                          C
000012                          C                 COMMON BLOCKS
000013                          C
000014                               COMMON /FIZ/ SYM(POUTLN,2), CODE(POUTLN), YAPOUT, OTURT, SKPLIN,
000015                              *             SKPSAM, DFTCOD, DFTSYM(2), DFTPT, ZONLIN, ZONSAM,
000016                              *             LIMLIN , LIMSAM, MED1(10), MED2(10), OTLINE, DATE(2),
000017                              *             COMENT(10),DEBUGF,LIMHIT,PROSAM,LMPSAM,
000018                              *             ASAM1, ASAM, ESAM1, ESAM, CTSEDS, EOFHIT,
000019                              *           SEDSAM(PSEDS),TRUNO,TSTNO,DESNO1,DESNO2,DUPNO
000020                               COMMON /DRUM/ IBADDR, COLADD(PAGCOL), COLINC(PAGCOL), NOCOL,
000021                              *             NOCOMM, NOLLIN, NOLWRD, DRMWRT,
000022                              *              FOR(8), ALADD, REALIN, SYMPAG, TIMREA
000023                               COMMON /INFI21/ FIZNAM, DSPYDT(2), DSPYTM, FLDESC, INPTS, INLINE,
000024                              *                ILINST, ILINED, ILINIC, ISAMST, ISAMED, ISAMIC
000025                               COMMON /CONSAM/ SAMSOM(PARSAM),IR(PSAMP5,4),HOLARR(PARSAM,2),
000026                              *                BUFPT, UNTFAS, JSTAT(2)
000027                               COMMON/UNTIF2/  MAP(PARFIL), OTFILE(PARFIL), TIMFIL,
000028                              *                CTFILE, ISLTST(PARFIL), NOLTST(PARFIL), TOTPCT,
000029                              *                PERCNT(POUTLN,PARFIL),ZCNI(PARFIL),
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```
000030                                  *               ZPC(POUTLN,PARFIL), ISLOCN(PARFIL),
000031                                  *               HOLECN(PARFIL), TISLCN, THOLCN
000032                                  *               ,ATFILE
000033                                  END
000034      PROC ORIGIN 2    ENTRY POINT 2    DEFCON= FCOPY
000035
000036
000037                                  END
    FIZPOP          PROCEDURE                       28 FEB 76  13:58:26   0  02655732    14    37  (DELETED)
                                                                          1  02656740    12     1
```

```
@ FOR,* FIZBOR/SKAAA,FIZBOR.FIZBOR                                   08 APR 76          11:24:45
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXECS LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:24:45

  SUBROUTINE FIZBOR    ENTRY POINT 000402

  STORAGE USED: CODE(1) 000461; DATA(0) 000074; BLANK COMMON(2) 000000

  EXTERNAL REFERENCES (BLOCK, NAME)

   0003   FDLIST
   0004   BERR3S

  STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001   000017 107G      0001   000104 131G      0001   000264 166G      0001   000322 175G      0001   000217 20L
   0001   000222 30L       0001   000241 40L       0001   000257 45L       0001   000351 46L       0001   000356 50L
   0000 I 000036 BORNUM    0000 I 000000 FL        0000 I 000026 I         0000 I 000034 IB        0000 I 000035 IE
   0000 I 000037 IJ        0000   000040 IWJPS     0000 I 000030 IPT       0000 I 000033 J         0000 I 000032 NI
   0000 I 000027 NV        0000 I 000031 SAMPS

00101      1•           SUBROUTINE FIZBOR(ISYM,LINUM,IR,NOFLD,FIELD,FLDSAV,VERTEX,
00101      2•          •                 NOSUB3,SAMSTR,SAMEND,SAMINC,LININC)
00101      3•     C•
00101      4•     C•    THIS SUBROUTINE SETS THE SYMBOL INDEX IN THE CLASSIFIED LINE (IR)
00101      5•     C•    ARRAY TO OUTLINE TRAINING OR TEST FIELDS IN THE MAP.
00101      6•     C•
00103      7•           IMPLICIT INTEGER(A-Z)
00104      8•           DIMENSION IR(1),FIELD(5,NOFLD),FLDSAV(4,NOFLD),VERTEX(1)
00105      9•           DIMENSION FL(22)
00106     10•           DO 50 I=1,NOFLD
00111     11•           IF(LINUM+LININC .LT. FIELD(1,I))GO TO 50
00113     12•           IF(LINUM-LININC .GT. FIELD(2,I))GO TO 50
00115     13•           IF(FIELD(3,I) .GT. SAMEND)GO TO 50
00117     14•           IF(FIELD(4,I) .LT. SAMSTR)GO TO 50
00117     15•     C•
00117     16•     C•    FOUND A FIELD THAT NEEDS BORDER ON THIS LINE. NOW FIND FIELD
00117     17•     C•    INTERSECTIONS ON THIS LINE.
00117     18•     C•
00121     19•           NV=FLDSAV(4,I)
00122     20•           IPT=FIELD(5,I)
00122     21•     C•
00122     22•     C•     TOP OR BOTTOM
00122     23•     C•
00123     24•           IF(LINUM.GT.FIELD(2,I))GO TO 40
00125     25•           IF(LINUM.LT.FIELD(1,I))GO TO 30
00127     26•           CALL FDLIST(VERTEX(IPT),NV,FL,LINUM,SAMPS,NI)
00130     27•           DO 20 J=1,NI,2
00133     28•           IB =(FL(J)-SAMSTR)/SAMINC
00134     29•           IE=(FL(J+1)-SAMSTR)/SAMINC + 2
00135     30•           IF(MOD(SAMSTR,SAMINC).NE.MOD(FL(J),SAMINC))IB=IB+1
00137     31•           IF (IB .LT. SAMSTR)  GO TO 20                                    FILZOR
00141     32•           IF (IE .GT. SAMEND)  GO TO 20                                    FILZOR
00143     33•           IF (IB .GT. SAMEND)  GO TO 20                                    FILZOR
00145     34•           IF (IE .LT. SAMSTR) GO TO 20                                     FILZOR
```

```
00147     35•           BORNUM=ISYM
00150     36•           IF(IR(IB).GT.NOSUB3)BORNUM = NOSUB3 + 3
00152     37•           IR(IB)=BORNUM
00153     38•           IF(IR(IE).GT.NOSUB3)BORNUM = NOSUB3 + 3
00155     39•           IR(IE) = BORNUM                                          FILZOR
00156     40•        20 CONTINUE                                                 FILZOR
00160     41•           GO TO 50
00161     42•        30 CONTINUE
00161     43•     C•
00161     44•     C•    GET INTERCEPTS FOR TOP LINE IN FIELD
00161     45•     C•
00162     46•           CALL FDLINT(VERTEX(IPT),NV,FL,FIELD(1,I),SAMPS,NI)
00163     47•           GO TO 45
00163     48•     C•
00163     49•     C•    GET INTERCEPTS FOR BOTTOM LINE IN FIELD
00163     50•     C•
00164     51•        40 CALL FDLINT(VERTEX(IPT),NV,FL,FIELD(2,I),SAMPS,NI)
00165     52•        45 DO 47 J=1,NI,2
00170     53•           IB = (FL(J)-SAMSTR)/SAMINC
00171     54•           IE = (FL(J+1)-SAMSTR)/SAMINC + 2
00172     55•           IF(MOD(SAMSTR,SAMINC).NE.MOD(FL(J),SAMINC))IB=IB+1
00174     56•           DO 46 IJ=IB,IE
00177     57•           IF (IJ .LT. SAMSTR) GO TO 46                             FILZOR
00201     58•           IF (IJ .GT. SAMEND)  GO TO 46                            FILZOR
00203     59•           BORNUM=ISYM
00204     60•           IF(IR(IJ).GT.NOSUB3)BORNUM=NOSUB3+3
00206     61•           IR(IJ) = BORNUM                                          FILZOR
00207     62•        46 CONTINUE                                                 FILZOR
00211     63•        47 CONTINUE
00213     64•        50 CONTINUE
00215     65•           END                                                   FLD80720

   END OF COMPILATION:       NO  DIAGNOSTICS.
FILZOR          SYMBOLIC                          08 APR 76  11:24:47   0  03031330    14    65  (DELETED)
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@ FOR,* FIZFLT/SKAAA,FIZFLT,FIZFLT                                   08 APR 76          11:24:47
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:24:47

   SUBROUTINE FIZFLT    ENTRY POINT 000314

   STORAGE USED: CODE(1) 000335; DATA(0) 000036; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   FIZ     000434
    0004   DRUM    000046
    0005   INFIZ1  000015
    0006   COMSAM  015560
    0007   UNTIFZ  003216
    0010   DISPL   001370

   EXTERNAL REFERENCES (BLOCK, NAME)

    0011   FIZTST
    0012   UERR38

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000024 132G      0001   000045 143G      0001   000122 164G      0001   000030 200@L     0001   000065 300@L
    0001   000102 302@L     0001   000270 400@L     0010   001342 ACROP     0004   000042 ALADD     0010   001351 ANALYS
    0010   001343 AOTHER    0003 I 000375 ASAM      0003 I 000374 ASAM1     0007   003215 ATFILE    0010   001344 ATOTAL
    0010   000570 BRCOMB    0010   000571 BRFEAT    0010   000567 BRFLG     0006 I 015554 BUFPT     0010   001354 CAMS
    0010   000000 CATFLG    0010   000001 CATNAM    0010   000572 CDATE     0007 I 003173 CHANGE    0010   000076 CLSNAM
    0010   000460 CLSSUB    0003   000206 CODE      0004   000001 COLADD    0004   000013 COLINC    0003   000356 COMENT
    0010 R 001075 CON       0010   001341 CROP      0010   001366 CRPKEY    0007 I 000021 CTFILE    0003   000400 CTSEDS
    0003   000354 DATE      0003   000370 DEBUGF    0010   001336 DESKEY    0003   000431 DESNO1    0003   000432 DESNO2
    0010   001340 DESOTH    0010   001337 DESUNI    0003   000315 DFTCOD    0003 I 000320 DFTPT     0003   000316 DFTSYM
    0004   000031 DRNWRT    0005   000001 DSPYDT    0005   000003 DSPYTM    0003   000433 DUPNO     0010   000564 EMPTRS
    0003   000401 EOFMIT    0003 I 000377 ESAM      0003 I 000376 ESAM1     0010   001175 FETVC2    0010   000575 FIELD2
    0010   000600 FIELD3    0010   001334 FILTER    0005   000000 FIZNAM    0005   000004 FLDESC    0010   001171 FLDKEY
    0010   000574 FLDSV2    0010   000577 FLDSV3    0004   000032 FOR       0003   000327 HED1      0003   000341 HED2
    0010   001001 HIGH      0006 I 011634 HOLARR    0007   003203 HOLECM    0004   000027 HOLLIN    0000 I 000001 HOLSAM
    0007   000032 HOLTST    0004   000030 HOLWRD    0000 I 000002 I         0004   000000 IBADDR    0005   000010 ILINED
    0005   000011 ILINIC    0005   000007 ILINST    0000 I 000003 IMIBUS    0000   000006 INJPS     0005   000006 INLINE
    0005   000005 INPTS     0000 I 000004 IPLUS     0006 I 001750 IR        0005   000013 ISAMED    0005   000014 ISAMIC
    0005   000012 ISAMST    0007   003173 ISLOCH    0007   000022 ISLTST    0006   015556 JSTAT     0010   001237 KATNO
    0003   000371 LIMHIT    0003   000325 LIMLIN    0003   000326 LIMSAM    0003   000373 LMPSAM    0007   000000 MAP
    0010   001335 MAPFRT    0010   001367 MFILE     0010   001333 NOCAT     0010   001236 NOCLS2    0004   000025 NOCOL
    0004   000026 NOCOMR    0010   001174 NOFET2    0010   001172 NOFLDZ    0010   001173 NOFLD3    0010   000554 NOMAP
    0010   001233 NOSUB2    0010   000556 NOSUB3    0010   001234 NOTRFD    0007   000010 OTFILE    0003   000353 OTLINE
    0003   000312 OTUNT     0010   000557 PCFDRY    0010   000602 PCTID3    0007   000043 PERCNT    0010   000566 PLTKEY
    0003 I 000372 PROSAM    0004   000043 REALIN    0000 I 000000 SAMPLE    0006   000000 SAMSON    0003   000402 SEDNAM
    0010   001345 SITE      0003   000313 SKPLIN    0003   000314 SKPSAM    0010   000563 STATKY    0010   000364 SUBCAT
    0010   000173 SUBNAM    0010   000270 SUBNO     0003   000000 SYM       0010   000677 SYMRTX    0004   000044 SYMPAG
    0003   000311 TAPOUT    0007 I 000022 TEST      0007   003214 THOLCM    0010 R 000603 THRES     0010   000562 THRSKY
    0010   000565 THRSVA    0007   000020 TIMFIL    0004   000045 TIMREA    0007   003213 TISLCM    0007   000042 TOTPCT
    0010   001235 TOTVT2    0010   000555 TOTVT3    0010   000561 TRNKEY    0003   000427 TRNNO     0010   000560 TSTKEY
    0003   000430 TSTNO     0006   015555 UNTFAS    0010   000576 VERTX2    0010   000601 VERTX3    0007 D 001073 ZCNI
    0003 D 000321 ZORLIN    0003 D 000323 ZOMSAM    0007 D 001113 ZPC
```

```
00001     1•           SUBROUTINE FIZFLT (LINE,KEYFIL,I1,I3)
00103     2•           IMPLICIT INTEGER (A-Y)
00104     3•           INCLUDE FIZCOM, LIST
00105     3•           IMPLICIT DOUBLE PRECISION (Z)
00106     3•           REAL CON,THRES
00106     3•      C
00106     3•      C                    PARAMETERS
00106     3•      C
00107     3•           PARAMETER PAGCOL = 10, PAGSYM = 110, PARSAM = 1000, PARLIN = 1000
00110     3•           PARAMETER PAGHRD = 19, PSCLAD = 61, ISUBCL = PSCLAD - 1
00111     3•           PARAMETER PSEDS = 21, POUTLN = PSCLAD+6, PSYM = 2*POUTLN,
00111     3•          •          PSAMPS= PARSAM + 5, PARFIL = 8
00111     3•      C
00111     3•      C                    COMMON BLOCKS
00111     3•      C
00112     3•           COMMON /FIZ/ SYM(POUTLN,2), CODE(POUTLN), TAPOUT, OTUNT, SKPLIN,
00112     3•          •             SKPSAM, DFTCOD, DFTSYM(2), DFTPT, ZOMLIN, ZOMSAM,
00112     3•          •             LINLIN , LIMSAM, HED1(10), HED2(10), OTLINE, DATE(2),
00112     3•          •             COMENT(10),DEBUGF,LIMHIT,PROSAM,LMPSAM,
00112     3•          •             ASAM1, ASAM, ESAM1, ESAM, CTSEDS, EOFHIT,
00112     3•          •          SEDNAM(PSEDS),TRNNO,TSTNO,DESNO1,DESNO2,DUPNO
00113     3•           COMMON /DRUM/ IBADDR, COLADD(PAGCOL), COLINC(PAGCOL), NOCOL,
00113     3•          •             NOCONR, NOLLIN, NOLNRD, DRMWRT,
00113     3•          •              FOR(8), ALADD, REALIN, SYMPAG, TIMREA
00114     3•           COMMON /INFIZ1/ FIZNAM, DSPYDT(2), DSPYTM, FLDESC, INPTS, INLINE,
00114     3•          •                ILINST, ILINED, ILINIC, ISAMST, ISAMED, ISAMIC
00115     3•           COMMON /COMSAM/ SAMSOM(PARSAM),IR(PSAMPS,4),HOLARR(PARSAM,2),
00115     3•          •                BUFPT, UNTFAS, JSTAT(2)
00116     3•           COMMON/UNTIFZ/  MAP(PARFIL), OTFILE(PARFIL), TIMFIL,
00116     3•          •                CTFILE, ISLTST(PARFIL), NOLTST(PARFIL), TOTPCT,
00116     3•          •                PERCNT(POUTLN,PARFIL),ZCNI(PARFIL),
00116     3•          •                ZPC(POUTLN,PARFIL), ISLDCH(PARFIL),
00116     3•          •                NOLECH(PARFIL), TISLCH, TNOLCH
00116     3•          •                ,ATFILE
00117     3•           END
00120     4•           INCLUDE CMBK10,LIST
00121     4•           COMMON/DISPL/CATFLG,CATNAM(61),CLSNUM(61),SUBNAM(61),SUBNO(60),
00121     4•          •             SUBCAT(60),CLSSUB(60),NUMAP,TOTVT3,NOSUB3,
00121     4•          •             PCFDKY,TSTKEY,TRNKEY,THRSKY,STATKY,EMPTR3,THRSVA,
00121     4•          •             PLTKEY,BMFLG,BMCOMB,BMFLAT,CDATE(2),
00121     4•          •             FLDSV2,FIELD2,VERTX2,FLDSV3,FIELD3,VERTX3,PCTID3,
00121     4•          •             THRES(60),SYMNTX(66),HIGH(60),CON(60)
00121     4•          •             ,FLDKEY,NOFLD2,NOFLD3,NOFET2,FETVC2(30)
00121     4•          •             ,NOSUB2,NOTRFD,TOTVT2,NOCLS2
00121     4•          •             ,CATNO(60),NOCAT,FILTER,MAPFNT
00121     4•          •             ,DESKEY,DESUN1,DESOTH,CROP ,ACROP,AOTHER,ATOTAL
00121     4•          •             ,SITE(4),ANALYS(3),CANS(10),CRPKEY
00121     4•          •             ,NFILE                                                FILZOM
00122     4•           END
00123     5•           DIMENSION TEST(PARFIL,2), CHANGE(PARFIL,2)
00123     6•      C
00123     7•      C                    EQUIVALENCE STATEMENTS
00123     8•      C
00124     9•           EQUIVALENCE (TEST(1,1),ISLTST(1)),(TEST(1,2),NOLTST(1)),
00124    10•          •           (CHANGE(1,1),ISLDCH(1)),(CHANGE(1,2),NOLECH(1))
00124    11•      C
00124    12•      C*************************************************************************
00124    13•      C
00124    14•      C                    TEST DETERMINES IF SCAN LINE  WILL HAVE
00124    15•      C                    -  DEFAULT VALUES
00124    16•      C                    0  NO FILTERING
00124    17•      C                    •  FILTERING
00124    18•      C
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00124     19*      C
00124     20*      C*********************************************************************
00124     21*      C
00125     22*            IF (KEYFIL)  1000, 2000, 3000
00125     23*      C
00125     24*      C*******************
00125     25*      C     CREATE A SCAN LINE OF POINTER DEFAULT VALUES
00125     26*      C*******************
00125     27*      C
00130     28*       1000 CONTINUE
00131     29*            DO 1050 SAMPLE = 1, PROSAM
00134     30*               HOLARR(SAMPLE,BUFPT)  = DFTPT
00135     31*       1050 CONTINUE
00137     32*            GO TO 4000
00137     33*      C
00137     34*      C*******************
00137     35*      C     SET VALUES IN HOLARR EQUAL TO VALUES IN IR ARRAY
00137     36*      C*******************
00137     37*      C
00140     38*       2000 CONTINUE
00141     39*            HOLSAM = 0
00142     40*            DO 2050 SAMPLE = ASAM, ESAM
00145     41*               HOLSAM = HOLSAM + 1
00146     42*               HOLARR(SAMPLE,BUFPT)  = IR(SAMPLE,LINE)
00147     43*       2050 CONTINUE
00151     44*            IF (HOLSAM .NE. PROSAM) HOLARR(HOLSAM+1,BUFPT) = DFTPT
00153     45*            GO TO 4000
00153     46*      C
00153     47*      C*******************
00153     48*      C     SPATIAL FILTER SCANNER LINE OF INPUT DATA
00153     49*      C*******************
00153     50*      C
00154     51*       3000 CONTINUE
00155     52*            HOLSAM = 0
00156     53*            IF (ASAM1 .EQ. ASAM)  GO TO 3020
00160     54*            HOLARR(1,BUFPT) = IR(ASAM,LINE)
00161     55*            HOLSAM = 1
00162     56*       3020 CONTINUE
00163     57*            DO 3080 SAMPLE = ASAM1, ESAM1
00166     58*               HOLSAM = HOLSAM + 1
00167     59*               I = 1
00170     60*               IF (IR(SAMPLE,LINE) .EQ. DFTPT)  I = 2
00172     61*               IMINUS = SAMPLE - 1
00173     62*               IPLUS =  SAMPLE + 1
00174     63*               CALL FIZTST (TEST(CTFILE,I), CHANGE(CTFILE,I),
00174     64*              *   IR(SAMPLE,LINE), HOLARR(HOLSAM,BUFPT),
00174     65*              *   IR(SAMPLE,I1), IR(SAMPLE,I3), IR(IMINUS,LINE),
00174     66*              *   IR(IPLUS,LINE), IR(IMINUS,I1), IR(IPLUS,I3),
00174     67*              *   IR(IPLUS,I1), IR(IMINUS,I3), DFTPT)
00175     68*       3080 CONTINUE
00177     69*            IF (HOLSAM .EQ. PROSAM)  GO TO 4000
00201     70*            HOLSAM = HOLSAM + 1
00202     71*            HOLARR(HOLSAM,BUFPT) = IR(ESAM,LINE)
00203     72*            IF (HOLSAM .NE. PROSAM)  HOLARR(HOLSAM+1,BUFPT) = DFTPT
00205     73*       4000 RETURN
00206     74*            END

     END OF COMPILATION:        NO  DIAGNOSTICS.
  FIZFLT          SYMBOLIC                    08 APR 76  11:24:49   0  03032231    14    74  (DELETED)
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@ FOR,* FIZMAP/SKAAA,FIZMAP,FIZMAP                                   08 APR 76          11:24:49
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:24:50

   SUBROUTINE FIZMAP    ENTRY POINT 000670

   STORAGE USED: CODE(1) 000706; DATA(0) 000731; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   FIZ     000434
    0004   DRUM    000046
    0005   INFIZ1  000015
    0006   COMSAM  015560
    0007   UNTIFZ  003216
    0010   DISPL   001370
    0011   GLOBAL  000076

   EXTERNAL REFERENCES (BLOCK, NAME)

