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FINAL DESIGN SPECIFICATION
FOR
EOD-LARSYS/STATISTICS AND DATA TRANSFORMATION
PROCESSORS MODIFICATION

Job Order 71-593

(TIRF 77-0034)

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

Contract NAS 9-15200
For

EARTH OBSERVATIONS DIVISION

SPACE AND LIFE SCIENCES DIRECTORATE

National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
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CONTENTS

CONTENTS

1. SCOPE

This document contains the design specifications and description of the modifications made to the Statistics and Data Transformation processors on the Procedure I tape of the EOD-LARSYS system. The requirements that were satisfied are specified in the task agreement 77-3 titled, "LARSYS/Data Transformation Processor Modification" originally dated 6/17/77 and revised 9/12/77 and the "EOD-LARSYS System Design Modifications for PCG Transformation Requirements" memo, dated 8/24/77. The modification requirements were provided by the Research, Test, and Evaluation Branch (RT&E) of the Earth Observations Division (EOD), of NASA/JSC.

The new modifications to the Statistics and Data Transformation processors are found on the LARSYS PCF tapes X03635 and X03597.

2. APPLICABLE DOCUMENTS

The following documents will serve as references:

- EOD-LARSYS Users' Document, LEC-3984, March 1977
- Task Description and Agreement, dated 6/17/77, "LARSYS/Data Transformation Processor Modification"
- Symat, Covar, Test Procedures for Matrix Calculations by W. L. Morris, C. L. Wiginton, and D. K. Lowell, Report #17, Contract NAS 9-12777, dated October 1972
- Principal Component Greenness (PCG) Transformation Requirements for LARSYS by R. A. Abotteen
- EOD-LARSYS System Design Modifications for PCG Transformation Requirements, dated August 24, 1977
- Action document: CAT1, TIRF: 77-0034, (New requirements for checking the first eigenvector of the unitary matrix)

3. SYSTEM DESCRIPTION

In order to load and execute the DATA-TR processor on the Procedure I tape, the DSPLAY, SELECT, and LABEL processors were removed from the Map and commented out in the Montor routine.

This document describes the changes that were implemented into the existing Procedure I Statistics and Data Transformation processors to generate and output an optional Greenness and/or Principal Component Greenness (PCG) Image. The basic image will continue to be a multi-temporal/multi-pass data tape. The result is a transformation which will assist in LACIE-type classification. The user will be provided the options of:

a. Filtering raw or sun angle corrected data vectors in the Statistics processor,

b. Using sun angle corrected data in the Data - Transformation processor to compute a greenness and/or principal component image.

3.1 <u>HARDWARE DESCRIPTION</u>

N/A

3.2 <u>SOFTWARE DESCRIPTION</u>

3.2.1 SOFTWARE COMPONENT NO. 1 (STAT)

The Statistics processor, STAT, will be modified to calculate on option the mean and covariance matrices from filtered and/or sun angle corrected data. These options will be provided if the new control cards 'SUNANG' and 'OPTION WATER' or 'OPTION TASSEL' are input by the user.

If the 'SUNANG' control card is present, the channel-oriented sun angle bias and gain correction factors will be applied to the corresponding channel component of the raw data vector.

$$X_T(I) = SAGAIN(I) * X_R(I) + SABIAS(I)$$

where $X_T(I)$ = the I-th channel component of the sun angle corrected data

SAGAIN(I) = the sun angle gain correction factor for the I-th channel

SABIAS(I) = the sun angle bias correction factor for the I-th channel

$X_R(I)$ = the I-th channel component of the raw data

The user will have the option of applying one of the following filters to the raw or sun angle corrected data vectors:

a. Water filter - initiated by the input of the 'OPTION WATER' control card. (see Appendix A.2 for the 'Water' filter test)

b. Tassel Cap filter - initiated by the input of the 'OPTION TASSEL' control card. (see Appendix A.2 for the 'Tassel Cap' filter test)

3.2.1.1 Linkages

The STAT processor uses the FORTRAN-V compiler, Univac software system routines, EOD-LARSYS utility routines, and the COMBK4 and STBASE common blocks.

See Appendix A for the modifications to be made to the individual subroutines.

3.2.1.2 Interfaces

The STAT processor interfaces with the EOD-LARSYS executive routine, MONTOR.

3.2.1.3 Inputs

The processor requires an MSS data tape (DATAPE). The default tape assignment is the logical unit C (Fortran Unit 3).

- NEW CONTROL CARDS

Keyword	Parameter	Function
(col. 1)	(col. 11-72)	
SUNANG	Tape (Default - no sun angle correction applied)	Sun angles will be extracted from the ERIPS 'unload' MSS image tape.
SUNANG	$n_1, \ldots, n_j$ (Default- no sun angle correction applied	n_i = sun angle for pass i, $1 \le i \le 8$. Sun angles are integer numbers which are $5 \le n_i \le 85$.
B-MATRIX	Cards (Default - none)	The B-Matrix will be found on the cards immediately following this control card.
B-MATRIX	File (Default - none)	The subroutine BMFIL will be called to read the B-Matrix off of the file, BMFILE
THRESHOLD	$a_1, \ldots, a_j$ (Default - for 'Tassel Cap' filter, $a_1 = 100$ $a_2 = 8.0$ $a_3 = 6.0$ $a_4 = 10.0$ $a_5 = 35.0$ for the 'Water' filter, $a_1 = 43.0$ $a_2 = 12.0$)	The a_i's are decimal (floating point) numbers, separated by commas; if the user requested a 'Tassel Cap' filter, j must be equal to 5; if the 'Water' filter was requested, j must be equal to 2.

Keyword	Parameter	Function
BIAS	$b_1, \ldots, b_4$ (Default - b_i = 0.0)	The b_i's are decimal (floating point) numbers, separated by commas; the bias values will be used only if the 'Tassel Cap' filter is requested.
OPTION	Tassel (Default - none)	Initiates the Tassel Cap filtering.
OPTION	Water (Default - none)	Initiates the Water filtering.

- MODIFIED CONTROL CARD

Keyword	Parameter	Function
(col. 1)	(col. 11-72)	
CHANNELS	Data = $l_1, \ldots, l_n$, (Default - n = 30), Filter = $m_1, \ldots m_j$ (Default - none)	The l_i's and m_i's are integer channel numbers, separated by commas; they must be a subset of the MSS Image tape. The l_i's will be used in the generation of the mean and covariance matrix. The m_k's are the channels to be used in the user-requested filter process. If the 'Tassel Cap' filter was requested, j must be equal to 4 (based on 4 channels/pass). If the 'Water' filter was requested j must be equal to 2.

The function and/or default value of the following 'SIZE' control cards will be initialized if the 'SUN ANGLE' control card is present:

1) XHIGH will default to 3000

2) XLOW will default to 0

3) XSIZ will default to 101

4) SPECBAS will default to $\min_{k\epsilon \text{ fields}}(\min_{j\epsilon \text{ channels}}(\mu_{kj} - \sigma_{kj}))$

Several modifications have been made to the function section of the 'SIZE SPECBAS = I' control card. If the 'SUN ANGLE' control card was read in, the

1) Y - axis increment will be set equal to $\{[\max_{k\epsilon \text{ fields}}(\max_{j\epsilon \text{ channels}}(\mu_{kj} + \sigma_{kj}))] - [\min_{k\epsilon \text{ fields}}(\min_{j\epsilon \text{ channels}}(\mu_{kj} - \sigma_{kj}))]\}/49 + 1.0$

2) The range of the Y-axis will be:

$(Y_{min} = \text{SPECBAS}, Y_{max} = \max_{k\epsilon \text{ fields}}(\max_{j\epsilon \text{ channels}}(\mu_{kj} + \sigma_{kj}))$

3.2.1.4 Outputs

The Statistics processor will continue to output the statistics on the default or user-requested SAVTAP file. The default logical unit is A (Fortran unit 1) and the default file number is 1. The line printer and file output remain unchanged.

3.2.1.5 Storage Requirements

See Appendix A

3.2.1.6 Description

The Statistics processor, STAT, of the EOD-LARSYS system has been modified to optionally calculate and output on SAVTAP a mean vector and mixture covariance matrix Σ_x calculated from the optionally filtered raw or sun angle corrected data vectors. Several new control cards will be implemented in the STAT processor to determine if the above calculations are to take place. The presence or absence of the 'SUNANG' control card will determine if raw or sun angle corrected data vectors are to be used in the generation of the above matrices. The user will also have the option of filtering out some data vectors from the above calculations by the presence or absence of the 'OPTION TASSEL' or 'OPTION WATER' control card.

The new mixture covariance matrix will be used in the DATA-TR processor to generate the mixture covariance matrix of the Green Image bands.

3.2.1.7 Flowchart

Appendix C

3.2.1.8 Listing

Appendix E

3.2.2 SOFTWARE COMPONENT NO. 2 (DATA-TR)

The Data Transformation processor, DATA-TR, of the EOD-LARSYS system has been modified to perform an optional Green Image and/or Principal Component Greenness (PCG) Image Transformation (s). The addition of a SUNANG control card allows for the sun angle gain and bias correction factors to be applied to the raw data before the above mentioned transformation(s). The Green Image and/or PCG image are additional to the current options for performing transformations in DATA-TR.

3.2.2.1 Linkages

The DATA-TR processor uses the Fortran-V complier, Univac software system routines, EOD-LARSYS utility routines, and the INFORM, TRBLCK, and GLOBAL common blocks.

3.2.2.2 Interfaces

The DATA-TR processor interfaces with the EOD-LARSYS executive routine, MONTOR.

3.2.2.3 Inputs

The processor requires an MSS data tape (DATAPE). The default tape assignment is the logical unit C (Fortran Unit 3).

- NEW CONTROL CARDS

Keyword (col. 1)	Parameter (col. 11-72)	Function
OPTION	Green (Default - Green image not generated for output)	The Green image will be generated and output.

Keyword (col. 1)	Parameter (col. 11-72)	Function
OPTION	PCG (Default - No Principal Components Green Image output)	The PCG image will be generated and output.
FORMAT	Universal (Default - Universal)	The transformed data will be output in the Universal format.
FORMAT	LARSYS (Default - Universal)	The Transformed data will be output in the LARSYS II format.
SUNANG	Tape (Default - no sun angle correction applied)	Sun angles will be extracted from the ERIPS "unload" MSS image tape.
SUNANG	$n_1, \ldots, n_j$ (Default - no sun angle correction applied)	n_i = sun angle for pass i, $1 \leq i \leq 8$. Sun angles are integer numbers, $5 \leq n_i \leq 85$.
TRFORM	OUTPUT/UNIT=N, FILE=M (Default - N=14, M=1)	N = the tape's Fortran logical unit number that the new image of transformed data is to be output on. M = the file number that the new image is to be output on. If both Greenness and PCG are to be generated, the former image will be on file M and the latter image on file (M+1)

3.2.2.4 Outputs

The Data-Transformation processor will output the transformed/rescaled data on the default or user-requested TRFORM file (TRNSFL) and/or unit, (TRFORM) in either the Universal or LARSYS II format. The default logical unit is L (Fortran unit 14) and the default file number is 1.

The two additional optional transformed/rescaled data output are Green Image and Principal Component Greenness (PCG) Image. If both Green and PCG images are to be generated, the Green image will be output on TRNSFL and PCG on TRNSFL+1.

3.2.2.5 Storage Requirements

See Appendix B

3.2.2.6 Description

In order to allow the user to optionally generate and output raw or sun angle corrected Green Image and/or PCG Image, several existing subroutines will be modified. In addition, several new subroutines and formulas will also be implemented into the Data Transformation processor.

The scaling parameters MAX, MIN, and CON calculated in KBTRAN will be derived from the sun angle corrected SAVTAP subclasses' mean and standard deviation terms when the sun angle correction option is requested.

The new subroutine GETGCV will be called to pull out the mixture covariance matrix Σ_x from SAVTAP. The new subroutine SUNF2 will provide the sun angle correction parameters.
The green image will be generated as follows:

$$\vec{G} = A\vec{x} + \vec{b}$$

where $\vec{G}$ = transformed green image vector

$\vec{x}$ = raw (or sun angle corrected) data vector

A = matrix in which each row contains the L1, L2, or user-specified Kauth greenness vector (stored internally in BMAT in the 'B-Matrix' format)

$\vec{b}$ = default or user-specified bias vector

The covariance matrix Σ_x will be used to generate the Green Image's covariance matrix Σ_G according to the formula:

$$\Sigma_G = A \; \Sigma_X \; A^T$$

where Σ_G = the Green Image's covariance matrix

Σ_X = the (optionally) filtered raw or sun angle corrected covariance matrix calculated in STAT

A^T = the transpose of the A transformation matrix

The newly generated covariance matrix Σ_G will then be input into the new subroutine PCMMAT to derive an nxn unitary matrix PCM.

The PCG image will then be generated as follows:

$$\vec{P} = (PCM)\ \vec{G}$$

where $\vec{P}$ = n-dimensional PCG image vector (n - number of passes; i.e., LANDSAT acquisitions)

PCM = an nxn unitary matrix obtained from PCMMAT

$\vec{G}$ = n-dimensional green image vector

The currently available options for rescaling the transformed data to a range of 0-255 for output will be unchanged. All rescaling options will be available to be applied to the Green image and/or the PCG image created as a result of these modifications.

3.2.2.7 <u>Flowchart</u>

Appendix D

3.2.2.8 <u>Listing</u>

Appendix F

4. OPERATION

The following section describes the modifications made to the Statistics and Data Transformation processors via the added or revised control cards.

4.1 USER DOCUMENTATION

The following list contains the new or revised control cards which were programmed into the STAT and DATA-TR processors. The format of these control cards remain in the standard EOD-LARSYS format; i.e. the keyword must begin in column 1 and the parameter(s) in column 11. The parameter list must end at or before column 72.

Stat:

- NEW CONTROL CARDS

Keyword (col. 1)	Parameter (col. 11-72)	Function
SUNANG	Tape (Default - no sun angle correction applied)	Sun angles will be extracted from the ERIPS 'unload' MSS image tape.
SUNANG	$n_1,\ldots,n_j$ (Default no sun angle correction applied	n_i = sun angle for pass i, $1 \leq i \leq 8$. Sun angles are integer numbers which are $5 \leq n_i \leq 85$.
B-MATRIX	Cards (Default - none)	The B-Matrix will be found on the cards immediately following this control card
B-MATRIX	File (Default - none)	The subroutine BMFIL will be called to read the B-Matrix off of the file, BMFILE

Keyword	Parameter	Function
THRESHOLD	$a_1,\ldots,a_j$ (Default - for 'Tassel Cap' filter, $a_1 = 100.0$ $a_2 = 8.0$ $a_3 = 6.0$ $a_4 = 10.0$ $a_5 = 35.0$ for the 'Water' filter, $a_1 = 43.0$ $a_2 = 12.0$)	The a_i's are decimal (floating point) numbers, separated by commas; if the user requested a 'Tassel Cap' filter, j must be equal to 5; if the 'Water' filter was requested, j must be equal to 2.
BIAS	$b_1,\ldots,b_4$ (Default - $b_i = 0.0$)	The b_i's are decimal (floating point) numbers, separated by commas; the bias values will be used only if the 'Tassel Cap' filter is requested.
OPTION	Tassel (Default - none)	Initiates the Tassel Cap filtering.
OPTION	Water (Default - none)	Initiates the Water filtering.

- MODIFIED CONTROL CARD

Keyword	Parameter	Function
(col. 1)	(col. 11-72)	
CHANNELS	Data = $l_1, \ldots, l_n$, (Default - n = 30),	The l_i's and m_i's are integer channel numbers,

Keyword	Parameter	Function
	Filter = $m_1, \ldots m_j$ (Default - none)	separated by commas; they must be a subset of the MSS Image tape. The l_i's will be used in the generation of the mean and covariance matrix. The m_k's are the channels to be used in the user-requested filter process. If the 'Tassel Cap' filter was requested, j must be equal to 4 (based on 4 channels/ pass). If the 'Water' filter was requested, j must be equal to 2.

Data-Tr:

- NEW CONTROL CARDS

Keyword (col. 1)	Parameter (col. 11-72)	Function
OPTION	PCG (Default - No Principal Components Green Image output)	The PCG image will be generated and output.
FORMAT	Universal (Default - Universal)	The transformed data will be output in the LARSYS II format.
SUNANG	Tape (Default - no sun	Sun angles will be extracted from the ERIPS

Keyword	Parameter	Function
	angle correction applied)	"unload" MSS image tape.
SUNANG	$n_1, \ldots, n_j$ (Default - no sun angle correction applied)	n_i = sun angle for pass i, $1 \leq i \leq 8$. Sun angles are integer numbers, $5 \leq n_i \leq 85$.
TRFORM	OUTPUT/UNIT=N, FILE=M (Default - N=14, M=1)	N = the tape's Fortran logical unit number that the new image of transformed data is to be output on. M = the file number that the new image is to be output on. If both Greenness and PCG are to be generated, the former image will be on file M and the latter image on file (M+1)
OPTION	GREEN (Default - Green image not generated for output)	The Green image will be generated and output.
FORMAT	LARSYS (Default - Universal)	The transformed data will be output in the LARSYS II format.

5. TEST PROCEDURE

5.1 DESCRIPTION OF TESTS

Four Statistics processor runs and two Data-Transformation processor runs were made to verify the new modifications. The output from each of the runs is contained in Appendix G. The Landsat I Kauth Greenness vector was used to generate the 'B-Matrix' in the Data-Transformation runs. In the Statistics processor runs, the Landsat I Kauth matrix was used in the 'Tassel Cap' filter option.

Test Run one (1) demonstrates the 'Tassel Cap' filter option on the generated statistics. The default tassel cap threshold values (100., 8., 6., 10., 35.) and the bias vector (0., 16., 25., 20.) were used in the transformation process.

Test Run two (2) outputs the statistics generated after applying the 'water' filter. The default water threshold values (43., 12.) were used.

Test Run three (3) illustrates the generation of the 'Green and PCG' images by the histogram method. The Data-Transformation run also illustrates the use of the new 'TRFORM' control card.

Test Run four (4) generates the statistics for sixteen (16) channels.

Test Run five (5) generates sun angle corrected, tassel cap filtered statistics. The new 'SUNANG TAPE' control card was used.

Test Run six (6) generates the sun angle corrected 'Green and PCG' images. The Data-Transformation run generated the images by the statistical method.

*No longer Section 6, except for RT&E; provide only 1 copy attached to TPS.

(System Identifier) 1 (Program/System Title) 2

TIRF # ________

AD # ________ As, and if, appropriate

J.O. # ________

(Test type) 3 Test Specification

APPROVAL SHEET

TEST CONDUCTOR: Cheevon Bal DATE: 2/27/78

COGNIZANT ENGINEER: J. C. Minter DATE: 2/27/78

REQUIREMENTS: R. A. Abotteen DATE: 2/27/78

USER: R. A. Abotteen DATE: 2/27/78

NASA TECHNICAL MONITOR: R. P. Heydorn DATE: 3/6/78

MAINTENANCE & OPERATIONS: ________ DATE: ________

LACIE QUALITY ASSURANCE: ________ DATE: ________

QUALITY ASSURANCE: ________ DATE: ________

REMARKS: ________

1 Image Processor
Support Processor
NOVA 1200
Univac 1108
Etc.

2 ASATS
CAMS I-100 Hybrid System
Universal R/W Program
Color Code Spectral Plots
Processor
Etc.

3 Acceptance
Qualification
Re-Qualification
Verification
Etc.

APPENDIX A

APPENDIX A

TABLE OF CONTENTS

A.1 SOFTWARE SUBPROGRAM NO. 1 (SETUP1)

The modifications to the subroutine SETUP1 will result in the reading and decoding of the following additional control cards:

a. SUNANG

b. B-MATRIX

c. THRESHOLD

d. BIAS

Two new additional parameters will be read and decoded from the 'OPTION' control card. They are:

a. OPTION TASSEL

b. OPTION WATER

The format of the 'CHANNELS' control card was modified to:

CHANNELS DATA = $d_1, \ldots, d_n$, FILTER = $f_1, \ldots, f_j$

where the d_i's and f_k's are integers.

Several new flags were initialized in the subroutine to be tested in the LEARN subroutine. The flags that were placed in the STBASE common block are:

a. SAKEY - sun angle key - if on, apply the sun angle correction factors to the current raw data.

b. FKEY - filter key - if FKEY=0, no filtering will be applied to the data vectors;

if FKEY=1, the water filter will be applied to the data vectors;

if FKEY=2, the Tassel Cap filter will be applied to the data vectors.

The following dimensioned variables were initialized in this subroutine to be used in the LEARN subroutine:

a. SSUNAG - the sun angles read from the 'SUNANG' control card

b. BIAS - the bias vector to be used in the Tassel Cap filtering process.

c. TH - the threshold values to be used in the 'Tassel Cap' or 'Water' filtering process.

d. BMAT - the matrix (in the B-MATRIX format) to be used in the Tassel Cap filter test.

e. FCHN - the channels of the data vector that will be used in the user-requested filter test.

If the flag SAKEY is on (i.e. the 'SUNANG' control card was read in), the following default parameter values from the 'SIZE' control card will be initialized:

1) XHIGH = 3000
2) XLOW = 0
3) XSIZ = 101
4) SPECBAS will default to $\min_{k \in \text{fields}}(\min_{j \in \text{channels}}(\mu_{kj} - \sigma_{kj}))$

As a result of the sun angle correction capability, several modifications have been made in the function section of the

'SIZE SPECBAS=I'

control card. The y-axis increment will be computed according to the formula $[\max_{k \in \text{fields}}(\max_{j \in \text{channels}}(\mu_{kj} + \sigma_{kj})) - \text{Spcbas}]/49 + 1.0$. (SPCBAS=SPECBAS)

In order to display the sun angle corrected spectral plot more accurately, the y-axis range will be (y_{min} = specbas, y_{max} = $\max_{k \in \text{fields}}(\max_{j \in \text{channels}}(\mu_{kj} + \sigma_{kj}))$).

The above changes take place in the subroutine CLSSPC. The processor will continue to have 50 y-axis values on the spectral plot.

A.1.1 Linkages

SETUP1 is called by the Statistics processor driver program, STAT.

The following subroutines may be called by SETUP1: NXTCHR, FIND, NUMBER, BMFIL, WRTBM, and FLTNUM.

A.1.2 Interfaces

SETUP1 references the following common blocks: STBASE and GLOBAL.

A.1.3 Inputs

The calling sequence to SETUP1 remains unchanged.

- NEW CONTROL CARDS

Keyword (col. 1)	Parameter (col. 11-72)	Function
SUNANG	Tape (Default: no sun angle correction applied)	Sun angles will be extracted from the ERIPS unload MSS image tape.
SUNANG	$n_1, \ldots, n_j$ (Default: no sun angle correction applied)	n_i = sun angle for pass i, $1 \le i \le 8$. Sun angles are integer numbers which are $5 \le n_i \le 85$.
B-MATRIX	Cards (Default: none)	The B-Matrix will be found on the cards immediately following this control card.
B-MATRIX	File (Default: none)	The subroutine BMFIL will be called to read the B-Matrix off of the file, BMFILE.
THRESHOLD	$a_1, \ldots, a_j$ (Default: for 'Tassel Cap' filter, $a_1 = 100$ $a_2 = 8.0$ $a_3 = 6.0$ $a_4 = 10.0$	The a_i's are decimal (floating point) numbers, separated by commas; if the user requested a 'Tassel Cap' filter, j must be equal to 5; if the Water filter was re-

Keyword (col. 1)	Parameter (col. 11-72	Function
	a_5 = 35.0 for the 'Water' filter, a_1 = 43.0 a_2 = 12.0	quested, j must be equal to 2.
BIAS	$b_1, \ldots, b_4$ (Default: b_i = 0.0)	The b_i's are decimal (floating point) numbers, separated by commas; the bias values will be used only if the 'Tassel Cap' filter is requested.
OPTION	Tassel (Default: none)	Sets the flag (FKEY=2) to apply the 'Tassel Cap' filter to the data vectors.
OPTION	Water (Default: none)	Set the flag (FKEY=1) to apply the 'Water' filter to the data vectors.

- MODIFIED CONTROL CARD

The following control card will replace the current 'CHANNELS' format.

Keyword (col. 1)	Parameter (col. 11-72)	Function
CHANNELS	Data = $l_1, \ldots, l_n$, (Default: n = 30), Filter = $m_1, \ldots, m_j$ (Default: none)	The l_i's and m_k's are integer channel numbers, separated by commas; they must be a subset of the MSS Image tape. The l_i's will be used in the generation of the mean and covariance matrix.

Keyword (col. 1)	Parameter (col. 11-72)	Function
		The m_k's are the channels to be used in the user-requested filter process. If the 'Tassel Cap' filter was requested, j must be equal to 4 (based on 4 channels/pass). If the 'Water' filter was requested, j must be equal to 2.

If the 'SUN ANGLE' control card was read in, the following default values and/or function will be initialized on the 'SIZE' control cards:

Keyword (col. 1)	Parameter (col. 11-72)	Function
SIZE	XHIGH=K $0<K\leq 255$ Default: XHIGH = 220 (no sun angle) XHIGH = 3000 (sun angle)	K is an integer which sets the maximum radiance value which will be histogrammed. XHIGH becomes X_{max} of the X-axis of the histogram plot.
SIZE	XLOW = L $0\leq L<XHIGH$ Default: XLOW = 120 (no sun angle) XLOW = 0 (sun angle)	L is an integer which sets the minimum radiance value which will be histogrammed. XLOW becomes X_{min} of the X-axis of the histogram plot.

Keyword (col. 1)	Parameter (col. 11-72)	Function
SIZE	XSIZ=K Default: XHIGH-XLOW (no sun angle) 101 (sun angle)	Sets the range which will be histogramed; maximum range is 101.
SIZE	SPECTRAL=I $0 \leq I \leq 105$ Default: SPECBAS=75 (no sun angle) $\min_{k \epsilon \text{ fields}}(\min_{j \epsilon \text{ channels}}(\mu_{kj} - \sigma_{kj}))$ (sun angle)	I is an integer which sets the minimum radiance value on the Y-axis of the spectral plot (i.e., Y_{min}). For no sun angle correction: The processor has a fixed Y-axis increment (3) and a fixed number of Y-axis values (50). Using SPECBAS, the processor determines the Y-axis range to be: Y_{min}=SPECBAS, Y_{max}=SPECBAS+150 For sun angle correction: The processor will calculate the Y-axis increment according to the formula: $[\max_{k \epsilon \text{ fields}}(\max_{j \epsilon \text{ channels}}(\mu_{kj} + \sigma_{kj})) -$ SPECBAS$]/49 + 1.0$. The range for the Y-axis is: (Y_{min} = specbas, $Y_{max} = \max_{k \epsilon \text{ fields}}(\max_{j \epsilon \text{ channels}}(\max_{kj} + \sigma_{kj}))$

A.1.4 Outputs

Three new additional line printer outputs have been implemented into the subroutine SETUP1:

a. If the Tassel Cap filter was requested but the number of input filter channels is not equal to four or the number of input threshold values is not five, the following error message will be output:

'The number of input filter channels or threshold values are not compatible with the filter option requested-Terminate Execution'.

b. If the 'Water' filter was requested but the number of input filter channels and/or threshold values is not two, the above error message will be output.

c. The subroutine WRTBM will be called to write out the user requested 'B-MATRIX' array from the card or tape file.

d. If the 'Tassel Cap' filter was requested but the user did not input the 'B-MATRIX' control card or if the dimension of the B-Matrix (KAUTH filter matrix) is not 4 x 4 then the following error message will be output:

'The B-Matrix was not input or was not of the right dimension-Terminate.'

A.1.5 Storage Requirements

DATA = 1022_8

CODE = 2215_8

A.1.6 Description

The purpose of the SETUP1 subroutine is to read and analyze all of the input processor control cards as well as their parameters.

As a result of the modifications to SETUP1, the user will be given the options to:

a. Apply the sun angle correction factors to the raw data vectors,

b. Apply a 'Tassel Cap', 'Water', or no filter to the raw or sun angle corrected data vectors, and

c. Calculate and output the filtered raw or sun angle corrected mean and covariance matrix computed over the image data set.

The covariance matrix will be used in the DATA-TR processor to generate a Principal Component Greenness Image.

A.1.7 Flowchart

Appendix C

A.1.8 Listing

Appendix E

A.2 SOFTWARE SUBPROGRAM NO. 2 (LEARN)

The functions that are provided by the subroutine LEARN are to enable the user to calculate the mean vector and covariance matrix from filtered raw or sun angle corrected data vectors. The new flag SAKEY will be tested to determine if the sun angle correction factors are to be applied to the raw data vectors. The value of the new flag FKEY will determine if Water, Tassel Cap, or no filter is to be applied to the data vectors.

A.2.1 Linkages

LEARN is called by STAT, the driver program for the STATISTICS processing.

The following subroutines may be called by LEARN: TAPHDR, SUNF1, FSBSFL, CMERR, LAREAD, LINERD, FDLINT, MTVEC1, FLDCOV, FLDSPC, FLDHIS, CLSCOV, CLSSPC, CLSHIS, MULSPC, FLDINT, and SETMRG.

Note: In order to stay within the core storage limits, several subroutines were taken out of the main link and copied and remapped into the appropriate processor's link. The subroutines SUNF1 (in LEARN) and SUNF2 (in SETUP 8, Data-Tr) are identical as well as MATVEC (in TRHIST, KBTRAN, LNTRAN and Data-Tr) and MTVEC1 (in LEARN). The subroutines SUNF1 and SUNF2 are identical to the existing subroutine SUNFAC except that the two former subroutines have the added capability to output the appropriate 'bias' factors.

A.2.2 Interfaces

LEARN references the STBASE, GLOBAL, COMBK4 and ISOLNK common blocks.

A.2.3 Inputs

The calling sequence to LEARN remains unchanged.

As a result of the sun angle correction option, the following calling sequences have been modified:

Call Fldspc (Fldmen, Dev, Fldsav,(1,N), Dumptr, Idata, Fldnam, Fldvar, Title, Nofeat, Fetvec, Spcbas, Sakey)

Call Clsspc (Avar (1, subno), Substd (1, subno), Title, Dumptr, Idata, Title, Nofeat, Fetvec, Spcbas, Sakey)

Call Mulspc (Avar (1, 1), Substd (1,1), Subdes, Spec (1,I), Idata, Nofeat, Fetvec, Spcbas, Sakey)

A.2.4 Outputs

The user will know how many data vectors were used in the calculation of the mean and covariance matrices from the following new line printer output:

'XXXXX Points will be used in the field mean, covariance calculations'

A.2.5 Storage Requirements

DATA = 31424_8

CODE = 3304_8

A.2.6 Description

The modifications that were made to the subroutine LEARN are to test the sun angle (SAKEY) and filter (FKEY) flags.

If the SAKEY flag is on (SAKEY = 1), the following will take place:

a. Test the flag ISUNT. If ISUNT is on (ISUNT = 1), the sun angles that relate to the B-Matrix channels will be read from the data tape. If ISUNT is off (ISUNT = 0), the sun angles were read in SETUP1. The sun angles will be used in the sun angle correction process.

b. The subroutine SUNF1 will be called to output the sun angle bias and gain correction factors.

c. The sun angle correction factors (bias and gain) will be applied to the raw data vectors before calculating the mean and covariance matrix.

If the filter flag (FKEY) is equal to:

a. Zero - the raw or sun angle corrected data vectors will not be filtered before calculating the mean and covariance matrices.

b. One - the 'Water' filter will be applied to the raw or sun angle corrected data vectors before calculating the mean and covariance.

The data vector will be filtered if the following holds:

$X_1 - \frac{t(1)}{t(2)} (X_2) \geq 0$ and $X_2 \leq t(2)$

where X_i = the radiance value of the f_i component of the current data vector.

f_i = the $i^{\underline{th}}$ channel value read from the FILTER parameter section of the CHANNELS control card.

t_i = the $i^{\underline{th}}$ user-supplied (the $i^{\underline{th}}$ parameter read off of the THRESHOLD control card) or default (t_1= 43.0, t_2 = 12.0) threshold value.

c. Two - the Tassel Cap filter will be applied to the raw or sun angle corrected data vectors before calculating the mean and covariance matrices.

The following transformation will be applied to each data vector before it is filtered.

$$\vec{Y} = \begin{pmatrix} Y_1 \\ Y_2 \\ Y_3 \\ Y_4 \end{pmatrix} = K\,\vec{X} + \vec{b}$$

where $\vec{Y}$ = transformed raw or sun angle corrected data vector,
$\vec{K}$ = the matrix input via cards or via the file, BMFILE,
$\vec{X}$ = the $f_1 \rightarrow f_4$ components of the raw or sun angle corrected data vector, and
$\vec{b}$ = tne user - supplied or default (b_i = 0.0) additive bias vector.

The data vector will be filtered if one of the following holds:

1. $Y_1 > t_1$
2. $Y_2 < t_2$
3. $Y_3 < t_3$
4. $Y_4 < t_4$
5. $Y_4 > t_5$

The default threshold values are t_1 = 100.0, t_2 = 8.0, t_3 = 6.0, t_4 = 10.0, and t_5 = 35.0

A.2.7 Flowchart

Appendix C

A.2.8 Listing

Appendix E

A.3 SOFTWARE SUBPROGRAM NO. 3 (SUNF1)

The new subroutine SUNF1 is a modified version of the existing subroutine SUNFAC. While SUNFAC only returns the sun angle gain factors, SUNF1 returns both the sun angle gain and bias factors.

A.3.1 Linkages

SUNF1 is called by the LEARN subroutine.

A.3.2 Interfaces

SUNF1 does not make reference to any common blocks.

A.3.3 Inputs

The dimensioned variable SABIAS was added to the calling sequence.

The new calling sequence to SUNF1 is:

- Call SUNF1 (SUNCOR, SUNANG, FETVEC, NOFEAT, ISUNC, ISUNT, SABIAS)

Parameter	Dimension	In/Out	Definition
SUNCOR	1	Out	The sun angle gain factors that correspond to the input sun angles
SUNANG	1	In	Array of sun angles
FETVEC	1	In	Array of selected channels
NOFEAT	1	In	Number of input channels
ISUNC	1	In	Number of input sun angles
ISUNT	1	In	If ISUNT = 1, read the sun angles off of the tape; otherwise, do not.
SABIAS	1	Out	The sun angle bias factors that correspond to SUNANG

A.3.4 Outputs

There are two new line printer outputs:

a. The sun angle gain factors are:

XXXXXX XXXXXX XXXXXX

b. The sun angle bias factors are:

XXXXXX XXXXXX XXXXXX

A.3.5 Storage Requirements

DATA = 1326_8

CODE = 306_8

A.3.6 Description

SUNF1 will return the sun angle bias and gain factors that correspond to the input sun angle array.

A.3.7 Flowchart

Appendix C

A.3.8 Listing

Appendix F

A.4 SOFTWARE SUBPROGRAM NO.4 (CLSSPC)

Several modifications were made to the existing CLSSPC subroutine as a result of the sun angle correction option.

A.4.1 Linkages

The subroutine LEARN calls CLSSPC by way of the entry points: CLSSPC, FLDSPC, and MULSPC.

A.4.2 Interfaces

CLSSPC references the GLOBAL common block.

A.4.3 Inputs

The flag SAKEY was added to the calling sequence. The new calling sequences are:

- Call CLSSPC (MEAN, SUBSTD, IDVEC, PTRVEC, PLOT, TITLE, NOFEAT, FETVEC, SPCBAS, SAKEY)
- Call FLDSPC (DMEAN, DEV, IDVEC, PTRVEC, PLOT, MEAN, SUBSTD, FLDNAM, NOFEAT, FETVEC, SPCBAS, SAKEY)
- Call MULSPC (MEAN, SUBSTD, JDVEC, PTRVEC, PLOT, NOFEAT, FETVEC, SPCBAS, SAKEY)

Parameter	Dimension	In/Out	Definition
MEAN	1	In	The mean vector(s)
SUBSTD	1	In	The standard deviation array(s)
DMEAN	1	In	MEAN is set equal to DMEAN
DEV	1	In	SUBSTD is set equal to DEV
IDVEC	1	In	The subclass name
PTRVEC	5	In	PTRVEC(1) = 1, PTRVEC(5) = 1 PTRVEC(2), (3), (4) = 0

Parameter	Dimension	In/Out	Definition
PLOT	(4,NOFEAT,49)	Out	The plot information array
TITLE	1	In	The subclass number
NOFEAT	1	In	The number of channels to be used
FETVEC	30	In	The array of selected channels
SPCBAS	1	In	The minimum radiance value on the Y-axis of the spectral plot
SAKEY	1	In	The flag to indicate if sun angle corrected data was used in the calculation of the mean and standard deviation
FLDNAM	FLDNAM is not used in CLSSPC		
JDVEC	1	In	The subclass name

A.4.4 Outputs

As a result of the sun angle option, MENLOW may be larger than MENHGH; therefore, if the above occurs, the following new message will be printed:

'IN CLSSPC, MENLOW IS GREATER THAN MENHGH - NO PLOTTING WILL BE DONE;

A.4.5 Storage Requirements

DATA = 312_8

CODE = 1353_8

A.4.6 Description

The purpose of CLSSPC is to print a spectral plot (may be composite) for the subclass and/or field indicated by the user. As a result of the sun angle correction option, the INCR and SPCBAS variables may be recomputed. If the flag SAKEY is on (i.e. = 1), the maximum of the input ($\mu+\sigma$) and the minimum of the input ($\mu - \sigma$) will be computed. If SPCBAS does not equal to -999, the user specified SPCBAS value will be used. If SPCBAS is equal to -999, MINV will be set equal to $\min_{k\varepsilon \text{ fields}} (\min_{j\varepsilon \text{ channels}}(\mu_{kj} - \sigma_{kj}))$.

The variable INCR will be set equal to $[\max(\max(\mu_{kj} + \sigma_{kj})) - \text{SPCBAS}]/49 + 1.0$.

The original CLSSPC was debugged in order to print the ERRLIN over the correct channel plot.

A.4.7 Flowchart

Appendix C

A.4.8 Listing

Appendix E

APPENDIX B

APPENDIX B

TABLE OF CONTENTS

B.1 SOFTWARE SUBPROGRAM NO. 1 (DATATR)

The driver program for the Data Transformation processing, DATATR, was modified to optionally generate an nxn unitary matrix PCM when the PCGC flag is on. The PCM matrix will be used in the generation of the Principal Component Greenness (PCG) Image.

B.1.1 Linkages

DATATR is called by the LARSYS executive program, MONTOR.

The following subroutines may be called by DATATR: SETUP8, SETREM, KBTRAN, MAXMAT, TRHIST, LNTRAN, MTMLS6, MTMDAT, and the new subroutines GETGCV and PCMMAT.

B.1.2 Interfaces

DATATR references the INFORM, TRBLCK, and GLOBAL common blocks.

B.1.3 Inputs

The calling sequence to DATATR remains unchanged.

The calling sequence to KBTRAN has been changed to:

- Call KBTRAN (BMAT, LCOMB, ARRAY, LAM, MAX, MIN, CON, TRANSF, NSUB)

Two new calling sequences were added to the subroutine Data-Tr:

- Call GETGCV (SAVTAP, CP, NCHAN, GCOV)

This subroutine (which is similar to the existing subroutine GETST) will read the filtered raw or sun angle corrected data covariance matrix $\sum_x$ from SAVTAP if the PCGC flag is on,

- Call PCMMAT (T, PCM, T, R, LCOMB, ID).
  This new subroutine will output an unitary orthogonal matrix.

B.1.4 Output

If the column dimension of the 'B-MATRIX' is not equal to the row and column dimensions of the data covariance matrix $\sum_x$

read from SAVTAP, the following error message will be output: 'THE DIMENSION OF BMAT XXX AND DCOV XXX ARE NOT COMPATIBLE - CALL EXIT'.

B.1.5 Storage Requirements

DATA = 6032_8 CODE = 462_8

B.1.6 Description

As a result of declaring 'Array' real in the subroutine KBTRAN, the array NSUB (initialized by integer 'Array') will be formulated in DATATR instead of KBTRAN.

The following modifications will take place only if the PCGC flag is on (i.e., the OPTION PCG control card was read in SETUP8):

a. The subroutine GETGCV will pull the data covariance matrix (to be used in the PCG processing) off of the SAVTAP. The covariance matrix will have been calculated from filtered raw or sun angle corrected data vectors depending on the 'OPTION' and 'SUNANG' control cards input by the user during the STAT processor mode. $\sum_X$ will be pulled from the (STAFIL+1) file.

b. Before the mixture covariance matrix of the Green Image bands ($\sum_G$) is to be generated, the row and column dimensions (the row and the column dimensions should be equal) will be checked against the column dimension of the B-MATRIX. If these dimensions are not equivalent, the error message stated in the output section B.1.4 will be printed.

c. The subroutines MTMLS6 and MTMDAT will generate the GCOV matrix.

$$\sum_G = B \sum_X B^T$$

where Σ_G = mixture covariance matrix of the Green Image bands,

B = Transformation matrix in which each row contains the greenness vector. The matrix is to be input in the 'B-MATRIX' format,

Σ_X = The PCG data covariance matrix read off of SAVTAP, and

B^T = The transpose of B.

d. The subroutine PCMMAT will be called to operate on the matrix Σ_G. The program will in turn return an nxn unitary matrix PCM. The PCG Image will then be generated by applying the PCM matrix to the Green Image.

B.1.7 Flowchart

Appendix D

B.1.8 Listing

Appendix F

B.2 SOFTWARE SUBPROGRAM NO. 2 (SETUP8)

The modifications to subroutine SETUP8 will result in the reading and decoding of the following additional and modified control cards:

a. TRFORM OUTPUT/UNIT=n, FILE=m

b. SUNANG $n_1, n_2, \ldots n_j$

c. OPTION GREEN

d. OPTION PCG

e. SUNANG TAPE

The following flags will be set and used in the other subprograms. They are added to the labeled common block, TRBLCK.

a. PCF - flag indicating that the 'OPTION GREEN' and/or 'OPTION PCG' control card was read in.

b. SAKEY - sun angle key - if on, apply the sun angle gain, SAGAIN and sun angle bias, SABIAS correction factors obtained from the subroutine SUNF2.

c. PCGC - flag indicating that the 'OPTION PCG' control card was read in.

d. GIC - flag indicating that the 'OPTION GREEN' control card was read in.

The following variables have been added to the common blocks TRBLCK and GLOBAL to be referenced by the other subprograms:

a. SAGAIN - sun angle gain correction factor.

b. SABIAS - sun angle bias correction factor.

c. TRNSFL - the file number that the output transformed data is to be output on (default = 1).

d. PCM - an array that contains the nxn unitary matrix output by the subroutine PCMMAT. This array will be used in the generation of the'Principle Component Greenness' image.

e. NCHPAS - designates the number of channels per pass (default = 4).

B.2.1 Linkages

SETUP8 is called by the driver program for Data Transformation, DATATR. SETUP8 in turn calls the TAPHDR, PRTCOV, NXTCHR, FIND, BMFIL, NUMBER, ORDER, FLTNUM, CRDSTA, REDSAV, and WRTBM routines. If sun angle corrections for the Green Image and/or PCG Image Transformations were requested, a call will be made to the new subroutine, SUNF2.

SUNF2 will return the set of sun angle gain and bias correction factors to be used on each data channels input.

B.2.2 Interfaces

SETUP8 references the following common blocks: INFORM, GLOBAL, ISOLNK, and TRBLCK.

B.2.3 Inputs

The calling sequence to SETUP8 remains unchanged.

- NEW CONTROL CARDS

Keyword (col. 1)	Parameter (col. 11-72)	Function
OPTION	Green (Default - Green Image not generated for output)	The Green image will be generated and output.

Keyword (col .1)	Parameter (col. 11-72)	Function
OPTION	PCG (Default - no Principal Components Green Image output)	The PCG Image will be generated and output.
FORMAT	UNIVERSAL (Default - Universal)	The transformed data will be output in the Universal format.
FORMAT	LARSYS (Default - Universal)	The transformed data will be output in the LARSYS II format.
SUNANG	Tape (Default - no sun angle correction applied)	Sun angles will be extracted from the ERIPS "unload" MSS image tape.
SUNANG	$n_1, \ldots, n_j$ (Default - no sun angle correction applied	n_i=sun angle for pass i, $1 \leq i \leq 8$. Sun angles are integer numbers, $5 \leq n_i \leq 85$.
TRFORM	OUTPUT/UNIT=N, FILE=M (Default - N=14 M=1)	N = the tape's Fortran logical unit number that the new image of transformed data is to be output on. M = the file number that the new image is to be output on. If both Greenness and PCG are requested, the former image will be output on file M and the latter image on file (M+1).

B.2.4 Outputs

Modification to SETUP8 will include the addition of the following error message:

a. If the B-MATRIX input flag BMTRIG is not on (=1), the error message will be:

   'The B-MATRIX CONTROL CARD WAS NOT FOUND - TERMINATE EXECUTION'.

   The line printer output will continue to list the (new) control cards read in by SETUP8.

B.2.5 Storage Requirements

DATA = 473_8 CODE = 2073_8

B.2.6 Description

The function of SETUP8 is to read and decode all of the input processor control cards as well as their parameters. The following modifications will be made:

a. The user will be able to specify on the new 'TRFORM' control card which unit number (default = 14) and file number (default = 1) are to be used for the output transformed image tape.

b. The user will be given the option of using raw or sun angle corrected data vectors in the transformation process depending on the absence or presence of the SUNANG control card. If the SUNANG control card was read in, the input 'MAXPT' vector will be sun angle corrected.

c. The user has the option of creating a Green Image and/or Principal Component Greeness (PCG) Image.

d. The transformed data will be output in the Universal format unless the LARSYS parameter is specified on the FORMAT control card.

e. If the Green Image and/or PCG Image is to be generated, the maximum dimension allowed for B-MATRIX is (n, n*k), where k = number of channels per pass and n = the number of passes and $n^2*k \leq 400$. The default number of channels per pass

(NCHPAS) is equal to 4. NCHPAS is set in the BLKCOM subroutine and included in the GLOBAL common block.

f. The statistical method will be performed if:

1. The 'MODULE FILE' and 'STATFILE' control cards are input

or 2. The 'MODULE CARDS' control card is input.

B.2.7 Flowchart

Appendix D

B.2.8 Listing

Appendix F

B.3 SOFTWARE SUBPROGRAM NO. 3 (KBTRAN)

The subroutine KBTRAN has been modified to test the new flags:

a. SAKEY - when it is on (SAKEY = 1), the channel-oriented sun angle correction bias and gain factors (obtained from the subroutine SUNF2) will be applied to the respective channel component of the mean vector and covariance matrix obtained from the subclasses statistics file, SAVTAP.

b. PCGC - when it is on (PCGC=1), the PCM array will be applied to the calculated MAX, MIN, and CON arrays to generate the PCG image's scaling parameters. These scaling parameters will be stored in the locations:

   BMAT (401) → BMAT (400 + 3 * LCOMB)

B.3.1 Linkages

Subprogram KBTRAN is called by the Data Transformation driver program, DATATR, when rescaling by the statistical method is requested by the user. KBTRAN calls the following subroutines: MATVEC, MTMLS6, MTMDAT, and PRTCOV.

B.3.2 Interfaces

The common blocks referenced by the KBTRAN subprogram are: INFORM, TRBLCK, GLOBAL, and COMBK4.

B.3.3 Inputs

The calling sequence for KBTRAN has been modified to:

- Call KBTRAN (BMAT, LCOMB, ARRAY, LAM, MAX, MIN, EPS, TRANSF, NSUB)

The explanation for adding the variable NSUB to the calling argument is found in section B.1.6 (DATATR-Description). 'ARRAY' was declared real as a result of the 'sun angle correction' option.

Parameter	Dimension	In/Out	Definition
BMAT	480	In	The transformation matrix array
LCOMB	1	In	The number of passes (linear combinations)
ARRAY	1	In	Array contains the mean and covariance matrices
LAM	1	In	An integer multiplied by the standard deviations of the input subclass statistics to derive an approximate range for rescaling the transformed data
MAX	16	Out	The maximum value for each pass
MIN	16	Out	The minimum value for each pass
EPS	16	Out	The array containing the computed 255/[max(I)-min(I)], I=1, . . . ,LCOMB
TRANSF	1	In	Flag to indicate if the transformed statistics is to be printed out
NSUB	75	In	The subclass name

B.3.4 Outputs

If the SAKEY is on:

a. The SAVTAP's mean vectors will be transformed using the sun angle correction factors, SAGAIN and SABIAS. The formula used is:

TM(I) = SAGAIN(I) * M(I) + SABIAS(I),

where TM(I) = Ith component (channel) of the sun angle corrected transformed mean vector,

SAGAIN(I) = Ith sun angle gain factor that relates to the Ith channel,

M(I) = Ith component (channel) of the mean vector from SAVTAP, and

SABIAS(I) = Ith sun angle bias factor that relates to the Ith channel.

b. The appropriate sun angle correction factors will be applied to the SAVTAP's covariance matrix, Σ_X, before transforming it to $B\Sigma_X B^T$, where B is the 'B-MATRIX' which contains the Kauth Greenness vectors and B^T is the transpose of B. The formula used on each component of Σ_X is:

TCOV(I,J) = SAGAIN(I) * COV(I,J) * SAGAIN(J)

where TCOV(I,J) = sun angle corrected transformed (I,J)th component of the SAVTAP's covariance matrix Σ, I, J = 1, . . . , NOFEAT, SAGAIN(I) = Ith sun angle gain factor that relates to channel I.

SAGAIN(J) = J-th sun angle gain factor that relates to channel J, and

COV,(I,J) = (I,J)th component of the SAVTAP's covariance matrix.

B.3.5 Storage Requirements

DATA = 4661_8 CODE = 1106_8

B.3.6 Description

If the SAKEY flag is on, the sun angle correction bias and gain factors will be applied to the corresponding component of the SAVTAP mean vector and covariance matrix.

A check to see if each component of the MAX vector is greater than or equal to the corresponding component of the MIN vector was initialized as a result of the 'sun angle correction' option being performed on the mean and covariance arrays. If the above test fails, the corresponding MAX and MIN components will be interchanged before generating the EPS vector.

If the PCGC flag is on (i.e. the 'OPTION PCG' control card was read in SETUP8), the matrix array PCM (output from the PCMMAT subroutine) will be applied to the calculated Green Image's MAX_G (=MAX), MIN_G(=MIN), and CON_G(=EPS) vectors to obtain the PCG

B.3.4 Outputs

If the SAKEY is on:

a. The SAVTAP's mean vectors will be transformed using the sun angle correction factors, SAGAIN and SABIAS. The formula used is:

TM(I) = SAGAIN(I) * M(I) + SABIAS(I),

where TM(I) = Ith component (channel) of the sun angle corrected transformed mean vector,

SAGAIN(I) = Ith sun angle gain factor that relates to the Ith channel,

M(I) = Ith component (channel) of the mean vector from SAVTAP, and

SABIAS(I) = Ith sun angle bias factor that relates to the Ith channel.

b. The appropriate sun angle correction factors will be applied to the SAVTAP's covariance matrix, Σ_X, before transforming it to $B\Sigma_X B^T$, where B is the 'B-MATRIX' which contains the Kauth Greenness vectors and B^T is the transpose of B. The formula used on each component of Σ_X is:

TCOV(I,J) = SAGAIN(I) * COV(I,J) * SAGAIN(J)

where TCOV(I,J) = sun angle corrected transformed (I,J)th component of the SAVTAP's covariance matrix Σ, I, J = 1, . . . , NOFEAT, Image's scaling parameters, MAX_P, MIN_P, and CON_P.

The PCG Image's

a. MAX_P vector (PCM * MAX_G) will be stored in locations BMAT (401) → BMAT (401 + LCOMB-1).

b. MIN_P vector (PCM * MIN_G) will be stored in locations BMAT (401 + LCOMB) → BMAT (401 + 2 * LCOMB-1).

c. CON_P vector (PCM * CON_G) will be stored in locations BMAT (401 + 2 * LCOMB) → BMAT (401 + 3 * LCOMB-1).

B.3.7 Flowchart

Appendix D

B.3.8 Listings

Appendix F

B.4 SOFTWARE SUBPROGRAM NO. 4 (TRHIST)

The following modifications to TRHIST will be performed if the PCGC flag is on (i.e. the 'OPTION PCG' control card was read in SETUP8):

a. The scaling parameters, MAX, MIN, and CON, obtained from the histogram of the transformed data will be multiplied by the PCM matrix array. The resulting vectors will be the PCG Image's scaling parameters, MAX_p, MIN_p, and CON_p.

b. The PCG Image's scaling parameters will be stored in BMAT's scratch storage locations: BMAT (401) → BMAT (401 + 3 * LCOMB-1).

B.4.1 Linkages

The driver program DATATR calls TRHIST when the user specifies rescaling by the histogram method.

TRHIST calls the following subroutines and/or function: LAREAD, TAPHDR, SQRT, FLDINT, LINERD, FDLINT, TRANSF, and MATVEC.

B.4.2 Interfaces

TRHIST references the following common blocks: INFORM, TRBLCK, COMBK4, and GLOBAL.

B.4.3 Inputs

The calling sequence to TRHIST remains unchanged.

Since TRANSF was changed from a 'subroutine' to a 'function', the calling sequence to TRANSF is:

- XT(J) = TRANSF (BMAT, IDATA, TOP, J, K, LCOMB, NSAMP, BIAS)

B.4.4 Outputs

There is no line printer output.

B.4.5 Storage Requirements

DATA = 242_8 CODE = 1247_8

B.4.6 Description

TRHIST will obtain the scaling parameters, MAX, MIN, and CON for the transformed data from the histogram of the transformed data of the first field of a set of fields.

Since the 'MAXPT' values may undergo a 'sun angle correction' transformation, a test to check the max and min vectors was initiated. If the current component of the MAX vector is not greater than or equal to the corresponding MIN component, the two values will be interchanged.

If the PCGC flag is on (i.e. the 'OPTION PCG' control card was read in SETUP8), the matrix array PCM (output from the subroutine PCMMAT) will be applied to the Green Image's scaling parameters MAX_G (=MAX), MIN_G(=MIN), and CON_G (=CON).
The PCGC Image's scaling parameters:

a. MAX_P (PCM * MAX_G) will be stored in locations BMAT (401) → BMAT (401 + LCOMB-1).

b. MIN_P (PCM * MIN_G) will be stored in locations BMAT (401 + LCOMB) → BMAT (401 + 2 * LCOMB-1).

c. CON_P (PCM * CON_G) will be stored in locations BMAT (401 + 2 * LCOMB) → BMAT (401 + 3 * LCOMB-1).

B.4.7 Flowchart

Appendix D

B. 4. 8 Listing

Appendix F

B.5 SOFTWARE SUBPROGRAM NO. 5 (PCMMAT)

The new subroutine PCMMAT was originally programmed for execution under EXEC8 by W. L. Morris, C. L. Wiginton, and D. K. Lowell (University of Houston Mathematics Department). The revised subroutine has been incorporated in the Data Transformation subroutine PCMMAT. PCMMAT operates on a real symmetric matrix A to produce an orthogonal matrix of approximate eigenvectors of A. For the Principal Component Greenness (PCG) transformation, the symmetric matrix is the mixture covariance matrix of the green bands (Σ_G) and the output orthogonal matrix is PCM. The n x n (n = LCOMB = row dimension of Σ_G) unitary matrix PCM will have its ith column correspond to the ith largest normalized eigenvector of Σ_G . The resulting components of PCM will be approximate eigenvalues (i.e. the error bounds will be between $\pm$ 0.000005) of Σ_G . In the present context,

$$\Sigma_G = B \Sigma_X B^T$$

where Σ_G = mixture covariance matrix of the green bands.

B = BMAT = matrix in which each row contains the greenness vector.

Σ_X = the filtered raw or sun angle corrected data covariance matrix calculated in STAT.

B.5.1 Linkages

PCMMAT is called by DATATR.

PCMMAT references the following new external subroutines and function: MINDEX, SUPSUM ORD1, and PCMAML. The SQRT routine is also referenced.

B.5.2 Interfaces

PCMMAT does not reference any common blocks. The interface with the calling program is by means of the calling sequence.

B.5.3 Inputs

The calling sequence to PCMMAT is:

Call PCMMAT (T, PCM, C, R, N, ID)

Parameter	Dimension	In/Out	Definition
T	(ID)	IN	A symmetric lower triangular real matrix array (for PCG transformation processing, T = the lower traingular section of $\sum_G$, the mixture covariance matrix of the green image bands).
PCM	(49)	OUT	An unitary orthogonal matrix of normalized eigenvectors of T.
C	N	OUT	Vectors of centers of Weinstein discs.
R	N	OUT	Vector of radii of Weinstein discs.
N	1	IN	The row and column dimension of T (for $\sum_G$, N=LCOMB=number of LANDSAT Passes).
ID	1	IN	The dimension of the input T array. $ID = \frac{N(N+1)}{2}$

B.5.4 Outputs

The orthogonal unitary matrix array PCM is returned to the calling subroutine DATATR, via calling argument.

The vector of eigenvalues and radii will be printed along with the transpose of the unitary matrix, PCM.

B.5.5 Storage Requirements

DATA = 1703_8 CODE = 1540_8

B.5.6 Description

PCMMAT proceeds through an iterative algorithm to produce the output orthogonal matrix PCM. PCM, which is composed of approximate eigenvectors of Σ_G is formulated by calling the following external subroutines and function:

a. MINDEX - selects the order of operations within PCMMAT.

b. ORD1 - reorders the components of the input vector into ascending order.

c. SUPSUM - adds the components of the reordered vector from ORD1.

d. PCMAML - computes the matrix products.

The relative error allowed in the approximate eigenvalues of Σ_G is set to 0.000005.

Before the final PCM matrix array is printed, the first row will be checked for concavity. If $(P_{1,1} + P_{1,N})/2 > (P_{1,2} + \cdots + P_{1,N-1})/N-2$, $P_{1,i} = - P_{1,i}$, for $i = 1, \cdots, N$. The $P_{1,i}$'s are the components from the first PCM column.

B.5.7 Flowchart

Appendix D

B.5.8 Listing

Appendix F

B.6 SOFTWARE SUBPROGRAM NO. 6 (TRANSF)

The calling sequence to TRANSF has been modified to exclude the XT variable. TRANSF has been changed from a subroutine to a function. The internal variable XT will be set equal to TRANSF. The flag SAKEY will be tested to determine if the input raw data vector, IDATA is to be sun angle corrected before performing the data transformation calculation.

B.6.1 Linkages

TRANSF is called by either the subroutines TRHIST and/or LNTRAN. TRANSF does not call any subroutine.

B.6.2 Interfaces

TRANSF refers to the TRBLCK common block.

B.6.3 Inputs

The calling sequence to TRANSF is:

- XT(J)=TRANSF (BMAT, IDATA, TOP, IL, K, LCOMB, NSAMP, BIAS).

Parameter	Dimension	In/Out	Definition
BMAT	480	IN	The matrix, which is stored in the 'B-MATRIX' format, to be used in the transformation process.
IDATA	TOP	IN	The input raw data vector to be transformed.
TOP	1	IN	The maximum usable locations in the array IDATA.
IL	1	IN	The component of the transformed data vector that will be generated.

Parameter	Dimension	In/Out	Definition
K	1	IN	The current sample pixel being processed.
LCOMB	1	IN	The number of linear combinations or passes to be used in the calculation.
NSAMP	1	IN	The number of sample data vectors to be transformed.
BIAS	16	IN	The bias vector to be used in the data-transformation process.

B.6.4 Outputs

There is no line printer output. The value of the IL-th component of the transformed data vector (XT) will be returned in the function name TRANSF.

B.6.5 Storage Requirements

DATA = 27_8 CODE = 135_8

B.6.6 Description

The flag SAKEY will be tested in the function TRANSF to determine if the input raw data vector is to be sun angle corrected or not. If the flag was turned on (i.e. SAKEY = 1), the following transformation will take place before the existing data transformation process:

TDATA = SAGAIN(I) * IDATA(L) + SABIAS(I)

where TDATA = the sun angle corrected I-th channel component of the current data vector,

SAGAIN(I) = the sun angle gain correction factor for the I-th channel,

IDATA(L) = the I-th channel component $\left(\frac{L \quad +1}{NSAMP+1}\right)$
of the current data vector
NSAMP = the number of sample data vectors (for the current scan line) that needs to be transformed, and

SABIAS(I) = the sun angle bias correction factor for the I-th channel.

If the SAKEY was not on (i.e. SAKEY = 0), the raw data vector, IDATA, will be used in the data transformation formula:

XT = IDATA * BMAT + BIAS

If the SAKEY was turned on (i.e. SAKEY = 1), the sun angle corrected data vector, TDATA, will be used in the transformation formula:

XT = TDATA * BMAT + BIAS

Before returning to the calling subroutine, TRANSF will be set equal to XT.

B.6.7 Flowchart

Appendix D

B.6.8 Listing

Appendix F

B.7 SOFTWARE SUBPROGRAM NO. 7 (LNTRAN)

The modifications to be made to the subroutine LNTRAN will enable the user to generate and output a 'Green' and/or 'Principal Component Greeness' (PCG) Image. The decision on whether these images are to be generated and output will depend on the new flags PCGC (turned on when the OPTION PCG control card was read in SETUP8) and GIC (turned on when the OPTION GREEN control card was read in SETUP8).

B.7.1 Linkages

LNTRAN may call the following subroutines: TAPHDR, LAREAD, FLDINT, WRTHDR, LINERD, FDLINT, TRANSF, WRTLIN, NTRAN, COMHST, and MATVEC.

LNTRAN is called by the driver program of Data Transformation, DATATR.

B.7.2 Interfaces

LNTRAN references the following common blocks: INFORM, TRBLCK, COMBK4, and GLOBAL.

B.7.3 Inputs

The calling sequence to LNTRAN remains unchanged.

B.7.4 Outputs

The user will be able to generate and output a Green and/or PCG Image depending on the value of the flags GIC and PCGC.

If Green or PCG Image is requested, the transformed data set will be output on the default (Fortran unit 14, file = 1) or user-specified tape unit and file number.

If both images are requested, the Green Image will be output on the default or user-specified file number and the PCG Image will be output on the following file.

The heading 'Green Image', 'PCG Image', or 'Transformed Image' will be printed before the respective image is output.

B.7.5 Storage Requirements

DATA = 21350_8 CODE = 3256_8

B.7.6 Description

If the GIC flag is on (GIC=1), the scaling parameters MAX, MIN, and CON derived from the histogram of the 'Green Image' will be used in the transforming, rescaling, and histogramming processes of the data vectors.

If the PCGC flag is on (PCGC=1), the scaling parameters (derived from the histogram of 'PCG' Image) stored in locations BMAT (401) → BMAT (400 + 3 * LCOMB) will be used in the processes of transforming, rescaling, and histogramming the data vectors. Recall that the MAX vector is stored in locations BMAT (401)→BMAT(400 + LCOMB), the MIN vector in locations BMAT (401 + LCOMB) → BMAT (400 + 2 * LCOMB), and the CON vector in locations BMAT (401 + 2 * LCOMB) → BMAT (401 + 3 * LCOMB).

Since different sun angle correction transformations were performed earlier, a test to check the MAX against the MIN vector was initiated. If a component of the MAX vector is less than the corresponding MIN component, the two values will be interchanged.

If the PCGC flag is on, the matrix PCM will be applied to the transformed data vectors output from the function TRANSF.

The transformed data vectors will be compared against $\pm$ 3000 if the user had requested the sun angle correction option and no rescaling of the transformed data.

B.7.7 Flowchart

Appendix D

B.7.8 Listing

Appendix F

B.8 SOFTWARE SUBPROGRAM NO. 8 (GETGCV)

The existing subroutine GETST was modified to create the new subroutine GETGCV. The sole purpose of GETGCV is to read one covariance matrix from SAVTAP.

B.8.1 Linkages

GETGCV is called by the DATA-TR subroutine.

B.8.2 Interfaces

GETGCV does not reference any common blocks.

B.8.3 Inputs

The calling sequence to GETGCV is:

- Call GETGCV (UNIT, FILE, NCHAN, COVAR)

Parameter	Dimension	In/Out	Definition
UNIT	1	IN	The fortran unit number from which the covariance matrix is to be read from
FILE	1	IN	The file number on 'UNIT' from which the covariance matrix is to be read from
NCHAN	1	IN	The number of channels requested from the training segment
COVAR	465	OUT	The covariance matrix array retrieved from the input unit and file number

B.8.4 Outputs

If the tape drive cannot position the tape to the requested file, the following error message will appear:

'ERROR IN POSITIONING UNIT XXX TO
FILE XXX'

The run will be terminated after the above message has been printed.

B.8.5 Storage Requirements

DATA = 103_8 CODE = 156_8

B.8.6 Description

The purpose of the new subroutine GETGCV is to retrieve the mixture covariance matrix from the requested file and unit number. This matrix generated in STAT, will be used in the transformation process to create an unitary matrix PCM. PCM will be used to generate the 'Principal Component Greenness' image.

B.8.7 Flowchart

Appendix D

B.8.8 Listing

Appendix F

B.9 SOFTWARE SUBPROGRAM NO. 9 (SUNF2)

The new subroutine SUNF2 is a modified version of the existing subroutine SUNFAC. While SUNFAC only returns the sun angle gain factors, SUNF2 returns both the sun angle gain and bias factors.

B.9.1 Linkages

SUNF2 is called by the SETUP8 subroutine.

B.9.2 Interfaces

SUNF2 does not make reference to any common blocks.

B.9.3 Inputs

The dimensioned variable SABIAS was added to the calling sequence.

The new calling sequence to SUNF2 is:

- Call SUNF2 (SUNCOR, SUNANG, FETVEC, NOFEAT, ISUNC, ISUNT, SABIAS)

Parameter	Dimension	In/Out	Definition
SUNCOR	1	OUT	The sun angle gain factors that correspond to the input sun angles
SUNANG	1	IN	Array of sun angles
FETVEC	1	IN	Array of selected channels
NOFEAT	1	IN	Number of input channels
ISUNC	1	IN	Number of input sun angles
ISUNT	1	IN	If ISUNT = 1, read the sun angles off of the tape; otherwise, do not.
SABIAS	1	OUT	The sun angle bias factors that correspond to the input sun angles.

B.9.4 Outputs

There are two new line printer outputs:

a. The sun angle gain factors are:

   XXXXXX XXXXXX . . . XXXXXX

b. The sun angle bias factors are:

   XXXXXX XXXXXX . . . XXXXXX

B.9.5 Storage Requirements

DATA = 1326_8

CODE = 306_8

B.9.6 Description

SUNF2 will return the sun angle bias and gain factors that correspond to the input sun angle array.

B.9.7 Flowchart

Appendix D

B.9.8 Listing

Appendix F

B.10 SOFTWARE SUBPROGRAM NO. 10 (PCMAML)

The new subroutine PCMAML performs the multiplication operation on the two input matrices, A and X.

B.10.1 Linkages

PCMAML is called by PCMMAT.

PCMAML references the new function, SUPSUM.

B.10.2 Interfaces

PCMAML does not reference any common blocks.

B.10.3 Inputs

The calling sequence to PCMAML is:

- PCMAML (A, X, B, I, J, K, NA, NX, NB)

Parameter	Dimension	In/Out	Definition
A	(NA, NX)	IN	The matrix to be used in the multiplication process.
X	(NX, NB)	IN	The other matrix to be used in the multiplication process.
B	(NA, NB)	OUT	The matrix generated from A*X.
I	1	IN	The number of rows in A
J	1	IN	The number of columns in A and rows in X
K	1	IN	The number of columns in X
NA	1	IN	NA=16
NX	1	IN	NX=16
NB	1	IN	NB=16

B.10.4 Outputs

There is no line printer output

B.10.5 Storage Requirements

DATA = 354_8

CODE = 161_8

B.10.6 Description

A work vector, P, is initialized each time a row of A is multiplied by a column of X. For row L of A and column M of X, the P vector will be equal to:

$$P = \begin{pmatrix} A(L,1) * X(1,M) \\ A(L,2) * X(2,M) \\ \vdots \\ A(L,J) * X(J,M) \end{pmatrix}.$$

The function SUPSUM will then be referenced to form the ordered sum of elements in P.

B.10.7 Flowchart

Appendix D

B.10.8 Listing

Appendix F

B.11 SOFTWARE SUBPROGRAM NO. 11 (SUPSUM)

The new function SUPSUM returns the ordered sum of the input vector, A.

B.11.1 Linkages

SUPSUM is called by the new subroutines PCMMAT and PCMAML. SUPSUM calls the new subroutine ORD1.

B.11.2 Interfaces

SUPSUM does not reference any common blocks.

B.11.3 Inputs

The calling sequence to function SUPSUM is:

X = SUPSUM (A, I, N)

Parameter	Dimension	In/Out	Definition
A	N	In	The vector that will be ordered and summed up.
I	1	IN	The ending position in A to sum to
N	1	IN	The size of A

B.11.4 Outputs

There is no line printer output.

B.11.5 Storage Requirements

DATA = 23_8

CODE = 132_8

B.11.6 Description

The input vector A goes through an ordering process in ORD1. After the components of A are placed in ascending order, they are then summed up to the Ith position in A.

B.11.7 Flowchart

Appendix D

B.11.8 Listing

Appendix F

B.12 SOFTWARE SUBPROGRAM NO. 12 (MINDEX)

The output vector JM will contain the indices that correspond to the R vector after R has been placed in ascending order.

B.12.1 Linkages

MINDEX is called by the new subroutine PCMMAT.

B.12.2 Interfaces

MINDEX does not reference any common blocks.

B.12.3 Inputs

The calling sequence to MINDEX is:

- Call MINDEX (R, JM, IM, N)

Parameter	Dimension	In/Out	Definition
R	N	IN	The input vector of values
JM	N	IN/OUT	The vector of length N whose elements have been initialized to JM(J)=J, J=1,•••,N.
IM	1	IN	The position (index) of place to begin the scan in R.
N	1	IN	The maximum size of R and JM.

B.12.4 Outputs

There is no line printer output.

B.12.5 Storage Requirements

DATA = 23_8

CODE = 77_8

B.12.6 Description

The new subroutine MINDEX will go through a search process in order to place the index of the smallest value in R into JM(1), the next smallest in JM(2), etc. The last value, JM(N) will contain the index of the largest value in R.

B.12.7 Flowchart

Appendix D

B.12.8 Listing

Appendix F

B.13 SOFTWARE SUBPROGRAM NO. 13 (ORD1)

The new subroutine ORD1 will reorder the input vector into ascending order.

B.13.1 Linkages

ORD1 is called by the new function SUPSUM

B.13.2 Interfaces

ORD1 does not reference any common blocks.