    0012   SETMRG
    0013   RREAD
    0014   RWDUS
    0015   RIO2S
    0016   RIO1S
    0017   RERR4S
    0020   RERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0000    000537 100F      0001    000012 1000L     0001    000121 1020L     0001    000132 1100L     0001    000205 1110L
    0001    000374 1180L     0001    000446 1200L     0001    000603 1300L     0001    000073 162G      0000    000540 200F
    0001    000147 214G      0001    000184 226G      0001    000236 253G      0001    000277 265G      0000    000613 270F
    0001    000304 271G      0000    000621 280F      0000    000632 285F      0000    000633 290F      0000    000635 300F
    0001    000636 3000L     0001    000550 341G      0001    000554 344G      0000    000655 350F      0001    000560 350G
    0001    000620 364G      0001    000625 370G      0000    000665 400F      0010    001342 ACROP     0004 I  000042 ALADD
    0010    001351 ANALYS    0010    001343 AOTHER    0003    000376 ASAM      0003    000374 ASAM1     0007 I  003215 ATFILE
    0010    001344 ATOTAL    0010    000570 BMCOMB    0010    000571 BMFEAT    0011    000055 BMFILE    0010    000567 BMFLG
    0011    000056 BMKEY     0006    015554 BUFPT     0010    001354 CARS      0010    000000 CATFLG    0010    000001 CATNAM
    0010    000572 CDATE     0010 I  000076 CLSNAM    0000 I  000516 CLSNUM    0010 I  000460 CLSSUB    0003    000206 CODE
    0000 I  000002 COL       0004 I  000001 COLADD    0004    000013 COLINC    0003    000356 COMENT    0010 R  001075 COM
    0010    001341 CROP      0010    001366 CRPKEY    0000 I  000514 CTCOL     0007 I  000021 CTFILE    0003    000400 CTSEDS
    0000 I  000525 CTWR      0011    000053 DATAPE    0003    000354 DATE      0011    000071 DATFIL    0003    000370 DEBUGF
    0010 I  001336 DESKEY    0003 I  000431 DESN01    0003 I  000432 DESN02    0010    001340 DESOTH    0010    001337 DESUNI
    0003    000315 DFTCOD    0003    000320 DFTPT     0003    000316 DFTSYM    0011    000067 DRMNDS    0004    000031 DRMWRT
    0011    000066 DRUMAD    0005    000001 DSPYDT    0005    000003 DSPYTM    0003 I  000433 DUPNO    0000 I  000526 EDDMLI
    0010    000564 EMPTRS    0003    000401 EOFMIT    0011    000062 ERIPTP    0011    000063 ERPKEY    0003    000377 ESAM
    0003    000376 ESAM1     0010    001175 FETVC2    0010    000575 FIELD2    0010    000600 FIELD3    0010    001334 FILTER
    0011    000075 FIZFIL    0011    000074 FIZKEY    0005    000000 FIZNAM    0011    000073 FIZUNT    0005 I  000004 FLDESC
    0010    001171 FLDKEY    0010    000574 FLDSV2    0010    000577 FLDSV3    0004 I  000032 FOR       0011 I  000000 HEAD
    0003    000327 HED1      0003    000341 HED2      0010    001001 HIGH      0011    000057 HISFIL    0011    000060 HISKEY
    0006    011634 HOLARR    0007    003203 HOLECM    0004    000027 HOLLIN    0007 I  000032 HOLTST    0004    000030 HOLWRD
    0000 I  000517 I         0000 I  000532 IADDR     0004    000000 IBADDR    0000 I  000521 IC        0000 I  000527 IDR
    0000 I  000515 IEND      0005    000010 ILIBED    0005    000011 ILIBIC    0005    000007 ILIBST    0000    000701 INJPS
    0005    000006 INLINE    0005    000005 INPTS     0006    001750 IR        0000 I  000522 IS        0005    000013 ISAMED
    0005    000014 ISAMIC    0005    000012 ISAMST    0007    003173 ISLOCM    0007 I  000022 ISLTST    0000 I  000520 ISTRT
    0000 I  000534 ISUB      0006    015556 JSTAT     0010    001237 KATNO     0003    000371 LIMMIT    0003 I  000325 LIMLIB
    0003 I  000326 LIMSAM    0000 I  000535 LINE      0003    000373 LMPSAM    0007    000000 MAP       0010    001335 MAPFRT
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0011   000052 MAPTAP    0011   000064 MAPUNT    0010   001367 NFILE     0010   001333 NOCAT     0010   001236 NOCLSZ
0004 I 000025 NOCOL     0004 I 000026 NOCOMR    0010   001174 NOFET2    0011   000065 NOFILE    0010   001172 NOFLD2
0010   001173 NOFLD3    0010   000554 NOMAP     0010 I 001233 NOSUB2    0010 I 000556 NOSUB3    0010   001234 NOTRFD
0007   000010 OTFILE    0003   000353 OTLINE    0003   000312 OTUNT     0011   000070 PAGSIZ    0010   000557 PCFDKY
0010   000402 PCTID3    0007   000043 PERCNT    0010   000366 PLTKEY    0000 I 000531 PPT       0003   000372 PROSAM
0000 I 000530 PT        0000 I 000523 PTS       0004 I 000043 REALIN    0000 I 000524 REAMR     0004   000000 SAMSOM
0011   000054 SAVTAP    0003   000402 SEDNAM    0010   001345 SITE      0003   000313 SKPLIN    0003   000314 SKPSAM
0011   000072 STAFIL    0000 I 000000 STAT      0010   000563 STATKY    0000 I 000533 STDRLI    0010   000364 SUBCAT
0010 I 000173 SUBNAM    0010   000270 SUBNO     0003 I 000000 SYM       0010   000677 SYMNTX    0004 I 000044 SYMPAG
0003   000311 TAPOUT    0007   003214 THOLCM    0010 R 000603 THRES     0010   000562 THRSKY    0010   000565 THRSVA
0007   000020 TIMFIL    0004 I 000045 TIMREA    0007   003213 TISLCM    0007   000042 TOTPCT    0010   001235 TOTVTZ
0010   000555 TOTVT3    0011   000061 TRFORM    0010   000561 TRNKEY    0003   000427 TRNNO    0010   000560 TSTKEY
0003   000430 TSTNO     0006   015555 UNTFAS    0010   000576 VERTX2    0010   000601 VERTX3    0000 I 000536 WR
0007 D 001073 ZCNI      0003 D 000321 ZONLIN    0003 D 000323 ZONSAM    0007 D 001113 ZPC
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00101      1•          SUBROUTINE FIZMAP (DMMARR, S  )
00103      2•          IMPLICIT INTEGER (A-Z)
00104      3•          INCLUDE FIZCOM,LIST
00105      3•          IMPLICIT DOUBLE PRECISION (Z)
00106      3•          REAL COR,THRES
00106      3•     C
00106      3•     C                  PARAMETERS
00106      3•     C
00107      3•          PARAMETER PAGCOL = 10, PAGSYM = 110, PARSAM = 1000, PARLIN = 1000
00110      3•          PARAMETER PAGWRD = 19, PSCLAD = 61, ISUBCL = PSCLAD - 1
00111      3•          PARAMETER PSEDS = 21, POUTLN = PSCLAD+6, PSYM = 2*POUTLN,
00111      3•         •          PSAMP5= PARSAM * 5, PARFIL = 8
00111      3•     C
00111      3•     C                  COMMON BLOCKS
00111      3•     C
00112      3•          COMMON /FIZ/ SYM(POUTLN,2), CODE(POUTLN), TAPOUT, OTUNT, SKPLIN,
00112      3•         •             SKPSAM, DFTCOD, DFTSYM(2), DFTPT, ZONLIN, ZONSAM,
00112      3•         •             LINLIN , LINSAM, HED1(10), HED2(10), OTLINE, DATE(2),
00112      3•         •             CONENT(10),DEBUGF,LINNIT,PROSAM,LRPSAM,
00112      3•         •             ASAM1, ASAM, ESAM1, ESAM, CTSEDS, EOFHIT,
00112      3•         •           SEDNAM(PSEDS),TRNNO,TSTNO,DESNO1,DESNO2,DUPNO
00113      3•          COMMON /DRUM/ IBADDR, COLADD(PAGCOL), COLINC(PAGCOL), NOCOL,
00113      3•         •             NOCOMR, NOLLIN, NOLWRD, DRNWRT,
00113      3•         •              FOR(8), ALADD, REALIN, SYMPAG, TIMREA
00114      3•          COMMON /INFIZ1/ FIZMAM, DSPYDT(2), DSPYTM, FLDESC, INPTS, INLINE,
00114      3•         •                ILINST, ILINED, ILINIC, ISAMST, ISAMED, ISAMIC
00115      3•          COMMON /COMSAM/ SAMSOM(PARSAM),IR(PSAMP5,4),HOLARR(PARSAM,2),
00115      3•         •                BUFPT, UNTFAS, JSTAT(2)
00116      3•          COMMON/UNTIFZ/  MAP(PARFIL), OTFILE(PARFIL), TIMFIL,
00116      3•         •                CTFILE, ISLTST(PARFIL), NOLTST(PARFIL), TOTPCT,
00116      3•         •                PERCNT(POUTLN,PARFIL),ZCNI(PARFIL),
00116      3•         •                ZPC(POUTLN,PARFIL), ISLOCM(PARFIL),
00116      3•         •                NOLECM(PARFIL), TISLCM, THOLCM
00116      3•         •                ,ATFILE
00117      3•          END
00120      4•          INCLUDE CMBK10,LIST
00121      4•          COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
00121      4•         •             SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00121      4•         •             PCFDKY,TSTKEY,TRNKEY,THRSKY,STATKY,ERPTRS,THRSVA,
00121      4•         •             PLTKEY,BMFLG,BMCOMB,BMFEAT,CDATE(2),
00121      4•         •             FLDSV2,FIELD2,VERTX2,FLDSV3,FIELD3,VERTX3,PCTID3,
00121      4•         •             THRES(60),SYMNTX(66),HIGH(60),COR(60)
00121      4•         •             ,FLDKEY,NOFLD2,NOFLD3,NOFET2,FETVC2(30)
00121      4•         •             ,NOSUB2,NOTRFD,TOTVTZ,NOCLSZ
00121      4•         •             ,NATNO(60),NOCAT,FILTER,MAPFMT
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00121     4*          *              ,DESKEY,DESUNI,DESOTH,CROP ,ACROP,AOTHER,ATOTAL
00121     4*          *              ,SITE(4),ABALYS(3),CANS(10),CRPKEY
00121     4*          *              ,BFILE                                          FILZOM
00122     4*           END
00123     5*           INCLUDE COMBK6,LIST
00124     5*           COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00124     5*          *             HISFIL,HISKEY,TRFORK,ERIPTP,ERPKEY,MAPUNT,BOFILE,
00124     5*          *              DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL
00124     5*          *              ,FIZUNT,FIZKEY,FIZFIL                           FILZOM
00125     5*           END
00126     6*           DIMENSION DRMARR(NOCOMR,2,REALIN,2),STAT(2),COL(PAGSYM,3)
00126     7*     C
00126     8*     C*************************************************************************
00126     9*     C                    FORMAT STATEMENTS
00126    10*     C*************************************************************************
00126    11*     C
00127    12*       100 FORMAT (/)
00130    13*       200 FORMAT (/,/,T42,'DISPLAY OF FIELD  ',A6,' PRODUCED BY FILZOM.',
00130    14*          *      /,T42,44('-'),/,/,/,T40,'FILTER = ',I1,T60,'ISLAND TEST =',
00130    15*          *       I2,T80,'HOLE TEST = ',I2,/,
00130    16*          *       /,/,T45,'CLASS',T77,'SUBCLASS',/,T42,'NO.',T50,
00130    17*          *       'NAME',T72,'NO.',T78,'NAME',T85,'SYMBOL')
00131    18*       270 FORMAT (T72,I2,T78,A6,T87,A1,/,1H+,T87,A1)
00132    19*       280 FORMAT (/,T42,I2,T50,A6,T72,I2,T78,A6,T87,A1,/,1H+,T87,A1)
00133    20*       285 FORMAT (/,/)
00134    21*       290 FORMAT (T9,110(1)
00135    22*       300 FORMAT (/,T8,'***ERROR*** FILZOM, SUBROUTINE FIZMAP',/,T20,
00135    23*          *       I10,' IS AN ILLEGAL DRUM ADDRESS.',/)
00136    24*       350 FORMAT (/,/,T73,'SPECIAL SYMBOLS',/,T73,15('-'))
00137    25*       400 FORMAT (/,T72,I2,T78,A6,T87,A1,/,1H+,T87,A1,/)
00137    26*     C
00137    27*     C*************************************************************************
00137    28*     C                    INITIALIZATION
00137    29*     C*************************************************************************
00140    30*           CALL SETHRG (68,0,68)
00141    31*           CTCOL = 0
00142    32*           IEND = 0
00143    33*      1000 CTCOL = CTCOL + 1
00144    34*           IF (CTCOL .GT. NOCOL)  RETURN
00146    35*           IF (IEND .GE. LIMSAM)  RETURN
00146    36*     C
00146    37*     C*************************************************************************
00146    38*     C                    PRINT SYMBOLS USED FOR GREYMAP
00146    39*     C*************************************************************************
00146    40*     C
00150    41*           WRITE (6,HEAD)
00152    42*           WRITE (6,200) FLDESC,ATFILE,ISLTST(CTFILE),HOLTST(CTFILE)
00160    43*           CLSNUM = 0
00161    44*           DO 1100 I = 1,NOSUB2
00164    45*              IF (CLSNUM .EQ. CLSSUB(I))  GO TO 1020
00166    46*              CLSNUM = CLSNUM + 1
00167    47*              WRITE (6,280) CLSNUM, CLSNAM(CLSNUM), I, SUBNAM(I),
00167    48*          *   SYM(I,1), SYM(I,2)
00177    49*              GO TO 1100
00200    50*      1020    WRITE (6,270) I, SUBNAM(I), SYM(I,1), SYM(I,2)
00206    51*      1100 CONTINUE
00210    52*           WRITE (6,350)
00212    53*           WRITE (6,400) (I,SUBNAM(I),SYM(I,1),SYM(I,2),I=NOSUB3,DUPNO)
00223    54*           IF (DESKEY .EQ. 0)  GO TO 1110
00225    55*           DO 1105 I = DESN01,DESN02
00230    56*              WRITE (6,100)
00232    57*              WRITE (6,270) I,SUBNAM(I),SYM(I,1),SYM(I,2)
00240    58*      1105 CONTINUE
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00242     59*      1110 CONTINUE
00242     60*     C
00242     61*     C*************************************************************************
00242     62*     C                    PRINT COLUMN HEADING
00242     63*     C*************************************************************************
00242     64*     C
00243     65*           WRITE (6,285)
00245     66*           IEND = SYMPAG + CTCOL
00246     67*           ISTRT = (IEND - SYMPAG) + 1
00247     68*           IF (IEND .GT. LIMSAM)  IEND = LIMSAM
00251     69*           IC = 0
00252     70*           DO 1150 IS = ISTRT,IEND
00255     71*              IC = IC + 1
00256     72*              COL(IC,1) = IS/100
00257     73*              COL(IC,2) = MOD(IS,100)/10
00260     74*              COL(IC,3) = MOD(IS,10)
00261     75*      1150 CONTINUE
00263     76*           PTS = (IEND - ISTRT) + 1
00264     77*           DO 1160 IC = 1,3
00267     78*              WRITE (6,290) (COL(IS,IC), IS = 1,PTS)
00275     79*      1160 CONTINUE
00277     80*           WRITE (6,285)
00277     81*     C
00277     82*     C*************************************************************************
00277     83*     C                    READ DATA FROM DRUM AND PRINT
00277     84*     C*************************************************************************
00277     85*     C
00301     86*           REAWR = REALIN * NOCOWR * 2
00302     87*           CTWR = 0
00303     88*           EDDNLI = 0
00304     89*           IDR = 1
00305     90*           PT = 1
00306     91*           PPT = 1
00307     92*           STAT(1) = 0
00310     93*           STAT(2) = 0
00311     94*           IADDR = COLADD(CTCOL)
00312     95*           IF ((CTWR+REAWR) .GT. ALADD)  REAWR = ALADD-CTWR
00314     96*           CALL RREAD (IADDR,DRMARR(1,1,1,PT),REAWR,STAT(PT))
00315     97*      1180 CONTINUE
00316     98*           CTWR = CTWR + REAWR
00317     99*           IF (IDR - TIMREA)  1190,1200,1300
00322    100*      1190 PPT = 3 - PPT
00323    101*           IF ((CTWR+REAWR) .GT. ALADD)  REAWR = ALADD -CTWR
00325    102*           IADDR = COLADD(CTCOL) + CTWR
00326    103*           CALL RREAD (IADDR,DRMARR(1,1,1,PPT),REAWR,STAT(PPT))
00327    104*      1200 IF (STAT(PT)-1) 1220,1200,3000
00332    105*      1220 STDRLI = EDDNLI + 1
00333    106*           EDDNLI = EDDNLI + REALIN
00334    107*           IF (EDDNLI .GT. LIMLIN)  EDDNLI = LIMLIN
00336    108*           ISUB = STDRLI - 1
00337    109*           WRITE (6,FOR) (LINE,(DRMARR(WR,1,LINE-ISUB,PT),WR=1,NOCOWR),
00337    110*          *(DRMARR(WR,2,LINE-ISUB,PT),WR=1,NOCOWR),LINE = STDRLI,EDDNLI)
00355    111*           PT = 3 - PT
00356    112*           IDR = IDR + 1
00357    113*           GO TO 1180
00360    114*      1300 CONTINUE
00361    115*           WRITE (6,285)
00363    116*           DO 1310 IC = 1,3
00366    117*              WRITE (6,290) (COL(IS,IC),IS = 1,PTS)
00374    118*      1310 CONTINUE
00376    119*           GO TO 1000
00376    120*     C*************************************************************************
00376    121*     C                    ERROR PRINT STATEMENT
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00376     122*     C***************************************************************************
00377     123*      3000 CONTINUE
00400     124*           WRITE (6,300)IADDR
00403     125*           RETURN 2
00404     126*           END

     END OF COMPILATION:        NO  DIAGNOSTICS.
   FIZMAP          SYMBOLIC                              08 APR 76  11:24:52   0  03033020    14   126  (DELETED)
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@ FOR,* FIZSOM/SkAAA,FIZSOM,FIZSOM                                   08 APR 76          11:24:53
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010810A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:24:53

   SUBROUTINE FIZSOM    ENTRY POINT 000054

   STORAGE USED: CODE(1) 000071; DATA(0) 000011; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NERR4S
    0004   NERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000007 10L       0000   000002 INJPS     0000 I 000001 K         0000 R 000000 RTEST


00101      1*            SUBROUTINE FIZSOM (INNUM,OTNUM,RZOOM,ISKNR,LIMIT,S  )
00103      2*            IMPLICIT INTEGER (A-Z)
00104      3*            REAL RTEST
00105      4*            DOUBLE PRECISION RZOOM
00106      5*            ISKNR = 0
00107      6*            RTEST = RZOOM * FLOAT(INNUM)
00110      7*         10 K = OTNUM + ISKNR
00111      8*            IF (K .GE. LIMIT)  RETURN
00113      9*            IF (K .GE. RTEST)  RETURN 6
00115     10*            ISKNR = ISKNR + 1
00116     11*            GO TO 10
00117     12*            END

     END OF COMPILATION:       NO  DIAGNOSTICS.
  FIZSOM          SYMBOLIC                          08 APR 76  11:24:54   0  03034536    14    12  (DELETED)
```

```
@ FOR,* FIZTP/SKAAA,FIZTP,FIZTP                                   08 APR 76          11:24:54
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A).
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:24:54


   SUBROUTINE FIZTP     ENTRY POINT 001735
              FIZTHD    ENTRY POINT 001740
              FIZTLB    ENTRY POINT 002000


   STORAGE USED: CODE(1) 002012; DATA(0) 002144; BLANK COMMON(2) 000000


   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   CDATE
    0004   NDCOD$
    0005   $YTRAN
    0006   NTRAN
    0007   CNERR
    0010   NIO1$
    0011   NIO2$
    0012   NWDU$
    0013   NERR2$
    0014   NERR3$


   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   001136 110L      0001   001230 120L      0001   001330 130L      0001   001364 135L      0001   001367 140L
    0001   001416 155L      0001   001437 160L      0001   001451 170L      0001   001457 180L      0001   001526 190L
    0001   001533 200L      0001   000033 201G      0001   001536 201L      0001   001563 205L      0001   001566 210L
    0001   000055 214G      0001   000067 222G      0001   000322 30L       0001   000753 374G      0001   000356 40L
    0001   001005 406G      0001   001053 426G      0001   000445 45L       0000   001736 500F      0000   001756 510F
    0000   002001 520F      0001   001371 524G      0000   002026 530F      0001   001502 565G      0001   000777 70L
    0001   001031 76L       0001   001046 80L       0001   001104 90L       0000   001735 900F      0000 I 001715 ANC
    0000 I 002071 ANCLNG    0000 I 001711 BEGBIT     0000 I 001710 BEGSKP     0000 I 001726 BGBIT      0000 I 001727 BGSKP
    0000 I 000030 BITBEG    0000 I 002076 COMWRD     0000 I 001652 DECARR     0000 I 002072 DOI        0000 I 001640 EBCDIC
    0000 I 001657 FEAT      0000 I 001700 I          0000 I 001672 IA         0000 I 001705 IADR       0000 I 001663 IB
    0000 I 001655 IBMONE    0000 I 000000 IBYTES     0000 I 001660 IC         0000 I 002055 ICHAR      0000 I 001675 ICOUNT
    0000 I 001703 IDEM      0000 I 001730 IDEM1      0000 I 001666 IE         0000 I 001664 IF         0000 I 001673 IFILE
    0000 I 001713 IHOLD     0000 I 001712 IHOLE      0000 I 001662 II         0000 I 001665 IL         0000 I 001716 ILEN
    0000 I 001717 ILENTH    0000 I 001661 IM         0000 I 001670 IN         0000   002115 INJPS      0000 I 001714 IPOS
    0000 I 001330 IRAY      0000 I 001720 IREMD      0000 I 001676 ISTAT      0000 I 001667 IU         0000 I 001671 IV
    0000 I 001677 IWD       0000 I 001701 IWD1       0000 I 001702 J          0000 I 001723 K          0000 I 001734 KA
    0000 I 001674 KAUNIT    0000 I 002060 NBITS      0000 I 001725 NBYTES     0000 I 001656 NC         0000 I 002102 NCAR
    0000 I 001733 NCLR      0000 I 002066 NCPR       0000 I 002057 NCS        0000 I 002100 NDSPR      0000 I 001706 NOBYTE
    0000 I 001721 NOCHAR    0000 I 002074 NOSAR      0000 I 002067 NPRC       0000 I 001732 NR         0000 I 002070 NRPOS
    0000 I 002103 NSAR      0000 I 002063 NVE        0000 I 001707 PACBIT     0000 I 000060 PACRAY     0000 I 001704 PACSKP
    0000 I 001722 PREBIT    0000 I 002056 PROFLG     0000 I 002065 PRS2       0000 I 001731 ROW        0000 I 002073 SARSTR
    0000 I 002061 SVD       0000 I 002054 VARBL      0000 I 001724 WORD