B.13.3 Inputs

The calling sequence to ORD1 is:

- Call ORD1 (A, I1, I2, N)

Parameter	Dimension	In/Out	Definition
A	N	IN/OUT	The vector to be ordered in ascending order.
I1	1	IN	The position in A to begin the ordering process.
I2	1	IN	The position in A to end the ordering process.
N	1	IN	The maximum length of vector A

B.13.4 Outputs

There is no line printer output

B.13.5 Description

The subroutine ORD1 will reorder the input vector A and place the results back in A. The components in the output vector A will be in ascending order.

B.13.6 Storage Requirements

DATA = 21_8

CODE = 132_8

B.13.7 Flowchart

Appendix D

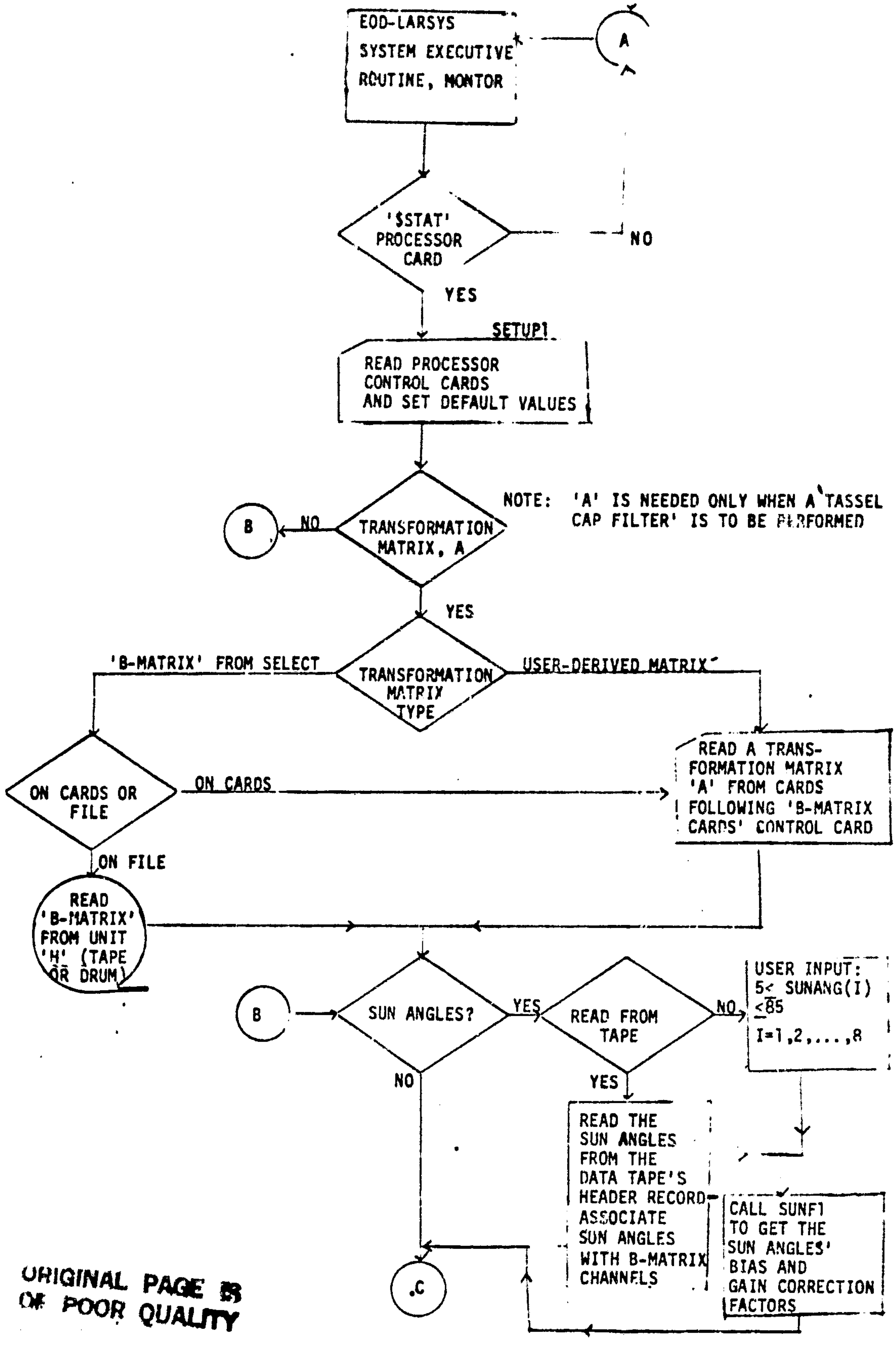
B.13.8 Listing

Appendix F

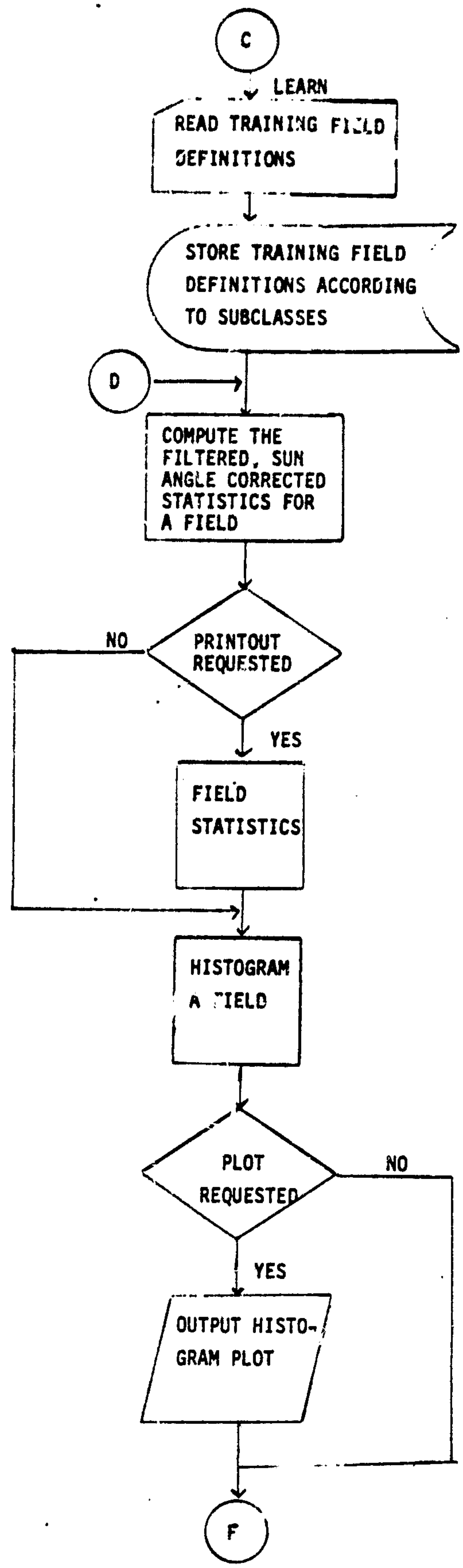
APPENDIX C

FUNCTIONAL FLOWCHART - STAT PROCESSOR

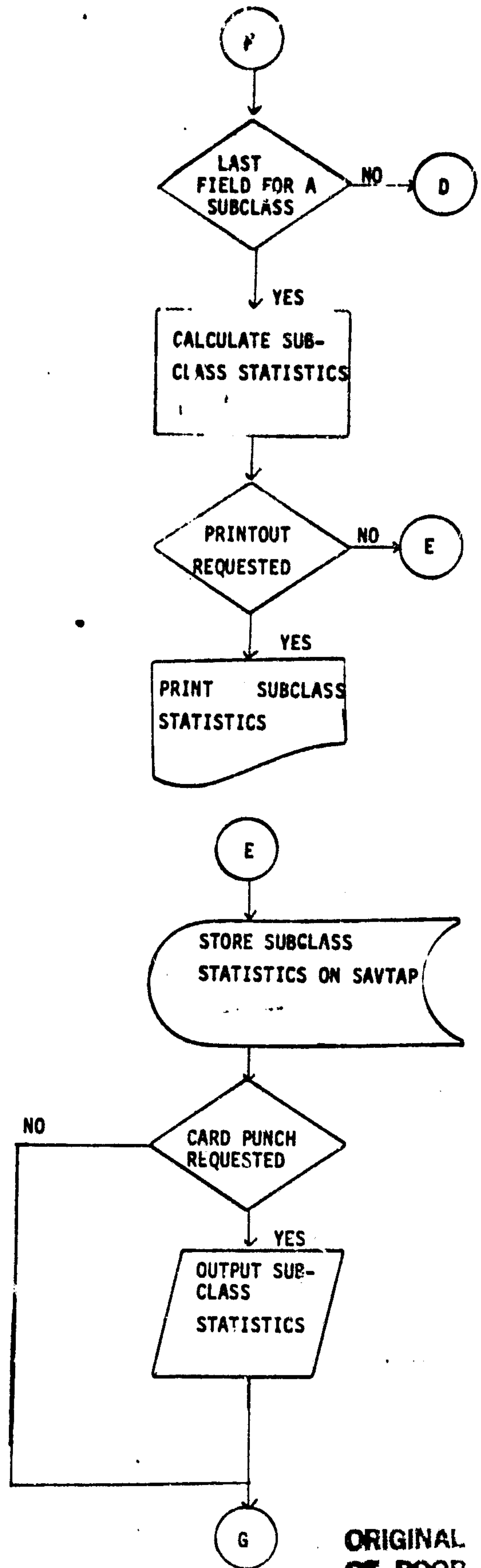
STAT PROCESSOR



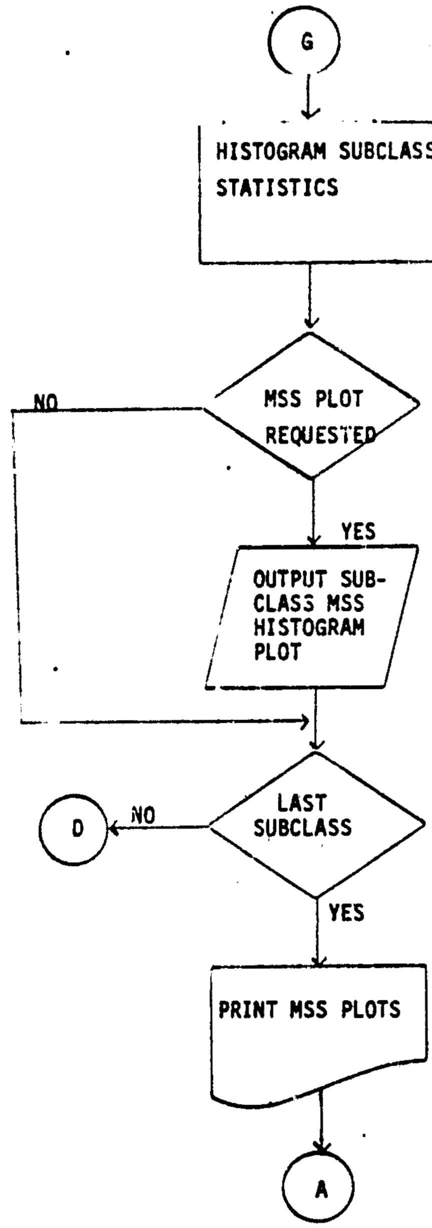
ORIGINAL PAGE IS OF POOR QUALITY



ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE IS OF POOR QUALITY


G
HISTOGRAM SUBCLASS STATISTICS
MSS PLOT REQUESTED
NO
YES
OUTPUT SUB-CLASS MSS HISTOGRAM PLOT
LAST SUBCLASS
NO
D
YES
PRINT MSS PLOTS
A

APPENDIX D

LISTINGS - STAT PROCESSOR
(MONTOR IS INCLUDED)

```
0016    _TRPL
0017    DOTDAT
0020    NERR2$
0021    NWDUS
0022    N102$
0023    NREWS
0024    NSTOP$

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

0001  000006 10L       0001  000121 100I      0000  000030 110F      0001  000133 120L      0000  000036 130F
0001  000151 140L      0000  000043 150F      0001  000143 160L      0000  000050 170F      0001  000201 175L

0000  000057 176F      0001  000213 180I      0000  000067 190F      0001  000041 20L       0001  000231 200L
0000  000077 213F      0001  000247 220L      0000  000107 230F      0001  000265 240L      0000  000117 250F
0001  000303 260L      0000  000127 270F      0001  000307 280L      0000  000004 30F       0001  000057 40L
0000  000011 50F       0001  000075 60L       0000  000016 70F       0001  000107 80L       0000  000023 90F
0002 I 000000 ARRAY    0003  000073 ASAV      0003  000074 ASAVFL    0003  000055 BMFILE    0003  000056 BMKEY
0003  000053 DATAPE    0003  000071 DATFIL    0000 I 000001 DBUG     0003  000102 DOTFIL    0003  000101 DOTUNT
0003 I 000067 DRMWDS   0003 I 000066 DRUMAD   0003  000062 ERIPTP    0003  000063 ERPKEY    0003  000000 HEAD
0003  000057 HISFIL    0003  000060 HISKEY    0000 I 000002 J60      0003  000100 MAPFIL    0003  000052 MAPTAP
0003 I 000064 MAPUNT   0003  000076 NHSTFI    0003  000075 NHSTUN    0003 I 000065 NOFILE   0003  000070 PAGSIZ
0003  000054 SAVTAP    0003  000077 SCTRUN    0003  000072 STAFIL    0000 I 000003 TIME     0000 I 000000 TOP
0003  000061 TRFORM

00100   1.   C     //MONTOR                                                      MONT0000
00100   2.   C                                                                   MONT0010
00100   3.   C*-------------------------------------------------------------------*MONT0020
00100   4.   C*                                                                  *MONT0030
00100   5.   C*    CALL..     SYSTEM MONITOR  (// EXEC  LARSYSAA )               *MONT0040
00100   6.   C*                                                                  *MONT0050
00100   7.   C*    PURPOSE.. MONITORS THE VARIOUS SYSTEM SUPERVISORS             *MONT0060
00100   8.   C*                                                                  *MONT0070
00100   9.   C*              ROUTINES MSCAN   CLSFY  DSPLAY  STAT
00100  10.   C*                       SELECT  HIST   GRAYMP  DATATR
00100  11.   C*                       ISOCLS
00100  12.   C*                                                                  *MONT0110
00100  13.   C*    RETURNS.. NONE                                                *MONT0120
00100  14.   C*                                                                  *MONT0130
00100  15.   C*-------------------------------------------------------------------*MONT0140
00100  16.   C                                                                   MONT0150
00100  17.   C                                                                   MONT0160
00101  18.         IMPLICIT INTEGER(A-H,O-Z)                                     MONT0170
00103  19.         COMMON ARRAY                                                  MONT0180
00104  20.         DIMENSION ARRAY(10600)
00104  21.   C.
00104  22.   C.    'ARRAY' IS A BLOCK OF STORAGE PASSED TO EACH PROCESSOR FOR THE
00104  23.   C.    VARIABLE DIMENSIONING OF OTHER ARRAYS. THE ARRAY IS NEVER USED
00104  24.   C.    TO PASS INFORMATION  FROM ONE PROCESSOR TO ANOTHER.
00104  25.   C.
00105  26.         DATA TOP/10600/
00107  27.         INCLUDE COMBK6.LIST
00107  28.   C                                                                   MONT0230
00107  29.   C                                                                   MONT0240
00110  29.         COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00110  29.      *              HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
00110  29.      *    DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00110  29.      *   ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
00110  29.      *    ,DOTUNT,DOTFIL
00111  29.         END
00112  30.         INCLUDE COMNT6.LIST
00112  30.   C.
00112  30.   C.    GLOBAL COMMON IS USED IN EVERY PROCESSOR. IT IS ALWAYS IN CORE.
00112  30.   C.    ALL PARAMETERS ARE INITIALIZED IN THE MONITOR ROUTINE OR BLKCOM
00112  30.   C.    EXCEPT AS NOTED BELOW
00112  30.   C.    DEFINITIONS
00112  30.   C.        HEAD    - STANDARD HEADING PRINTED ON MOST OUTPUT PAGES.
00112  30.   C.        MAPTAP  - FORTRAN UNIT NUMBER ON WHICH THE MAPTAP FILE IS
```

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```
00112        30.    C.                WRITTEN (=2)
00112        30.    C.        DATAPE = UNIT NO. FOR THE IMAGE DATA TAPE (=3)
00112        30.    C.        SAVTAP = UNIT NO. ON WHICH THE STATISTICS FILE IS WRITTEN (=1
00112        30.    C.        BMFILE = UNIT NO. ON WHICH THE B-MATRIX FILE IS WRITTEN (=10)
00112        30.    C.        BMKEY  = TRIGGER INDICATING THAT THE B-MATRIX FILE HAS BEEN
00112        30.    C.                 WRITTEN. CAN BE SET IN SELECT CLASSIFY OR DATA-TR.
00112        30.    C.        HISFIL = UNIT NO. ON WHICH THE HISTOGRAM FILE IS WRITTEN (=13)
00112        30.    C.        HISKEY = TRIGGER INDICATING THE HISTOGRAM FILE HAS BEEN
00112        30.    C.                 WRITTEN. SET IN HIST PROCESSOR.
00112        30.    C.        TRFORM = UNIT NO. ON WHICH THE TRANSFORMED IMAGE IS WRITTEN BY
00112        30.    C.                 THE DATA-TRANSFORMATION PROCESSOR. (=14)
00112        30.    C.        ERIPTP = UNIT NO. ON WHICH THE ISOCLS PROCESSOR WRITES
00112        30.    C.                 CLUSTER STATISTICS FOR THE ERIPS SYSTEM. (=16)
00112        30.    C.        ERPKEY = TRIGGER INDICATING THAT THE ERIPS INTERFACE TAPE
00112        30.    C.                 HAS BEEN WRITTEN.
00112        30.    C.        MAPUNT = UNIT NO. ON WHICH THE ISOCLS OR DISPLAY PROCESSOR
00112        30.    C.                 WRITES THE CLUSTERED OR CLASSIFIED DATA
00112        30.    C.              TO BE DISPLAYED ON THE PMIS DAS
00112        30.    C.        NOFILE = NO. OF FILES WRITTEN ON UNIT 16 (MAP OUTPUT TAPE)
00112        30.    C.                 BY DISPLAY AND/OR ISOCLS
00112        30.    C.                 SET EITHER IN ISOCLS OR DISPLAY.
00112        30.    C.        DRUMAD = BEGINNING ADDRESS FOR THE RANDOM ACCESS HIGH SPEED
00112        30.    C.                 DRUM FILE. THIS FILE IS USED AS A SCRATCH FILE IN
00112        30.    C.                 SEVERAL PROCESSORS. REFERENCES TO SYSTEM ROUTINES
00112        30.    C.                 'RREAD' AND 'RWRITE' ACCESS THIS FILE.
00112        30.    C.        DRMWDS = NO. OF WORDS AVAILABLE ON THE RANDOM ACCESS FILE.
00112        30.    C.        PAGSIZ = NO. OF LINES AVAILABLE FOR PRINTING ON A PAGE.
00112        30.    C.        DATFIL = NO. OF E-O-F'S TO BE READ OVER BY TAPERD ROUTINE IN
00112        30.    C.                 ORDER TO POSITION THE DATA TAPE TO DESIRED FILE
00112        30.    C.        STAFIL = NO. OF E-O-F'S TO SKIP OVER TO POSITION STAT FILE")
00112        30.    C.          ASAV = UNIT NO. ON WHICH TRSTAT WRITES THE TRANSFORMED
00112        30.    C.                 STATS
00112        30.    C.        ASAVFL = NO. OF E-O-F'S TI SJIP OVER TO POSITION TRANSFORMED
00112        30.    C.                 STATS
00112        30.    C.        DOTUNT = UNIT NO. ON WHICH DOT DATA FILE (DOTFIL) IS WRITTEN
00112        30.    C.        DOTFIL = NO. OF E-O-F S TO SKIP OVER TO POSITION DOTFIL FILE
00113        30.          END
00114        31.          DBUG=-1                                                          MONT0250
00114        32.    C.
00114        33.    C.    SYSTEM ROUTINE RINIT ASSIGNS THE RANDOM ACCESS DRUM FILE.
00114        34.    C.
00114        35.    C.         -DRUMAD-- IS THE ADDRESS TO BEGIN WRITING
00114        36.    C.         -DRMWDS- IS THE NO. OF WORDS AVAILABLE ON THE DRUM FILE.
00114        37.    C.
00114        38.    C.    THE FOLLOWING PROCESSORS USE THE RANDOM ACCESS DRUM FILE FOR SCRATCH
00114        39.    C.         -ISOCLS-
00114        40.    C.         -DISPLY-
00114        41.    C.         -SELECT-
00114        42.    C.
00114        43.    C.         -GRAYMP-
00114        44.    C.         -SIGEXT-
00114        45.    C.
00115        46.          CALL RINIT(DRUMAD,DRMWDS)
00116        47.       10 CONTINUE                                                         MONT0270
00117        48.          CALL RESET                                                       MONT0280
00120        49.          CALL MSCAN(JGO,DBUG)                                             MONT0290
00121        50.          GO TO (20,40,60,80,100,120,140,160,175,180,200,220,240,260,
00121        51.         *       280),JGO
```

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85

```
00114   C.          -ISOCLS-
00114   C.          -DISPLY-
00114   C.          -SELECT-
00114   C.
00114   C.          -GRA.MP-
00114   C.          -SIGEXT-
00114   C.
00115         CALL RINIT(DRUMAD,DRMWDS)
00116      10 CONTINUE                                                        MONTO270
00117         CALL RESET                                                      MONTO280
00120         CALL MSCAN(JGO,DBUG)                                            MONTO290
00121         GO TO (20,40,60,80,100,120,140,160,175,180,200,220,240,260,
00121        *      280),JGO
00121   C                                                                     MONTO310
00122      20 CONTINUE                                                        MONTO320
00123         CALL STAT(ARRAY,TOP)
00124         CALL CLOCK(TIME)                                                MONTO340
00125         WRITE (6,30)TIME                                                MONTO350
00130      30 FORMAT(' TIME FOR STAT',F10.3)                                  MONTO360
00131         GO TO 10                                                        MONTO380
00131   C                                                                     MONTO390
00131   C                                                                     MONTO400
00132      40 CONTINUE                                                        MONTO410
00133         CALL CLSFY(ARRAY,TOP)
00134         CALL CLOCK(TIME)                                                MONTO430
00135         WRITE (6,50)TIME                                                MONTO440
00140      50 FORMAT(' TIME FOR CLASSIFY',F10.3 )                             MONTO450
00141         GO TO 10                                                        MONTO470
00141   C                                                                     MONTO480
00141   C                                                                     MONTO490
00142      60 CONTINUE                                                        MONTO500
00142   C   *** DSPLAY                                                            *NE?
00143         CALL CLOCK(TIME)                                                MONTO520***-1
00144         WRITE (6,70)TIME                                                MONTO530
00147      70 FORMAT(' TIME FOR DISPLAY',F10.3)                               MONTO540
00150         GO TO 10                                                        MONTO560
00150   C                                                                     MONTO570
00150   C                                                                     MONTO580
00151      80 CONTINUE                                                        MONTO590
00151   C.      CALL SELECT(ARRAY,TOP)                                            *NEW
00152         CALL CLOCK(TIME)                                                MONTO610***-1
00153         WRITE (6,90)TIME                                                MONTO620
00156      90 FORMAT(' TIME FOR SELECT',F10.3)                                MONTO630
00157         GO TO 10                                                        MONTO650
00157   C                                                                     MONTO660
00157   C                                                                     MONTO670
00160     100 CONTINUE
00160   C   *** HIST
00161         CALL CLOCK(TIME)
00162         WRITE(6,110)TIME
00165     110 FORMAT(' TIME FOR HISTOGRAM',F10.3)
00166         GO TO 10
00166   C
00166   C       GO HERE FOR ISOCLS
00166   C
00167     120 CONTINUE
00170         CALL ISOCLS(ARRAY,TOP)
00171         CALL CLOCK(TIME)
00172         WRITE(6,130) TIME
00175     130 FORMAT(' TIME FOR ISOCLS',F10.3)
00176         GO TO 10
00176   C
00176   C       GO HERE FOR GRAYMAP
00177     140 CONTINUE
00177   C   *** GRAYMAP
00200         CALL CLOCK(TIME)
00201         WRITE(6,150) TIME
00204     150 FORMAT(' TIME FOR GRAYMAP',F10.3)
00205         GO TO 10
00205   C
00205   C       GO HERE FOR DATA-TRANSFORMATION
```

```
00205      C
00206        160 CONTINUE
00207             CALL DATATR(ARRAY,TOP)                                  *NEW
00210            CALL CLOCK(TIME)                                         **-1
00211            WRITE(6,170) TIME
00214        170 FORMAT(' TIME FOR DATA-TRANSFORMATION',F10.3)
00215            GO TO 10
00215      C*
00215      C*    GO HERE FOR SIGEXT MODULE
00215      C*
00216        175 CONTINUE
00216      C  *** SIGEXT
00217            CALL CLOCK(TIME)
00220            WRITE(6,176)TIME
00223        176 FORMAT(//' TIME FOR SIGEXT ',F10.3, 'MINUTES' )
00224            GO TO 10
00224      C
00224      C     GO HERE FOR TRSTAT
00224      C
00225        180 CONTINUE
00226             CALL TRSTAT(ARRAY,TOP)                                  *NEW
00227            CALL CLOCK(TIME)                                         **-1
00230            WRITE(6,190)TIME
00233        190 FORMAT(//' TIME FOR TRSTAT',F10.3,' MINUTES')
00234            GO TO 10
00234      C
00234      C     GO HERE FOR NDHIST
00234      C
00235        200 CALL NDHIST(ARRAY,TOP)
00236            CALL CLOCK(TIME)
00237            WRITE(6,210)TIME
00242        210 FORMAT(//' TIME FOR NDHIST',F10.3,' MINUTES')
00243            GO TO 10
00243      C
00243      C     GO HERE FOR SCTRPL
00243      C
00244        220 CALL SCTRPL(ARRAY,TOP)
00245            CALL CLOCK(TIME)
00246            WRITE(6,230)TIME
00251        230 FORMAT(//' TIME FOR SCTRPT',F10.3,' MINUTES')
00252            GO TO 10
00252      C
00252      C
00252      C     GO HERE FOR DOTDATA
00252      C
00253        240 CALL DOTDAT(ARRAY,TOP)
00254            CALL CLOCK(TIME)
00255            WRITE(6,250)TIME
00260        250 FORMAT(//' TIME FOR DOTDATA',F10.3,' MINUTES')
00261            GO TO 10
00261      C
00261      C     GO HERE FOR LABEL
00261      C
00262        260 CONTINUE
00262      C     *** CALL LABEL(ARRAY,TOP)                                    *NEW
00263            CALL CLOCK(TIME)                                         **-1
00264        270 FORMAT(//' TIME FOR LABEL',F10.3,' MINUTES')
00265            GO TO 10
```

```
00265     168*      C
00266     169*        260 IF (NOFILE .GT. 0) REWIND MAPUNT
00270     170*            END                                                             MONT0690

      END OF COMPILATION:          NO  DIAGNOSTICS.
   MONTOR            SYMBOLIC                                  20 JUN 77  01:56:58   0  02614506   14   170  (DELETED)
   MONTOR   CODE     RELOCATABLE                               20 JUN 77  01:56:58   1  01640346   36     1  (DELETED)
                                                                                     0  01640412   14    34
```

```
FOR,* STAT,STAT                                                                 05 APR 77          7*43*17.770
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E1201001QA)
THIS COMPILATION WAS DONE ON 05 APR 77 AT 07*43*17

   SUBROUTINE STAT       ENTRY POINT 000214

   STORAGE USED* CODE(1) 000237  DATA(0) 000210  BLANK COMMON(2) 000000

    COMMON BLOCKS*

    0003   STBASE 000017
    0004   STCBLK 000217

   EXTERNAL REFERENCES (BLOCK, NAME)

    0005   SETUP1
    0006   LEARN
    0007   NWDU$
    0010   NIC2$
    0011   NERR3$

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

    0000   000075 2F        0003 I 000011 AVAR1    0003 I 000012 CLSID1    0004   000212 CLSPTS    0000   000145 COMENT
    0003 I 000010 COVAR1    0000   000124 DATE     0004   000105 FETVC2    0004   000047 FETVEC    0004   000203 FLDINF
    0004   000211 FLDPTS    0003 I 000016 FLDSV1   0003 I 000015 FLMEN1    0003 I 000014 FLVAR1    0000   000106 HEAD
    0000   000110 HED1      0000   000131 HED2     0003 I 000015 HFTAL1    0004   000143 HISVEC    0003 I 000006 HSTAL1
    0004   000011 IBLOCK    0000   000160 INJP$    0000 I 000000 KEPPTS    0004   000001 MAXCLS    0004   000000 MAXFET
    0004   000002 MAXFLD    0000 I 000074 MAXSUB   0004   000202 NCCLS     0004   000003 NOFEAT    0004   000004 NOFET2
    0004   000201 NOFLD     0004   000007 NOHIST   0004   000006 NOSPEC    0003 I 000005 SAVER1    0004   000010 SPCBAS
    0003 I 000007 SPEC1     0003 I 000004 SUBCL1   0003 I 000001 SUBMN1    0003 I 000003 SUBSD1    0003 I 000000 SUMSV1
    0003 I 000002 SUBVR1    0004   000005 VARSIZ   0004   000214 XHGH      0004   000215 XLOW      0004   000213 XSIZ
    0004   000216 YSIZ

 00100        1*      C      //STAT                                                        SUP10010
 00101        2*             COMPILER (DATA=SHORT)
 00103        3*             SUBROUTINE STAT(ARRAY,TCP)                                    SUP10030
 00105        4*             IMPLICIT INTEGER (A-H,O-Z)                                    SUP10050
 00106        5*             DOUBLE PRECISION ARRAY(1500)
 00107        6*             DIMENSION KEPPTS(60)                                          SUP10060
 00107        7*      C                                                                   ISUP10170
 00107        8*      CI     PURPOSE.. COORDINATES THE VARIOUS ROUTINES                   ISUP10180
 00107        9*      CI               FOR *STATISTICS* STEP                              ISUP10190
 00107       10*      CI
 00110       11*             INCLUDE COMBK4,LIST
 00111       11*             DIMENSION HED1(10),HED2(10),DATE(2),COMENT(10)
 00112       11*             EQUIVALENCE (HED1(1),HEAD(3)),(DATE(1),HEAD(15)),
 00112       11*            *            (HED2(1),HEAD(20)),(COMENT(1),HEAD(32))
 00113       11*             END
 00114       12*             INCLUDE COMBK8,LIST
 00114       12*      C STAT COMMON BLOCK
```

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```
00115    12*        COMMON /STBASE/SUBSV1,SUBMN1,SUBVR1,SUBSD1,SUBCL1,SAVER1,HSTAL1,
00115    12*       *SPEC1,COVAR1,AVAR1,CLSID1,FLMEN1,FLVAR1,HFTAL1,FLDSV1
00116    12*        COMMON /STCBLK/        MAXFET,MAXCLS,MAXFLD,NCFEAT,NOFET2,
00116    12*       *VARSIZ,NOSPEC,NOHIST,SPCBAS,IBLOCK(30),FETVEC(30),
00116    12*       *FETVC2(30),HISVEC(30),NCFLD,NOCLS,
00116    12*       *    FLDINF(6),FLDPTS,CLSPTS,XSIZ,XHGH,XLOW,YSIZ
00117    12*        END
00120    13*        CALL SETUP1(APRAY,TCF MAXSUB)
00121    14*        CALL LEARN(ARRAY(SPEC1),ARRAY(COVAR1),ARRAY(AVAR1),
00121    15*       *              ARRAY(CLSID1),ARRAY(SUBSV1),ARRAY(FLMEN1),ARRAY(FLVAR1)
00121    16*       *,             ARRAY(SUBMN1),ARRAY(SUBVR1),ARRAY(SUBSD1),ARRAY(SUBCL1)
00121    17*       *,             ARRAY(HFTAL1),ARRAY(HSTAL1),ARRAY(FLDSV1),
00121    18*       *              ARRAY(SAVER1),KEPPTS,MAXSUB)
00122    19*        WRITE (6,2)                                                        SUP10520
00124    20*      2 FORMAT(////////// 2X,'***  $STAT - COMPLETED  ***' //////)
00125    21*        RETURN                                                             SUP10540
00125    22*         END                                                               SUP10550

     END OF COMPILATION:        NO  DIAGNOSTICS.
   STAT              SYMBOLIC                     29 MAR 77  12:39:41  0  02160256   14   22  (DELETED)
   STAT      CODE    RELOCATABLE                  29 MAR 77  12:39:41  1  02160742   36    1  (DELETED)
                                                                       0  02161006   14   17
```

```
0000    000014 FLVARI    0000 I 000016 HFDKEY    0003 I 000      STALI     0000 I 000211 I        0000 I 000241 ISIA
0005    000023 HFD2      0004 I 000015 HSBKEY    0003 I 000      STALI     0000 I 000234 IPI      0000 I 000247 KCHN
0004 I  000143 HISVEC    0000 I 000215 INFMT     0000   0007     INJPS     0000 I 000243 K        0005   000100 MAPFIL
0000 I  000235 IL        0000 I 000223 ISUNT     0000 I 000232 J           0000 I 000230 4        0004 I 000002 MAXFLD
0000 I  000224 ISUNC     0000 I 000200 LACD      0000 I 000245 LCUMB       0004 I 000000 MAXFET   0005   000076 NHSTFI
0000 I  000244 KEY       0005   000064 MAPUNT    0004 I 000001 MAXCLS      0000 I 000221 NFCH     0004 I 000003 NOFEAT
0005    000052 MAPTAP    0000 I 000212 NALOCK    0005   000103 NCMPAS      0004   000202 NOCLS    0004 I 000004 NOSPEC
0000 I  000205 NACD      0000 I 000246 NKCHN     0000 I 000233 NMI         0004 I 000007 NOHIST   0010 I 000000 NUMBER
0005    000075 NHSTUN    0005   000045 NOFILE    0004   000201 NOFLD       0000 I 000250 NTH      0005   000070 PAGSIZ
0004    000004 NOFET2    0004   000011 NOTHNG    0000 I 003242 NSUNAG      0000 I 000160 OPTCOD   0004 I 001205 SAKEY
0004    000021 NOTHG2    0006 I 000000 NXTCHR    0000 I 003206 OBCD        0004 I 000012 PCHKEY   0000 I 000231 SETFLG
0000 I  000000 NUMVEC    0004   000024 PCCLKY    0004   000021 PCFDKY      0005   000077 SCTRUN
0004    000031 PCALKY    0005 I 000054 SAVTAP    0000 I 003201 SBCD
0003 I  000005 SAVERI

0004 I  000020 SFDKEY    0000 I 000036 SINVEC    0000 I 003251 SIZE        0004 I 000010 SPCBAS   0003 I 000007 SPECI
0004 I  000013 SSFKEY    0004 I 000017 SSLKEY    0004 I 003217 SSUNAG      0005 I 000072 STAFIL   0004   000030 STATKY
0003 I  000004 SUBCLI    0003 I 000001 SUBHNI    0003 I 000003 SUBSDI      0003 I 000000 SUBSVI   0003 I 000002 SUBVHI
0000 I  000214 SYMMAX    0000 I 000237 TEMP      0004 R 003233 TH          0000 I 000222 THKEY    0004   000027 THRSKY
0000 I  000252 TIPTOP    0005   000061 TRFORM    0004   000026 TRNKEY      0005   000104 TRNSFL   0004   000025 TSTKEY
0004 I  000005 VARSIZ    0000 I 000202 XBCD      0000 I 000217 XHF         0004 I 000219 XHGH     0000 I 000216 XLF
0004 I  000215 XLOW      0000 I 000220 XSF       0004 I 000213 XSIZ        0000 I 000203 YBCD     0004 I 000216 YSIZ
0000 I  000240 ZERO

00101      1*               COMPILER (DATA=SHORT)                                               SET10000
00103      2*               SUBROUTINE SETUPI(SPCVEC,TOP,MAXSUB)                                SET10020
00103      3*        C                                                                          SET10030
00105      4*               IMPLICIT INTEGER (A-H,O-Z)
00106      5*               DIMENSION  COMENT(10), DATE(2), HEDI(10), HED2(10), NUMVEC(30)
00106      6*        C
00107      7*               DIMENSION  SINVEC(3), SPCVEC(5,20), CARD2(42)
00107      8*        C                                                                               *NEW
00110      9*               DIMENSION CINDEX(17),OPTCOD(7),EQUVEC(2)                                 *NEW
00111     10*               REAL BIAS,TH,BMAT                                                        *NEW
00112     11*                DIMENSION BTEST(3)                                            ISET10070***1
00112     12*        CI                                                                    ISET10080
00112     13*        CI----------------------------------------------------------------------ISET10190
00112     14*        CI     PURPOSE.: READS AND ANALYZES SUPERVISOR CONTROL CARDS         ISET10200
00112     15*        CI              FOR THE 'STATISTICS' STEP
00113     16*               INCLUDE COMRKA,LIST
00113     16*        C STAT COMMON BLOCK
00114     16*               COMMON /STHASF/SUHSVI,SUBHNI,SUHVHI,SUBSDI,SUBCLI,SAVERI,NSTALI,
00114     16*              *SPECI,COVARI,AVARI,CLSIDI,FLMENI,FLVARI,HFTALI,FLUSVI
00115     16*               COMMON /STCHLK/        MAXFET,MAXCLS,MAXFLD,NOFEAT,NOFET2,
00115     16*              *VARSIZ,NOSPEC,NOHIST,SPCBAS,IBLOCK(30),FETVEC(30),
00115     16*              *FETVC2(30),HISVEC(30),NOFLD,NOCLS,
00115     16*              *   FLDINF(6),FLDPTS,CLSPTS,XSIZ,XHGH,XLOW,YSIZ
00115     16*              * ,SSUNAG(8),BIAS(4),TH(5),BMAT(480),FCHN(4),FKEY,SAKEY                  *NEW
00116     16*               END
00117     17*               EQUIVALENCE      (IBLOCK( 1),NOTHNG),(IBLOCK( 2),PCHKEY),           SET10410
00117     18*              *      (IBLOCK(3),SSFKEY),(IBLOCK(4),CFDKEY),
00117     19*              *         (IBLOCK(5),HSBKEY),(IBLOCK(6),HFDKEY),
00117     20*              *         (IBLOCK(7), SSLKEY),(IBLOCK(8),SFDKEY),
00117     21*              4              (IBLOCK( 9),NOTHG2),(IBLOCK(10),CALKEY),                 SET10450
00117     22*              5              (IBLOCK(11),PCFDKY),(IBLOCK(12),PCCLKY),                 SET10460
00117     23*              6              (IBLOCK(13),TSTKEY),(IBLOCK(14),TRNKEY),                 SET10470
00117     24*              7              (IBLOCK(15),THRSKY),(IBLOCK(16),STATKY),                 SET10480
00117     25*              8              (IBLOCK(17),PCALKY)                                      SET10490
00117     26*        C                                                                          SET10500
00120     27*               EQUIVALENCE     (HEDI(1),HEAD(3)), (DATE(1),HEAD(15)),              SET10510
00120     28*              1                (HED2(1),HEAD(20)),(CONENT(1),HEAD(32))             SET10520
00120     29*        C                                                                          SET10530
00120     30*        C      ------------------------------------------------------------------SET10540
00120     31*        C                                                                          SET10550
00121     32*               INCLUDE  COMRK6,LIST
00121     33*        C                                                                          SET10730
00121     34*        C                                                                          SET10740
00121     35*        C      ------------------------------------------------------------------SET10750
00121     36*        C                                                                          SET10760
00121     37*        C
```

```
      C
      C
            COMMON/GLOBA/ HEAD(42),MAPTAP,DATAPE,SAVTAP,UMFILE,UMKEY,
           *             HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
           *     DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
           *  ,NHSTON,NHSTFI,SCTRUN,MAPFIL
           * ,OUTUNT,OUTFIL,NCHPAS,TRNSFL                                   *NEW
            END                                                           **-1
            DATA  SINVEC/2,',' , '=' / , EQUAL/'=' /, BLANK/ ' ' /
            DATA          CRCD/'C'/,FBCD/'F'/,LBCD/'L'/,SBCD/'S'/,XBCD/'X'/, SET107?0
           1              YRCD/'Y'/,BLANK/' '/,HBCD/'H'/               SET19.?0
           1              ,NBCD/'N'/,ORCD/'O'/,ABCD/'A'/               SET10800
      C                                                                   *NEW
            DATA CINMAX/17/,EQUVEC/1,'='/                                 *NEW
             DATA ATEST/2,'C','F'/                                 SET10820**-1
      C                                                            SET10840
      C
            DATA OPTCOD/'N','P','C','H','S','T','W'/                      *NEW
            DATA  CINDEX/'OPTION', 'CHANNE', 'HISTO', 'SPECTR', 'IBLOCK', **-1
           1'SIZE','DATE','*END*','COMMEN',
           2 'HED1','HED2','DATAFI','STATFI','SUNANG',                    *NEW
           3 'B-MATR','THRESH','BIAS'/                                    *NEW
      C                                                            SET10890**-1
      C ---------------------------------------------------------------SET10900
      C ---------------------------------------------------------------SET10910
      C                                                            SET10920
      C     INIZ                                                   SET10930
      C ---------------------------------------------------------------SET10940
      C                                                            SET10950
      C*
      C*    READ AND UNPACK HEADER RECORD TO SET MAXFET ACCORDING TO ID(5)
      C*
          1 DO 2 I=1,30                                            SET10960
            FETVEC(I) = 1                                          SET10970
            HISVEC(I) = 1                                          SET10980
          2 IBLOCK(I) = 0                                          SET10990
            NBLOCK = 0                                             SET11000
            CALKEY =0                                              SET11010
            CCLKEY = 1                                             SET11020
            MAXCLS = 15
            MAXSUB=15
            MAXFET=30
            SYMMAX=30
            NOSPEC = 0                                             SET11050
             SPCHAS = -999                                                *NEW
            YSIZ = 14                                              SET11070**-1
            XSIZ=0                                                 SET11080
            XLOW=120                                               SET11090
            XHGH=220                                               SET11100
            INFMT = 0
            NOFEAT=0
             XLF=0                                                        *NEW
             XHF=                                                         *NEW
             XSF=0                                                        *NEW
      C      INITIALIZE THE SUN ANGLES                                    *NEW
              DO 4 I=1,8                                                  *NEW
             SSUNAG(I)=60                                                 *NEW
          4  CONTINUE                                                     *NEW
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```
00173         NOSPEC = 0
00174          SPCHAS = -999                                                  SET11070**-1
00175         YSIZ = 14                                                       SET11080
00176         XSIZ=0                                                          SET11090
00177         XLOW=120                                                        SET11100
00200         XHGH=220
00201         INFMT = 0
00202         NOFEAT=0                                                                  *NE*
00203          XLF=0                                                                    *NE*
00204          XHF=0                                                                    *NE*
00205          XSF=0                                                                    *NE*
00205   C      INITIALIZE THE SUN ANGLES                                                *NE*
00206           DO 4 I=1,8                                                              *NE*
00211          SSUNAG(I)=69                                                             *NE*
00212       4  CONTINUE                                                                 *NE*

00212   C      INITIALIZE THE BIAS VECTOR                                               *NE*
00214         DO 3 I=1,9                                                                *NE*
00217         BIAS(I)=0.                                                                *NE*
00220      3  CONTINUE                                                                  *NE*
00222          NFCH=0                                                                   *NE*
00223          FKEY=0                                                                   *NE*
00224         THKEY=0                                                                   *NE*
00225         ISUNT=0                                                                   *NE*
00226         ISUNC=0                                                                   *NE*
00227         SAKEY=0                                                                   *NE*
00230         BMTRIG=0                                                                  *NE*
00230   C                                                                     SET11110
00230   C                                                                     SET11120
00230   C     READ AND ANALYZE SUPERVISOR CONTROL CARDS                       SET11130
00230   C     ----------------------------------------------------------------SET11140
00230   C                                                                     SET11150
00231     200 COL = 0                                                         SET11160
00232         READ(5,2002) CODE,CARD2
00241    2002 FORMAT (A6,4X,62A1)                                             SET11180
00242     225 WRITE(6,2252)  CODE,CARD2                                       SET11190
00251    2252 FORMAT (I5,A4,4X,62A1)                                          SET11200
00252         DO 230 I=1,CINMAX                                               SET11210
00255     230 IF (CINDEX(I) .EQ. CODE)                                        SET11220
00255       1 GO TO(10,600,700,800,1100,1200,1400,900,1500,1400,
00255       2 1700 1710,1720,1730,1740,1750,1760),I                                     *NE*
00260         GO TO 1000                                                      SET11250**-1
00260   C                                                                     SET11260
00260   C     OPTION CARD                                                     SET11270
00260   C     ---------------------                                           SET11280
00260   C                                                                     SET11290
00261      10 M = NXTCHR(CARD2,COL)                                           SET11300
00262         IF(M .EQ. BLANK ) GO TO 200                                     SET11310
00264         IF( M .EQ. OPTCOD(1) ) GO TO 20                                 SET11320
00266         IF (M.EQ.OPTCOD(6)) GO TO 26                                              *NE*
00270          IF (M.EQ.OPTCOD(7)) GO TO 35                                             *NE*
00272         SETFLG = 1                                                      SET11330
00273         IF ( M .NE. NBCO ) GOTO 14                                      SET11340
00275         J = COL-1                                                       SET11350
00276         M = NXTCHR(CARD2,COL)                                           SET11360
00277         IF (M .NE. OBCO ) GOTO 12                                       SET11370
00301         SETFLG = 0                                                      SET11380
00302         J = COL                                                         SET11390
00302   C                                                                     SET11400
00303      12 COL = J                                                         SET11410
00304         M = NXTCHR(CARD2,COL)                                           SET11420
00305      14 DO 15 I=2,5                                                     SET11430
00310      15 IF( M .EQ. OPTCOD(I) )  GO TO (40,30,25,30,30), I
00310   C
00313         IF( M .EQ. BLANK)  GO TO 200
00315      40 M = COL + 10
00316         WRITE(6,402)   M
00321     402 FORMAT(/ 1X,'***  STAT/SETUP1 --- ERROR IN OPTION(S) REQUESTED - S
00321        1CAN OF OPTION(S) DISCONTINUED AT CARD COLUMN',I5,2X,'***' /)
00322         GO TO 200                                                       SET11470
00322   C                                                                     SET11480
00323      20 M = FIND(CARD2,COL,SINVEC)                                      SET11490
00324         IF ( SINVEC(M) .NE. EQUAL ) GO TO 40                            SET11500
00326         M = NUMBER(CARD2,COL,NUMVFC,29)
```

83

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      IF( NUMVEC(30) .LE. 0)  GO TO 40
      MAXSUB=NUMVEC(30)
      GO TO 10
C
   25 J = 20
      M = NXTCHR(CARD2,COL)
      IF ( M .EQ. OBCD ) J=3
      IF ( M .EQ. ABCD ) J=9
      IF ( J .LT. 20 ) GOTO 32
      GOTO 40
C
   30 J = I*2-3
   32 M = FIND(CARD2,COL,SINVEC)
      IF ( SINVEC(M) .NE. EQUAL ) GOTO 38
      M = NXTCHR(CARD2,COL)
      IF ( M .EQ. CBCD ) IBLOCK(J) = SETFLG
      IF ( M .EQ. FBCD ) IBLOCK(J+1) = SETFLG
      M = FIND(CARD2,COL,SINVEC)
      IF ( M .LE. 0 ) GOTO 200
      GOTO 10
C
   38 IBLOCK(J) = SETFLG
      IBLOCK(J+1) = SETFLG
      IF ( M .LE. 0 ) GOTO 200
      GOTO 10
C     FOUND THE TASSEL CAP OPTION - SET FKEY=2
   26  FKEY=2
       M=FIND(CARD2,COL,SINVEC)
       IF (M.EQ.2) GO TO 10
       GO TO 200
C     FOUND THE WATER OPTION - SET FKEY=1
   35  FKEY=1
       M=FIND(CARD2,COL,SINVEC)
       IF (M.EQ.2) GO TO 10
       GO TO 200
C
C     CHANNELS
C     --------
C     ------------------------
C
C      LOOK FOR DATA OR FILTER PARAMETER
  400  J=FIND(CARD2,COL,EQUVEC)
       IF (J.EQ.-1) GO TO 200
C     LOOK FOR DATA PARAMETER
       IF (CARD2(COL-4).NE.'D') GO TO 601
      NOFEAT = NUMBER(CARD2,COL,FETVEC,NOFEAT)
       GO TO 602
C     LOOK FOR FILTER PARAMETER
  601  IF (CARD2(COL-6).NE.'F') GO TO 600
      NFCH=NUMBER(CARD2,COL,FCHN,NFCH)
      GO TO 600
C
C     ELIMINATE OUT-OF-RANGE REQUESTED FEATURES,IF ANY.
C     ORDER THE RESULTING FEATURE VECTOR
C
  602  NM1 = NOFEAT - 1
      IF( NM1 .LE. 0)  NM1 = 1
      DO  611  I=1,NM1,1
```

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84

C-2

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00401                 C     ----
00403                       IF (CARD2(COL-4).NE.'D') GO TO 601
00405       193.            NOFEAT = NUMBER(CARD2,COL,FETVEC,NOFEAT)                              ..-3
00406       194.             GO TO 602                                                            *NEW
00406       195.      C     LOOK FOR FILTER PARAMETER                                             *NEW
00407       196.       601   IF (CARD2(COL-6).NE.'F') GO TO 600                                   *NEW
00411       197.            NFCH=NUMBER(CARD2,COL,FCHN,NFCH)                                      *NEW
00412       198.            GO TO 600                                                             *NEW
00412       199.      C
00412       200.      C     ELIMINATE OUT-OF-RANGE REQUESTED FEATURES,IF ANY.
00412       201.      C     ORDER THE RESULTING FEATURE VECTOR
00412       202.      C
00413       203.       602   NM1 = NOFEAT - 1                                                     *NEW
00414       204.            IF( NM1 .LE. 0)  NM1 = 1                                              ..-1
00416       205.            DO  611  I=1,NM1,1

00421       206.            IP1 = I + 1
00422       207.            IF( IP1 .GT. NOFEAT)  GO TO 611
00424       208.            DO  610  J=IP1,NOFEAT,1
00427       209.            IF( FETVEC(I) .EQ. FETVEC(J)) FETVEC(J) = I*MAXFET+J
00431       210.       610  CONTINUE
00433       211.       611  CONTINUE
00435       212.            II = 0
00436       213.            DO  612  I=1,NOFEAT,1
00441       214.            CHK = FETVEC(I)
00442       215.            IF( CHK .LE. 0 .OR. CHK .GT. MAXFET)  GO TO 612
00444       216.            II = II + 1
00445       217.            FETVEC(II) = FETVEC(I)
00446       218.       612  CONTINUE
00450       219.            NOFEAT = II
00451       220.            IF( NOFEAT .EQ. 0)  GO TO 1303
00453       221.            NM1 = NOFEAT - 1
00454       222.            IF( NM1 .LE. 0)  NM1 = 1
00456       223.            DO  614  I=1,NM1,1
00461       224.            IP1 = I + 1
00462       225.            IF( IP1 .GT. NOFEAT)  GO TO 614
00464       226.            DO  613  J=IP1,NOFEAT,1
00467       227.            IF( FETVEC(I) .LT. FETVEC(J))  GO TO 613
00471       228.            TEMP = FETVEC(I)
00472       229.            FETVEC(I) = FETVEC(J)
00473       230.            FETVEC(J) = TEMP
00474       231.       613  CONTINUE
00476       232.       614  CONTINUE
00500       233.            GO TO 600                                                             *NEW
00500       234.      C                                                                    SET11950..-1
00500       235.      C     HISTOGRAM CARD                                                 SET11960
00500       236.      C     ----------------------                                         SET11970
00500       237.      C                                                                    SET11980
00501       238.       700 J = NXTCHR(CARD2,COL)                                           SET11990
00502       239.            IF  ( J .EQ. BLANK ) GOTO 200                                  SET12000
00504       240.            COL = COL-1                                                    SET12010
00505       241.            NOHIST = NUMBER(CARD2,COL,HISVEC,NOHIST)
00505       242.      C
00505       243.      C  ELIMINATE OUT OF RANGE REQUESTED SUBCLASSES,IF ANY, AND
00505       244.      C  ORDER THE RESULTING SUBCLASS VECTOR
00505       245.      C
00506       246.            NM1 = NOHIST - 1
00507       247.            IF( NM1 .LE. 0)  NM1 = 1
00511       248.            DO  711  I=1,NM1,1
00514       249.            IP1 = I + 1
00515       250.            IF( IP1 .GT. NOHIST)  GO TO 711
00517       251.            DO  710  J=IP1,NOHIST,1
00522       252.            IF( HISVEC(I) .EQ. HISVEC(J)) HISVEC(J) = I*SYMMAX+J
00524       253.       710  CONTINUE
00526       254.       711  CONTINUE
00530       255.            II = 0
00531       256.            DO  712  I=1,NOHIST,1
00534       257.            CHK = HISVEC(I)
00535       258.            IF( CHK .LE. 0 .OR. CHK .GT. SYMMAX)  GO TO 712
00537       259.            II = II + 1
00540       260.            HISVEC(II) = HISVEC(I)
00541       261.       712  CONTINUE
00543       262.            NOHIST = II
00544       263.            IF( NOHIST .EQ. 0)  GO TO 1303
```

85

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      NM1 = NOHIST - 1
      IF( NM1 .LE. 0)  NM1 = 1
      DO  714  I=1,NM1,1
      IP1 = I + 1
      IF( IP1 .GT. NOHIST)  GO TO 714
      DO  713  J=IP1,NOHIST,1
      IF( HISVEC(I) .LT. HISVEC(J))  GO TO 713
      TEMP = HISVEC(I)
      HISVEC(I) = HISVEC(J)
      HISVEC(J) = TEMP
  713 CONTINUE
  714 CONTINUE
      GO TO 200
C
C     SPEC CARD
C     ------------------------
C
  800 J = NXTCHR(CARD2,COL)
      IF  ( J .EQ. BLANK ) GOTO 200
      COL = COL-1
      NOSPEC = NOSPEC + 1
      IF( NOSPEC .GT. 20)  GO TO 200
      J = NUMBER(CARD2,COL,NUMVEC,0)
      IF ( J .GT.  4 ) J = 4
      DO 810 I=1,J
      IF (NUMVEC(I) .LE. 0 ) GOTO 815
  810 SPCVEC(I,NOSPEC) = NUMVEC(I)
      I = J+1
  815 SPCVEC(5,NOSPEC) = I-1
      GOTO 200
C
C     IBLOCK CARD
C     ------------------------
C
 1100 J = NXTCHR(CARD2,COL)
      IF  ( J .EQ. BLANK ) GOTO 200
      COL = COL-1
      NBLOCK = NUMBER(CARD2,COL,NUMVEC,NBLOCK)
      DO  1110  I=1,NBLOCK,1
 1110 IF( NUMVEC(I) .EQ. 1 )  IBLOCK(I) = 1
      GO TO 200
C
C     SIZE CARD
C     ------------------------
C
   97 COL=COL-1
 1200 J = NXTCHR(CARD2,COL)
      IF( J .EQ. BLANK ) GOTO 200
      IF ( J .EQ. XRCD) GO TO 1220
      IF ( J .EQ. SRCD) GO TO 1230
      IF ( J .EQ. YRCD) GO TO 1210
      GO TO 1000
C
 1220 J = NXTCHR(CARD2,COL)
      M = FIND(CARD2,COL,SINVEC)
      IF( SINVEC(M) .NE. EQUAL ) GO TO 1000
      M = NUMBER(CARD2,COL,NUMVEC,29)
      IF( J .EQ. LRCD)  XLOW = NUMVEC(30)
```

```
00633      C
00634         97 COL=COL-1                                       SET12400
00635       1200 J = NXTCHR(CARD2,COL)                           SET12410
00636            IF( J .EQ. BLANK ) GOTO 200                     SET12420
00640            IF ( J .EQ. XRCD) GO TO 1220                    SET12430
00642            IF ( J .EQ. SRCD) GO TO 1230                    SET12440
00644            IF ( J .EQ. YRCD) GO TO 1240                    SET12450
00646            GO TO 1000                                      SET12460
00646      C                                                     SET12470
00647       1220 J = NXTCHR(CARD2,COL)                           SET12480
00650            M = FIND(CARD2,COL,SINVEC)                      SET12490
00651            IF( SINVEC(M) .NE. EQUAL ) GO TO 1003
00653            M = NUMBER(CARD2,COL,NUMVEC,29)
00654            IF( J .EQ. LRCD)  XLOW = NUMVEC(30)

00656            IF (J.EQ.LHCD) XLF=1                            *NEW
00660            IF( J .EQ. HRCD)  XHGH = NUMVEC(30)             *NEW
00662            IF (J.EQ.HHCD) XHF=1
00664            IF(J.NE.SBCD) GO TO 97                          *NEW
00666            XSF=1
00667            XSIZ = NUMVEC(30)
00670            GO TO 97                                        SET12560
00670      C                                                     SET12570
00671       1230 M = FIND(CARD2,COL,SINVEC)                      SET12580
00672            IF( SINVEC(M) .NE. EQUAL ) GO TO 1000
00674            M = NUMBER( CARD2,COL,NUMVEC,29)
00675            SPCBAS = NUMVEC(30)
00676            GO TO 97                                        SET12620
00676      C                                                     SET12630
00677       1240 M = FIND(CARD2,COL,SINVEC)                      SET12640
00700            IF( SINVEC(M) .NE. EQUAL ) GO TO 1000
00702            M = NUMBER(CARD2,COL,NUMVEC,29)
00703            YSIZ = NUMVEC(30)
00704            GO TO 97                                        SET12680
00704      C                                                     SET12690
00704      C     DATE CARD                                       SET12700
00704      C     ------------------------                        SET12710
00704      C                                                     SET12720
00705       1400 M = NXTCHR(CARD2,COL)                           SET12730
00706            IF( M .EQ. BLANK ) GO TO 200                    SET12740
00710            READ (30,999) DATE                              SET12750
00716        999 FORMAT (10X,10A6)                               SET12760
00717            GO TO 200                                       SET12770
00717      C                                                     SET12780
00717      C     COMMENT CARD                                    SET12790
00717      C     ------------------------                        SET12800
00717      C                                                     SET12810
00720       1500 READ (30,999) COMENT                            SET12820
00726            GO TO 200                                       SET12830
00726      C                                                     SET12840
00726      C     HED1 CARD                                       SET12850
00726      C     ------------------------                        SET12860
00726      C                                                     SET12870
00727       1600 READ (30,999) HED1                              SET12880
00735            GO TO 200                                       SET12890
00736                                                            SET12900
00736      C                                                     SET12910
00736      C     HED2 CARD                                       SET12920
00736      C     ------------------------                        SET12930
00736      C                                                     SET12940
00736       1700 READ (30,999) HED2                              SET12950
00744            GOTO 200
00744      C
00744      C     DATA FILE CARD
00744      C
00745       1710 M = NXTCHR(CARD2,COL)
00746            IF (M .EQ. 1H ) GO TO 200
00750            IF (M .EQ. 'U') GO TO 1715
00752            IF (M .EQ. 'F') GO TO 1717
00754       1713 WRITE(6,753)
00756        753 FORMAT('  ERROR ON DATA FILE CARD')
00757            GO TO 200
00760       1715 J = FIND(CARD2,COL,EQUVEC)
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C0761            IF ( J .EQ. -1)  GO TO 1713
C0763            M = NUMBER(CARD2,COL,DATAPE,ZERO)
00764            COL = COL - 1
00765            GO TO 1710
00766      1717  J = FIND(CARD2,COL,F, VFC)
C0767            IF(J.EQ.-1) GO TU 1713
00771            M = NUMBER(CARD2,COL,DATFIL,ZERO)
00772            DATFIL = DATFIL - 1
00773            IF (DATFIL .LT. 0)  DATFIL = 0
00775            COL = COL - 1
00776            GO TO 1710
C0776      C
C0776      C     STAT FILE CARD
00776      C
00777      1720  M = NXTCHR(CARD2,COL)
01000            IF (M .EQ. 1H )  GO TO 200
01002            IF (M .EQ. 'U')  GO TO 1725
C1004            IF (M .EQ. 'F')  GO TO 1727
C1006      1723  WRITE(6,755)
C1010       755  FORMAT('  ERROR ON STAT FILE CARD')
01011            GO TO 200
01012      1725  J = FIND(CARD2,COL,EQUVEC)
01013            IF ( J .EQ. -1)  GO TO 1723
01015            M = NUMBER(CARD2,COL,SAVTAP,ZERO)
01016            COL = COL - 1
01017            GO TO 1720
C1020      1727  J = FIND(CARD2,COL,EQUVEC)
01021            IF (J .EQ. -1)  GO TO 1723
01023            M = NUMBER(CARD2,COL,STAFIL,ZERO)
01024            STAFIL = STAFIL - 1
01025            IF (STAFIL .LT. 0) STAFIL = 0
01027            COL = COL - 1
01030            GO TO 1720
01030      C      SUNANG CONTROL CARD                                    NEW
01031      1730    J=NXTCHR(CARD2,COL)                                    NEW
01032             IF (J.NE.'T') GO TO 1731                                NEW
01032      C      SET THE FLAG TO READ THE SUNANGLES OFF OF THE TAPE     NEW
01034             ISUNT=1                                                 NEW
01035            SAKEY=1                                                  NEW
01036             GO TO 200                                               NEW
01037      1731     ISTART=0                                              NEW
01040            COL = COL-1                                              NEW
01041             NSUNAG=NUMBER(CARD2,COL,SSUNAG,ISTART)                  NEW
01042              IF (NSUNAG.GT.8) NSUNAG=8                              NEW
01044            IF (NSUNAG.EQ.0) GO TO 200                               NEW
01046             ISUNC=NSUNAG                                            NEW
01047            DO 1732 K=1,NSUNAG                                       NEW
01047      C      TEST TO SEE IF THE INPUT SUNANGLE WAS LEGITIMATE - IF NOT,  NEW
01047      C        SET IT TO 60                                          NEW
01052      1732    IF ((SSUNAG(K).LT.5).OR.(SSUNAG(K).GT.85)) SSUNAG(K)=60  NEW
01055            SAKEY=1                                                  NEW
01056             GO TO 200                                               NEW
01056      C      B-MATRIX CONTROL CARD                                   NEW
01057      1740    J=NXTCHR(CARD2,COL)                                    NEW
01060            IF (J.EQ.BLANK) GO TO 1000                               NEW
01062             COL=COL-1                                               NEW
01063             M=FIND(CARD2,COL,BTEST)                                 NEW
01064            IF (M.EQ.-1) GO TO 1000
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88

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      COL = COL-1
       NSUNAG=NUMBFR(CARD2,COL,SSUNAG,15,...                                  *NEW
        IF (NSUNAG.GT.8) NSUNAG=8                                              *NEW
      IF (NSUNAG.EQ.0) GO TO 200                                               *NEW
       ISUNC=NSUNAG                                                            *NEW
      DO 1732 K=1,NSUNAG                                                       *NEW
C      TEST TO SEE IF THE INPUT SUNANGLE WAS LEGITIMATE - IF NOT,              *NEW
C       SET IT TO 60                                                           *NEW
 1732   IF ((SSUNAG(K).LT.5).OR.(SSUNAG(K).GT.85)) SSUNAG(K)=60                *NEW
      SAKEY=1                                                                  *NEW
       GO TO 200                                                               *NEW
C      B-MATRIX CONTROL CARD                                                   *NEW
 1740   J=NXTCHR(CARD2,COL)                                                    *NEW
      IF (J.EQ.BLANK) GO TO 1000                                               *NEW
       COL=COL-1                                                               *NEW
       M=FIND(CARD2,COL,M   ST)
      IF (M.EQ.-1) GO TO 1000

        BMTRIG=1                                                               *NEW
        IF (M.EQ.2) GO TO 1741                                                 *NEW
C       B-MATRIX DATA ON TAPE FILE                                             *NEW
        KEY=2                                                                  *NEW
C      READ B-MATRIX ARRAY FROM TAPE FILE                                      *NEW
       CALL BMFIL(BMAT,LCOMB,NKCHN,KCHN,KEY)                                   *NEW
        CALL WRTBM(BMAT,LCOMB,NKCHN,KCHN)                                      *NEW
       GO TO 200                                                               *NEW
C       B-MATRIX DATA READ FROM CARD FILE                                      *NEW
 1741   KEY=1                                                                  *NEW
        CALL BMFIL(BMAT,LCOMB,NKCHN,KCHN,KEY)                                  *NEW
        CALL WRTBM(BMAT,LCOMB,NKCHN,KCHN)                                      *NEW
        GO TO 200                                                              *NEW
C      THRESHOLD CONTROL CARD                                                  *NEW
 1750   NTH=FLTNUM(CARD2,COL,TH,5)                                             *NEW
       THKEY=1                                                                 *NEW
       WRITE (6,1751) (TH(I),I=1,NTH)                                          *NEW
 1751   FORMAT(//2X,'THE THRESHOLDS ARE'/5(2X,F7.2))                           *NEW
       GO TO 200                                                               *NEW
C      BIAS CONTROL CARD                                                       *NEW
 1760   J=FLTNUM(CARD2,COL,BIAS,4)                                             *NEW
       WRITE (6,1761) (BIAS(I),I=1,4)                                          *NEW
 1761   FORMAT(//2X,'THE BIAS ARE'/4(2X,F7.2))                                 *NEW
        GO TO 200                                                              *NEW
C                                                                      SET13060
C      CALCULATE BASES OF THE ARRAYS                                   SET13070
C      ---------------------------------------------------------------SET13080
C                                                                      SET13090
  900  CONTINUE
        IF (SAKEY.EQ.0.AND.SPCBAS.EQ.-999) SPCBAS = 75                         *NEW
        IF (SAKEY.EQ.0) GO TO 901                                              *NEW
C       RESET THE HIST  DEFAULTS                                               *NEW
        IF (XLF.EQ.0) XLOW=0                                                   *NEW
        IF (XHF.EQ.0) XHGH=3000                                                *NEW
        IF (XSF.EQ.0) XSIZ=101                                                 *NEW
  901    CONTINUE                                                              *NEW
       IF( NOSPEC .GT. 20)  NOSPEC = 20
       IF( NOSPEC .NE. 0)  GO TO 950
       NOSPEC = (MAXCLS+3)/4                                           SET13110
       SPCVEC(1,1) = 0                                                 SET13120
  950 VARSIZ = NOFEAT*(NOFEAT+1)/2                                     SET13130
       IF(XSIZ.LE.0) XSIZ=XHGH-XLOW+1                                  SET13140
       IF(XSIZ.GT.101) XSIZ=101                                        SET13150
       SPECI=(5*NOSPEC+1)/2*2
       COVARI=(VARSIZ+1)/2*2
       AVARI=(NOFEAT*MAXSUB+1)/2*2
       CLSIDI=(MAXSUB+1)/2*2
       SUBSVI=(5*MAXSUB+1)/2*2
       FLMENI=NOFEAT*2
       FLVARI=VARSIZ*2
       SUBMNI=NOFEAT*2
       SUBVRI=VARSIZ*2
       SUBSDI=(NOFEAT*MAXSUB+1)/2*2
       SUBCLI=(MAXSUB+1)/2*2
       HFTALI=(XSIZ*NOHIST+1)/2*2+HFDKEY
       HSTALI=(XSIZ*NOHIST+1)/2*2+HSBKEY
       SIZE=SPECI+COVARI+AVARI+CLSIDI+SUBSVI+FLMENI+FLVARI+
      * SUBMNI+SUBVRI+SUBSDI+SUBCLI+HFTALI+HSTALI
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01171        MAXFLD=(TOP-SIZE-32)/32
01172        IF(MAXFLD.LE.0) GO TO 1300
01174        SPECI=1
01175        COVARI=SPECI+(5*NOSPEC+1)/2
01176        AVARI=COVARI+(VARSIZ+1)/2
01177        CLSIDI=AVARI+(NOFFAT*MAXSUB+1)/2
01200        SUBSVI=CLSIDI+(MAXSUB+1)/2
01201        FLMENI=SUBSVI+(5*MAXSUB+1)/2
01202        FLVARI=FLMENI+NOFFAT
01203        SUBMNI=FLVARI+VARSIZ
01204        SUBVRI=SUBMNI+NOFFAT
01205        SUBSDI=SUBVRI+VARSIZ
01206        SUBCLI=SUBSDI+(NOFEAT*MAXSUB+1)/2
01207        HFTALI=SUBCLI+(MAXSUB+1)/2
01210        HSTALI=HFTALI+(XSIZ*NOHIST+1)/2+HFDKEY
01211        FLDSVI=HSTALI+(XSIZ*NOHIST+1)/2+HSBKEY
01212        SAVERI=FLDSVI+(10*MAXFLD)/2
01213        TIPTOP=SAVERI+(22*MAXFLD)/2
01214        BADCOR=TOP-2*TIPTOP
01215        IF(BADCOR.LT.0) GO TO 1300
01215  C     PRINT OUT OPTIONS                                                  SET13460
01215  C     ---------------------------------------------------------------SET13470
01215  C                                                                        SET13480
01217        WRITE(6,HEAD)                                                      SET13490
01221        IF(PCHKEY+SSFKEY+CFDKEY+HSBKEY+HFDKEY+SSLKEY
01221       1   +SFDKEY+CALKEY .LE. 0 )  GOTO 960                               SET13510
01223        WRITE(6,9001)                                                      SET13520
01225        IF(CFDKEY .EQ.  1)  WRITE(6,9002)                                  SET13530
01230        IF(SFDKEY .EQ.  1)  WRITE(6,9004)                                  SET13540
01233        IF(SSLKEY.EQ.1) WRITE(6,9006)
01236        IF(PCHKEY .EQ. 1) WRITE(6,9008)                                    SET13560
01241        IF( HFDKEY .EQ.  1)  WRITE(6,9012)                                 SET13570
01244        IF(HSBKEY.EQ.1) WRITE(6,9014)
01247        IF ( CALKEY .EQ. 1 ) WRITE(6,9016)                                 SET13590
01252        IF(SSFKEY.EQ.1) WRITE(6,9018)
01252  C      CHECK TASSEL CAP FILTER OPTIONS                                              *NEW
01255         IF (FKEY.NE.2) GO TO 951                                                     *NEW
01257         IF (BMTRIG.NE.1) GO TO 985                                                   *NEW
01261          IF (NKCHN.NE.4) GO TO 985                                                   *NEW
01263        IF (THKEY.EQ.1) GO TO 952                                                     *NEW
01263  C     SET THE DEFAULT THRESHOLD VALUES                                              *NEW
01265        TH(1)=100.                                                                    *NEW
01266         TH(2)=8.                                                                     *NEW
01267         TH(3)=6.                                                                     *NEW
01270         TH(4)=10.                                                                    *NEW
01271        TH(5)=35.                                                                     *NEW
01272        NTH=5                                                                         *NEW
01273   952  IF (NTH.NE.5.OR.NFCH.NE.4) GO TO 1304                                         *NEW
01273  C      CHECK THE WATER FILTER OPTIONS                                               *NEW
01275   951   IF (FKEY.NE.1) GO TO 960                                                     *NEW
01277        IF (THKEY.EQ.1) GO TO 961                                                     *NEW
01277  C     SET THE DEFAULT THRESHOLD VALUES                                              *NEW
01301         TH(1)=43.                                                                    *NEW
01302        TH(2)=12.                                                                     *NEW
01303        NTH=2                                                                         *NEW
01304   961  IF (NTH.NE.2.OR.NFCH.NE.2) GO TO 1304                                         *NEW
01304  C
01306  9001 FORMAT(1X,'YOU HAVE SELECTED THE FOLLOWING  $STAT  PROCESSOR OPTIO
```

```
      TH(4)=10.                                                        *NEW
      TH(5)=35.                                                        *NEW
      NTH=5                                                            *NEW
  952 IF (NTH.NE.5.OR.NFCH.NE.4) GO TO 1304                            *NEW
C      CHECK THE WATER FILTER OPTIONS                                  *NEW
  951  IF (FKEY.NE.1) GO TO 960                                        *NEW
      IF (THKEY.EQ.1) GO TO 961                                        *NEW
C     SET THE DEFAULT THRESHOLD VALUES                                 *NEW
       TH(1)=43.                                                       *NEW
      TH(2)=12.                                                        *NEW
      NTH=2                                                            *NEW
  961 IF (NTH.NE.2.OR.NFCH.NE.2) GO TO 1304                            *NEW
C
 9001 FORMAT(1X,'YOU HAVE SELECTED THE FOLLOWING  $STAT  PROCESSOR OPTIO
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     1NS:'//)
 9002 FORMAT(T5,' PRINT MEAN AND COVARIANCE FOR EACH FIELD')           SET13620
 9004 FORMAT(T5,' PRINT SPECTRAL PLOT FOR EACH FIELD')                 SET13630
 9006 FORMAT(T5,' PRINT SPECTRAL PLOT FOR EACH SUBCLASS')
 9008 FORMAT(T5,' PUNCH MEAN AND COVARIANCE MATRIX FOR EACH SUBCLASS')
 9012 FORMAT(T5,' PRINT A HISTOGRAM FOR EACH FIELD')                   SET13660
 9014 FORMAT(T5,' PRINT A HISTOGRAM  FOR EACH SUBCLASS')
 9016 FORMAT(T5,' *** USE CALIBRATED DATA ***')                        SET13680
 9018 FORMAT(T5,' PRINT MEAN AND COVARIANCE FOR EACH SUBCLASS')
  960 WRITE(6,9502) RADCOR,MAXFLD,MAXSUB,(FETVEC(I),I=1,NOFEAT)
 9502 FORMAT('0'//'#SUPERVISOR INFORMATION:'//T5,'UNUSED CORE',I6,' LOCA
     *TIONS'/T5,'MAXIMUM NO. OF FIELDS...',I3/T5,'MAXIMUM NO. OF SUBCLASS
     - 2ES...',I3/T5,'CHANNELS SELECTED ARE  ',15(I3,','))/T27,15(I3,',') )
      IF( HFDKEY+HCLKEY .NE. 0) WRITE(6,9504)  (HISVEC(I),I=1,NCHIST)  SET13740
 9504 FORMAT(T5,'HISTOGRAM CHANNELS ARE ',15(I3,',')/T28,15(I3,',') )
      IF( SPCVEC(1,1) .EQ. 0 )  GOTO 971                               SET13760
      WRITE(6,9505)                                                    SET13770
 9505 FORMAT(T5,'MULTISPECTRAL PLOTS ARE...')                          SET13780
      DO 970 J =1,NOSPEC                                               SET13790
      K = SPCVEC(5,J)                                                  SET13800
      WRITE(6,9506)  (SPCVEC(I,J),I=1,K)                               SET13810
 9506 FORMAT(T44,')',T31,'(',4(I2,','))                                SET13820
  970  CONTINUE                                                        SET13830
  971 CONTINUE                                                         SET13840
  980 RETURN                                                           SET13850
C                                                                      SET13860
C       ERROR  ROUTINES                                                SET13870
C     ---------------------------------------------------------------SET13880
C                                                                      SET13890
 1000 WRITE (6,10002) CODE, CARD2                                      SET13900
10002 FORMAT(///5X,'///// FROM SUBR. SETUP1  ---   BAD CONTROL CARD ENC
     1OUNTERED  ---  INPUT CARD IS ...'//8X,2H'',A6,4X,62A1,2H'' //)
      GO TO 200                                                        SET13920
C                                                                      SET13930
 1300 WRITE (6,1302)                                                   SET13940
 1302 FORMAT(////  5X,'/////  FROM SUBR. SETUP1  ---  DECREASE OPTIONS'
     1 // 5X,'*****  TERMINATING PROGRAM EXECUTION FROM SUBR. SETUP1  **
     2****' /1H1)
      GO TO 1305
 1303 WRITE(6,10002)  CODE, CARD2
      WRITE(6,13031)  MAXFET
13031 FORMAT(//5X,'CHECK CHANNELS OR SUBCLASS NO.S REQUESTED-CANNOT BE
     1 LESS THAN OR EQUAL ZERO, OR GREATER THAN',I5///5X,
     2  '******  TERMINATING PROGRAM EXECUTION FROM SUBR. SETUP1  ******'
     3 /1H1)
 1305 CALL EXIT
 1304   WRITE (6,1306)                                                 *NEW
 1306   FORMAT (//2X,'THE NUMBER OF INPUT FILTER CHANNELS OR THRESHOLD *NEW
     C VALUES ARE NOT'/2X,'COMPATIBLE WITH THE FILTER OPTION REQUESTED - *NEW
     C TERMINATE EXECUTION')                                           *NEW
        CALL EXIT                                                      *NEW
  985   WRITE (6,986 )                                                 *NEW
  986   FORMAT (//2X,'THE R-MATRIX WAS NOT INPUT OR WAS NOT OF THE RIGHT *NEW
     C  DIMENSION - TERMINATE')                                        *NEW
       CALL EXIT                                                       *NEW
        END                                                            SET13970
```

```
 END OF COMPILATION:          NO  DIAGNOSTICS.
SETUP1          SYMBOLIC                                  20 JUN 77  01:59:28  0  03032054  14  479  (DELETED)
SETUP1  CODE    RELOCATABLE                               20 JUN 77  01:59:28  1  01731974  36    1  (DELETED)
                                                                               0  01731540  14  167
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92

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0001   001763 1010G   0001   000343 11L     0001   00226L 1016    0001   002215 1106G   0001   002321 1130G
0001   002321 1133G   0001   002416 1144G   0001   002436 1154G   0001   002556 1177G   0000   001340 12F
0001   002564 1203G   0001   002623 1217G   0001   002636 1226G   0001   002670 12[illegible]3G   0001   002673 1246G
0001   002734 1266G   0001   002753 1273G   0001   000362 13L     0001   003324 1315G   0001   003039 1323G
0001   003051 1332G   0001   000417 14L     0001   002121 15L     0001   000125 150G    0001   000133 153G
0001   002161 14L     0000   001365 145F    0001   000151 165G    0001   000215 19L     0001   002132 2L
0001   000200 201G    0001   001177 2917L   0001   000226 22L     0001   000317 241G    0001   000317 244G
0001   000340 254G    0001   000340 257G    0001   002270 270L    0001   002300 280L    0000   001502 29F
0001   002152 3L      0001   002325 300L    0001   002345 301L    0001   002467 33L     0001   000507 337G
0001   000510 342G    0001   000553 362G    0001   000564 367G    0001   000604 374G    0001   002515 380L
0001   002531 390L    0001   000616 402G    0000   001440 41F     0001   000634 411G    0001   000642 415G
0000   001420 42F     0001   000650 421G    0000   001433 43F     0001   002717 440L    0001   000715 444G


0001   002726 450L    0001   000706 452G    0001   000741 456G    0001   002770 460L    0000   001530 465F
0001   000761 446G    0000   001545 470F    0003   001560 471F    0001   001000 476G    0001   003076 480L
0001   003111 490L    0001   001576 50L     0000   001562 500F    0001   001013 505G    0001   002020 51L
0001   003123 510L    0001   001076 514G    0001   001706 52L     0000   001607 520F    0001   001042 529G
0001   002142 53L     0001   003135 530L    0001   001051 531G    0000   001646 540F    0001   000247 541L
0000   001327 542F    0001   001140 551G    0001   001167 565G    0001   000142 6L      0001   000526 60L
0001   001225 607G    0001   001233 614G    0001   001032 62L     0001   001252 623G    0001   001267 626G
0000   001342 63F     0001   001275 633G    0000   001350 64F     0001   001344 653G    0000   001371 66F
0000   001375 67F     0001   001372 670G    0001   001373 673G    0000   001401 68F     0000   001406 69F
0001   001703 70L     0001   001431 706G    0001   001461 713G    0001   001515 721G    0001   001537 725G
0001   001722 774G    0001   001364 8L      0001   001367 9L      0000   001413 90F     0001   002442 79L
0000   001517 95F     0000   001522 96F     0000   001525 97F     0005   000073 ASAV    0005   000074 ASAVFL
0003   000011 AVAR1   0000 I 001253 BADFLG  0000 I 001321 BC      0000   001647 BESTVC  0004 R 000227 BIAS
0000 I 001241 BLANK   0004 I 000240 BMAT    0005   000355 BMFILE  0005   000056 BMKEY   0004 I 000022 CALKEY
0000 I 001252 CALSW   0004 I 000014 CFDKEY  0000 I 001256 CFLAG   0003   000012 CLSID1  0004   000212 CLSPTS
0000 I 001254 CLSTOT  0005   000037 COMENT  0000 I 001244 COMMA   0000 R 001705 COR     0003   000010 COVAR1
0000 I 001243 CPAR    0000 I 001240 DASH    0005 I 000053 DATAPE  0005   000016 DATE    0005 I 000071 DATFIL
0000 D 000151 DEV     0005   000102 DOTFIL  0005   000101 DOTUNT  0005   000067 DRMADS  0005   000066 DRUMAD
0000 I 000245 DUMPTR  0000 I 001317 EC      0000 I 001237 ENDCHD  0000 I 001300 ENDTAP  0005   000062 EKIPTP
0005   000063 ERPKEY  0000 I 001323 FC      0004 I 001200 FCHN    0004   000105 FETVC2  0004 I 000047 FETVEC
0000 I 001272 FIELDL  0000 I 001271 FIELDI  0004 I 001204 FKEY    0000 I 000137 FL      0004 I 000203 FLDINF
0000 I 001257 FLDNAM  0004 I 000211 FLDPTS  0003   000016 FLDSV1  0004   000211 FLDTYP  0003   000013 FLMEN1
0003   000014 FLVAR1  0005 I 000000 HEAD    0005   000302 HED1    0005   000023 HED2    0004 I 000016 HFDKEY
0003   000015 HFTAL1  0005   000057 HISFIL  0005   000360 HISKEY  0004 I 000143 HISVEC  0004 I 000015 HSDKEY
0003   000016 HSTAL1  0000 I 001246 I       0004   000011 IBLOCK  0000 I 001705 IDATA   0000 R 000005 IDV
0000 I 001322 IDT     0000 I 001325 II      0000 I 001307 INDEX1  0000 I 001310 INDEX2  0000   031272 INJPS
0000 I 001324 IPUT    0004 I 000011 ISUNC   0006 I 000010 ISUNT   0000 I 001247 J       0000 I 001326 JI
0000 I 001264 JJ      0000 I 001303 JJJ     0000 I 001314 JK      0000 I 001277 JLINES  0000 I 001312 JPT
0000 I 001261 K       0000 I 001306 KC      0000 I 001266 KJ      0000 I 001304 KK      0000 I 001313 KPT
0000 I 001311 L       0013 I 000000 LARFAD  0000 I 001647 LHIST   0004 I 000204 LINEND  0000 I 001274 LINES
0004 I 000205 LININC  0004   000015 LINSAP  0004 I 000203 LINSTR  0000 I 001315 M       0005   000100 MAPFIL
0005   000052 MAPTAP  0005   000064 MAPUNT  0004   000001 MAXCLS  0004 I 000000 MAXFET  0004 I 000002 MAXFLD
0000 I 001265 MP      0000 I 001267 MPP     0000 I 001273 N       0000 I 001260 NC      0005 I 000103 NCMPAS
0005   000076 NHSTF1  0005   000075 NHSTUN  0000 I 001301 NLINES  0000 I 001305 NN      0004 I 000202 NOCLS
0004 I 000003 NOFEAT  0004   000004 NOFFT2  0005   000065 NOFILE  0004 I 000201 NOFLD   0004 I 000007 NOMIST
0004 I 000006 NOSPEC  0004   000021 NOTMG2  0004   000011 NOTHNG  0000 I 001302 NS      0000 I 00127[illegible] NSAMP
0000 I 001251 NSTAT   0000 I 001242 OPAR    0005   000070 PAGSIZ  0004   000031 PCALKY  0004   000027 PCCLKY
0004   000023 PCFDKY  0004 I 000012 PCHKEY  0000 I 001275 PTS     0000 I 001245 PUNCH   0000 R 000053 SABIAS
0000 R 000015 SAGAIN  0004 I 001205 SAKEY   0004 I 000207 SAMEND  0004 I 000210 SAMINC  0004 I 000206 SAMSTR
0003   000005 SAVER1  0005 I 000054 SAVTAP  0000 I 001255 SCLTOT  0005   000077 SCTRUN  0004 I 000020 SFDKEY
0006   000014 SMINC   0006   000013 SMSTP   0006   000012 SMSTK   0004 I 000010 SPCBAS  0003   000007 SPEC1
0004 I 000013 SSFKEY  0004 I 000017 SSLKEY  0004 I 000217 SSUNAG  0005 I 000072 STAFIL  0004   000030 STATKY
0003   000004 SUBCL1  0000 I 000253 SUBDES  0003   000001 SUBMN0  0000 I 000252 SUBNO   0000 I 001270 SUBPTS
0003   000003 SUBSD1  0003   000000 SUBSV1  0003   000002 SUBVN0  0004 I 000000 SUMANG  0000 I 001250 T
0000 R 000000 TCV     0000 R 000064 TD      0000 I 001320 TF      0000 R 000007 TFD     0004 R 000233 TH
0004   000027 THRSKY  0000 I 001246 TITLE   0000 I 001316 TL      0000 R 000006 TL)     0000 R 000010 TN
0000 I 001263 TNC     0000 I 001242 TOTVRT  0005   000361 TRFUKM  0004   000026 TRNKEY  0005   000104 TRNSFL
0004   000025 TSTKEY  0000 R 000011 TTC     0000   001245 TTITLE  0004 I 000005 VARSIZ  0004 I 000111 VERTCS
0004 I 000214 XHGH    0004 I 000215 XLOW    0000 R 000147 XSCALE  0000 R 000150 XSHFT   0004 I 000213 XSIZ
0004 I 000216 YSIZ

00101      1*         SUBROUTINE LEARN(SPEC,COVAR,AVAR,CLSDES,SUBSAV,
00101      2*        *              FLDMEN,FLDVAR,SUBMEN,SUBVAR,SUBSTD,
00101      3*        *        SUBCLS,HFTALY,HSTALY,FLDSAV,SAVERT,KEPFTS,MAXSUB)
00103      4*         IMPLICIT INTEGER(A-Z)
```

```
00104    5*        INCLUDE COMRK4.LIST
00105    5*        DIMENSION HED1(10),HED2(10),DATE(2),COMENT(10)
00106    5*        EQUIVALENCE (HED1(1),HEAD(3)),(DATE(1),HEAD(15)),
00106    5*       *            (HED2(1),HEAD(20)),(COMENT(1),HEAD(32))
00107    5*        END
00110    6*        INCLUDE COMRK8.LIST
00110    6*   C STAT COMMON BLOCK
00111    6*        COMMON /STBASE/SUBSV1,SUBMN1,SUBVR1,SUBSD1,SUBCL1,SAVER1,HSTAL1,
00111    6*       *SPEC1,COVAR1,AVAR1,CLSID1,FLMEN1,FLVAR1,HFTAL1,FLDSV1
00112    6*        COMMON /STCALK/         MAXFET,MAXCLS,MAXFLD,NOFEAT,NESA 2,
00112    6*       *VARSIZ,NOSPEC,NOHIST,SPCBAS,IBLOCK(30),FETVEC(30),
00112    6*       *FETVC2(30),HISVEC(30),NOFLD,NOCLS,
00112    6*       *   FLDINF(6),FLDPTS,CLSPTS,XSIZ,XHGH,XLOW,YSIZ
00112    6*       * ,SSUNAG(8),BIAS(4),TH(5),BMAT(480),FCHN(4),FKEY,SAKEY                  *NEW
00113    6*        END
00114    7*        INCLUDE COMRK6.LIST
00115    7*        COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00115    7*       *             HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NUFILE,
00115    7*       *   DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00115    7*       *  ,NHSTUN,NHSTFI,SCTRUN,MAPFIL                                          *NEW
00115    7*       * ,DOTUNT,DOTFIL,NCHPAS,TRNSFL                                          **-1
00116    7*        END                                                                   *NEW
00117    8*        INCLUDE CMRK16.LIST
00120    8*        COMMON/ISOLNK/SUNANG(8),ISUNT,ISUNC,SMSTR,SMSTP,SMINC,LINSKP
00121    8*        END                                                                   *NEW
00122    9*          REAL TCV(4),BIAS,TO                                                 *NEW
00123   10*        REAL IOJ,TLO,TFO ,TH,TN ,TTC(4)                                       *NEW
00124   11*         REAL SAGAIN(30),SABIAS(30)
00125   12*        DIMENSION LHIST(30),VERTCS(2,11),FL(8)
00126   13*        EQUIVALENCE (LHIST,RESTVC)
00127   14*        REAL XSCALE,XSHFT,
00127   15*       * COVAR(VARSIZ),AVAR(NOFEAT,MAXSUB),SUBSTD(NOFEAT,MAXSUB)
00130   16*        DOUBLE PRECISION FLDMEN(NOFEAT),FLDVAR(VARSIZ),SUBMEN(NOFEAT),
00130   17*       * SUBVAR(VARSIZ),COR(465),DEV(30)
00131   18*        DIMENSION SPEC(5,NOSPEC),FLDSAV(10,MAXFLD),CLSDES(MAXSUB),
00131   19*       * HFTALY(NOHIST,XSIZ),HSTALY(NOHIST,XSIZ),KEPPTS(MAXSUB),
00131   20*       * IDATA(12000),DUMPTR(5),SUBSAV(4,MAXSUB),
00131   21*       *SAVERT(22,MAXFLD),SUBCLS(SUBNO),SUBDES(500)
00131   22*   C                                                                 LEAR0540
00132   23*        EQUIVALENCE       (IBLOCK( 1),NOTHNG),(IBLOCK( 2),PCHKEY),      LEAR0550
00132   24*       *      (IBLOCK(3),SSFKEY),(IBLOCK(4),LFDKEY),
00132   25*       *            (IBLOCK(5),HSBKEY),(IBLOCK(6),HFDKEY),
00132   26*       *            (IBLOCK(7), SSLKEY),(IBLOCK(8),SFDKEY),
00132   27*       4                 (IBLOCK( 9),NOTHG2),(IBLOCK(10),CALKEY),   LEAR0590
00132   28*       5                 (IBLOCK(11),PCFDKY),(IBLOCK(12),PCCLKY),   LEAR0600
00132   29*       6                 (IBLOCK(13),TSTKEY),(IBLOCK(14),TRNKEY),   LEAR0610
00132   30*       7                 (IBLOCK(15),THRSKY),(IBLOCK(16),STATKY),   LEAR0620
00132   31*       8                 (IBLOCK(17),PCALKY)                        LEAR0630
00133   32*        EQUIVALENCE (IDATA(1),COR(1))
00134   33*        DATA ENDCRD/'SEND  '/,DUMPTR/1,3*0,1/,DASH/'------'/,
00134   34*       * BLANK/'  '/,OPAR/'('/,CPAR/')'/,COMMA/','/,PUNCH/-3/
00145   35*        EQUIVALENCE (TITLE(2),TITLE(1))
00146   36*        EQUIVALENCE      (FLDINF(1), LINSTR), (FLDINF(2),LINENO),       LEAR0730
00146   37*       1                 (FLDINF(3),LININC), (FLDINF(4), SAMSTR),   LEAR0740
00146   38*       2                 (FLDINF(5),SAMEND),(FLDINF(6),SAMINC),     LEAR0750
00146   39*       3                 (FLDINF(7),FLDTYP)                         LEAR0760
00146   40*   C                                                                 LEAR0840
00146   41*   C    ------------------------------------------------------------LEAR0850
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00146      C     --------------------------------------------------------------LEAR0860
00146      C                                                                   LEAR0870
00146      C     INIZ                                                          LEAR0880
00146      C     --------------------------------------------------------------LEAR0890
00146      C                                                                   LEAR0900
00146      C*    SET UP LOGICAL ARRAY FOR FEATURES TO BE HISTOGRAMMED.
00147            DO 7 I=1,NOHIST
00152            DO 5 J=1,NOFFAT
00155            IF(HISVEC(I).EQ.FETVEC(J))GO TO 6
00157          5 CONTINUE
00161          6 LHIST(I)=J
00162          7 CONTINUE
00164            DO 922 I=1,MAXSUB
00167        922 SUBCLS(I)=0
00167      C*    READ HEADER RECORD ON DATA TAPE
00171            CALL TAPHDR(DATAPE,DATFIL)
00172            REWIND SAVTAP
00173            IF (SAKEY.EQ.0) GO TO 22                                          *NEW
00175            IF (ISUNT.EQ.0) GO TO 19                                          *NEW
00175      C      PULL THE SUN ANGLES OFF OF THE DATA TAPE                         *NEW
00175      C      ASSOCIATE SUN ANGLE WITH THE CHANNEL NUMBERS                     *NEW
00177             T=0                                                              *NEW
00200             DO 24 I=1,NOFEAT,NCHPAS                                          *NEW
00203            J=FETVEC(I)                                                       *NEW
00204             J=(J+3)/4                                                        *NEW
00205              T=T+1                                                           *NEW
00206             SSUNAG(T)=SUNANG(J)                                              *NEW
00207         24 CONTINUE                                                          *NEW
00207      C     CALL   SUNFI TO GET THE SUN ANGLE BIAS AND GAIN CORRECTION FACTORS *NEW
00211         19 CALL   SUNFI(SAGAIN,SSUNAG,FETVEC,NOFEAT,ISUNC,ISUNT,SABIAS)      *NEW
00212         22  IF (STAFIL.EQ.0) GO TO 541                                       *NEW
00214            CALL FSRSFI(SAVTAP,STAFIL,NSTAT)                                  **-1
00215         23  IF (NSTAT.EQ.0) GO TO 541                                        *NEW
00217            WRITE(6,542) NSTAT                                                **-1
00222        542 FORMAT(' BAD POSITIONING OF SAVTAP, TERMINATING ',I3)
00223            CALL CHERR
00224        541 CONTINUE
00225            CALSW = CALKEY                                                LEAR0910
00226            BADFLG = 0                                                    LEAR0920
00227            NOFLD =0                                                      LEAR0930
00230            NOCLS = 0                                                     LEAR0940
00231         10 CONTINUE                                                      LEAR0970
00232            WRITE(6,HEAD)
00234            IF(HSBKEY+HFDKEY.EQ.0) GO TO 14
00236            XSCALE=FLOAT(1-XSIZ)/(XHGH-XLOW)                              LEAR1010
00237            XSHFT=-XHGH*XSCALE+1.0                                        LEAR1020
00240            DO 20 I=1,XSIZ                                                LEAR1030
00243            DO 20 J=1,NOHIST                                              LEAR1040
00246         20 HFTALY(J,I) = 0                                               LEAR1050
00251            IF(HSBKEY+HFDKEY.NE.2) GO TO 14
00253            DO 30 I=1,XSIZ                                                LEAR1070
00254            DO 30 J=1,NOHIST                                              LEAR1080
00261         30 HSTALY(J,I)=0
00264            GO TO 14
00264      C CLASSES
00265         11 READ(30,12) TITLE
00270         12 FORMAT(10X,A6)
00271            NOCLS=NOCLS+1
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95

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      CLSTOT=NOCLS
      CLSDES(NOCLS)=TITLE
      GO TO 14
C SUBCLASSES
   13 READ(3,12) TITLE
      SUBNO=SUBNO+1
      IF(SUBNO.GT.MAXSUB) GO TO 9[illegible]
      SCLTOT=SUBNO
      SUBSAV(4,SUBNO)=TITLE
      SUBSAV(2,SUBNO)=NOFLD+1          @ STARTING FIELD
      SUBSAV(1,SUBNO)=NOCLS
      SUBCLS(NOCLS)=SUBCLS(NOCLS)+1
C READ FIELD CARD
   14 CFLAG=AREAD(FLDNAM,VERTCS,FLDINF,NC)
      IF(CFLAG.EQ.0) GO TO 60       @END \
      IF(CFLAG.EQ.-1) GO TO 11        @CLASS
      IF(CFLAG.EQ.-2) GO TO 13         @SUBCLASS
      NOFLD=NOFLD+1
      IF(NOFLD.GT.MAXFLD) GO TO 510
      FLDSAV(1,NOFLD)=FLDNAM
      FLDSAV(2,NOFLD)=NOCLS
      FLDSAV(3,NOFLD)=SUBNO
      FLDSAV(4,NOFLD)=NC
      FLDSAV(5,NOFLD)=LINSTR
      FLDSAV(6,NOFLD)=LINEND
      FLDSAV(7,NOFLD)=SAMSTR
      FLDSAV(8,NOFLD)=SAMEND
      FLDSAV(9,NOFLD)=LININC
      FLDSAV(10,NOFLD)=SAMINC
      SUBSAV(3,SUBNO)=NOFLD            @ENDING FIELD OF SUB
      K=0
      DO 111 J=1,11
      DO 111 I=1,2
      K=K+1
  111 SAVERT(K,NOFLD)=VERTCS(I,J)
      TOTVRT=TOTVRT+NC
      GO TO 14
   60 CONTINUE
      WRITE(SAVTAP) NOCLS,SUBNO,NOFEAT,NOFLD,TOTVRT,(FETVEC(I),I=1,NOFEA
     *T)
      DO 61 I=1,NOFLD
      TNC=2*FLDSAV(4,I)
      WRITE(SAVTAP) (FLDSAV(J,I),J=1,4)
   61 WRITE(SAVTAP) (SAVERT(J,I),J=1,TNC)
      WRITE(SAVTAP)(CLSDES(J),J=1,NOCLS),(SUBCLS(J),J=1,NOCLS),
     *              (SUBSAV(4,J),J=1,SUBNO)
      IF(PCHKEY.NE.1) GO TO 62
      WRITE(PUNCH,63)
   63 FORMAT('MODULE     TRAINING FIELD DECK')
      WRITE(PUNCH,64) NOCLS,SUBNO,NOFEAT,NOFLD,TOTVRT
   64 FORMAT('NOCLS ',I4,' NOSUB  ',I2,' NOFEAT ',I2,' NOFLD ',I3,
     * ' TOTVRT ',I4)
      WRITE(PUNCH,165) (FETVEC(I),I=1,NOFEAT)
  165 FORMAT('CHNVEC',4X,30I2)
      DO 65 I=1,NOFLD
      WRITE(PUNCH,66) (FLDSAV(J,I),J=1,4)
   66 FORMAT(A6,4X,I2,8X,I2,8X,I2)
      TNC=2*FLDSAV(4,I)
```

```
      IF(PCHKEY.NE.1) GO TO 62
      WRITE(PUNCH,A3)
   63 FORMAT('MODULE     TRAINING FIELD DECK')
      WRITE(PUNCH,44) NOCLS,SUBNO,NOFEAT,NOFLD,TOTVRT
   44 FORMAT('NOCLS ',I4,' NOSUB   ',I2,' NUFEAT ',I2,' NOFLD ',I3,
     * ' TOTVRT ',I4)
      WRITE(PUNCH,165) (FFTVEC(I),I=1,NOFEAT)
  165 FORMAT('CHNVEC',4X,30I2)
      DO 65 I=1,NOFLD
      WRITE(PUNCH,66) (FLDSAV(J,I),J=1,4)
   66 FORMAT(A6,4X,I2,8X,I2,8X,I2)
      TNC=2*FLDSAV(4,I)

   65 WRITE(PUNCH,67) (SAVERT(J,I),J=1,TNC)
   67 FORMAT('VERTICES  ',14I5)
      WRITE(PUNCH,68) (CLSDES(J),J=1,NOCLS)
   68 FORMAT(('CLSDES  ',9(2X,A6)))
      WRITE(PUNCH,69) (SUBCLS(J),J=1,NOCLS)
   69 FORMAT(('SUBNO   ',24(1X,I2)))
      WRITE(PUNCH,90) (SUBSAV(4,J),J=1,SUBNO)
   90 FORMAT(('SUBDES  ',10(A6,1X)))
   62 CONTINUE
      WRITE(6,41) (DASH,I=1,14)
      DO 40 K=1,NOFLD
      JJ=2*(FLDSAV(4,K)-1)
      MP=FLDSAV(2,K)
      KJ=10
      IF(JJ.LE.10) KJ=JJ
      MPP=FLDSAV(3,K)
      WRITE(6,42) K,FLDSAV(1,K),CLSDES(MP),SUBSAV(4,MPP),FLDSAV(10,K),
     *FLDSAV(9,K),((OPAR,SAVERT(I,K),COMMA,SAVERT(I+1,K),CPAR),I=1,KJ,2)
      IF(JJ.LE.10) GO TO 2017
      WRITE(6,43) ((OPAR,SAVERT(I,K),COMMA,SAVERT(I+1,K),CPAR),I=11,JJ,2
     *)
 2017 CONTINUE
   42 FORMAT(4X,I4,2X,A6,2X,A6,2X,A6,3X,I4,3X,I4,4X,
     *5(A1,I4,A1,I4,A1,2X))
   43 FORMAT(50X,5(A1,I4,A1,I4,A1,2X))
   40 CONTINUE
   41 FORMAT(//T50,'TRAINING FIELDS'/T49,3A6//
     *7X,'FIELD',T36,'SAMPLE LINE'/
     *5X,'NO.  NAME',4X,'CLASS',3X,'SUBCLASS  INC     INC',
     *4X,'VERTICES(SAMPLE,LINE)'/
     *4X,2A6,2X,A6,2X,A6,A2,1X,A6,1X,A4,4X,3A6,A3)
      SUBNO=0
   70 SUBNO=SUBNO+1
      SUBPTS=0
      DO 71 I=1,NOFEAT
   71 SUBMEN(I)=0.
      DO 72 I=1,VARSIZ
   72 SUBVAR(I)=0.
      FIELD1=SUBSAV(2,SUBNO)
      FIELDL=SUBSAV(3,SUBNO)
      DO 301 N=FIELD1,FIELDL
      DO 73 I=1,NOFEAT
   73 FLDMEN(I)=0.
      DO 74 I=1,VARSIZ
   74 FLDVAR(I)=0.
      LINSTR=FLDSAV(5,N)
      LINEND=FLDSAV(6,N)
      LININC=FLDSAV(9,N)
      SAMSTR=FLDSAV(7,N)
      SAMEND=FLDSAV(8,N)
      SAMINC=FLDSAV(10,N)
      CALL FLDINT(FLDINF,FETVEC,NOFEAT)
      LINES=(LINEND-LINSTR)/LININC+1
      PTS=(SAMEND-SAMSTR)/SAMINC+1
      NSAMP=PTS
      FLDPTS=0
      DO 17 JLINES=1,LINES
      CALL LINERD(IDATA,ENDTAP)
```

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```
00656            IF(IFPDTA(N).EQ.1) GO TO 1A
00660            IF(JLINES.NE.1) GO TO 8
00662            NLINES=LINSTR
00663            GO TO 9
00664          8 NLINES=NLINES+LININC
00665          9 CONTINUE
00666            K=0
00667            DO 93 I=1,11
00672            DO 93 J=1,2
00675            K=K+1
00676         93 VERTCS(J,I)=SAVERT(K,N)
00701            CALL FDLINT(VERTCS,FLDSAV(4,N),FL,NLINES,NS,JJJ)
00702            KK=0
00703            NN=1
00704            KC=0
00705            DO 1 J=1,NOFFAT
00710            INDEX1=(J-1)*NSAMP
00711            JJ=J
00712            DO 3 K=1,JJ
00715            KK=KK+1
00716            INDEX2=(K-1)*NSAMP
00717            L=1
00720            DO 2 JPT=1,NSAMP
00723            KPT=(JPT-1)*SAMINC+SAMSTR
00724            DO 4 JK=L,JJJ,2
00727            IF(KPT.LT.FL(JK)) GO TO 2
00731            IF(KPT.GT.FL(JK+1)) GO TO 15                                  *NEW
00733             M=IDATA(INDEX1+JPT)                                          *NEW
00734             IDJ=FLOAT(M)                                                 *NEW
00735             M=IDATA(INDEX2+JPT)                                          *NEW
00736             TD=FLOAT(M)                                                  *NEW
00736      C      APPLY THE SUN ANGLE CORRECTION FACTORS TO THE DATA IF SAKEY=1 *NEW
00737            IF (SAKEY.EQ.0) GO TO 50                                      *NEW
00741             IDJ=SAGAIN(J)*IDJ + SABIAS(J)                                *NEW
00742             TD=SAGAIN(K)*TD + SABIAS(K)                                  *NEW
00742      C     APPLY THE APPROPRIATE FILTER TO THE DATA                      *NEW
00742      C      APPLY NO FILTER - FKEY=0                                     *NEW
00743       50   IF (FKEY.EQ.0) GO TO 51                                       *NEW
00745             IF (J.NE.1) GO TO 51                                         *NEW
00745      C      APPLY THE WATER FILTER - FKEY=1                              *NEW
00747             IF (FKEY.NE.1) GO TO 52                                      *NEW
00751             TL=(FCHN(2)-1)*NSAMP + JPT                                   *NEW
00752            EC = FCHN(2)                                                  *NEW
00753             TLD = SAGAIN(EC)*IDATA(TL) + SABIAS(EC)                      *NEW
00754            TF = (FCHN(1)-1)*NSAMP + JPT                                  *NEW
00755              BC = FCHN(1)                                                *NEW
00756            TFD = SAGAIN(BC)*IDATA(TF) + SABIAS(BC)                       *NEW
00757             IDT=IDATA(TL)                                                *NEW
00760              IF (SAKEY.EQ.0) TLD=FLOAT(IDT)                              *NEW
00762             IDT=IDATA(TF)                                                *NEW
00763             IF (SAKEY.EQ.0) TFD=FLOAT(IDT)                               *NEW
00765             TN = TFD -.(TH(1)/TH(2))*TLD                                 *NEW
00766             IF (TN.GE.0.AND.TLD.LE.TH(2)) GO TO 2                        *NEW
00770             GO TO 51                                                     *NEW
00770      C      APPLY THE TASSEL CAP FILTER - FKEY=2                         *NEW
00771       52   IF (FKEY.NE.2) CALL EXIT                                      *NEW
00773            DO 54 I=1,4                                                   *NEW
00776             FC = (FCHN(I)-1)*NSAMP + JPT
```

```
00756            TFD = SAGAIN(BC)*IDATA(TF) + SABIAS(BC)                *NEW
00757             IDT=IDATA(TL) .                                       *NEW
00760              IF (SAKEY.EQ.0) TLD=FLOAT(IDT)                       *NEW
00762             IDT=IDATA(TF)                                         *NEW
00763             IF (SAKEY.EQ.0) TFD=FLOAT(IDT)                        *NEW
00765             TN = TFD - (TH(1)/TH(2))*TLD                          *NEW
00766             IF (TN.GE.0.AND.TLD.LE.TH(2)) GO TO 2                 *NEW
00770             GO TO 51                                              *NEW
00770     C       APPLY THE TASSEL CAP FILTER - FKEY=2                  *NEW
00771      52    IF (FKEY.NE.2) CALL EXIT                               *NEW
00773            DO 54 I=1,4                                            *NEW
00776             FC = (FCHN(I)-1)*NSAMP + JPT                          *NEW


00777             BC = ICHN(I)                                          *NEW
01000            TCV(I) = SAGAIN(BC)*IDATA(FC) + SABIAS(BC)             *NEW
01001             IDT=IDATA(FC)                                         *NEW
01002             IF (SAKEY.EQ.0) TCV(I)=FLOAT(IDT)                     *NEW
01004      54     CONTINUE                                              *NEW
01004     C      CALCULATE THE TASSEL CAP FILTER VECTOR                 *NEW
01006             CALL MTVEC1(BMAT,TCV,TTC,4,4)                         *NEW
01007             DO 55 I=1,4                                           *NEW
01012      55    TCV(I) = TTC(I) + BIAS(I)                              *NEW
01012     C       APPLY THE FILTER TEST                                 *NEW
01014            IF (TCV(1).GT.TH(1)) GO TO 2                           *NEW
01016             IF  (TCV(2).LT.TH(2)) GO TO 2                         *NEW
01020             IF  (TCV(3).LT.TH(3)) GO TO 2                         *NEW
01022             IF  (TCV(4).LT.TH(4)) GO TO 2                         *NEW
01024             IF  (TCV(4).GT.TH(5)) GO TO 2                         *NEW
01026      51     CONTINUE                                              *NEW
01027            IF(J.EQ.1) FLDPTS=FLDPTS+1                             **-1
01031            IF(K.EQ.1) FLDMEN(J)=FLDMEN(J)+IDJ
01033             FLDVAR(KK)=FLDVAR(KK) + IDJ*TD                        *NEW
01034            IF(LHIST(NN).NE.J) GO TO 2                             **-1
01036            KC=1
01037             IPUT=IDJ*XSCALE+XSHFT+0.501                           *NEW
01040            IF(IPUT.LT.1) IPUT=1                                   **-1
01042            IF(IPUT.GT.XSIZ) IPUT=XSIZ
01044            HFTALY(NN,IPUT)=HFTALY(NN,IPUT)+1
01045            IF(JPT.EQ.NSAMP) NN=NN+1
01047            GO TO 2
01050       15 L=L+2
01051            IF(L.GT.JJJ) GO TO 53
01053        4 CONTINUE
01055        2 CONTINUE
01057            IF(JPT.EQ.NSAMP) GO TO 3
01061       53 IF(KC.EQ.1) NN=NN+1
01063            KC=0
01064        3 CONTINUE
01066        1 CONTINUE
01070       17 CONTINUE
01072       16 CONTINUE
01073              WRITE(6,29) FLDPTS                                   *NEW
01076      29     FORMAT(//2X,I5,' POINTS WILL BE USED IN THE FIELD   MEAN,COVARIAN  *NEW
01076           ICE CALCULATIONS')                                      *NEW
01077            SUBPTS=SUBPTS+FLDPTS
01100            DO 200 I=1,NOFEAT
01103      200 SUBMEN(I)=SUBMEN(I)+FLDMEN(I)
01105            DO 21 I=1,VARSIZ
01110       21 SUBVAR(I)=SUBVAR(I)+FLDVAR(I)
01112            TITLE=SUBSAV(4,SUBNO)
01113            IF(CFDKEY+SFDKEY+HFDKEY.EQ.0) GO TO 301
01115            IF(CFDKEY+SFDKEY.EQ.0) GO TO 280
01117            CALL FLDCOV(COR,DEV,FLDMEN,FLDVAR,FLDPTS,CFDKEY,FLDSAV(1,N),
01117           *NOFEAT,MAXFET,VARSIZ)
01117      C PLOT SPECTRAL RESPONSE FOR FIELDS
01120            IF(SFDKEY.EQ.0) GO TO 270
01122            CALL FLDSPC(FLDMEN,DEV,FLDSAV(1,N),DUMPTR,IDATA,
01122           * FLDNAM,FLDVAR,TITLE,NOFEAT,FETVEC,SPCBAS,SAKEY)       *NEW
01123      270 IF(HFDKEY.EQ.0) GO TO 301                                **-1
01125      280 IF(HSAKEY.EQ.0) GO TO 300
01127            DO 290 I=1,XSIZ
```

```
01132          DO 290 J=1,NOHIST
01135      290 HSTALY(J,I)=HSTALY(J,I)+HFTALY(J,I)
01140      300 CONTINUE
01141          CALL FLDHIS(HFTALY,IDATA,FLDSAV(1,N),XSIZ,XHGH,XLOW,YSIZ,
01141         *NOHIST,FLDPTS,TITLE,HISVEC)
01142      301 CONTINUE
01142    C CALCULATE COVAR MTX AND MEAN VECTOR FOR SUBCLASS
01144          CALL CLSCOV(COR,DEV,SUBMEN,SUBVAR,SUBPTS,SSFKEY,
01144         *TITLE,NOFEAT,MAXFET,VARSIZ)
01144    C SAVE SUBCLASS MEAN,COVAR,STD DEV
01145      130 DO 31 I=1,NOFEAT
01150          AVAR(I,SUBNO)=SUBMEN(I)
01151       31 SUBSTD(I,SUBNO)=DEV(I)
01153          DO 32 J=1,VARSIZ
01154       32 COVAR(J)=SUBVAR(J)
01160          KEPPTS(SUBNO)=SUBPTS
01160    C PLOT SPECTRAL RESPONSE FOR EACH SUBCLASS
01161          IF(SSLKEY.EQ.0) GO TO 33
01163          CALL CLSSPC(AVAR(1,SUBNO),SUBSID(1,SUBNO),TITLE,DUMPTR,IDATA,
01163         * TITLE,NOFEAT,FETVEC,SPCBAS,SAKEY)                                  *NE?
01163    C PRINT SUBCLASS HIST                                                     *0=?
01164       33 IF(HSBKEY.EQ.0) GO TO 390
01166          TITLE=SUBSAV(4,SUBNO)
01167          IF(HFDKEY.EQ.0) GO TO 380
01171          CALL CLSHIS(HSTALY,IDATA,TITLE    ,XSIZ,XHGH,XLOW,YSIZ,
01171         *NOHIST,FLDPTS,HISVEC)
01172          GO TO 390
01173      380 CALL CLSHIS(HFTALY,IDATA,TITLE    ,XSIZ,XHGH,XLOW,YSIZ,
01173         *NOHIST,FLDPTS,HISVEC)
01174      390 WRITE(SAVTAP) KEPPTS(SUBNO),(COVAR(I),I=1,VARSIZ),
01174         *              (AVAR(I,SUBNO),I=1,NOFEAT)
01207          IF(PCHKEY.NE.1) GO TO 94
01211          WRITE(PUNCH,95) KEPPTS(SUBNO)
01214       95 FORMAT('NOPTS ',6X,I8)
01215          WRITE(PUNCH,96) (AVAR(I,SUBNO),I=1,NOFEAT)
01223       96 FORMAT('MEANS',5E15.8)
01224          WRITE(PUNCH,97) (COVAR(I),I=1,VARSIZ)
01232       97 FORMAT('COVAR',5E15.8)
01233       94 IF(SUBNO.LT.SCLTOT) GO TO 70
01235          ENDFILE SAVTAP
01236          REWIND SAVTAP
01236    C                                                               LEAR2780
01236    C        PUBLISH THE MULTISPECTRAL PLOTS                        LEAR2790
01236    C     ----------------------------------------------------------LEAR2800
01236    C                                                               LEAR2810
01237      410 IF (SPEC(1,1).NE.0) GO TO 450                             LEAR2820
01241          JK = 0                                                    LEAR2830
01242          DO 430 I=1,NOSPEC                                         LEAR2840
01245          DO 420 J=1,4                                              LEAR2850
01250          II=I
01251          JJ=J
01252          JK =JK+1                                                  LEAR2860
01253          SPEC(J,I) = JK                                            LEAR2870
01254          IF(JK.EQ.SUBNO) GO TO 440
01256      420 CONTINUE                                                  LEAR2890
01260      430 SPEC(5,I) = 4                                             LEAR2900
01262      440 SPEC(5,II)=JJ
01263          NOSPEC=II
```

```
01241            JK = 0                                                       LEAR2830
01242            DO 430 I=1,NOSPEC                                            LEAR2840
01245            DO 420 J=1,4                                                 LEAR2850
01250            II=I
01251            JJ=J
01252            JK =JK+1                                                     LEAR2860
01253            SPEC(J,I) = JK                                               LEAR2870
01254            IF(JK.EQ.SUBNO) GO TO 440
01256        420 CONTINUE                                                     LEAR2890
01260        430 SPEC(5,I) = 4                                                LEAR2900
01262        440 SPEC(5,II)=JJ
0126             NOSPEC=II

01264        450 CONTINUE                                                     LEAR2930
01265            DO 480 I=1,NOSPEC                                            LEAR2940
01270            K = SPEC(5,I)                                                LEAR2950
01271            JJ = 0                                                       LEAR2960
01272            DO 460 J=1,K                                                 LEAR2970
01275            IF(SPEC(J,I).GT.SUBNO) GO TO 460
01277            JJ = JJ +1                                                   LEAR2990
01300            SPEC(JJ,I) = SPEC(J,I)                                       LEAR3000
01301        460 CONTINUE                                                     LEAR3010
01303            IF (JJ.EQ.0) GO TO 480                                       LEAR3020
01305            SPEC(5,I) = JJ                                               LEAR3030
01306            WRITE (6,HEAD)                                               LEAR3040
01310            WRITE(6,465)
01312        465 FORMAT(// 27X,'COMPOSITE SPECTRAL PLOT (MEAN,PLUS AND MINUS ONE ST
01312           1D. DEV. ) FOR:' / )
01313            WRITE (6,470)(SPEC(J,I),J=1,JJ)                              LEAR3050
01321        470 FORMAT(38X,'TRAINING SUBCLASS(ES) ',4I4/41X,'------------------'/)
01322            DO 98 JI=1,SUBNO
01325         98 SUBDES(JI)=SUBSAV(4,JI)
01327            IF( JJ .LT. 4)  WRITE(6,471)  ( DASH,II=1,3 )
01336        471 FORMAT(41X,3A6 / )
01337            CALL MULSPC(AVAR(1,1),SUBSTD(1,1),SUBDES,SPEC(1,I),IDATA,
01337           * NOFEAT,FETVEC,SPCBAS,SAKEY)                                *NEW
01340        480 CONTINUE                                                     LEAR3080***I
01342            CALL SETMRG(66,4,42)
01343            RETURN                                                       LEAR3140
01343      C                                                                  LEAR3150
01343      C     ERROR ROUTINES                                               LEAR3160
01343      C     ---------------------------------------------------------------LEAR3170
01343      C                                                                  LEAR3180
01344        490 BADFLG = 2                                                   LEAR3190
01345            WRITE(6,500) MAXSUB,MAXSUB
01351        500 FORMAT(//5X,'*** STAT/LEARNN   MAX NO. OF',I8,3X, 'SUBCLASSES EXEC
01351           *EEDED---FIRST',I8,3X,'SUBCLASSES USED--REMAINDER IGNORED'///)
01352            GO TO 530                                                    LEAR3230
01352      C                                                                  LEAR3240
01353        510 BADFLG = 1                                                   LEAR3250
01354            WRITE(6,520) MAXFLD,MAXFLD,SUBNO
01361        520 FORMAT(//// 5X,'***** STAT/LEARNN --- MAX. OF',I8,,3X,
01361           1 'FIELDS EXCEEDED --- ',I8,3X,'FIELDS RETAINED FOR',I8,3X,
01361           *'SUBCLASSES'/5X,'***REMAINDER OF INPUT TRAINING FIELDS NOT USED'/)
01361      C                                                                  LEAR3290
01362        530 READ (5,540)I                                                LEAR3300
01365        540 FORMAT (A6)                                                  LEAR3310
01366            IF (I.NE.ENDCRD) GO TO 530                                   LEAR3320
01370            GO TO 60
01370      C                                                                  LEAR3340
01371            END                                                          LEAR3350

   END OF COMPILATION:        NO  DIAGNOSTICS.
 LEARNN        SYMBOLIC                       20 JUN 77  01:56:27   6  02534334   14   371  (DELETED)
 LEARNN  CODE  RELOCATABLE                    20 JUN 77  01:56:27   1  01615524   48     1  (DELETED)
                                                                    0  01615604   14   181
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EXTERNAL REFERENCES (BLOCK, NAME)

 0003   NWDOU$
 0004   NI02$
 0005   NI01$
 0006   NFMR3$

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

 0001  000034 156G     0001   000116 200G     0000   001227 210F     0000   001231 215F     0001   000135 217L
 0000  001240 220F     0001   000173 220G     0000   001246 230F     0001   000207 230G     0000   001257 231F
 0001  000222 237G     0000   001223 90F      0000 R 001212 BLANK    0000 R 000505 BIAS     0000 R 000001 EXTRA



 0000 I 001211 I       0000 I 001221 IEND     0000 I 001222 IENDS    0000 I 001216 IND      0000   001272 INJPS
 0000 I 001220 ISTART  0000 I 001214 K        0000 I 001215 KR       0000 I 001213 KS       0000 I 001217 NOFETR
 0000 I 000000 SUNA


00101      1*          SUBROUTINE SUNFI(SUNCOR,SUNANG,FETVEC,NOFEAT,ISUNC,ISUNT,SABIAS)          *NEW
00103      2*          INTEGER SUNANG,FETVEC,SUNA                                                *-1
00104      3*          DIMENSION EXTRA(324),SUNANG(1),FETVEC(1),SUNCOR(1)
00105      4*          DIMENSION BIAS(324),SABIAS(1)                                             *NEW
00106      5*          DATA(EXTRA(I), I=1,36) /16.413,14.887,14.089,13.401,
00106      6*         ,13.015,11.901,11.323,10.816,10.755,9.893,9.449,9.052,
00106      7*         ,9.094,8.413,8.063,7.745,7.832,7.285,7.002,6.744,
00106      8*         ,6.880,6.425,6.190,5.973,6.098,5.722,5.527,5.346,
00106      9*         ,5.474,5.156,4.991,4.838,4.967,4.694,4.551,4.419/
00110     10*          DATA(EXTRA(I),I=37,72) /4.530,4.297,4.174,4.061,
00110     11*         ,4.163,3.961,3.855,3.757,3.852,3.675,3.583,3.497,
00110     12*         ,3.580,3.426,3.344,3.269,3.342,3.207,3.135,3.069,
00110     13*         ,3.135,3.015,2.952,2.893,2.953,2.846,2.789,2.737,
00110     14*         ,2.788,2.693,2.643,2.597,2.642,2.557,2.513,2.471/
00112     15*          DATA(EXTRA(I),I=73,108) /2.511,2.435,2.395,2.358,
00112     16*         ,2.393,2.325,2.289,2.255,2.285,2.223,2.191,2.161,
00112     17*         ,2.187,2.131,2.102,2.076,2.097,2.047,2.021,1.997,
00112     18*         ,2.016,1.971,1.947,1.925,1.940,1.899,1.878,1.858,
00112     19*         ,1.871,1.834,1.815,1.797,1.807,1.773,1.756,1.740/
00114     20*          DATA(EXTRA(I),I=109,144) /1.748,1.717,1.701,1.687,
00114     21*         ,1.693,1.665,1.651,1.637,1.642,1.617,1.603,1.591,
00114     22*         ,1.594,1.571,1.559,1.548,1.550,1.529,1.518,1.508,
00114     23*         ,1.508,1.489,1.479,1.470,1.469,1.452,1.443,1.435,
00114     24*         ,1.432,1.417,1.409,1.402,1.398,1.384,1.377,1.370/
00116     25*          DATA(EXTRA(I),I=145,180) /1.366,1.353,1.347,1.341,
00116     26*         ,1.336,1.324,1.318,1.313,1.307,1.297,1.291,1.286,
00116     27*         ,1.280,1.271,1.266,1.261,1.255,1.246,1.242,1.238,
00116     28*         ,1.230,1.223,1.219,1.216,1.208,1.201,1.198,1.195,
00116     29*         ,1.186,1.180,1.177,1.174,1.166,1.161,1.158,1.155/
00120     30*          DATA(EXTRA(I),I=181,216) /1.146,1.142,1.140,1.137,
00120     31*         ,1.128,1.124,1.122,1.120,1.111,1.107,1.106,1.104,
00120     32*         ,1.094,1.091,1.090,1.089,1.078,1.076,1.075,1.074,
00120     33*         ,1.064,1.062,1.061,1.060,1.050,1.048,1.047,1.047,
00120     34*         ,1.036,1.035,1.035,1.034,1.023,1.023,1.022,1.022/
00122     35*          DATA(EXTRA(I),I=217,252) /1.011,1.011,1.011,1.011,
00122     36*         ,1.000,1.000,1.000,1.000,.989,.989,.990,.990,
00122     37*         ,.979,.979,.980,.980,.969,.970,.970,.971,
00122     38*         ,.960,.961,.961,.962,.951,.952,.953,.954,
00122     39*         ,.943,.944,.945,.946,.935,.937,.937,.938/
00124     40*          DATA(EXTRA(I),I=253,288)/ .928,.929,.930,.931,
00124     41*         ,.921,.923,.924,.925,.914,.916,.917,.918,
00124     42*         ,.908,.910,.911,.912,.902,.904,.906,.907,
00124     43*         ,.897,.899,.901,.902,.892,.894,.896,.897,
00124     44*         ,.887,.890,.891,.892,.882,.885,.887,.888/
00126     45*          DATA(EXTRA(I),I=289,324) /.878,.881,.883,.884,
00126     46*         ,.875,.878,.879,.881,.871,.874,.876,.878,
00126     47*         ,.868,.871,.873,.875,.865,.869,.870,.872,
00126     48*         ,.863,.866,.868,.870,.861,.864,.866,.868,
00126     49*         ,.859,.862,.864,.866,.857,.861,.863,.864/
00130     50*          DATA (BIAS(I),I=1,36) /10.28,16.43,43.78,16.79,13.7,60.31,17.     *NEW
00130     51*         2 12.49,-6.09,2.02,27.86,9.63,-9.40,-1.20,17.32,7.66,-11.00,      *NEW
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102

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00130   3 -2.99,13.54,6.27,-12.21,-4.36,10.69,5.20,-12.23,-4.82,8.49,          *NEW
00130   4 4.42,-12.13,-5.11,7.16,3.81,-12.05,-5.35,5.91,3.30/                  *NEW
00132    DATA (BIAS(I),I=37,72) /-11.41,-5.14,5.18,2.93,-10.80,-4.91,          *NEW
00132   2 4.46,2.62,-10.28,-4.71,3.91,2.36,-9.64,-4.42,3.50,2.14,              *NEW
00132   3 -6.95,-4.07,3.20,1.97,-8.35,-3.76,2.93,1.81,-7.82,-3.50,             *NEW
00132   4 2.78,1.68,-7.19,-3.16,2.54,1.56,-6.62,-2.86,2.40,1.46/               *NEW
00134    DATA (BIAS(I),I=73,108) /-6.11,-2.59,2.27,1.37,-5.64,-2.31,           *NEW
00134   2 2.16,1.29,-5.12,-2.03,2.11,1.23,-4.65,-1.76,2.00,1.17,-4.22,         *NEW
00134   3 -1.51,2.02,1.12,-3.83,-1.28,1.97,1.07,-3.50,-1.13,1.87,1.01,         *NEW
00134   4 -3.20,-1.00,1.78,.95,-2.92,-.87,1.70,.89/                            *NEW
00136    DATA (BIAS(I),I=109,144) /-2.66,-.75,1.62,.84,-2.38,-.61,             *NEW
00136   2 1.58,.80,-2.12,-.47,1.54,.77,-1.87,-.34,1.51,.73,-1.64,              *NEW
00136   3 -.21,1.47,.70,-1.43,-.11,1.44,.67,-1.24,-.01,1.49,.64,               *NEW
00136   4 -1.07,.07,1.36,.61,-.90,-.16,1.32,.59/                               *NEW
00140    DATA (BIAS(I),I=145,180) /-.74,.23,1.29,.56,-.62,.27,1.23,.53,        *NEW
00140   2 -.51,.31,1.18,.50,-.41,.36,1.12,.47,-.31,.38,1.07,.44,-.92,          *NEW
00140   3 .40,1.02,.41,-.14,.41,.96,.38,-.10,.41,.89,.36,-.04,.41,             *NEW
00140   4 .83,.33/                                                             *NEW
00142    DATA (BIAS(I),I=181,216) /.01,.42,.78,.33,.05,.41,.71,.27,            *NEW
00142   2 .07,.38,.64,.24,.09,.35,.57,.21,.10,.32,.50,.19,.12,.30,             *NEW
00142   3 .44,.16,.11,.25,.34,.13,.08,.18,.26,.09,.05,.12,.17,.06/             *NEW
00144    DATA (BIAS(I),I=217,252) /.03,.06,.08,.03,-.00,-.00,-.00,             *NEW
00144   2 -.00,-.05,-.08,-.10,-.04,-.12,-.18,-.21,-.07,-.18,-.28,              *NEW
00144   3 -.32,-.11,-.24,-.37,-.42,-.15,-.30,-.45,-.52,-.18,-.37,              *NEW
00144   4 -.56,-.63,-.21,-.46,-.67,-.75,-.25/                                  *NEW
00146    DATA (BIAS(I),I=253,288) /-.55,-.78,-.86,-.29,-.63,-.89,              *NEW
00146   2 -.97,-.33,-.70,-.99,-1.07,-.36,-.80,-1.10,-1.18,-.40,                *NEW
00146   3 -.91,-1.25,-1.32,-.44,-1.02,-1.38,-1.44,-.48,-1.12,                  *NEW
00146   4 -1.50,-1.56,-.52,-1.22,-1.61,-1.67,-.55,-1.34,-1.76,-1.80,-.59/      *NEW
00150    DATA (BIAS(I),I=289,324) /-1.54,-1.99,-2.00,-.65,-1.73,-2.21,         *NEW
00150   2 -2.19,-.72,-1.89,-2.40,-2.36,-.77,-2.05,-2.58,-2.62,-.82,            *NEW
00150   3 -2.21,-2.77,-2.69,-.87,-2.55,-3.14,-3.01,-.97,-2.84,-3.47,           *NEW
00150   4 -3.29,-1.05,-3.09,-3.76,-3.53,-1.13,-3.31,-4.00,-3.74,-1.19/         *NEW
00152    DATA BLANK/' '/
00154    KS = 0
00155    DO 200 I=1,NOFEAT
00160    K=(FETVEC(I)-1)/4
00161    IF (ISUNC.NE.0.AND.I.EQ.1) KS=K
00163    KR=FETVEC(I)-K*4
00164    K=K+1
00165    SUNA = SUNANG(K-KS)
00166 100 IND=(SUNA-5)*4+KR
00167    SUNCOR(I)=EXTRA(IND)
00170    SABIAS(I)=BIAS(IND)                                                   *NEW
00171 200 CONTINUE
00173    WRITE(6,90)
00175  90 FORMAT(//T61,'SUN ANGLES'/)
00176    WRITE (6,210) (SUNANG(I), I = 1,8)
00204 210 FORMAT(T45,8I5)
00205    WRITE(6,215)
00207 215 FORMAT(//T52,'CORRECTIONS FOR SUN ANGLES')
00207  C
00210    NOFETR = NOFEAT
00211    ISTART = 1
00212    IEND = 16
00213 217 IF (IEND .GE. NOFETR) IEND = NOFETR
00215    IENDS = ISTART + IEND - 1
00216    WRITE(6,220)(BLANK,FETVEC(I),I=ISTART,IE  S)
```

```
00173      97*              WRITE(6,90)
00175      98*           90 FORMAT(//T61,'SUN ANGLES'/)
00176      99*              WRITE (6,210) (SUNANG(I), I = 1,8)
00204     100*          210 FORMAT(T45,8I5)
00205     101*              WRITE(6,215)
00207     102*          215 FORMAT(//T52,'CORRECTIONS FOR SUN ANGLES')
00207     103*        C
00210     104*              NOFETR = NOFEAT
00211     105*              ISTART = 1
00212     106*              IEND = 16
00213     107*          217 IF (IEND .GE. NOFETR) IEND = NOFETR
00215     108*              IENDS = ISTART + IEND - 1
00216     109*              WRITE(6,220)(BLANK,FETVEC(I),I=ISTART,IENDS)

00225     110*          220 FORMAT(//1X,16(A1,'CH(',I2,')',1X))
00226     111*              WRITE(6,230)(SUNCOR(I),I=ISTART,IENDS)
00234     112*          230 FORMAT (3X,'THE SUN ANGLE GAIN FACTORS ARE'/16(2X,F6.2))            *NE*
00235     113*              WRITE (6,231) (SABIAS(I),I=ISTART,IENDS)                              *NE*
00243     114*          231 FORMAT (3X,'THE SUN ANGLE BIAS FACTORS ARE'/16(2X,F6.2))            *NE*
00243     115*        C                                                                         **-1
00244     116*              NOFETR = NOFETR - IEND
00245     117*              ISTART = IENDS + 1
00246     118*              IF (NOFETR .LE. 0) RETURN
00250     119*              GO TO 217
00251     120*              END

       END OF COMPILATION:          NO  DIAGNOSTICS.
```

```
0001   000730 377G     0001   000402 400L     0000   000147 4002F    0001   000730 4016     0001   000777 4296
0001   000573 430L     0001   000620 450L     0001   001137 4776     0001   000469 500L     0001   001155 5066
0000   000161 7002F    0000   000166 7003F    0000   000172 EQU2F    0000   000201 EQU3F    0001   001023 BUU4L
0001   001121 900L     0000   000222 9002F    0003   000073 ASAV     0003   000079 ASAVFL   0000 R 000002 BIAS
0000 I 000034 BLANK    0003   000055 BHFILE   0003   000356 BMKEY    0000 I 000062 EUF     0000 I 000046 CNT
0000 I 000035 DASH     0003   000053 DATAPE   0003   000071 DATFIL   0000 R 000005 DEVI    0003   000102 DOTFIL
0003   000101 DOTUNT   0003   000067 DRMWDS   0003   000066 DRUMAD   0003   000062 ERIPTP   0003   000063 ERPKEY
0000 I 000026 ERRLIN   0003 I 000000 HEAD     0003   000057 HISFIL   0003   000060 HISKEY   0000 I 000036 I
0000 R 000003 INCR     0000   000235 INJPS    0000 I 000051 ISTOP    0000 I 000037 J       0000 I 000042 JBIAS
0000 I 000056 JF       0000 I 000057 JFEAT    0000 I 000055 JK       0000 I 000067 JKL     0000 I 000052 JKSV
0000 I 000053 JP       0000 I 000041 JPLOT    0000 I 000040 JPSTR    0000 I 000050 K       0000 I 000000 LOC
0003   000100 MAPFIL   0003   000052 MAPTAP   0003   000064 MAPUNT   0000 I 000043 MAXV    0000 I 000059 MENBAS
0000 I 000061 MENHGH   0000 R 000004 MENI     0000 I 000060 MENLUN   0000 I 000044 MINV    0000 I 000045 MT
0003   000103 NCHPAS   0003   000076 NHSTFI   0003   000075 NHSTUN   0003   000065 NOFILE   0000 I 000033 NOLINE
0000 L 000001 OVRFLG   0000 I 000047 OVRFLW   0003   00007C PAGSIZ   0003   000054 SAVTAP   0003   000077 SCTRUN
0003   000072 STAFIL   0000 I 000006 SYMVEC   0000 I 000012 TAB      0003   000061 TRFORM   0003   000109 TRNSFL
0000 I 000066 WAT


00100     1*    C      //SPECOGRM                                                                  CLSS0000
00101     2*           COMPILER(DATA=SHORT)                                                        CLSS0010
00101     3*    C                                                                                  CLSS0020
00103     4*           SUBROUTINE CLSSPC(MEAN,SUBSTD,IDVEC,PTRVEC,PLOT,
00103     5*          * TITLE,NOFEAT,FETVEC,SPCBAS,SAKEY)                                                   *NEW
00105     6*           IMPLICIT INVFGER (A-H,O-Z)                                                  CLSS0040***-1
00106     7*           LOGICAL OVRFLG                                                              CLSS0050
00107     8*           REAL MEAN(1),SUBSTD(1),BIAS,INCR,MENI,DEVI
00110     9*           DOULLE PRECISION DEV(1),DMEAN(1)
00111    10*           DIMENSION PLOT(4,NOFEAT,49),PTRVEC(5)
00112    11*           INCLUDE COMBK4,LIST
00113    11*           COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00113    11*          *                HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
00113    11*          *    DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00113    11*          *  ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
00113    11*          *  ,DOTUNT,DOTFIL,NCHPAS,TRNSFL                                                       *NEW
00114    11*           END                                                                                  ***1
00115    12*           DIMENSION FETVEC(30)
00115    13*          *, SYMVEC(4),TAB(12),ERRLIN(5)
00115    14*    C                                                                                  CLSS0780
00115    15*    C      --------------------------------------------------------------------------CLSS0790
00115    16*    C                                                                                  CLSS0800
00116    17*           DATA SYMVEC/'S','+','=','.'/,  INCR/3.0/, NOLINE/49/,                      CLSS0810
00116    18*          1     BLANK /' '/                                                            CLSS0820
00116    19*    C                                                                                  CLSS0830
00123    20*           DATA  TAB /'12','20','28','36','44','52'                                    CLSS0840
00123    21*          1           ,'60','68','76','84','92','99'/                                  CLSS0850
00125    22*           DATA  ERRLIN /30H('+',T        ,'(',A1,')',I3)    /                          CLSS0860
00125    23*    C                                                                                  CLSS0870
00127    24*           DATA  DASH/'-------'/
00127    25*    C                                                                                  CLSS0880
00127    26*    C      --------------------------------------------------------------------------CLSS0890
00127    27*    C      --------------------------------------------------------------------------CLSS0900
00127    28*    C                                                                                  CLSS0910
00127    29*    C       SPEC INIZ                                                                  CLSS0920
00127    30*    C                                                                                  CLSS0930
00131    31*           WRITE(6,HEAD)                                                               CLSS0940
```

```
C                                                                       CLSS0830
      DATA  TAB /'12','20','28','36','44','52'                          CLSS0840
     1        ,'60','68','76','84','92','99'/                           CLSS0850
      DATA  ERPLIN /30H1'+','T        ,'1','A1,')','13)    /            CLSS0860
C                                                                       CLSS0870
      DATA  DASH/'-------'/
C                                                                       CLSS0880
C     ------------------------------------------------------------------CLSS0890
C     ------------------------------------------------------------------CLSS0900
C                                                                       CLSS0910
C      SPEC INIZ                                                        CLSS0920
C                                                                       CLSS0930
      WRITE(6,HEAD)                                                     CLSS0940


      WRITE(6,10021)
      WRITE(6,10021)  TITLE    ,(DASH,I=1,2)
10021 FORMAT(     34X,'SPECTRAL PLOT (MEAN,PLUS AND MINUS ONE STD. DEV. )
     1 FOR:' / )
 1002 FORMAT(44X,'TRAINING SUBCLASS   ',A6/47X,2A6/)
      WRITE(6,20021)
      WRITE(6,9002) SYMVEC(2),IDVEC
      GO TO 250                                                         CLSS1000
C                                                                       CLSS1010
C     ------------------------------------------------------------------CLSS1020
C                                                                       CLSS1030
      ENTRY FLDSPC(DMEAN,DEV,IDVEC,PTRVEC,PLOT,MEAN,SUBSTD,FLDNAM,
     * NOFEAT,FETVEC,SPCBAS,SAKEY)                                          *NEW
      WRITE(6,HEAD)                                                     CLSS1050**-1
      WRITE(6,10021)
      WRITE(6,1004) IDVEC,(DASH,I=1,2)
 1004 FORMAT(47X,'TRAINING FIELD   ',A6/47X,2A6/)
      WRITE(6,20021)
20021 FORMAT( / 47X, 'PLOT LEGEND:' / 47X, '------------' )
      WRITE(6,2002) SYMVEC(2),IDVEC
 2002 FORMAT(60X,A1,' = FIELD   ',A6)
C                                                                       CLSS1130
      DO 100 J=1,NOFEAT                                                 CLSS1140
  100 MEAN(J) = DMEAN(J)                                                CLSS1150
      DO 399 I=1,NOFEAT
  399 SUBSTD(I)=DEV(I)
  250 JPSTR = 2                                                         CLSS1180
      JPLOT = 2                                                         CLSS1190
      JBIAS = 1                                                         CLSS1200
C                                                                       CLSS1210
C      COMBINED INIZ                                                    CLSS1220
C                                                                       CLSS1230
C      IF THE SAKEY=1, RECOMPUTE INCR,SPCBAS                                *NEW
  300  IF (SAKEY.EQ.0) GO TO 305                                            *NEW
C      FIND THE MIN(MEAN-ST) AND MAX(MEAN+ST)                               *NEW
       MAXV=MEAN(1)+SUBSTD(1)+1.                                            *NEW
       MINV=MEAN(1)-SUBSTD(1)                                               *NEW
       DO 301 I=2,NOFEAT                                                    *NEW
       MT=MEAN(I)+SUBSTD(I)+1.                                              *NEW
       IF (MAXV.LT.MT) MAXV=MT                                              *NEW
       IF (SPCBAS.NE.-999) GO TO 301                                        *NEW
       MT=MEAN(I)-SUBSTD(I)                                                 *NEW
       IF (MINV.GT.MT) MINV=MT                                              *NEW
  301  CONTINUE                                                             *NEW
       IF (SPCBAS.NE.-999) MINV = SPCBAS                                    *NEW
       SPCBAS=MINV                                                          *NEW
       INCR=(MAXV-MINV)/49 + 1.0                                            *NEW
       WRITE(6,303) MAXV,SPCBAS,INCR                                        *NEW
  303  FORMAT(//2X,'MAXV=',I10,' SPCBAS=',I10,' INCR=',F8.2)                *NEW
  305  BIAS=SPCBAS                                                          *NEW
      WRITE(6,4002)                                                         **-1
      CNT = BIAS                                                        CLSS1250
      OVRFLW = 0                                                        CLSS1260
      OVRFLG = .TRUE.                                                   CLSS1270
      DO 350 J=1,NOFEAT
      DO 350 I=1,4                                                      CLSS1290
      DO 350 K=1,49                                                     CLSS1300
  350 PLOT(I,J,K) = BLANK                                               CLSS1310
```

```
00276          LOC=1
00277          ISTOP=NOFEAT
00300          IF(NOFEAT.GT.12)ISTOP=12
00300    C                                                      CLSS1320
00300    C     SET UP 'PLOT' MATRIX                             CLSS1330
00300    C                                                      CLSS1340
00302          JKSV=0
00303      400 DO 690 JP=JPSTR,JPLOT                            CLSS1350
00306          MENBAS = (PTRVEC(JP-JBIAS)-1)*NOFEAT             CLSS1360
00307          IF( OVRFLG) WRITE(6,4002)                        CLSS1380
00312     4002 FORMAT(' ')                                      CLSS1390
00313          OVRFLG = .FALSE.                                 CLSS1400
00314          JK=JKSV
00315          JF = 0
00316          DO 500 JFEAT=LOC,ISTOP
00321                JK = JK+JFEAT                              CLSS1430
00322                MENI = MEAN(MENBAS+JFEAT)                  CLSS1440
00323          DEVI=SURSTD(MENBAS+JFEAT)
00324                MENLOW = (MENI-DEVI-BIAS)/INCR+0.5         CLSS1470
00325                MENHGH = (MENI+DEVI-BIAS)/INCR+0.5         CLSS1480
00326                IF( MENLOW .GE. 1) GO TO 430               CLSS1490
00330          OVRFLW = MENI-DEVI+0.5                           CLSS1500
00331                MENLOW = 1                                 CLSS1510
00332      430       IF(MENHGH .LE. NOLINE)  GO TO 450          CLSS1520
00334          OVRFLW = MENI+DEVI+0.5                           CLSS1530
00335                MENHGH = NOLINE                            CLSS1540
00336           IF (MENLOW.GT.MENHGH) GO TO 306                         *NEW
00340      450       DO 490 J =MENLOW,MENHGH                    CLSS1550
00343      490          PLOT(JP,JFEAT,J) = SYMVEC(JP)           CLSS1560
00345          JF=JF+1                                                  *NEW
00346          IF(OVRFLW .EQ. 0 ) GOTO 500                      CLSS1570
00350          ERRLIN(2)=TAB(JF)                                        **-1
00351          WRITE(6,ERRLIN)  SYMVEC(JP),OVRFLW               CLSS1590
00355          OVRFLG = .TRUE.                                  CLSS1600
00356          OVRFLW = 0                                       CLSS1610
00357      500       CONTINUE                                   CLSS1620
00361      690    CONTINUE                                      CLSS1630
00361    C                                                      CLSS1640
00361    C     PRINT OUT 'PLOT' MATRIX                          CLSS1650
00363          WRITE(6,3004) CNT,CNT                            CLSS1660
00367     3004  FORMAT(3X,I4,2X,'I------I',12('--------I'),1X,I4)       *NEW
00370          CNT = CNT+INCR                                   CLSS1680**-1
00371      700 DO 790 K= 1,NOLINE                               CLSS1690
00374          WRITE(6,7002)CNT,((PLOT(I,J,K),I=1,4),J=LOC,ISTOP)
00406          WRITE(6,7003)CNT
00411     7002  FORMAT(3X,I4,2X,'I ',12(4X,4A1))                        *NEW
00412     7003  FORMAT('+',111X,'I',1X,I4)                              *NEW
00413             CNT = CNT+INCR                                CLSS1720**-2
00414      790    CONTINUE                                      CLSS1730
00414    C
00416      800 WRITE(6,3004)  CNT, CNT
00416    C
00422          WRITE(6,8002)  ( FETVEC(I), I=LOC,ISTOP)
00430     8002 FORMAT( / 1X, 'CHANNEL NO.' , 3X, I2, ( 11(6X,I2) )  )
00431          WRITE(6,8003)  DASH,DASH
00435     8003 FORMAT(1X, 2A6 ///)
00435    C
00436           GO TO 8004                                              *NEW
```