00100      1*     C!*************************************************************C!
00100      2*     C     FIZTP IS A MODIFICATION OF THE SUBROUTINE TAPWRT IN THE LARSYS
00100      3*     C     SYSTEM.
00100      4*     C
00100      5*     C!                                                            C!
00100      6*     C!    THE PURPOSE OF TAPWRT IS TO WRITE A DATA TAPE IN EITHER UNIVER- C!
00100      7*     C!    SAL FORMAT OR LARSYS II FORMAT. THERE ARE TWO ENTRY POINTS TO   C!
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```
00100      8*      CI    THE SUBROUTINE -- WRTHDR AND WRTLIN.                                    CI
00100      9*      CI    WRTHDR WRITES THE HEADER RECORD IN 32 BIT BYTES FOR LARSYS II           CI
00100     10*      CI    AND 8 BIT BYTES FOR UNIVERSAL. ONE CALL TO WRTHDR MUST BE MADE          CI
00100     11*      CI    FOR EACH REEL OF TAPE. THIS INFORMATION IS PACKED.                      CI
00100     12*      CI                                                                            CI
00100     13*      C     CALL WRTHDR(NC,FEAT,NSAMP,FORMAT,TRFORM)
00100     14*      CI         NC      -- NO.OF CHANNELS TO BE WRITTEN FOR EACH DATA SET          CI
00100     15*      CI         FEAT    -- ARRAY CONTAINING CHANNELS TO BE WRITTEN                 CI
00100     16*      CI         NSAMP   -- NO. OF SAMPLES PER CHANNEL                              CI
00100     17*      CI         FORMAT -- =1 FOR UNIVERSAL                                         CI
00100     18*      C                  TRFORM -- NO. OF TAPE OUTPUT UNIT
00100     19*      CI                           =2 FOR LARSYS II                                 CI
00100     20*      CI    WRTLIN WRITES THE DATA IN 8 BIT BYTES AND IS ALSO PACKED. A             CI
00100     21*      CI    CALL TO THIS ROUTINE MUST BE MADE FOR EACH DATA SET TO BE WRIT-         CI
00100     22*      CI    TEN                                                                     CI
00100     23*      CI                                                                            CI
00100     24*      CI    CALL WRTLIN(IDATA,LSTLIN)                                               CI
00100     25*      CI         IDATA   -- ARRAY CONTAINING DATA TO BE WRITTEN                     CI
00100     26*      CI         LSTLIN -- = 0 FOR N-1 DATA SETS                                    CI
00100     27*      CI                   =-1 FOR LAST DATA SET                                    CI
00100     28*      CI                                                                            CI
00100     29*      CI         ICHAN   -- ACTIVE CHANNELS HAVE CORRESPONDING BIT POSITION         CI
00100     30*      CI                    TURNED ON                                               CI
00100     31*      CI         PROFLG --                                                          CI
00100     32*      CI         NCS     -- NO. OF CHANNELS                                         CI
00100     33*      CI         NBITS   -- NO. OF BITS PER BYTE                                    CI
00100     34*      CI         SVD     -- START OF VIDEO DATA                                     CI
00100     35*      CI         NVE     -- SAME  AS NSAMP                                          CI
00100     36*      CI         PRSZ    -- PHYSICAL RECORD SIZE IN BYTES                           CI
00100     37*      CI         NCPR    -- NO. CHANNELS PER RECORD                                 CI
00100     38*      CI         NPRC    -- NO. PHYICAL RECORDS PER CHANNEL                         CI
00100     39*      CI         NRPDS   -- NO. OF RECORDS PER DATA SET                             CI
00100     40*      CI         ANCLNG -- LENGTH OF ANCILLARY BLOCK IN BYTES                       CI
00100     41*      CI         DOI     -- DATA ORDER INDICATOR                                    CI
00108     42*      CI         SAMSTR -- SAMPLE START                                             CI
00100     43*      CI         COMWRD -- SIZE OF COMPUTER WORD IN BITS                            CI
00100     44*      CI         NDSPR   -- NO. OF DATA SETS PER RECORD                             CI
00100     45*      CI         NCAR    -- NO. OF CHANNELS ON ANCILLARY RECORD                     CI
00100     46*      CI    PACRAY -- DATA IS PACKED INTO THIS ARRAY AND THEN WRITTEN ON            CI
00100     47*      CI              TAPE BY CALLING NTRAN                                         CI
00100     48*      CI    ICOUNT -- RUNNING TOTAL OF NO. OF DATA SETS WRITTEN                     CI
00100     49*      CI                                                                            CI
00100     50*      CI*************************************************************************CI
00101     51*            SUBROUTINE FIZTP
00103     52*            IMPLICIT INTEGER (A-Z)
00103     53*      C
00103     54*      C     ENTRY POINT FOR HEADER RECORD
00103     55*      C
00104     56*            ENTRY FIZTHD (NSAMP,FORMAT,TRFORM,DONRYY,SEDKEY)
00104     57*      C
00106     58*            DIMENSION VARBL(24), IBYTES(24), BITBEG(24), PACRAY(680),
00106     59*           *ICHAN(2), IRAY(200)
00107     60*            DIMENSION EBCDIC(10)
00110     61*            DIMENSION DECARR(3)
00111     62*            DATA IBYTES/80,8, 1, 1, 1, 2, 2, 2, 2, 2, 1, 1, 1, 2, 1, 2, 2,641,
00111     63*           * 1,1024, 1,6, 2, 2/
00113     64*            DATA BITBEG/ 1,1,29,29,29,21,21,21,21,21,29,29,29,21,29,21,21,  1,
00113     65*           *29,   1,29,1,21,21/
00115     66*            DATA IBMONE/0010104000000/
00117     67*            DATA NC/1/, FEAT/1/
00122     68*            DATA EBCDIC(1)/0361/, EBCDIC(2)/0362/, EBCDIC(3)/0362/,
00122     69*           *     EBCDIC(4)/0364/, EBCDIC(5)/0365/, EBCDIC(6)/0366/,
00122     70*           *     EBCDIC(7)/0367/, EBCDIC(8)/0370/, EBCDIC(9)/0371/,
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00122    71*          *     EBCDIC(10)/0360/
00135    72*           DATA IC/0303/, IR/0324/, II/0311/, IB/0100/
00142    73*           DATA IF/0306/, IL/0323/, IE/0305/, IU/0344/, IB/0325/,
00142    74*          *     IV/0345/,IA/0301/
00152    75*           DATA IFILE/0/
00154    76*           EQUIVALENCE                                          (VARBL(17),NOSAM),
00154    77*          1           (VARBL(2),ICHAN), (VARBL(10),PRSZ),
00154    78*          2           (VARBL(3),PROFLG),(VARBL(11),NCPR),  (VARBL(19),COMMRD)
00154    79*          3.          (VARBL(4),NCS),   (VARBL(12),NPRC),
00154    80*          4           (VARBL(5),NBITS), (VARBL(13),NRPDS), (VARBL(21),NDSPR),
00154    81*          5           (VARBL(6),SVD),   (VARBL(14),ABCLNG),
00154    82*          6                             (VARBL(15),DOI),   (VARBL(23),NCAR),
00154    83*          7           (VARBL(8),NVE),   (VARBL(16),SAMSTR),(VARBL(24),NSAM)
00155    84*           DATA VARBL(1),VARBL(7),VARBL(9),VARBL(18),VARBL(20),VARBL(22)/6*-9
00155    85*          *0/
00164    86*       900 FORMAT (3I2)
00165    87*           KAUNIT = TRFORM
00166    88*           ICOUNT=0
00167    89*           SAMSTR=1
00170    90*           ISTAT =0
00171    91*           NCS = NC
00172    92*           NVE = NSAMP
00173    93*           NSAM = NSAMP
00174    94*           NOSAM = NSAMP
00175    95*           IFILE = IFILE + 1
00176    96*           CALL CDATE (DDMMYY)
00177    97*           DECODE (6,900,DDMMYY) DECARR
00205    98*           IF (FORMAT .EQ. 1) GO TO 40
00205    99*      C
00205   100*      C    PACKING HEADER RECORD IN LARSYS II FORMAT
00205   101*      C
00207   102*           IRAY(4) =0
00210   103*           IRAY(5) =NC
00211   104*           IRAY(6) =NSAMP
00211   105*      C
00211   106*      C    IRAY(51) THRU IRAY(NC+5) WILL BE FILLED WITH ONES
00211   107*      C
00212   108*           IWD = 5+NC
00213   109*           DO 10    I=1,IWD
00216   110*        10 IRAY(50+I) = IBMORE
00216   111*      C
00216   112*      C    FILL REST OF 200 WORDS OF IRAY WITH ZEROS
00216   113*      C
00220   114*           IWD1 = IWD + 51
00221   115*           DO 20    J=IWD1,199
00224   116*        20 IRAY(J+1) = 0
00226   117*           IDEM   =    178
00227   118*           PACSKP = IABS(0)
00230   119*           IADR   = 1
00231   120*           NBITS  = 32
00232   121*           NOBYTE = 200
00233   122*           PACBIT = 1
00234   123*           BEGSKP = 4
00235   124*           BEGBIT = 5
00236   125*           CALL BYTRAN (BEGBIT,IRAY(IADR),BEGSKP,NOBYTE,NBITS,PACBIT,
00236   126*          *PACRAY(IADR),PACSKP)
00237   127*           FLD(0,28,PACRAY(2)) = FLD(8,28,IFILE)
00240   128*           IHOLE = DECARR(1)/10
00241   129*           IF (IHOLD .EQ. 0)  IHOLD = 10
00243   130*           FLD(28,8,PACRAY(14)) = FLD(28,8,EBCDIC(IHOLD))
00244   131*           IHOLD = MOD(DECARR(1),10)
00245   132*           IF (IHOLD .EQ. 0) IHOLD = 10
00247   133*           FLD (0,8,PACRAY(15)) = FLD(28,8,EBCDIC(IHOLE))
```

```
00250    134*          IHOLD = DECARR(2)/10
00251    135*          IF (IHOLD .EQ. 0)  IHOLD = 10
00253    136*          FLD (8,8,PACRAY(15)) = FLD(28,8,EBCDIC(IHOLD))
00254    137*          IHOLD = MOD(DECARR(2),10)
00255    138*          IF (IHOLD .EQ. 0)  IHOLD = 10
00257    139*          FLD (16,8,PACRAY(15)) = FLD(28,8,EBCDIC(IHOLD))
00260    140*          IHOLD = DECARR(3)/10
00261    141*          IF (IHOLD .EQ. 0) IHOLD = 10
00263    142*          FLD (24,8,PACRAY(15)) = FLD(28,8,EBCDIC(IHOLD))
00264    143*          IHOLD = MOD(DECARR(3),10)
00265    144*          IF (IHOLD .EQ. 0) IHOLD = 10
00267    145*          FLD (32,4,PACRAY(15)) = FLD(28,4,EBCDIC(IHOLD))
00270    146*          FLD (0,4,PACRAY(16)) = FLD(32,4,EBCDIC(IHOLD))
00271    147*          CALL BTRAN(KAUBIT,1,IDEN,    PACRAY,ISTAT,22)
00272    148*       30 IF (ISTAT .EQ. -1) GO TO 30
00274    149*          IF (ISTAT .GE. 0)    RETURN
00276    150*          IF (ISTAT .LT. -1)   WRITE(6,500)
00301    151*          IF (ISTAT .LT. -1) CALL CMERR
00301    152*     C
00301    153*     C    PACKING HEADER RECORD IN UNIVERSAL FORMAT
00301    154*     C
00303    155*       40 FLD(0,1,ICHAR(1)) = 1
00304    156*          FLD( 4,8,PACRAY(8)) = FLD(28,8,IB)
00305    157*          FLD(12,8,PACRAY(8)) = FLD(28,8,IB)
00306    158*          FLD(20,8,PACRAY(8)) = FLD(28,8,IB)
00307    159*          FLD(28,8,PACRAY(8)) = FLD(28,8,IB)
00310    160*          IF (SEQKEY .EQ. 0)  GO TO 45
00312    161*          FLD (4,8,PACRAY(8)) = FLD (28, 8, IC)
00313    162*          FLD(12,8,PACRAY(8)) = FLD (28, 8, IM)
00314    163*          FLD(20,8,PACRAY(8)) = FLD (28, 8, II)
00315    164*       45 CONTINUE
00316    165*          FLD(0,8,PACRAY(1)) = FLD (28, 8, IU)
00317    166*          FLD(8,8,PACRAY(1)) = FLD (28, 8, IB)
00320    167*          FLD(16,8,PACRAY(1))=FLD (28, 8, II)
00321    168*          FLD(24,8,PACRAY(1)) =FLD (28, 8, IV)
00322    169*          FLD(32,4,PACRAY(1)) =FLD (28, 4, IA)
00323    170*          FLD(0,4,PACRAY(2)) = FLD(32,4,IA)
00324    171*          FLD(4,8,PACRAY(2)) = FLD(28,8,IC)
00325    172*          FLD(0,8,PACRAY(9)) = FLD(28,8,IF)
00326    173*          FLD(8,8,PACRAY(9)) = FLD(28,8,II)
00327    174*          FLD(16,8,PACRAY(9)) = FLD(28,8,IL)
00330    175*          FLD(24,8,PACRAY(9)) = FLD(28,8,IE)
00331    176*          FLD(32,4,PACRAY(9)) = FLD(28,4,IB)
00332    177*          FLD(0,4,PACRAY(10)) = FLD(32,4,IB)
00333    178*          FLD(4,8,PACRAY(10)) = FLD(28,8,EBCDIC(IFILE))
00334    179*          FLD(12,8,PACRAY(14)) = DECARR(1)
00335    180*          FLD(20,8,PACRAY(14)) = DECARR(2)
00336    181*          FLD(28,8,PACRAY(14)) = DECARR(3)
00337    182*          IPOS = 1
00340    183*       50 FLD(IPOS,1,ICHAR(1)) = 1
00341    184*          IDEN = 680
00342    185*          NPRC = 0
00343    186*          PROFLG = 1
00344    187*          NBITS = 8
00345    188*          SVD = 1
00346    189*          PRSZ = 3060
00347    190*          ABCLNG = 70
00350    191*          ABC = ABCLNG + 2
00351    192*          DOI = 0
00352    193*          CONNRD = 36
00353    194*          NDSPR = 1
00354    195*          NCPR = 0
00355    196*          IF (NBAMP .GT. 2998) WRITE(6,510)
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```
00360    197*          IF (NSAMP .GT. 2998) NSAMP = 2998
00362    198*          ILEN = (NC*NSAMP) + ANC
00363    199*          ILENTH  = (NC*NSAMP + ANC   )/ 3000
00364    200*          IREND   = MOD((NC*NSAMP + ANC   ),3000)
00365    201*          IF (ILENTH .EQ. 0) NCAR = NC
00367    202*          IF (ILENTH .EQ. 0) NRPDS = 1
00371    203*          IF (ILENTH .EQ. 0) GO TO 80
00373    204*          DO 60   J=1,NC
00376    205*          IF((NSAMP*J+ANC   ) .GT. 3000)   NCAR = J-1
00400    206*       60 IF((NSAMP*J+ANC   ) .GT. 3000)   GO TO 70
00403    207*       70 CONTINUE
00404    208*          NOCHAN = NC - NCAR
00405    209*          DO 75    J=1,NOCHAN
00410    210*          IF(NSAMP*J .GT. 2998)  NCPR = J-1
00412    211*       75 IF(NSAMP*J .GT. 2998)  GO TO 76
00415    212*           NCPR = NOCHAN
00416    213*       76 CONTINUE
00417    214*          NRPDS = NOCHAN / NCPR + 1
00420    215*          IF (MOD(NOCHAN,NCPR) .NE. 0)   NRPDS = NRPDS + 1
00422    216*       80 BEGSKP = IABS(0)
00423    217*          PACSKP = IABS(0)
00424    218*          PREBIT = 0
00425    219*          DO 100  K=1,24
00430    220*          IF (VARBL(K) .EQ. -99)  GO TO  90
00432    221*          CALL BYTRAN(BITBEG(K),VARBL(K),BEGSKP,IBYTES(K),NBITS,PACBIT,PACRA
00432    222*         *Y(NWORD),PACSKP)
00433    223*       90   NWORD =((IBYTES(K) + PREBIT) + NBITS) / 36  + 1
00434    224*          PACBIT = MOD(((IBYTES(K)+PREBIT)+NBITS),36) + 1
00435    225*       100 PREBIT = PREBIT + IBYTES(K)
00437    226*          CALL BTRAN(KAUNIT,1,IDEN,    PACRAY,ISTAT,22)
00440    227*       110 IF (ISTAT .EQ. -1)  GO  TO 110
00442    228*          IF (ISTAT .GE. 0)    RETURN
00444    229*          IF (ISTAT .LT. -1)  WRITE(6,500)
00447    230*          IF (ISTAT .LT. -1)  CALL CHERR
00447    231*     C
00451    232*          ENTRY FIZTLN (IDATA, LSTLIN)
00451    233*     C
00453    234*          DIMENSION IDATA(NSAMP,NC)
00454    235*          ICOUNT = ICOUNT + 1
00455    236*          ANC = ANCLNG + 2
00456    237*          IF (FORMAT .EQ. 1)             GO TO 140
00456    238*     C
00456    239*     C    WRITES PACKED DATA ON TAPE IN LARSYS II FORMAT
00456    240*     C
00456    241*     C    PACKING ONE SET OF DATA INTO ONE RECORD
00456    242*     C
00460    243*          NBITS = 8
00461    244*          ANCLNG = 4
00462    245*          NBYTES = NSAMP*NC
00463    246*          BGBIT  = 36 - NBITS + 1
00464    247*          BGSKP  = 28
00465    248*          FLD(IABS(0),16,PACRAY(1)) = ICOUNT
00466    249*          FLD(17,16,PACRAY(1))      = 0
00467    250*       120 IF (ISTAT .EQ. -1)             GO TO 120
00471    251*          IF (ISTAT .LT. -1)             WRITE(6,520)ICOUNT
00475    252*          IF (ISTAT .LT. -1)             CALL CHERR
00477    253*          CALL BYTRAN(BGBIT,IDATA(1,1),BGSKP,NBYTES,NBITS,33,PACRAY(1),PACSK
00477    254*         *P)
00500    255*          IDEN =((NSAMP*NC + ANCLNG)+8)/36
00501    256*          IDEN1= MOD((NSAMP*NC + ANCLNG)+8,36)
00502    257*          IF (IDEN1 .NE. 0)              IDEN = IDEN + 1
00504    258*          CALL BTRAN(KAUNIT,1,IDEN,PACRAY,ISTAT)
00505    259*          IF (LSTLIN) 130,135,135
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00508   260*      130  IF (ISTAT .EQ. -1) GO TO 130
00512   261*           IF (ISTAT .LT. -1) WRITE (6,520) ICOUNT
00516   262*           IF (ISTAT .LT. -1) CALL CHERR
00520   263*           CALL BTRAN(KAUNIT,9,22)
00521   264*           LSTLIN = 0
00522   265*      135  RETURN
00522   266*      C
00522   267*      C    WRITE PACKED DATA ON TAPE IN UNIVERSAL FORMAT
00522   268*      C
00523   269*      140  DO 150   I=1,16
00526   270*      150  PACRAY(I) = 0
00530   271*           BGBIT = 36 - NBITS + 1
00531   272*           IDEM = 680
00532   273*           PACBIT = 1
00533   274*           ROW    = 1
00534   275*           BGSKP  = 28
00535   276*           NR     = NRPDS - 1
00536   277*           IF(NCPR.EQ.0) GO TO 155
00540   278*           NCLR   = MOD((NC-NCAR),NCPR)
00541   279*       155 NORD=17
00541   280*      C
00541   281*      C    PACKING ANCILLARY INFORMATION INTO PACRAY
00541   282*      C
00542   283*           FLD(IABS(0),16,PACRAY(1)) = 1
00543   284*           FLD(20,16,PACRAY(16))     = ICOUNT
00543   285*      C
00543   286*      C    DATA IS NOT PACKED WITH ANCILLARY RECORD
00543   287*      C
00544   288*           IF (NCAR .NE. 0)              GO TO 160
00546   289*           KA = 1
00547   290*           GO TO 210
00547   291*      C
00547   292*      C    ALL DATA IS PACKED      ON ANCILLARY RECORD
00550   293*      160  IF (NCAR .NE. NC)             GO TO 170
00552   294*           NBYTES = IREMD - ANC
00553   295*           KA = 2
00554   296*           GO TO 210
00554   297*      C
00554   298*      C    PART OF DATA IS PACKED ON ANCILLARY RECORD
00554   299*      C
00555   300*      170  NBYTES = NCAR*NSAMP
00556   301*           KA = 3
00557   302*           GO TO 210
00557   303*      C
00557   304*      C    DATA IS PACKED ON MORE THAN ONE RECORD
00557   305*      C
00560   306*      180  ANC    = 2
00561   307*           NORD   = 1
00562   308*           PACBIT = 17
00563   309*           KA     = 4
00564   310*      185  DO 190   I=1,NR
00567   311*           FLD(IABS(0),16,PACRAY(1)) = I+1
00570   312*           NBYTES = NCPR * NSAMP
00571   313*           IF (NCLR .NE.  0   .AND. I .EQ. NR)  NBYTES = NCLR*NSAMP
00573   314*           GO TO 210
00574   315*       190 CONTINUE
00576   316*       200 IF (LSTLIN) 201,205,205
00601   317*       201 IF (ISTAT .EQ. -1)  GO TO 205
00603   318*           IF (ISTAT .LT. -1)  WRITE (6,530) ICOUNT
00607   319*           CALL BTRAN (KAUNIT,9,22)
00610   320*           LSTLIN = 0
00611   321*       205 RETURN
00612   322*      210  IF (ISTAT .EQ. -1)             GO TO 210
```