107

```
00411   7002 FORMAT(3X,I4,2X,'[ ',I2(4X,4A1))                              *NEW
00412   7003 FORMAT('+',111X,'[',1X,I4)                                    *NEW
00413          CNT = CNT+INCR                                    CLSS1720***-2
00414    790   CONTINUE                                          CLSS1730
00414        C
00416    800 WRITE(6,3004)  CNT, CNT
00416        C
00422        WRITE(6,8002)  ( FETVEC(I), I=LOC,ISTOP)
00430   8002 FORMAT( / 1X, 'CHANNEL NO.' , 3X, I2, ( I1(6X,I2) )  )
00431        WRITE(6,8003)  DASH,DASH
00435   8003 FORMAT(1X, 2A4 ///)
00435        C                                                              *NEW
00436        GO TO 8004

00437    306  WRITE(6,307)                                                   *NEW
00441    307  FORMAT(//2X,'IN CLSSPC,MENLOW IS GREATER THAN MENHGH - NO      *NEW
00441       * PLOTTING WILL BE DONE')                                        *NEW
00442        RETURN                                                          *NEW
00443   8004  IF (ISTOP.EQ.NOFEAT) RETURN                                    ***1
00445        CNT=BIAS
00446        JKSV=JK
00447        LOC=LOC+12
00450        ISTOP=ISTOP+12
00451        IF(ISTOP.GT.NOFEAT)ISTOP=NOFEAT
00453        GO TO 400                                           CLSS1830
00453   C                                                        CLSS1840
00453   C    ----------------------------------------------------CLSS1850
00453   C                                                        CLSS1860
00453   C
00454        ENTRY MULSPC(MEAN,SUBSTD,JDVEC,PTRVEC,PLOT,                    *NEW
00454       * NOFEAT,FETVEC,SPCBAS,SAKEY)                                   ***1
00456        DIMENSION JDVEC(1,1),BUF(4)
00457        WRITE(6,2002I)                                      CLSS1890
00461        JPSTR =1                                            CLSS1900
00462        JPLOT = PTRVEC(5)                                   CLSS1910
00463        IF(JPLOT .NE. 1) GOTO 900                           CLSS1920
00465        JPSTR = 2                                           CLSS1930
00466        JPLOT = 2                                           CLSS1940
00467        JBI S = 1                                           CLSS1950
00470        WAT PTRVEC(1)
00471        WRITE(6,9002) SYMVEC(2),JDVEC(1,WAT)                CLSS1970
00475        GOTO 300                                            CLSS1980
00476    900 DO 22 JKL=JPSTR,JPLOT          @ SUB=SUB            CLSS1990
00501        WAT=PTRVEC(JKL)
00502     22 BUF(JKL)=JDVEC(1,WAT)
00504        WRITE(6,9002)  (SYMVEC(I),BUF(I),
00504       *  I=JPSTR,JPLOT) @ SEE DEFINE-SUBSCRIPTED SUBSCRIPT CLSS2030
00513   9002 FORMAT(57X,A1,' = SUBCLASS ',A6)                    CLSS2050
00514        JBIAS = 0                                           CLSS2060
00515        GO TO 300                                           CLSS2070
00516        END

   END OF COMPILATION:       NO  DIAGNOSTICS.
CLSSPC       SYMBOLIC                 20 JUN 77  01:53:11   0  02221674  19  161  (DELETED)
CLSSPC  CODE RELOCATABLE              20 JUN 77  01:53:11   1  01477252  36    1  (DELETED)
                                                            0  01477316  14   74
```

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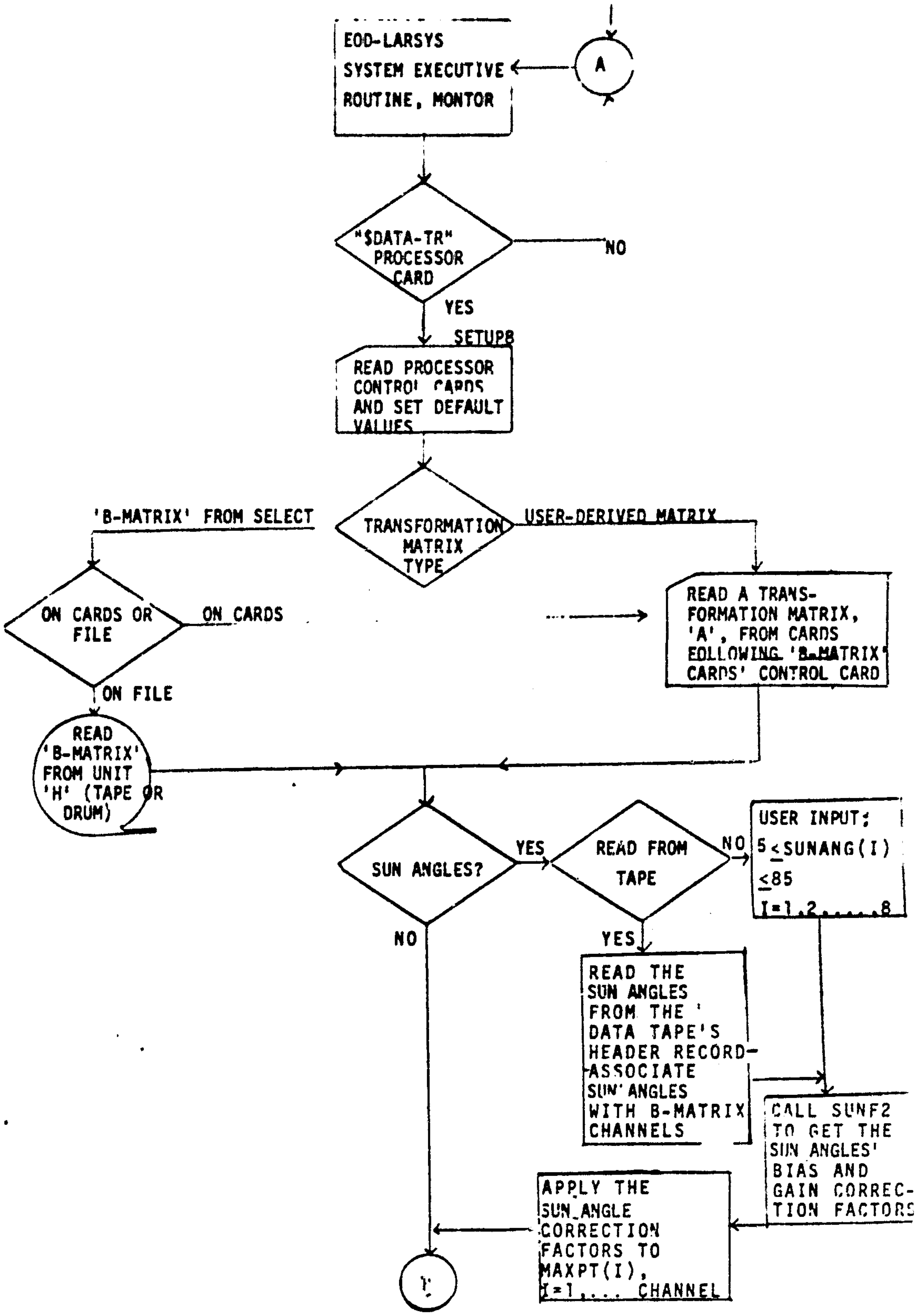
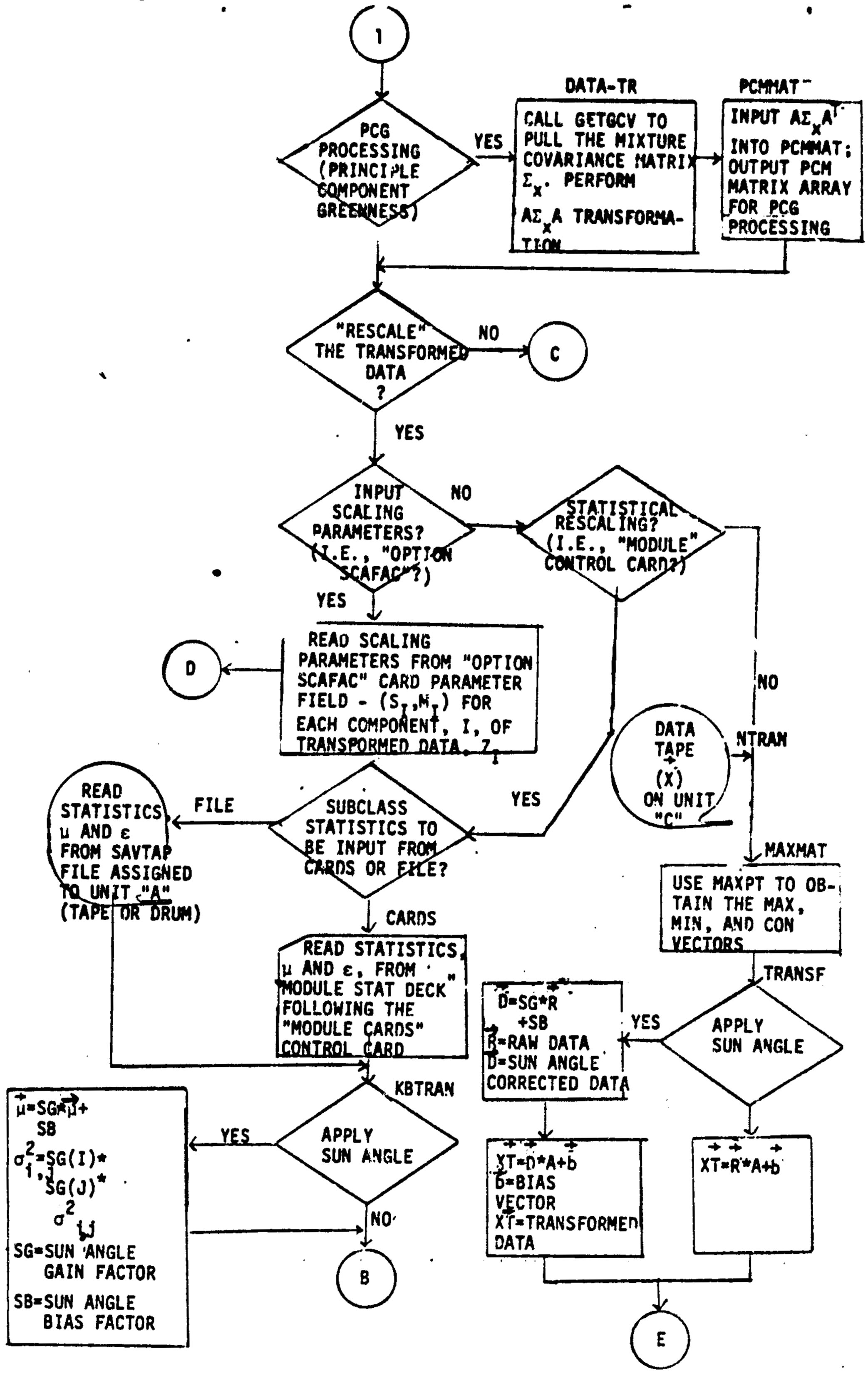
APPENDIX E

FUNCTIONAL FLOWCHART - DATA-TR PROCESSOR

DATA-TR PROCESSOR





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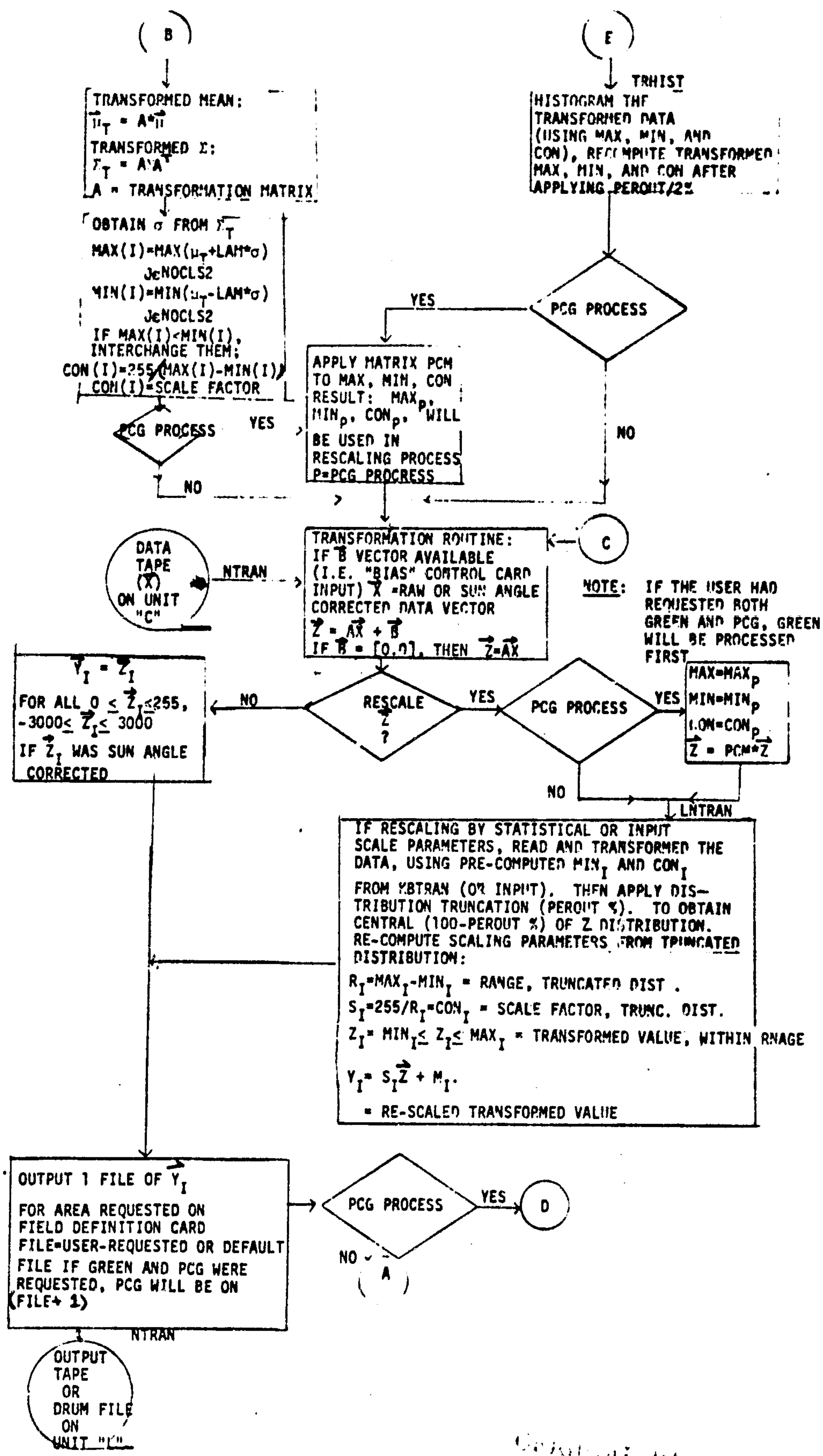
B
E
TRHIST
TRANSFORMED MEAN:
μT = A*μ
TRANSFORMED Σ:
ΣT = AΣA^T
A = TRANSFORMATION MATRIX
HISTOGRAM THE TRANSFORMED DATA (USING MAX, MIN, AND CON), RECOMPUTE TRANSFORMED MAX, MIN, AND CON AFTER APPLYING PEROUT/2%
OBTAIN σ FROM ΣT
MAX(I)=MAX(μT+LAM*σ)
J∈NOCLS2
MIN(I)=MIN(μT-LAM*σ)
J∈NOCLS2
IF MAX(I)<MIN(I), INTERCHANGE THEM;
CON(I)=255/(MAX(I)-MIN(I))
CON(I)=SCALE FACTOR
PCG PROCESS
YES
NO
APPLY MATRIX PCM TO MAX, MIN, CON RESULT: MAXp, MINp, CONp, WILL BE USED IN RESCALING PROCESS
P=PCG PROCRESS
DATA TAPE (X) ON UNIT "C"
NTRAN
TRANSFORMATION ROUTINE:
IF B VECTOR AVAILABLE (I.E. "BIAS" CONTROL CARD INPUT) X =RAW OR SUN ANGLE CORRECTED DATA VECTOR
Z = AX + B
IF B = [0,0], THEN Z=AX
C
NOTE: IF THE USER HAD REQUESTED BOTH GREEN AND PCG, GREEN WILL BE PROCESSED FIRST
YI = ZI
FOR ALL 0 ≤ Z ≤255,
-3000≤ ZI≤ 3000
IF ZI WAS SUN ANGLE CORRECTED
RESCALE Z ?
MAX=MAXp
MIN=MINp
CON=CONp
Z = PCM*Z
LNTRAN
IF RESCALING BY STATISTICAL OR INPUT SCALE PARAMETERS, READ AND TRANSFORMED THE DATA, USING PRE-COMPUTED MINI AND CONI FROM XBTRAN (OR INPUT). THEN APPLY DISTRIBUTION TRUNCATION (PEROUT %). TO OBTAIN CENTRAL (100-PEROUT %) OF Z DISTRIBUTION. RE-COMPUTE SCALING PARAMETERS FROM TRUNCATED DISTRIBUTION:
RI=MAXI-MINI = RANGE, TRUNCATED DIST .
SI=255/RI=CONI = SCALE FACTOR, TRUNC. DIST.
ZI= MINI≤ ZI≤ MAXI = TRANSFORMED VALUE, WITHIN RNAGE
YI= SIZ + MI.
= RE-SCALED TRANSFORMED VALUE
OUTPUT 1 FILE OF YI
FOR AREA REQUESTED ON FIELD DEFINITION CARD
FILE=USER-REQUESTED OR DEFAULT FILE IF GREEN AND PCG WERE REQUESTED, PCG WILL BE ON (FILE+ 1)
D
A
NTRAN
OUTPUT TAPE OR DRUM FILE ON UNIT "E"

112

APPENDIX F

LISTINGS - DATA-TR PROCESSOR

```
 0021      NTRAN
 0020      XIT
 0021      NWOUS
 0022      N102S
 0023      N101S
 0024      NERR3S

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

 0001    000005 126G       0001    000131 157G       0001    000146 164G       0001    000222 20L        0001    000226 207G
 0001    000174 21L        0001    000345 227G       0001    003255 30L        0000    005741 43F        0000    005750 42F


 0001    000312 50L        0001    000343 60L        0000    005753 80F        0001    000406 81L        0000    005765 82F
 0000 I  005732 A          0000 R  001253 ACON       0000 I  005723 ADDNUM     0000 R  001213 AMAX       0000 R  001233 AMIN
 0005    000073 ASAV       0005    000074 ASAVFL     0003    003606 AVAR2      0000 R  000040 BIAS       0000 R  000060 BMAT
 0005    000055 BMFILE     0005    000056 BMKEY      0000 I  005715 BMIN16     0003    000010 CLSID2     0003    000301 CLSVC2
 0000 I  005646 COMNT      0000 R  001020 CON        0000 R  001042 CONMIN     0003    000007 COVAR2     0000 I  005725 CP
 0005    000053 DATAPE     0005    000071 DATFIL     0005    003102 DOTFIL     0005    000101 DOTUNT     0005    000067 DRMWOS
 0005    000066 DRUMAD     0005    000062 ERIPTP     0005    003063 ERPKEY     0003    000015 FETVC2     0004    000010 FETVEC
 0000 I  002502 FILMIS     0004    000002 FLDINF     0000 I  005736 FLDNAM     0003    000013 FLDSV2     0000 R  001273 GCOV
 0004    000051 GIC        0003    000760 GROUPS     0003    000663 GRPCHK     0003    000566 GRPDEX     0003    000472 GRPNAM
 0000 I  005622 HDR1       0000 I  005634 HDR2       0005 I  003000 HEAD       0005    000057 HISFIL     0005    000060 HISKEY
 0000 I  005710 I          0000 I  005733 ID         0000 I  005660 INDATE     0000    006007 INJPS      0000 I  005712 IPL19
 0000 I  005711 IPL2       0000 I  005740 IPL31      0000 I  005734 IPP        0000 I  005730 J          0003    000375 KEPPTS
 0000 I  005717 LAM        0000 I  005735 LAR        0000 I  005714 LCOMB      0000 I  005731 M          0005    000100 MAPFIL
 0005    000052 MAPTAP     0005    000064 MAPUNT     0000 R  000000 MAX        0000 I  002444 MAXPT      0000 R  000020 MIN
 0000 I  005727 N          0000 I  005737 NC         0000 I  005726 NCHAN      0005    000103 NCHPAS     0000 I  005713 NF
 0005    000076 NHSTFI     0005    000075 NHSTUN     0003    003003 NOCLS2     0004 I  000001 NOFEAT     0003 I  000002 NOFET2
 0005    000065 NOFILE     0003    000005 NOFLD2     0003    003471 NOGRP      0003 I  000001 NOSUB2     0000 I  005724 NPUN
 0000 I  001100 NSUB       0004    000000 OUTFMT     0005    000073 PAGSIZ     0004    000046 PCF        0004 I  000047 PCGC
 0004 R  000146 PCM        0000 I  005716 PERDUT     0000 R  002435 R          0000 I  005722 RESCAL     0004    000110 SABIAS
 0004    000052 SAGAIN     0004    000050 SAKEY      0005 I  003054 SAVTAP     0000 I  005720 SCAFLG     0005    000077 SCTRUN
 0005 I  000072 STAFIL     0003 I  000012 SUBDS2     0003    003011 SUBNO2     0003    000166 SUBPTR     0003    000053 SUBVC2
 0000 R  002125 T          0003    000004 TOTVT2     0000 I  005721 TRANSF     0005    000061 TRFORM     0005    000104 TRNSFL
 0003    000003 VARSZ2     0000 I  005662 VERTCS     0003    000014 VERTX2


 00101      1*            SUBROUTINE DATATR(ARRAY,TOP)                                    DATR0001
 00101      2*      C
 00103      3*            IMPLICIT INTEGER(A-Z)                                           DATR0002
 00103      4*      C                                                                     DATR0003
 00103      5*      C                                                                     DATR0004
 00104      6*            REAL   BIAS(16), BMAT(480), MAX(16), MIN(16), CON(16), CONMIN(32) DATR0005
 00105      7*             DIMENSION NSUB(75)                                                         *NEW
 00105      8*      C                                                                     DATR0006
 00106      9*            REAL   AMAX(16), AMIN(16), ACON(16)                             DATR0007
 00107     10*             REAL PCM                                                                   *NEW
 00110     11*             REAL GCOV(410),T(200),R(7)                                                 *NEW
 00110     12*      C                                                                     DATR0008
 00110     13*      C                                                                     DATR0009
 00111     14*            DIMENSION   ARRAY(TOP),  MAXPT(30),  FILMIS(1616)               DATR0010
 00111     15*      C                                                                     DATR0011
 00112     16*            DIMENSION   HDR1(10) , HDR2(10) , COMNT(10) , INDATE(2)         DATR0012
 00113     17*            INCLUDE COMRK1,LIST                                             DATR0013
 00114     17*            COMMON/INFORM/NOCLS2,NOSUB2,NOFET2,VARSZ2,TOTVT2,NOFLD2,
 00114     17*           *              AVAR2,COVAR2,CLSID2,SUBNO2,SUBDS2,FLDSV2,VERTX2,
 00114     17*           *              FETVC2(30),SUBVC2(75),SUBPTR(75),CLSVC2(60),
 00114     17*           *              KEPPTS(60),NOGRP,GRPNAM(60),GRPDEX(61),
 00114     17*           *              GRPCHK(61),GROUPS(124)
 00115     17*            END
 00116     18*            INCLUDE COMRK9,LIST                                             DATR0014
 00116     18*      C DATA TRANSFORMATION COMMON BLOCK
 00117     18*            COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FETVEC(30),PCF,                       *NEW
 00117     18*           1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                                *NEW
 00120     18*            END                                                                         ***1
 00121     19*            INCLUDE COMRK4,LIST                                             DATR0015
 00122     19*            COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
 00122     19*           *              HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
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     *    DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,AVAVFL
     *   ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
     *   ,OUTUNT,OUTFIL,NCHPAS,TRNSFL
      END
      DIMENSION VERTCS(2,11)
C
C        RESCALING METHOD IS DETERMINED IN SETUPB :
C
C        SCAFLG = 1 .  RESCALE BY HISTOGRAM METHOD
C
C        SCAFLG = 2 . RESCALE BY STATISTICS METHOD
C
C        SCAFLG = 3 . RESCALE WITH USER-INPUT SCALING PARAMETERS
C
C        IF THE FLAG   RESCAL   IS ZERO, NO RESCALING OCCURS
C
C
      DO 10 I=1,10
      IPL2 = I + 2
      HDR1(I) = HEAD(IPL2)
      IPL19 = I + 19
      HDR2(I) = HEAD(IPL19)
   10 COMNT(I) = 4H
C
      INDATE(1) = HEAD(15)
      INDATE(2) = HEAD(16)
C
C
      NF = 0
C
      CALL SETUPB(BMAT,LCOMB,BMTRIG,PFROUT,MAXPT,ARRAY,LAM,
     *   SCAFLG , TOP, TRANSF, RESCAL, BIAS, ADDNUM, CONMIN, NPUN )
C     CALCULATE THE GREEN IMAGE COVARIANCE MATRIX IF PLGC=1
      IF (PCGC+NF.1) GO TO 21
      CP=STAFIL+2
C     CALL GETGCV TO READ THE PCG DATA COVARIANCE MATRIX
C     CALCULATED IN STAT
      CALL GETGCV(SAVTAP,CP,NCHAN,GCOV)
      IF (NCHAN.NF.NOFEAT) GO TO 81
       CALL MTMLSA(BMAT,GCOV,T,LCOMB,NOFET2)
      CALL MTMUAT(T,BMAT,GCOV,LCOMB,NOFET2,LCOMB,MAX,I)
C     CALCULATE THE PCM MATRIX
      WRITE(6,40)
   40 FORMAT(//2X,*THE INPUT MATRIX TO PCMMAT IS*/)
      N=1
      DO 41 J=1,LCOMB
      M=J+LCOMB
      WRITE(6,42) (GCOV(A),A=N,M)
   41 N=M+1
   42 FORMAT(1H0,8(F12.6))
      ID=(LCOMB*(LCOMB+1))/2
      CALL PCMMAT(T,PCM,T,R,LCOMB,ID)
   21 IF (RESCAL.EQ.0) GO TO 50
C
C
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115

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00154      49    FORMAT(//2X,*THE INPUT MATRIX TO PCMM      */)              *NEW
00155            N=1                                                           *NEW
00156            DO 41 J=1,LCOMB                                               *NEA
00161            M=J*LCOMB                                                     *NEW
00162            WRITE(6,42) (GCOV(A),A=N,M)                                   *NEW
00170      41    N=M+1                                                         *NEW
00172      42    FORMAT(1H0,8(F12.6))                                          *NEA
00173            ID=(LCOMB*(LCOMB+1))/2                                        *NEW
00174            CALL PCMMAT(T,PCM,T,R,LCOMB,ID)                               *NEW
00175      21    IF (RESCAL.EQ.0) GO TO 50                                     *NEW
00175      C                                                          DATR0048***-1
00175      C                                                          DATR0049

00177            IF (SCAFLG.EQ.1) GO TO 30                            DATR0050
00177      C                                                          DATR0051
00201            IF (SCAFLG.EQ.2) GO TO 20                            DATR0052
00201      C                                                          DATR0053
00203            IF( SCAFLG .EQ. 3 )                                  DATR0054
00203      C                                                          DATR0055
00203          *        CALL SETREM ( CONMIN, CON, MIN, ADUNUM, LCOMB )  DATR0056
00205            GO TO 50                                             DATR0057
00205      C                                                          DATR0058
00205      C                                                          DATR0059
00205      C        IF RESCALING BY THE STATISTICS METHOD, APPLY TRANSFORMATION TO DATR0060
00205      C        STATS ( MEANS, COVARIANCES ) , OBTAIN TRANSFORMED MAX AND MIN  DATR0061
00205      C        USING TRANSFORMED STATS .                         DATR0062
00205      C                                                          DATR0063
00206      20     DO 12 I=1,NOSUB2                                             *NEW
00211             IPP = SUBDS2 + I - 1                                         *NEW
00212      12     NSUB(I) = ARRAY(IPP)                                         *NEW
00214             CALL KBTRAN(BMAT,LCOMB,ARRAY,LAM,MAX,MIN,CON,TRANSF,NSUB)    *NEW
00214      C                                                          DATR0065***-1
00215            GO TO 50                                             DATR0066
00215      C                                                          DATR0067
00215      C                                                          DATR0068
00215      C        IF RESCALING BY THE HISTOGRAM METHOD,  OBTAIN THE PREDICTED    DATR0069
00215      C        MAX AND MIN OF EACH COMPONENT OF THE TRANSFORMED DATA          DATR0070
00215      C        ( VIA  MAXMAT )  AND PERFORM A HISTOGRAM OF THE TRANSFORMED    DATR0071
00215      C        DATA ( VIA  TRHIST ), IN ORDER  TO OBTAIN THE RESCALING        DATR0072
00215      C        PARAMETERS ,  CON  AND  MIN .                     DATR0073
00215      C                                                          DATR0074
00215      C                                                          DATR0075
00216      30    CALL  MAXMAT ( AMAX, AMIN, ACON, BMAT, LCOMB, MAXPT )          DATR0076
00217            CALL TRHIST(ARRAY,AMAX,AMIN,ACUN,BMAT,LCOMB,PEROUT,   DATR0077
00217           *FILHIS,TOP,LAR,FLDNAM,NC,VERTCS,MAX,MIN,CON,          DATR0078
00217           *      BIAS)                                           DATR0079
00217      C                                                          DATR0080
00217      C                                                          DATR0081
00217      C        APPLY TRANSFORMATION TO INPUT DATA, RESCALE ( IF OPTED ), APPLYDATR0082
00217      C $  REJECTION ( PEROUT ) TO DISTRIBUTION OF TRANSFORMED DATA, AND     DATR0083
00217      C        OUTPUT THE TRANSFORMED DATA ON THE FILE  ,  INFORM .          DATR0084
00217      C                                                          DATR0085
00217      C                                                          DATR0086
00220            IF (LAR.EQ.0) GO TO 60                               DATR0087
00220      C                                                          DATR0088
00220      C                                                          DATR0089
00222      50 CALL LNTRAN(ARRAY,MAX,MIN,CON,BMAT,LCOMB,BMTRIG,SCAFLG,PEROUT,   DATR0090
00222         * FILHIS,TOP,LAR,FLDNAM,NC,VERTCS, RESCAL, BIAS,        DATR0091
00222         *  NF , NPUN )                                          DATR0092
00222      C                                                          DATR0093
00222      C                                                          DATR0094
00223            IF (SCAFLG.EQ.1) GO TO 30                            DATR0095
00223      C                                                          DATR0096
00223      C                                                          DATR0097
00225      60 CONTINUE                                                DATR0098
00225      C                                                          DATR0099
00226            DO 70 I=1,10                                         DATR0100
00231            IPL2 = I + 2                                         DATR0101
00232            HEAD(IPL2) = HOR1(I)                                 DATR0102
00233            IPL19 = I + 19                                       DATR0103
00234            HEAD(IPL19) = HOR2(I)                                DATR0104
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00235    1320            IPL31 = I + 31                                              DATR0105
00236    1330         70 HEAD(IPL31) = COMNT(I)                                      DATR0106
00236    1340      C                                                                 DATR0107
00240    1350            HEAD(15) = INDATE(1)                                        DATR0108
00241    1360            HEAD(16) = INDATE(2)                                        DATR0109
00241    1370      C                                                                 DATR0110
00241    1380      C                                                                 DATR0111
00242    1390            WRITE (6,80)                                                DATR0112
00244    1400         80 FORMAT(//////////// 10X, '*** SDATA-TR  COMPLETED  ***  //////)   DATR0113
00244    1410      C                                                                 DATR0114
00245    1420            RETURN                                                      DATR0115
00246    1430       81    WRITE (6,82) NOFFAT,NCHAN                                          *NEW
00252    1440       82    FORMAT (//2X,'THE DIMENSION OF BMAT',I3,/' AND DCOV',I3,' ARE NOT  *NEW
00252    1450           C COMPATIBLE - CALL EXIT')                                           *NEW
00253    1460            CALL EXIT                                                           *NEW
00254    1470            END                                                         DATR0116

    END OF COMPILATION:          NO  DIAGNOSTICS.
  DATATR          SYMBOLIC                        20 JUN 77  01:53:36   0  02260142   14   117  (DELETED)
  DATATR   CODE   RELOCATABLE                     20 JUN 77  01:53:36   1  01512606   36     1  (DELETED)
                                                                        0  01512652   14    23
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117

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0000 L 000156 NUDTAP    0013 I 000000 NUMBER    0000 L 000161 NUSFIL    0000 I 000160 NUSTAP    0010 I 000000 NXTCHR
0000 I 000152 OP        0000 I 000234 ORIG      0006 I 000000 OUTFMT    0005   000070 PAGSIZ    0006 I 000046 PCF
0006 I 000047 PCGC      0006   000146 PCM       0006 R 000110 SABIAS    0006 R 000052 SAGAIN    0006 I 000050 SAKEY
0006   000006 SAMEND    0004   000007 SAMINC    0006   000005 SAMSTR    0005 I 000054 SAVTAP    0000 I 000263 SC
0005   000077 SCTRUN    0000 I 000026 SINVEC    0003   000014 SMINC     0003   000013 SMSTP     0003   000012 SMSTR
0005 I 000072 STAFIL    0004 I 000012 SUBDS2    0004   000311 SUBNO2    0004   000166 SUBPTR    0004 I 000053 SUBVC2
0003 I 000000 SUNANG    0000 I 000250 T         0000 I 000264 TEMP      0004   000004 TOTVT2    0005 I 000061 TRFORM
0005 I 000104 TRNSFL    0004 I 000003 VARSZ2    0000 I 000257 VECMAX    0004   000014 VERTX2    0000 I 000251 Z
0000 I 000226 ZERO


00101      1*            SUBROUTINE SETUP8(BMAT,LCOMB,BMTRIG,PEROUT,MAXPT,ARRAY,LAM,SCAFLG,   SB0001
00101      2*          *   TOP, TRANSF, RESCAL, BIAS, ADDNUM, CONMIN, NPUN )               SET00002
00101      3*      C
00103      4*            IMPLICIT INTEGER(A-Z)                                                SET00003
00104      5*            REAL   CONMIN(32) ,  BIAS(16) ,  BMAT(960)                           SET00004
00105      6*            INCLUDE CMBK16,LIST                                                           *NEW
00106      6*            COMMON/ISOLNK/SUNANG(8),ISUNT,ISUNC,SMSTR,SMSTP,SMINC,LINSKP
00107      6*            END
00110      7*            DIMENSION MAXPT(30)                                                  SET00005
00111      8*            DIMENSION ARRAY(1)                                                   SET00006
00112      9*            DIMENSION EQUVEC(2)                                                  SET00007
00112     10*      C                                                                          SET00008
00112     11*      C                                                                          SET00009
00113     12*            INCLUDE COMBK1,LIST                                                  SET00010
00114     12*            COMMON/INFORM/NOCLS2,NOSUB2,NOFET2,VARSZ2,TOTVT2,NOFLD2,
00114     12*          *           AVAR2,COVAR2,CLSID2,SUBNO2,SUBDS2,FLDSV2,VERTX2,
00114     12*          *           FETVC2(30),SUBVC2(75),SUBPTR(75),CLSVC2(60),
00114     12*          *           KEPPTS(60),NOGRP,GRPNAM(60),GRPDEX(61),
00114     12*          *           GRPCHK(61),GROUPS(124)
00115     12*            END
00116     13*            INCLUDE COMBK4,LIST                                                  SET00011
00117     13*            DIMENSION HED1(10),HED2(10),DATE(2),COMENT(10)
00120     13*            EQUIVALENCE (HED1(1),HEAD(3)),(DATE(1),HEAD(15)),
00120     13*          *          (HED2(1),HEAD(20)),(COMENT(1),HEAD(32))
00121     13*            END
00122     14*            INCLUDE COMBK6,LIST                                                  SET00012
00123     14*            COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00123     14*          *              HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
00123     14*          *    DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00123     14*          *  ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
00123     14*          * ,DOTUNT,DOTFIL,NCHPAS,TRNSFL                                                  *NEW
00124     14*            END                                                                           **-1
00125     15*            INCLUDE COMBK9,LIST                                                  SET00013
00125     15*      C DATA TRANSFORMATION COMMON BLOCK
00126     15*            COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FETVEC(30),PCF,                         *NEW
00126     15*          1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                                  *NEW
00127     15*            END                                                                           **-1
00130     16*            EQUIVALENCE (FLDINF(1),LINSTR),(FLDINF(2),LINEND),                   SET00014
00130     17*          *             (FLDINF(3),LININC),(FLDINF(4),SAMSTR),                   SET00015
00130     18*          *             (FLDINF(5),SAMEND),(FLDINF(6),SAMINC)                    SET00016
00131     19*            REAL MAXPT                                                                    *NEW
00132     20*             REAL SAGAIN,SABIAS                                                           *NEW
00133     21*             DIMENSION CINDEX(20),                                                        *NEW
00133     22*          *      SINVEC(3), FRVEC1(3) , FRVEC2(3), CAND2(62),                    SET00018**-1
00133     23*          *     BTEST(3)                                                         SET00019
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00124      END
00125      INCLUDE COMMK9,LIST                                                SET#0013
00125    C DATA TRANSFORMATION COMMON BLOCK                                     •NEW
00126      COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FE..LC(30),PCF,                •NEW
00126     1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                        •**-1
00127      END                                                                SET#0014
00130      EQUIVALENCE (FLDINF(1),LINSTR),(FLDINF(2),LINEND),                 SET#0015
00130     •            (FLDINF(3),LININC),(FLDINF(4),SAMSTR),                 SET#0016
00130     •            (FLDINF(5),SAMEND),(FLDINF(6),SAMINC)                      •NEW
00131      REAL MAXPT                                                           •NEW
00132       REAL SAGAIN,SABIAS                                                  •NEW
00133       DIMENSION CINDEX(20),                                             SET#0018•**-1
00133     •     SINVEC(3), FRVEC1(3) , FRVEC2(3), CARD2(62),                  SET#0019
00133     •     BTEST(3)

00133    C                                                                    SET#0020
00133    C                                                                    SET#0021
00134       DIMENSION   EQUVEC(3)  ,  OP(2)  ,  CP(2)                         SET#0022
00134    C                                                                    SET#0023
00134    C                                                                    SET#0024
00135       LOGICAL    NODTAP , NODFIL , NOSTAP , NOSFIL                      SET#0025
00135    C                                                                    SET#0026
00136       DATA CINDEX/'M-MATR','CHANNE','FORMAT','MED1','MED2',             SET#0027
00136     • 'DATE','COMMEN','MAXPT','PEROUT','SUBCLA',                        SET#0028
00136     •'MODULE','LAM','OPTION','•END•','DATAFI','STATFI',                 SET#0029
00136     1 'RESCAL','BIAS','SUNANG','TRFORM'/                                  •NEW
00136    C                                                                    SET#0031•**-1
00140      DIMENSION MTX(6)                                                     •NEW
00141       DIMENSION MXPT(30)                                                  •NEW
00141    C                                                                    SET#0033•**-1
00142       DATA MTX/5,'O','T','S','P','G'/                                     •NEW
00142    C                                                                    SET#0035•**-1
00144      DATA   OP/ 1 , '(' /  ,  CP/ 1 , ')' /  ,  ZERO/ 0 /               SET#0036
00144    C                                                                    SET#0037
00150      DATA EQUVEC/1,'='/                                                 SET#0038
00152        DATA SINVEC/2,'.','='/,                                          SET#0039
00152     • CINMAX/20/,MAXFET/30/,                                              •NEW
00152     • FRVEC1/2,'I','O'/ ,FRVEC2/2,'U','L'/,BLANK/' '/,                  SET#0041•**-1
00152     • BTEST/2,'C','F'/,OUTFMT/1/,TRFORM/14/,TRNSFL/0/                     •NEW
00152    C                                                                    SET#0043•**-1
00152    C                                                                    SET#0044
00152    C        INITIALIZE FLAGS AND DEFAULT VALUES                         SET#0045
00152    C                                                                    SET#0046
00152    C                                                                    SET#0047
00165      NOSUB2=0                                                           SET#0048
00166      NOGRP=0                                                            SET#0049
00167      BMTRIG=0                                                           SET#0050
00170      NSF = 1                                                            SET#0051
00171       RESCAL = 0                                                        SET#0052
00172      SCAFLG = 0                                                         SET#0053
00173      MPT = 0                                                            SET#0054
00174      ORIG = 0                                                           SET#0055
00175      TRANSF = 0                                                         SET#0056
00176      NPUN = 0                                                           SET#0057
00177       ISUNT=0                                                             •NEW
00200       ISUNC=0                                                             •NEW
00201      SAKEY=0                                                              •NEW
00202      PCGC=0                                                               •NEW
00203       GIC=0                                                               •NEW
00204      PCF=0                                                                •NEW
00204    C                                                                    SET#0058
00204    C  INITIALIZE THE TRANSFORMATION BIAS VECTOR ( BIAS ) AND NO. OF     SET#0059
00204    C  BIAS VALUES  (  NBS )                                             SET#0060
00204    C                                                                    SET#0061
00205      DO 10 I=1,14.                                                      SET#0062
00210   10 BIAS(I) = 0.0                                                      SET#0063
00212      NBS = 0                                                            SET#0064
00213       NODTAP =  .FALSE.                                                 SET#0065
00214       NODFIL =  .FALSE.                                                 SET#0066
00215       NOSTAP =  .FALSE.                                                 SET#0067
00216       NOSFIL =  .FALSE.                                                 SET#0068
00217      BMSWT=1                                                            SET#0069
00217    C                                                                    SET#0070
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00217    C  INITIALIZE THE MAXIMUM EXPECTED DATA VALUE, FOR EACH CHANNEL          SET00071
00217    C                                                                        SET00072
00220          DO 20 I=1,30                                                       SET00073
00223     20    MAXPT(I)=225.0                                                             *NEW
00223    C                                                                        SET00075***1
00223    C  INITIALIZE  %  DISTRIBUTION CUT-OFF,  PEROUT ,  AND                   SET00076
00223    C  THE STANDARD DEVIATION MULTIPLE ,  LAM .                              SET00077
00223    C                                                                        SET00078
00225          LAM=2                                                              SET00079
00226          PEROUT=5                                                           SET00080
00226    C                                                                        SET00081
00226    C  INITIALIZE THE HEADING FOR UNTRANSFORMED STATISTICS PRINTOUT          SET00082
00226    C                                                                        SET00083
00227          COVHDI(1) = 4H... OR                                               SET00084
00230          COVHDI(2) = 4HIGINAL                                               SET00085
00231          COVHDI(3) = 4H STATI                                               SET00086
00232          COVHDI(4) =    4HSTICS                                             SET00087
00233          COVHDI(5) = 4H ...                                                 SET00088
00234          DO 30 I=6,10                                                       SET00089
00237     30 COVHDI(I) = BLANK                                                    SET00090
00237    C                                                                        SET00091
00241          DO 40 I=1,10                                                       SET00092
00244     40 COMENT(I) = BLANK                                                    SET00093
00244    C     READ DATAPF'S HEADER RECORD TO INITIALIZE NOFEAT AND THE SUNANG             *NEW
00244    C        VECTOR                                                                   *NEW
00246          CALL TAPHDR(DATAPF,DATFIL)                                                  *NEW
00246    C                                                                        SET00094
00247     50 COL=0                                                                SET00095
00250          IF(NUSTAP .OR. NUSFIL) SCAFLG=2    @ STATFILE CARD READ -          SET00096
00252          READ (5,60)CODE,CARD2                                              SET00097
00261     60 FORMAT(A6,4X,62A1)                                                   SET00098
00262          WRITE (6,70)CODE,CARD2                                             SET00099
00271     70 FORMAT(T5,A6,4X,62A1)                                                SET00100
00272          DO 80 I=1,CINMAX                                                   SET00101
00275     80 IF (CINDEX(I).EQ.CODE) GO TO (110,150,160,180,190,210,200,230,250.SET00102
00275       *270,360,280,290,500,380,430,480,490,700,750),I                                *NEW
00275    C                                                                        SET00104***1
00300     90 WRITE (6,100)CODE,CARD2                                              SET00105
00300    C                                                                        SET00106
00307    100 FORMAT(//// 5X,'*** BAD CONTROL CARD - DATATR/SETUP@ ***' // 5X,     SET00107
00307       *    A6, 4X, 62A1  /// )                                              SET00108
00307    C                                                                        SET00109
00310          GO TO 50                                                           SET00110
00310    C B-MATRIX CARD                                                          SET00111
00311    110 J=NXTCHR(CARD2,COL)                                                  SET00112
00312          IF (J.EQ.BLANK) GO TO 540                                          SET00113
00314          COL=COL+1                                                          SET00114
00315          M=FIND(CARD2,COL,BTEST)                                            SET00115
00316          IF (M.EQ.-1) GO TO 540                                             SET00116
00320          BMTHIG=1                                                           SET00117
00321          IF (M.EQ.2) GO TO 120                                              SET00118
00321    C B-MATRIX DATA ON TAPE FILE                                             SET00119
00323          KEY=2                                                              SET00120
00323    C READ B-MATRIX ARRAY FROM TAPE FILE                                     SET00121
00324          CALL BMFIL(BMAT,LCOMB,NOFFAT,FLTVEC,KEY)                           SET00122
00325          GO TO 130                                                          SET00123
00325    C B-MATRIX DATA READ FROM CARD FILE                                      SET00124
00326    120 KEY=1                                                                SET00125
```

120

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00311         110 J=NXTCHR(CARD2,COL)
00312             IF (J.EQ.BLANK) GO TO 540                        SET#0113
00314             COL=COL-1                                        SET#0114
00315             M=FIND(CARD2,COL,HTEST)                          SET#0115
00316             IF (M.EQ.-1) GO TO 540                           SET#0116
00320             BMTRIG=1                                         SET#0117
00321             IF (M.EQ.2) GO TO 120                            SET#0118
00321       C B-MATRIX DATA ON TAPE FILE                           SET#0119
00323             KEY=2                                            SET#0120
00323       C READ B-MATRIX ARRAY FROM TAPE FILE                   SET#0121
00324             CALL BMFIL(BMAT,LCOMB,NOFFAT,FETVEC,KEY)         SET#0122
00325             GO TO 130                                        SET#0123
00325       C B-MATRIX DATA READ FROM CARD FILE                    SET#0124
00326         120 KEY=1                                            SET#0125

00327             CALL BMFIL(BMAT,LCOMB,NOFFAT,FETVEC,KEY)         SET#0126
00330         130 NOFET2=NOFFAT                                    SET#0127
00331             NOFET4=LCOMB                                     SET#0128
00332             DO 140 N=1,NOFFAT                                SET#0129
00335         140 FETVC2(N)=FETVEC(N)                              SET#0130
00337             GO TO 50                                         SET#0131
00337       C FEATURE CARD                                         SET#0132
00340         150 CONTINUE                                         SET#0133
00341             GO TO 50                                         SET#0134
00341       C FORMAT CARD                                          SET#0135
00342         160 CONTINUE                                         SET#0136
00343             KM=FIND(CARD2,COL,FRVEC2)                                *NEW
00344             IF (KM.EQ.2) OUTFMT=1                                    *NEW
00346             IF (KM.EQ.3) OUTFMT=2                                    *NEW
00350             GO TO 50                                                 *NEW
00350       C HED1 CARD                                            SET#0146**-9
00351         180 READ (30,220)HED1                                SET#0147
00357             GO TO 50                                         SET#0148
00357       C HED2 CARD                                            SET#0149
00360         190 READ (30,220)HED2                                SET#0150
00366             GO TO 50                                         SET#0151
00366       C COMMENT CARD                                         SET#0152
00367         200 READ (30,220)COMENT                              SET#0153
00375             GO TO 50                                         SET#0154
00375       C DATE CARD                                            SET#0155
00376         210 M=NXTCHR(CARD2,COL)                              SET#0156
00377             IF (M.EQ.BLANK) GO TO 50                         SET#0157
00401             READ (30,220)DATE                                SET#0158
00407         220 FORMAT(10X,18A6)                                 SET#0159
00410             GO TO 50                                         SET#0160
00410       C MAXPT CARD                                           SET#0161
00411         230 J=NXTCHR(CARD2,COL)                              SET#0162
00412             IF (J.EQ.BLANK) GO TO 540                        SET#0163
00414             COL=COL-1                                        SET#0164
00415               MPT=NUMBER(CARD2,COL,MXPT,MPT)                         *NEW
00416              DO 231 I=1,MPT                                          *NEW
00421             T=MXPT(I)                                                *NEW
00422             MAXPT(I)=FLOAT(T)                                        *NEW
00423       231   CONTINUE                                                 *NEW
00423       C                                                      SET#0166**-1
00425             IF (MPT.GT.30) GO TO 90                          SET#0167
00425       C                                                      SET#0168
00427             GO TO 50                                         SET#0169
00427       C PEROUT CARD                                          SET#0170
00430         250 J=NXTCHR(CARD2,COL)                              SET#0171
00431             IF (J.EQ.BLANK) GO TO 540                        SET#0172
00433             COL=COL-1                                        SET#0173
00434             M = NUMBER ( CARD2, COL, ARRAY, ZERO )           SET#0174
00435             PEROUT = ARRAY(1)                                SET#0175
00435       C                                                      SET#0176
00436             IF (M.NE.1) GO TO 90                             SET#0177
00436       C                                                      SET#0178
00440             GO TO 50                                         SET#0179
00440       C SUBCLASS CARD                                        SET#0180
00441         270 NOSUB2=NUMBER(CARD2,COL,SUBVC2,NOSUB2)           SET#0181
00442             CALL ORDER(SUBVC2,NOSUB2)                        SET#0182
00443             GO TO 50                                         SET#0183
00443       C LAM CARD                                             SET#0184
```

```
00444      280 J=NXTCHR(CARD2,COL)                                     SET#0185
00445          IF (J.EQ.BLANK) GO TO 540                               SET#0186
00447          COL=COL-1                                               SET#0187
00450          M = NUMBER ( CARD2, COL, ARRAY, ZERO )                  SET#0188
00451          LAM = ARRAY(1)                                          SET#0189
00451    C                                                             SET#0190
00452          IF (M.NE.1) GO TO 99                                    SET#0191
00452    C                                                             SET#0192
00454          GO TO 50                                                SET#0193
00454    C                                                             SET#0194
00454    C                                                             SET#0195
00454    C        OPTION  CARD                                         SET#0196
00454    C                                                             SET#0197
00455      290 M=FIND(CARD2,COL,MTX)                                   SET#0198
00455    C                                                             SET#0199
00456          M = IABS( M )                                           SET#0200
00456    C                                                             SET#0201
00457           IF (M.EQ.0.OR.M.GT.6) GO TO 540                                 *NEW
00457    C                                                             SET#0203***I
00457    C                                                             SET#0204
00457    C        IF  M = 1,  END-OF-CARD  HAS BEEN REACHED            SET#0205
00457    C                                                             SET#0206
00457    C                                                             SET#0207
00461          GO TO (50,300,310,320,350,355),M                                 *NEW
00461    C                                                             SET#0209***I
00461    C                                                             SET#0210
00461    C     IF  M = 2,  ''O''  ,  OR  ''ORIG''                      SET#0211
00461    C                                                             SET#0212
00462      300 ORIG = 1                                                SET#0213
00462    C                                                             SET#0214
00463          M = FIND ( CARD2, COL, SINVEC )                         SET#0215
00463    C                                                             SET#0216
00464          IF (M.EQ.2) GO TO 290                                   SET#0217
00464    C                                                             SET#0218
00466          GO TO 50                                                SET#0219
00466    C                                                             SET#0220
00466    C                                                             SET#0221
00466    C        IF  M = 3,  ''T''  OR  ''TRANSF''                    SET#0222
00466    C                                                             SET#0223
00466    C                                                             SET#0224
00467      310 TRANSF = 1                                              SET#0225
00467    C                                                             SET#0226
00470          M = FIND ( CARD2, COL, SINVEC )                         SET#0227
00470    C                                                             SET#0228
00471          IF (M.EQ.2) GO TO 290                                   SET#0229
00471    C                                                             SET#0230
00473          GO TO 50                                                SET#0231
00473    C                                                             SET#0232
00473    C                                                             SET#0233
00473    C          IF  M = 4,   ' S'  ---  CHECK FOR  ''SCAFAC''      SET#0234
00473    C                                                             SET#0235
00474      320 J = NXTCHR ( CARD2, COL )                               SET#0236
00474    C                                                             SET#0237
00474    C                                                             SET#0238
00474    C        IF NEXT CHARACTER IS  ''C''  ,  ASSUME   ''SCAFAC''  SET#0239
00474    C                                                             SET#0240
00475          IF (J.NE.'C') GO TO 540                                 SET#0241
00475    C                                                             SET#0242
```

```
00471              ** ......... ...
00471       C                                                        SET*0231
00473              GO TO 50                                          SET*0232
00473       C                                                        SET*0233
00473       C         IF  M = 4,   'S'  ---  CHECK FOR  ''SCAFAC''   SET*0234
00473       C                                                        SET*0235
00474        320 J = NXTCHR ( CARD2, COL )                           SET*0236
00474       C                                                        SET*0237
00474       C                                                        SET*0238
00474       C        IF NEXT CHARACTER IS  ''C''  ,  ASSUME  ''SCAFAC''   SET*0239
00474       C                                                        SET*0240
00475              IF (J.NE.'C') GO TO 540                           SET*0241
00475       C                                                        SET*0242

00477              Z = FIND ( CARD2, COL, SINVEC )                   SET*0243
00477       C                                                        SET*0244
00500              IF (Z.EQ.3) GO TO 330                             SET*0245
00500       C                                                        SET*0246
00502              GO TO 540                                         SET*0247
00502       C                                                        SET*0248
00502       C                                                        SET*0249
00502       C        SCALF FACTOR OPTION :  READ SCALING PAIRS, CON AND MIN , INTO   SET*0250
                                            CONMIN
00502       C                                                        SET*0251
00502       C                                                        SET*0252
00502       C                                                        SET*0253
00503        330 SCAFLG = 3                                          SET*0254
00503       C                                                        SET*0255
00504        340 Z = FIND ( CARD2, COL, OP )                         SET*0256
00504       C                                                        SET*0257
00505              IF (Z.NE.2) GO TO 50                              SET*0258
00505       C                                                        SET*0259
00507              NMN =  FLTNUM ( CARD2, COL , CONMIN(NSF) , 2 )    SET*0260
00507       C                                                        SET*0261
00510              IF (NMN.NE.2) GO TO 540                           SET*0262
00510       C                                                        SET*0263
00512              ADDNUM = NSF + 1                                  SET*0264
00513              IF ((NSF+NMN).GT.31) GO TO 50                     SET*0265
00513       C                                                        SET*0266
00515              NSF = NSF + NMN                                   SET*0267
00515       C                                                        SET*0268
00516              Z = FIND ( CARD2, COL, CP )                       SET*0269
00516       C                                                        SET*0270
00517              IF (Z.EQ.2) GO TO 340                             SET*0271
00517       C                                                        SET*0272
00521              GO TO 540                                         SET*0273
00521       C                                                        SET*0274
00521       C      TEST FOR PUNCH OR PCG PARAMETER                        *NEW
00522        350    M=NXTCHR(CARD2,COL)                                   *NEW
00523               IF (M.EQ.'U') GO TO 351                               *NEW
00525               IF (M.EQ.'C') GO TO 352                               *NEW
00527               GO TO 50                                              *NEW
00527       C                                                        SET*0275
00527       C         PUNCH  OPTION                                  SET*0276
00527       C                                                        SET*0277
00530        351    NPUN = 1                                              *NEW
00530       C                                                        SET*0279**-1
00530       C                                                        SET*0280
00531              GO TO 290                                         SET*0281
00531       C                                                             *NEW
00531       C       PCG OPTION                                            *NEW
00531       C                                                             *NEW
00532        352    PCGC=1                                                *NEW
00533               GO TO 290                                             *NEW
00533       C      GREEN OPTION                                           *NEW
00534        355    GI =1                                                 *NEW
00535               GO TO 290                                             *NEW
00535       C                                                        SET*0282
00535       C                                                        SET*0283
00535       C MODULE STAT DECK                                       SET*0284
00536        360 MK=NXTCHR(CARD2,COL)                                SET*0285
00537              IF (MK.NE.MTEST(3)) GO TO 370                     SET*0286
00537       C                                                        SET*0287
```

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00541           SCAFLG = 2
00541     C
00542           GO TO 50
00543       370 CALL CROSTA(ARRAY,TOP)
00543     C
00544           SCAFLG = 2
00544     C
00545           GO TO 50
00545     C
00545     C DATAFILE POSITIONING CARD
00545     C
00546       380 IF (NUDTAP.AND.NUDFIL) GO TO 50
00546     C
00550           M = NXTCHR ( CARD2 , COL )
00550     C
00551           IF (M.EQ.BLANK) GO TO 50
00551     C
00553           IF (M.EQ.'U') GO TO 410
00555           IF (M.EQ.'F') GO TO 420
00557       390 WRITE (6,400)
00561       400 FORMAT(///// 5X, '***** DATATR/SETUPB ***** ERROR ON INPUT DATA
00561     C
00561          *FILE CARD ---  CONTINUING TO PROCESS INPUT   *****' ///// )
00561     C
00562           GO TO 50
00563       410 J=FIND(CARD2,COL,EQUVEC)
00564           IF (J.EQ.-1) GO TO 390
00566           M=NUMBER(CARD2,COL,DATAPE,ZERO)
00567           COL=COL-1
00567     C
00570           IF (M.NE.1) GO TO 390
00570     C
00572           NUDTAP =  .TRUE.
00572     C
00573           GO TO 380
00574       420 J=FIND(CARD2,COL,EQUVEC)
00575           IF (J.EQ.-1) GO TO 390
00577           FILNO = NUMBER ( CARD2, COL, DATFIL, ZERO )
00577     C
00600           IF (FILNO.NE.1) GO TO 390
00600     C
00602           NUDFIL =  .TRUE.
00602     C
00603           DATFIL=DATFIL-1
00604           COL=COL-1
00605           GO TO 380
00605     C
00605     C STATFILE POSITIONING CARD
00605     C
00606       430 M=NXTCHR(CARD2,COL)
00607           IF (M.EQ.BLANK) GO TO 50
00607     C
00611           IF (M.EQ.'U') GO TO 460
00613           IF (M.EQ.'F') GO TO 470
00615       440 WRITE (6,450)
00617       450 FORMAT( ///// 5X,'***** DATATR/SETUPB ***** ERROR ON INPUT STATFI
00617     C
00617          *LE CARD  ---  CONTINUING TO PROCESS INPUT  *****' /// )
```

194

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00604          COL=COL-1
00605          GO TO 380                                                  SETW0333
00605   C                                                                 SETW0334
00605   C STATFILE POSITIONING CARD                                       SETW0335
00605   C                                                                 SETW0336
00606     430 M=NXTCHR(CARD2,COL)                                         SETW0337
00607          IF (M.EQ.BLANK) GO TO 50                                   SETW0338
00607   C                                                                 SETW0339
00611          IF (M.EQ.'U') GO TO 460                                    SETW0340
00613          IF (M.EQ.'F') GO TO 470                                    SETW0341
00615     440 WRITE (6,450)                                               SETW0342
00617     450 FORMAT( ///// 5X,'***** DATATR/SETUPB *****  ERROR ON INPUT STATFISETW0343
00617   C                                                                 SETW0344
00617         *LE CARD  ---  CONTINUING TO PROCESS INPUT  *****' /// )    SETW0345