```
00614    323•          IF (ISTAT .LT. -1)            WRITE(6,530)ICOUNT
00620    324•          IF (ISTAT .LT. -1)   CALL CMERR
00622    325•          IF (NCAR .NE. 0) CALL BYTRAN(BGBIT,IDATA(1,ROW),BGSKP,NBYTES,NBITS
00622    326•         •,PACBIT,PACRAY(WORD),PACSKP)
00624    327•          CALL NTRAN(KAUNIT,1,IDEN,    PACRAY,ISTAT,ZZ)
00625    328•          IF (KA .NE. 4)                ROW = NCAR + ROW
00627    329•          IF (KA .EQ. 4)                ROW = ROW  + NCPR
00631    330•          GO TO (180,200,180,190),KA
00632    331•      500 FORMAT (/,T8,'***ERROR*** SUBROUTINE FIZTP',/,T20,
00632    332•         •       'ABORTED BECAUSE OF BAD TAPE OR WRONG ASG CARD.')
00633    333•      510 FORMAT (/,T8,'***ERROR*** SUBROUTINE FIZTP',/,T20,
00633    334•         •       'USER NSAMP IS TOO LARGE, THUS NSAMP WAS RESET ',
00633    335•         •       'TO 2998.')
00634    336•      520 FORMAT (/,T8,'***ERROR*** SUBROUTINE FIZTP',/,T20,
00634    337•         •       'RECORD ',I5,' WAS BEING WRITTEN WHEN PROGRAM ABORTED ',
00634    338•         •       'DUE TO BAD TAPE.')
00635    339•      530 FORMAT (/,T8,'***ERROR*** SUBROUTINE FIZTP',/,T20,
00635    340•         •       'DATA SET',I5,' WAS BEING WRITTEN WHEN PROGRAM ABORTED ',
00635    341•         •       ,'DUE TO BAD TAPE.')
00636    342•           END

    END OF COMPILATION:       NO  DIAGNOSTICS.
  FIZTP          SYMBOLIC                    08 APR 76  11:24:58   0  03036717   14   342  (DELETED)
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```
@ FOR,* FIZTST/SKAAA,FIZTST,FIZTST                                   08 APR 76          11:24:59
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:24:59

   SUBROUTINE FIZTST    ENTRY POINT 000161

   STORAGE USED: CODE(1) 000214; DATA(0) 000134; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000035 131G      0001   000076 156G      0001   000112 171G      0001   000031 2000L     0001   000056 2100L
    0001   000060 2120L     0001   000063 2140L     0001   000074 3000L     0001   000106 4000L     0001   000137 4100L
    0000 I 000000 ADJSAM    0000 I 000010 CTSAM     0000 I 000107 I         0000   000112 INJPS     0000 I 000105 MAXCT
    0000 I 000110 PT        0000 I 000104 SAVPT


00101      1*           SUBROUTINE FIZTST (TEST,CHANGE,CENTER,ARRHOL,ADJSA1,
00101      2*          *                   ADJSA2,ADJSA3,ADJSA4,ADJSA5,ADJSA6,
00101      3*          *                   ADJSA7,ADJSA8,DFTPT)
00103      4*           IMPLICIT INTEGER (A-Y)
00104      5*           DIMENSION ADJSAM(8), CTSAM(61)
00105      6*           DATA CTSAM /61 * 0/
00107      7*           ADJSAM(1) = ADJSA1
00110      8*           ADJSAM(2) = ADJSA2
00111      9*           ADJSAM(3) = ADJSA3
00112     10*           ADJSAM(4) = ADJSA4
00113     11*           ADJSAM(5) = ADJSA5
00114     12*           ADJSAM(6) = ADJSA6
00115     13*           ADJSAM(7) = ADJSA7
00116     14*           ADJSAM(8) = ADJSA8
00117     15*           IF (TEST) 4000,1000,2000
00122     16*      1000 CONTINUE
00123     17*           ARRHOL = CENTER
00124     18*           RETURN
00125     19*      2000 CONTINUE
00126     20*           MAXCT = 0
00127     21*           SAVPT = 0
00130     22*           DO 2100 I = 1, 8
00133     23*             PT = ADJSAM(I)
00134     24*             CTSAM(PT) = CTSAM(PT) + 1
00135     25*             IF (CTSAM(PT) - MAXCT) 2100,2100,2020
00140     26*      2020   MAXCT = CTSAM(PT)
00141     27*             SAVPT = PT
00142     28*             IF (MAXCT .GE. TEST)  GO TO 2140
00144     29*      2100 CONTINUE
00146     30*      2120 ARRHOL = CENTER
00147     31*           GO TO 3000
00150     32*      2140 IF (SAVPT .EQ. CENTER) GO TO 2120
00152     33*           ARRHOL = SAVPT
00153     34*           CHANGE = CHANGE + 1
00154     35*      3000 CONTINUE
00155     36*           DO 3020 I = 1,8
```

```
00160     37•              PT = ADJSAM(I)
00161     38•              CTSAM(PT) = 0
00162     39•         3020 CONTINUE
00164     40•              RETURN
00165     41•         4000 CONTINUE
00166     42•              MAXCT = 0
00167     43•              SAVPT = 0
00170     44•              DO 4100 I = 1,8
00173     45•                 PT = ADJSAM(I)
00174     46•                 IF (PT-DFTPT) 4010,4100,4010
00177     47•         4010    CTSAM(PT) = CTSAM(PT) + 1
00200     48•                 IF (CTSAM(PT)-MAXCT) 4100,4100,4020
00203     49•         4020    MAXCT = CTSAM(PT)
00204     50•                 SAVPT = PT
00205     51•                 IF (MAXCT .GE. IABS(TEST))  GO TO 2140
00207     52•         4100 CONTINUE
00211     53•              GO TO 2120
00212     54•              END

    END OF COMPILATION:        0  DIAGNOSTICS.
 F12TST          SYMBOLIC                          08 APR 76  11:25:00    0  03040174    14     54  (DELETED)
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```
@ FOR,* FIZMRT/SKAAA,FIZMRT,FIZMRT                                   08 APR 76          11:25: 0
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:25:00

  SUBROUTINE FIZMRT    ENTRY POINT 000532

 STORAGE USED: CODE(1) 000576; DATA(0) 004100; BLANK COMMON(2) 000000

  COMMON BLOCKS:

  0003   DISPL  001370
  0004   FIZ    000434
  0005   DRUM   000046
  0006   INFIZ1 000015
  0007   COMSAM 015560
  0010   UNTIFZ 003216

 EXTERNAL REFERENCES (BLOCK, NAME)

  0011   FIZTLN
  0012   FIZBOR
  0013   RWRITE
  0014   RWDUS
  0015   RIOZS
  0016   RERR4S
  0017   RERR3S

 STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

  0000   003762 100F      0001   000046 1200L     0001   000112 1260L     0001   000117 1300L     0001   000140 1330L
  0001   000351 1364L     0001   000356 1365L     0001   000431 1385L     0001   000025 140G      0001   000053 150G
  0001   000442 1500L     0001   000463 1600L     0001   000102 167G      0001   000465 1700L     0001   000135 207G
  0001   000144 216G      0001   000226 230G      0001   000263 241G      0001   000306 245G      0001   000371 273G
  0001   000470 3000L     0001   000430 302G      0001   000440 321G      0003   001342 ACROP     0005   000042 ALADD
  0003   001351 ANALYS    0003   001343 AOTHER    0004   000375 ASAM      0004   000374 ASAM1     0010   003215 ATFILE
  0003   001344 ATOTAL    0000 I 003760 BIT       0003   000570 BMCOMB    0003   000571 BMFEAT    0003   000567 BMFLG
  0007 I 015554 BUFPT     0003   001354 CAMS      0003   000000 CATFLG    0003   000001 CATNAM    0003   000572 CDATE
  0003   000076 CLSNAM    0003   000440 CLSSUB    0004 I 000206 CODE      0000 I 003752 COL       0005 I 000001 COLADD
  0005 I 000013 COLINC    0000 I 003754 COLSAM    0004   000356 COMENT    0003 R 001075 CON       0003   001341 CROP
  0003   001366 CRPKEY    0010 I 000021 CTFILE    0004   000400 CTSEDS    0004   000354 DATE      0004   000370 DEBUGF
  0003   001336 DESKEY    0004   000431 DESNO1    0004   000432 DESNO2    0003   001340 DESOTH    0003   001337 DESUNI
  0004   000315 DFTCOD    0004 I 000320 DFTPT     0004   000316 DFTSYM    0000 I 003753 DRMLIN    0005 I 000031 DRMWRT
  0000 I 000000 DRSTAT    0006   000001 DSPYDT    0006   000003 DSPYTM    0004   000433 DUPNO     0003   000564 EMPTRS
  0004   000401 EOFHIT    0004   000377 ESAM      0004   000376 ESAM1     0003   001175 FETVC2    0003   000575 FIELD2
  0003   000600 FIELD3    0003   001334 FILTER    0006   000000 FIZNAM    0006   000004 FLDESC    0003   001171 FLDKEY
  0003   000574 FLDSV2    0003   000577 FLDSV3    0005   000032 FOR       0004   000327 HED1      0004   000341 HED2
  0003   001001 HIGH      0007 I 011634 HOLARR    0010   003203 HOLECH    0005 I 000027 HOLLIN    0010   000032 HOLTST
  0005 I 000030 HOLWRD    0000 I 003744 I         0005   000000 IBADDR    0006   000010 ILINED    0006   000011 ILINIC
  0006   000007 ILINST    0000   004046 INJPS     0006   000006 INLINE    0006   000005 INPTS     0007 I 001750 IR
  0006   000013 ISAMED    0006   000014 ISAMIC    0006   000012 ISAMST    0010   003173 ISLOCH    0010   000022 ISLTST
  0000 I 003757 J         0007   015556 JSTAT     0000 I 003761 K         0003   001237 KATNO     0000 I 003746 L
  0004 I 000371 LIMHIT    0004 I 000325 LIMLIN    0004 I 000326 LIMSAM    0000 I 003741 LININC    0004 I 000373 LMPSAM
  0000 I 003737 LSTLIN    0010 I 000000 MAP       0003   001335 MAPFMT    0003   001367 MFILE     0003   001333 MOCAT
  0003   001236 MOCLS2    0005 I 000025 MOCOL     0005 I 000026 MOCOMR    0003   001174 MOFETZ    0003 I 001172 MOFLD2
  0003 I 001173 MOFLD3    0003   000554 MOMAP     0003   001233 MOSUB2    0003   000556 MOSUB3    0003   001234 MOTRFD
  0000 I 003750 OEDLIN    0000 I 003743 OEDSAM    0000 I 003747 OSTLIN    0000 I 003742 OSTSAM    0010 I 000010 OTFILE
  0004 I 000353 OTLINE    0004   000312 OTUNT     0000 I 000012 OUTCOD    0000 I 001762 OUTSYM    0003   000557 PCFDKY
  0003   000602 PCTID3    0010 I 000043 PERCNT    0003   000566 PLTKEY    0004 I 000372 PROSAM    0000 I 003745 PT
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0005   000043 REALIN    0000 I 003740 SAMINC    0007 I 000000 SAMSOW    0000 I 003751 SAMSTR    0004   000402 SEDNAM
0003   001345 SITE      0004   000313 SKPLIN    0004   000314 SKPSAM    0003   000563 STATKY    0003   000364 SUBCAT
0003   000173 SUBNAM    0003   000270 SUBNO     0004 I 000000 SYM       0003   000677 SYMMTX    0005   000044 SYMPAG
0004   000311 TAPOUT    0010   003214 THOLCM    0003 R 000603 THRES     0003   000562 THRSKY    0003   000565 THRSVA
0010   000020 TIMFIL    0005   000045 TIMREA    0010   003213 TISLCM    0010 I 000042 TOTPCT    0003 I 001235 TOTVT2
0003 I 000555 TOTVT3    0003   000561 TRNKEY    0004 I 000427 TRNNO     0003 I 000560 TSTKEY    0004 I 000430 TSTNO
0007   015555 UNTFAS    0003   000576 VERTX2    0003   000601 VERTX3    0000 I 003755 WORD      0000 I 003756 WRSAM
0010 D 001073 ZCM1      0004 D 000321 ZONLIN    0004 D 000323 ZONSAM    0010 D 001113 ZPC
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```
00101      1*          SUBROUTINE FIZWRT(IZ, LINSOW, S    , TRNSAV, TRNFLD, TRNVER,
00101      2*         *TSTSAV, TSTFLD, TSTVER, DRUARR, I1)
00103      3*          IMPLICIT INTEGER (A - Y)
00104      4*          INCLUDE CMBK10,LIST
00105      4*          COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
00105      4*         *            SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00105      4*         *            PCFDKY,TSTKEY,TRNKEY,THRSKY,STATKY,EMPTRS,THRSVA,
00105      4*         *            PLTKEY,BMFLG,BMCOMB,BMFEAT,CDATE(2),
00105      4*         *            FLDSV2,FIELD2,VERTX2,FLDSV3,FIELD3,VERTX3,PCTID3,
00105      4*         *            THRES(60),SYMMTX(66),HIGH(60),COM(60)
00105      4*         *            ,FLDKEY,NOFLD2,NOFLD3,NOFET2,FETVC2(30)
00105      4*         *            ,NOSUB2,NOTRFD,TOTVT2,NOCLSZ
00105      4*         *            ,KATNO(60),NOCAT,FILTER,MAPFMT
00105      4*         *            ,DESKEY,DESUNI,DESOTH,CROP ,ACROP,AOTHER,ATOTAL
00105      4*         *            ,SITE(4),ANALYS(3),CAMS(10),CRPKEY
00105      4*         *            ,BFILE                                          FILZOR
00106      4*          END
00107      5*          INCLUDE FIZCOM, LIST
00110      5*          IMPLICIT DOUBLE PRECISION (Z)
00111      5*          REAL COM,THRES
00111      5*    C
00111      5*    C                 PARAMETERS
00111      5*    C
00112      5*          PARAMETER PAGCOL = 10, PAGSYM = 110, PARSAM = 1000, PARLIN = 1000
00113      5*          PARAMETER PAGWRD = 19, PSCLAD = 61, ISUBCL = PSCLAD - 1
00114      5*          PARAMETER PSEDS = 21, POUTLN = PSCLAD+6, PSYM = 2*POUTLN,
00114      5*         *          PSAMPS= PARSAM + 5, PARFIL = 8
00114      5*    C
00114      5*    C                 COMMON BLOCKS
00114      5*    C
00115      5*          COMMON /FIZ/ SYM(POUTLN,2), CODE(POUTLN), TAPOUT, OTUNT, SKPLIN,
00115      5*         *             SKPSAM, DFTCOD, DFTSYM(2), DFTPT, ZONLIN, ZONSAM,
00115      5*         *             LINLIN , LINSAM, HED1(10), HED2(10), OTLINE, DATE(2),
00115      5*         *             COMENT(10),DEBUGF,LIMHIT,PROSAM,LNPSAM,
00115      5*         *             ASAM1, ASAM, ESAM1, ESAM, CTSEDS, EOFHIT,
00115      5*         *         SEDNAM(PSEDS),TRNNO,TSTNO,DESN01,DESN02,DUPNO
00116      5*          COMMON /DRUM/ IBADDR, COLADD(PAGCOL), COLINE(PAGCOL), NOCOL,
00116      5*         *             NOCOMR, NOLLIN, NOLWRD, DRNWRT,
00116      5*         *              FOR(8), ALADD, REALIN, SYMPAG, TIMREA
00117      5*          COMMON /IBFIZ1/ FIZNAM, DSPYDT(2), DSPYTM, FLDESC, INPTS, IBLINE,
00117      5*         *                ILINST, ILINED, ILINIC, ISAMST, ISARED, ISAMIC
00120      5*          COMMON /COMSAM/ SAMSOW(PARSAM),IR(PSAMPS,6),HOLARR(PARSAM,2),
00120      5*         *                BUFPT, UNTFAS, JSTAT(2)
00121      5*          COMMON/UNTIFZ/  MAP(PARFIL), OTFILE(PARFIL), TIMFIL,
00121      5*         *                CTFILE, ISLTST(PARFIL), HOLTST(PARFIL), TOTPCT,
00121      5*         *                PERCNT(POUTLN,PARFIL),ZCM1(PARFIL),
00121      5*         *                ZPC(POUTLN,PARFIL), ISLOCH(PARFIL),
00121      5*         *                HOLECH(PARFIL), TISLCM, THOLCM
00121      5*         *                ,ATFILE
00122      5*          END
00123      6*          DIMENSION DRSTAT(PAGCOL)
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00124      7*          DIMENSION OUTCOD(PARSAM), OUTSYM(PSAMPS)
00125      8*          DATA LSTLIN/0/, SAMINC/1/, LININC/1/
00131      9*          DIMENSION TRNSAV(4,NOFLD2), TRNFLD(5,NOFLD2), TRNVER(2,TOTVT2),
00131     10*         *          TSTSAV(4,NOFLD3), TSTFLD(5,NOFLD3), TSTVER(2,TOTVT3),
00131     11*         *          DRUARR(NOCOMR,2,MOLLIN,NOCOL)
00132     12*          DATA OUTSYM/PSAMPS*POUTLN/
00134     13*      100 FORMAT (/,T8,'***ERROR*** FILZOM, SUBROUTINE FIZWRT',T20,
00134     14*         *       I10,' IS AN ILLEGAL ',
00134     15*         *        'ADDRESS FOR COLUMN PRINTOUT',I4,'.',/,T20,
00134     16*         *        'THE STARTING DRUM ADDRESS FOR THE COLUMN EQUALS',I10,
00134     17*         *        '.',/,T20,'ERROR OCCURRED WHILE TRYING TO WRITE THE ',
00134     18*         *        I5,' RECORD ON THE DRUM FOR THIS COLUMN PRINTOUT.')
00135     19*          OSTSAM = 0
00136     20*          OEDSAM = 0
00137     21*          DO 1200 I = 1,PROSAM
00142     22*             IF (SAMSOM(I) .LT. 1)  GO TO 1200
00144     23*             OSTSAM = OEDSAM + 1
00145     24*             OEDSAM = OEDSAM + SAMSOM(I)
00146     25*             PT = HOLARR(I,BUFPT)
00147     26*             DO 1180 L = OSTSAM, OEDSAM
00152     27*                OUTCOD(L) = CODE(PT)
00153     28*                OUTSYM(L) = PT
00154     29*                PERCNT(PT,CTFILE) = PERCNT(PT,CTFILE) + LINSOM
00155     30*                TOTPCT = TOTPCT + LINSOM
00156     31*     1180    CONTINUE
00160     32*     1200 CONTINUE
00162     33*          OSTLIN = OTLINE + 1
00163     34*          OEDLIN = OTLINE + LINSOM
00163     35*      C
00163     36*      C
00163     37*      C*************************************************************************
00163     38*      C                  DO-LOOP TO WRITE DATA OUT ON TAPE
00163     39*      C*************************************************************************
00163     40*      C
00164     41*          IF (OTFILE(CTFILE) .EQ. 0)  GO TO 1300
00166     42*          DO 1280 I = 1, LINSOM
00171     43*             OTLINE = OTLINE + 1
00172     44*             IF (LIMLIN - OTLINE) 1240,1240,1260
00175     45*     1240    LSTLIN = -1
00176     46*     1260    CALL FIZTLN (OUTCOD,LSTLIN)
00177     47*     1280 CONTINUE
00201     48*     1300 CONTINUE
00202     49*          IF (MAP(CTFILE) .EQ. 0)  GO TO 1700
00204     50*          IF (LINSOM .LT. 2)  GO TO 1330
00206     51*          DO 1320 I = 1,LMPSAM
00211     52*             IR(I,11) = OUTSYM(I)
00212     53*     1320 CONTINUE
00212     54*      C
00212     55*      C*************************************************************************
00212     56*      C                  DO-LOOP TO WRITE DATA ON DRUM FOR GREYMAP
00212     57*      C*************************************************************************
00212     58*      C
00214     59*     1330 CONTINUE
00215     60*          DO 1600 I = OSTLIN, OEDLIN
00220     61*             CALL FIZDOR (TRNNO, I, OUTSYM, NOFLD2, TRNFLD, TRNSAV,
00220     62*         *   TRNVER, OFTPT, SAMSTR, LIMSAM, SAMINC, LININC)
00221     63*             IF (TSTKEY .EQ. 1)  CALL FIZDOR (TSTNO, I, OUTSYM, NOFLD3,
00221     64*         *   TSTFLD, TSTSAV, TSTVER, OFTPT,SAMSTR, LIMSAM, SAMINC, LININC)
00223     65*             OSTSAM = 0
00224     66*             OEDSAM = 0
00225     67*             COL = 0
00226     68*             DRMLIN = DRMLIN + 1
00227     69*             DO 1360 COLSAM = 1, LIMSAM, PAGSYM
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```
00232    70•                 WORD = 0
00233    71•                 OSTSAM = COLSAM
00234    72•                 OEDSAM = OSTSAM + PAGSYM - 1
00235    73•                 COL = COL + 1
00236    74•                 IF (OEDSAM .GT. LIMSAM) OEDSAM = LIMSAM
00240    75•                 DO 1340 MRSAM = OSTSAM, OEDSAM, 6
00243    76•                    WORD = WORD + 1
00244    77•                    DO 1335 J = 0, 5
00247    78•                       PT = OUTSYM(MRSAM + J)
00250    79•                       BIT = J * 6
00251    80•                       FLD(BIT,6,DRUARR(WORD,1,DRMLIB,COL)) =
00251    81•          *            FLD(0,6,SYM(PT,1))
00252    82•                       FLD(BIT,6,DRUARR(WORD,2,DRMLIB,COL)) =
00252    83•          *            FLD(0,6,SYM(PT,2))
00253    84•       1335          CONTINUE
00255    85•       1340       CONTINUE
00257    86•       1360    CONTINUE
00261    87•               IF (LIMWIT) 1364,1364,1363
00264    88•       1363    IF (I .EQ. OEDLIB)  GO TO 1365
00266    89•       1364    IF (DRMLIB .LT. HOLLIB)  GO TO 1500
00270    90•       1365    DRMWRT = DRMWRT + 1
00271    91•               HOLWRD = DRMLIB * NOCOWR * 2
00272    92•               DO 1380 K = 1, NOCOL
00275    93•                  CALL AWRITE (COLINC(K), DRUARR(1,1,1,K), HOLWRD, DRSTAT(I))
00276    94•                  COLINC(K) = COLINC(K) + HOLWRD
00277    95•       1380    CONTINUE
00301    96•               DO 1390 K = 1, NOCOL
00304    97•       1385       IF (DRSTAT(K) .EQ. 1)  GO TO 1385
00306    98•                  IF (DRSTAT(K) .NE. 0)  GO TO 3000
00310    99•       1390    CONTINUE
00312   100•               DRMLIB = 0
00313   101•       1500    CONTINUE
00314   102•               IF (OEDLIB .EQ. 1)  GO TO 1600
00316   103•               IF (I .EQ. OEDLIB)  GO TO 1600
00320   104•               DO 1520 COLSAM = 1,LIMSAM
00323   105•                  OUTSYM(COLSAM) = IR(COLSAM,I1)
00324   106•       1520    CONTINUE
00326   107•       1600 CONTINUE
00330   108•       1700 CONTINUE
00331   109•            RETURN
00331   110•       C
00331   111•       C*******************************************************************
00331   112•       C                     FATAL ERROR
00331   113•       C*******************************************************************
00331   114•       C
00332   115•        3000 CONTINUE
00333   116•            WRITE (6,100) COLINC(K), K, COLADD(K), DRMWRT
00341   117•            RETURN 3
00342   118•            END