00617   C                                                                 SETW0346
00620          NUSTAP = .FALSE.                                           SETW0347
00621          NUSFIL = .FALSE.                                           SETW0348
00621   C                                                                 SETW0349
00622          GO TO 50                                                   SETW0350
00622   C                                                                 SETW0351
00623     460 J=FIND(CARD2,COL,EQUVEC)                                    SETW0352
00624          IF (J.EQ.-1) GO TO 440                                     SETW0353
00626          M=NUMBER(CARD2,COL,SAVTAP,ZERO)                            SETW0354
00627          COL=COL-1                                                  SETW0355
00627   C                                                                 SETW0356
00630          IF (M.NE.1) GO TO 440                                      SETW0357
00630   C                                                                 SETW0358
00630   C                                                                 SETW0360**-1
00632          GO TO 430                                                  SETW0361
00633     470 J=FIND(CARD2,COL,EQUVEC)                                    SETW0362
00634          IF (J.EQ.-1) GO TO 440                                     SETW0363
00636          FILST = NUMBER( CARD2, COL, STAFIL, ZERO )                 SETW0364
00636   C                                                                 SETW0365
00637          IF (FILST.NE.1) GO TO 440                                  SETW0366
00637   C                                                                 SETW0367
00637   C                                                                 SETW0369***-1
00641          STAFIL=STAFIL-1                                            SETW0370
00642          COL=COL-1                                                  SETW0371
00643          GO TO 430                                                  SETW0372
00643   C                                                                 SETW0373
00643   C      RESCALE OPTION CARD                                        SETW0374
00643   C                                                                 SETW0375
00644     480  CONTINUE                                                   SETW0376
00645           RESCAL = 1                                                SETW0377
00646          GO TO 50                                                   SETW0378
00646   C                                                                 SETW0379
00646   C      BIAS CONTROL CARD                                          SETW0380
00646   C                                                                 SETW0381
00647     490  CONTINUE                                                   SETW0382
00650           NB = NXTCHR(CARD2, COL)                                   SETW0383
00651          IF (NB.EQ.BLANK) GO TO 540                                 SETW0384
00653           COL = COL -1                                              SETW0385
00654          VECMAX = 16 - NBS                                          SETW0386
00655           NK = NBS + 1                                              SETW0387
00656           NBS = FLTNUM (CARD2, COL, BIAS(NK), VECMAX)               SETW0388
00657          GO TO 50                                                   SETW0389
00657   C                                                                     *NEW
00657   C       SUNANG CONTROL CARD                                           *NEW
00657   C                                                                     *NEW
00660    700    J=NXTCHR(CARD2,COL)                                           *NEW
00661           IF (J.NE.'T') GO TO 701                                       *NEW
00661   C       SET THE FLAG TO READ THE SUNANGLES OFF OF THE TAPE            *NEW
00663          ISUNT=1                                                        *NEW
00664          SAKEY=1                                                        *NEW
00665          GO TO 50                                                       *NEW
00666    701     ISTART=0                                                     *NEW
00667          COL=COL-1                                                      *NEW
00670          J=NUMBER(CARD2,COL,ARRAY(TOP-30),ISTART)                       *NEW
00671           IF (J.GT.8) J=8                                               *NEW
00673          IF (J.EQ.0) GO TO 50                                           *NEW
00675          ISUNC=0                                                        *NEW
00676           DO 702 JJ=1,J                                                 *NEW
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00701              ISUNC=ISUNC+1                                                       *NEW
00702              SUNANG(JJ)=ARRAY(TOP-31+ISUNC)                                      *NEW
00702        C     TEST TO SEE IF THE INPUT SUNANGLE WAS LEGITIMATE - IF NOT,          *NEW
00702        C           SET IT TO 63                                                  *NEW
00703         702  IF ((SUNANG(JJ).LT.5).OR.(SUNANG(JJ).GT.85)) SUNANG(JJ)=60          *NEW
00706              SAKEY=1                                                             *NEW
00707              SC=J                                                                *NEW
00710              GO TO 50                                                            *NEW
00710        C                                                                         *NEW
00710        C     TRFORM  CONTROL CARD                                                *NEW
00710        C                                                                         *NEW
00711         750   M=NXTCHR(CARD2,COL)                                                *NEW
00712               IF (M.NE.'0') GO TO 50                                             *NEW
00714         752   M=FIND(CARD2,COL,EQUVEC)                                           *NEW
00715              IF (M.EQ.-1) GO TO 50                                               *NEW
00717              IF (CARD2(COL-1).EQ.'E') GO TO 751                                  *NEW
00721              IF (CARD2(COL-1).NE.'T') GO TO  752                                 *NEW
00721        C     READ OFF THE USER SUPPLIED UNIT NUMBER                              *NEW
00723               M=NUMBER(CARD2,COL,TRFORM,ZERO)                                    *NEW
00724              GO TO 752                                                           *NEW
00724        C     READ OFF THE USER SUPPLIED FILE NUMBER                              *NEW
00725         751  M=NUMBER(CARD2,COL,TRNSFL,ZERO)                                     *NEW
00726              TRNSFL=TRNSFL - 1                                                   *NEW
00727               GO TO 752                                                          *NEW
00727        C                                                               SET00390
00727        C .END. CARD                                                    SET00391
00730         500 CONTINUE                                                   SET00392
00730        C                                                               SET00393
00731              I  ( RESCAL .GT. 0  .AND.  SCAFLG .EQ. 0 )   SCAFLG = 1   SET00394
00731        C                                                               SET00395
00731        C                                                               SET00396
00731        C        IF RESCALING BY THE STATISTICAL METHOD, READ STATISTICS FROM  SET00397
00731        C        FILE ( SAVTAP ) , REDUCE THE STATISTICS TO THE SET OF CHANNELS SET00398
00731        C        SPECIFIED IN FETVC2 , AND STORE IN ARRAY .             SET00399
00731        C                                                               SET00400
00731        C                                                               SET00401
00733              IF ( SCAFLG .EQ. 2 )  CALL REDSAV( ARRAY, TOP, NMSNT )    SET00402
00733        C                                                               SET00403
00733        C                                                               SET00404
00735              IF (ORIG.EQ.0) GO TO 530                                  SET00405
00735        C                                                               SET00406
00735        C                                                               SET00407
00737              DO 510 I=1,10                                             SET00408
00742              TEMP = COMENT(I)                                          SET00409
00743              COMENT(I) = COVHDI(I)                                     SET00410
00744         510 COVHDI(I) = TEMP                                           SET00411
00744        C                                                               SET00412
00746              CALL PRTCOV(ARRAY(COVAR2),ARRAY(AVAR2),VARSZ2,NOFET2,ARRAY(SUBDS2)SET00413
00746             *)                                                         SET00414
00746        C                                                               SET00415
00744        C                                                               SET00416
00747              DO 520 I=1,10                                             SET00417
00752         520 COMENT(I) = COVHDI(I)                                      SET00418
00752        C                                                               SET00419
00752        C                                                               SET00420
00752        C                                                               SET00421
00752        C        PRINT OUT THE INPUT TRANSFORMATION MATRIX              SET00422
00752        C                                                               SET00423
```

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            510 COVHDI(I) = TEMP                                                        SET#0411
00744           C                                                                           SET#0412
00746              CALL PRTCOV(ARRAY(COVAR2),ARRAY(AVAR2),..NS22,NOFET2,ARRAY(SUBUS2)SET#0413
00746             *)                                                                        SET#0414
00746           C                                                                           SET#0415
00746           C                                                                           SET#0416
00747              DO 520 I=1,18                                                            SET#0417
00752          520 COMENT(I) = COVHDI(I)                                                    SET#0418
00752           C                                                                           SET#0419
00752           C                                                                           SET#0420
00752           C                                                                           SET#0421
00752           C        PRINT OUT THE INPUT TRANSFORMATION MATRIX                          SET#0422
00752           C                                                                           SET#0423

00752           C                                                                           SET#0424
00754          530 IF (RMTRIG.NE.1) GO TO 553                                                   *NEW
00756              CALL WRTBM(RMAT,NOFET4,NOFET2,FETVC2)                                        *NEW
00756           C SET NOCLS2=NOSUB2 FOR REST OF PROGRAM                                     SET#0426**-1
00757              NOCLS2=NOSUB2                                                            SET#0427
00757           C                                                                           SET#0428
00760              IF ( RESCAL .EQ. 0 )  SCAFLG = 0                                         SET#0429
00762               IF ((GTC.EQ.1).OR.(PCGC.EQ.1)) PCF=1                                        *NEW
00762           C   SET UP THE SUN ANGLE CORRECTION FACTORS IF SAKEY=1                          *NEW
00764                IF (SAKEY.EQ.0) RETURN                                                     *NEW
00764           C   ASSOCIATE THE TAPE'S SUN ANGLE WITH FETVEC                                  *NEW
00766               IF (ISUNT.NE.1) GO TO 551                                                   *NEW
00770              T=0                                                                          *NEW
00771              DO 552 I=1,NOFEAT,NCHPAS                                                     *NEW
00774              J=FETVEC(I)                                                                  *NEW
00775               J=(J+3)/4                                                                   *NEW
00776              T=T+1                                                                        *NEW
00777          552   SUNANG(T)=SUNANG(J)                                                        *NEW
00777           C                                                                               *NEW
00777           C   CALL  SUNF2 TO GET THE SUN ANGLE BIAS AND GAIN CORRECTION FACTORS           *NEW
01001          551 CALL  SUNF2(SAGAIN,SUNANG,FETVEC,NOFEAT,ISUNC,ISUNT,SABIAS)                  *NEW
01001           C   APPLY SUN ANGLE CORRECTION FACTOR TO MAXPT                                  *NEW
01002              DO 501 I=1,NOFEAT                                                            *NEW
01005               MAXPT(I) = SAGAIN(I)*MAXPT(I) + SABIAS(I)                                   *NEW
01006          501   CONTINUE                                                                   *NEW
01006           C                                                                           SET#0430
01010              RETURN                                                                   SET#0431
01010           C                                                                           SET#0432
01010           C                                                                           SET#0433
01010           C                                                                           SET#0434
01011          540 WRITE (6,550)CODE,CARD2                                                  SET#0435
01011           C                                                                           SET#0436
01020          550 FORMAT(//// 5X,'*****  INVALID CONTROL CARD REJECTED BY DATATR/SETSET#0437
01020           C                                                                           SET#0438
01020             *UP8  *****' // 5X, A6, 4X, 62A1 //// )                                   SET#0439
01020           C                                                                           SET#0440
01020           C                                                                           SET#0441
01020           C                                                                           SET#0442
01021              GO TO 50                                                                 SET#0443
01022          553  WRITE (6,554)                                                               *NEW
01024          554  FORMAT (//2X,'THE B-MATRIX CONTROL CARD WAS NOT FOUND - TERMINATE           *NEW
01024             C EXECUTION')                                                                 *NEW
01025              CALL EXIT                                                                    *NEW
01026              END                                                                      SET#0444

     END OF COMPILATION:            NO  DIAGNOSTICS.
    SETUP8          SYMBOLIC                      20 JUN 77  01:59:56   0  03132100    14   445  (DELETED)
    SETUP8  CODE    RELOCATABLE                   20 JUN 77  01:59:56   1  01757214    48     1  (DELETED)
                                                                        0  01757274    14   104
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137

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0007      HTMLS6
0010      HTMDAT
0011      PRTCOV
0012      NWOUS
0013      NI02S
0014      NI01S
0015      NERR3S

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

0001   000441 100L     0000   004520 119F     0001   000714 121L     0001   000467 14L      0001   000033 1406
0001   000043 147G     0001   000102 157G     0001   000144 179G     0001   000200 206G     0001   000072 21L
0001   000206 211G     0000   004540 225F     0001   000265 225G     0000   004545 226F     0000   004552 227F
0000   004531 228F     0001   000316 242G     0001   000342 252G     0001   000373 260G     0001   000376 263G
0001   000125 31L      0001   000514 326G     0001   000527 334G     0001   000542 342G     0001   000604 357G
0001   000446 371G     0001   000710 403G     0001   003166 51L      0001   000237 52L      0001   000345 90L
0001   000416 90L      0005   000073 ASAV     0005   000074 ASAVFL   0003 I 000006 AVAR2    0000 I 004517 B
0000 R 002675 BMEAN    0005   000055 BMFILE   0005   000056 BMKEY    0000 R 000015 C        0000 R 000755 CC
0003   000010 CLSID2   0003   000301 CLSVC2   0005 I 000037 COMENT   0003 I 000007 COVAR2   0000 I 000000 COVHD2
0000 I 004514 CV1      0000 R 001715 D        0005   000053 DATAPE   0005   000016 DATE     0005   000071 DATFIL
0000 R 001735 DIAG     0005   000102 DOTFIL   0005   000101 DOTUNT   0005   000067 DRM*DS   0005   000066 DRUMAD
0005   000062 ERIPTP   0005   000063 ERPKEY   0000 I 004512 F        0003   000015 FETVC2   0004   000010 FETVEC
0004   000002 FLDINF   0003   000013 FLDSV2   0000 I 004510 G        0004   000051 GIC      0003   000760 GROUPS
0003   000663 GRPCHK   0003   000566 GRPDEX   0003   000472 GRPNAM   0005   000300 HEAD     0005   000002 HEDI
0005   000023 HED2     0005   000057 HISFIL   0005   003060 HISKEY   0000 I 004501 I        0000 I 004513 II
0000   004572 INJPS    0000 I 004505 J        0000 I 004503 K        0003   000375 IEPPTS   0000 I 004506 KK
0000 I 004507 KKK      0000 I 004502 L7       0000 I 004511 M        0005   000100 MAPFIL   0005   000052 MAPTAP
0005   000064 MAPUNT   0005   000103 NCHPAS   0000 I 004516 NEL      0005   000076 NHSTFI   0005   000075 NHSTUN
0003 I 000000 NOCLSZ   0004   000001 NOFEAT   0003 I 000002 NOFETZ   0005   000065 NOFILE   0003   000005 NOFLD2
0003   000471 NOGRP    0003   000001 NOSUB2   0004   000003 OUTFMT   0005   000070 PAGSIZ   0004   000046 PCF
0004 I 000047 PCGC     0004 R 000146 PCM      0004 R 000110 SABIAS   0004 R 000052 SAGAIN   0004 I 000050 SAKEY
0005   000054 SAVTAP   0005   000077 SCTRUN   0005   000072 STAFIL   0003   000012 SUBDS2   0003   000011 SUBNG2
0003   000166 SUBPTR   0003   000053 SUBVC2   0000 I 004504 T        0000 I 004515 TEMP     0000 R 000014 TMAX
0000 R 000013 TMIN     0000 R 000012 TMP      0003   000004 TOTVT2   0005   000061 TRFORM   0005   000104 TRNSFL
0003 I 000003 VARSZ2   0003   000014 VERTX2

00101      1*         SUBROUTINE KBTRAN                                         KBTR0001
00101      2*     *(BMAT,LCOMB,ARRAY,LAM,MAX,MIN,EPS,TRANSF,NSUB)                       *NE*
00101      3*      C                                                                    **-1
00103      4*         IMPLICIT INTEGER(A-Z)                                     KBTR0003
00103      5*      C                                                            KBTR0004
00104      6*         DIMENSION  COVHD2(18)                                     KBTR0005
00104      7*      C                                                            KBTR0006
00105      8*             REAL ARRAY(1)                                                 *NE*
00106      9*         REAL SAGAIN,SABIAS                                                *NE*
00107     10*         REAL PCM                                                          *NE*
00110     11*         REAL TMP                                                          *NE*
00110     12*      C                                                                    *NE*
00111     13*         REAL TMIN,TMAX                                            KBTR0008**-1
00111     14*      C                                                            KBTR0009
00112     15*         REAL    BMAT(480), MAX(16), MIN(16), EPS(16)              KBTR0010
00112     16*      C                                                            KBTR0011
00113     17*         REAL    C(480), CC(480),  D(16),  DIAG(480),  BMEAN(900)  KBTR0012
00113     18*      C                                                            KBTR0013
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OF POOR QUALITY

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      IMPLICIT INTEGER(A-Z)
C                                                                 KBTR0003
      DIMENSION  COVHD2(10)                                       KBTR0004
C                                                                 KBTR0005
         REAL ARRAY(1)                                            KBTR0006
       REAL SAGAIN,SABIAS                                                 *NEW
       REAL PCM                                                           *NEW
       REAL TMP                                                           *NEW
C                                                                         *NEW
      REAL TMIN,TMAX                                              KBTR0008***-1
C                                                                 KBTR0009
      REAL    BMAT(480), MAX(16), MIN(16), EPS(16)                KBTR0010
C                                                                 KBTR0011
      REAL    C(480), CC(480), U(16), UIAV(96), BMEAN(900)        KBTR0012
C                                                                 KBTR0013

C                                                                 KBTR0014
      INCLUDE COMBK1,LIST                                         KBTR0015
      COMMON/INFORM/NOCLS2,NOSUB2,NOFET2,VARSZ2,TOTVT2,NOFLD2,
     *          AVAR2,COVAR2,CLSID2,SUBNO2,SUBUS2,FLDSV2,VERTX2,
     *          FETVC2(30),SUBVC2(75),SUBPTR(75),CLSVC2(60),
     *          KEPPTS(60),NOGRP,GRPNAM(60),GRPUEX(61),
     *          GRPCHK(61),GROUPS(124)
      END
      INCLUDE COMBK9,LIST                                         KBTR0016
C DATA TRANSFORMATION COMMON BLOCK
      COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FETVEC(30),PCF,              *NEW
     1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                      *NEW
      END                                                                ***-1
      INCLUDE COMBK4,LIST                                         KBTR0017
      DIMENSION HED1(10),HED2(10),DATE(2),COMENT(10)
      EQUIVALENCE (HED1(1),HEAD(3)),(DATE(1),HEAD(15)),
     *          (HED2(1),HEAD(20)),(COMENT(1),HEAD(32))
      END
      INCLUDE COMBK6,LIST                                         KBTR0018
C                                                                 KBTR0019
C COMPUTE TRANSFORMED MEANS FOR EACH SUBCLASS                     KBTR0020
C                                                                 KBTR0021
      COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
     *          HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
     *    DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
     *   ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
     *  ,DOTUNT,DOTFIL,NCHPAS,TRNSFL                                     *NEW
      END                                                                ***-1
      DIMENSION NSUB(75)                                          KBTR0022
C                                                                 KBTR0023
C                                                                 KBTR0024
      COVHD2(1) = 6H... TR                                        KBTR0025
      COVHD2(2) = 6HANSFOR                                        KBTR0026
      COVHD2(3) = 6HMED ST                                        KBTR0027
      COVHD2(4) = 6HATISTI                                        KBTR0028
      COVHD2(5) = 6HCS ...                                        KBTR0029
      DO 10 I=6,10                                                KBTR0030
   10 COVHD2(I) = 6H                                              KBTR0031
      LZ=AVAR2                                                    KBTR0035***-3
      K=1                                                         KBTR0036
      DO 30 I=1,NOCLS2                                            KBTR0037
C      IF SAKEY=1, APPLY THE SUN ANGLE CORRECTION FACTORS                *NEW
C       TO THE MEAN BEFORE TRANSFORMING IT                               *NEW
      IF (SAKEY.EQ.1) GO TO 21                                           *NEW
      CALL MATVEC(BMAT,ARRAY(LZ),BMEAN(K),LCOMB,NOFET2)           KBTR0038
      GO TO 31                                                           *NEW
   21 T=LZ-1                                                             *NEW
      DO 23 J=1,NOFET2                                                   *NEW
      T=T+1                                                              *NEW
   23 C(J)=SAGAIN(J)*ARRAY(T) + SABIAS(J)                                *NEW
      CALL MATVEC(BMAT,C(1),BMEAN(K),LCOMB,NOFET2)                       *NEW
   31 LZ=LZ + NOFET2                                                     *NEW
   30 K=K+LCOMB                                                   KBTR0040***-1
C                                                                 KBTR0041
C COMPUTE TRANSFORMED COVARIANCE MATRIX FOR EACH SUBCLASS         KBTR0042
C                                                                 KBTR0043
      KK=0                                                        KBTR0044
      K=COVAR2                                                    KBTR0045
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00172              KKK=1
00173              DO 50 I=1,NOCLS2                                            KBTR0046
00173        C MULTIPLY BMAT BY COVARIANCE MATRIX                              KBTR0047
00173        C                                                                 KBTR0048
00173        C      IF SAKEY=1, APPLY THE SUN ANGLE CORRECTION                         *NEW
00173        C       FACTORS TO THE COVARIANCE BEFORE TRANSFORMING IT                  *NEW
00176              IF (SAKEY.EQ.1) GO TO 51                                            *NEW
00200              CALL MTMLS6(BMAT,ARRAY(K),C,LCOMB,NOFET2)                   KBTR0049
00201              GO TO 52                                                            *NEW
00202         51     T=K-1                                                             *NEW
00203              G=0                                                                 *NEW
00204              M = 1                                                               *NEW
00205              DO 24 J=1,NOFET2                                                    *NEW
00210              DO 25 F=1,J                                                         *NEW
00213              T=T+1                                                               *NEW
00214              G=G+1                                                               *NEW
00215         25   CC(G)=SAGAIN(J)*SAGAIN(F)*ARRAY(T)                                  *NEW
00217               M = G + 1                                                          *NEW
00220         24   CONTINUE                                                            *NEW
00222             CALL MTMLS6(BMAT,CC(1),C,LCOMB,NOFET2)                               *NEW
00222        C MULTIPLY RESULTING MATRIX BY TRANSPOSE OF BMAT                  KBTR0050
00223         52    CALL MTMDAT(C,BMAT,CC,LCOMB,NOFET2,LCOMB,D,ARRAY(KKK))             *NEW
00224              DO 40 II=1,LCOMB                                            KBTR0052***1
00227         40 DIAG(KK+II)=D(II)                                             KBTR0053
00231              KKK=KKK+(LCOMB*(LCOMB+1))/2                                 KBTR0054
00232              KK=KK+LCOMB                                                 KBTR0055
00233              K=K+VARSZ2                                                  KBTR0056
00234         50 CONTINUE                                                      KBTR0057
00234        C                                                                 KBTR0058
00234        C PRINT TRANSFORMED COVARIANCE MATRIX                              KBTR0059
00234        C                                                                 KBTR0060
00236              CVI=(LCOMB*(LCOMB+1))/2                                     KBTR0061
00236        C                                                                 KBTR0062
00237              IF (TRANSF.EQ.0) GO TO 80                                   KBTR0063
00241              DO 60 I=1,10                                                KBTR0064
00244              TEMP = COMENT(I)                                            KBTR0065
00245              COMENT(I) = COVHD2(I)                                       KBTR0066
00246         60 COVHD2(I) = TEMP                                              KBTR0067
00246        C                                                                 KBTR0068
00250              CALL PRTCOV(ARRAY(I),BMEAN(I),CVI,LCOMB,NSUB(I))            KBTR0069
00251              DO 70 I=1,10                                                KBTR0070
00254         70 COMENT(I) = COVHD2(I)                                         KBTR0071
00256         80 CONTINUE                                                      KBTR0072
00256        C                                                                 KBTR0073
00256        C CALCULATE MINIMUM AND MAXIMUM FOR EACH SUBCLASS                 KBTR0074
00256        C                                                                 KBTR0075
00257              DO 120 I=1,LCOMB                                            KBTR0076
00262              DO 110 J=1,NOCLS2                                           KBTR0077
00265               NEL = (J - 1) * LCOMB + I                                  KBTR0078
00266               MAX(I) = BMEAN(NEL) + LAM * DIAG(NEL)                      KBTR0079
00267              IF (J.NE.1) GO TO 90                                        KBTR0080
00271               TMAX = MAX(I)                                              KBTR0081
00272         90   CONTINUE                                                    KBTR0082
00273               IF( MAX(I) .GE. TMAX) TMAX = MAX(I)                        KBTR0083
00275               MIN(I) = BMEAN(NEL) - LAM * DIAG(NEL)                      KBTR0084
00276              IF (J.NE.1) GO TO 100                                       KBTR0085
00300               TMIN = MIN(I)                                              KBTR0086
00301        100   CONTINUE                                                    KBTR0087
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130

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00256        C CALCULATE MINIMUM AND MAXIMUM FOR EACH SUBCLASS                    KBTR0074
00256        C                                                                    KBTR0075
00257              DO 120 I=1,LCOMB                                               KBTR0076
00262              DO 110 J=1,NOCLS2                                              KBTR0077
00265                NEL = (J - 1) * LCOMB + 1                                    KBTR0078
00266                MAX(I) = RMEAN(NEL) + LAM * DIAG(NEL)                        KBTR0079
00267              IF (J.NE.1) GO TO 90                                           KBTR0080
00271               TMAX = MAX(I)                                                 KBTR0081
00272           90  CONTINUE                                                      KBTR0082
00273                IF( MAX(I) .GE. TMAX) TMAX = MAX(I)                          KBTR0083
00275                MIN(I) = RMEAN(NEL) - LAM * DIAG(NEL)                        KBTR0084
00276              IF (J.NE.1) GO TO 100                                          KBTR0085
00300                TMIN = MIN(I)                                                KBTR0086
00301          100  CONTINUE                                                      KBTR0087

00302                IF( MIN(I) .LE. TMIN) TMIN = MIN(I)                          KBTR0088
00304          110 CONTINUE                                                       KBTR0089
00306               MIN(I) = TMIN                                                 KBTR0090
00307              MAX(I) = TMAX                                                  KBTR0091
00307        C      CHECK TO SEE IF MAX .GT. MIN                                           *NEW
00310              IF (MAX(I).GE.MIN(I)) GO TO 14                                          *NEW
00312              TMP = MAX(I)                                                            *NEW
00313               MAX(I) = MIN(I)                                                        *NEW
00314              MIN(I) = TMP                                                            *NEW
00315          14   CONTINUE                                                               *NEW
00316               EPS(I) = 255. /(MAX(I) - MIN(I))                              KBTR0092
00317          120 CONTINUE                                                       KBTR0093
00321                WRITE(6,119)                                                          *NEW
00323          119  FORMAT(//2X,'THE SCALING PARAMETERS FROM KBTRAN ARE')                  *NEW
00324                WRITE(6,226) (MAX(I),I=1,LCOMB)                                       *NEW
00332               WRITE(6,226) (MIN(I),I=1,LCOMB)                                        *NEW
00340               WRITE(6,227) (EPS(I),I=1,LCOMB)                                        *NEW
00340        C     CALCULATE THE PCG IMAGE SCALING PARAMETERS IF PCGC=1                    *NEW
00346              IF (PCGC.NE.1) GO TO 121                                                *NEW
00346        C      PLACE THE SCALING PARAMETERS (MAX,MIN,CON) THAT WERE DERIVED           *NEW
00346        C     FROM THE PCG-IMAGE INTO LOCATION BMAT(401) - BMAT(401+3*LCOMB-1)        *NEW
00350              WRITE (6,228)                                                           *NEW
00352          228  FORMAT(/2X,'THE PCG SCALING PARAMETERS ARE')                           *NEW
00353               CALL MATVEC(PCM,MAX,BMAT(401),LCOMB,LCOMB)                             *NEW
00354              B=LCOMB + 400                                                           *NEW
00355              WRITE (6,225) (BMAT(I),I=401,B)                                         *NEW
00363          225  FORMAT(/2X,'THE MAX IS'/2X,7F8.2)                                      *NEW
00364              B = B + 1                                                               *NEW
00365              CALL MATVEC (PCM,MIN,BMAT(B),LCOMB,LCOMB)                               *NEW
00366              T=B+LCOMB-1                                                             *NEW
00367               WRITE (6,226) (BMAT(I),I=B,T)                                          *NEW
00375          226  FORMAT(/2X,'THE MIN IS'/2X,7F8.2)                                      *NEW
00376              B=B+LCOMB                                                               *NEW
00377               CALL MATVEC(PCM,EPS,BMAT(B),LCOMB,LCOMB)                               *NEW
00400              T=B+LCOMB-1                                                             *NEW
00401               WRITE (6,227) (BMAT(I),I=B,T)                                          *NEW
00407          227  FORMAT(/2X,'THE CON IS'/2X,7F8.2)                                      *NEW
00410          121   RETURN                                                                *NEW
00411              END                                                            KBTR0095***-1

    END OF COMPILATION:        NO  DIAGNOSTICS.
  KBTRAN          SYMBOLIC                        20 JUN 77  01:56:08  0  02505302  14   96  (DELETED)
  KBTRAN  CODE    RELOCATABLE                     20 JUN 77  01:56:08  1  01605132  36    1  (DELETED)
                                                                       0  01605176  14   32
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SUBRC    : TRHIST    ENTRY POINT 001121

STORAGE USED: CODE(1) 001250; DATA(0) 002431 BLANK COMMON(2) 000000

 COMMON BLOCKS:

  0003    INFORM 001154
  0004    TRHLCK 000227
  0005    GLOBAL 000105


EXTERNAL REFERENCES (BLOCK, NAME)

  0006    LAREAD
  0007    TAPHDR
  0010    FLOINT
  0011    LINERD
  0012    FDLINT
  0013    TRANSF
  0014    MATVEC
  0015    SQRT
  0016    NWDUS
  0017    NI02S
  0020    NI01S
  0021    NERR2S
  0022    NERR3S

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

  0001    000011 10L      0001    000445 110L     0001    000447 120L     0001    000063 134G     0001    000451 140L
  0001    000727 152L     0001    000754 153L     0001    001912 154L     0001    001052 155L     0001    000543 160L
  0001    000202 161G     0001    000204 165G     0001    000546 170L     0001    000215 173G     0001    000603 180L
  0001    000606 190L     0001    000420 191L     0001    000253 210G     0001    001071 210L     0001    000267 214G
  0000    000124 221F     0001    000317 224G     0000    000142 225F     0000    000147 226F     0000    000154 227F
  0000    000133 228F     0001    000463 267G     0001    000504 274G     0001    000520 301G     0001    000557 314G
  0001    000646 345G     0001    000661 353G     0001    000674 361G     0001    000733 377G     0001    000233 40L
  0001    000765 407G     0001    001025 423G     0001    001065 437G     0001    000236 50L      0001    000411 60L
  0001    000415 70L      0001    000424 80L      0001    000436 90L      0000 I  000104 ALP      0005    000073 ASAV
  0005    000074 ASAVEL   0003    000006 AVAR2    0000 I  000121 B        0005    000055 BMFILE   0005    000056 BMKEY
  0003    000010 CISID2   0003    000301 CLSVC2   0005    000037 COMENT   0003    000007 COVAR2   0005 I  000053 DATAPE
  0005    000016 DATE     0005 I  000071 DATFIL   0005    000102 DOTFIL   0005    000101 DOTUNT   0000 I  000117 DPT
  0005    000067 DRMNDS   0005    000066 DRUMAD   0000 I  000106 FNOTAP   0005    000062 ERIPTP   0005    000063 ERPKEY
  0003    000015 FFTVC2   0004 I  000010 FFTVEC   0000 I  000063 FL       0004 I  000002 FLDINF   0000 I  000073 FLDINP
  0003    000013 FIDSV2   0004    000051 GIC      0003    000760 GROUPS   0003    000663 GRPCHK   0003    000566 GRPDEX
  0003    000472 GRPNAM   0005    000000 HEAD     0005    000002 HED1     0005    000023 HED2     0005    000057 HISFIL
  0005    000060 HISKEY   0000 I  000101 I        0000 I  000107 ILIN     0000    000170 INJPS    0000 I  000105 J
  0000 I  000111 JJ       0000 I  000120 JM1      0000 I  000112 K        0003    000375 KEPPTS   0000 I  000113 KP
  0006 I  000000 LAREAD   0000 I  000103 LINES    0000 I  000114 LK       0000 I  000115 LKP1     0005    000100 MAPFIL
  0005    000052 MAPTAP   0005    000064 MAPUNT   0005    000103 NCHPAS   0005    000076 NHSTFI   0005    000075 NHSTUN
  0003    000000 NOCLS2   0004 I  000001 NOFFAT   0003    000002 NOFET2   0005    000065 NOFILE   0003    000005 NOFLU2
  0003    000471 NOGRP    0003    000001 NOSUB2   0000 I  000110 NS       0000 I  000102 NSAMP    0004    000000 OUTFMT
  0005    000070 PAGSIZ   0004    000046 PCF      0004 I  000347 PCGC     0004 R  000146 PCM      0000 R  000020 PERCEN
  0004    000110 SABIAS   0004    000052 SAGAIN   0004    000050 SAKEY    0005    000054 SAVTAP   0005    000077 SCTRUN
  0005    000072 STAFIL   0003    000012 SUBDS2   0003    000011 SUBNU2   0003    000166 SUBPTR   0003    000053 SUBVC2
  0000 R  000042 SUMFIL   0000 I  000123 T        0000 R  000116 TEMP     0000 I  000043 TOTPTS   0003    000009 TOTVT2
  0013 I  000000 TRANSF   0005    000061 TRFORM   0005    000104 TRNSFL   0003    000003 VARSZ2   0003    000014 VERTX2
  0000 I  000122 WK       0000 R  000040 XMIN     0000 R  000041 XPLR     0000 R  000000 XT


 00101      1*            SUBROUTINE TRHIST(IDATA,AMAX,AMIN,ACON,BMAT,LCUMB,       TRHS0001
 00101      2*           *PEROUT,FILMIS,TOP,LAB,FIDNAM,NC,VERTCS,MAX,MIN,CON,      TRHS0002
 00101      3*           *     BIAS)                                                TRHS0003
 00101      4*      C                                                               TRHS0004
 00101      5*      C HISTOGRAM THE TRANSFORMED DATA AND CALCULATE THE MIN MAX AND RANGE  TRHS0005
 00101      6*      C FOR THIS DATA TO ALLOW RESCALING IN THE 0-255 RANGE           TRHS0006
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00101      C                                                                      TRMS0007
00103            IMPLICIT INTEGER(A-Z)                                            TRMS0008
00103      C                                                                      TRMS0009
00104            REAL   BIAS(16), XT(16), PERCEN(16), MIN(16), MAX(16), CON(16)  TRMS0010
00104      C                                                                      TRMS0011
00105            REAL   RMAT(480), AMIN(16), AMAX(16), ACON(16)                  TRMS0012
00105      C                                                                      TRMS0013
00106            REAL   XMIN , XPER ,  SUMFIL                                     TRMS0014
00106      C                                                                      TRMS0015
00107            INCLUDE COMRK1,LIST                                              TRMS0016
00110            COMMON/INFORM/NOCLS2,NOSUB2,NOFET2,VARS22,TOTVI2,NOFLD2,
00110           *            AVAR2,COVAR2,CLSID2,SUBNO2,SUBDS2,FLDSV2,VERTX2,
00110           *            FETVC2(30),SUBVC2(75),SUBPTR(75),CLSVC2(60),
00110           *            KEPPTS(60),NOGRP,GRPNAM(60),GRPDEA(61),
00110           *            GRPCHK(61),GROUPS(124)
00111            END
00112            INCLUDE COMRK9,LIST                                              TRMS0017
00112      C DATA TRANSFORMATION COMMON BLOCK
00113            COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FETVEC(30),PCF,                      *NE*
00113          1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                              *NE*
00115            END                                                                         **-1
00115            INCLUDE COMRK4,LIST                                              TRMS0018
00116            DIMENSION HED1(10),HED2(10),DATE(2),COMENT(10)
00117            EQUIVALENCE (HED1(1),HEAD(3)),(DATE(1),HEAD(15)),
00117           *            (HED2(1),HEAD(20)),(COMENT(1),HEAD(32))
00120            END
00121            INCLUDE COMRK6,LIST                                              TRMS0019
00122            COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00122           *            HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NOFILE,
00122           *    DRUMAD,DRMADS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00122           *  ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
00122           * ,DOTUNT,DOTFIL,NCHPAS,TRNSFL                                                *NE*
00123            END                                                                         **-1
00124            DIMENSION  FILHIS(LCOMB,100), IDATA(TOP), TOTPTS(16) ,          TRMS0020
00124           * VERTCS(2,11),FL(6),FLDINP(6)                                   TRMS0021
00124      C                                                                      TRMS0022
00124      C                                                                      TRMS0023
00124      C        READ THE  COORDINATES ( VERTICES ) OF THE FIELD, FOR THE     TRMS0024
00124      C      DATA TO BE TRANSFORMED                                          TRMS0025
00124      C                                                                      TRMS0026
00124      C                                                                      TRMS0027
00125       10 LAR=LARFAD(FLDNAM,VERTCS,FLDINF,NC)                                TRMS0028
00126            IF (LAR.EQ.0) GO TO 210                                          TRMS0029
00130            IF (LAR.LE.-1) GO TO 10                                          TRMS0030
00130      C                                                                      TRMS0031
00130      C                                                                      TRMS0032
00130      C      POSITION THE INPUT DATA TAPE AND READ IN THE HEADER RECORD     TRMS0033
00130      C                                                                      TRMS0034
00130      C                                                                      TRMS0035
00132            CALL TAPHDR( DATAPE , DATFIL )                                   TRMS0036
00132      C                                                                      TRMS0037
00133            DO 20 I=1,LCOMB                                                  TRMS0038
00136            MAX(I)=AMAX(I)                                                   TRMS0039
00137            MIN(I)=AMIN(I)                                                   TRMS0040
00140       20 CON(I)=ACON(I)                                                     TRMS0041
00142            NSAMP=(FLDINF(5)-FLDINF(4))/FLDINF(6)+1                          TRMS0042
00143            LINES=(FLDINF(2)-FLDINF(1))/FLDINF(3)+1                          TRMS0043
00144            ALP=SQRT((LINES*NSAMP)/2000)                                     TRMS0044
```

```
   20 CONT(I)=ACON(I)                                          TRNS0091
      NSAMP=(FLDINF(5)-FLDINF(4))/FLDINF(6)+1                  TRNS0092
      LINES=(FLDINF(2)-FLDINF(1))/FLDINF(3)+1                  TRNS0093
      ALP=SQRT((LINES*NSAMP)/2000)                             TRNS0094

      IF(ALP.LE.1) ALP=1                                       TRNS0045
      FLDINP(1)=FLDINF(1)                                      TRNS0046
      FLDINP(2)=FLDINF(2)                                      TRNS0047
      FLDINP(4)=FLDINF(4)                                      TRNS0048
      FLDINP(5)=FLDINF(5)                                      TRNS0049
      FLDINP(3)=ALP                                            TRNS0050
      FLDINP(6)=ALP                                            TRNS0051
      LINES=(FLDINP(2)-FLDINP(1))/FLDINP(3)+1                  TRNS0052
      NSAMP=(FLDINP(5)-FLDINP(4))/FLDINP(6)+1                  TRNS0053
      CALL FLDINT(FLDINP,FETVEC,NOFEAT)                        TRNS0054
      DO 30 I=1,LCOMB                                          TRNS0055
      TOTPTS(I) = 0                                            TRNS0056
      DO 30 J=1,101                                            TRNS0057
   30 FILHIS(I,J) = 0                                                  *NEW
      DO 130 I=1,LINES                                         TRNS0059***1
      CALL LINERD(IDATA,ENDTAP)                                TRNS0060
      IF (ENDTAP.NE.0) GO TO 140                               TRNS0061
      IF (I.NE.1) GO TO 40                                     TRNS0062
      ILIN=FLDINP(1)                                           TRNS0063
      GO TO 50                                                 TRNS0064
   40 ILIN=ILIN+FLDINP(3)                                      TRNS0065
   50 CONTINUE                                                 TRNS0066
      CALL FDLINT(VERTCS,NC,FL,ILIN,NS,JJ)                     TRNS0067
      DO 110 K=1,NSAMP                                         TRNS0068
      KP=(K-1)*FLDINP(6)+FLDINP(4)                             TRNS0069
      DO 101 IK=1,JJ,2                                         TRNS0070
      LKP1 = IK + 1                                            TRNS0071
      IF (KP.LT.FL(IK)) GO TO 110                              TRNS0072
      IF (KP.GT.FL(LKP1)) GO TO 90                             TRNS0073
      DO 80 J=1,LCOMB                                          TRNS0074
      XT(J)=0.                                                 TRNS0075
C                                                              TRNS0076
C        CALL TRANSF TO DO A DATA TRANSFORMATION               TRNS0077
C                                                              TRNS0078
       REAL PCM                                                        *NEW
        REAL TEMP                                                      *NEW
       XT(J) = TRANSF                                                  *NEW
     C       (BMAT,IDATA,TOP,J,K,LCOMB,NSAMP,BIAS)                     *NEW
C                                                              TRNS0081***2
C                                                              TRNS0082
C         HISTOGRAM THE TRANSFORMED DATA ( USING TRANSFORMED DATA MAX  TRNS0083
C         AND MIN AND SCALE FACTOR, CON , COMPUTED IN SUBR. MAXMAT     TRNS0084
C         TO OBTAIN THE HISTOGRAM ''BIN LEVEL'' FOR EACH TRANSFORMED   TRNS0085
C         DATA POINT )                                         TRNS0086
C                                                              TRNS0087
C                                                              TRNS0088
      IF (XT(J).LE.MIN(J)) GO TO 60                            TRNS0089
      IF (XT(J).GE.MAX(J)) GO TO 70                            TRNS0090
      DPT=(XT(J)-MIN(J))/CON(J)+1                              TRNS0091
C                                                              TRNS0092
      IF( DPT .LE. 0). DPT = 1                                 TRNS0093
      IF ( DPT .GT. 101 )  DPT = 101                           TRNS0094
C                                                              TRNS0095
      FILHIS(J,DPT)=FILHIS(J,DPT)+1                            TRNS0096
      GO TO 80                                                 TRNS0097
   60 FILHIS(J,1)=FILHIS(J,1)+1                                TRNS0098
      GO TO 80                                                 TRNS0099
   70 FILHIS(J,101) = FILHIS(J,101) + 1                        TRNS0100
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00250        60 TOTPTS(J)=TOTPTS(J)+1                                        TRMS0101
00252           GO TO 110                                                    TRMS0102
00253        90 IF (LKPI.GE.JJ) GO TO 120                                    TRMS0103
00255       100 CONTINUE                                                     TRMS0104
00257       110 CONTINUE                                                     TRMS0105
00261       120 CONTINUE                                                     TRMS0106
00262       130 CONTINUE                                                     TRMS0107
00264       140 CONTINUE                                                     TRMS0108
00264     C                                                                  TRMS0109
00264     C                                                                  TRMS0110
00264     C        ELEMINATE PEROUT/2  %  OF POINTS FROM UPPER AND LOWER TAILS OF TRMS0111
00264     C        THE TRANSFORMED DATA DISTRIBUTION --- OBTAIN THE REVISED MAX  TRMS0112
00264     C        AND SCALING PARAMETERS CON AND MIN AFTER APPLICATION OF PEROUT TRMS0113
00264     C                                                                  TRMS0114
00264     C                                                                  TRMS0115
00265           XPER=PEROUT/200.                                             TRMS0116
00265     C CALCULATE MIN,MAX,AND CON ARRAYS                                 TRMS0117
00266           DO 150 I=1,LCOMB                                             TRMS0118
00271       150 PERCEN(I)=XPER*TOTPTS(I)                                     TRMS0119
00273           DO 200 I=1,LCOMB                                             TRMS0120
00276           XMIN=MIN(I)                                                  TRMS0121
00277           SUMFIL=0.                                                    TRMS0122
00300           DO 160 J=1,101                                               TRMS0123
00303           SUMFIL=SUMFIL+FILHIS(I,J)                                    TRMS0124
00304           IF (SUMFIL.LT.PERCEN(I)) GO TO 160                           TRMS0125
00306           MIN(I)=(J-1)*CON(I)+XMIN                                     TRMS0126
00307           GO TO 170                                                    TRMS0127
00310       160 CONTINUE                                                     TRMS0128
00312       170 SUMFIL=0.                                                    TRMS0129
00313           DO 180 J=101,1,-1                                            TRMS0130
00316           SUMFIL=SUMFIL+FILHIS(I,J)                                    TRMS0131
00317           IF (SUMFIL.LT.PERCEN(I)) GO TO 180                           TRMS0132
00321           JMI = J - 1                                                  TRMS0133
00322           MAX(I) = JMI * CON(I) + XMIN                                 TRMS0134
00323           GO TO 190                                                    TRMS0135
00324       180 CONTINUE                                                     TRMS0136
00326       190  CONTINUE                                                    TRMS0137
00326     C      CHECK TO SEE IF MAX.GT.MIN                                          *NEW
00327             IF (MAX(I).GT.MIN(I)) GO TO 191                                    *NEW
00331            TEMP = MAX(I)                                                       *NEW
00332             MAX(I) = MIN(I)                                                    *NEW
00333            MIN(I) = TEMP                                                       *NEW
00334      191    CONTINUE                                                           *NEW
00335            CON(I) = 255. / (MAX(I) - MIN(I))                           TRMS0138
00336       200 CONTINUE                                                     TRMS0139
00340           WRITE(6,221)                                                         *NEW
00342       221 FORMAT(//2X,'THE PARAMETERS FROM TRHIST')                            *NEW
00343            WRITE(6,226) (MAX(I),I=1,LCOMB)                                     *NEW
00351           WRITE(6,226) (MIN(I),I=1,LCOMB)                                      *NEW
00357           WRITE(6,227) (CON(I),I=1,LCOMB)                                      *NEW
00357     C     CALCULATE THE PCG IMAGE SCALING PARAMETERS IF PCGC=1                 *NEW
00365            IF (PCGC.NE.1) GO TO 210                                            *NEW
00365     C      PLACE THE SCALING PARAMETERS (MAX,MIN,CON) THAT WERE DERIVED        *NEW
00365     C     FROM THE PCG-IMAGE INTO LOCATION BMAT(401) - BMAT(401+3*LCOMB-1)     *NEW
00367           WRITE (6,228)                                                        *NEW
00371       228  FORMAT(/2X,'THE PCG SCALING PARAMETERS ARE')                        *NEW
00372            CALL MATVEC(PCH,MAX,XT,LCOMB,LCOMB)                                 *NEW
00373           B=LCOMB + 400                                                        *NEW
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135

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00342        221   FORMAT(//2X,'THE PARAMETERS FROM TRHIST')                        *NEW
00343               WRITE(6,225) (MAX(I),I=1,LCOMB)                                  *NEW
00351              WRITE(6,226) (MIN(I),I=1,LCOMB)                                   *NEW
00357              WRITE(6,227) (CON(I),I=1,LCOMB)                                   *NEW
00357        C     CALCULATE THE PCG IMAGE SCALING PARAMETERS IF PCGC=1              *NEW
00365               IF (PCGC.NE.1) GO TO 210                                         *NEW
00365        C      PLACE THE SCALING PARAMETERS (MAX,MIN,CON) THAT WERE DERIVED     *NEW
00365        C     FROM THE PCG-IMAGE INTO LOCATION BMAT(401) - BMAT(401+3*LCOMB-1)  *NEW
00367              WRITE (6,228)                                                     *NEW
00371        228    FORMAT(/2X,'THE PCG SCALING PARAMETERS ARE')                     *NEW
00372               CALL MATVEC(PCM,MAX,XT,LCOMB,LCOMB)                              *NEW
00373              B=LCOMB + 400                                                     *NEW

00374               J=400                                                            *NEW
00375               WK = 1                                                           *NEW
00376        152    DO 151 I=1,LCOMB                                                 *NEW
00401               J = J + 1                                                        *NEW
00402        151     BMAT(J) = XT(I)                                                 *NEW
00404               GO TO (153,154,155),WK                                           *NEW
00405        153   WRITE (6,225) (BMAT(I),I=401,B)                                   *NEW
00413        225    FORMAT(/2X,'THE MAX IS'/2X,7F8.2)                                *NEW
00414              B = B + 1                                                         *NEW
00415               CALL MATVEC(PCM,MIN,XT,LCOMB,LCOMB)                              *NEW
00416              T=B+LCOMB-1                                                       *NEW
00417               WK = 2                                                           *NEW
00420               GO TO 152                                                        *NEW
00421        154    WRITE (6,226) (BMAT(I),I=B,T)                                    *NEW
00427        226    FORMAT(/2X,'THE MIN IS'/2X,7F8.2)                                *NEW
00430              B=B+LCOMB                                                         *NEW
00431               CALL MATVEC(PCM,CON,XT,LCOMB,LCOMB)                              *NEW
00432              T=B+LCOMB-1                                                       *NEW
00433               WK = 3                                                           *NEW
00434               GO TO 152                                                        *NEW
00435        155   WRITE (6,227) (BMAT(I),I=B,T)                                     *NEW
00443        227    FORMAT(/2X,'THE CON IS'/2X,7F8.2)                                *NEW
00443        C                                                               TRHS0140
00443        C                                                               TRHS0141
00443        C         RETURN THE SCALING PARAMETERS,  CON  AND  MIN ,  REQUIRED TO  TRHS0142
00443        C         RESCALE THE TRANSFORMED DATA TO THE RANGE , 0 - 255  ,         TRHS0143
00443        C                                                               TRHS0144
00443        C                                                               TRHS0145
00444        210 RETURN                                                      TRHS0146
00445            END                                                         TRHS0147

     END OF COMPILATION:        NO  DIAGNOSTICS.
  TRHIST          SYMBOLIC                      20 JUN 77  02:01:04   0  03324050   14   147  (DELETED)
  TRHIST   CODE   RELOCATABLE                   20 JUN 77  02:01:04   1  02033042   36     1  (DELETED)
                                                                      0  02033106   14    50
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136

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@ FOR PCHMAT,PCHMAT                                                                    03 MAR 78        17: 0:43.260
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E1201001OA)
THIS COMPILATION WAS DONE ON 03 MAR 78 AT 17:00:43

   SUBROUTINE PCHMAT    ENTRY POINT 001422

   STORAGE USED: CODE(1) 001534; DATA(0) 001703; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   PCHAML
    0004   SUPSUM
    0005   MINDEX
    0006   SORT
    0007   NWDUS
    0010   N1025
    0011   N1015
    0012   NERR3S

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

    0000   001556 102F     0001   000062 127G    0001   000074 132G    0001   000117 143G    0001   000134 147G
    0001   001234 148L     0000   001547 151F    0000   001566 152F    0000   001576 153F    0001   000145 156G
    0001   000151 142G     0001   000206 172G    0001   000222 175G    0001   000261 207G    0001   000302 216G
    0001   000341 224G     0001   000364 232G    0001   000437 251G    0001   000546 271G    0001   001002 30L
    0001   000615 304G     0001   000741 31L     0001   000706 331G    0001   000575 35L     0001   001015 365G
    0001   000323 38L      0001   000272 39L     0001   001063 406G    0001   001113 414G    0000   001544 420F
    0001   001137 422G     0001   001155 430G    0001   001162 435G    0001   001211 451G    0001   001231 461G
    0001   001031 50L      0001   001766 500G    0001   001275 503G    0001   001317 513G    0001   001346 530G
    0001   001364 541G     0001   000761 60L     0001   001055 70L     0000 R 000002 A       0000 R 001011 AA
    0000 R 001533 AWIIB    0000 R 001532 AWIIS   0000 R 001507 AWIJ    0000 R 001501 DEL     0000 R 001525 EIGEN
    0000 R 001517 EPS      0000 R 001476 ERR     0000 R 001477 ERRCM   0000 R 001520 GAMMA   0000 I 001503 I
    0000 I 001514 IB       0000 I 001002 IFMT    0000 I 001513 IK      0000 I 000000 IN      0000   001624 INJPS
    0000 I 000001 IOUT     0000 I 001511 IS      0000 I 001504 J       0000 I 001537 JJ      0000 I 001411 JM
    0000 I 001506 K        0000 I 001541 KF      0000 I 001502 KK      0000 I 001542 KP      0000 I 001543 L
    0000 I 001540 M        0000 I 001472 NCMAX   0000 I 001475 NM      0000 I 001473 NMAX    0000 I 001534 NR
    0000 I 001505 NRM      0000 I 001471 NRMAX   0000 R 001500 RE      0000 R 001474 REL     0000 R 001521 RHO
    0000 R 001512 RMIN     0000 R 001510 RSUM    0000 R 001536 SE      0000 R 001535 SM      0000 R 001522 SM11
    0000 R 001524 SM12     0000 R 001523 SM22    0004 R 000000 SUPSUM  0000 R 001451 U       0000 R 001431 V
    0000 R 000402 W        0000 R 001515 WAAW    0000 R 001516 WAW     0000 R 001531 WIIB    0000 R 001530 WIIS
    0000 R 001526 X1       0000 R 001527 X2

00101      1*          SUBROUTINE PCHMAT(T,PCM,C,R,N,ID)
00101      2*     C                                                              MAI00530
00101      3*     C     INPUT OUTPUT DEVICE ASSIGNMENTS                          MAI00540
00103      4*           IN = 5                                                   MAI00550
00104      5*           IOUT = 6                                                 MAI00560
00104      6*     C                                                              MAI00570
00104      7*     C  ............ PARAMETER DEFINITIONS ............................... MAI05140
00104      8*     C     A = N BY N SYMMETRIC REAL MATRIX (INPUT)                 MAI05150
00104      9*     C     PCM = N BY N ORTHOGONAL MATRIX OF EIGENVECTORS (OUTPUT)
```

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      R 000402 *        0000 R 001515 WAAR     0000 R L      WAW
      R 001524 X1       0000 R 001527 X2

00101           SUBROUTINE PCMMAT(T,PCM,C,R,N,ID)
00101     C                                                         MAI00530
00101     C     INPUT OUTPUT DEVICE ASSIGNMENTS                     MAI00540
00103           IN = 5                                              MAI00550
00104           IOUT = 6                                            MAI00560
00104     C                                                         MAI00570
00104     C  ............ PARAMETER DEFINITIONS ..................  MAI05140
00104     C     A = N BY N SYMMETRIC REAL MATRIX (INPUT)            MAI05150
00104     C     PCM = N BY N ORTHOGONAL MATRIX OF EIGENVECTORS (OUTPUT)

00104     C     C = N VECTOR OF CENTERS OF WENISTEIN  DISCS (OUTPUT)  MAI05170
00104     C     R = N VECTOR OF RADII OF WENISTEIN DISCS (OUTPUT)     MAI05180
00104     C     REL = RELATIVE ERROR=0.000005
00104     C     JM,V,U ARE WORKING VECTORS
00104     C     AW IS A WORKING MATRIX
00104     C     SUBROUTINES USED .                                  MAI05310
00104     C                                                         MAI05320
00104     C      SUPSUM,ORG1,MINDEX,MATMUL
00104     C                                                         MAI05340
00104     C                                                         MAI05350
00105            DIMENSION A(16,16),W(16,16),C(16),R(16),IFMT(7)
00106            DIMENSION AW(16,16)
00107            DIMENSION JM(16),V(16),U(16),PCM(49)
00110            DIMENSION T(10)
00111           DATA IFMT/ '(//,','  ','(1X,','G14.','6,','1X),','' )' /  MAI00360
00111     C                                                         MAI05370
00111     C                                                         MAI05400
00111     C --- --- --- --- --- --- --- --- --- --- --- --- --- --- MAI05410
00111     C                                                         MAI05420
00113            NRMAX=16
00114            NCMAX=200
00115            NMAX=NRMAX
00116           REL=0.000005
00117           NM=N-1                                              MAI05430
00120           IN = 1                                              MAI05440
00121           ERR = .01                                           MAI05450
00122           ERRCM = 1.0 - ERR                                   MAI05460
00123           RE = REL*REL                                        MAI05470
00124           DEL = -2.0/N                                        MAI05480
00125            KK=0
00126            DO 201 I=1,N
00131            DO 199 J=1,I
00134            KK=KK+1
00135      199     A(I,J) = T(KK)
00137      201    CONTINUE
00141            NRM=N - 1
00142            DO 501 I=1,NRM
00145            K = I + 1
00146            DO 500 J=K,N
00151      500   A(I,J) = A(J,I)
00153      501   CONTINUE
00155           DO 10 I=1,N                                         MAI05490
00160           JM(I)=I                                             MAI05500
00161           DO 11 J=1,N                                         MAI05510
00164      11   W(I,J) = DEL                                        MAI05520
00166      10   W(I,I) = 1.0 + DEL                                  MAI05530
00170             CALL PCMAM1(A,W,AW,N,N,N,NMAX,NMAX,NMAX)
00171           DO 12 J=1, N                                        MAI05550
00174           DO 13 I=1, N                                        MAI05560
00177           AWIJ = AW(I,J)                                      MAI05570
00200            (I) = W(I,J) * AWIJ                                MAI05580
00201      13   V(I) = AWIJ**2                                      MAI05590
00203            C(J)=SUPSUM(U,N,NMAX)
00204       12   R(J)=SUPSUM(V,N,NMAX) -(C(J))**2
00206           DO 14 J=1, N                                        MAI05620
00211      14   U(J) = R(J)                                         MAI05630
00213           RSUM=SUPSUM(U,N,N)                                  MAI05640
00213     C                                                         MAI05650
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C ---------------------------------------------------------------
C     MAIN LOOP
C
   39 CONTINUE
      DO 30 K=IN,NM
      CALL MINDEX(R,JM,K,N)
      IS=JM(K)
      IF( R(IS) .LE. 0.0 ) GO TO 60
   38 RMIN=R(IS)
C
C     ITERATIVE SUM LOOP   ------------
C
      DO 31 IK=K,NM
      IB=JM(IK+1)
      DO 32 I=1,N
      U(I) = AW(I,IS) * AW(I,IB)
   32 V(I) =  W(I,IS) * AW(I,IB)
      WAAW=SUPSUM(U,N,N)
      WAW=SUPSUM(V,N,N)
      DEL=WAAW-2.*C(IS)*WAW
      DEL=(DEL/R(IS))**2
      EPS=ERR*(ERR+(R(IB)/R(IS))-1.)
      IF(DEL.LT.EPS)GO TO 31
      GAMMA=C(IS)
      RHO=R(IS)
      DO 33 J=1,NM
C
C     FORM ITERATION MATRIX
C
      SM11=R(IS)+(C(IS)-GAMMA)**2
      SM22=R(IB)+(C(IB)-GAMMA)**2
      SM12=WAAW-2.*GAMMA*WAW
      EIGEN=0.5*(SM11+SM22-SQRT((SM11-SM22)**2+4.*SM12**2))
      X1=SM22-EIGEN
      X2=-SM12
      DEL=SQRT(X1**2+X2**2)
      X1=X1/DEL
      X2=X2/DEL
      IF ( EIGEN .LE. 0.0 ) GO TO 35
      IF( EIGEN .GT. RHO*FRRCH ) GO TO 35
      DO 34 I=1,N
      U(I)=(X1*AW(I,IS)+X2*AW(I,IB))*(X1*W(I,IS)+X2*W(I,IB))
   34 CONTINUE
      GAMMA=SUPSUM(U,N,N)
      RHO=EIGEN
   33 CONTINUE
   35 CONTINUE
      DO 36 I=1,N
      WIIS = W(I,IS)
      WIIB = W(I,IB)
      U(I) = X1*WIIS + X2*WIIB
      V(I) = X2*WIIS - X1*WIIB
      W(I,IS)=U(I)
      W(I,IB)=V(I)
      AWIIS = AW(I,IS)
      AWIIB = AW(I,IB)
      U(I) = X1*AWIIS + X2*AWIIB
      V(I) = X2*AWIIS - X1*AWIIB
```

```
          WIIS = W(I,IS)                                          MAI06140
          WIIB = W(I,IB)                                          MAI06150
          U(I) = X1*WIIS + X2*WIIB                                MAI06160
          V(I) = X2*WIIS - X1*WIIB                                MAI06170
          W(I,IS)=U(I)                                            MAI06180
          W(I,IB)=V(I)                                            MAI06190
          AWIIS = AW(I,IS)                                        MAI06200
          AWIIB = AW(I,IB)                                        MAI06210
          U(I) = X1*AWIIS + X2*AWIIB                              MAI06220
          V(I) = X2*AWIIS - X1*AWIIB                              MAI06230
          AW(I,IS)=U(I)                                           MAI06240
          AW(I,IB)=V(I)                                           MAI06250
          U(I)=W(I,IS)*U(I)                                       MAI06260
          V(I)=W(I,IB)*V(I)                                       MAI06270
   36     CONTINUE                                                MAI06280
            WRITE(6,40) IS
   40      FORMAT(//2X,'IS=',I4)
           WRITE(6,420) (W(I,IS),I=1,N)
           WRITE(6,41) IB
   41      FORMAT(//2X,'IB=',I4)
           WRITE(6,420) (W(I,IB),I=1,N)
          C(IS)=SUPSUM(U,N,N)                                     MAI06290
          C(IB)=SUPSUM(V,N,N)                                     MAI06300
          DO 37 I=1,N                                             MAI06310
          U(I) = (AW(I,IS) - C(IS) * W(I,IS))**2                  MAI06320
   37     V(I) = (AW(I,IB) - C(IB) * W(I,IB))**2                  MAI06330
          R(IS) = SUPSUM(U,N,N)                                   MAI06340
          R(IB) = SUPSUM(V,N,N)                                   MAI06350
          IF( R(IS) .LE. 0.0 ) GO TO 60                           MAI06360
   31     CONTINUE                                                MAI06370
    C                                                             MAI06380
    C     END OF SUB LOOP    ------------------                   MAI06390
    C                                                             MAI06400
          IF (R(IS) .LT. RE*C(IS)**2 ) GO TO 30                   MAI06410
          IF( RMIN .GT. 4.0*R(IS)) GO TO 38                       MAI06420
          GO TO 30                                                MAI06430
    C                                                             MAI06440
    C                                                             MAI06450
   60     CONTINUE                                                MAI06460
          JM(K) = JM(IN)                                          MAI06470
          JM(IN) = IS                                             MAI06480
          R(IS) = 0.0                                             MAI06490
          IN = IN + 1                                             MAI06500
          IF( IN .GE. N ) GO TO 70                                MAI06510
          GO TO 39                                                MAI06520
   30     CONTINUE                                                MAI06530
    C                                                             MAI06540
    C     END OF MAIN LOOP                                        MAI06550
    C                                                             MAI06560
    C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---   MAI06570
    C     TERMINAL CHECK                                          MAI06580
    C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---   MAI06590
          IS=0                                                    MAI06600
          DO 50 I=1,N                                             MAI06610
          U(I)=R(I)                                               MAI06620
          IF( R(I) .LT. RE*C(I)**2 ) GO TO 50                     MAI06630
          IS=IS+1                                                 MAI06650
```

```
00440        50    CONTINUE
00442              IF(IS.EQ.0)GO TO 70
00444              DEL=SUPSUM(U,N,N)                                    MAI06660
00445              IF(2.*DEL.GT.RSUM)GO TO 70                           MAI06670
00447              RSUM = DEL                                           MAI06680
00450              GO TO 39                                             MAI06690
00450        C --- --- --- --- --- --- --- --- --- --- --- --- ---      MAI06700
00450        C                                                          MAI06710
00450        C                                                          MAI06720
00450        C     FINAL ORDERING                                       MAI06730
00450        C --- --- --- --- --- --- --- --- --- --- --- --- ---      MAI06740
00450        C                                                          MAI06750
00451        70    CONTINUE                                             MAI06760
00452              DO 75 I=1, N                                         MAI06770
00455        75    U(I) = ABS(C(I))                                     MAI06780
00457              CALL MINDEX(U,JM,1,N)                                MAI06790
00460              DO 71 I=1,N                                          MAI06800
00463              IS=JM(N-I+1)                                         MAI06810
00464              U(I)=C(IS)                                           MAI06820
00465              V(I)=SQRT(R(IS))                                     MAI06830
00466              DO 71 J=1,N                                          MAI06840
00471        71    AW(J,I) = W(J,IS)                                    MAI06850
00474               WRITE(6,77)                                         MAI06860
00476        77     FORMAT(//2X,'AW SHOULD BE EQUAL TO TRANSPOSE OF W') MAI06870
00477               DO 78 J=1,N
00502        78     WRITE(6,420) (AW(J,I),I=1,N)
00511              DO 72 I=1,N
00514              C(I)=U(I)
00515              R(I)=V(I)                                            MAI06880
00516              DO 72 J=1,N                                          MAI06890
00521        72    W(I,J)=AW(I,J)                                       MAI06900
00521        C --- --- --- --- --- --- --- --- --- --- --- --- ---      MAI06910
00521        C                                                          MAI06920
00521        C                                                          MAI06930
00524              NR = N                                               MAI06940
00525              WRITE(IOUT,150)                                      MAI06950
00527        150   FORMAT(//,10X,'A MATRIX = ',/)
00530        420   FORMAT(1H0,8(F12,6))                                 MAI01110
00531              DO 415 I = 1,NR                                      MAI01120
00534        415   WRITE(IOUT,420) (A(I,J),J=1,NR)                      MAI01130
00543              WRITE(IOUT,151)                                      MAI01140
00545        151   FORMAT(///,10X,'MATRIX OF EIGENVECTORS = ',/)        MAI01150
00546               SM=0.                                               MAI01160
00547               SE=0.                                               MAI01170
00550              SE = (W(1,1)+W(N,1))/2
00551              JJ = N-1
00552              DO 149 J=2,JJ
00555        149   SM=SM + W(J,1)
00557              SM = SM/(N-2)
00560              IF (SM.GE.SE) GO TO 148
00562               DO 147 J=1,N
00565        147    W(J,1) = -W(J,1)
00567        148    CONTINUE
00570              DO 116 J = 1,NR
00573        116   WRITE(IOUT,420) (W(I,J),I=1,NR)                      MAI01180
00602              WRITE (6,102)                                        MAI01190
00604        102    FORMAT(//2X,'THE TRANSPOSE OF - PCM MATRIX - IS')
00605               M = 0
```

```
00606              KE = N
00607              KP = 1
00610              DO 100 I=1,N
00613              DO 101 J=1,N
00616              M = M + 1
00617              PCM(M) = W(I,J)
00620      101     CONTINUE
00622              WRITE(6,420) (PCM(L),L=KP,KE)
00630              KP = KP + N
00631               KE = KP + N - 1
00632      100     CONTINUE
00634              WRITE(IOUT,152)                                         MAI01200
00636      152     FORMAT(///,10X,' VECTOR OF EIGEN VALUES C(I) = ',/)     MAI01210
00637              WRITE(IOUT,IFMT) (C(I),I=1,NR)                          MAI01220
00645              WRITE(IOUT,153)                                         MAI01230
00647      153     FORMAT(///,10X,'VECTOR OF RADII R(I) = ',/)             MAI01240
00650              WRITE(IOUT,IFMT) (R(I) I=1,NR)                          MAI01250
00656              RETURN                                                  MAI06960
00657               END

END OF COMPILATION:       NO  DIAGNOSTICS.
```

142

TRAN. /

```
FUNCTION TRANSF      ENTRY POINT 000117

STORAGE USED: CODE(1) 000136; DATA(0) 000030; BLANK COMMON(2) 000000

 COMMON BLOCKS:

 0003   TRBLCK 000227


EXTERNAL REFERENCES (BLOCK, NAME)

 0004   NERR3S

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

 0001     000066 10L      0001     000051 11L      0001     000017 115G     0003     000010 FETVEC   0003     000002 FLDINF
 0003     000051 GIC      0000     000007 INJPS    0000 I   000003 IT       0000 I   000007 JSAMP    0003 I   000001 NOFEAT
 0003     000000 OUTFMT   0003     000046 PCF      0003     000047 PCGC     0003     000146 PCM      0003 R   000110 SABIAS
 0003 R   000052 SAGAIN   0003 I   000050 SAKEY    0000 R   000002 TDATA    0000 I   000000 TRANSF   0000 R   000001 XT
 0000 I   000005 ZCOMB


00101               FUNCTION TRANSF                                                        *NEW
00101             * (BMAT,IDATA,TOP,IL,K,LCOMB,NSAMP,BIAS)                                 *NEW
00103                 IMPLICIT INTEGER (A-Z)                                 TRAN0003**-2
00103        C                                                               TRAN0004
00104               REAL SAGAIN,SABIAS                                                     *NEW
00105               REAL BMAT(480),BIAS(16),XT                                             *NEW
00106               REAL TDATA                                                             *NEW
00107                 INCLUDE COMBK9, LIST                                   TRAN0006**-1
00107        C DATA TRANSFORMATION COMMON BLOCK                                            *NEW
00110               COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FETVEC(30),PCF,                  *NEW
00110             1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                           **-1
00111               END
00112                 DIMENSION IDATA (TOP)                                  TRAN0007
00112        C                                                               TRAN0008
00112        C      SUBROUTINE TRANSF DOES A DATA-TRANSFORMATION USING THE   TRAN0009
00112        C     FORMULA                                                   TRAN0010
00112        C             XT = IDATA * BMAT + BIAS                          TRAN0011
00112        C              XT = COMPONENT(IL), TRANSFORMED DATA VECTOR      TRAN0012
00112        C              IDATA = INPUT DATA VECTOR ( NOFEAT X 1 )         TRAN0013
00112        C              BMAT = TRANSFORMATION MATRIX ( LCOMB X NOFEAT )  TRAN0014
00112        C                BIAS = ADDITIVE BIAS                           TRAN0015
00112        C                                                               TRAN0016
00113               XT = 0.                                                                *NEW
00114              DO 10 IT=1,NOFEAT                                         TRAN0017
00117                  JSAMP = (IT - 1) * NSAMP + K                          TRAN0018
00120                  ZCOMB = LCOMB * (IT - 1) + IL                         TRAN0019
00120        C     IF SAKEY=1, APPLY THE SUN ANGLE CORRECTION FACTOR TO IDATA              *NEW
00120        C      BEFORE THE TRANSFORMATION                                              *NEW
00121              IF (SAKEY.EQ.1) GO TO 11                                                *NEW
00123              XT = XT +                                                               *NEW
00123            C          IDATA(JSAMP) * BMAT(ZCOMB)                       TRAN0021**-1
00124              GO TO 10                                                                *NEW
00125     11        TDATA = SAGAIN(IT)*IDATA(JSAMP) + SABIAS(IT)                           *NEW
00126               XT = XT + TDATA*BMAT(ZCOMB)                                            *NEW
00127        10    CONTINUE                                                  TRAN0022
00131              XT=XT + BIAS(IL)                                                        *NEW
00132              TRANSF=XT                                                               *NEW
00133                RETURN                                                  TRAN0024**-1
00134                END
```

```
     END OF COMPILATION:          NO. DIAGNOSTICS.
TRANSF              SYMBOLIC                               20 JUN 77  02:01:01  0  03323312   14   25  (DELETED)
TRANSF   CODE       RELOCATABLE                            20 JUN 77  02:01:01  1  02032632   24    1  (DELETED)
                                                                                0  02032662   14    6
```

```
0V          001701 7106      0001          002302 7?0L      000?          0??  7??       ????          ??????         ????          ?????? ????
0000        020671 750F      0001          002057 757G      0000          020      760F      0000          020720 770F      0000          020735 780I
0000        020753 790F      0001          000126 8L        0001          002321 80L       0000          020777 800F      0000          021022 810F
0000        021054 820F      0000          021106 830F      0000          021141 840F      0001          002631 850L      0000          021155 860F
0000        021204 870F      0000          021214 880F      0001          002761 890L      0001          000043 9L        0001          002776 900L
0000        021227 910F      0001          003011 920L      0001          003026 923L      0005          000073 ASAV      0005          000074 ASAVFL
0003        000006 AVAR2     0000 I        020265 BADMAX    0000 I        020245 BADMIN    0005          000055 BMFILE    0005          000056 BMKEY
0003        000010 CISID2    0003          000301 CISVC2    0000 I        020412 CHIN      0005          000037 COMENT    0000 I        020347 COMMA
0000 R      000270 CONSAV    0003          000007 COVAR2    0000 I        020346 CP        0000 R        000104 CUT       0005 I        000053 DATAPE
0005        000016 DATE      0005 I        000071 DATFIL    0005          000102 DOTFIL    0005          000101 DOTUNT    0000 I        020403 DPT
0005        000067 DRMADS    0005          000066 DRUMAD    0000 I        020372 ENDTAP    0005          000062 ERIPTP    0005          000063 ERPKEY
0003 I      000015 FFTVC2    0004 I        000010 FFTVEC    0000 I        020351 FINI      0000 I        000535 FL        0004 I        000002 FLDINF
0003        000013 FIDSV2    0004 I        000051 GIC       0003          000760 GROUPS    0003          000663 GRPCHK    0003          000566 GRPDEX
0003        000472 GRPNAM    0005          000090 HEAD      0005          003002 HED1      0005          000023 HED2      0000 I        000370 HISBUF
0005        000057 HISFIL    0005          000060 HISKEY    0000 I        020355 I         0000 I        020411 IA        0000 I        020407 IB

0000 I      000000 IDIM      0000 I        020410 IF        0000 I        020406 IG        0000 I        020376 IH        0000 I        020420 IL
0000 I      020373 ILIN      0000 I        020363 IN        0000          021301 INJPS     0000 I        020367 J         0000 I        020375 JJ
0000 I      020401 JK        0000 I        020402 JKPI      0000 I        020364 K         0003          000375 KEPPTS    0000 I        020356 KF
0000 I      020357 KK        0000 I        020400 KP        0000 I        020360 LAM       0007 I        000000 LAREAD    0000 I        020366 LINES
0000 I      020370 LSTLIN    0000 I        020371 M         0005          000100 MAPFIL    0005          000052 MAPTAP    0005          000064 MAPUNT
0000 R      000041 MATOT     0000 I        020325 MAXCUT    0000 R        000253 MAXSAV    0000 I        020305 MINCUT    0000 R        000230 MINSAV
0000 R      000042 MITOT     0000 I        020421 MN        0000 I        020361 MTRAN     0005          000103 NCHPAS    0000 R        000043 NEWMAX
0000 R      000063 NEWMIN    0005          000076 NHSTFI    0005          000075 NHSTUN    0003          000000 NOCLS2    0004 I        000001 NOFEAT
0003        000002 NOFET2    0005          000065 NOFILE    0003          000005 NOFLU2    0003          000471 NOGRP     0003          000001 NOSUB2
0000 I      020413 NPCT      0000 R        000206 NPER1     0000 R        000207 NPER2     0000 I        020374 NS        0000 I        020362 NSAMP
0000 R      000105 NXCON     0000 I        020345 OP        0004 I        000000 OUTFMT    0005          000070 PAGSIZ    0004 I        000046 PCF
0004 I      000047 PCGC      0004 R        000146 PCM       0000 I        000350 PMAX      0000 I        000330 PMIN      0000 I        020352 PPCF
0000 I      020405 RSET      0000 I        020354 S         0004          000110 SABIAS    0004          000052 SAGAIN    0004 I        000050 SAKEY
0005        000054 SAVTAP    0005          000077 SCTRUN    0005          000072 STAFIL    0003          000012 SUBUS2    0003          000011 SUBNO2
0003        000164 SURPTR    0003          000053 SUBVC2    0000 R        000103 SUM       0000 I        020353 T         0000 R        000106 TEMP
0000 R      000021 TMAX      0000 R        000001 TMIN      0000 I        000313 TOTPTS    0003          000004 TOTVT2    0015 I        000000 TRANSF
0005 I      000061 TRFORM    0005 I        000104 TRNSFL    0000 I        020350 TTL       0003          000003 VARSZ2    0003          000014 VERTX2
0000 R      000126 XCON      0000 I        020365 XDIM      0000 I        020415 XHGH      0000 I        020416 XLCM      0000 I        020414 XSIZ
0000 R      000144 XT        0000 R        000210 XXCON     0000 I        000545 Y         0000 R        000164 YREAL     0000 I        020417 YSIZ
0000 I      020404 ZS        0000 I        020377 ZSAMP

00101         SUBROUTINE LNTRAN(IDATA,MAX,MIN,CON,BMAT,LCOMB,NMTRIG,SCAFLG,   LNTR0001
00101        * PEROUT,FILHIS,TOP,LAR,FLDNAM,NC,VERTCS, RESCAL, BIAS,           LNTR0002
00101        *   NF , NPUN )                                                   LNTR0003
00101    C                                                                     LNTR0004
00101    C                                                                     LNTR0005
00101    C      IF   SCAFLG = 1 .   RESCALE BY HISTOGRAM METHOD                LNTR0006
00101    C                                                                     LNTR0007
00101    C      IF   SCAFLG = 2 .  RESCALE BY THE STATISTICS METHOD            LNTR0008
00101    C                                                                     LNTR0009
00101    C      IF   SCAFLG = 3 .  RESCALE WITH USER-INPUT SCALING PARAMETERS  LNTR0010
00101    C                                                                     LNTR0011
00101    C                                                                     LNTR0012
00101    C      NOTE:   IF THE FLAG, RESCAL , IS ZERO, NO RESCALING IS         LNTR0013
00101    C              PERFORMED. HOWEVER, PEROUT IS APPLIED TO THE TRANSFORMEDLNTR0014
00101    C              DATA DISTRIBUTION PRIOR TO FINAL OUTPUT OF TRANSFORMED LNTR0015
00101    C              DATA VALUES .                                          LNTR0016
00101    C                                                                     LNTR0017
00103         IMPLICIT INTEGER(A-Z)                                            LNTR0018
00104         REAL   TMIN(16), TMAX(16),  MATOT ,  MITOT                       LNTR0019
00104    C                                                                     LNTR0020
00105         REAL  NEWMAX(16) , NEWMIN(16) ,  SUM ,  CUT                      LNTR0021
00105    C                                                                     LNTR0022
00106          REAL NXCON                                                      LNTR0023
00107          REAL PCM                                                               *NEW*
00110         REAL TEMP(16)                                                           *NEW*
00110    C                                                                     LNTR0024
00111         REAL   BIAS(16), XCON(16), XT(16),  YREAL(16),  NPER1,  NPER2   LNTR0025
00111    C                                                                     LNTR0026
00112         REAL   MAX(16), MIN(16), CON(16),  BMAT(480) ,  XXCON(16)       LNTR0027
00112    C                                                                     LNTR0028
00113         REAL   MINSAV(16) , MAXSAV(16) , CONSAV(16)                      LNTR0029
00113    C                                                                     LNTR0030
00114         DIMENSION   TOTPTS(16) , PMIN(16) , PMAX(16)                     LNTR0031
00114    C                                                                     LNTR0032
```

```
      C                                                                 LNTR0033
            DIMENSION HISBUF(10),VERTCS(2,11),FL(8)                     LNTR0034
      C                                                                 LNTR0035
            DIMENSION   IDATA(TOP) ,  Y(8000) ,  FILMIS(LCOMB,10) )     LNTR0036
      C                                                                 LNTR0037
            DIMENSION   BADMIN(16) , BADMAX(16) , MINCUT(16) , MAXCUT(16)  LNTR0038
      C                                                                 LNTR0039
            DATA OP/'('/,CP/')'/,COMMA/','/                             LNTR0040
            DATA TTL/'TOTAL '/                                          LNTR0041
      C                                                                 LNTR0042
      C                                                                 LNTR0043
            INCLUDE COMBK1,LIST                                         LNTR0044
            COMMON/INFORM/NOCLS2,NOSUB2,NOFET2,VARS22,TOTVT2,NOFLD2,
           *               AVAR2,COVAR2,CLSID2,SUBNO2,SUBDS2,FLDSV2,VERTX2,
           *               FETVC2(30),SUBVC2(75),SUBPTR(75),CLSVC2(60),
           *               KEPPTS(40),NOGRP,GRPNAM(60),GRPDEX(61),
           *               GRPCHK(61),GROUPS(124)
            END
            INCLUDE COMBK9,LIST                                         LNTR0045
      C DATA TRANSFORMATION COMMON BLOCK
            COMMON/TRBLCK/OUTFMT,NOFEAT,FLDINF(6),FETVEC(30),PCF,                 *NEW
           1 PCGC,SAKEY,GIC,SAGAIN(30),SABIAS(30),PCM(49)                         *NEW
            END                                                                   **-1
            INCLUDE COMBK4,LIST                                         LNTR0046
            DIMENSION HED1(10),HED2(10),DATE(2),COMENT(10)
            EQUIVALENCE (HED1(1),HEAD(3)),(DATE(1),HEAD(15)),
           *            (HED2(1),HEAD(20)),(COMENT(1),HEAD(32))
            END
            INCLUDE COMBK6,LIST                                         LNTR0047
            COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
           *               HISFIL,HISKEY,TRFORM,EXIPTP,ERPKEY,MAPUNT,NOFILE,
           *    DRUMAD,DRMWDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
           * ,NHSTUN,NHSTFI,SCTRUN,MAPFIL
           * ,DOTUNT,DOTFIL,NCHPAS,TRNSFL                                          *NEW
            END                                                                   **-1
             NF=TRNSFL                                                            *NEW
      C     FINI=1 IF BOTH GREEN AND PCG IMAGE PROCESSINGS WERE REQUESTED         *NEW
            FINI=0                                                                *NEW
             PPCF=0                                                               *NEW
      C      CHECK TO SEE IF GREEN AND/OR PCG IMAGE REQUESTED                     *NEW
             IF (PCF.NE.1) GO TO 9                                                *NEW
             IF (GIC.EQ.1) GO TO 9                                                *NEW
      C      SET THE FLAG PPCF= TO INDICATE PCG IMAGE                             *NEW
             PPCF=1                                                               *NEW
             IF (RESCAL.EQ.0) GO TO 50                                            *NEW
      C                                                                 LNTR0049**-1
      C     CHECK FOR RESCALE FACTORS INPUT BY USER (  SCAFLG = 3 )     LNTR0050
             IF (PPCF.NE.1) GO TO 8                                               *NEW
      C      PULL THE PCF'S SCALING PARAMETERS FROM BMAT                          *NEW
              T=400+LCOMB                                                         *NEW
             S=400+2*LCOMB                                                        *NEW
             DO 7 I=1,LCOMB                                                       *NEW
             MAX(I)=BMAT(400+I)                                                   *NEW
             MIN(I)=BMAT(T+I)                                                     *NEW
             CON(I)=BMAT(S+I)                                                     *NEW
      C      CHECK TO SEE IF MAX.GT.MIN                                           *NEW
             IF (MAX(I).GT.MIN(I))  GO TO 7                                       *NEW
             TEMP(I) = MAX(I)                                                     *NEW
```

146

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        IF (RESCAL.EQ.0) GO TO 50
C                                                                 LNTR0049**-1
C     CHECK FOR RESCALE FACTORS INPUT BY USER ( SCAFLG = 3 )      LNTR0050
      IF (PPCF.NE.1) GO TO 8                                              *NEW
C     PULL THE PCF'S SCALING PARAMETERS FROM BMAT                         *NEW
      T=400+LCOMB                                                         *NEW
      S=400+2*LCOMB                                                       *NEW
      DO 7 I=1,LCOMB                                                      *NEW
      MAX(I)=BMAT(400+I)                                                  *NEW
      MIN(I)=BMAT(T+I)                                                    *NEW
      CON(I)=BMAT(S+I)                                                    *NEW
C     CHECK TO SEE IF MAX.GT.MIN                                          *NEW
      IF (MAX(I).GT.MIN(I))  GO TO 7                                      *NEW
      TEMP(I) = MAX(I)                                                    *NEW
```

```
      MAX(I) = MIN(I)                                                     *NEW
      MIN(I) = TEMP(I)                                                    *NEW
      CON(I) = ABS(CON(I))                                                *NEW
    7 CONTINUE                                                            *NEW
    8 CONTINUE                                                            *NEW
C                                                                 LNTR0051
      IF (SCAFLG.NE.3) GO TO 20                                   LNTR0052
C                                                                 LNTR0053
C        COMPUTE THE TRANSFORMED DATA MAX , USING INPUT           LNTR0054
C        SCALING PARAMETERS , CON  AND  MIN .                     LNTR0055
C                                                                 LNTR0056
      DO 10 KF=1,LCOMB                                            LNTR0057
      MAX(KF) = 255./ CON(KF) + MIN(KF)                           LNTR0058
   10 CONTINUE                                                    LNTR0059
C                                                                 LNTR0060
   20 CONTINUE                                                    LNTR0061
C                                                                 LNTR0062
C        COMPUTE THE OUTPUT HISTOGRAM SCALE FACTOR,  XCON          LNTR0063
C                                                                 LNTR0064
      DO 30 KK=1,LCOMB                                            LNTR0065
      XCON(KK)=(MAX(KK)-MIN(KK))/80                               LNTR0066
   30 FETVC2(KK)=KK                                               LNTR0067
C                                                                 LNTR0068
      IF (SCAFLG.EQ.1) GO TO 80                                   LNTR0069
C                                                                 LNTR0070
C       FOR STATISTICAL OR INPUT SCALE PARAMETERS, SAVE THE INITIAL    LNTR0071
C       SCALING PARAMETERS ( MIN, MAX , CON )  FOR RE-INITIALIZATION   LNTR0072
C       OF THESE PARAMETERS ON THE SECOND AND SUCCEEDING FIELDS TO BE  LNTR0073
C       INPUT , TRANSFORMED , AND RESCALED ( IF RESCAL GT 0 )          LNTR0074
C                                                                 LNTR0075
C                                                                 LNTR0076
      DO 40 I=1,LCOMB                                             LNTR0077
      MAXSAV(I) = MAX(I)                                          LNTR0078
      MINSAV(I) = MIN(I)                                          LNTR0079
   40 CONSAV(I) = CON(I)                                          LNTR0080
C                                                                 LNTR0081
C                                                                 LNTR0082
C        POSITION THE INPUT DATA FILE, AND READ IN THE HEADER RECORD   LNTR0083
C                                                                 LNTR0084
   50 CONTINUE                                                    LNTR0085
      CALL TAPHOR(DATAPE,DATFIL)                                  LNTR0086
C                                                                 LNTR0087
C                                                                 LNTR0088
C        READ THE COORDINATES ( VERTICES ) OF THE FIELD FOR THE DATA   LNTR0089
C        TO BE TRANSFORMED .                                      LNTR0090
C                                                                 LNTR0091
C                                                                 LNTR0092
C     DO NOT READ IN THE COORDINATE AGAIN FOR PCG PROCESSING IF READ IN   *NEW
C     FOR GREEN RPOCESSING                                                *NEW
      IF (FIN1.EQ.1) GO TO 61                                             *NEW
   60 LAM=LAREAD(FLONAM,VERTCS,FLDINF,NC)                         LNTR0093
   61 IF (LAM.EQ.0) GO TO 920                                             *NEW
      IF (LAM.LT.0) GO TO 900                                     LNTR0095**-1
C                                                                 LNTR0096
C                                                                 LNTR0097
C        FOR STATISTICAL OR INPUT SCALING PARAMETERS, INITIALIZE THE   LNTR0098
C        SCALING PARAMETERS  MAX , MIN , CON , XCON  FOR THIS FIELD    LNTR0099
C                                                                 LNTR0100
```

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00237   C                                                                       LNTRO101
00241         IF (RESCAL.EQ.0) GO TO 80                                         LNTRO102
00241   C                                                                       LNTRO103
00243         DO 70 I=1,LCOMB                                                   LNTRO104
00246         MAX(I) = MAXSAV(I)                                                LNTRO105
00247         MIN(I) = MINSAV(I)                                                LNTRO106
00250         CON(I) = CONSAV(I)                                                LNTRO107
00251      70 XCON(I) = ( MAX(I) - MIN(I) )/80.                                 LNTRO108
00253      80 NF = NF + 1                                                       LNTRO109
00253   C                                                                       LNTRO110
00254         DO 90 I=1,LCOMB                                                   LNTRO111
00257         MAXCUT(I) = 0                                                     LNTRO112
00260         MINCUT(I) = 0                                                     LNTRO113
00261         NEWMAX(I) = 255.0                                                 LNTRO114
00262          IF (SAKEY.EQ.1) NEWMAX(I) = 3000.                                         *NE*
00264         XXCON(I) = XCON(I)                                                LNTRO115
00265           NEWMIN(I) = 0.                                                           *NE*
00266      90  IF (SAKEY.EQ.1) NEWMIN(I) = -3000.                                        *NE*
00266   C                                                                       LNTRO117**-1
00271         MTRAN = 0                                                         LNTRO118
00271   C                                                                       LNTRO119
00272         NSAMP=(FLDINF(5)-FLDINF(4))/FLDINF(6)+1                           LNTRO120
00273         IDIM=NOFEAT*NSAMP                                                 LNTRO121
00274         IF (IDIM.GT.TOP) GO TO 130                                        LNTRO122
00276         IN=NC-1                                                           LNTRO123
00277         WRITE (6,100)                                                     LNTRO124
00301         WRITE (6,110)FLDNAM,IN,FLDINF(6),FLDINF(3),((OP,VERTCS(1,K),COMMA,LNTRO125
00301        *VERTCS(2,K),CP),K=1,IN)                                           LNTRO126
00317     100 FORMAT(1H1,T24,'NO. OF    SAMPLE  LINE'/,                         LNTRO127
00317        *T12,'FIELDNAME  VERTICES    INC     INC  VERTICES(SAMPLE,LINE)')  LNTRO128
00320     110 FORMAT(13X,A6,6X,I2,7X,I4,2X,I4,2X,5(A1,I4,A1,I4,A1,2X)/          LNTRO129
00320        * 5(A1,I4,A1,I4,A1,2X))                                            LNTRO130
00321         XDIM=LCOMB*NSAMP                                                  LNTRO131
00321   C                                                                       LNTRO132
00321   C                                                                       LNTRO133
00322         IF (XDIM.LE.8000) GO TO 150                                       LNTRO134
00322   C                                                                       LNTRO135
00322   C                                                                       LNTRO136
00324         WRITE (6,120)                                                     LNTRO137
00326     120 FORMAT(//' THE NUMBER OF COMPONENTS TIMES THE NUMBER OF SAMPLES EXLNTRO138
00326        *CEEDS THE SIZE OF THE STORAGE AREA ***'//)                        LNTRO139
00327         STOP 1                                                            LNTRO140
00330     130 WRITE (6,140)                                                     LNTRO141
00332     140 FORMAT('*** NUMBER OF CHANNELS TIMES NUMBER OF SAMPLES EXCEEDS 10*LNTRO142
00332        *00 ***'//)                                                        LNTRO143
00333         STOP                                                              LNTRO144
00333   C                                                                       LNTRO145
00333   C                                                                       LNTRO146
00333   C INITIALIZE TAPE READING FOR THIS FIELD                                LNTRO147
00333   C                                                                       LNTRO148
00334     150 CALL FLDINT(FLDINF,FETVEC,NOFEAT)                                 LNTRO149
00334   C                                                                       LNTRO150
00335         LINES=(FLDINF(2)-FLDINF(1))/FLDINF(3)+1                           LNTRO151
00335   C                                                                       LNTRO152
00336          IF (MTRAN.EQ.1) GO TO 151                                                 *NEW
00336   C     POSITION TAPE TO DEFAULT OR USER SPECIFIED FILE NUMBER                     *NE*
00336   C                                                                                *NE*
00340          S=NF-1                                                                    *NE*
```

```
00332    175.        140 FORMAT(' *** NUMBER OF CHANNELS TIMES NU ...
00332    175.           *DD ****'//)                                      LNTR0143
00333    176.            STOP                                             LNTR0144
00333    177.        C                                                    LNTR0145
00333    178.        C                                                    LNTR0146
00333    179.        C INITIALIZE TAPE READING FOR THIS FIELD             LNTR0147
00333    180.        C                                                    LNTR0148
00334    181.        150 CALL FLDINT(FLDINF,FETVEC,NOFEAT)                LNTR0149
00334    182.        C                                                    LNTR0150
00335    183.            LINES=(FLDINF(2)-FLDINF(1))/FLDINF(3)+1          LNTR0151
00335    184.        C                                                    LNTR0152
00336    185.            IF (NTRAN.EQ.1) GO TO 151                                  *NEW
00336    186.        C   POSITION TRFORM TO DEFAULT OR USER SPECIFIED FILE NUMBER   *NEW
00336    187.        C                                                              *NEW
00340    188.            S=NF-1                                                     *NEW

00341    189.            CALL NTRAN(TRFORM,10,8,S,22)                               *NEW
00342    190.        151 CONTINUE                                                   *NEW
00342    191.        C                                                    LNTR0153
00342    192.        C      WRITE HEADER RECORD ON OUTPUT FILE , TRFORM .  LNTR0154
00342    193.        C                                                    LNTR0155
00342    194.        C                                                    LNTR0156
00343    195.            CALL WRTHDR(LCOMB,FETVC2,NSAMP,OUTFMT,TRFORM)    LNTR0157
00343    196.        C                                                    LNTR0158
00343    197.        C                                                    LNTR0159
00344    198.            DO 170 I=1,LCOMB                                 LNTR0160
00347    199.            BADMAX(I) = 0                                    LNTR0161
00350    200.            BADMIN(I) = 0                                    LNTR0162
00351    201.            PMIN(I) = 0                                      LNTR0163
00352    202.            PMAX(I) = 0                                      LNTR0164
00353    203.            TOTPTS(I) = 0                                    LNTR0165
00354    204.            TMIN(I) = 1.0E35                                 LNTR0166
00355    205.            TMAX(I) = -1.0E35                                LNTR0167
00356    206.            XCON(I) = XXCON(I)                               LNTR0168
00357    207.            DO 160 J=1,101                                   LNTR0169
00362    208.        160 FILHIS(I,J) = 0                                  LNTR0170
00364    209.        170 CONTINUE                                         LNTR0171
00364    210.        C                                                    LNTR0172
00364    211.        C                                                    LNTR0173
00366    212.            LSTLIN=0                                         LNTR0174
00367    213.            M=0                                              LNTR0175
00370    214.        180 M=M+1                                            LNTR0176
00371    215.            IF (M.GT.LINES) GO TO 350                        LNTR0177
00371    216.        C                                                    LNTR0178
00371    217.        C      READ ONE SCAN LINE OF DATA FROM THE INPUT TAPE LNTR0179
00371    218.        C                                                    LNTR0180
00373    219.            CALL LINERD(IDATA,ENDTAP)                        LNTR0181
00374    220.            IF (ENDTAP.NE.0) GO TO 350                       LNTR0182
00376    221.            IF (M.NE.1) GO TO 190                            LNTR0183
00400    222.            ILIN=FLDINF(1)                                   LNTR0184
00401    223.            GO TO 200                                        LNTR0185
00402    224.        190 ILIN=ILIN+FLDINF(3)                              LNTR0186
00403    225.        200 CONTINUE                                         LNTR0187
00403    226.        C                                                    LNTR0188
00403    227.        C      DETERMINE THE SAMPLE INTERCEPTS ON THE CURRENT SCAN LINE,    LNTR0189
00403    228.        C      WHICH ARE CONTAINED IN THE DESIRED FIELD BOUNDARIES. PLACE   LNTR0190
00403    229.        C      THE SAMPLE INTERCEPTS IN  FL  , AND THE NUMBER OF INTERCEPTS LNTR0191
00403    230.        C      IN  JJ .                                      LNTR0192
00403    231.        C                                                    LNTR0193
00404    232.            CALL FDLINT(VERTCS,NC,FL,ILIN,NS,JJ)             LNTR0194
00405    233.            DO 210 K=1,NSAMP                                 LNTR0195
00410    234.            DO 210 IH=1,LCOMB                                LNTR0196
00413    235.            ZSAMP=(IH-1)*NSAMP+K                             LNTR0197
00414    236.        210 Y(ZSAMP)=0                                       LNTR0198
00414    237.        C                                                    LNTR0199
00417    238.            NX ON = 255./100.                                LNTR0200
00420    239.            IF (SAKEY.EQ.1) NXCON = 1000./100.                         *NEW
00420    240.        C                                                    LNTR0201
00420    241.        C                                                    LNTR0202
00420    242.        C      TRANSFORM, RESCALE, AND HISTOGRAM EACH DATA SAMPLE          LNTR0203
00420    243.        C                                                    LNTR0204
00422    244.            DO 330 K=1,NSAMP                                 LNTR0205
00425    245.            KP=(K-1)*FLDINF(6)+FLDINF(4)                     LNTR0206
00426    246.            DO 320 JK=1,JJ,2                                 LNTR0207
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00431            JKP1 = JK + 1                                              LNTR0208
00432            IF (KP.LT.FL(JK)) GO TO 330                                LNTR0209
00434            IF (KP.GT.FL(JKP1)) GO TO 310                              LNTR0210
00436            DO 220 I=1,LCOMB                                           LNTR0211
00441            XT(I)=0.                                                   LNTR0212
00441      C                                                                LNTR0213
00441      C     CALL TRANSF TO DO A DATA TRANSFORMATION                    LNTR0214
00441      C                                                                LNTR0215
00442             XT(I) = TRANSF                                                     *NEW
00442        C       (BMAT,IDATA,TOP,I,K,LCOMB,NSAMP,BIAS)                           *NEW
00443        220  CONTINUE                                                  LNTR0218***-2
00443      C      IF PPCF=1, APPLY PCM TO XT                                         *NEW
00445             IF (PPCF.EQ.0) GO TO 221                                           *NEW
00447             CALL MATVEC(PCM,XT,TEMP,LCOMB,LCOMB)                               *NEW
00450            DO 222 I=1,LCOMB                                                    *NEW
00453        222  XT(I)=TEMP(I)                                                      *NEW
00455        221  DO 300 I=1,LCOMB                                                   *NEW
00460            IF( XT(I) .LT. TMIN(I) )  TMIN(I) = XT(I)                  LNTR0220***-1
00462            IF( XT(I) .GT. TMAX(I) )  TMAX(I) = XT(I)                  LNTR0221
00462      C                                                                LNTR0222
00462      C     IF RESCAL = 0 NO RESCALING IS APPLIED.  OTHER WISE RESCALE LNTR0223
00462      C        USING SCALING PARAMETERS DERIVED FROM EITHER HISTOGRAM, LNTR0224
00462      C        STATISTICS, OR USER-INPUT ( SCAFLG= 1, 2, OR 3 )        LNTR0225
00462      C                                                                LNTR0226
00462      C                                                                LNTR0227
00464            IF (RESCAL.GT.0) GO TO 260                                 LNTR0228
00464      C                                                                LNTR0229
00464      C                                                                LNTR0230
00464      C        IF TRANSFORMED DATA IS NOT RESCALED ,                   LNTR0231
00464      C        TEST FOR OUT- OF - RANGE  TRANSFORMED  VALUES           LNTR0232
00464      C                                                                LNTR0233
00464      C        SET = 0  ANY VALUE LESS THAN 0, OR LESS THAN THE NEW MIN LNTR0234
00464      C        AFTER APPLICATION OF PEROUT                             LNTR0235
00464      C        SET = 255  ANY VALUE GREATER THAN 255, OR GREATER THAN  LNTR0236
00464      C        THE NEW MAX AFTER APPLICATION OF PEROUT                 LNTR0237
00464      C                                                                LNTR0238
00464      C                                                                LNTR0239
00466            IF (XT(I).LT.NEWMIN(I)) GO TO 230                          LNTR0240
00470            IF (XT(I).GT.NEWMAX(I)) GO TO 240                          LNTR0241
00472            GO TO 250                                                  LNTR0242
00473        230 IF( MTRAN .EQ. 0 )  BADMIN(I) = BADMIN(I) + 1              LNTR0243
00475              XT(I) = NEWMIN(I)                                                 *NEW
00476            GO TO 250                                                  LNTR0245***-1
00477        240 IF ( MTRAN .EQ. 0 )  BADMAX(I) = BADMAX(I) + 1             LNTR0246
00501            XT(I) = 255.                                               LNTR0247
00502             IF (SAKEY.EQ.1) XT(I) = 3000.                                      *NEW
00504        250 CONTINUE                                                   LNTR0248
00504      C                                                                LNTR0249
00504      C                                                                LNTR0250
00504      C        FOR THE CURRENT SCAN LINE,  HISTOGRAM THE TRANSFORMED DATA ,  LNTR0251
00504      C        AND STORE THE TRANSFORMED DATA INTO THE OUTPUT ARRAY,  Y  .   LNTR0252
00504      C                                                                LNTR0253
00505            DPT = XT(I)/NXCON + 1.1                                    LNTR0254
00506              TOTPTS(I) = TOTPTS(I) + 1                                LNTR0255
00507              IF( DPT .GT. 101) DPT = 101                              LNTR0256
00511            IF ( DPT .LE. 0 )  DPT = 1                                 LNTR0257
00513              FILHIS(I,DPT) = FILHIS(I,DPT) + 1                        LNTR0258
00514              ZS = (I -1) * NSAMP + K                                  LNTR0259
```

```
      XT(I) = 255.
      IF (SAKEY.EQ.1) XT(I) = 3000.
  250 CONTINUE
C
C
C        FOR THE CURRENT SCAN LINE, HISTOGRAM THE TRANSFORMED DATA ,
C        AND STORE THE TRANSFORMED DATA INTO THE OUTPUT ARRAY,  Y  .
C
      DPT = XT(I)/NXCON + 1.1
        TOTPTS(I) = TOTPTS(I) + 1
        IF( DPT .GT. 101) DPT = 101
      IF ( DPT .LE. 0 )  DPT = 1
        FILHIS(I,DPT) = FILHIS(I,DPT) + 1
        ZS = (I -1) * NSAMP + K


      Y(ZS) = XT(I) + 0.5
      GO TO 300
  240  CONTINUE
C
C        FOR THE CURRENT SCAN LINE, HISTOGRAM THE TRANSFORMED DATA, AND
C        STORE THE TRANSFORMED DATA INTO THE OUTPUT ARRAY,  Y  .
C
      IF (XT(I).LT.MIN(I)) GO TO 270
      IF (XT(I).GT.MAX(I)) GO TO 280
      YREAL(I)=CON(I)*(XT(I)-MIN(I))
C
      DPT = ( XT(I) - MIN(I) )/ XCON(I) + 11
C
      IF ( DPT .LE. 0.)  DPT = 1
      IF ( DPT .GT. 101 )  DPT = 101
C
      GO TO 290
  270 DPT = ABS( MIN(I) - XT(I) )/XCON(I)
C
      DPT = 10 - DPT
C
      PMIN(I) = PMIN(I) + 1
      IF(DPT.LE.0) DPT=1
      YREAL(I)=0
      GO TO 290
  280 DPT = ABS( XT(I) - MAX(I) )/XCON(I)
C
      DPT = DPT + 91
C
      PMAX(I) = PMAX(I) + 1
      IF(DPT.GT.101) DPT=101
      YREAL(I)=255
  290 TOTPTS(I)=TOTPTS(I)+1
      FILHIS(I,DPT)=FILHIS(I,DPT)+1
      ZSAMP=(I-1)*NSAMP+K
      Y(ZSAMP) = YREAL(I) + 0.5
  300  CONTINUE
      GO TO 330
  310 IF (JKPI.GE.JJ) GO TO 340
  320 CONTINUE
  330 CONTINUE
  340 CONTINUE
      IF(M.EQ.LINES) LSTLIN=-1
C
C
C        OUTPUT ONE LINE OF TRANSFORMED DATA ON THE OUTPUT FILE , TRFORM
C
C
      CALL WRTLIN(Y,LSTLIN)
      GO TO 180
C
C        IF RESCALING THE TRANSFORMED DATA BY EITHER THE STATISTICAL
C        OR USER-INPUT SCALING PARAMETERS,
C        APPLY PEROUT ( % OF POINTS TO BE REJECTED)  TO THE TRANSFORMED
C        DATA DISTRIBUTION - OBTAIN THE MAX, AND SCALING PARAMETERS
C        MIN AND CON , AFTER APPLICATION OF PEROUT ( ALSO, THE HISTOGRAM
C        SCALE FACTOR , XCON ) .
C
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00571   C        IF NOT RESCALING.  APPLY PEROUT TO THE TRANSFORMED DATA.      LNTR0318
00571   C   GET  NEW MAX AND MIN. RE-HISTOGRAM , AND OUTPUT THE REVISED DISTR.  LNTR0319
00571   C                                                                       LNTR0320
00572     350 CONTINUE                                                          LNTR0321
00572   C                                                                       LNTR0322
00573         IF (PEROUT.LE.0) GO TO 600                                        LNTR0323
00573   C                                                                       LNTR0324
00575         IF (SCAFLG.EQ.1) GO TO 600                                        LNTR0325
00575   C                                                                       LNTR0326
00577         IF (NTRAN.EQ.1) GO TO 600                                         LNTR0327
00577   C                                                                       LNTR0328
00601         IF (RESCAL.GT.0) GO TO 430                                        LNTR0329
00601   C                                                                       LNTR0330
00603         NPERI = FLOAT(PEROUT)/200.0                                       LNTR0331
00603   C                                                                       LNTR0332
00604         DO 420 I=1,LCOMB                                                  LNTR0333
00607         CUT =  NPERI *  FLOAT( TOTPTS(I) )                                LNTR0334
00610         SUM = 0.0                                                         LNTR0335
00611         DO 370 J=1,101,1                                                  LNTR0336
00614         IF (SUM.GE.CUT) GO TO 360                                         LNTR0337
00616         GO TO 370                                                         LNTR0338
00617     360 MINCUT(I) = SUM                                                   LNTR0339
00620         NEWMIN(I) = (J-1) * NXCON + 0.5                                   LNTR0340
00621         GO TO 380                                                         LNTR0341
00621   C                                                                       LNTR0342
00622     370 SUM = SUM + FILHIS(I,J)                                           LNTR0343
00624     380 SUM = 0.0                                                         LNTR0344
00625         DO 400 J=101,1,-1                                                 LNTR0345
00630         IF (SUM.GE.CUT) GO TO 390                                         LNTR0346
00632         GO TO 400                                                         LNTR0347
00633     390 MAXCUT(I) =  SUM                                                  LNTR0348
00634         NEWMAX(I) = ( J - 1 ) * NXCON + 0.5                               LNTR0349
00635         GO TO 410                                                         LNTR0350
00636     400 SUM = SUM + FILHIS(I,J)                                           LNTR0351
00640     410 CONTINUE                                                          LNTR0352
00641     420 CONTINUE                                                          LNTR0353
00643         GO TO 580                                                         LNTR0354
00643   C                                                                       LNTR0355
00643   C                                                                       LNTR0356
00644     430 NPER1 = PEROUT * .01 + .001                                       LNTR0357
00645         NPER2 = PEROUT * .01 - .001                                       LNTR0358
00645   C                                                                       LNTR0359
00646         RSET=0                                                            LNTR0360
00647         IG = 0                                                            LNTR0361
00650         IB = 0                                                            LNTR0362
00651         IE = 0                                                            LNTR0363
00652         IA = 0                                                            LNTR0364
00652   C                                                                       LNTR0365
00653         DO 560 I=1,LCOMB                                                  LNTR0366
00656         MATOT=TOTPTS(I)*NPER1                                             LNTR0367
00657         MITOT=TOTPTS(I)*NPER2                                             LNTR0368
00660          IF (FLOAT(PMIN(I)).GT.MATOT) GO TO 440                                  *NEW
00662         GO TO 460                                                         LNTR0370***1
00662   C RESET MIN SMALLER                                                     LNTR0371
00663     440 CMIN=PMIN(I)                                                      LNTR0372
00664         DO 450 J=10,1,-1                                                  LNTR0373
00667         IG=IG+1                                                           LNTR0374
00670         CMIN=CMIN-FILHIS(I,J)                                             LNTR0375
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00647          IA = 0
00650   407*   IB = 0                                         LNTR0362
00651   408*   IE = 0                                         LNTR0363
00652   409*   IA = 0                                         LNTR0364
00652   410*  C                                               LNTR0365
00653   411*   DO 560 I=1,LCOMB                               LNTR0366
00656   412*   MATOT=TOTPTS(I)*NPER1                          LNTR0367
00657   413*   MITOT=TOTPTS(I)*NPER2                          LNTR0368
00660   414*    IF (FLOAT(PMIN(I)).GT.MATOT) GO TO 440              *NEW
00662   415*   GO TO 460                                      LNTR0370***1
00662   416*  C RESET MIN SMALLER                             LNTR0371
00663   417*   440 CHIN=PMIN(I)                               LNTR0372
00664   418*   DO 450 J=30,1,-1                               LNTR0373
00667   419*   IG=IG+1                                        LNTR0374
00670   420*   CHIN=CHIN-FILHIS(I,J)                          LNTR0375

00671   421*      IF (FLOAT(CHIN).GT.MATOT) GO TO 450               *NEW
00673   422*      IF (FLOAT(CHIN).LT.MITOT) IG=IG-1                 *NEW
00675   423*   RSET=1                                         LNTR0378***2
00676   424*   MIN(I)=MIN(I)-IG*XCON(I)                       LNTR0379
00677   425*   IG=0                                           LNTR0380
00700   426*   GO TO 490                                      LNTR0381
00701   427*   450 CONTINUE                                   LNTR0382
00703   428*   460  IF (FLOAT(PMIN(I)).LT.MITOT) GO TO 470          *NEW
00705   429*   GO TO 490                                      LNTR0384***1
00705   430*  C RESET MIN LARGER                              LNTR0385
00706   431*   470 CHIN=PMIN(I)                               LNTR0386
00707   432*   DO 480 J=11,91                                 LNTR0387
00712   433*   IB=IB+1                                        LNTR0388
00713   434*   CHIN=CHIN+FILHIS(I,J)                          LNTR0389
00714   435*      IF (FLOAT(CHIN).LT.MITOT) GO TO 480               *NEW
00716   436*      IF (FLOAT(CHIN).GT.MATOT) IB=IB-1                 *NEW
00720   437*   MIN(I)=MIN(I)+IB*XCON(I)                       LNTR0392***2
00721   438*   IB=0                                           LNTR0393
00722   439*   RSET=1                                         LNTR0394
00723   440*   GO TO 490                                      LNTR0395
00724   441*   480 CONTINUE                                   LNTR0396
00724   442*  C CHECK MAX                                     LNTR0397
00726   443*   490  CONTINUE                                  LNTR0398
00727   444*      IF (FLOAT(PMAX(I)).GT.MATOT) GO TO 500            *NEW
00731   445*   GO TO 520                                      LNTR0400***1
00731   446*  C RESET MAX LARGER                              LNTR0401
00732   447*   500 CHIN=PMAX(I)                               LNTR0402
00733   448*   DO 510 J=92,101                                LNTR0403
00736   449*   IE=IE+1                                        LNTR0404
00737   450*   CHIN=CHIN-FILHIS(I,J)                          LNTR0405
00740   451*    IF (FLOAT(CHIN).GT.MATOT) GO TO 510                 *NEW
00742   452*     IF (FLOAT(CHIN).LT.MITOT) IE=IE-1                  *NEW
00744   453*   RSET=1                                         LNTR0408***2
00745   454*   MAX(I)=MAX(I)+IE*XCON(I)                       LNTR0409
00746   455*   IE=0                                           LNTR0410
00747   456*   GO TO 550                                      LNTR0411
00750   457*   510 CONTINUE                                   LNTR0412
00750   458*  C RESET MAX SMALLER                             LNTR0413
00752   459*   520  IF (FLOAT(PMAX(I)).LT.MITOT) GO TO 530          *NEW
00754   460*   GO TO 550                                      LNTR0415***1
00755   461*   530 CHIN=PMAX(I)                               LNTR0416
00756   462*   DO 540 J=91,1,-1                               LNTR0417
00761   463*   IA=IA+1                                        LNTR0418
00762   464*   CHIN=CHIN+FILHIS(I,J)                          LNTR0419
00763   465*    IF (FLOAT(CHIN).LT.MITOT) GO TO 540                 *NEW
00765   466*    IF (FLOAT(CHIN).GT.MATOT) IA=IA-1                   *NEW
00767   467*   RSET=1                                         LNTR0422***2
00770   468*   MAX(I)=MAX(I)-IA*XCON(I)                       LNTR0423
00771   469*   IA=0                                           LNTR0424
00772   470*   GO TO 550                                      LNTR0425
00773   471*   540 CONTINUE                                   LNTR0426
00775   472*   550 CONTINUE                                   LNTR0427
00776   473*   560 CONTINUE                                   LNTR0428
01000   474*   IF (RSET.EQ.0) GO TO 400                       LNTR0429
01002   475*   DO 570 I=1,LCOMB                               LNTR0430
01005   476*   XCON(I)=(MAX(I)-MIN(I))/80                     LNTR0431
01006   477*   XXCON(I) = XCON(I)                             LNTR0432
01007   478*   570  CON(I) = 255. / (MAX(I) - MIN(I))         LNTR0433
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01007       C                                                                   LNTRO434
01007       C                                                                          *NEW
01011         580  S=NF-1                                                              *NEW
01012                CALL NTRAN(TRFORM,10,8,S,22)                                      *NEW
01013              NTRAN=1                                                      LNTRO441**-6
C1014              GO TO 150                                                    LNTRO442
01015         600  CONTINUE                                                     LNTRO443
01016              NTRAN=0                                                      LNTRO444
01016       C                                                                   LNTRO445
01017                IF (GIC.EQ.1.AND.PPCF.EQ.0) WRITE(6,601)                          *NEW
01022                IF (PCGC.EQ.1.AND.PPCF.EQ.1) WRITE(6,602)                         *NEW
01025                IF (PCF.NE.1) WRITE(6,603)                                        *NEW
01030         601    FORMAT(/////,22X,'GREEN IMAGE')                                   *NEW
01031         602    FORMAT(/////22X,'PCG IMAGE')                                      *NEW
01032         603   FORMAT(/////22X,'TRANSFORMED IMAGE')                               *NEW
01033              IF (RESCAL.EQ.0) GO TO 710                                   LNTRO446
01033       C                                                                   LNTRO447
C1035              WRITE (6,610)NF                                              LNTRO448
01040         610 FORMAT(///// 22X,'* OUTPUT FILE ', I3, 1X,'*' /////// 5X,     LNTRO449
01040          *  '*** TRANSFORMED VALUES RESCALED TO A RANGE  0 - 255  ***' )  LNTRO450
01040       C                                                                   LNTRO451
01041              IF (SCAFLG.EQ.1) WRITE (6,620)                               LNTRO452
01044              IF (SCAFLG.EQ.2) WRITE (6,630)                               LNTRO453
01047              IF (SCAFLG.EQ.3) WRITE (6,640)                               LNTRO454
01047       C                                                                   LNTRO455
C1052         620 FORMAT( 24X, '(HISTOGRAM METHOD)' / )                         LNTRO456
01053         630 FORMAT( 23X, '(STATISTICS METHOD)' / )                        LNTRO457
01054         640 FORMAT( 20X, '(INPUT SCALING PARAMETERS)' / )                 LNTRO458
C1054       C                                                                   LNTRO459
C1054       C                                                                   LNTRO460
01055              WRITE (6,650)                                                LNTRO461
01055       C                                                                   LNTRO462
01057         650 FORMAT(//// 7X, '*** ORIGINAL TRANSFORMED DATA RANGE  ***' // LNTRO463
01057          *  T11, 'MIN' , T32, 'MAX' , T51, '( BIAS )'  // )               LNTRO464
01057       C                                                                   LNTRO465
01060              DO 660 M=1,LCOMB                                             LNTRO466
01063         660 WRITE (6,670)TMIN(M),TMAX(M),BIAS(M)                          LNTRO467
01063       C                                                                   LNTRO468
01071         670 FORMAT( 5X, F11.4, 10X, F11.4, 9X, '(' , F11.4, 1X, ')' / )   LNTRO469
01071       C                                                                   LNTRO470
01072              WRITE (6,680)                                                LNTRO471
01074         680 FORMAT(///// 7X, '*** TRANSFORMED DATA RANGE, AFTER APPLICATION OFLNTRO472
01074          * PEROUT  ***' // 7X, 'MIN' , 10X, 'MAX' , 10X,                  LNTRO473
01074          *    'CON  = 255/(MAX-MIN) ' // )                                LNTRO474
01074       C PRINT OUT NEW MAX,MIN,CON ARRAYS                                  LNTRO475
01075              DO 690 M=1,LCOMB                                             LNTRO476
01100         690 WRITE (6,700)MIN(M),MAX(M),CON(M)                             LNTRO477
01106        700    FORMAT(2X,3(F11.4,2X))                                             *NEW
01106       C                                                                   LNTRO479**-1
01107              GO TO 850                                                    LNTRO480
01107       C                                                                   LNTRO481
01107       C                                                                   LNTRO482
01110         710 IF (PEPOUT.GT.0) GO TO 730                                    LNTRO483
01110       C                                                                   LNTRO484
01112              DO 720 I=1,LCOMB                                             LNTRO485
01115              IF ( BADMIN(I) .EQ. 0 )  NEWMIN(I) = TMIN(I)                 LNTRO486
01117              IF ( BADMAX(I) .EQ. 0 )  NEWMAX(I) = TMAX(I)                 LNTRO487
01121         720 CONTINUE                                                      LNTRO488
```

```
C PRINT OUT NEW MAX,MIN,CON ARRAYS
      DO 690 M=1,LCOMB
  690 WRITE (6,700)MIN(M),MAX(M),CON(M)
  700   FORMAT(2X,3(F11.4,2X))
C
      GO TO 850
C
C
  710 IF (PEROUT.GT.0) GO TO 730
C
      DO 720 I=1,LCOMB
      IF ( BADMIN(I) .EQ. 0 )  NEWMIN(I) = TMIN(I)
      IF ( BADMAX(I) .EQ. 0 )  NEWMAX(I) = TMAX(I)
  720 CONTINUE
```

```
C
  730 WRITE (6,740)NF
  740 FORMAT(///// 19X, '* OUTPUT FILE ', I3, 1X, '*' )
C
      WRITE (6,750)
  750 FORMAT(///// 5X,'***  TRANSFORMED VALUES NOT RESCALED  ***' // )
C
      WRITE (6,760)LCOMB,(TMIN(I),I=1,LCOMB)
  760 FORMAT(/ 5X, 'TRANSFORMED MINIMUMS, COMPONENTS  1-' , I2, 2X,
     * '...' // 2(5X, 8F12.2/)  )
C
      WRITE (6,770)LCOMB,(TMAX(I),I=1,LCOMB)
  770 FORMAT(/ 5X, 'TRANSFORMED MAXIMUMS, COMPONENTS  1-' , I2, 2X,
     * '...' // 2( 5X, 8F12.2 / )  )
C
      WRITE (6,780)LCOMB,(BIAS(I),I=1,LCOMB)
C
  780 FORMAT(/// 5X, 'TRANSFORMED VALUE BIAS, COMPONENTS  1 - ' , I4,2X,
C
     *  ':' // 2( 5X, 8F12.2 / )  )
C
C
C
      TEMP(1) = 0.
      IF (SAKEY.EQ.1) TEMP(1) = -3000.
      WRITE(6,790) TEMP(1)  ,(I,BADMIN(I),I=1,LCOMB)
  790 FORMAT(///5X,'NO. OF TRANSFORMED VALUES LESS THAN',F7.1,'(SET=)
C
     * ' // (5X,'COMPONENT', 1X, I2, '...' , I6, 2X, 'VALUES' ) )
C
C
      TEMP(2) = 255.
      IF (SAKEY.EQ.1) TEMP(2) = 3000.
      WRITE(6,800) TEMP(2)  ,(I,BADMAX(I),I=1,LCOMB)
  800 FORMAT(///5X,'NO. OF TRANSFORMED VALUES GREATER THAN (SET=)',F7.1,
     * //(5X,'COMPONENT',1X,I2,'...',I6,2X,'VALUES'))
C
C
      NPER1 = FLOAT(PEROUT)/2.0
C
      WRITE(6,810) TEMP(1),NPER1,LCOMB,(MINCUT(I),I=1,LCOMB)
  810 FORMAT(///3X,'NO. OF LOWER TAIL POINTS REJECTED (SET=',F7.1,'
     *OR OUTPUT )  TO SATISFY', F6.1,2X,'% CUT-OFF, COMPONENTS  1 -'
     * I4, 2X, '...' // 16(I8) )
C
      WRITE(6,820) TEMP(2),NPER1,LCOMB,(MAXCUT(I),I=1,LCOMB)
  820 FORMAT(///3X,'NO. OF UPPER TAIL POINTS REJECTED (SET=',F7.1,'
     *OR OUTPUT )  TO SATISFY', F6.1, 2X, '% CUT-OFF,  COMPONENTS  1  -'
     * , I4, 2X, '...' // 16( I8 ) )
      NPCT = 100 - PEROUT
      WRITE (6,830)NPCT,LCOMB,(NEWMIN(I),I=1,LCOMB)
  830 FORMAT(//// 3X,'*****  FINAL OUTPUT TRANSFORMED VALUES, CENTRAL' ,
     *  I5,3X,'%' , 2X, 'OF DISTRIBUTION :' // 3X, 'MINIMUMS, COMPONENTS
     *  1 - ' , I4, 2X, '...' //  2(5X, 8F12.2 / )  )
C
      WRITE (6,840)LCOMB,(NEWMAX(I),I=1,LCOMB)
  840 FORMAT(// 3X,'MAXIMUMS, COMPONENTS  1 - ', I4, 2X,'...' //
     *  2( 5X, 8F12.2 / )  )
```

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      C                                                                 LNTR0546
      C                                                                 LNTR0547
      C                                                                 LNTR0548
      C PRINT HISTOGRAMS                                                LNTR0549
      C                                                                 LNTR0550
  850 CONTINUE                                                          LNTR0551
      C                                                                 LNTR0552
        XSIZ=101                                                        LNTR0553
        XHGH=255                                                        LNTR0554
         IF (SAKEY.EQ.1.AND.RESCAL.EQ.0) XHGH = 3000                            .NEW
         IF (SAKEY.EQ.1.AND.RESCAL.EQ.0) XLOW=-3000                             .NEW
        YSIZ=15                                                         LNTR0556..-1
        CALL COMHST(FILHIS,HISBUF,TTL,LCOMB,FETVC2,XSIZ,XHGH,XLOW,YSIZ) LNTR0557
      C                                                                 LNTR0558
      C                                                                 LNTR0559
         IF (RESCAL.EQ.0) GO TO 920                                             .NEW
      C                                                                 LNTR0561..-1
      C                                                                 LNTR0562
      C                                                                 LNTR0563
        WRITE (6,860)NF                                                 LNTR0564
      C                                                                 LNTR0565
  860 FORMAT(1H1 // 5X,'SCALING PARAMETERS USED ON TRANSFORMED VALUES, OLNTR0566
      C                                                                 LNTR0567
       .UTPUT FILE', I5// 19X, 'MINIMUM', 7X, 'MAXIMUM', 7X,            LNTR0568
      C                                                                 LNTR0569
       . 'SCALE FACTOR ( CON )'  )                                      LNTR0570
      C                                                                 LNTR0571
        WRITE (6,870)(FETVC2(IL),MIN(IL),MAX(IL),CON(IL),IL=1,LCOMB)    LNTR0572
      C                                                                 LNTR0573
  870 FORMAT(1X, 'COMPONENT',I3,1X,F12.3,2X,F12.3,7X,F12.3 )            LNTR0574
      C                                                                 LNTR0575
      C                                                                 LNTR0576
        IF (INPUN.LE.0) GO TO 890                                       LNTR0577
      C                                                                 LNTR0578
        PUNCH 880,(CON(MN),MIN(MN),MN=1,LCOMB)                          LNTR0579
      C                                                                 LNTR0580
  880 FORMAT(  ('OPTION',4X, 'SCAFAC=' , 2( ' (', F9.3, ',' , F9.3,     LNTR0581
       . ' ) , ' )  )  )                                                LNTR0582
      C                                                                 LNTR0583
  890  CONTINUE                                                         LNTR0584
      C                                                                 LNTR0585
      C                                                                 LNTR0586
      C  RETURN TO PROCESS THE PCG IMAGE IF THE PCGC AND PPCF FLAGS ARE ON      .NEW
         IF (PCGC.EQ.1.AND.PPCF.EQ.0) GO TO 923                                 .NEW
      C                                                                 LNTR0588..-1
      C                                                                 LNTR0589
      C  ONLY 1 FIELD WILL BE PROCESSED                                         .NEW
         RETURN                                                                 .NEW
  900 IF (LAM.EQ.0) GO TO 920                                           LNTR0591..-1
        WRITE (6,910)FLDNAM                                             LNTR0592
  910 FORMAT(//// 5X,'*****  DATATR/LNTRAN *****  ERROR ON INPUT FIELD DELNTR0593
       .FINITION CARD, FOR FIELD NAME  ',1H', A6, 1H', 3X, '*****', /   LNTR0594
       .)                                                                       .NEW
         RETURN                                                                 .NEW
  920  CONTINUE                                                         LNTR0597..-2
         IF (PCGC.EQ.1.AND.PPCF.EQ.0) GO TO 923                                 .NEW
        RETURN                                                          LNTR0598
  923   PPCF=1                                                                  .NEW
```

```
 01325    6380  *      IF (PCGC.EQ.1.AND.PPCF.EQ.0) GO TO 923                                                *NEW
 01325    6390  C                                                                            LNTRO588***-1
 01325    6400  C                                                                            LNTRO589
 01325    6410  C      ONLY 1 FIELD WILL BE PROCESSED                                                *NEW
 01327    6420           RETURN                                                                      *NEW
 01330    6430     900 IF (LAM.EQ.0) GO TO 920                                               LNTRO591***-1
 01332    6440         WRITE (6,910)FLDNAM                                                   LNTRO592
 01335    6450     910 FORMAT(//// 5X,'******* DATATR/LNTRAN *****  ERROR ON INPUT FIELD DELNTRO593
 01335    6460        *FINITION CARD, FOR FIELD NAME  ',1H', A6, 1H', 3X, '*******', /       LNTRO594
 01335    6470        *)                                                                             *NEW
 01336    6480         RETURN                                                                        *NEW
 01337    6490     920 CONTINUE                                                              LNTRO597***-2
 01340    6500         IF (PCGC.EQ.1.AND.PPCF.EQ.0) GO TO 923                                        *NEW
 01342    6510         RETURN                                                                LNTRO598
 01343    6520     923 PPCF=1                                                                        *NEW


 01344    6530         FINI=1                                                                        *NEW
 01345    6540          GO TO 9                                                                      *NEW
 01346    6550         END                                                                   LNTRO599

      END OF COMPILATION:        NO DIAGNOSTICS.
    LNTRAN         SYMBOLIC                       20 JUN 77  01:56:37   0  02554456   14   599  (DELETED)
    LNTRAN  CODE   RELOCATABLE                    20 JUN 77  01:56:37   1  01625102   48     1  (DELETED)
                                                                        0  01625162   14   191
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157

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00101         SUBROUTINE GETGCV(UNIT,FILE,NCHAN,COVAR)                          *NEW
00101   C.                                                                      ***2
00101   C***********************************************************************
00101   C.
00101   C.      SUBROUTINE GETSTA RETRIEVES THE MEANS AND STANDARD DEVIATIONS
00101   C.      FROM A STATISTICS FILE IN THE LARSYS 'SAVTAP' FORMAT.
00101   C.
00101   C.      INPUT ARGUMENTS:
00101   C.
00101   C.        UNIT    = FORTRAN UNIT NUMBER FROM WHICH THE STATS ARE TO BE
00101   C.                  RETRIEVED.
00101   C.        FILE    = FILE NO. ON 'UNIT' FROM WHICH THE STATS ARE TO BE
00101   C.                  RETRIEVED.
00101   C.        NOCHAN  = NO. OF CHANNELS REQUESTED FROM TRAINING SEGMENT.
00101   C.                    NOCHAN LESS THAN OR = NO. OF CHANNELS ON STAT FILE
00101   C.        CHNVEC  = ARRAY CONTAINING ACTUAL CHANNELS REQUESTED FROM
00101   C.                    TRAINING SEGMENT. MUST BE A SUBSET OF CHANNELS
00101   C.                    ON STAT FILE
00101   C.
00101   C.       ITRIG    = IF ITRIG=1, ST. DEV. WILL BE RETURNED ALONG WITH MEANS.
00101   C.
00101   C.      OUTPUT ARGUMENTS:
00101   C.
00101   C.        MENS    = ARRAY CONTAINING THE MEAN VECTORS FOR EACH SUBCLASS
00101   C.                   ( A SUBSET OF THE CHANNELS MAY BE SELECTED, BUT NOT
00101   C.                    A SUBSET OF THE SUBCLASSES).
00101   C.        STDEV   = ARRAY CONTAINING THE SUBSET OF ST. DEV. FOR REQUES-
00101   C.                   TED CHANNELS IN EACH SUBCLASS
00101   C.                  IN EACH SUBCLASS.
00101   C.        NOSUB   = NUMBER OF SUBCLASSES ON THE STAT FILE
00101   C.      CHNVEC = ARRAY CONTAINING ACTUAL CHANNELS REQUESTED FROM
00101   C.                  TRAINING SEGMENT
00101   C.
00101   C***********************************************************************
00101   C***********************************************************************
00101   C.
00101   C.   **NOTE**  THE STORAGE ARRAYS PASSED TO THIS SUBROUTINE FOR THE
00101   C.             MEANS AND STANDARD DEVIATIONS SHOULD BE SINGLY DIMENSIONED
00101   C.             IN THE CALLING ROUTINE.  ON OUTPUT THE ITEMS ARE STORED
00101   C.             AS FOLLOWS: (SAME FOR STDEV)
00101   C.
00101   C.                      MEANS(1)        =   CHANNEL 1, SUBCLASS 1
00101   C.                           (2)        =   CHANNEL 2, SUBCLASS 1
00101   C.                            3         =   CHANNEL 3, SUBCLASS 1
00101   C.                            .         =           .
00101   C.                            .         =           .
00101   C.                      (NOCHAN)        =           NOCHAN,SUBCLASS 1
00101   C.                      (NOCHAN+1)      =   CHANNEL 1, SUBCLASS 2
00101   C.                      (NOCHAN+2)      =   CHANNEL 2, SUBCLASS 2
00101   C.                      (NOCHAN+3)      =   CHANNEL 3, SUBCLASS 2
00101   C.                              .       =
00101   C.                              .       =
00101   C.                      (2*NOCHAN)      =   CHANNEL NOCHAN OF SUBCLASS 2
00101   C.                          .
00101   C.                          .
00101   C.                          .
00101   C.                        ETC.
```

```
00101     C*
00101     C*                                   .                  -        .
00101     C*                                   .                  -        .
00101     C*                              (NOCHAN)                -        NOCHAN,SUBCLASS 1
00101     C*                              (NOCHAN+1)              -   CHANNEL 1, SUBCLASS 2
00101     C*                              (NOCHAN+2)              -   CHANNEL 2, SUBCLASS 2
00101     C*                              (NOCHAN+3)              -   CHANNEL 3, SUBCLASS 2
00101     C*                                   .                  -
00101     C*                                   .                  -
00101     C*                              (2*NOCHAN)              -   CHANNEL NOCHAN OF SUBCLASS 2
00101     C*                                   .
00101     C*                                   .
00101     C*                                   .
00101     C*                                  ETC.


00101     C*                                  THRU
00101     C*                              (NOCHAN*NOSUB)
00101     C*
00101     C************************************************************************
00101     C*                                                                                    *NEW
00103           DIMENSION CHNVC1(30)                                                           **-1
00104           DATA BLANK/' '/                                                                **-2
00106           IMPLICIT INTEGER(A-Z)                                                          *NEW
00107            REAL COVAR(465)                                                               **-2
00110           REWIND UNIT
00111           NF=FILE-1
00112           CALL FSBSFL(UNIT,NF,ISTAT1)
00113           IF(ISTAT1.EQ.0)GO TO 5
00115           WRITE(6,100)UNIT,FILE
00121       100 FORMAT(1X,'ERROR IN POSITIONING UNIT',I3,' TO FILE', I3)
00122           CALL CHERR
00123         5 CONTINUE
00124           READ(UNIT)NOCLS,NOSUB,NCHAN,NOFLD,TOTVRT,(CHNVC1(I),I=1,NCHAN)
                                                                                               *-23
00124     C*
00124     C*    READ PAST THE TRAINING FIELD INFORMATION
00124     C*
00137           DO 10 I=1,NOFLD
00142           READ(UNIT)DUM
00145           READ(UNIT)DUM
00150        10 CONTINUE
00152           READ(UNIT)DUM
00155           VARSIZ = NCHAN*(NCHAN+1)/2                                                     *NEW
00156            READ (UNIT) N,(COVAR(J),J=1,VARSIZ)                                           *NEW
00165           RETURN                                                                         *NEW
00166           END

     END OF COMPILATION:          NO  DIAGNOSTICS.
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```
@ FOR,* SUNF1,SUNF2,SUNF2/CODE                                                                    03 MAR 78          17: 0:38. 31
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(FXECH LEVEL E1201001OA)
THIS COMPILATION WAS DONE ON 03 MAR 78 AT 17:00:38

-1,1

      SUBROUTINE SUNF2(SUNCOR,SUNANG,FETVEC,NOFEAT,ISUNC,ISUNT,SABIAS)

   SUBROUTINE SUNF2      ENTRY POINT 000263

   STORAGE USED: CODE(1) 000307; DATA(0) 001327; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NWDU$
    0004   NI02$
    0005   NI01$
    0006   NERR3$

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

    0001   000034 156G      0001   000116 200G      0000   001227 210F      0000   001231 215F      0001   000135 217L
    0000   001240 220F      0001   000173 220G      0000   001246 230F      0001   000207 230G      0000   001257 231F
    0001   000222 237G      0000   001223 90F       0000 R 001212 BLANK     0000 R 000505 BIAS      0000 R 000001 EXTRA
    0000 I 001211 I         0000 I 001221 IEND      0000 I 001222 IENDS     0000 I 001216 IND       0000   001272 INJP$
    0000 I 001220 ISTART    0000 I 001214 K         0000 I 001215 KR        0000 I 001213 KS        0000 I 001217 NOFETR
    0000 I 000000 SUNA


00101      1*          SUBROUTINE SUNF2(SUNCOR,SUNANG,FETVEC,NOFEAT,ISUNC,ISUNT,SABIAS)          *NEW
00103      2*          INTEGER SUNANG,FETVEC,SUNA                                                  **-1
00104      3*          DIMENSION EXTRA(324),SUNANG(1),FETVEC(1),SUNCOR(1)
00105      4*          DIMENSION BIAS(324),SABIAS(1)
00106      5*          DATA(EXTRA(I), I=1,36) /16.413,14.887,14.089,13.401,
00106      6*         *13.015,11.901,11.323,10.816,10.755,9.893,9.449,9.052,
00106      7*         *9.094,8.413,8.063,7.745,7.832,7.285,7.002,6.794,
00106      8*         *6.880,6.425,6.190,5.973,6.098,5.722,5.527,5.346,
00106      9*         *5.474,5.156,4.991,4.838,4.967,4.694,4.551,4.419/
00110     10*          DATA(EXTRA(I),I=37,72) /4.530,4.297,4.174,4.061,
00110     11*         *4.163,3.961,3.855,3.757,3.852,3.675,3.583,3.497,
00110     12*         *3.580,3.426,3.344,3.269,3.342,3.207,3.135,3.069,
00110     13*         *3.135,3.015,2.952,2.893,2.953,2.846,2.789,2.737,
00110     14*         *2.788,2.693,2.643,2.597,2.642,2.557,2.513,2.471/
00112     15*          DATA(EXTRA(I),I=73,108) /2.511,2.435,2.395,2.358,
00112     16*         *2.393,2.325,2.289,2.255,2.285,2.223,2.191,2.161,
00112     17*         *2.187,2.131,2.102,2.076,2.097,2.047,2.021,1.997,
00112     18*         *2.016,1.971,1.947,1.925,1.940,1.899,1.878,1.858,
00112     19*         *1.871,1.834,1.815,1.797,1.807,1.773,1.756,1.740/
00114     20*          DATA(EXTRA(I),I=109,144) /1.748,1.717,1.701,1.687,
00114     21*         *1.693,1.666,1.651,1.637,1.642,1.617,1.603,1.591,
00114     22*         *1.594,1.571,1.559,1.548,1.550,1.529,1.518,1.508,
00114     23*         *1.508,1.489,1.479,1.470,1.469,1.452,1.443,1.435,
```

```
00110
00110           ,4.163,3.961,3.855,3.757,3.[illegible]
00110           ,3.580,3.426,3.344,3.269,3.342,3.207,3.135        9,
00110     1[illegible]      ,3.135,3.015,2.952,2.893,2.953,2.846,2.789        7,
00110     14,   ,2.788,2.693,2.643,2.597,2.642,2.557,2.513,         71/
00112     15,    DATA(EXTRA(I),I=73,108) /2.511,2.435,2.395,2.356,
00112     16,   ,2.393,2.325,2.289,2.255,2.285,2.223,2.191,2.161,
00112     17,   ,2.187,2.131,2.102,2.076,2.097,2.047,2.021,1.997,
00112     18,   ,2.014,1.971,1.947,1.925,1.940,1.899,1.878,1.858,
00112     19,   ,1.871,1.834,1.815,1.797,1.807,1.773,1.756,1.740/
00114     20,    DATA(EXTRA(I),I=109,144) /1.748,1.717,1.701,1.687,
00114     21,   ,1.693,1.665,1.651,1.637,1.642,1.617,1.603,1.591,
00114     22,   ,1.594,1.571,1.559,1.548,1.550,1.529,1.518,1.508,
00114     23,   ,1.508,1.489,1.479,1.470,1.469,1.452,1.443,1.435,

00114     24,   ,1.432,1.417,1.409,1.402,1.398,1.384,1.377,1.370/
00116     25,    DATA(EXTRA(I),I=145,180) /1.366,1.353,1.347,1.341,
00116     26,   ,1.336,1.324,1.318,1.313,1.307,1.297,1.291,1.286,
00116     27,   ,1.280,1.271,1.266,1.261,1.255,1.246,1.242,1.238,
00116     28,   ,1.230,1.223,1.219,1.216,1.208,1.201,1.198,1.195,
00116     29,   ,1.186,1.180,1.177,1.174,1.166,1.161,1.158,1.155/
00120     30,    DATA(EXTRA(I),I=181,216) /1.146,1.142,1.140,1.137,
00120     31,   ,1.128,1.124,1.122,1.120,1.111,1.107,1.106,1.104,
00120     32,   ,1.094,1.091,1.090,1.089,1.078,1.076,1.075,1.074,
00120     33,   ,1.064,1.062,1.061,1.060,1.050,1.048,1.047,1.047,
00120     34,   ,1.034,1.035,1.035,1.034,1.023,1.023,1.022,1.022/
00122     35,    DATA(EXTRA(I),I=217,252) /1.011,1.011,1.011,1.011,
00122     36,   ,1.000,1.000,1.000,1.000,.989,.989,.990,.990,
00122     37,   ,.979,.979,.980,.980,.969,.970,.970,.971,
00122     38,   ,.960,.961,.961,.962,.951,.952,.953,.954,
00122     39,   ,.943,.944,.945,.946,.935,.937,.937,.938/
00124     40,    DATA(EXTRA(I),I=253,288)/ .928,.929,.930,.931,
00124     41,   ,.921,.923,.924,.925,.914,.916,.917,.918,
00124     42,   ,.908,.910,.911,.912,.902,.904,.906,.907,
00124     43,   ,.897,.899,.901,.902,.892,.894,.896,.897,
00124     44,   ,.887,.890,.891,.892,.882,.885,.887,.888/
00126     45,    DATA(EXTRA(I),I=289,324) /.878,.881,.883,.884,
00126     46,   ,.875,.878,.879,.881,.871,.874,.876,.878,
00126     47,   ,.868,.871,.873,.875,.865,.869,.870,.872,
00126     48,   ,.863,.866,.868,.870,.861,.864,.866,.868,
00126     49,   ,.859,.862,.864,.866,.857,.861,.863,.864/
001[illegible]     50,    DATA (BIAS(I),I=1,36) /10.28,16.43,43.78,16.79,.13,7.40,.31,.17,
00130     51,   2 12.49,-6.09,2.02,2.27,.86,9.63,-9.40,-1.20,17.32,7.66,-11.00,
00130     52,   3 -2.99,13.54,4.27,-12.21,-4.36,10.64,5.20,-12.23,-4.82,8.49,
00130     53,   4 4.42,-12.13,-5.11,7.16,3.81,-12.05,-5.35,5.91,3.30/
00132     54,    DATA (BIAS(I),I=37,72) /-11.41,-5.14,5.10,2.93,-10.80,-4.91,
00132     55,   2 4.46,2.62,-10.28,-4.71,3.91,2.36,-9.64,-4.42,3.50,2.14,
00132     56,   3 -8.95,-4.07,3.20,1.97,-8.35,-3.76,2.93,1.81,-7.82,-3.50,
00132     57,   4 2.78,1.68,-7.19,-3.16,2.54,1.56,-6.62,-2.86,2.40,1.46/
00134     58,    DATA (BIAS(I),I=73,108) /-6.11,-2.59,2.27,1.37,-5.64,-2.33,
00134     59,   2 2.16,1.29,-5.12,-2.03,2.11,1.23,-4.65,-1.76,2.06,1.17,-4.22,
00134     60,   3 -1.51,2.02,1.12,-3.83,-1.28,1.97,1.07,-3.50,-1.13,1.87,1.01,
00134     61,   4 -3.20,-1.00,1.78,.95,-2.92,-.87,1.73,.89/
00136     62,    DATA (BIAS(I),I=109,144) /-2.66,-.75,1.62,.84,-2.38,-.61,
00136     63,   2 1.58,.80,-2.12,-.47,1.54,.77,-1.87,-.34,1.51,.73,-1.64,
00136     64,   3 -.21,1.47,.70,-1.43,-.11,1.44,.67,-1.24,-.01,1.49,.64,
00136     65,   4 -1.07,.07,1.36,.61,-.90,-.16,1.32,.59/
00140     66,    DATA (BIAS(I),I=145,180) /-.74,.23,1.29,.56,-.62,.27,1.23,.53,
00140     67,   2 -.51,.31,1.18,.50,-.41,.36,1.12,.47,-.31,.38,1.07,.44,-.92,
00140     68,   3 .40,1.02,.41,-.16,.41,.76,.38,-.10,.41,.89,.36,-.04,.41,
00140     69,   4 .83,.33/
00142     70,    DATA (BIAS(I),I=181,216) /.01,.42,.78,.30,.05,.41,.71,.27,
00142     71,   2 .07,.38,.64,.24,.09,.35,.57,.21,.10,.32,.50,.19,.12,.30,
00142     72,   3 .44,.16,.11,.25,.36,.13,.08,.18,.26,.09,.05,.12,.17,.06/
00144     73,    DATA (BIAS(I),I=217,252) /.03,.06,.08,.03,-.03,-.00,-.00,
00144     74,   2 -.00,-.05,-.08,-.10,-.04,-.12,-.18,-.21,-.07,-.18,-.28,
00144     75,   3 -.32,-.11,-.24,-.37,-.42,-.15,-.30,-.45,-.52,-.18,-.37,
00144     76,   4 -.56,-.63,-.21,-.46,-.67,-.75,-.25/
00146     77,    DATA (BIAS(I),I=253,288) /-.55,-.78,-.36,-.29,-.63,-.89,
00146     78,   2 -.97,-.33,-.70,-.99,-1.07,-.35,-.80,-1.10,-1.18,-.40,
00146     79,   3 -.91,-1.25,-1.32,-.44,-1.02,-1.38,-1.44,-.48,-1.12,
00146     80,   4 -1.50,-1.56,-.52,-1.22,-1.61,-1.67,-.55,-1.34,-1.76,-1.80,-.59/
00150     81,    DATA (BIAS(I),I=289,324) /-1.54,-1.99,-2.00,-.65,-1.73,-2.21,
```

```
00150          2 -2.19,-.72,-1.89,-2.40,-2.36,-.77,-2.05,-2.54,-2.62,-.82,
00150          3 -2.21,-2.77,-2.69,-.87,-2.55,-3.14,-3.01,-.97,-2.84,-3.47,
00150          4 -3.29,-1.05,-3.09,-3.76,-3.53,-1.13,-3.31,-4.00,-3.74,-1.19/
00152           DATA BLANK/' '/
00154           KS = 0
00155           DO 200 I=1,NOFEAT
00160           K=(FETVEC(I)-1)/4
00161           IF (ISUNC.NE.0.AND.I.EQ.1) KS=K
00163           KR=FETVEC(I)-K*4
00164           K=K+1
00165           SUNA = SUNANG(K-KS)
00166      100  IND=(SUNA-5)*4+KR
00167           SUNCOR(I)=EXTRA(IND)
00170           SABIAS(I)=BIAS(IND)
00171      200  CONTINUE
00173           WRITE(6,90)
00175       90  FORMAT(//T61,'SUN ANGLES'/)
00176           WRITE (6,210) (SUNANG(I), I = 1,8)
00204      210  FORMAT(T45,8I5)
00205           WRITE(6,215)
00207      215  FORMAT(//T52,'CORRECTIONS FOR SUN ANGLES')
00207     C
00210           NOFETR = NOFEAT
00211           ISTART = 1
00212           IEND = 16
00213      217  IF (IEND .GE. NOFETR) IEND = NOFETR
00215           IENDS = ISTART + IEND - 1
00216           WRITE(6,220)(BLANK,FETVEC(I),I=ISTART,IENDS)
00225      220  FORMAT(//1X,16(A1,'CH(',I2,')',1X))
00226           WRITE(6,230)(SUNCOR(I),I=ISTART,IENDS)
00234      230  FORMAT (3X,'THE SUN ANGLE GAIN FACTORS ARE'/16(2X,F6.2))
00235           WRITE (6,231) (SABIAS(I),I=ISTART,IENDS)
00243      231  FORMAT (3X,'THE SUN ANGLE BIAS FACTORS ARE'/16(2X,F6.2))
00243     C
00244           NOFETR = NOFETR - IEND
00245           ISTART = IENDS + 1
00246           IF (NOFETR .LE. 0) RETURN
00250           GO TO 217
00251           END

     END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR PCHAMI.PCMAML                                                                    03 MAR 78        (7! 0149.77)
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E1201001DA)
THIS COMPILATION WAS DONE ON 03 MAR 78 AT 17:00:49

   SUBROUTINE PCMAML     ENTRY POINT 000133

   STORAGE USED: CODE(1) 000162; DATA(0) 000355; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   SUPSUM
    0004   NERR3$

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

    0001   000035 105G       0001   000045 110G       0001   000067 113G       0000   000315 INJP$      0000 I 000310 I1
    0000 I 000312 I2         0000 I 000311 I3         0000 R 000000 P          0003 R 000000 SUPSUM


00101      1*             SUBROUTINE PCMAML(A,X,B,I,J,K,NA,NX,NB)
00101      2*     C                                                                     MAI03520
00101      3*     C                                                                     MAI03530
00101      4*     C      * MATRIX MULTIPLICATION                                        MAI03540
00101      5*     C  ............ PARAMETER DEFINITIONS ............................    MAI03550
00101      6*     C      * A(I,J) * X(J,K) = B(I,K)                                     MAI03560
00101      7*     C      * WHERE                                                        MAI03570
00101      8*     C      * I = NUMBER OF ROWS IN A                                      MAI03580
00101      9*     C      * J = NUMBER OF COLUMNS IN A AND ROWS IN X                     MAI03590
00101     10*     C      * K = NUMBER OF COLUMNS IN X                                   MAI03600
00101     11*     C      *                                                              MAI03620
00101     12*     C      *                                                              MAI03630
00101     13*     C      SUBROUTINES USED                                               MAI03640
00101     14*     C         SUPSUM, ORDER                                               MAI03650
00101     15*     C      *                                                              MAI03660
00101     16*     C      *                                                              MAI03670
00103     17*             DIMENSION A(NA,NX),X(NX,NB),B(NA,NB),P(200)
00103     18*     C                                                                     MAI03690
00103     19*     C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- MAI03700
00103     20*     C      *  P = WORK VECTOR FOR SUMMING.  DIMENSION LIMITS MULTIPLY TO  MAI03710
00103     21*     C      *        LARGEST DIMENSION BEING 200.                          MAI03720
00103     22*     C      P = COMMON WORK AREA USED BY MATMUL
00103     23*     C                                                                     MAI03770
00103     24*     C                                                                     MAI03790
00104     25*            DO 100 I1 = 1, I                                               MAI03800
00107     26*            DO 100 I3 = 1, K                                               MAI03810
00112     27*            DO 200 I2 = 1, J                                               MAI03820
00115     28*            P(I2) = A(I1,I2) * X(I2,I3)                                    MAI03830
00116     29*     200    CONTINUE                                                       MAI03840
00120     30*             B(I1,I3) = SUPSUM(P,J,NX)
00121     31*     100    CONTINUE                                                       MAI03860
00124     32*            RETURN                                                         MAI03870
00125     33*             END
```

END OF COMPILATION: NO DIAGNOSTICS.