      END OF COMPILATION:        NO  DIAGNOSTICS.
   FIZWRT          SYMBOLIC                          08 APR 76  11:25:03   0  03040660    14   118  (DELETED)
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0 ASR,* BYTRAN.BYTRAN                                                    08 APR 76          11:25: 3
ASSEMBLED BY UNIVAC 1108 EXEC II ASSEMBLER   2404 0008A
THIS ASSEMBLY WAS DONE ON 08 APR 76 AT 11:25:04
000001                                  .  CALL BYTRAN(SBIT1,SWORD1,SBSKP,NBYTES,BYTESZ,DBIT1,DWORD1,DBSKP)
000002                                  .
000003                                  .
000004                                  .
000005                                  .          SBIT1 = BIT NO. OF FIRST BIT,FIRST BYTE,FIRST
000006                                  .                  SOURCE WORD( =1,2,3,...,36  LEFT-TO-RIGHT )
000007                                  .
000008                                  .          SWORD1 = FIRST SOURCE WORD ADDRESS
000009                                  .
000010                                  .          SBSKP = NO. OF BITS TO SKIP BETWEEN BYTES,IN SOURCE
000011                                  .                  BYTE STRING
000012                                  .
000013                                  .                  IF = 0, BYTES ARE A CONTIGUOUS BYTE STRING
000014                                  .
000015                                  .          IF .GT. 0,STARTING WITH BYTE 1 LEFT JUSTIFIED TO SBIT1,
000016                                  .                    NBYTES  BYTES ARE UNPACKED EVERY SBSKP BITS,
000017                                  .                    WORD BOUNDARIES IGNORED IN UNPACKING SOURCE BYTE
000018                                  .                    STRING
000019                                  .
000020                                  .          NBYTES = TOTAL NO. OF BYTES TO BE UNPACKED FROM SOURCE STRING
000021                                  .          AND PACKED INTO DESTINATION STRING
000022                                  .
000023                                  .          BYTESZ = BYTE SIZE ( NO. OF BITS/BYTE )
000024                                  .
000025                                  .          DBIT1 = BIT NO. FOR FIRST BIT OF FIRST BYTE ,FIRST WORD OF
000026                                  .          DESTINATION STRING   ( = 1,2,3,...,36  LEFT-TO-RIGHT )
000027                                  .
000028                                  .          DWORD1 = FIRST DESTINATION WORD ADDRESS
000029                                  .
000030                                  .          DBSKP = NO. BITS TO SKIP BETWEEN BYTES PACKED INTO DESTINATION
000031                                  .                  BYTE STRING
000032                                  .
000033                                  .                  IF = 0, BYTES ARE PACKED IN A CONTIGUOUS BYTE STRING
000034                                  .                         WITH FIRST BYTE LEFT-JUSTIFIED TO DBIT1 OF DWORD1
000035                                  .
000036                                  .                  IF .GT. 0, DBSKP BITS ARE SKIPPED OVER BETWEEN BYTES
000037                                  .                            WHEN PACKING THE BYTES IN THE DESTINATION
000038                                  .                            STRING
000039                                  .
000040                                  .          NBYTES AND BYTESZ ARE COMMON TO SOURCE AND DESTINATION BYTE
000041                                  .          STRINGS. OTHER VARIABLES INDEPENDENT OF EACH OTHER.
000042                                  .
000043                                  .
000044                                  .                       NOTE:  THIS VERSION OF BYTRAN TESTS FOR
000045                                  .                       THE PACKING MODE TO BE RIGHT-JUSTIFICATION OF
000046                                  .                       THE BYTE IN THE DESTINATION WORDS. IF
000047                                  .                       RIGHT-JUSTIFY IS THE PACKING MODE,BYTRAN WILL
000048                                  .                       ZERO THE DESTINATION WORD PRIOR TO PACKING .
000049                                  .
000050                                  .                       ALSO,ONLY ASCENDING WORD ADDRESSES ARE
000051                                  .                       ALLOWED IN THE SOURCE STRING AND
000052                                  .                       DESTINATION STRING .
000053                                  .
000054                                  .
000055                                  .                       EXECUTION TIME =  .075 MILLISEC PER BYTE
000056                                  .
000057                                  .
000058                                 $(1)
000059                                          NBPR
```

```
000060    01    000000  74 04 00 00 0 000000          BOP   0,NAME
000061          000001  06 01 13 00 0 000001  BYTRAN* SX,HZ X11,RETADD
000062          000002  71 12 04 00 0 000002          DS    A4,RSAVE
000063          000003  01 00 06 00 0 000004          SA    A6,RSAVE+2
000064          000004  06 00 01 00 0 000005          SX    X1,RSAVE+3
000065          000005  06 00 02 00 0 000006          SX    X2,RSAVE+4
000066          000006  04 00 01 00 0 000007          SR    R1,RSAVE+5
000067          000007  44 00 02 00 0 000010          SR    R2,RSAVE+6
000068          000010  12 00 04 13 1 000003          LMA   A4,*3,X11
000069          000011  17 00 04 00 0 000012          ABM   A4,ONE
000070          000012  27 00 01 00 0 000020          LX    X1,A4       . X1= LOOP COUNTER= NO. BYTES-1
000071          000013  12 00 04 13 1 000004          LMA   A4,*4,X11
000072          000014  03 31 04 00 0 000060          SM,HZ  A4,MSK     . A4 = BYTE SIZE
000073          000015  12 00 05 13 1 000002          LMA   A5,*2,X11
000074          000016  16 00 05 00 0 000020          AMA   A5,A4
000075          000017  03 00 05 00 0 000022          SM    A5,ISKP     . ****
000076                                                .
000077                                                .                 *** = INITIALIZATION FOR FORWARD ADDRESSING
000078          000020  12 00 05 13 1 000007  CONT1   LMA   A5,*7,X11   . ****
000079          000021  16 00 05 00 0 000020          AMA   A5,A4
000080          000022  03 00 05 00 0 000023          SM    A5,OSKP     . ****
000081          000023  17 00 04 00 0 000013  CONT2   ABM   A4,THRTY6    . ****
000082          000024  01 00 04 00 0 000021          SA    A4,SIZM36   . SIZM36 = BYTES2 - 36
000083          000025  10 00 04 13 0 000001          L     A4,1,X11    . A4 = INITIAL SOURCE WORD ADDRESS
000084          000026  17 00 04 00 0 000012          ABM   A4,ONE      . SOURCE WORD ADDRESS - 1
000085          000027  31 00 04 00 0 000013          MSI   A4,THRTY6   . CUMULATIVE BIT COUNT (SOURCE)
000086          000030  12 00 06 13 1 000000          LMA   A6,*0,X11   . A6 = BIT NO. OF FIRST BIT,FIRST BYTE (SOURCE)
000087          000031  17 00 06 00 0 000012          ABM   A6,ONE      . A6 = BIT 1 ADDRESS (SOURCE)  (0-35)
000088          000032  16 00 06 00 0 000020          AMA   A6,A4
000089          000033  03 00 06 00 0 000014          SM    A6,CUMIN    . A6 = CUMIN = INITIAL CUMULATIVE BIT COUNT(SOURCE
000090          000034  10 00 04 13 0 000006          LA    A4,6,X11    . A4 = INITIAL DEST. WORD ADDRESS
000091          000035  17 00 04 00 0 000012          ABM   A4,ONE
000092          000036  31 00 04 00 0 000013          MSI   A4,THRTY6   . A4 = CUMULATIVE BIT COUNT (DEST.)
000093          000037  12 00 11 13 1 000005          LMA   A9,*5,X11   . A9 = BIT NO. OF FIRST BIT,FIRST BYTE (DEST. )
000094          000040  17 00 11 00 0 000012          ABM   A9,ONE      . A9 = BIT 1 ADDRESS (DEST.) (0-35)
000095          000041  12 00 05 00 0 000025          LM    A5,A9
000096          000042  16 00 11 00 0 000020          AMA   A9,A4
000097          000043  03 00 11 00 0 000015          SM    A9,CUMOUT   . A9 = CUMOUT = INITIAL CUMULATIVE BIT COUNT (DEST
000098          000044  05 00 00 00 0 000020          SZ    RTJSFY
000099          000045  16 00 05 13 1 000004          AR    A5,*4,X11   . A5 = DEST. BIT 1 ADDRESS + BYTE SIZE
000100          000046  52 00 05 00 0 000013          TE    A5,THRTY6
000101          000047  74 04 00 00 0 000057          J     $+8
000102          000050  05 00 00 00 0 000020          SZ    A4
000103          000051  12 00 05 00 0 000023          LM    A5,OSKP
000104          000052  34 00 04 00 0 000013          DI    A4,THRTY6
000105          000053  52 00 05 00 0 000011          TE    A5,ZERO
000106          000054  74 04 00 00 0 000057          J     $+3
000107          000055  10 00 05 00 0 000012          LA    A5,ONE
000108          000056  03 00 05 00 0 000020          SM    A5,RTJSFY   . RIGHT-JUSTIFY FLAG SET
000109          000057  10 00 04 00 0 000017          LA    A4,MASK
000110          000060  73 12 04 00 0 000000  MSK     LSSL  A4,0
000111          000061  23 00 02 00 0 000020          LR    R2,A4       . INITIALIZE MASK REGISTER
000112          000062  05 00 00 00 0 000021  NOMWD   SZ    A5
000113          000063  34 00 05 00 0 000013          DI    A5,THRTY6
000114          000064  14 00 05 00 0 000012          A     A5,ONE
000115          000065  03 00 05 00 0 000024          SM    A5,SWD      . A5 = SWD = CURRENT SOURCE WORD ADDRESS
000116          000066  05 00 00 00 0 000024          SZ    A8
000117          000067  34 00 10 00 0 000013          DI    A8,THRTY6
000118          000070  14 00 10 00 0 000012          A     A8,ONE
000119          000071  03 00 10 00 0 000025          SM    A8,DWD      . A8 = DWD = CURRENT DEST. WORD ADDRESS
000120          000072  50 00 00 00 0 000020          TZ    RTJSFY      .
000121          000073  05 00 00 00 1 000025          SZ    *DWD        . ZERO-FILL THE DESTINATION WORD
000122                                                .                 IF THE RIGHT-JUSTIFY FLAG IS SET
```

```
000123  000074  31 00 05 00 0 000013          MSI   A5,THRTY6
000124  000075  17 00 05 00 0 000014          ANR   A5,CURIN        . A5 = SOURCE WD1 X 36 - CURIN
000125  000076  10 00 04 00 0 000013          LA    A4,THRTY6
000126  000077  17 00 04 00 0 000021          ANR   A4,A5           . A4 = 36 - (WD1 X 36 - CURIN)
000127                                                                   = BIT1 ADDRESS,CURRENT SOURCE WORD
000128  000100  14 00 04 00 0 000021          AA    A4,SIZM36       . A4 = IBIT1 + BYTES2 - 36 = SHIFT DIRECTION
000129                                                                AND MAGNITUDE
000130  000101  03 00 04 00 0 000026          SR    A4,SHFCNT       . A4      = SOURCE WORD SHIFT COUNT (MAGNITUDE)
000131  000102  71 13 12 00 1 000024          DL    A10,*SWD        . A10,A11 = SOURCE WD1,WD1+1
000132  000103  51 00 00 00 0 000020          TNZ   A4
000133  000104  74 04 00 00 0 000112          J     $+6             . SHIFT COUNT = 0
000134  000105  60 00 00 00 0 000020          TP    A4
000135  000106  74 04 00 00 0 000111          J     $+3
000136  000107  73 13 12 00 1 000026  SHFT1   LDSL  A10,*SHFCNT     . SHIFT COUNT POSITIVE-RIGHT JUSTIFY THE
000137                                                                SOURCE BYTE IN A10
000138  000110  74 04 00 00 0 000112          J     $+2
000139  000111  73 02 12 00 1 000026          SSL   A10,*SHFCNT     . SHIFT COUNT NEGATIVE- RIGHT JUSTIFY THE
000140                                                                SOURCE BYTE IN A10
000141  000112  71 13 16 00 1 000025          DL    A14,*DWD        . A14,A15 = DESTINATION WD1,WD1+1
000142  000113  31 00 10 00 0 000013          MSI   A8,THRTY6
000143  000114  17 00 10 00 0 000015          ANR   A8,CUROUT       . A8 = DESTINATION WD1 X 36 - CUROUT
000144  000115  10 00 05 00 0 000013          LA    A5,THRTY6
000145  000116  17 00 05 00 0 000024          ANR   A5,A8           . A5 = 36 - (WD1X36 - CUROUT)
000146                                                                   = BIT 1 ADDRESS IN DEST. WORD
000147  000117  14 00 05 00 0 000021          AA    A5,SIZM36       . A5 = OBIT1 + BYTES2 - 36
000148                                                                   = SHIFT DIRECTION AND MAGNITUDE
000149  000120  03 00 05 00 0 000026          SR    A5,SHFCNT       . SHFCNT = DEST. WORD SHIFT (MAGNITUDE)
000150  000121  51 00 00 00 0 000021          TNZ   A5
000151  000122  74 04 00 00 0 000130          J     $+6
000152  000123  60 00 00 00 0 000021          TP    A5              . SHIFT COUNT NON-ZERO - TEST FOR POSITIVE COUNT
000153  000124  74 04 00 00 0 000127          J     $+3
000154  000125  73 11 16 00 1 000026  SHFT2   LDSC  A14,*SHFCNT     . SHIFT COUNT POSITIVE- RIGHT JUSTIFY THE
000155                                                                DESTINATION BYTE POSITION IN A14
000156  000126  74 04 00 00 0 000130          J     $+2
000157  000127  73 01 16 00 1 000026          DSC   A14,*SHFCNT     . SHIFT COUNT NEGATIVE- RIGHT JUSTIFY THE
000158                                                                DESTINATION BYTE POSITION IN A14
000159  000130  43 00 12 00 0 000032          MLU   A10,A14         . SOURCE WORD,WITH BYTE RIGHT-ADJUSTED,MASKED
000160                                                                WITH DESTINATION WORD,BYTE POSITION
000161                                                                RIGHT-ADJUSTED, RESULT IN  A11
000162  000131  10 00 16 00 0 000027          LA    A14,A11         . A14 RE-INITIALIZED WITH ADJUSTED DEST. WORD,
000163                                                                INCLUDING PACKED BYTE
000164  000132  51 00 00 00 0 000021          TNZ   A5
000165  000133  74 04 00 00 0 000141          J     $+6
000166  000134  60 00 00 00 0 000021          TP    A5
000167  000135  74 04 00 00 0 000140          J     $+3
000168  000136  73 01 16 00 1 000026          DSC   A14,*SHFCNT     . SHIFT WAS POSITIVE- RESTORE DEST. WD1,WD1+1
000169                                                                TO ORIGINAL BIT POSITIONS
000170  000137  74 04 00 00 0 000141          J     $+2
000171  000140  73 11 16 00 1 000026          LDSC  A14,*SHFCNT     . SHIFT WAS NEGATIVE- RESTORE DEST. WD1,WD1+1
000172                                                                TO ORIGINAL BIT POSITIONS
000173  000141  71 12 16 00 1 000025          DS    A14,*DWD        . DESTINATION WD1,WD1+1 RETURNED,
000174                                                                WITH PACKED BYTE
000175  000142  12 00 06 00 0 000014          LMA   A6,CURIN
000176  000143  14 00 06 00 0 000022          A     A6,ISKP
000177  000144  03 00 06 00 0 000014          SR    A6,CURIN        . CURIN UPDATED FOR BYTE SIZE AND OFFSET
000178  000145  12 00 11 00 0 000015          LMA   A9,CUROUT
000179  000146  14 00 11 00 0 000023          A     A9,OSKP
000180  000147  03 00 11 00 0 000015          SR    A9,CUROUT       . CUROUT UPDATED FOR BYTE SIZE AND OFFSET
000181  000150  70 00 01 00 0 000062          JGD   X1,NOWWD        . DECREMENT BYTE COUNT, GO GET NEXT SOURCE BYTE
000182  000151  71 13 04 00 0 000002          DL    A4,RSAVE
000183  000152  10 00 06 00 0 000004          LA    A6,RSAVE+2
000184  000153  27 00 01 00 0 000005          LX    X1,RSAVE+3
000185  000154  27 00 02 00 0 000006          LX    X2,RSAVE+4
```

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000186          000155  23 00 01 00 0 000007            LR    R1,RSAVE+5
000187          000156  23 00 02 00 0 000010            LR    R2,RSAVE+6
000188          000157  27 00 13 00 0 000001            LX    X11,RETADD
000189          000160  74 04 00 13 0 000011            J     0,X11          . RETURN TO CALLING PROGRAM
000190                                                  S(0)
000191      00  000000  073631270623                    NAME  +     'BYTRAN'
000192          000001  000000000000                    RETADD  +   0
000193          000002                                  RSAVE RES   7
000194          000011  000000000000                    ZERO  +     0
000195          000012  000000000001                    ONE   +     1
000196          000013  000000000044                    THRTY6  +   36
000197          000014  000000000000                    CURIN  +    0
000198          000015  000000000000                    CUROUT  +   0
000199          000016  000000000000                    BYTESZ  +   0
000200          000017  777777777777                    RASK  +     0777777777777
000201          000020  000000000000                    RTJSFY  +   0
000202          000021  000000000000                    SIZR36  +   0
000203          000022  000000000000                    ISKP  +     0
000204          000023  000000000000                    OSKP  +     0
000205          000024  000000000000                    SWD  +      0
000206          000025  000000000000                    DWD  +      0
000207          000026  000000000000                    SWFCNT  +   0
000208                                                  END
    BYTRAN          SYMBOLIC                                14 JAN 76  16:24:19   0  01477702   14   208  (DELETED)
    BYTRAN  CODE    RELOCATABLE                             14 JAN 76  16:24:19   1  01505442   12     1  (DELETED)
                                                                                   0  01505456   14    14
```

```
@ FOR,* FDLINT,FDLINT,FDLINT                                                    08 APR 76          11:25:32
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:25:32

   SUBROUTINE FDLINT    ENTRY POINT 001001

   STORAGE USED: CODE(1) 00107Z; DATA(0) 000077; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   UERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000034 100L      0001   000474 1000L     0001   000024 113G      0001   000073 200L      0001   000320 2000L
    0001   000706 Z9L       0001   000102 300L      0001   000424 3000L     0001   000430 3C01L     0001   000664 317G
    0001   000675 323G      0001   000720 340G      0001   000740 35L       0001   000133 400L      0001   000465 4000L
    0001   000651 5L        0001   000137 500L      0001   000563 5000L     0001   000264 510L      0001   000330 600L
    0001   000546 6000L     0001   000365 700L      0001   000527 7000L     0001   000641 8000L     0001   000615 9000L
    0000 I 000014 I         0000 I 000016 IM1       0000   000044 IMJPS     0000 I 000017 IP1       0000 I 000022 IPZ
    0000 I 000015 J         0000 I 000011 L         0000 I 000031 MM        0000 I 000012 N         0000 I 000033 NI
    0000 I 000035 NJ        0000 I 000037 NN        0000 I 000013 NPTSE     0000 I 000032 NPTS1     0000 I 000034 NP1
    0000 I 000036 NTEMP     0000 R 000023 RL        0000 R 000030 RXX       0000 R 000024 RX1       0000 R 000025 RXZ
    0000 R 000026 RY1       0000 R 000027 RYZ       0000 I 000005 XNM1      0000 R 000020 XNP1      0000 I 000007 XNP2
    0000 I 000004 XX        0000 I 000000 X1        0000 I 000001 XZ        0000 I 000006 YNM1      0000 R 000021 YNP1
    0000 I 000010 YNPZ      0000 I 000002 Y1        0000 I 000003 YZ


00101      1*            SUBROUTINE FDLINT(FIELD,NPTS,FL,YLINE,NSAMP,JJ)
00101      2*      CI
00101      3*      CI    THIS SUBROUTINE WILL RETURN THE PIXEL NUMBERS OF THOSE
00101      4*      CI    PIXELS ON A A GIVEN LINE THAT ARE CONTAINED WITHIN THE
00101      5*      CI    BOUNDARIES OF A NONE-RECTANGULAR FIELD
00101      6*      CI
00101      7*      CI
00101      8*      CI    INPUT    FIELD - NONE-RECTANGULAR FIELD TABLE
00101      9*      CI                     ALL THE VERTICES MUST BE IN CLOCKWISE
00101     10*      CI                     ORDER AND THE LAST VERTEX HAS TO BE EQUAL
00101     11*      CI                     TO THE FIRST VERTEX FOR FIELD CLOSURE
00101     12*      CI                     THE FIRST VERTEX MUST HAVE MINIMUM
00101     13*      CI                     PIXEL VALUE
00101     14*      CI             NPTS  - NO OF POINTS OF THE N-R FIELD
00101     15*      CI             YLINE - SCAN LINE NUMBER
00101     16*      CI
00101     17*      CI    OUTPUT   FL    - ARRAY CONTAINING THE ORDERED PIXEL INTERCEPTS
00101     18*      CI             NSAMP - NO OF SAMPLES CONTAINED IN THE FIELD OF
00101     19*      CI                     A GIVEN SCAN LINE
00101     20*      CI             JJ    - THE LENGTH OF THE ARRAY FL
00101     21*      CI
00103     22*           PARAMETER MAXI=8
00104     23*           DIMENSION FIELD(2,NPTS),FL(MAXI)
00105     24*           INTEGER X1,XZ,Y1,YZ,XX,FL,FIELD,YLINE
00106     25*           INTEGER XNM1,YNM1,XNPZ,YNPZ
00107     26*           IF(NPTS.EQ.2)GO TO 35
00107     27*      C*   ONE VERTEX FIELD
00111     28*           L= YLINE
```

```
00112    29*          DO 7 B = 1,MAXI
00115    30*        7 FL(B) = 0
00117    31*          NPTSE = NPTS-1
00120    32*          I = 1
00121    33*          JJ = 0
00122    34*      100 X1=FIELD(1,I)
00123    35*          Y1=FIELD(2,I)
00124    36*          J = I+1
00125    37*          X2=FIELD(1,J)
00126    38*          Y2=FIELD(2,J)
00127    39*          IF ( I .EQ. 1 ) GO TO 200
00131    40*          IM1 = I-1
00132    41*          XNM1=FIELD(1,IM1)
00133    42*          YNM1=FIELD(2,IM1)
00134    43*          GO TO 300
00135    44*      200 XNM1=FIELD(1,NPTSE)
00136    45*          YNM1=FIELD(2,NPTSE)
00137    46*      300 IP1 = I+1
00140    47*          XNP1=FIELD(1,IP1)
00141    48*          YNP1=FIELD(2,IP1)
00142    49*          IF ( I .EQ. NPTSE) GO TO 400
00144    50*          IP2 = I+2
00145    51*          XNP2=FIELD(1,IP2)
00146    52*          YNP2=FIELD(2,IP2)
00147    53*          GO TO 500
00150    54*      400 XNP2=FIELD(1,2)
00151    55*          YNP2=FIELD(2,2)
00152    56*      500 IF ( Y1 .EQ. Y2 ) GO TO 1000
00154    57*          IF((L.EQ.Y2).AND.(Y2.EQ.YNP2)) GO TO 2000
00156    58*          IF((L.EQ.Y1).AND.(Y1.EQ.YNM1)) GO TO 2000
00160    59*          RL = L
00161    60*            RX1 = X1
00162    61*            RX2 = X2
00163    62*            RY1 = Y1
00164    63*            RY2 = Y2
00165    64*            RXX =(((RL-RY1)*(RX2-RX1))/(RY2-RY1))+RX1
00166    65*            XX = RXX+.5
00167    66*          IF(Y1.LT.Y2)  GO TO 510
00171    67*          XX=RXX
00172    68*          IF((RXX-XX).GT..5) XX=XX+1
00174    69*      510 CONTINUE
00175    70*          IF ((XX.GE. X1) .AND. (XX .LE. X2) ) GO TO 600
00177    71*          IF ((XX.LE. X1) .AND. (XX .GE. X2) ) GO TO 600
00201    72*     2000 I = I+1
00202    73*          IF ( I .GT. NPTSE ) GO TO 5
00204    74*          GO TO 100
00205    75*      600  IF(L.LE.Y1.AND.L.GE.Y2) GO TO 700
00207    76*          IF(L.LE.Y2.AND.L.GE.Y1) GO TO 700
00211    77*          GO TO 2000
00212    78*      700 JJ = JJ+1
00213    79*          FL(JJ) = XX
00214    80*          IF ( JJ .EQ. 1 ) GO TO 2000
00216    81*          IF ( I .NE. NPTSE ) GO TO 3000
00220    82*          IF(L.NE.Y2) GO TO 3000
00222    83*          XNM1=X1
00223    84*          YNM1=Y1
00224    85*          X1=X2
00225    86*          Y1=Y2
00226    87*          X2=FIELD(1,2)
00227    88*          Y2=FIELD(2,2)
00230    89*          GO TO 3001
00231    90*     3000 IF ( L .NE. Y1 ) GO TO 2000
00233    91*     3001    IF ((Y1.LT. YNM1) .AND. (Y1 .GT. Y2 )) GO TO 4000
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00235     92•           IF ((Y1 .GT. YBM1) .AND. (Y1 .LT. YZ)) GO TO 4000
00237     93•           GO TO 2000
00240     94•      4000 FL(JJ) = 0
00241     95•           JJ = JJ-1
00242     96•           GO TO 2000
00243     97•      1000 IF(L.NE.Y1) GO TO 2000
00245     98•           IF(X1.GT.X2) GO TO 5000
00247     99•           IF(YBM1.LT.Y1) GO TO 6000
00251    100•           IF ( YBP2 .GT. Y2 ) GO TO 7000
00253    101•           JJ = JJ+1
00254    102•           FL(JJ) = X1
00255    103•           GO TO 2000
00256    104•      7000 JJ = JJ+1
00257    105•           FL(JJ) = X1
00260    106•           MM = JJ+1
00261    107•           FL(MM) = X2
00262    108•           JJ = MM
00263    109•           GO TO 2000
00264    110•      6000 IF ( YBP2 .LT. Y2 ) GO TO 2000
00266    111•           JJ = JJ+1
00267    112•           FL(JJ) = X2
00270    113•           GO TO 2000
00271    114•      5000 IF ( YBM1 .LT. Y1 ) GO TO 9000
00273    115•           IF ( YBP2 .GT. Y2 ) GO TO 2000
00275    116•           JJ = JJ+1
00276    117•           FL(JJ) = X2
00277    118•           IF(NPTSE.EQ.2)FL(JJ)=X1
00301    119•           GO TO 2000
00302    120•      9000 IF ( YBP2 .GT. Y2 ) GO TO 8000
00304    121•           JJ = JJ+1
00305    122•           FL(JJ) = X1
00306    123•           MM = JJ+1
00307    124•           FL(MM) = X2
00310    125•           JJ = MM
00311    126•           GO TO 2000
00312    127•      8000 JJ = JJ+1
00313    128•           FL(JJ) = X1
00314    129•           GO TO 2000
00315    130•         5 NPTS1 = JJ-1
00316    131•           DO 29 NI = 1,NPTS1
00321    132•           NP1 = NI+1
00322    133•           DO 29 NJ = NP1,JJ
00325    134•           IF ( FL(NI) - FL(NJ) ) 29,29,28
00330    135•        28 NTEMP = FL(NI)
00331    136•           FL(NI) = FL(NJ)
00332    137•           FL(NJ) = NTEMP
00333    138•        29 CONTINUE
00336    139•           NSAMP = 0
00337    140•           DO 30 N = 1,JJ,2
00342    141•           NN = N+1
00343    142•           NSAMP = NSAMP+(FL(NN) -FL(N)+1)
00344    143•        30 CONTINUE
00346    144•           RETURN
00347    145•        35 IF(YLINE.NE.FIELD(2,1))RETURN
00351    146•           FL(1)=FIELD(1,1)
00352    147•           FL(2)=FIELD(1,1)
00353    148•           NSAMP=1
00354    149•           JJ=2
00355    150•           RETURN
00356    151•           END

      END OF COMPILATION:       NO  DIAGNOSTICS.
```