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OF POOR QUALITY

```
@ FOR SUPSUM,SUPSUM
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(FXECB LEVEL E1201001OA)          03 MAR 78          17: 0148.537
THIS COMPILATION WAS DONE ON 03 MAR 78 AT 17:00:48

    FUNCTION SUPSUM        ENTRY POINT 000107

    STORAGE USED: CODE(1) 000133; DATA(0) 000024; BLANK COMMON(2) 000000

    EXTERNAL REFERENCES (BLOCK, NAME)

     0003   ORDI
     0004   NERR3$

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

     0001   000041 100L      0001   000065 110L      0001   000034 111G      0000 I 000001 IM2      0000   000005 INJP$
     0000 I 000002 J         0000 I 000003 JP1       0000 R 000000 SUPSUM

          FUNCTION SUPSUM(A,I,N)
      C   *                                                                 MAI04390
      C ............ PARAMETER DEFINITIONS ...............................  MAI04390
      C   A = INPUT VECTOR.                                                 MAI04400
      C   I = ENDING POSITION IN A TO SUM TO.                               MAI04410
      C   N = SIZE OF A                                                     MAI04420
      C   NOTE:  --  THE VALUES IN A ARE DESTROYED BY THIS FUNCTION         MAI04430
      C                                                                     MAI04440
      C   FUNCTION TO FORM THE ORDERED SUM OF ELEMENTS IN A.                MAI04450
      C                                                                     MAI04460
      C   *                                                                 MAI04470
      C   *                                                                 MAI04480
      C   SUBROUTINES USED                                                  MAI04490
      C     ORDI                                                            MAI04500
      C   *                                                                 
      C   *                                                                 MAI04520
      C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- MAI04530
      C                                                                     MAI04540
          DIMENSION A(N)                                                    MAI04550
      C                                                                     MAI04560
      C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- MAI04570
          IF( I .LE. 2 ) GO TO 110                                          MAI04580
           CALL ORDI(A,1,I,N)                                               MAI04590
          IM2 = I - 2
          DO 100 J=1, IM2                                                   MAI04610
          JP  = J + 1                                                       MAI04620
          A(JP1) = A(J) + A(JP1)                                            MAI04630
          IF( ABS(A(JP1)) .LE. ABS(A(J+2)) ) GO TO 100                      MAI04640
           CALL ORDI(A,JP1,I,N)                                             MAI04650
      100 CONTINUE
      110 SUPSUM = A(I) + A(I-1)                                            MAI04670
          RETURN                                                            MAI04680
           END                                                              MAI04690
```

165

END OF COMPILATION: NO DIAGNOSTICS.

```
00523      18*            WRITE(IOUT,152)                                              
00525      48*     152    FORMAT(///,10X,' VECTOR OF EIGEN VALUE.    ,I = ',/)          MAI01200
00526     229*            WRITE(IOUT,IFMT) (C(I),I=1,NR)                               MAI01210
00534     230*            WRITE(IOUT,153)                                              MAI01220
00536     231*     153    FORMAT(///,10X,'VECTOR OF RADII R(I) = ',/)                  MAI01230
00537     232*            WRITE(IOUT,IFKT) (R(I),I=1,NR)                               MAI01240
00545     233*            RETURN                                                       MAI01250
00546     234*             END                                                         MAI06960

      END OF COMPILATION:          NO  DIAGNOSTICS.


@ FOR MINDEX,MINDEX
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(FXFCB LEVEL E1201031OA)                     03 MAR 78          17: 0:47.303
THIS COMPILATION WAS DONE ON 03 MAR 78 AT 17:00:47

   SUBROUTINE MINDEX     ENTRY POINT 000065

   STORAGE USED: CODE(1) 000100; DATA(0) 000024; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003    NERR3S

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

    0001   000044 10L       0001   000023 1076      0001   000015 9L        0000 I 000002 I        0000 I 000001 ICK
    0000 I 000000 IJ        0000   000005 INJPS     0000 I 000003 L         0000 I 000004 M

00101       1*            SUBROUTINE MINDEX(R,JM,IM,N)                                 MAI04710
00101       2*      C                                                                  MAI01260
00101       3*      C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- MAI01270
00101       4*      C                                                                  MAI06970
00101       5*      C                                                                  MAI04750
00101       6*      C     SUBROUTINE TO PLACE THE INDEX OF THE SMALLEST VALUE IN R INTO    MAI04760
00101       7*      C        JM(1). THE NEXT SMALLEST IN JM(2) ETC.                      MAI04770
00101       8*      C                                                                  MAI04780
00101       9*      C ............ PARAMETER DEFINITIONS ............................ MAI04790
00101      10*      C     R = INPUT VECTOR OF VALUES                                   MAI04800
00101      11*      C     JM = VECTOR OF LENGTH N WHOSE ELEMENTS HAVE BEEN INITIALIZED MAI04810
00101      12*      C        TO JM(1) = 1, JM(2) = 2, JM(3) = 3, ... JM(N) = N .       MAI04820
00101      13*      C     IM = POSITION (INDEX) OF PLACE TO BEGIN SCAN IN R            MAI04830
00101      14*      C     N = MAX SIZE OF R AND JM                                    MAI04840
00101      15*      C     .                                                            MAI04850
00101      16*      C     .                                                            MAI04860
00101      17*      C     SUBROUTINES USED                                             MAI04870
00101      18*      C        NONE.                                                     MAI04880
00101      19*      C     .                                                            MAI04890
00101      20*      C     .                                                            MAI04900
00101      21*      C                                                                  MAI04910
00103      22*            DIMENSION R(N),JM(N)                                         MAI04920
00103      23*      C                                                                  MAI04930
00103      24*      C --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- MAI04940
00103      25*      C                                                                  MAI04950
00104      26*            IJ=N-1                                                       MAI04960
00105      27*      9     ICK=0                                                        MAI04970
00106      28*            DO 10 I=IM,IJ                                                MAI04980
00111      29*            L=JM(I)                                                      MAI04990
00112      30*            M=JM(I+1)                                                    MAI05000
00113      31*            IF(R(L).LE.R(M))GO TO 10                                     MAI05010
00115      32*            JM(I)=M                                                      MAI05020
00116      33*            JM(I+1)=L                                                    MAI05030
00117      34*            ICK=1                                                        MAI05040
```

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```
00120      35.     10    CONTINUE                                                    MAI05050
00122      36.           IF(ICK.NE.0)GO TO 9                                         MAI05060
00124      37.           RETURN                                                      MAI05070
00125      38.            END

        END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR ORD1,ORD1                                                                    03 MAR 78        17; 0;51. 46
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 03 MAR 78 AT 17:00:51

   SUBROUTINE ORD1       ENTRY POINT 000116

   STORAGE USED: CODE(1) 000133; DATA(0) 000022; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NERR3S

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

    0001   000022 110G       0001   000005 150L      0001   000077 200L      0001   000102 210L      0000 R 000003 COPY
    0000   000006 INJPS      0000 I 000000 IXSTOP    0000 I 000001 J         0000 I 000002 JP1       0000 I 000004 K
    0000 I 000005 KP1

00101      1*          SUBROUTINE ORD1(A,I1,I2,N)
00101      2*    C                                                              MAI03930
00101      3*    C     SUBROUTINE TO REORDER A VECTOR INTO ASCENDING ORDER      MAI03940
00101      4*    C     .                                                        MAI03950
00101      5*    C     .                                                        MAI03960
00101      6*    C  ............ PARAMETER DEFINITIONS ........................ MAI03970
00101      7*    C     A = INPUT VECTOR    ---    RESULTS RETURNED IN A         MAI03980
00101      8*    C     I1 = BEGINNING POSITION IN VECTOR                        MAI03990
00101      9*    C     I2 = ENDING POSITION IN VECTOR                           MAI04000
00101     10*    C     N = MAXIMUM LENGTH OF VECTOR                             MAI04010
00101     11*    C     .                                                        MAI04020
00101     12*    C     .                                                        MAI04030
00101     13*    C     SUBROUTINES USED                                         MAI04040
00101     14*    C        NONE.                                                 MAI04050
00101     15*    C     .                                                        MAI04060
00101     16*    C     .                                                        MAI04070
00101     17*    C                                                              MAI04080
00103     18*          DIMENSION A(N)                                           MAI04090
00103     19*    C                                                              MAI04100
00103     20*    C --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  MAI04110
00103     21*    C                                                              MAI04120
00104     22*          IXSTOP = I2 - 1                                          MAI04130
00105     23*          IF( (IXSTOP-I1) .LT. 1 ) GO TO 210                       MAI04140
00107     24*          DO 200 J=I1, IXSTOP                                      MAI04150
00112     25*          JP1 = J + 1                                              MAI04160
00113     26*          IF( ABS(A(J)) .LE. ABS(A(JP1)) ) GO TO 200               MAI04170
00115     27*          COPY = A(J)                                              MAI04180
00116     28*          A(J) = A(JP1)                                            MAI04190
00117     29*          A(JP1) = COPY                                            MAI04200
00120     30*          K = J                                                    MAI04210
00121     31*    150   K = K - 1                                                MAI04220
00122     32*          IF( K .LT. I1 ) GO TO 200                                MAI04230
00124     33*          KP1 = K + 1                                              MAI04240
```

```
00125      340.          IF( ABS(A(K)) .LE. ABS(A(KP1)) ) GO TO 200                    MAI04250
00127      350.          COPY = A(K)                                                   MAI04260
00130      360.          A(K) = A(KP1)                                                 MAI04270
00131      370.          A(KP1) = COPY                                                 MAI04280
00132      380.          GO TO 150                                                     MAI04290
00133      390.    200   CONTINUE                                                      MAI04300
00135      400.    210   CONTINUE                                                      MAI04310
00136      410.          RETURN                                                        MAI04320
00137      420.          END                                                           MAI04330

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

APPENDIX G

VERIFICATION RUNS

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT ... ORIGINAL 23 FEB 78
HOUSTON,TEXAS

TEST RUN 1

```
$STAT
   DATAFI    FILE=6
   CHANNE    DATA=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16  FILTER=5,6,7,8
   B-MATR    CARDS
```

172

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

LINEAR TRANSFORMATION (B) MATRIX

```
NO. LINEAR COMB.  =  4
NO. CHANNELS      =  4
```

```
CH( 5)    CH( 6)    CH( 7)    CH( 8)
```

LINEAR TRANSFORMATION (B) MATRIX

NO. LINEAR COMB. = 4
NO. CHANNELS = 4

LIN. CMB.	CH(5)	CH(6)	CH(7)	CH(8)
1	.4330+00	.6320+00	.5860+00	.2640+00
2	-.2800+00	-.5620+00	.6000+00	.4910+00
3	-.8290+00	.5220+00	-.3900-01	.1940+00
4	.2230+00	.1200-01	-.5430+00	.8100+00
BIAS	0.0,16.0,25.0,20.0			

```
THE BIAS ARE
    .00      16.00      25.00      20.00
  OPTION     TASSEL
  OPTION     COVAR
  OPTION     HIST
  HISTO      1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
  STATFI     FILE=2
  OPTION     MAXSUB=1
  HEDI       RUN TO MAKE SURE THE CHANGES DIDN•T EFFECT THE ORIGINAL
  .END.
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFE IE ORIGINAL 23 FEB 78
HOUS. ,TEXAS

YOU HAVE SELECTED THE FOLLOWING SSTAT PROCESSOR OPTIONS:

PRINT MEAN AND COVARIANCE FOR EACH FIELD
PRINT A HISTOGRAM FOR EACH FIELD
PRINT A HISTOGRAM FOR EACH SUBCLASS
PRINT MEAN AND COVARIANCE FOR EACH SUBCLASS

SUPERVISOR INFORMATION:

UNUSED CORE 28 LOCATIONS
MAXIMUM NO. OF FIELDS..204
MAXIMUM NO. OF SUBCLASSES... 1
CHANNELS SELECTED ARE 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16,
HISTOGRAM CHANNELS ARE 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16,

INPUT IMAGE DATA TAPE INFORMATION

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

174

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

TRAINING FIELDS

FIELD NO.	FIELD NAME	CLASS	SUBCLASS	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
1	BI-01	BARLEY	SWHEAT	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

[illegible]

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   23 FEB 78
HOUSTON,TEXAS

TRAINING FIELDS

FIELD NO.	FIELD NAME	CLASS	SUBCLASS	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
1	81-01	BARLEY	SWHEAT	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

22850 POINTS WILL BE USED IN THE FIELD   MEAN,COVARIANCE CALCULATIONS

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RUN TO MAKE SURE THE CHANGES DIDN'T EFFEC . ORIGINAL HOUSTO.., .EXAS 23 FEB 78

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING FIELD 81-01

MEAN:	32.88	36.49	46.25	19.18	27.11	26.08	55.25	24.80	22.63	22.40	43.46	20.20
ST DEV:	5.21	8.47	10.43	5.02	4.61	8.38	12.97	7.22	4.41	8.01	8.21	4.98
MEAN:	26.16	34.34	40.01	17.25								
ST DEV:	4.74	9.39	10.25	4.42								

COVARIANCE MATRIX

27.10											
42.28	71.81										
30.49	36.99	108.85									
10.34	10.28	50.30	25.22								
12.24	17.91	17.56	6.51	21.28							
20.47	31.16	33.36	12.62	36.37	70.22						
14.58	23.26	27.74	13.52	-11.53	-35.94	168.19					
5.20	8.40	11.37	6.13	-11.22	-28.15	91.02	52.19				
8.60	10.52	19.38	8.20	13.38	27.76	-23.67	-15.89	19.41			
15.52	20.71	34.54	15.40	25.54	52.45	-43.99	-29.61	33.68	64.15		
7.80	10.28	23.03	11.92	-5.87	-16.33	78.44	43.36	-9.26	-19.92	67.39	
2.51	3.46	8.37	4.80	-7.10	-16.72	50.78	29.10	-10.11	-20.16	38.53	24.80
11.61	19.63	7.52	1.70	.71	-1.07	29.74	15.45	-3.43	-5.15	12.29	7.75
20.27	36.30	10.18	1.66	-2.09	-11.07	72.71	38.88	-11.59	-20.06	32.42	21.15
11.61	21.66	4.86	1.02	-10.94	-27.19	89.53	49.46	-19.54	-34.89	46.84	30.80
2.26	4.49	.52	.30	-6.56	-14.76	39.36	22.15	-9.72	-17.54	22.06	14.61

22.47			
41.64	88.18		
38.50	84.32	104.99	
13.57	31.45	43.17	19.56

CORRELATION MATRIX

1.00											
.96	1.00										
.56	.42	1.00									
.40	.24	.96	1.00								
.51	.46	.36	.28	1.00							
.47	.44	.38	.30	.94	1.00						
.22	.21	.21	.21	-.19	-.33	1.00					
.14	.14	.15	.17	-.34	-.47	.97	1.00				
.37	.28	.42	.37	.66	.75	-.91	-.50	1.00			
.37	.31	.44	.38	.69	.78	-.92	-.51	.95	1.00		
.18	.15	.27	.29	-.16	-.24	.74	.73	-.26	-.30	1.00	
.10	.08	.16	.19	-.31	-.40	.79	.81	-.46	-.51	.94	1.00
.47	.49	.15	.07	.03	-.03	.48	.45	-.16	-.14	.32	.33
.41	.46	.10	.04	-.05	-.14	.60	.57	-.28	-.27	.42	.45
.22	.25	.05	.02	-.23	-.32	.67	.67	-.43	-.43	.56	.60
.10	.12	.01	.01	-.32	-.40	.69	.69	-.50	-.50	.61	.66

1.00			
.94	1.00		
.79	.88	1.00	
.65	.76	.95	1.00

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL . 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD BI-A1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

CHANNEL 1

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD   B1-A1

(NO. SAMPLES=   22850 , SUBCLASS= SWHEAT)

```
CHANNEL  1
----------

   EACH * REPRESENTS   1633  POINT(S).

 22862 I                                                                                                   S
 21229 I                                                                                                   *
 19596 I                                                                                                   *
 17963 I                                                                                                   *
 16330 I                                                                                                   *
 14697 I                                                                                                   *
 13064 I                                                                                                   *
 11431 I                                                                                                   *
  9798 I                                                                                                   *
  8165 I                                                                                                   *
  6532 I                                                                                                   *
  4899 I                                                                                                   *
  3266 I                                                                                                   *
  1633 I                                                                                                   *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120

CHANNEL  2
----------

   EACH * REPRESENTS   1638  POINT(S).

 22932 I                                                                                                   *
 21294 I                                                                                                   *
 19656 I                                                                                                   *
 18018 I                                                                                                   *
 16380 I                                                                                                   *
 14742 I                                                                                                   *
 13104 I                                                                                                   *
 11466 I                                                                                                   *
  9828 I                                                                                                   *
  8190 I                                                                                                   *
  6552 I                                                                                                   *
  4914 I                                                                                                   *
  3276 I                                                                                                   *
  1638 I                                                                                                   *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFEC. HE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

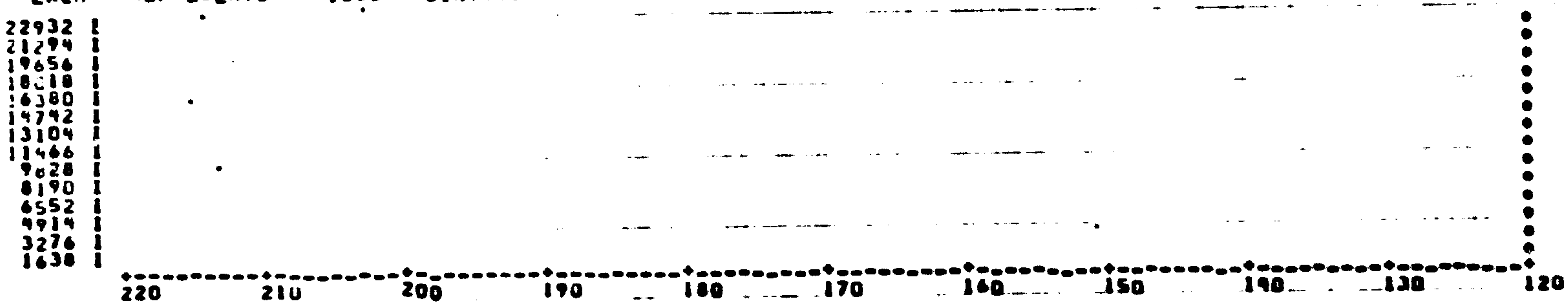
HISTOGRAM

TRAINING FIELD   BI-ÑI

(NO. SAMPLES=   22850 , SUBCLASS= SWHEAT)

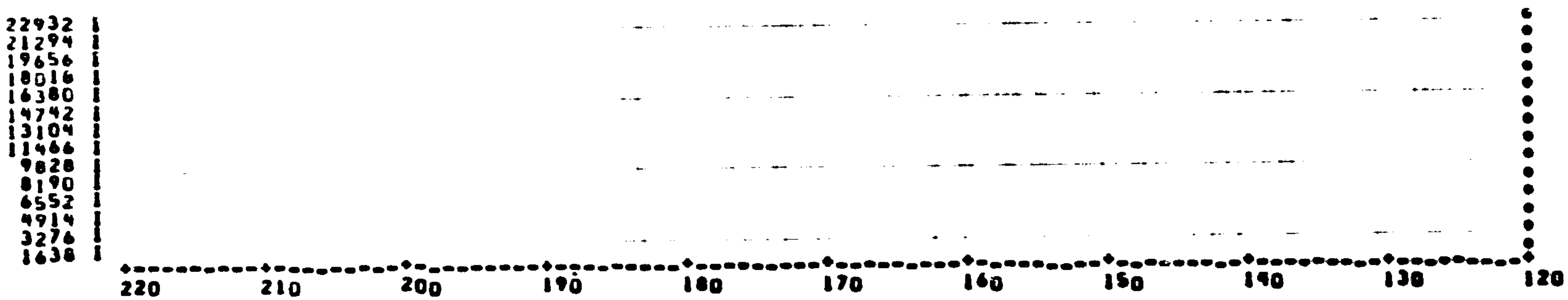
CHANNEL 3

EACH • REPRESENTS   1638 POINT(S).



CHANNEL 4

EACH • REPRESENTS   1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING FIELD   BI-ÑI

(NO. SAMPLES=   22850 , SUBCLASS= SWHEAT)

CHANNEL 5

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

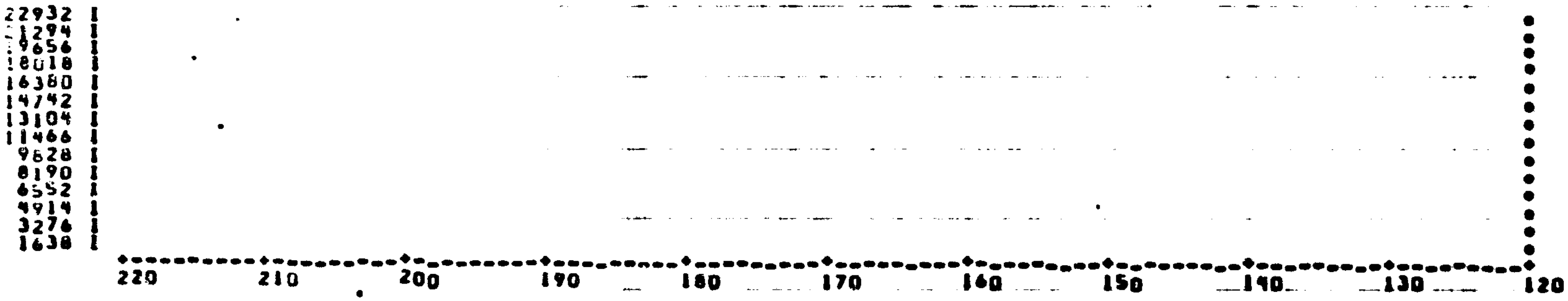
HISTOGRAM

TRAINING FIELD 81-A1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

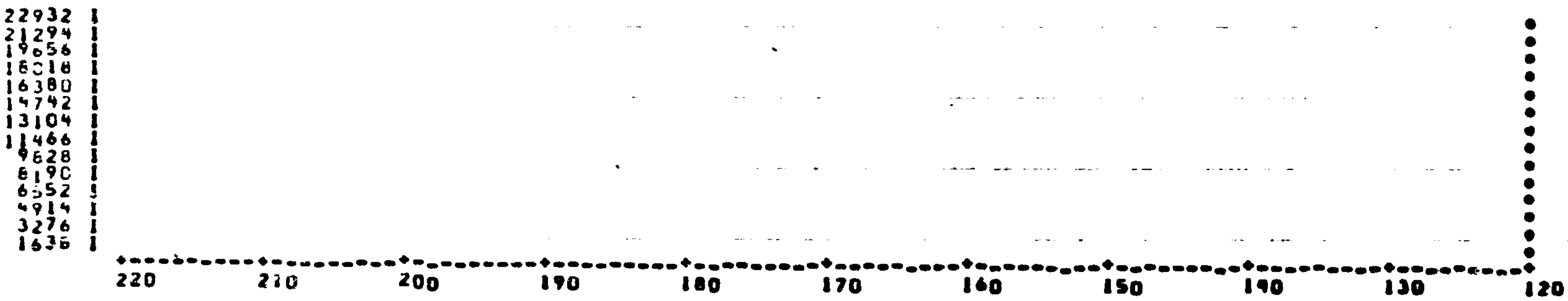
CHANNEL 5

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 6

EACH • REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

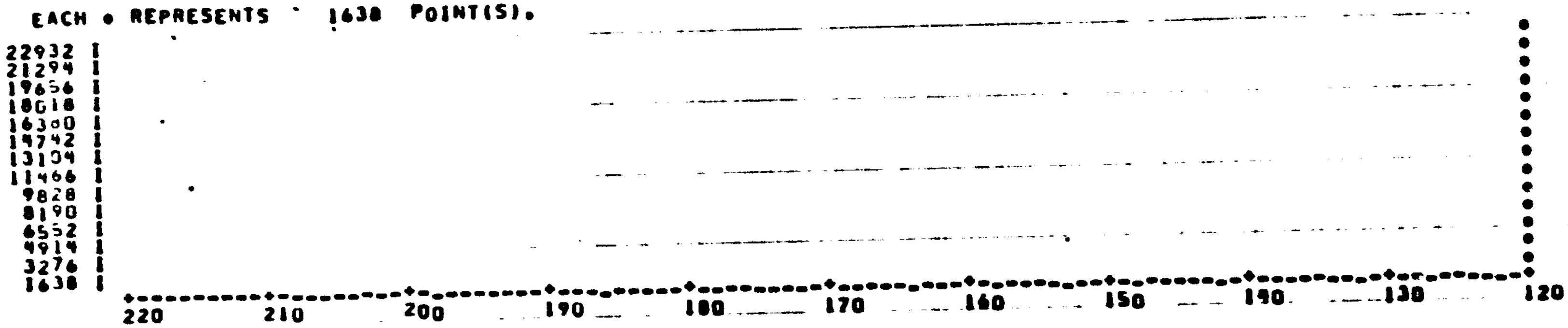
HISTOGRAM

TRAINING FIELD B1-n1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

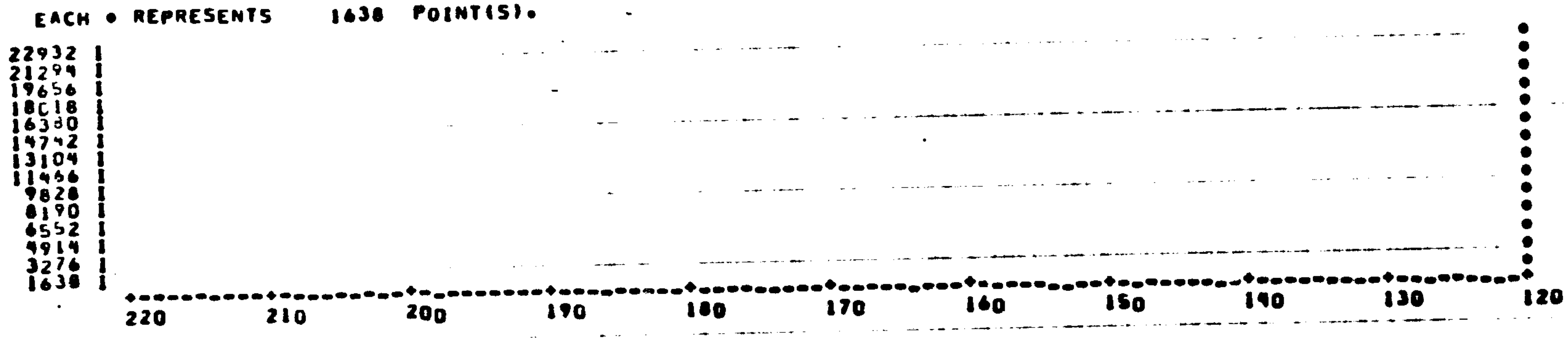
CHANNEL 7

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 8

EACH • REPRESENTS 1638 POINT(S).



C-3

181

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD B1-n1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

CHANNEL 9

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

23 FEB 78

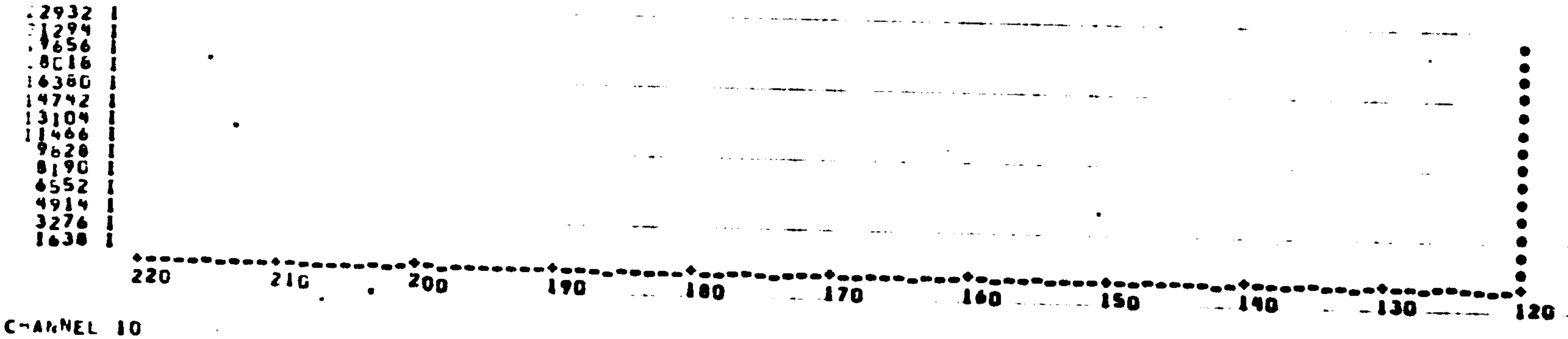
HISTOGRAM

TRAINING FIELD   B1-01

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

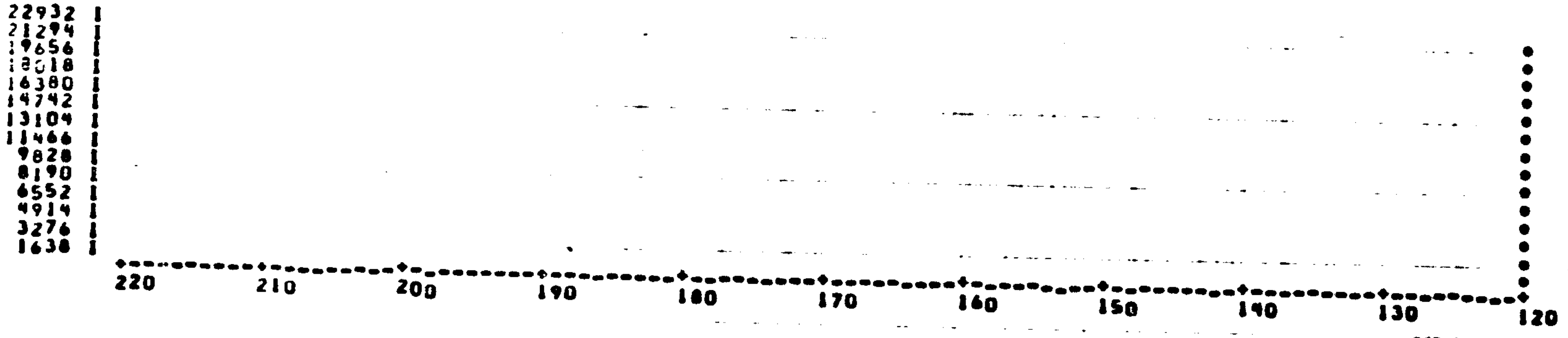
CHANNEL 9

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 10

EACH • REPRESENTS 1638 POINT(S).



182

RUN TO MAKE SURE THE CHANGES DIDN'T EFFE THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

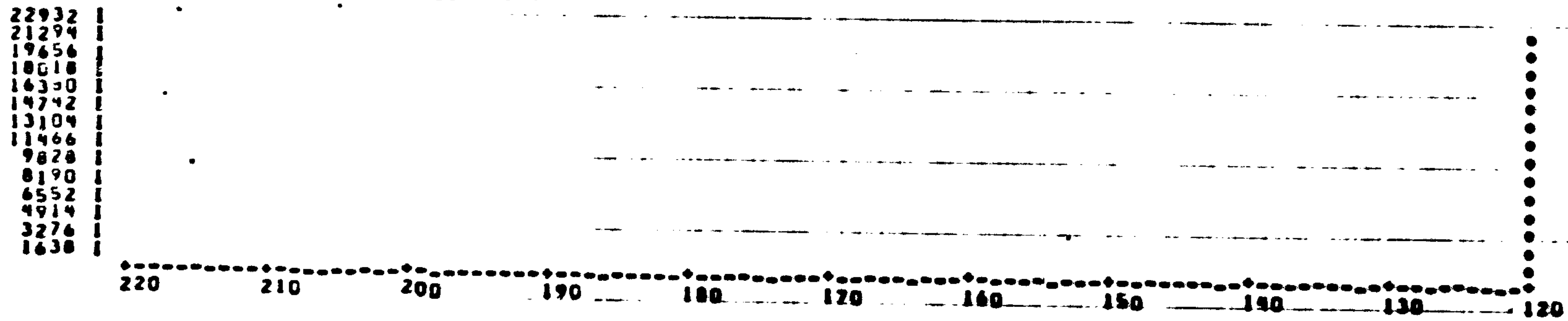
HISTOGRAM

TRAINING FIELD   B1-n1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

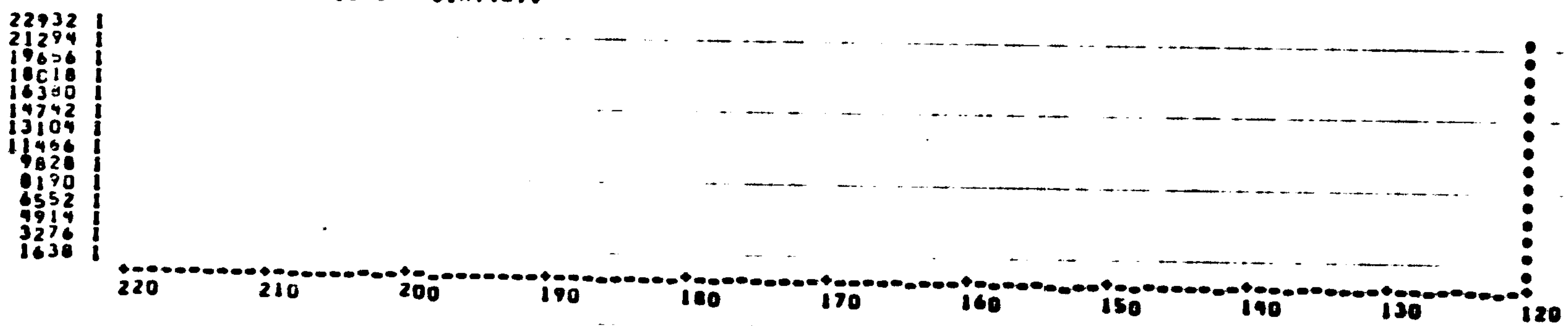
CHANNEL 11

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 12

EACH • REPRESENTS 1638 POINT(S).



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OF POOR QUALITY

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING FIELD   B1-n1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

CHANNEL 13

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

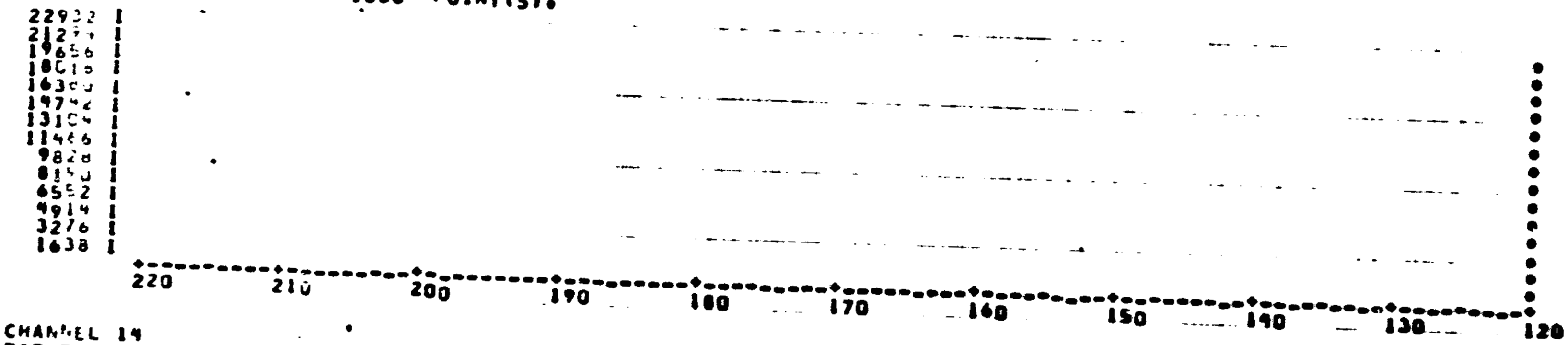
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

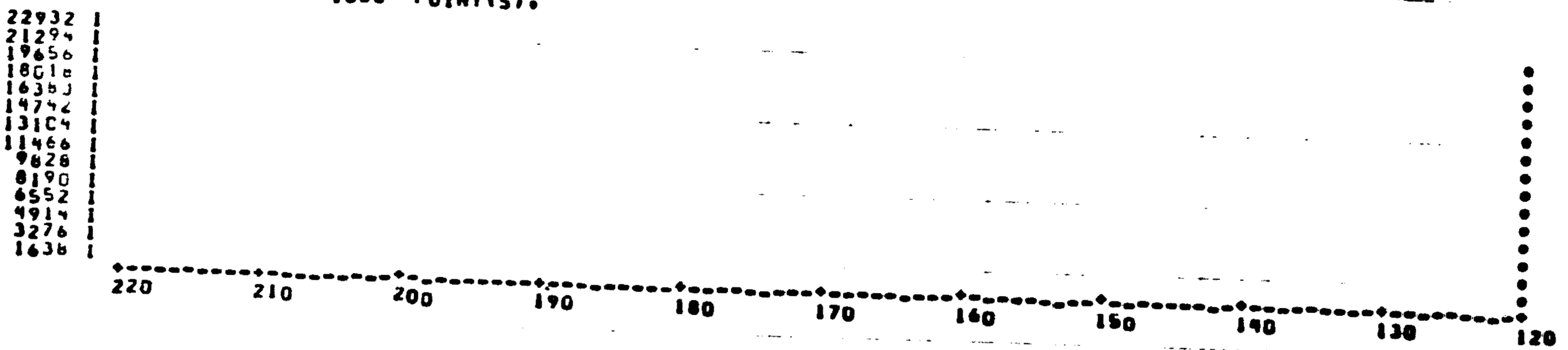
CHANNEL 13

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 14

EACH • REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

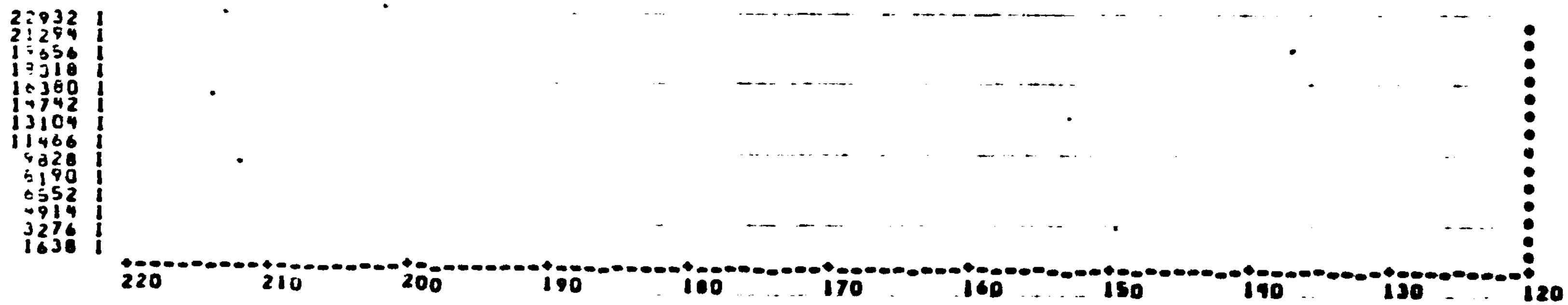
HISTOGRAM

TRAINING FIELD BI-A1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

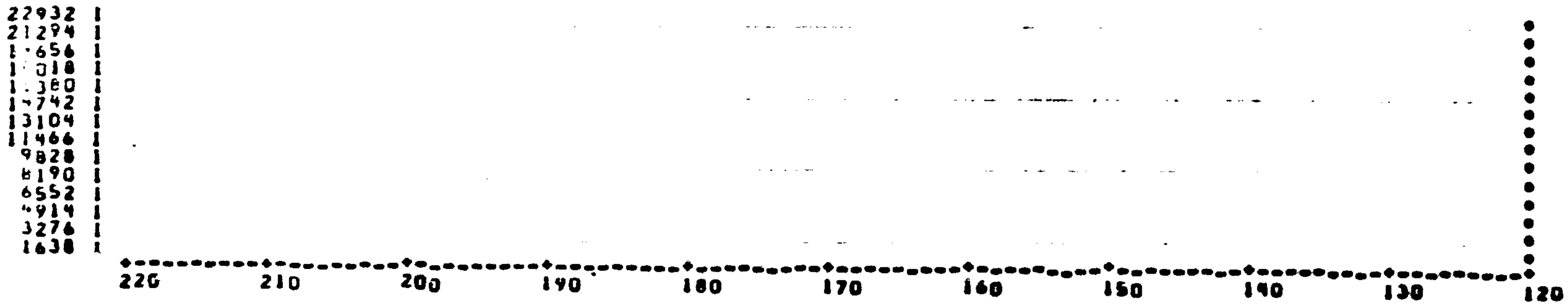
CHANNEL 15

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 16

EACH * REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFE.. THE ORIGINAL
HOUSTON,TEXAS

?? ..B 78

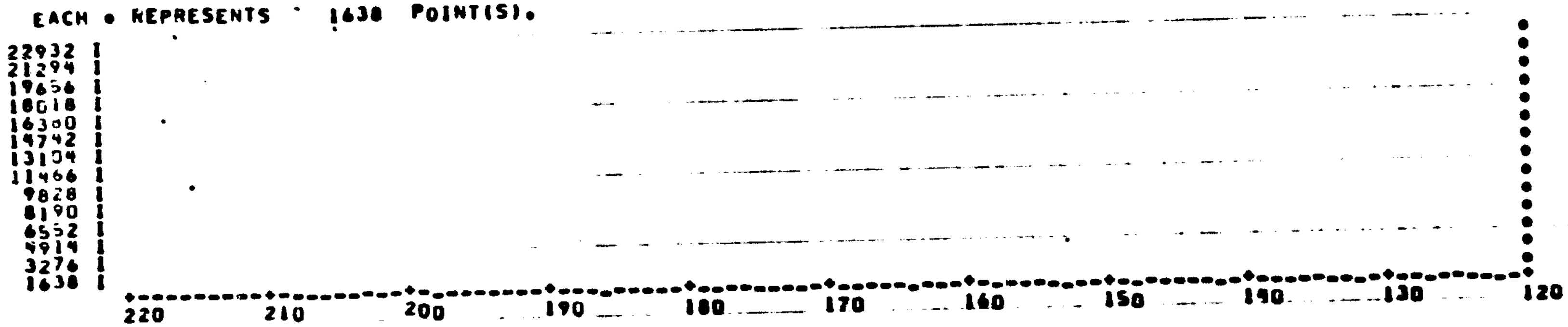
HISTOGRAM

TRAINING FIELD 81-n1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

CHANNEL 7

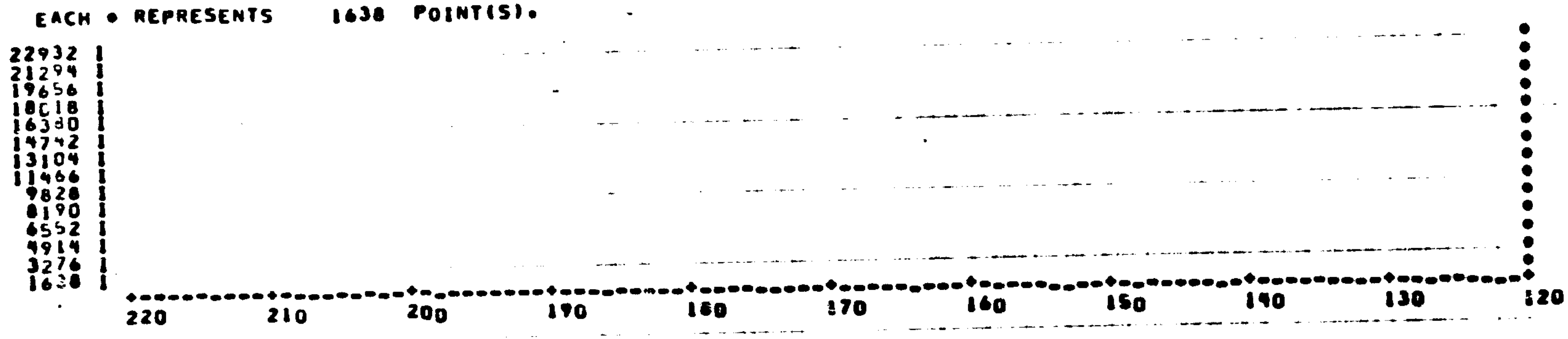
EACH • REPRESENTS 1638 POINT(S).



C-3

CHANNEL 8

EACH • REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING FIELD 81-n1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

CHANNEL 9

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

23 FEB 78

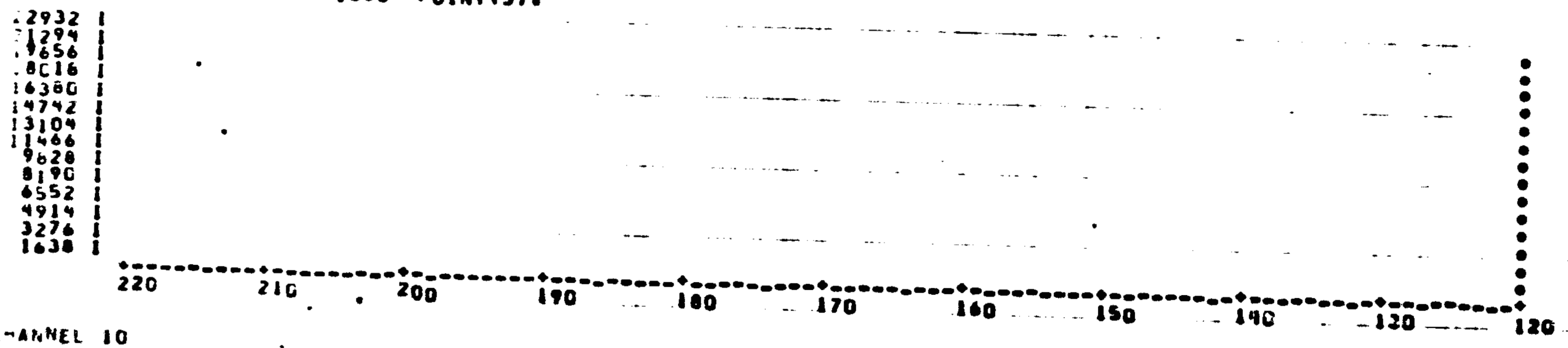
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

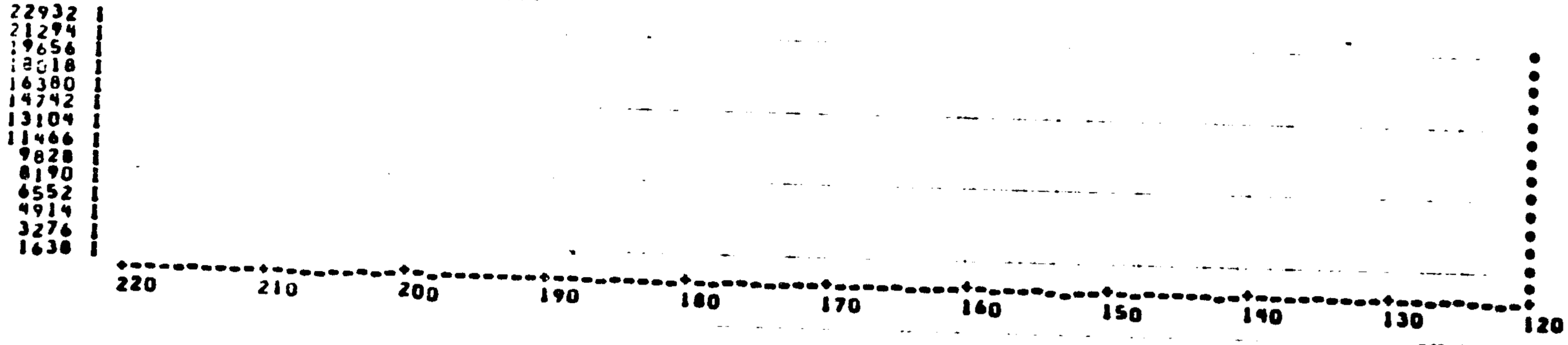
CHANNEL 9

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 10

EACH * REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFE THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

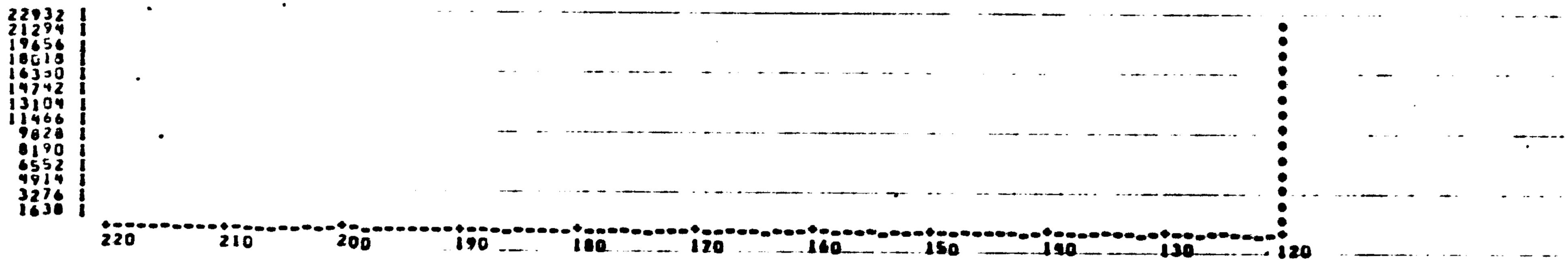
HISTOGRAM

TRAINING FIELD 81-ñ1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

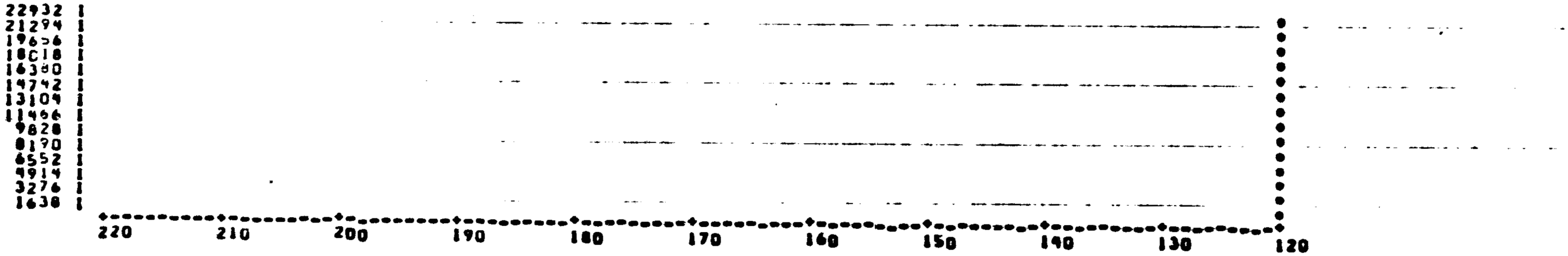
CHANNEL 11

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 12

EACH • REPRESENTS 1638 POINT(S).



ORIGINAL PAGE IS
OF POOR QUALITY

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD 81-ñ1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

CHANNEL 13

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

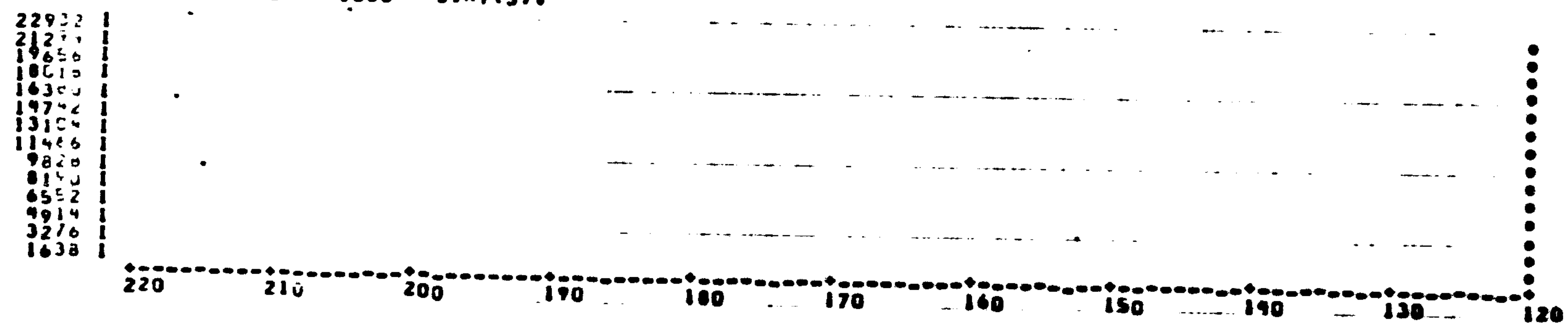
HISTOGRAM

TRAINING FIELD B1-A1

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

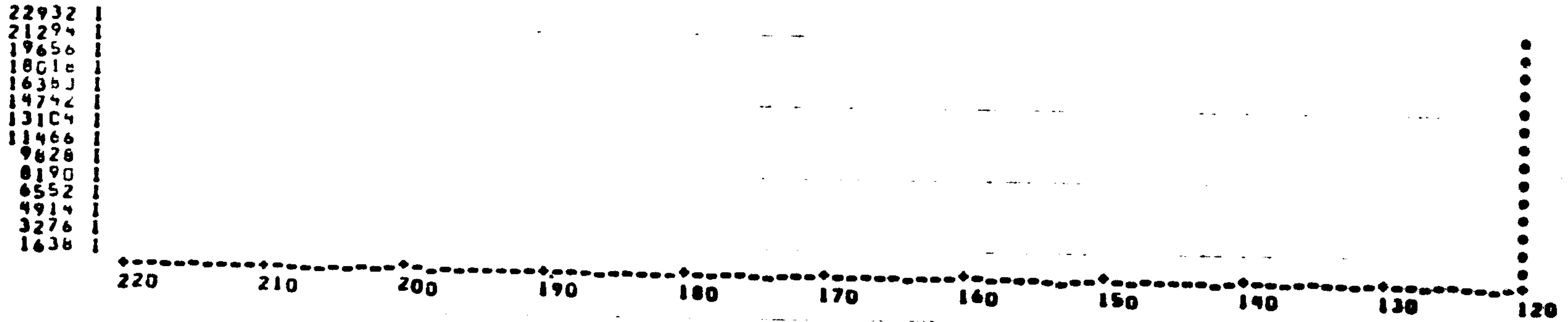
CHANNEL 13

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 14

EACH * REPRESENTS 1638 POINT(S).



184

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

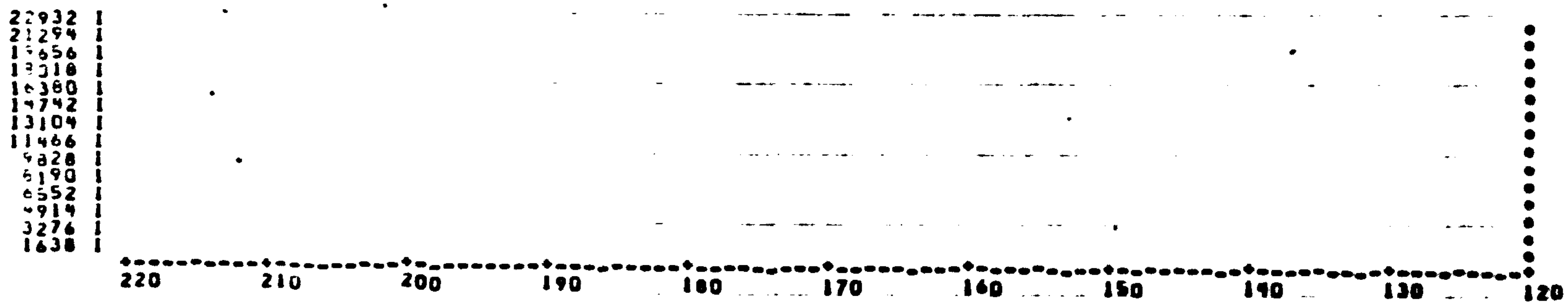
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22850 , SUBCLASS= SWHEAT)

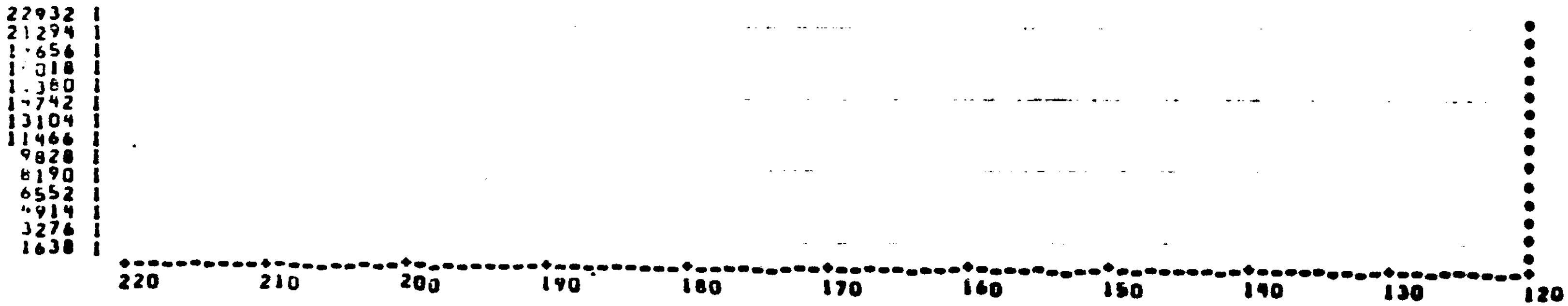
CHANNEL 15

EACH • REPRESENTS 1630 POINT(S).



CHANNEL 16

EACH • REPRESENTS 1638 POINT(S).



185

RUN TO MAKE SURE THE CHANGES DIDN'T EFFL THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING SUBCLASS SWHEAT

MEAN:	32.88	36.49	46.25	19.18	27.11	26.08	55.25	24.80	22.63	22.90	43.36	20.20
ST DEV:	5.21	6.47	10.43	5.02	4.61	8.38	12.97	7.22	4.41	8.01	8.21	4.90

MEAN:	26.16	34.34	40.01	17.25
ST DEV:	4.74	9.39	10.25	4.42

COVARIANCE MATRIX

27.10											
42.28	71.81										
30.49	36.99	108.85									
10.34	10.28	50.30	25.22								
12.24	17.91	17.56	6.51	21.28							
20.47	31.16	33.36	12.62	36.37	70.22						
14.58	23.26	27.74	13.52	-11.53	-35.94	168.19					
5.20	6.40	11.37	6.13	-11.22	-28.15	91.02	52.19				
8.60	10.52	19.38	8.20	13.38	27.76	-23.67	-15.89	19.41			
15.52	20.71	36.54	15.40	25.54	52.45	-43.99	-29.61	33.68	64.15		
7.80	10.28	23.03	11.92	-5.07	-16.33	78.44	43.36	-9.26	-19.92	67.39	
2.51	3.46	8.37	4.80	-7.10	-16.72	50.78	29.10	-10.11	-20.16	38.53	24.80
11.61	19.63	7.52	1.70	.71	-1.07	29.74	15.45	-3.43	-5.15	12.29	7.75

20,27	36.30	13.18	1.66	-2.09	-11.07	72.71	38.88	-11.59	-20.06	32.42	21.15
11.61	21.66	4.86	1.02	-10.94	-27.19	89.53	49.46	-19.54	-34.87	46.84	30.80
2.26	4.49	.52	.30	-6.56	-14.76	39.36	22.15	-9.72	-17.54	22.06	14.61

22.47			
41.64	88.18		
38.50	84.32	104.99	
13.57	31.45	43.17	19.56

CORRELATION MATRIX

1.00											
.96	1.00										
.56	.42	1.00									
.90	.24	.96	1.00								
.51	.46	.36	.28	1.00							
.47	.44	.38	.30	.94	1.00						
.22	.21	.21	.21	-.19	-.33	1.00					
.14	.14	.15	.17	-.34	-.47	.97	1.00				
.37	.28	.42	.37	.66	.75	-.41	-.50	1.00			
.37	.31	.44	.38	.69	.78	-.42	-.51	.95	1.00		
.18	.15	.27	.29	-.16	-.24	.74	.73	-.26	-.30	1.00	
.10	.08	.16	.19	-.31	-.40	.79	.81	-.46	-.5[illegible]	.94	1.00
.47	.49	.15	.07	.03	-.03	.48	.45	-.16	-.14	.32	.33
.41	.46	.10	.04	-.05	-.14	.60	.57	-.28	-.27	.42	.45
.22	.25	.05	.02	-.23	-.32	.67	.67	-.43	-.43	.56	.60
.10	.12	.01	.01	-.32	-.40	.69	.69	-.50	-.50	.61	.66

1.00			
.94	1.00		
.79	.88	1.00	
.65	.76	.95	1.00

187

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

CHANNEL 1

EACH * REPRESENTS 1633 POINT(S).

```
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL                    23 FEB 78
                          HOUSTON,TEXAS

                            HISTOGRAM
                         ---------------

                    TRAINING SUBCLASS   SWHFAT
                 ------------------------------

CHANNEL  1
----------

   EACH * REPRESENTS   1633  POINT(S).

 22862 I                                                                                               $
 21229 I                                                                                               *
 19596 I                                                                                               *
 17963 I                                                                                               *
 16330 I                                                                                               *
 14697 I                                                                                               *
 13064 I                                                                                               *
 11431 I                                                                                               *
  9798 I                                                                                               *
  8165 I                                                                                               *
  6532 I                                                                                               *
  4899 I                                                                                               *
  3266 I                                                                                               *
  1633 I                                                                                               *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120

CHANNEL  2
----------

   EACH * REPRESENTS   1638  POINT(S).

 22932 I                                                                                               *
 21294 I                                                                                               *
 19656 I                                                                                               *
 18018 I                                                                                               *
 16380 I                                                                                               *
 14742 I                                                                                               *
 13104 I                                                                                               *
 11466 I                                                                                               *
  9828 I                                                                                               *
  8190 I                                                                                               *
  6552 I                                                                                               *
  4914 I                                                                                               *
  3276 I                                                                                               *
  1638 I                                                                                               *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFEC. THE ORIGINAL
HOUSTON,TEXAS

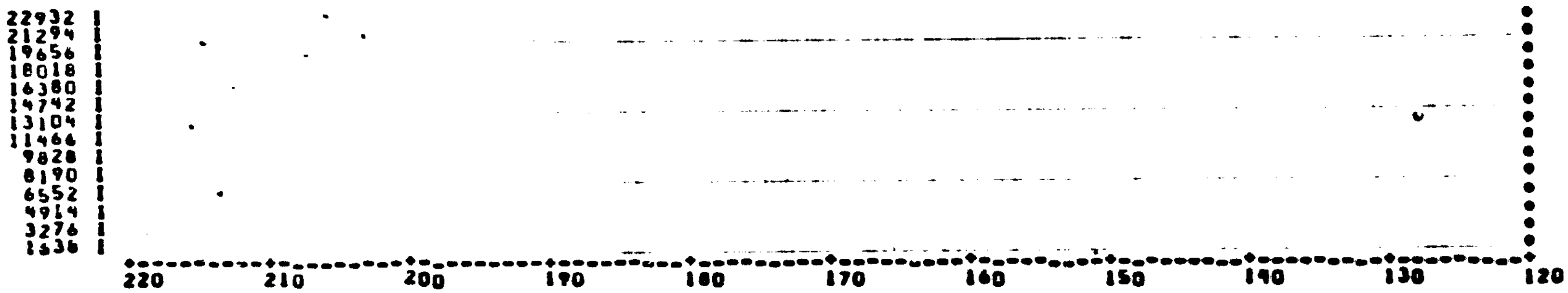
23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SUNFAT

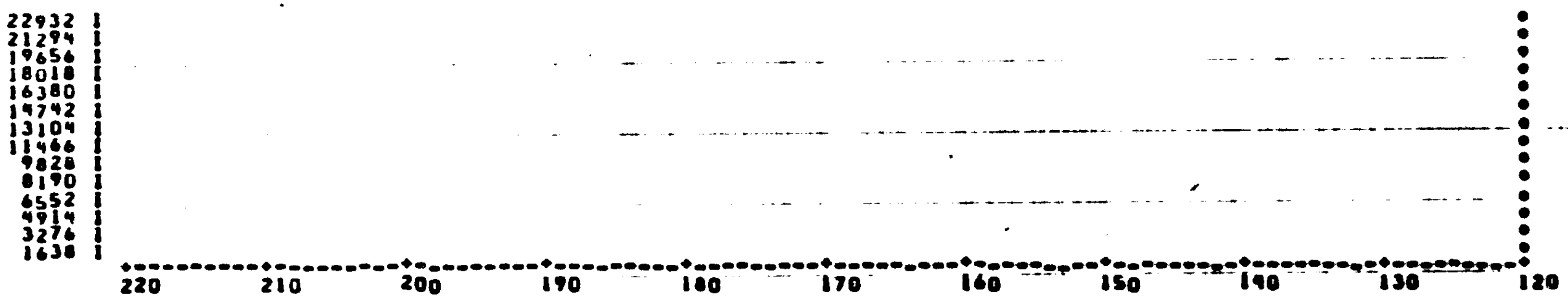
CHANNEL 3

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 4

EACH • REPRESENTS 1638 POINT(S).



189

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SUNFAT

CHANNEL 5

EACH • REPRESENTS 1638 POINT(S).

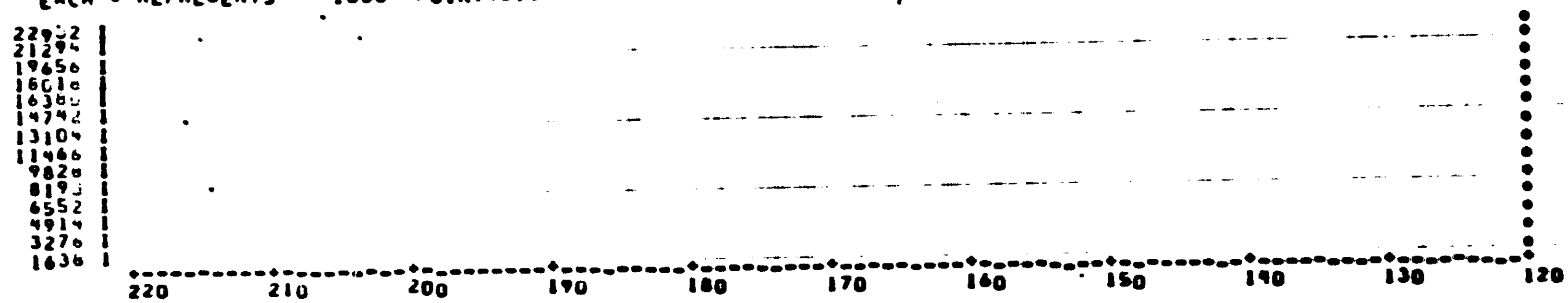
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SUNFAT

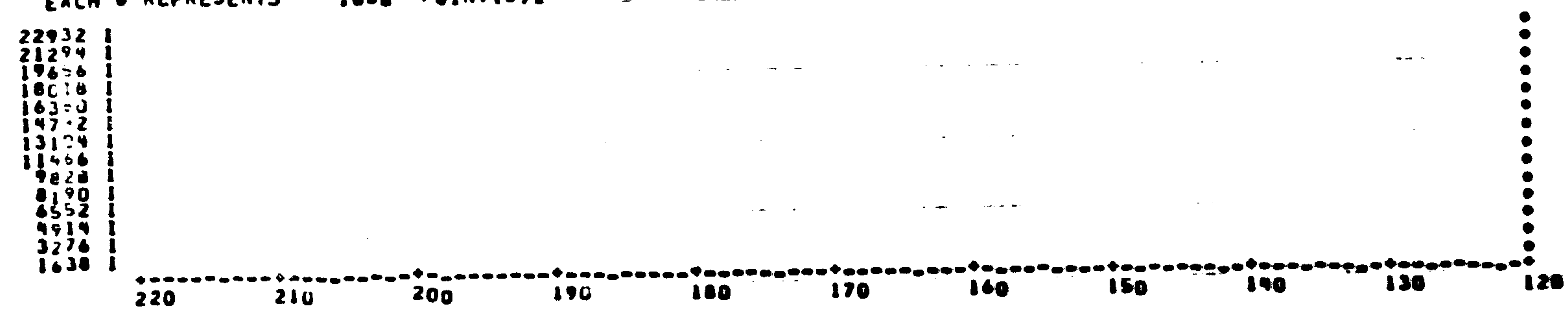
CHANNEL 5

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 6

EACH • REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFEL ,HE ORIGINAL
HOUSTON,TEXAS

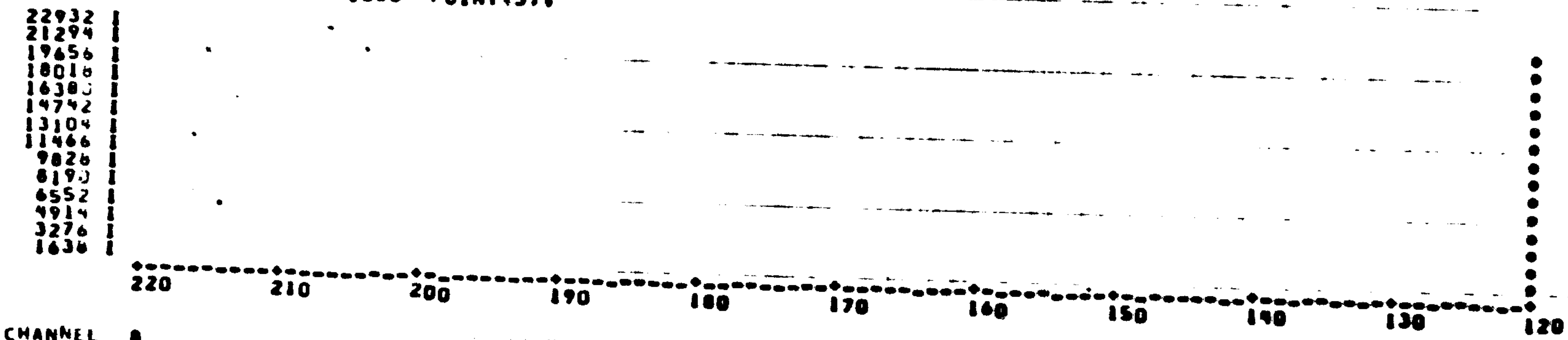
23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SWHFAT

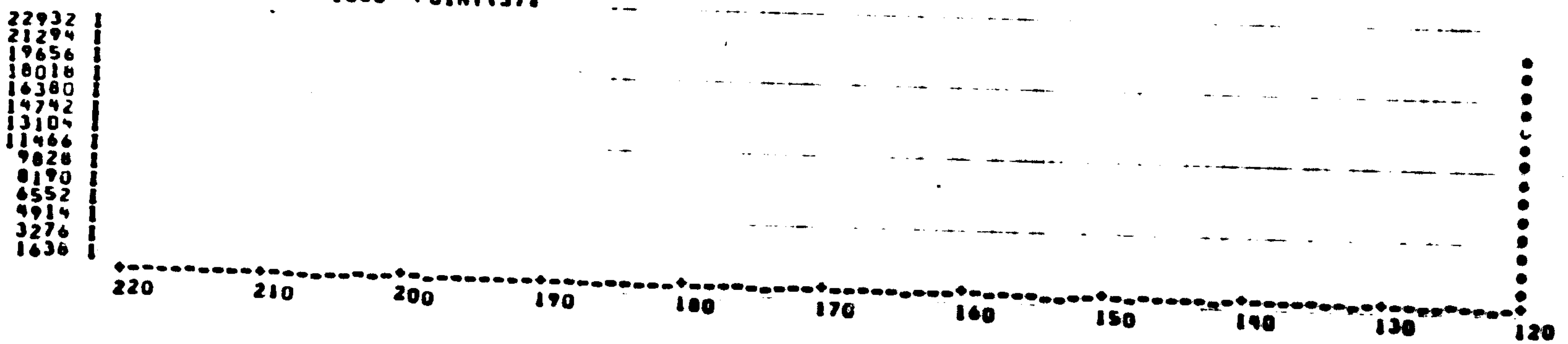
CHANNEL 7

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 8

EACH • REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SWHFAT

CHANNEL 9

EACH • REPRESENTS 1638 POINT(S).

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL HOUSTON,TEXAS 23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SBMFAT

CHANNEL 9

```
  EACH * REPRESENTS    1638  POINT(S).
 22932 I                                                                                        *
 21294 I                                                                                        *
 19656 I                                                                                        *
 18018 I                                                                                        *
 16380 I                                                                                        *
 14742 I                                                                                        *
 13104 I                                                                                        *
 11466 I                                                                                        *
  9828 I                                                                                        *
  8190 I                                                                                        *
  6552 I                                                                                        *
  4914 I                                                                                        *
  3276 I                                                                                        *
  1638 I                                                                                        *
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
      220       210       200       190       180       170       160       150       140       130       120
```

CHANNEL 10

```
  EACH * REPRESENTS    1638  POINT(S).
 22932 I                                                                                        *
 21294 I                                                                                        *
 19656 I                                                                                        *
 18018 I                                                                                        *
 16380 I                                                                                        *
 14742 I                                                                                        *
 13104 I                                                                                        *
 11466 I                                                                                        *
  9828 I                                                                                        *
  8190 I                                                                                        *
  6552 I                                                                                        *
  4914 I                                                                                        *
  3276 I                                                                                        *
  1638 I                                                                                        *
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
      220       210       200       190       180       170       160       150       140       130       120
```

192

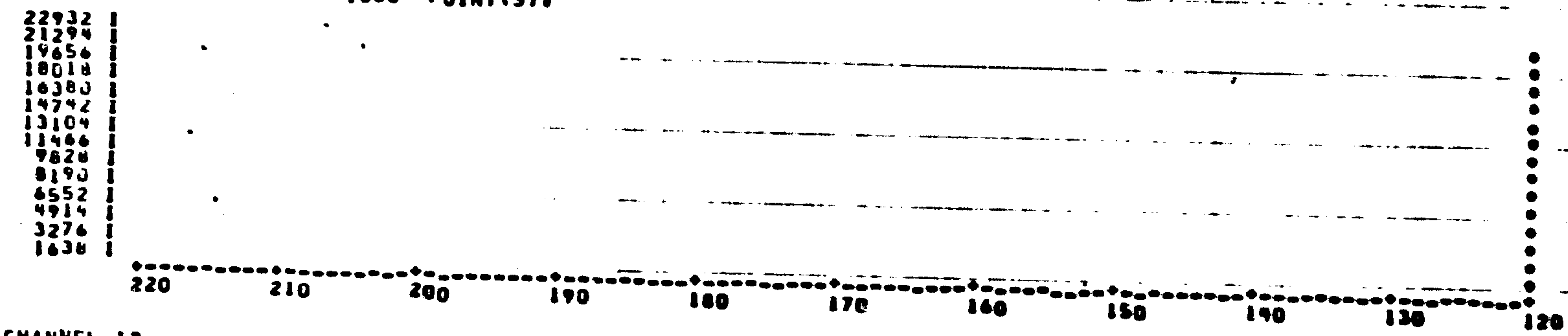
RUN TO MAKE SURE THE CHANGES DIDN'T EFFE.. THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

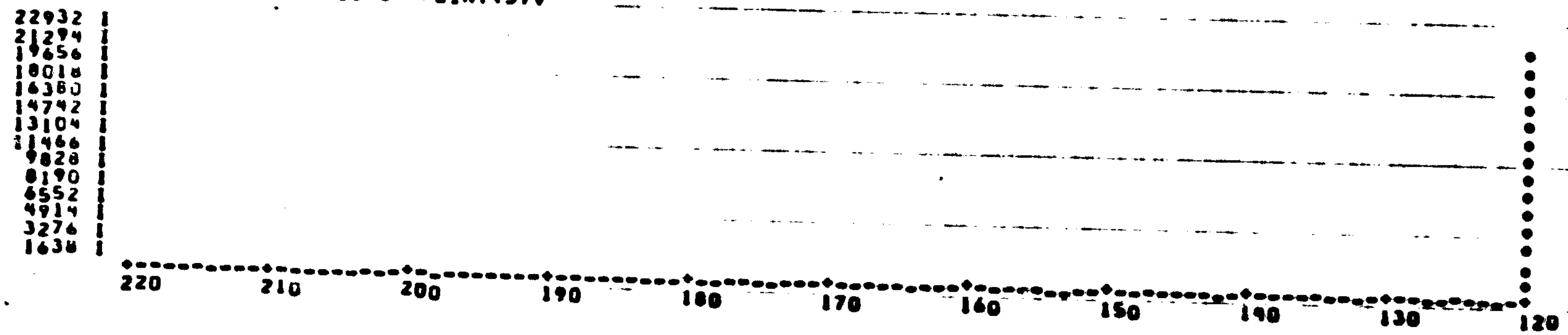
CHANNEL 11

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 12

EACH * REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

CHANNEL 13

EACH * REPRESENTS 1638 POINT(S).

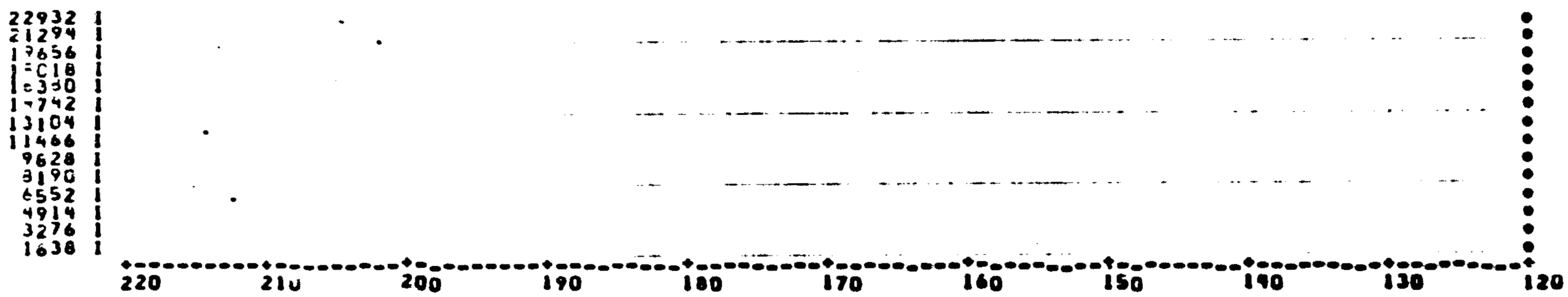
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

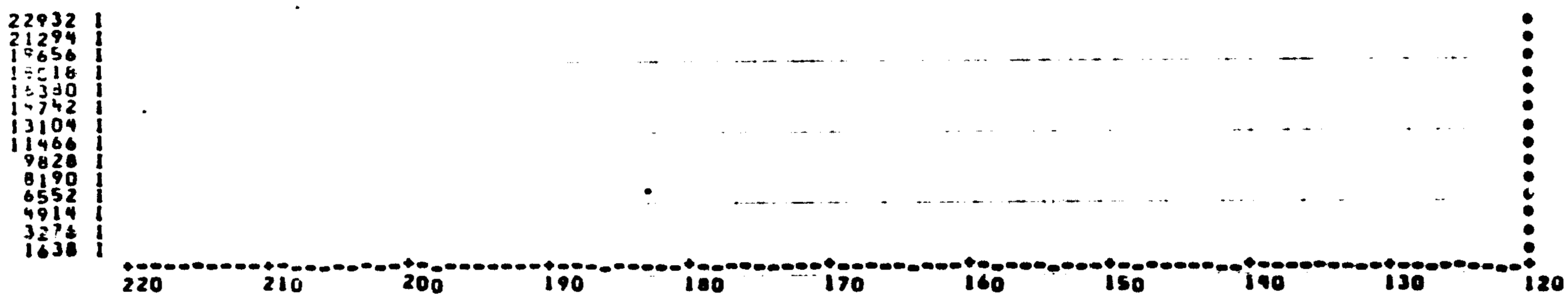
CHANNEL 13

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 14

EACH • REPRESENTS 1638 POINT(S).



194

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS   SWHFAT

```
CHANNEL 15
----------

  EACH * REPRESENTS    1638  POINT(S).