FDLIBT	SYMBOLIC	14 JAN 76	16:25:40	0	01728516	14	151 (DELETED)
FDLIBT	SYMBOLIC	08 APR 76	11:25:34	0	03044511	14	151 (DELETED)

```
@ FOR,* NRTFLD,NRTFLD,NRTFLD                                                    08 APR 76          11:25:55
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 08 APR 76 AT 11:25:55

  SUBROUTINE NRTFLD    ENTRY POINT 000350

  STORAGE USED: CODE(1) 000372; DATA(0) 000200; BLANK COMMON(2) 000000

   COMMON BLOCKS:

   0003   GLOBAL 000076

  EXTERNAL REFERENCES (BLOCK, NAME)

   0004   UNDU$
   0005   UIO2$
   0006   UIO1$
   0007   UERR3$

  STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0000   000013 100F      0001   000072 133G      0001   000145 154G      0000   000021 200F      0001   000227 201G
   0001   000260 220G      0001   000315 235G      0000   000027 230F      0000   000050 300F      0000   000066 400F
   0001   000176 5L        0000   000100 500F      0001   000266 6L        0000   000115 650F      0001   000323 7L
   0000   000123 700F      0000   000133 705F      0000   000140 710F      0003   000055 BMFILE    0003   000056 BMKEY
   0003   000053 DATAPE    0003   000071 DATFIL    0003   000067 DRMWDS    0003   000066 DRUMAD    0003   000062 ERIPTP
   0003   000063 ERPKEY    0003   000075 FIZFIL    0003   000074 FIZKEY    0003   000073 FIZUNT    0000 I 000011 FLDNAM
   0003 I 000000 HEAD      0003   000057 HISFIL    0003   000060 HISKEY    0000 I 000002 I         0000 I 000001 IB
   0000 I 000007 IC        0000 I 000006 IE        0000   000146 INJPS     0000 I 000010 IS        0000 I 000012 J
   0000 I 000000 LPRN      0003   000052 MAPTAP    0003   000064 MAPUNT    0003   000065 NOFILE    0000 I 000004 NO
   0000 I 000005 NR        0000 I 000003 NV        0003   000070 PAGSIZ    0003   000054 SAVTAP    0003   000072 STAFIL
   0003   000061 TRFORM

00101      1*           SUBROUTINE NRTFLD(FLDSAV,VERTEX,NOFLD,KEY,CLSNAM,SUBNAM)
00103      2*           DIMENSION CLSNAM(1),SUBNAM(1)
00104      3*           IMPLICIT INTEGER(A-Z)
00104      4*     C*
00104      5*     C*    THIS SUBROUTINE PRINTS SAVED TRAINING OR TEST FIELDS
00104      6*     C*
00105      7*           DIMENSION FLDSAV(4,NOFLD),VERTEX(2,1)
00106      8*           DATA LPRN/'('/
00110      9*           INCLUDE COMBK6,LIST
00111      9*          . COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00111      9*          *             HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
00111      9*          *              DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL
00111      9*          *             ,FIZUNT,FIZKEY,FIZFIL                                    FIL20R
00112      9*           END
00113     10*           IB=1
00114     11*           WRITE(6,HEAD)
00116     12*           IF(KEY.EQ.1)WRITE(6,100)
00121     13*           IF(KEY.EQ.2)WRITE(6,200)
00124     14*           IF(KEY.NE.3)WRITE(6,300)
00127     15*           IF(KEY.EQ.3)WRITE(6,250)
00132     16*           DO 10 I=1,NOFLD
00135     17*           NV=FLDSAV(4,I)
```

```
00136    18*            NQ=NV-1
00137    19*            NR=NQ-5
00140    20*            IF(NQ.GT.5)NQ=5
00142    21*            IE=IB+NQ-1
00143    22*            IC=FLDSAV(2,I)
00144    23*            IS=FLDSAV(3,I)
00145    24*            FLDNAM=FLDSAV(1,I)
00146    25*            IF(KEY.NE.3)GO TO 5
00150    26*            WRITE(6,700)I,FLDNAM,(LPRM,VERTEX(1,J),VERTEX(2,J),J=IB,IE)
00162    27*            IF(IS.EQ.1)WRITE(6,705)
00165    28*            IF(IS.EQ.2)WRITE(6,710)
00170    29*            GO TO 6
00171    30*          5 CONTINUE
00172    31*            IF(IS.EQ.0)WRITE(6,400)I,FLDNAM,IC,CLSNAM(IC),
00172    32*           *                  (LPRM,VERTEX(1,J),VERTEX(2,J),J=IB,IE)
00207    33*            IF(IS.NE.0)WRITE(6,500)I,FLDNAM,IC,CLSNAM(IC),IS,SUBNAM(IS),
00207    34*           *                  (LPRM,VERTEX(1,J),VERTEX(2,J),J=IB,IE)
00226    35*          6 CONTINUE
00227    36*            IF(NR.LE.0)GO TO 7
00231    37*            IB=IE+1
00232    38*            IE=IB+NR-1
00233    39*            WRITE(6,650)(LPRM,VERTEX(1,J),VERTEX(2,J),J=IB,IE)
00243    40*          7 CONTINUE
00244    41*            IB=IE+2
00245    42*         10 CONTINUE
00247    43*            RETURN
00250    44*        100 FORMAT(///  45X,'SAVED TRAINING FIELDS'/)
00251    45*        200 FORMAT(///  46X,'INPUT TEST FIELDS'/)
00252    46*        250 FORMAT(///45X,'DESIGNATED FIELDS'///T18,'FIELD',T40,'DESIGNATED',
00252    47*           *   T80,'VERTICES (SAMPLE,LINE)'/)
00253    48*        300 FORMAT(1X,T18,'FIELD',T34,'CLASS',T47,'SUBCLASS',T80,'VERTICES  (S
00253    49*           *AMPLE,LINE)'/)
00254    50*        400 FORMAT(T15,I3,T20,A6,T30,I3,T35,A6,T65,5(A1,I4,',',I4,')',1X))
00255    51*        500 FORMAT(T15,I3,T20,A6,T30,I3,T35,A6,T45,I3,T50,A6,T65,
00255    52*           *  5(A1,I4,',',I4,')',1X))
00256    53*        650 FORMAT(1X,T65,5(A1,I4,',',I4,')',1X))
00257    54*        700 FORMAT(T15,I3,T20,A6,T65,5(A1,I4,',',I4,')',1X))
00260    55*        705 FORMAT(1H*,T40,'UNIDENTIFIABLE')
00261    56*        710 FORMAT(1H*,T40,'OTHER')
00262    57*            END

   END OF COMPILATION:       0  DIAGNOSTICS.
MRTFLD          SYMBOLIC                          14 JAN 76  16:30:06    0  02531676    14    57  (DELETED)
MRTFLD          SYMBOLIC                          08 APR 76  11:25:56    0  03042063    14    57  (DELETED)
```

PROGRAM PRINTER OUTPUT

T FILZOM 09 APR 76 9:51:15

STARTING ADDRESS 014000

CORE LIMITS 014000 042334 100000 154647 163772 163777

```
FILZOM/RQ995A
0   100000-116626
1   014000-023572

NSTOP$/RLEC5
1   023573-023609

NIER$ /RLEC5
0   116627-116627
1   023605-024112
2   116630-116724

NFMT$ /RLEC9
1   024113-025050
2   116725-116741

NFTV$ /RL22
1   025051-025073

NCNVT$/RLEC5
1   025074-025320
2   116742-117030

NOTIN$/RLEC5
1   025321-025770
2   117031-117074

FPACK$/CODE
1   025771-026034

DEPTH /******
0   117075-117102

NERR$ /RLEC9
0   117103-117272
1   026035-026477

NIOIN$/RLEC5
1   026500-026551
2   117273-117323

NRWND$/RLEC9
1   026552-026644

NTAB$ /CODE
```

```
0   117329-117972

CMERR$/CODE
0   117973-117973

FIXMAP/RKAAA
0   117974-120924
1   026695-027552

SETMRG/CODE
1   027553-027566

FIXWRT/RKAAA
0   120925-124524
1   027567-030364

FIXBOR/RKAAA
0   124525-124620
1   030365-031045

FDLINT/CODE
0   124621-124717
1   031046-032137

FIXFLT/RKAAA
0   124720-124755
1   032140-032474

FIXTST/RKAAA
0   124756-125111
1   032475-032710

FIXTP /RKAAA
0   125112-127255
1   032711-034722

NTRAN /RLEC4
0   127256-127256
1   034723-036215
2   127257-127475

TLABL$/CODE
0   127476-127505

TSCRH$/CODE
0   127506-127560

THRU$ /CODE
0   127561-127661

TSWAP$/CODE
0   127662-127767

TINTL$/CODE
0   127770-130071

BYTRAN/CODE
0   130072-130120
1   036216-036376

MSC$01/CODE
0   130121-130142
```

```
[redacted]
```

```
$TODS /CODE
 1   036377-036933

$OUTS /RLEC9
 0   130193-130477
 1   036939-037936
 2   130150-130185

$BDCV8/RLEC9
 0   130166-130352

$RADIO/CODE
 0   130353-130420
 1   037937-037626

FEZSOW/RKAAA
 0   130421-130431
 1   037627-037717

WRTFLD/CODE
 0   130432-130631
 1   037720-040311

FEZWRF/RKAAA
 0   130632-131062
 1   040312-040792

$INPTS/RLEC5
 0   131063-131065
 1   040793-042060
 2   131066-131123

$INITS/RLEC9
 1   042061-042216
 2   131124-131153

TDATE /CODE
 0   131154-131163

EDATES/CODE
 1   042217-042253

FSBSFL/CODE
 0   131164-131236

$W    /CODE
 0   131237-131441

CLOCK /CODE
 0   131442-131444
 1   042254-042334

DISPL /******
 0   131445-133039

GLOBAL/******
 0   133039-133132

UNTIFZ/******
 0   133133-136390

COMSAM/******
 0   136391-144139
```

FIZ1/******
0 159131-159195

DRUM /******
0 159196-159213

FIZ /******
0 159214-159697

END OF ALLOCATION 1103 0039A 09099

CHECK LEAD CARDS FOR PROGRAM FILZ09

```
                                        0000000001111111112222222222333333333344444444445555555555666666666677777777
                                        1234567890123456789012345678901234567890123456789012345678901234567890123456789
***GOOD ***  INPUT CARD                COMMENT      CRI NO. 37 TEST AREA

***GOOD ***  INPUT CARD                OUTPUT       L

***VARIABLES CHECKED LATER***           SKIP        200  160

***VARIABLES CHECKED LATER***           ZOOM          1    1

***GOOD ***  INPUT CARD                LIMIT       250  220

***GOOD ***  INPUT CARD                FILTER        7

***GOOD ***  INPUT CARD                ISLAND       -3   -3   -3   -3   -3   -3   -3

***GOOD ***  INPUT CARD                HOLE         -3   -3   -3   -3   -3   -3   -3
```

LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS

09 APR 76

CRI NO. 37 TEST AREA

SUMMARY OF INPUT TAPE

INFIZ INPUT ON LOGICAL UNIT 11.

INFIZ FILE 1 GENERATED ON 06 APR 76 AT 16:07:33 WILL BE PROCESSED.

SUMMARY OF INPUT SCANNER DATA:

USER-INPUT THRESHOLDING HAS BEEN APPLIED.

PROCESSOR DISPLAY DID NOT APPLY SPATIAL FILTERING.

DATA CLASSIFIED FOR MAPTAP FILE 1 ON 10 FEB 76 .

NUMBER OF INPUT LINES = 512.

NUMBER OF INPUT SAMPLES = 512.

NUMBER OF CLASSES = 9.

NUMBER OF SUBCLASSES = 9.

NUMBER OF TRAINING FIELDS = 9.

NUMBER OF TEST OR DESIGNATE FIELDS = 0.

CRE NO. 37 TEST AREA

PROCESSING FOR FILZOM

TAPE OUTPUT ON LOGICAL UNIT 19 -- LARSYS II FORMAT.

ON INPUT TAPE BEFORE PROCESSING BEGINS 200 LINES WILL BE SKIPPED.

ON EACH LINE OF THE INPUT TAPE 160 SAMPLES WILL BE SKIPPED.

ZOOM LINE FACTOR = 1.000

ZOOM SAMPLE FACTOR = 1.000

LINE LIMIT = 250

SAMPLE LIMIT = 220

INPUT LINES 451 TO 512 WILL NOT BE PROCESSED DUE TO THE ZOOM LINE FACTOR.

ON EACH INPUT LINE, SAMPLES 381 TO 512 WILL NOT BE PROCESSED DUE TO THE ZOOM SAMPLE FACTOR.

ISLAND TEST = -3 -3 -3 -3 -3 -3 -3

UNCLASSIFIED PIXEL TEST (HOLE) = -3 -3 -3 -3 -3 -3 -3

DEFAULT CODE FOR UNCLASSIFIED PIXELS = 128

DEFAULT SYMBOL FOR UNCLASSIFIED PIXELS = 0

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09 APR 76

CRT NO. 37 TEST AREA

TRAINING FIELDS FOR FILZOM OUTPUT

FIELD	CLASS	SUBCLASS	CODE	SYMBOL	VERTICES (SAMPLE,LINE)			
1 +1.5 C	1 +1.5	1 +1.5	152	1	(9, 240)	(12, 240)	(12, 259)	(9, 259)
2 +0.75C	2 +0.75	2 +0.75	140	9	(39, 240)	(42, 240)	(42, 259)	(39, 259)
3 +0.25	3 +0.25	3 +0.25	132	0	(65, 240)	(72, 240)	(72, 259)	(65, 259)
4 -0.25	4 -0.25	4 -0.25	124	8	(96, 240)	(103, 240)	(103, 259)	(96, 259)
5 -0.75	5 -0.75	5 -0.75	116	9	(126, 240)	(133, 240)	(133, 259)	(126, 259)
6 -1.5	6 -1.5	6 -1.5	109	6	(157, 240)	(164, 240)	(164, 259)	(157, 259)
7 -2.5	7 -2.5	7 -2.5	88	2	(188, 240)	(195, 240)	(195, 259)	(188, 259)
8 -3.5	8 -3.5	8 -3.5	72	8	(217, 240)	(229, 240)	(229, 259)	(217, 259)
9 WATER	9 WATER	9 WATER	176		(319, 240)	(335, 240)	(335, 259)	(319, 259)

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CRI NO. 37 TEST AREA

SUMMARY OF OUTPUT FOR FILZOM

OUTPUT FILE 1 ON UNIT 19 -- LARSYS II FORMAT.

NUMBER OF RECORDS THAT HAVE BEEN READ FROM LOGICAL UNIT 21= 251.
NUMBER OF UNCLASSIFIED PIXELS THAT HAVE BEEN RECLASSIFIED DUE TO THE HOLE TEST (-3) FOR FILTER 7 =
TOTAL NUMBER OF HOLE PIXELS THAT HAVE BEEN RECLASSIFIED 1067.
NUMBER OF ISLAND PIXELS THAT HAVE BEEN RECLASSIFIED DUE TO THE ISLAND(-3) FOR FILTER 7 = 731.
TOTAL NUMBER OF ISLAND PIXELS THAT HAVE BEEN RECLASSIFIED = 6589.
TOTAL NUMBER OF ZOOMED OUTPUT POINTS = 55000.

PERCENT TABLE

SUBCLASS NAME	TOTAL POINTS	PERCENTAGES
+1.5	666	1.21
+0.75	1060	1.93
+0.25	1327	2.41
-0.25	3285	5.97
-0.75	15909	28.93
-1.5	8560	15.56
-2.5	8367	15.21
-3.5	2991	5.43
WATER	13332	24.24
HOLE	3	.01
UNIDEN	0	.00
OTHER	0	.00

FOR FILTER 7 THE AVERAGE CRI FOR ALL LAND PIXELS IS -1.306.

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09 APR 76

CRI NO. 37 TEST AREA

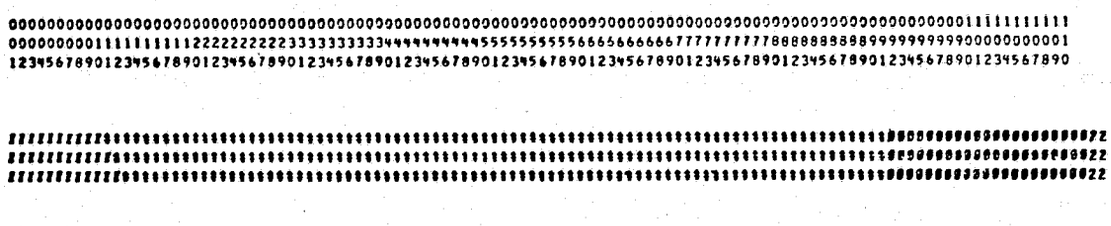
DISPLAY OF FIELD WHOLE PRODUCED BY FILZOM.

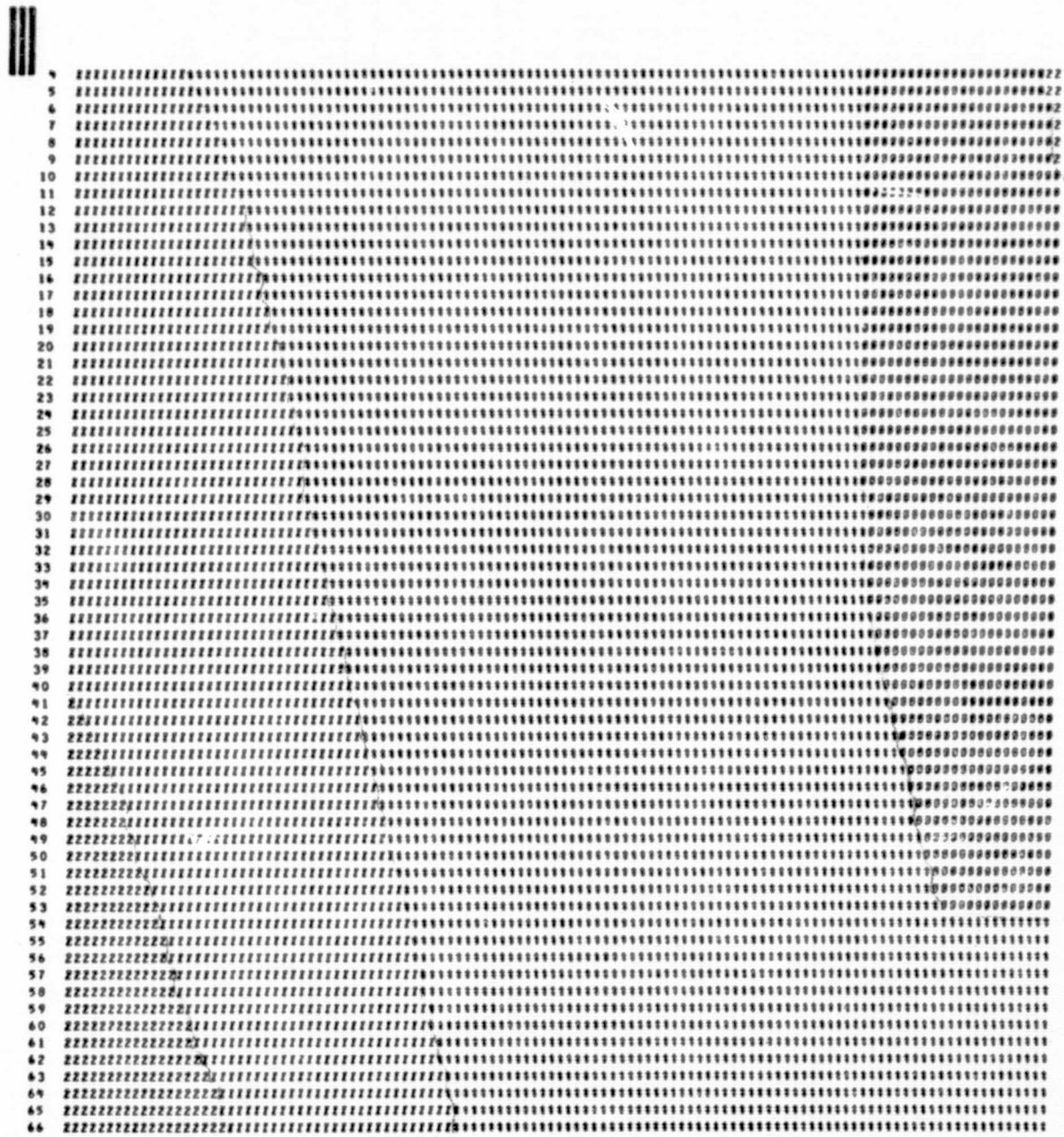
FILTER = 7 ISLAND TEST =-3 HOLE TEST = -3

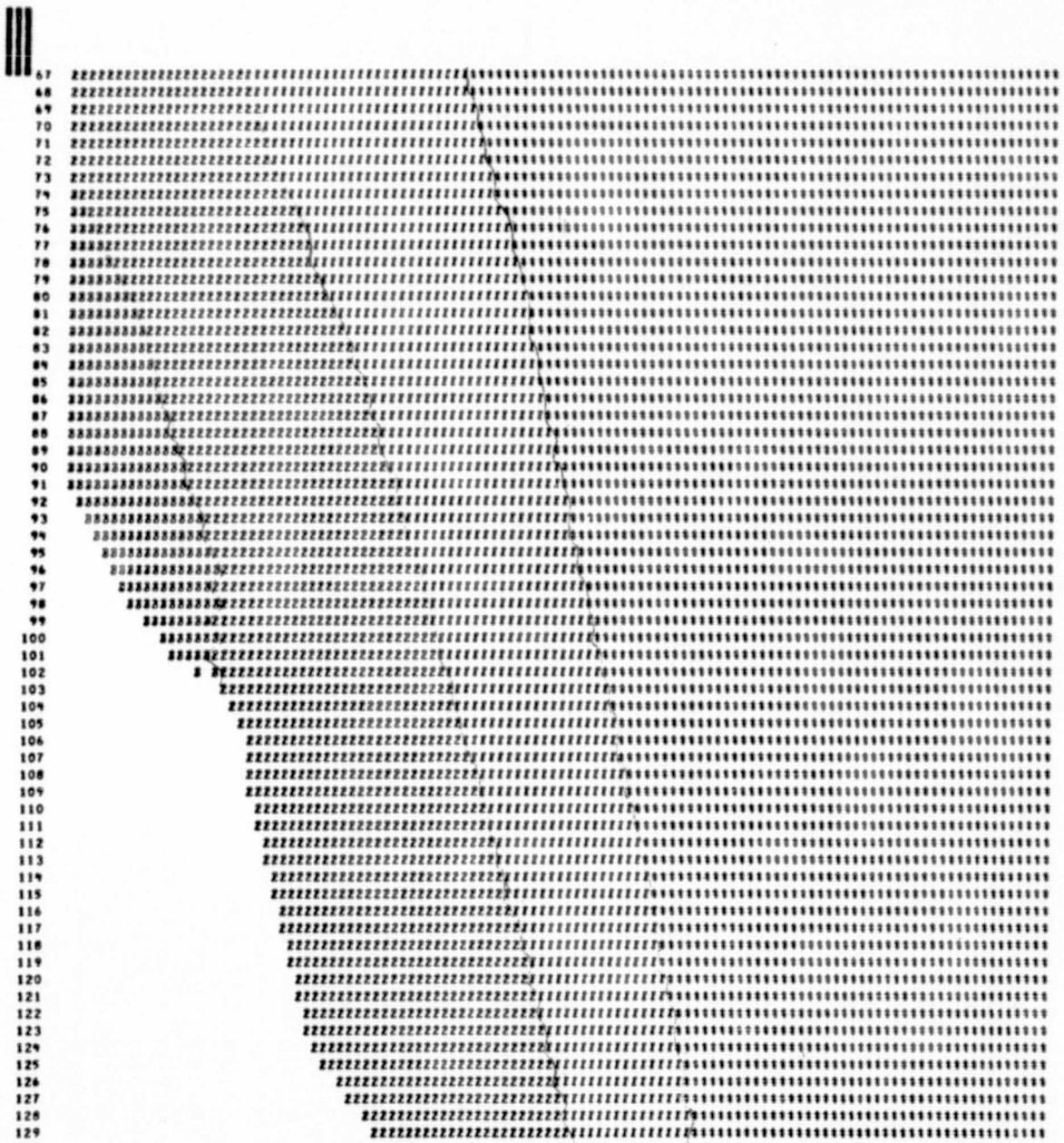
CLASS NO.	CLASS NAME	SUBCLASS NO.	SUBCLASS NAME	SUBCLASS SYMBOL
1	+1.5	1	+1.5	1
2	+0.75	2	+0.75	2
3	+0.25	3	+0.25	3
4	-0.25	4	-0.25	4
5	-0.75	5	-0.75	5
6	-1.5	6	-1.5	6
7	-2.5	7	-2.5	7
8	-3.5	8	-3.5	8
9	WATER	9	WATER	

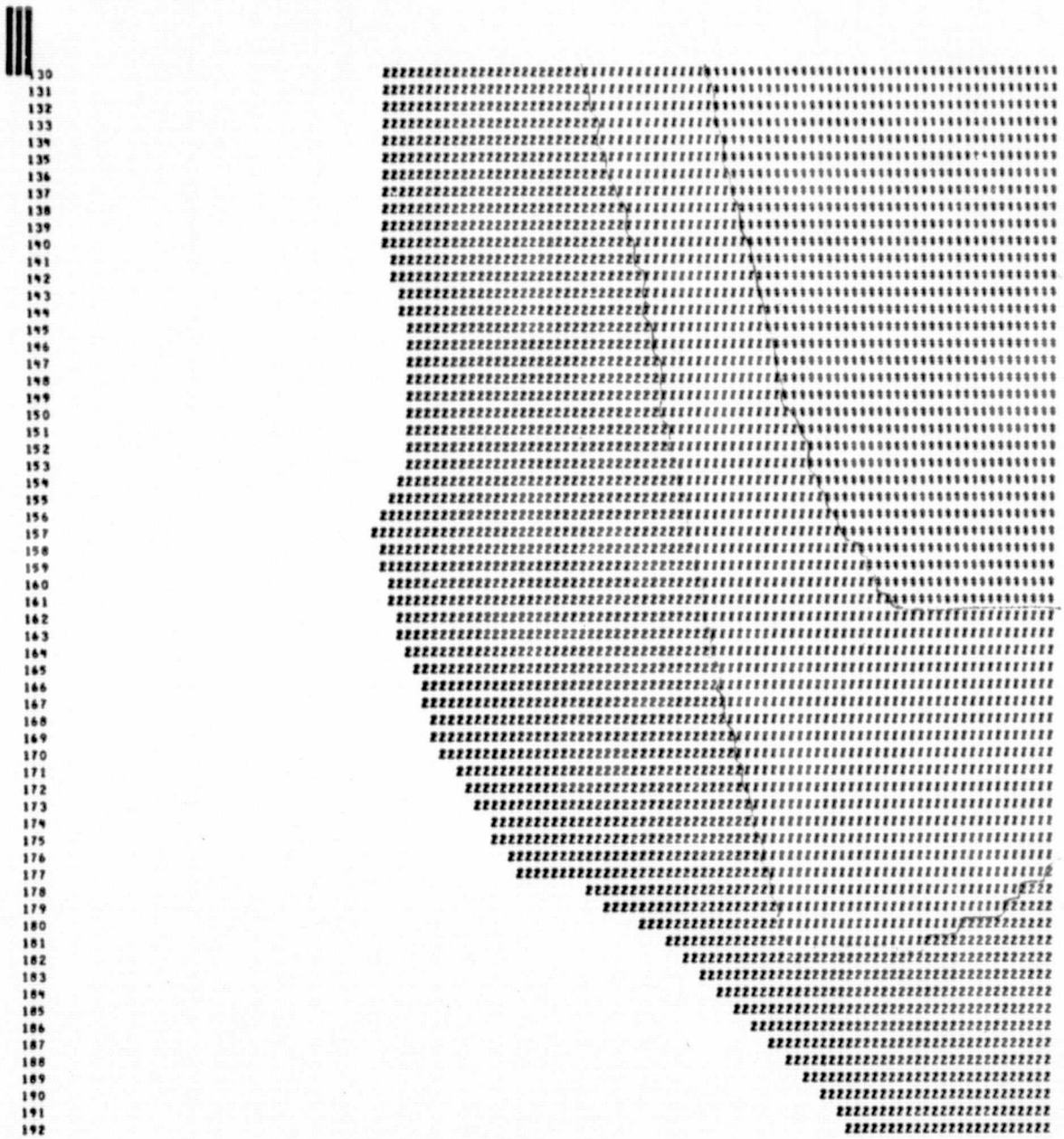
SPECIAL SYMBOLS

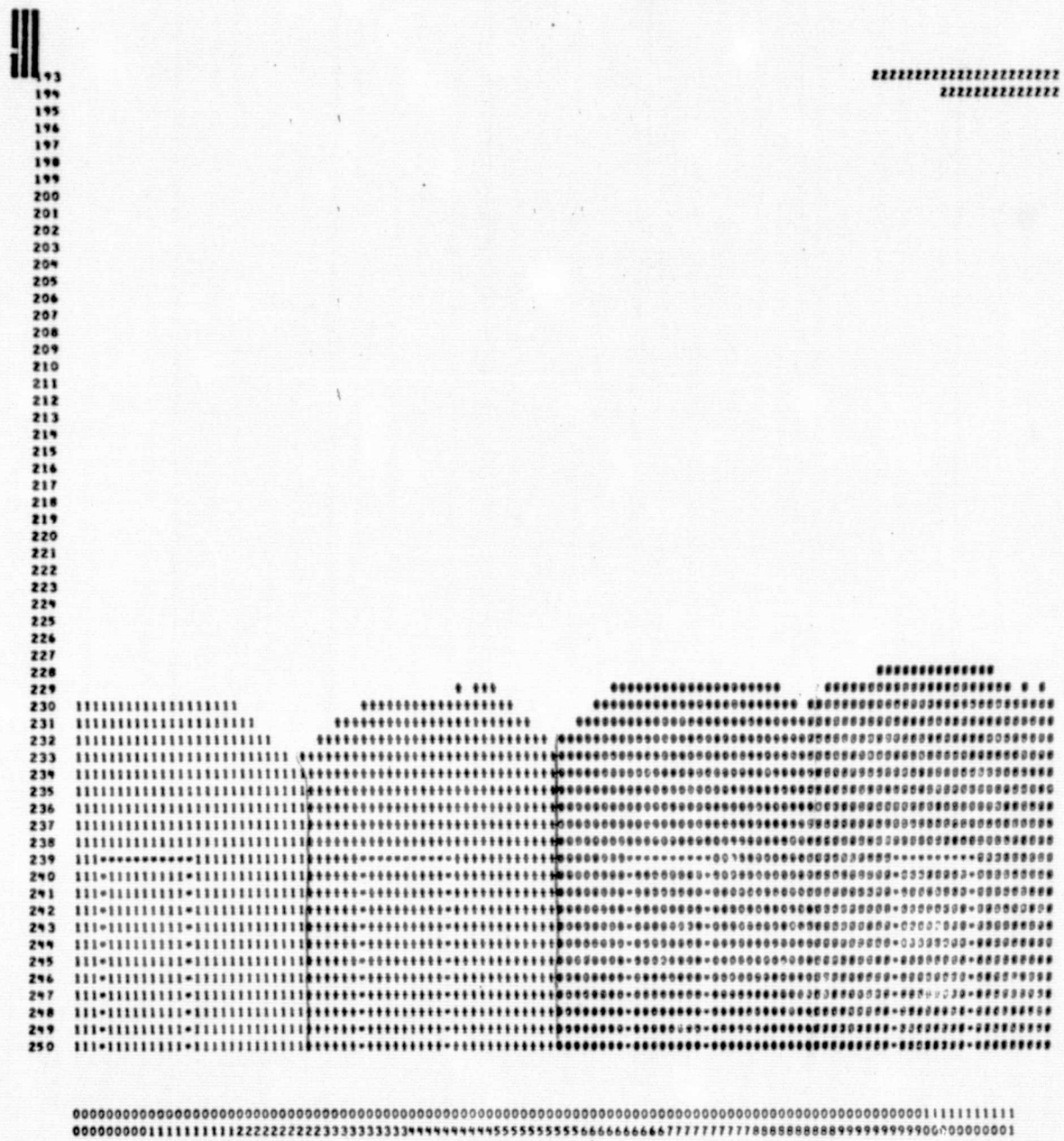
10	HOLE	0
11	TRNFLD	*
12	TSTFLD	+
13	DUPFLD	#











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09 APR 76

CRI NO. 37 TEST AREA

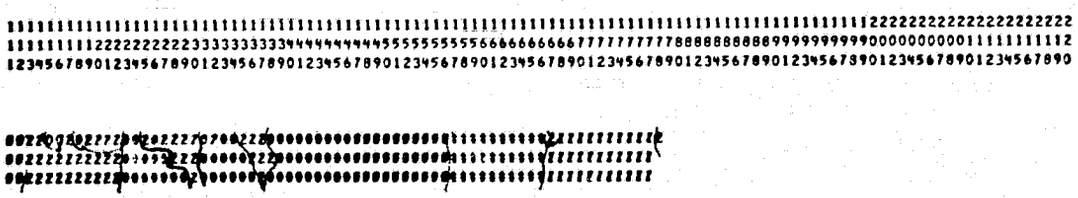
DISPLAY OF FIELD WHOLE PRODUCED BY FILZOM.

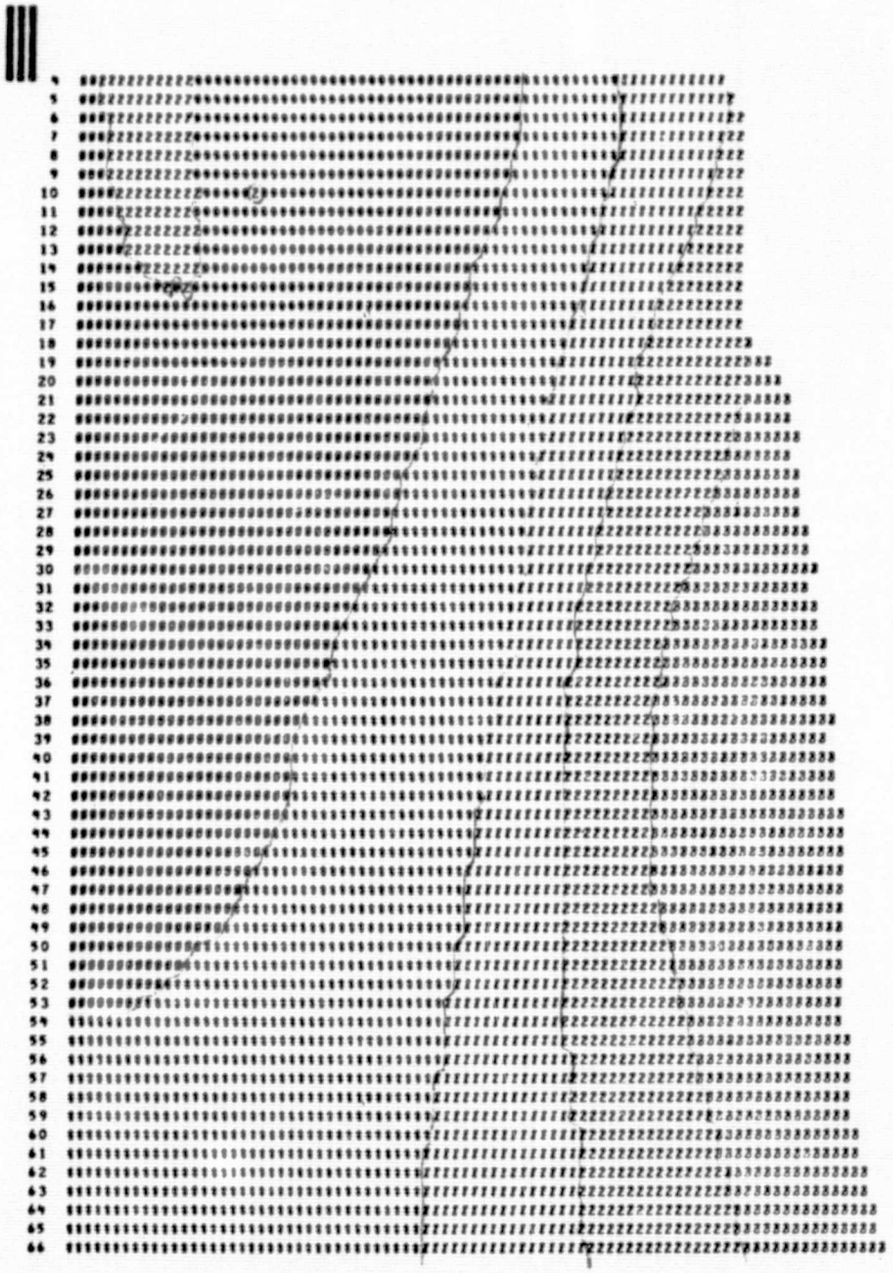
FILTER = 7 ISLAND TEST =-3 HOLE TEST = -3

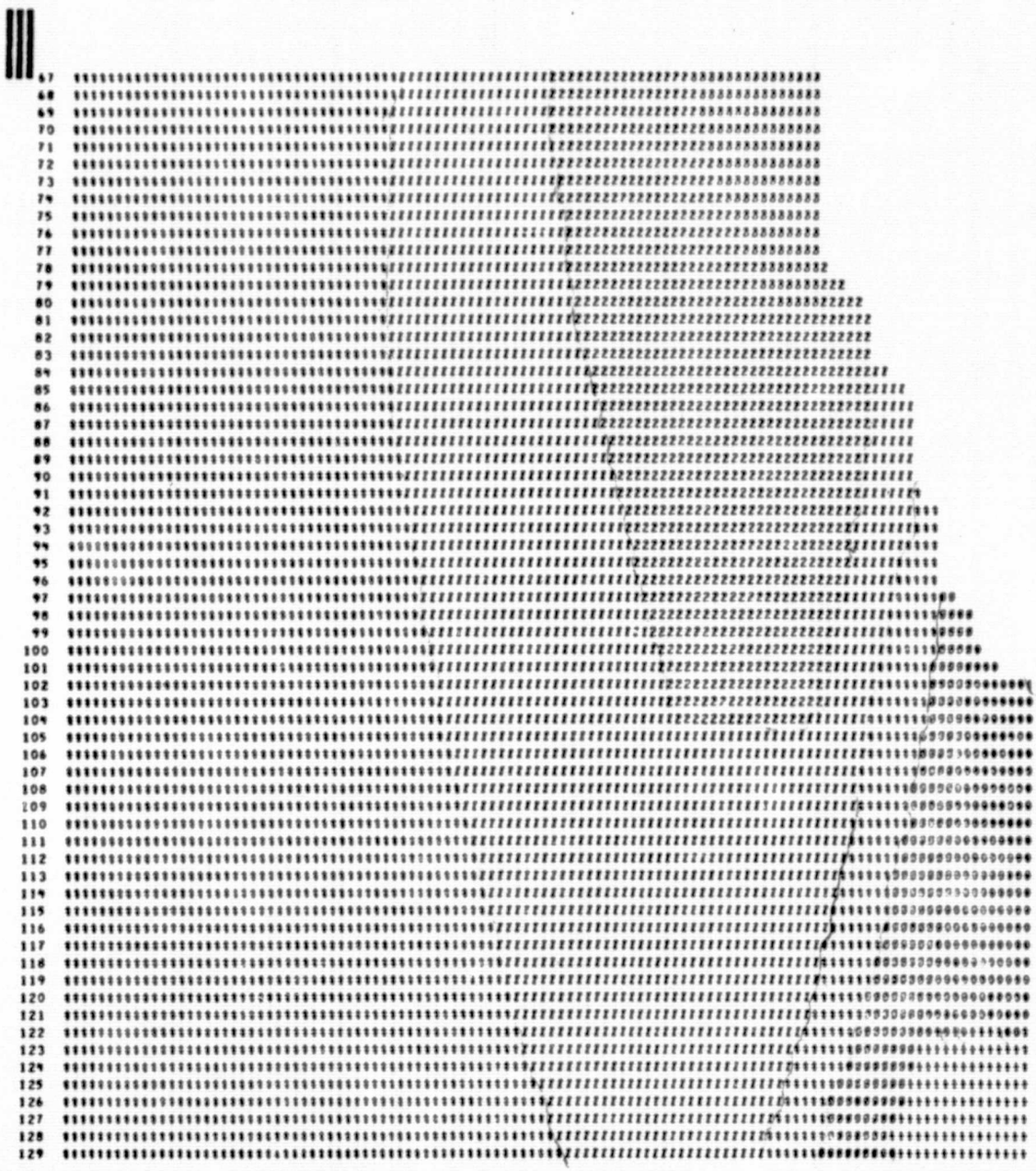
CLASS NO.	CLASS NAME	SUBCLASS NO.	SUBCLASS NAME	SUBCLASS SYMBOL
1	+1.5	1	+1.5	1
2	+0.75	2	+0.75	2
3	+0.25	3	+0.25	3
4	-0.25	4	-0.25	4
5	-0.75	5	-0.75	5
6	-1.5	6	-1.5	6
7	-2.5	7	-2.5	7
8	-3.5	8	-3.5	8
9	WATER	9	WATER	

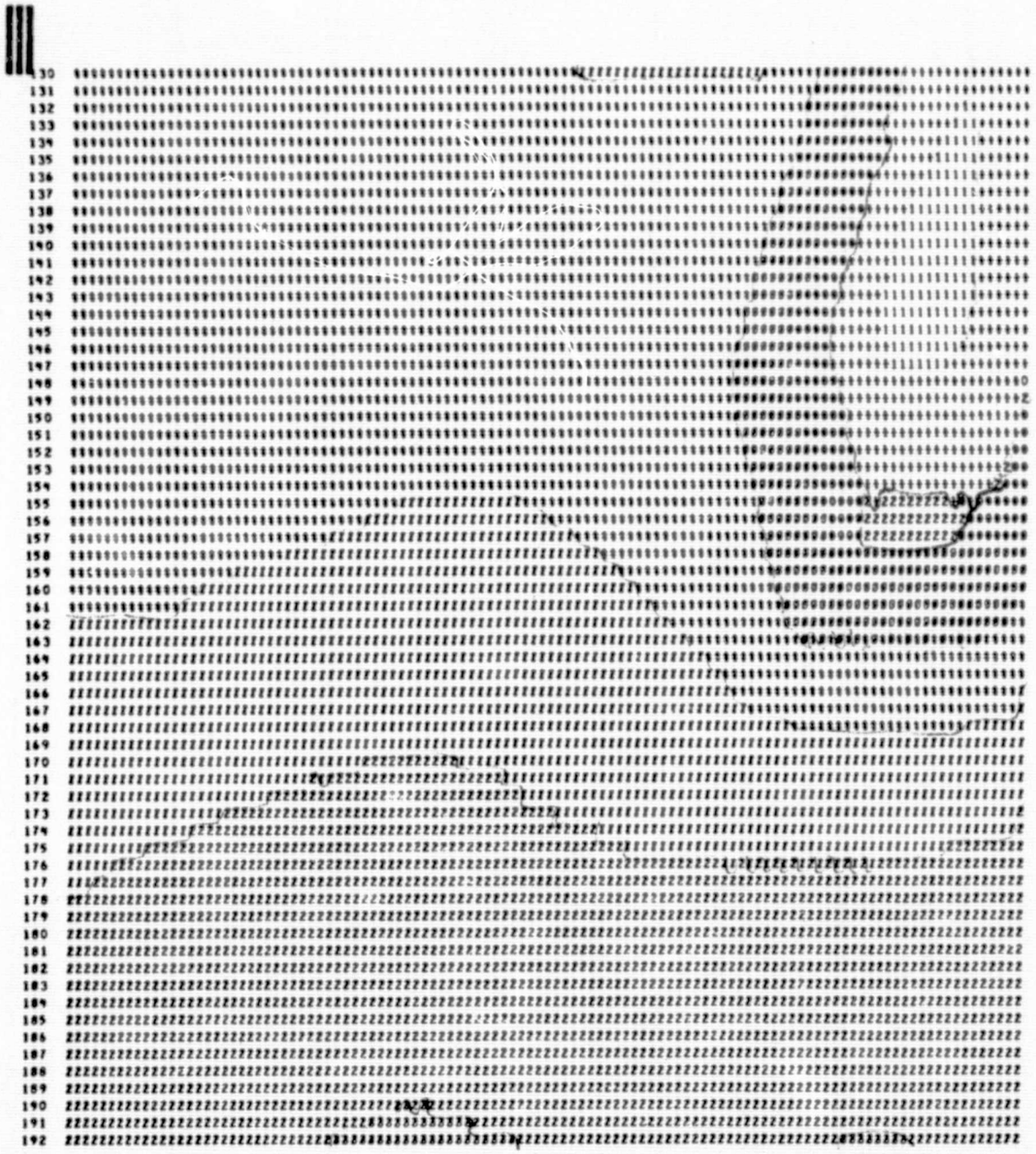
SPECIAL SYMBOLS

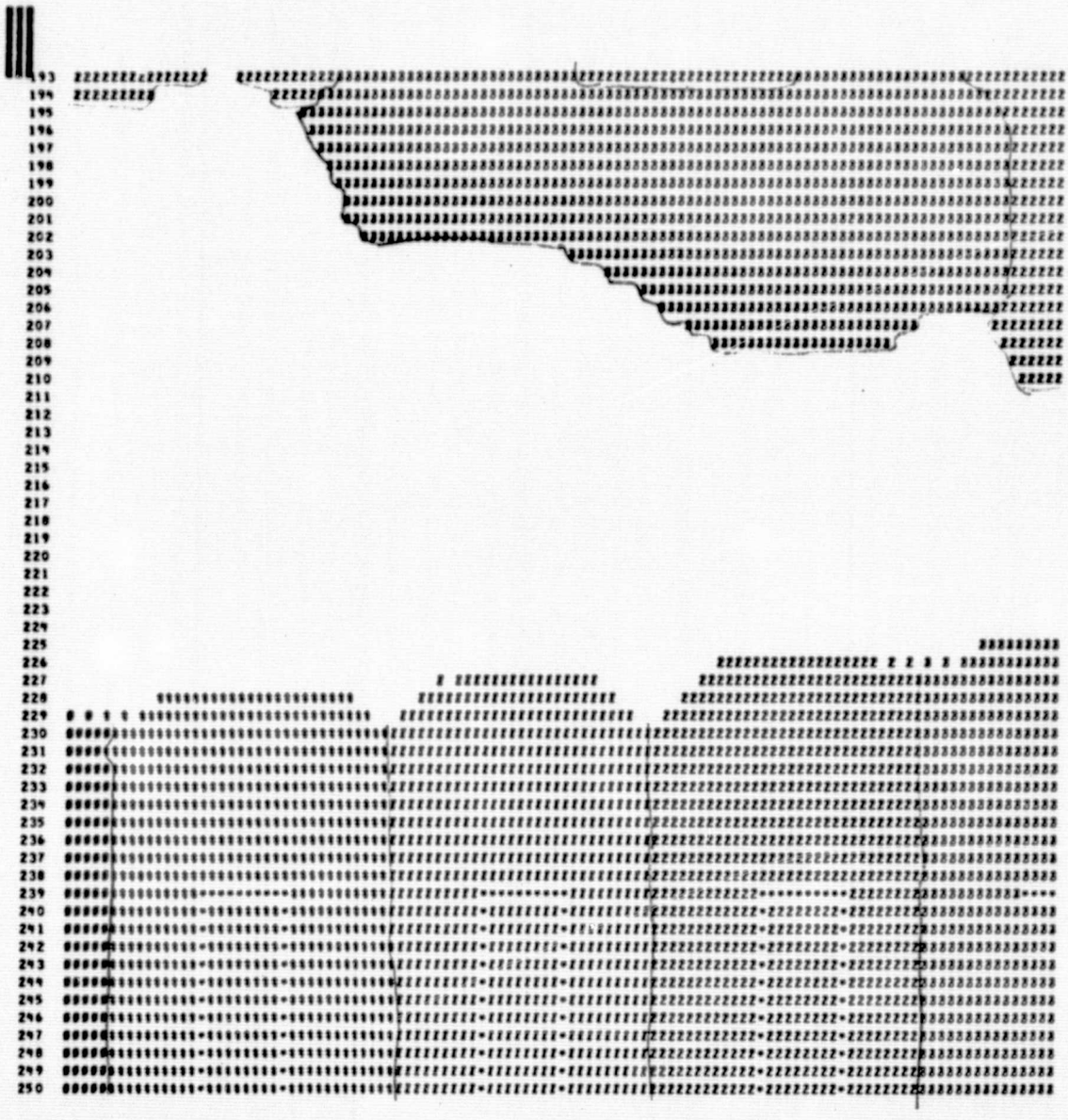
10	HOLE	0
11	TRNFLD	*
12	TSTFLD	+
13	DUPFLD	#











1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

TIME FOR FILZOM = 4.752 MINUTES.

APPENDIX E

EXCERPT FROM DISPLAY PROCESSOR, USER DOCUMENTATION EOD-LARSYS WITH MODIFICATIONS

APPENDIX E

EXCERPT FROM DISPLAY PROCESSOR, USER DOCUMENTATION
EOD-LARSYS WITH MODIFICATIONS

The DISPLAY processor reads a classification tape (MAPTAP) output by CLASSIFY and performs the following functions:

- Provides a line-printer map of each classified field on the MAPTAP. Training and test fields within the classified image are outline.
- Produces classification summaries for each classified field. These summaries provide a break-down on the number of pixels classified and the number of pixels thresholded from each subclass, class, and category.
- Optionally produces an intensive test site classification summary for one zone type versus all 'other' zone types. The user specified zone may be a category, class or subclass.
- Allows the user to 'designate' fields to be excluded from the classification summaries. Fields may be designated 'unidentifiable' or 'other'. Pixels within the unidentifiable fields are counted and are not considered in the classification summaries. Pixels within the designated 'other' fields are counted as a separate zone type regardless of how they were classified. In the intensive test site report these pixels are included in the 'other' category.

  All pixels within the 'designated' areas are printed with the pound, '#', symbol.

  See section 12.4.4[3] for sample input of 'designated' fields.
- If thresholding is requested, assigns a pixel to the threshold class if:

$$Q_i > t_i$$

where: Q_i = the value of the quadratic form $(x-\mu_i)\ K_i^{-1}\ (x-\mu_i)^T$ as computed by CLASSIFY for subclass i

μ_i = mean vector for subclass i

K_i = covariance matrix for subclass i

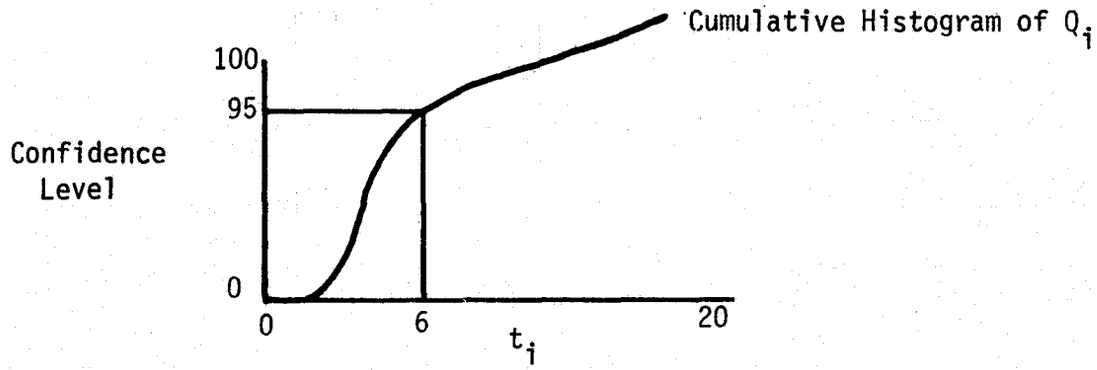
t_i = threshold value for subclass i

- Allows the threshold value t_i to be determined in one of three ways.

  1. User input. The user inputs the exact threshold value. See control cards (THRESHOLD) and (OPTION THRESHOLD VALUE).

  2. Chi square. The user inputs confidence levels for each subclass on the THRESHOLD card and includes the OPTION CHI-SQUARE. The program obtains the chi-square threshold value from an internal chi-square functional routine.

  3. Empirical. The user inputs confidence levels for each subclass on the THRESHOLD card and includes the OPTION EMPIRICAL card. The program determines the empirical distribution function for each sub-class from the cumulative histogram of the quadratic form for correctly classified pixels in the ground truth areas, (i.e. training or test fields).



From this example curve the user input of a 95% confidence level for sub-class i would result in a threshold value of 6.0.

- Produces plots of the empirical distribution function when the OPTION PLOT is exercised.
- Optionally performs a four nearest neighbor spatial filtering on the classified image. This algorithm takes into consideration that, in many instances, a pixel is most likely to be like its nearest neighbors. When the option is exercised (via the OPTION FILTER control card), the four nearest neighbors of each pixel are examined. If all the neighbors are classified the same and the pixel in question is classified differently, then it is assumed that the pixel was classified incorrectly and its classification is changed.

Line 1	C
2	C X C
3	C

The pixel classified as X will be changed to C. See reference 9[3] for more information on this algorithm.

- Optionally outputs the classified image on to tape in either LARSYS-2 or Universal format. (This option is exercised via the FORMAT control card.)
- Provides classification performance summaries for ground truth areas within the classified image. The following six performance summaries are available to the user. 'Fields' in these reports are training fields used in STAT or ISOCLS and passed to DISPLAY on the MAPTAP, or they may be 'test' fields input directly to DISPLAY (see section 12.4.4)[3]

  1. Field by subclass
  2. Field by class
  3. Field by category
  4. Class by subclass
  5. Class by class
  6. Class by category

12.1 INPUT FILES

The only input file required for DISPLAY is the MAPTAP (Section 4.4)[3] file output by CLASSIFY. This file must be assigned to logical unit B (Fortran unit 2). If DISPLAY is executed back-to-back with CLASSIFY the file may be a assigned to FASTRAND. However, if DISPLAY is to be executed later, the file must be assigned to tape and saved when CLASSIFY is executed.

12.2 OUTPUT FILES

The DISPLAY processor will optionally generate a tape of the classified image for display on the DAS. The control card "FORMAT" (Section 12.4.3)[3] allows the user to exercise this option. When requested the tape should be assigned to a 9-track tape drive for compatibility with the DAS tape drives. The tape assignment must be made to logical unit N (Fortran unit 16).

The modified DISPLAY processor will optionally generate a tape containing the classified image and pertinent information about each zone. The option is exercised via the FIZKEY control card. The tape assignment must be made to logical unit I (FORTRAN unit 11). If more than one execution of DISPLAY is desired, multiple files can be output on the INFIZ tape.

12.3 SCRATCH FILES

The random access drum file is used as a scratch file in DISPLAY. No assignment is necessary.

12.4 CARD INPUT

All formats referred to in this section are defined in section 3.

12.4.1 PROCESSOR CARD

Keyword	Parameter	Function
$DISPLAY	FILE = N (Default N = 1)	Designates to the monitor routine which processor is to be executed. Parameter value N is the file number on the MAPTAP file to be displayed.

12.4.2 SPECIAL SYSTEM DECKS

None

12.4.3 CONTROL CARDS

Keyword	Parameter Value	Function
OPTIONS	STATS (DEFAULT: No statistics printed)	Prints statistics for subclasses used in the previous CLASSIFY run. These statistics are saved on the MAPTAP.
OPTIONS	PCT (DEFAULT: Performance summary printed for classes only).	Print a performance summary on a per field basis as well as per class basis. This is a performance summary for ground truth fields, (i.e. training or test fields within the classified image).
OPTIONS	NOMAP (DEFAULT: Map printed)	Do not print a map of the data. Only a performance summary is printed.
OPTIONS	FILTER (DEFAULT: Spatial filtering is not performed)	Perform four nearest neighbor spatial filtering on the classified image.
OPTION	FIZKEY (DEFAULT: No INFIZ tape is generated).	An INFIZ tape is generated.

Keyword	Parameter Value	Function
THRESHOLD	T_1,T_2 ... (DEFAULT: No thresholding)	Use the threshold values T_1,T_2 ... for subclasses 1,2,... respectively. Thresholds must be positive floating point numbers. One value must be specified for each subclass on the MAPTAP. Thresholds may also be specified in the following format: $N_1*T_1,N_2*T_2,...$ where N_1 and N_2 are integers which specify how many consecutive times the corresponding thresholds should be used. For the CHI-SQUARE option and the EMPIRICAL option the numbers input on this card are the confidence levels. (i.e. T_1 = .99 means that the user wants to maintain 99% or reject 1%). For the THRESHOLD VALUE option, the numbers input on this card are the actual threshold values to be used for thresholding (i.e. T T_1 = 10.02 means that the threshold value for subclass 1 is 10.02.

Keyword	Parameter Value	Function
OPTIONS	CHI SQUARE (DEFAULT: None) *See footnote	Compute thresholds from the chi-square distribution, using the confidence levels input on the THRESHOLD control card.
OPTIONS	PLOT	Plot the empirical distribution functions obtained from the cummulative histograms of the quadratic form for each subclass.
OPTIONS	EMPIRICAL (DEFAULT: None) *See footnote	Compute the empirical threshold values using the percentages input on the THRESHOLD control card.
OPTION	THRESHOLD VALUES (DEFAULT: None) *See footnote	Use the numbers input on the THRESHOLD control card for the actual threshold value.
SYMBOLS	S_1, S_2 ... (DEFAULT: 1,2, -9 A,B,C,D, ... Z, 1,2,3,4)	Assign symbols S_1, S_2, ... to subclasses 1,2, ... respectively.

*If the THRESHOLD control card is input, one of the three options (CHI-SQUARE, EMPIRICAL, or THRESHOLD VALUES) should be input also. If the OPTION card is omitted and the THRESHOLD card is input, chi-square is assumed.

Keyword	Parameter Value	Function
ACREAGE	TOTAL = X, CROP = Y, OTHER = Z (DEFAULT: None)	The total acreage in the intensive test site is X. Acreage of the crop named on the 'CROP' control card is Y. Acreage of all other crop types in the intensive test site is Z. X, Y, and Z are floating point numbers. This input is meaningful only if the 'CROP' control card is input also.
SITE	Any 24 characters (DEFAULT: Blanks)	Name of the intensive test site. This is used in printing the heading for the intensive test site report.
ANALYST	Any 18 characters (DEFAULT: Blanks)	Name of the data analyst. This is printed in the heading for the intensive test site report.
PROCEDURE	Any 60 characters (DEFAULT: Blanks)	Procedure used in classification of the intensive test site. This is printed in the heading for the intensive test site report.

Keyword	Parameter Value	Function
FORMAT	NAME (DEFAULT: No output classification map tape is generated by DISPLAY)	NAME = UNIVERSAL The output classification tape is generated in the Universal format. NAME = LARSYS The output classification tape is generated in the LARSYS-2 format
HED1	Any 60 characters beginning in column 11. (DEFAULT: LYNDON B. JOHNSON SPACE CENTER)	Replace first header line with the 60 characters in the parameter field.
HED2	Any 60 characters beginning in column 11. (DEFAULT: HOUSTON, TEXAS)	Replace second header line with the 60 characters in the parameter field.
COMMENT	Any 60 characters beginning in column 11. (DEFAULT: blanks)	Print a comment line using the 60 characters found in the parameter field.
DATE	Any 12 characters beginning in column 11. (DEFAULT: current date)	Replace the date in the standard heading with the 12 characters in the parameter field.

Keyword	Parameter Value	Function
END	(none)	Signals the end of the control cards
$END*	(none)	Signals the end of all control cards for the current processing function.