22932 I                                                                                      *
21294 I                                                                                      *
 [illegible]656 I                                                                                      *
 [illegible]18 I                                                                                      *
 [illegible]380 I                                                                                      *
 [illegible]742 I                                                                                      *
 [illegible]3104 I                                                                                      *
11466 I                                                                                      *
 [illegible]828 I                                                                                      *
 [illegible]190 I                                                                                      *
 [illegible]552 I                                                                                      *
 [illegible]914 I                                                                                      *
 3276 I                                                                                      *
 1638 I                                                                                      *
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------*
     220       210       200       190       180       170       160       150       140       130       120
```

```
CHANNEL 16
----------

  EACH * REPRESENTS    1638  POINT(S).

22932 I                                                                                      *
21294 I                                                                                      *
19656 I                                                                                      *
18018 I                                                                                      *
16380 I                                                                                      *
14742 I                                                                                      *
13104 I                                                                                      *
11466 I                                                                                      *
 9828 I                                                                                      *
 8190 I                                                                                      *
 6552 I                                                                                      *
 4914 I                                                                                      *
 3276 I                                                                                      *
 1638 I                                                                                      *
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------*
     220       210       200       190       180       170       160       150       140       130       120
```


195

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

COMPOSITE SPECTRAL PLOT (MEAN,PLUS AND MINUS ONE STD. DEV.) FOR:

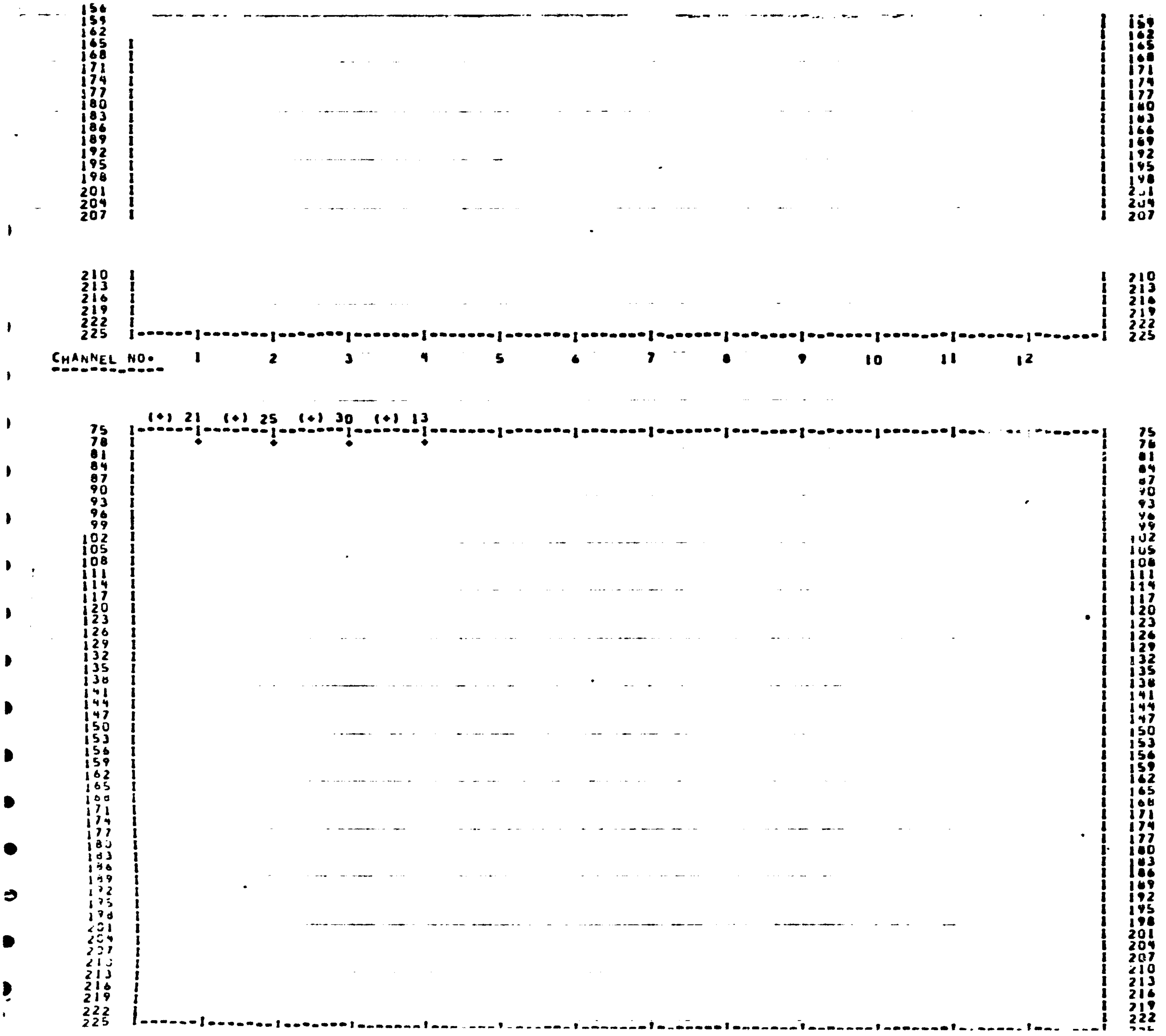
TRAINING SUBCLASS(ES) 1

PLOT LEGEND:

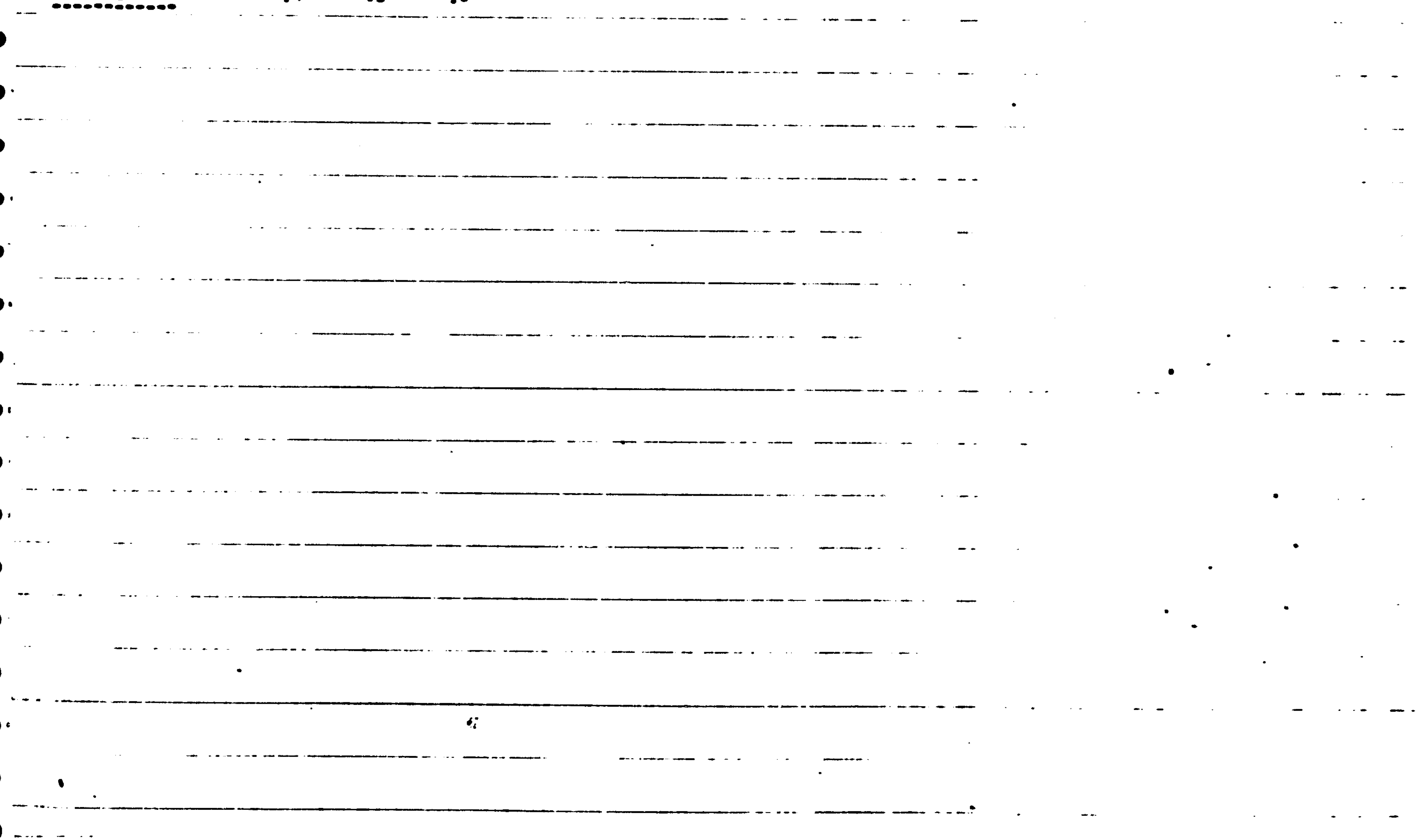
+ = SUBCLASS SWHEAT

```
     (+) 28  (+) 28  (+) 36  (+) 14  (+) 22  (+) 18  (+) 42  (+) 18  (+) 18  (+) 14  (+) 35  (+) 15
 75 I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I  75
 78 I       +       +       +       +       +       +       +       +       +       +       +       +       I  78
 81 I                                                                                                       I  81
 84 I                                                                                                       I  84
 87 I                                                                                                       I  87
 90 I                                                                                                       I  90
 93 I                                                                                                       I  93
 96 I                                                                                                       I  96
 99 I                                                                                                       I  99
102 I                                                                                                       I 102
105 I                                                                                                       I 105
108 I                                                                                                       I 108
111 I                                                                                                       I 111
114 I                                                                                                       I 114
117 I                                                                                                       I 117
120 I                                                                                                       I 120
123 I                                                                                                       I 123
126 I                                                                                                       I 126
129 I                                                                                                       I 129
132 I                                                                                                       I 132
135 I                                                                                                       I 135
138 I                                                                                                       I 138
141 I                                                                                                       I 141
144 I                                                                                                       I 144
147 I                                                                                                       I 147
150 I                                                                                                       I 150
153 I                                                                                                       I 153
156 I                                                                                                       I 156
159 I                                                                                                       I 159
162 I                                                                                                       I 162
165 I                                                                                                       I 165
168 I                                                                                                       I 168
171 I                                                                                                       I 171
174 I                                                                                                       I 174
177 I                                                                                                       I 177
180 I                                                                                                       I 180
183 I                                                                                                       I 183
186 I                                                                                                       I 186
189 I                                                                                                       I 189
192 I                                                                                                       I 192
195 I                                                                                                       I 195
198 I                                                                                                       I 198
201 I                                                                                                       I 201
204 I                                                                                                       I 204
207 I                                                                                                       I 207
```

216


CHANNEL NO.
1 2 3 4 5 6 7 8 9 10 11 12
(+) 21 (+) 25 (+) 30 (+) 13
156 159 162 165 168 171 174 177 180 183 186 189 192 195 198 201 204 207
210 213 216 219 222 225
75 78 81 84 87 90 93 96 99 102 105 108 111 114 117 120 123 126 129 132 135 138 141 144 147 150 153 156 159 162 165 168 171 174 177 180 183 186 189 192 195 198 201 204 207 210 213 216 219 222 225

CHANNEL NO. 13 14 15 16



```
***  $STAT - COMPLETED  ***

TIME FOR STAT     6.106
```

RUN TO MAKE SURE THE CHANGES DIDN'T EF. THE ORIGINAL   23 FEB 78
HOUSTON,TEXAS

TEST RUN 2

```
S.TAT

    DATAFI    FILE=6
    OPTION    COVAR
    CHANNE    DATA=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16  FILTER=5.8
    STATFI    FILE=2
    OPTION    MAXSUB=1
    OPTION    HIST
    HISTO     1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
    OPTION    WATER
    .END.
```


200

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   23 FEB 78
HOUSTON,TEXAS

YOU HAVE SELECTED THE FOLLOWING SSTAT PROCESSOR OPTIONS:

```
    PRINT MEAN AND COVARIANCE FOR EACH FIELD
    PRINT A HISTOGRAM FOR EACH FIELD
    PRINT A HISTOGRAM  FOR EACH SUBCLASS
    PRINT MEAN AND COVARIANCE FOR EACH SUBCLASS
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

YOU HAVE SELECTED THE FOLLOWING SSTAT PROCESSOR OPTIONS:

PRINT MEAN AND COVARIANCE FOR EACH FIELD
PRINT A HISTOGRAM FOR EACH FIELD
PRINT A HISTOGRAM FOR EACH SUBCLASS
PRINT MEAN AND COVARIANCE FOR EACH SUBCLASS

SUPERVISOR INFORMATION:

UNUSED CORE 28 LOCATIONS
MAXIMUM NO. OF FIELDS..204
MAXIMUM NO. OF SUBCLASSES... 1
CHANNELS SELECTED ARE 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16,
HISTOGRAM CHANNELS ARE 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16,

INPUT IMAGE DATA TAPE INFORMATION

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

Je.1

TRAINING FIELDS

FIELD NO.	FIELD NAME	CLASS	SUBCLASS	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
1	BI-01	WHEAT	SBAR	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

22466 POINTS WILL BE USED IN THE FIELD MEAN,COVARIANCE CALCULATIONS

207

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING FIELD BI-01

MEAN:	33.10	37.12	47.04	19.51	27.57	26.53	56.20	25.31	23.02	22.78	44.10	20.54

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING FIELD 81-01

MEAN:	33.10	37.12	47.04	19.51	27.57	26.53	56.20	25.31	23.02	22.78	44.10	20.54
ST DEV:	4.97	7.06	8.57	4.39	2.98	7.72	10.86	6.50	3.29	7.52	5.99	4.24
MEAN:	26.60	34.93	40.69	17.54								
ST DEV:	3.31	8.32	8.89	3.84								

COVARIANCE MATRIX

24.70											
34.82	49.88										
20.64	8.28	73.52									
6.22	-1.71	35.74	19.26								
6.36	1.02	-3.94	-2.42	8.87							
14.97	15.14	12.96	4.13	24.70	59.59						
2.43	-11.40	-16.21	-4.68	-37.76	-61.61	117.99					
-.30	-7.25	-8.44	-2.07	-23.14	-39.92	68.67	42.31				
3.67	-3.66	1.51	.79	2.95	17.97	-45.82	-25.96	10.84			
10.76	6.86	19.15	8.19	15.42	43.19	-66.26	-39.80	25.44	56.52		
-1.80	-17.05	-11.44	-2.33	-26.41	-36.27	38.19	25.34	-26.48	-37.[illegible]9	35.86	
-1.98	-9.30	-7.73	-1.85	-16.74	-26.17	32.25	20.85	-18.23	-28.37	23.96	18.13
5.94	3.37	-13.39	-7.00	-11.60	-12.95	5.12	4.39	-13.78	-15.42	-7.22	-1.31

203

2.91	15.13	-17.26	-9.76	-18.31	-26.83	.97	29.69	-25.30	-33.77	7.09	9.96
2.83	-3.36	-27.23	-12.30	-29.98	-45.80	52.63	33.00	-35.62	-51.07	17.98	17.27
-1.57	-6.38	-13.39	-5.99	-19.80	-22.89	23.97	15.07	-16.67	-29.55	9.93	8.80

10.96			
26.79	67.18		
20.96	61.87	78.95	
5.96	21.69	31.91	19.72

CORRELATION MATRIX

1.00					
.99	1.00				
.98	.14	1.00			
.28	-.06	.95	1.00		
.43	.05	-.15	-.18	1.00	
.39	.28	.20	.12	1.07	1.00

CORRELATION MATRIX

1.00											
.99	1.00										
.98	.19	1.00									
.28	-.06	.95	1.00								
.93	.05	-.15	-.18	1.00							
.39	.28	.20	.12	1.07	1.00						
.05	-.15	-.17	-.10	-1.17	-.73	1.00					
-.01	-.16	-.15	-.07	-1.19	-.79	.97	1.00				
.22	-.16	.05	.05	.30	.71	-1.28	-1.21	1.00			
.29	.13	.30	.25	.69	.79	-.81	-.81	1.03	1.00		
-.06	-.90	-.22	-.09	-1.98	-.78	.59	.65	-1.34	-.82	1.00	
-.09	-.31	-.21	-.10	-1.32	-.80	.70	.75	-1.30	-.89	.94	1.00
.36	.19	-.47	-.48	-1.18	-.51	.19	.20	-1.26	-.62	-.36	-.09
.31	.26	-.24	-.27	-.79	-.92	.95	.46	-.92	-.54	.19	.27
.06	-.05	-.36	-.32	-1.13	-.67	.55	.57	-1.22	-.76	.33	.96
-.08	-.29	-.41	-.32	-1.30	-.77	.56	.60	-1.32	-.85	.91	.54

1.00			
.97	1.00		
.71	.89	1.00	
.97	.68	.94	1.00

23 FEB 78

RUN TO MAKE SURE THE CHANGES DIDN'T EFI THE ORIGINAL
HOU. .,TEXAS

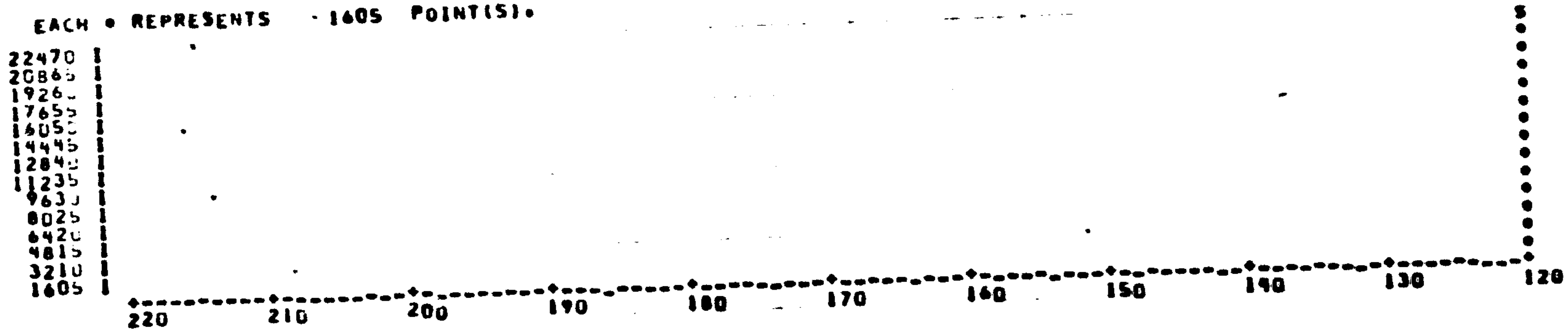
HISTOGRAM

TRAINING FIELD BI-ñl

(NO. SAMPLES= 22466 , SUBCLASS= SBAR)

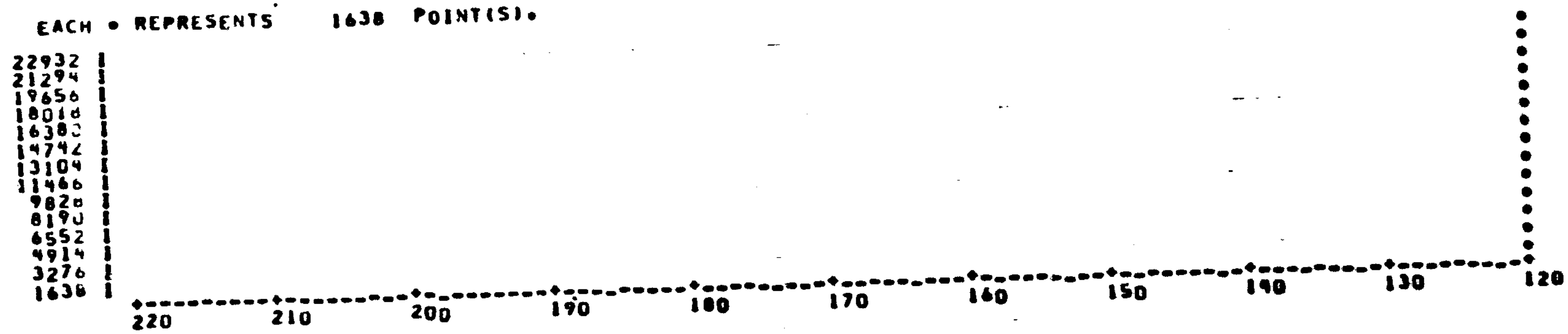
CHANNEL 1

EACH • REPRESENTS 1605 POINT(S).



CHANNEL 2

EACH • REPRESENTS 1638 POINT(S).



206

ORIGINAL PAGE IS
OF POOR QUALITY

23 FEB 78

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD BI-ñl

(NO. SAMPLES= 22466 , SUBCLASS= SBAR)

CHANNEL 3

EACH • REPRESENTS

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

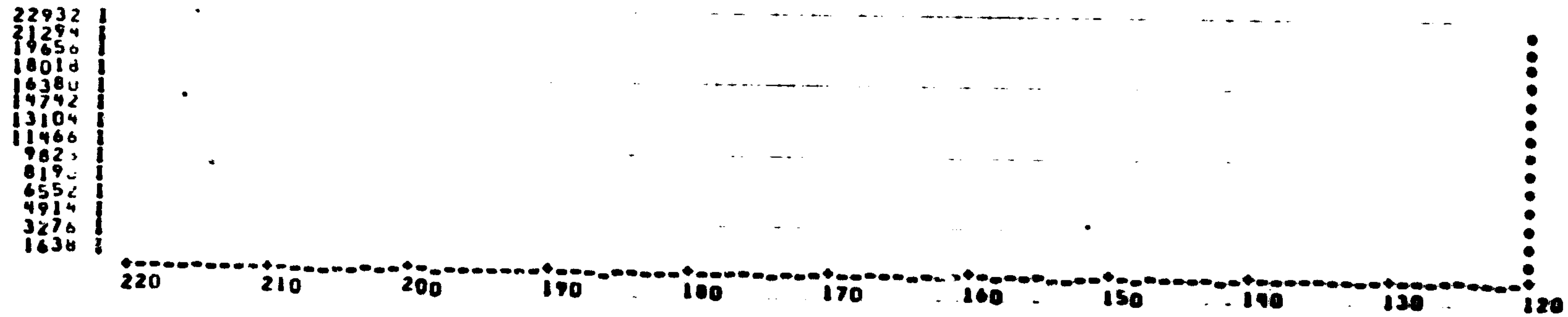
HISTOGRAM

TRAINING FIELD   81-81

(NO. SAMPLES=   22466 , SUBCLASS= SBAR)

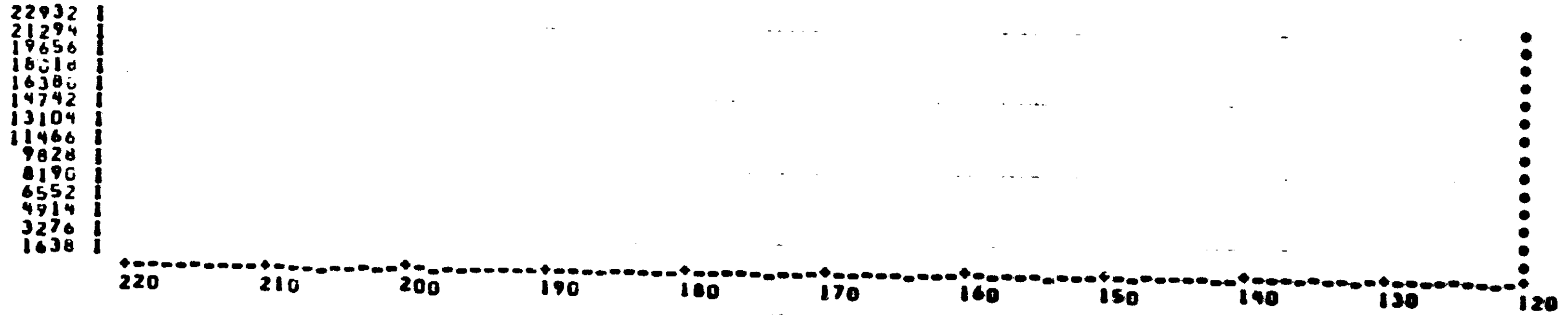
CHANNEL 3

EACH • REPRESENTS   1638 POINT(S).



CHANNEL 4

EACH • REPRESENTS   1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFEC[illegible] [illegible] ORIGINAL
HOUST[illegible] [illegible]EXAS

23 FEB 78

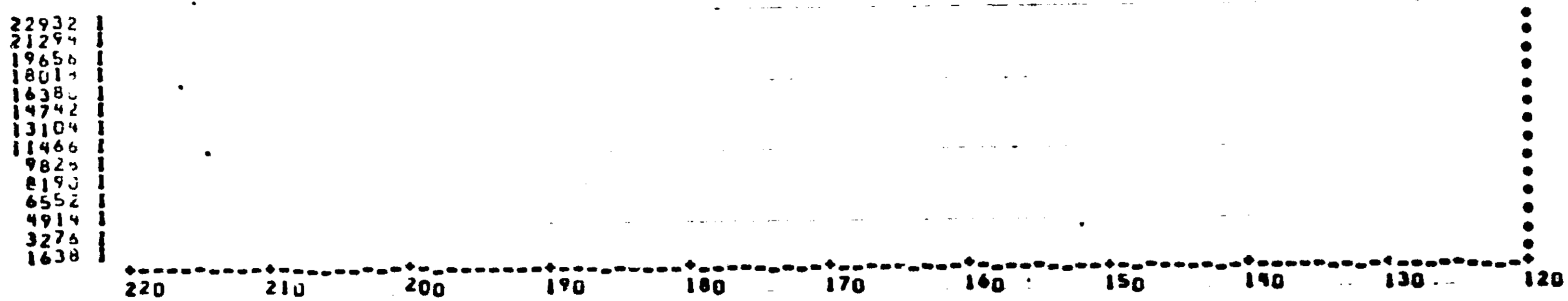
HISTOGRAM

TRAINING FIELD   B1-01

(NO. SAMPLES=   22466 , SUBCLASS= SBAR   )

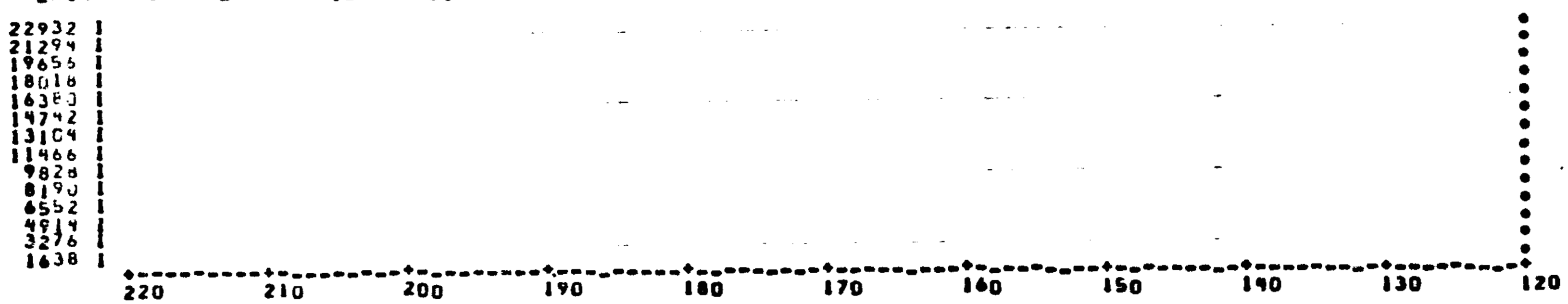
CHANNEL 5

EACH * REPRESENTS   1638 POINT(S).



CHANNEL 6

EACH * REPRESENTS   1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING FIELD   B1-01

(NO. SAMPLES=   22466 , SUBCLASS= SBAR   )

CHANNEL 7

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

ORIGINAL PAGE IS
OF POOR QUALITY

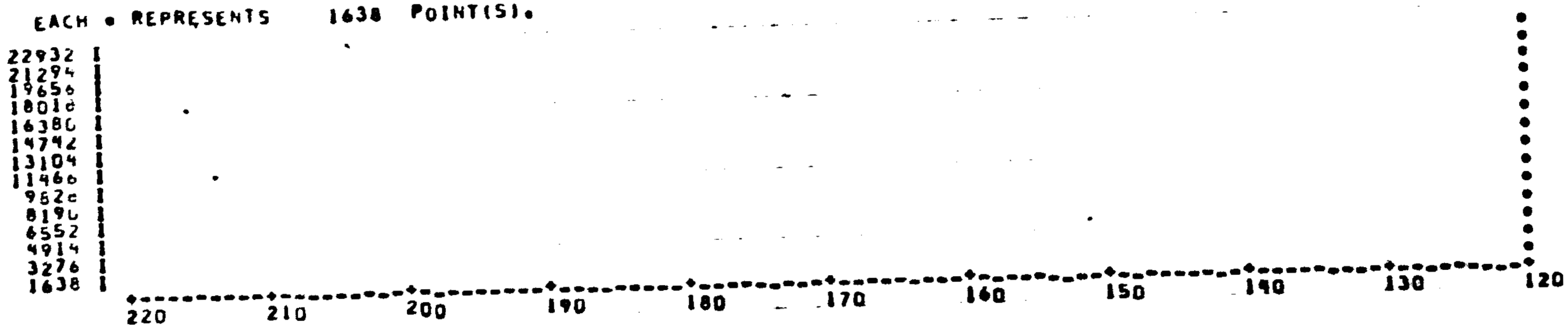
HISTOGRAM

TRAINING FIELD   B1-01

(NO. SAMPLES=   22466 , SUBCLASS= SBAR)

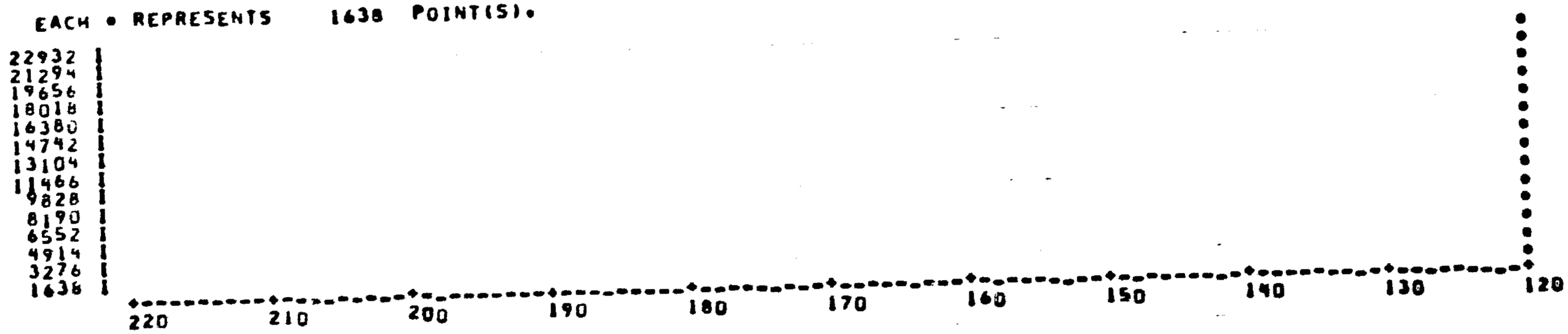
CHANNEL 7

EACH . REPRESENTS   1638 POINT(S).



CHANNEL 8

EACH . REPRESENTS   1638 POINT(S).



209

RUN TO MAKE SURE THE CHANGES DIDN'T EFFE… HE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

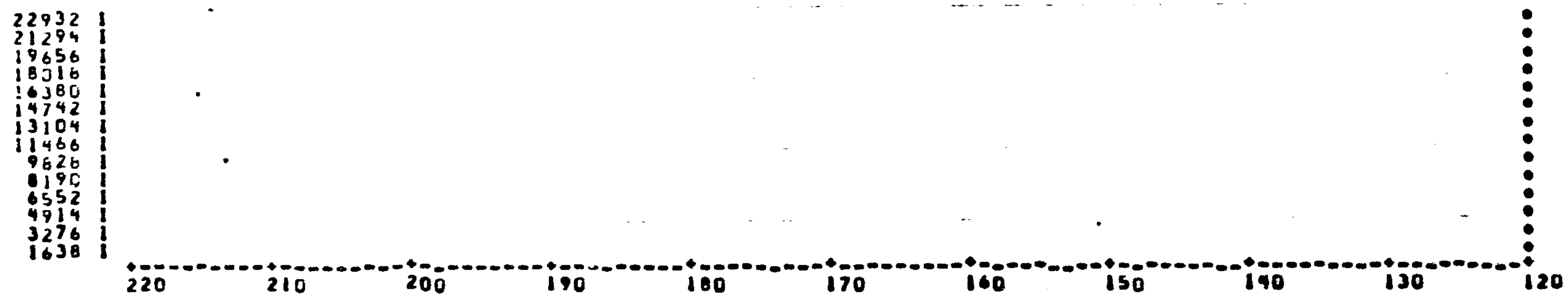
HISTOGRAM

TRAINING FIELD   BI-ñI

(NO. SAMPLES=   22466 , SUBCLASS= SBAR)

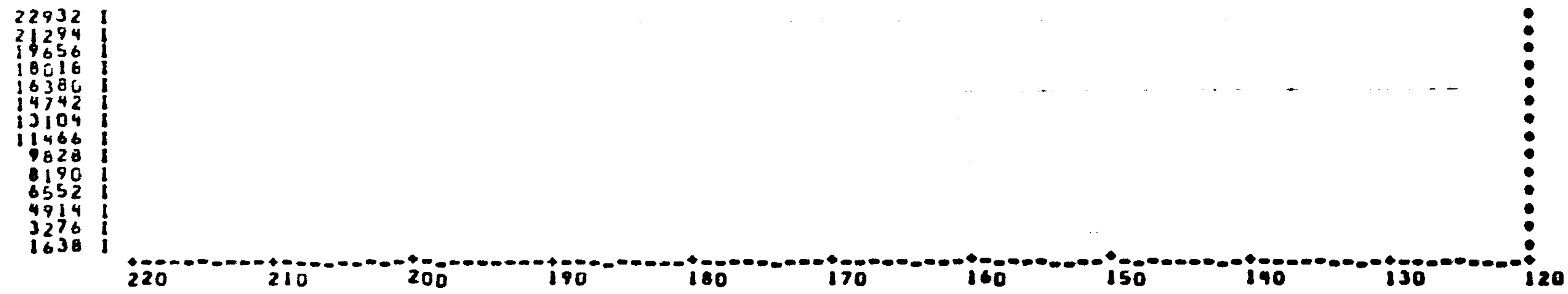
CHANNEL 9

EACH • REPRESENTS   1638 POINT(S).



CHANNEL 10

EACH • REPRESENTS   1638 POINT(S).



210

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

HISTOGRAM

TRAINING FIELD   BI-ñI

(NO. SAMPLES=   22466 , SUBCLASS= SBAR)

CHANNEL 11

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL — 23 FEB 78

HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22466 , SUBCLASS= SBAR)

CHANNEL 11

```
   EACH * REPRESENTS    1638  POINT(S).

22932 I                                                                              *
21294 I                                                                              *
19656 I                                                                              *
18018 I                                                                              *
16380 I                                                                              *
14742 I                                                                              *
13104 I                                                                              *
11466 I                                                                              *
 9828 I                                                                              *
 8190 I                                                                              *
 6552 I                                                                              *
 4914 I                                                                              *
 3276 I                                                                              *
 1638 I                                                                              *
       +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+
      220     210     200     190     180     170     160     150     140     130     120
```

CHANNEL 12

```
   EACH * REPRESENTS    1638  POINT(S).

22932 I                                                                              *
21294 I                                                                              *
19656 I                                                                              *
18018 I                                                                              *
16380 I                                                                              *
14742 I                                                                              *
13104 I                                                                              *
11466 I                                                                              *
 9828 I                                                                              *
 8190 I                                                                              *
 6552 I                                                                              *
 4914 I                                                                              *
 3276 I                                                                              *
 1638 I                                                                              *
       +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+
      220     210     200     190     180     170     160     150     140     130     120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

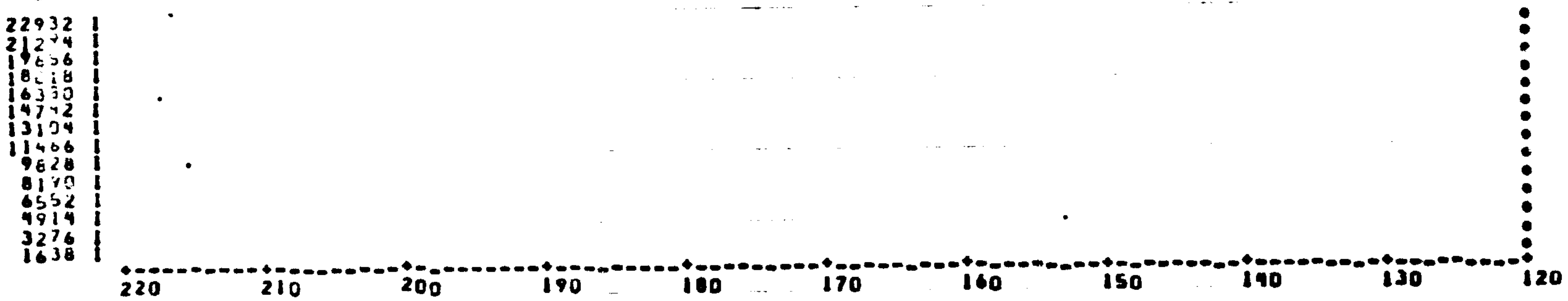
HISTOGRAM

TRAINING FIELD BI-N1

(NO. SAMPLES= 22466 , SUBCLASS= SBAR)

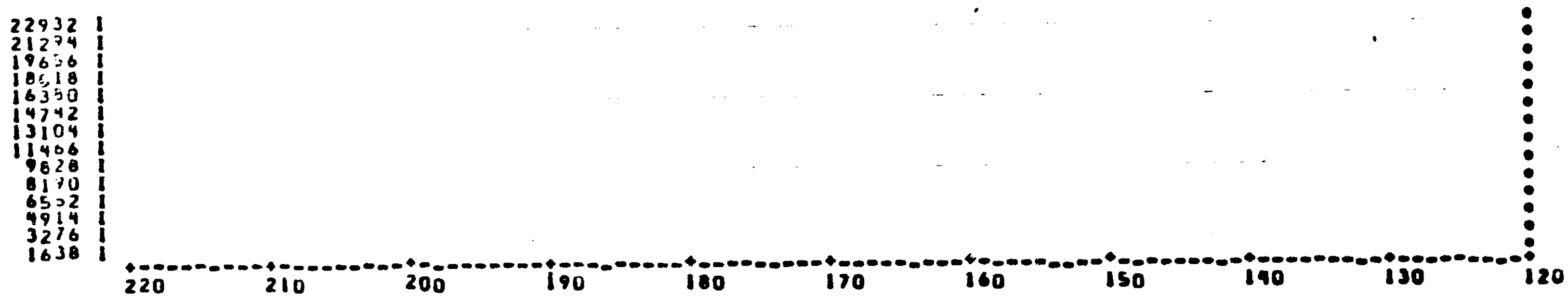
CHANNEL 13

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 14

EACH • REPRESENTS 1638 POINT(S).



212

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD BI-N1

(NO. SAMPLES= 22466 , SUBCLASS= SBAR)

CHANNEL 15

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

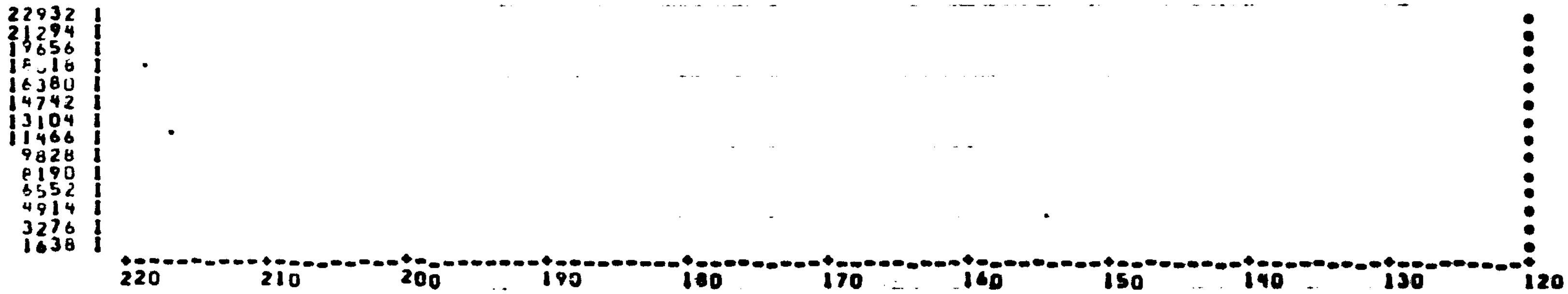
HISTOGRAM

TRAINING FIELD BI-NI

(NO. SAMPLES= 22466 , SUBCLASS= SBAR)

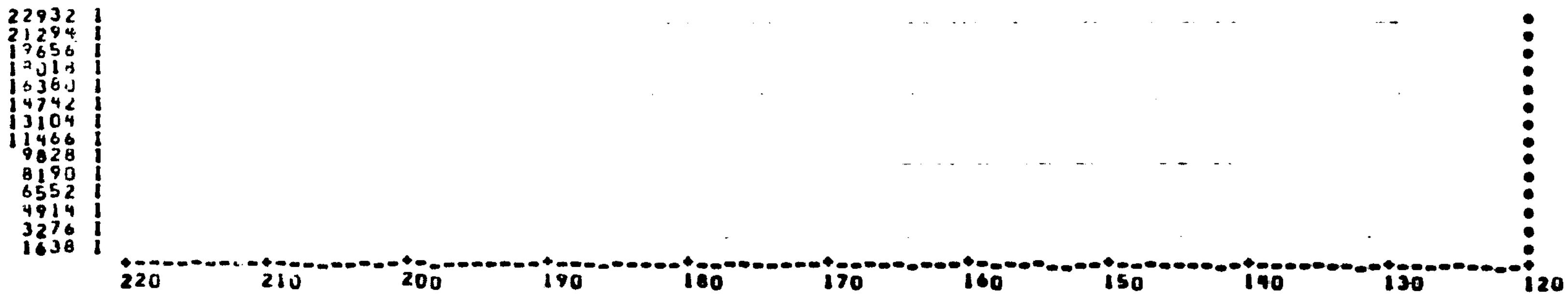
CHANNEL 15

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 16

EACH • REPRESENTS 1638 POINT(S).



213

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

23 FEB 78

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING SUBCLASS SBAR

MEAN:	33.10	37.12	47.04	19.51	27.57	26.53	56.20	25.31	23.02	22.78	44.10	20.54
ST DEV:	4.97	7.06	8.57	4.39	2.98	7.72	10.86	6.50	3.29	7.52	5.99	4.24
MEAN:	26.60	34.93	40.69	17.54								
ST DEV:	3.31	8.32	8.89	3.84								

COVARIANCE MATRIX

24.70											
34.82	49.88										
20.64	8.28	73.52									
6.22	-1.71	35.74	19.26								
6.36	1.02	-3.94	-2.42	8.87							
14.97	15.14	12.96	4.13	24.70	59.59						
2.43	-11.40	-16.21	-4.68	-37.76	-61.61	117.99					
-.30	-7.25	-8.44	-2.07	-23.14	-39.92	68.67	42.11				
3.67	-3.66	1.51	.79	2.95	17.97	-45.82	-25.96	10.84			
10.76	6.86	19.15	8.19	15.42	43.19	-66.26	-39.80	25.44	56.52		
-1.80	-17.05	-11.44	-2.33	-26.41	-36.27	38.14	25.34	-26.48	-37.14	3[illegible].36	
-1.98	-9.30	-7.73	-1.85	-16.74	-26.17	32.25	20.85	-18.23	-28.37	23.96	18.13
5.94	3.37	-13.39	-7.00	-11.60	-12.95	5.12	4.39	-13.78	-15.42	-7.22	-1.31

.91	15.13	-17.26	-9.76	-18.31	-26.83	40.97	24.69	-25.30	-33.77	7.09	9.96
2.83	-3.36	-27.23	-12.30	-29.98	-45.80	52.63	33.00	-35.62	-51.07	17.48	17.27
-1.57	-6.38	-13.34	-5.44	-14.80	-22.84	23.47	15.07	-16.67	-24.55	9.43	8.80

10.96			
26.74	69.18		
20.96	61.87	78.95	
5.96	21.69	31.91	14.72

215

CORRELATION MATRIX

1.00					
.99	1.00				
.48	.14	1.00			
.28	-.06	.95	1.00		
.43	.05	-.15	-.18	1.00	
.39	.28	.20	[illegible]	[illegible]	[illegible]

CORRELATION MATRIX

1.00											
.99	1.00										
.48	.14	1.00									
.28	-.06	.95	1.00								
.43	.05	-.15	-.18	1.00							
.39	.28	.20	.12	1.07	1.00						
.05	-.15	-.17	-.10	-1.17	-.73	1.00					
-.01	-.16	-.15	-.07	-1.19	-.79	.97	1.00				
.22	-.16	.05	.05	.30	.71	-1.28	-1.21	1.00			
.29	.13	.30	.25	.69	.74	-.81	-.81	1.03	1.00		
-.06	-.40	-.22	-.09	-1.48	-.78	.59	.65	-1.34	-.82	1.00	
-.09	-.31	-.21	-.10	-1.32	-.80	.70	.75	-1.30	-.89	.94	1.00
.36	.14	-.47	-.48	-1.18	-.51	.14	.20	-1.24	-.62	-.36	-.09
.31	.26	-.24	-.27	-.74	-.42	.45	.46	-.92	-.59	.19	.27
.06	-.05	-.36	-.32	-1.13	-.67	.55	.57	-1.22	-.76	.33	.46
-.08	-.24	-.41	-.32	-1.30	-.77	.56	.60	-1.32	-.85	.41	.54

1.00			
.97	1.00		
.71	.84	1.00	
.47	.68	.94	1.00

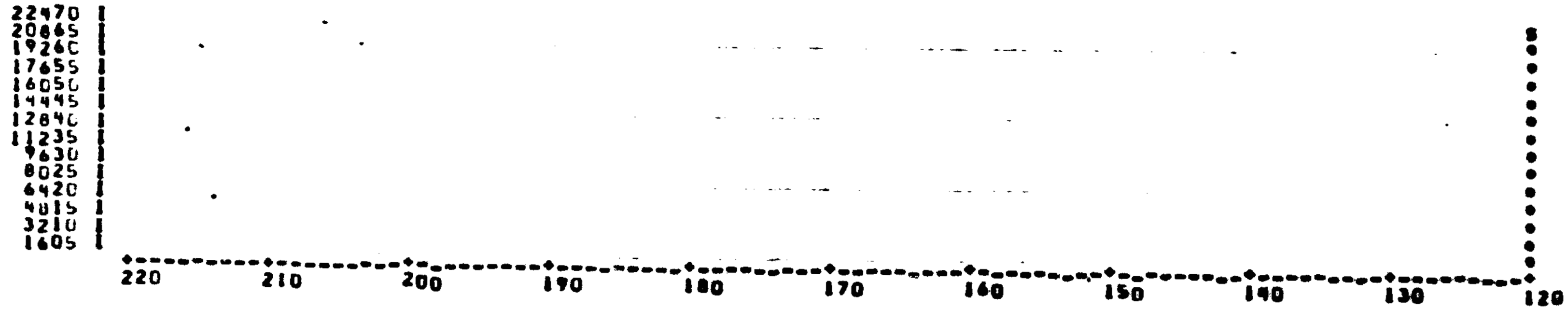
RUN TO MAKE SURE THE CHANGES DIDN'T EFFE\ HE ORIGINAL 23 FEB 78
HOUSTON, TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

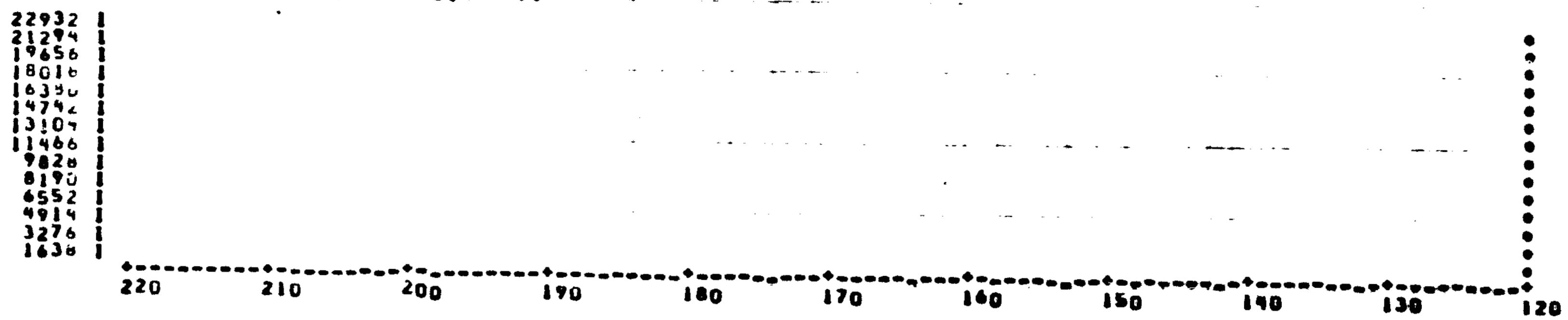
CHANNEL 1

EACH • REPRESENTS 1605 POINT(S).



CHANNEL 2

EACH • REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON, TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

CHANNEL 3

EACH • REPRESENTS 1638 POINT(S).

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

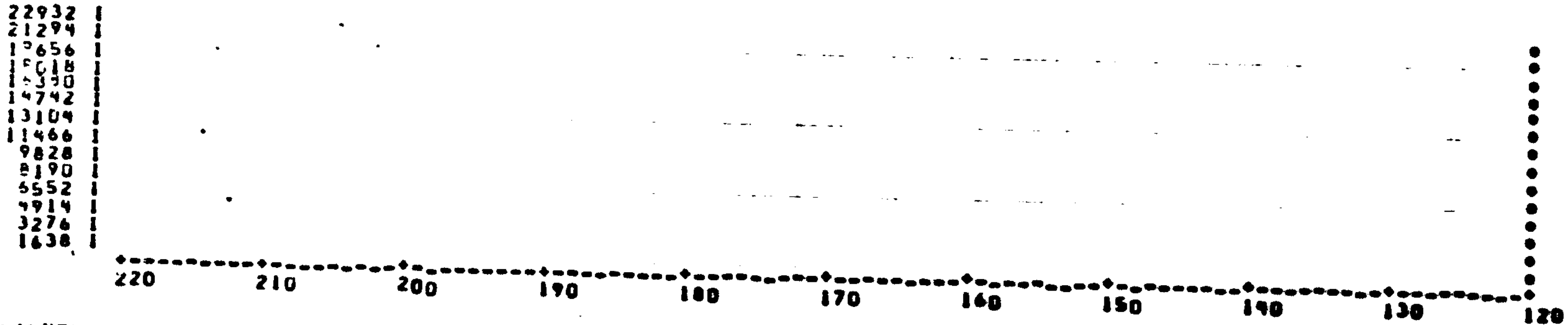
23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SBAR

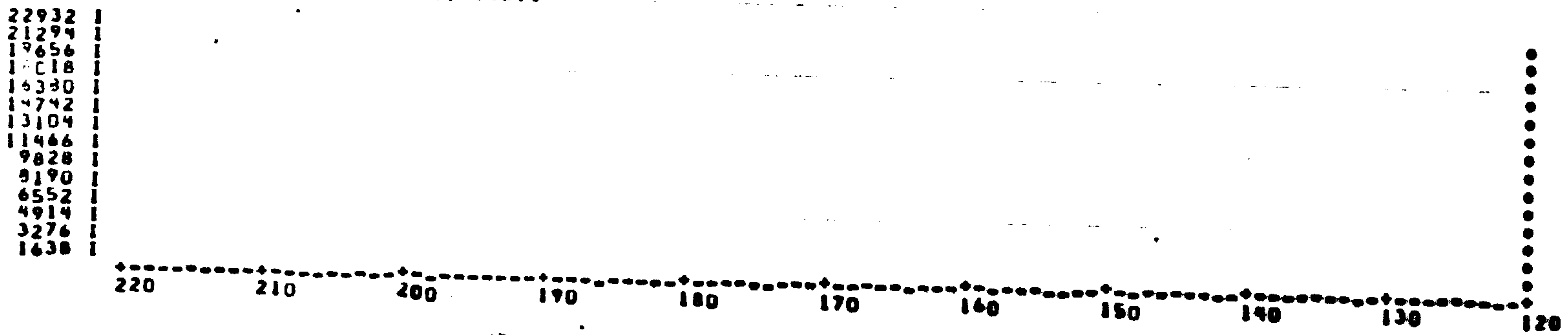
CHANNEL 3

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 4

EACH * REPRESENTS 1638 POINT(S).



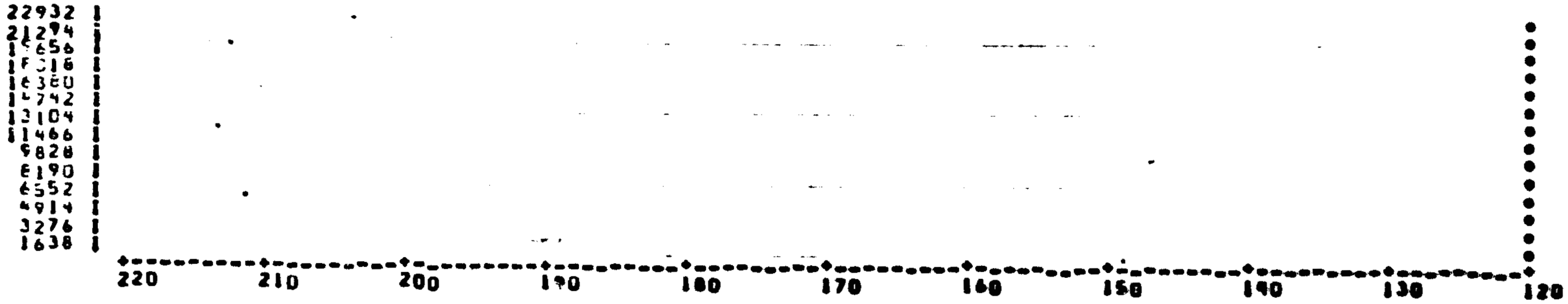
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

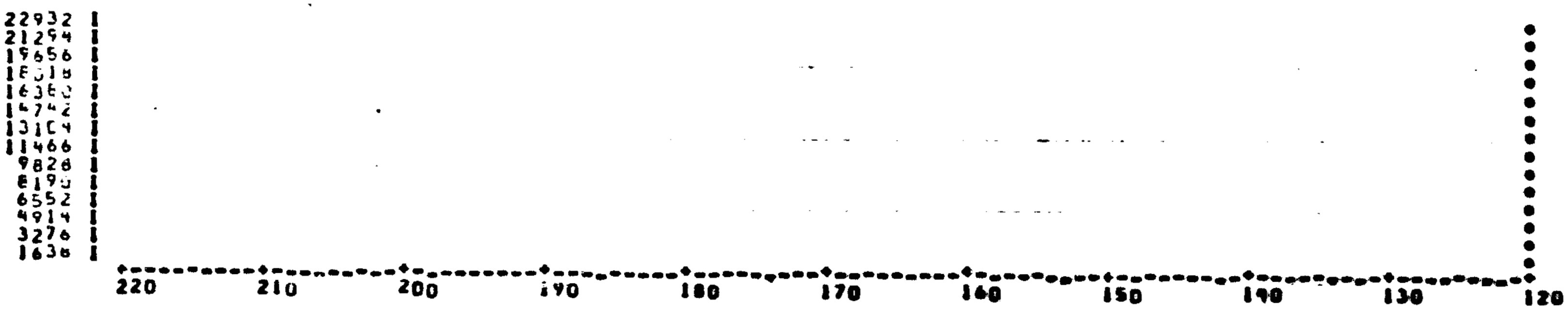
CHANNEL 5

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 6

EACH * REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

CHANNEL 7

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

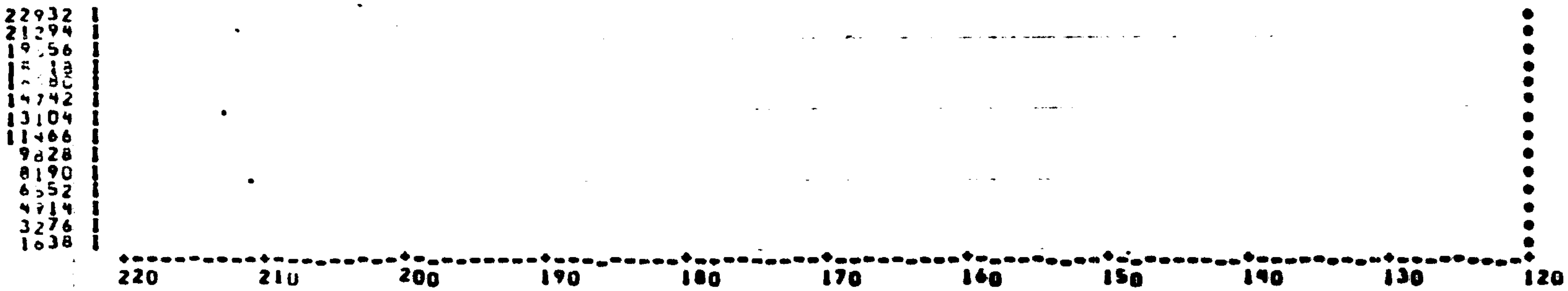
23 FEB 78

HISTOGRAM

TRAINING SUBCLASS SBAR

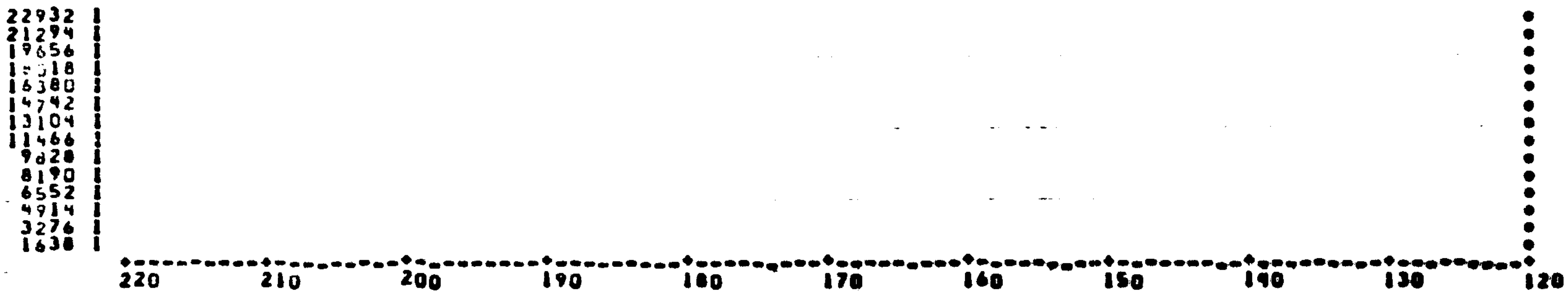
CHANNEL 7

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 8

EACH • REPRESENTS 1638 POINT(S).



220

RUN TO MAKE SURE THE CHANGES DIDN'T EFFEC. THE ORIGINAL　　23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

CHANNEL 9

EACH * REPRESENTS 1638 POINT(S).

```
22932 I                                                                                              *
21294 I                                                                                              *
19656 I                                                                                              *
18018 I                                                                                              *
16380 I                                                                                              *
14742 I                                                                                              *
13104 I                                                                                              *
11466 I                                                                                              *
 9828 I                                                                                              *
 8190 I                                                                                              *
 6552 I                                                                                              *
 4914 I                                                                                              *
 3276 I                                                                                              *
 1638 I                                                                                              *
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
      220       210       200       190       180       170       160       150       140       130       120
```

CHANNEL 10

EACH * REPRESENTS 1638 POINT(S).

```
22932 I                                                                                              *
21294 I                                                                                              *
19656 I                                                                                              *
18018 I                                                                                              *
16380 I                                                                                              *
14742 I                                                                                              *
13104 I                                                                                              *
11466 I                                                                                              *
 9828 I                                                                                              *
 8190 I                                                                                              *
 6552 I                                                                                              *
 4914 I                                                                                              *
 3276 I                                                                                              *
 1638 I                                                                                              *
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
      220       210       200       190       180       170       160       150       140       130       120
```

221

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL　　23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

CHANNEL 11

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

23 FEB 78

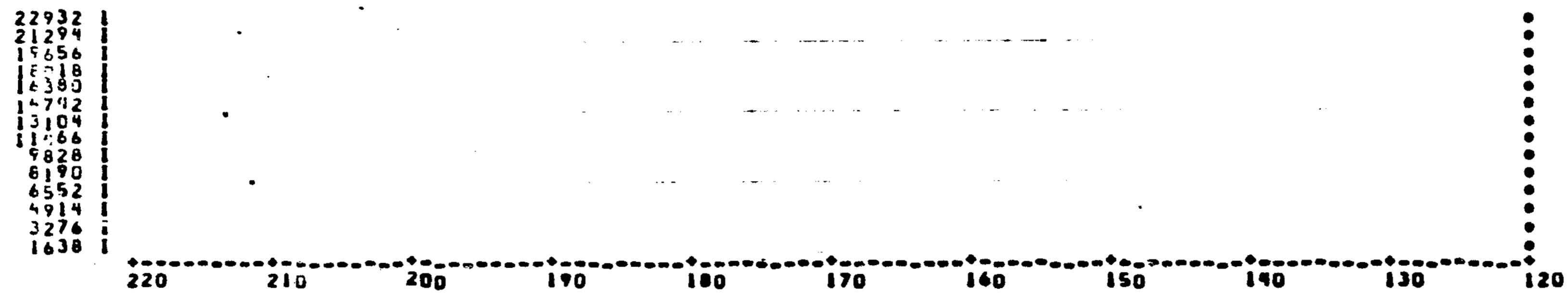
ORIGINAL PAGE IS
OF POOR QUALITY

HISTOGRAM

TRAINING SUBCLASS SBAR

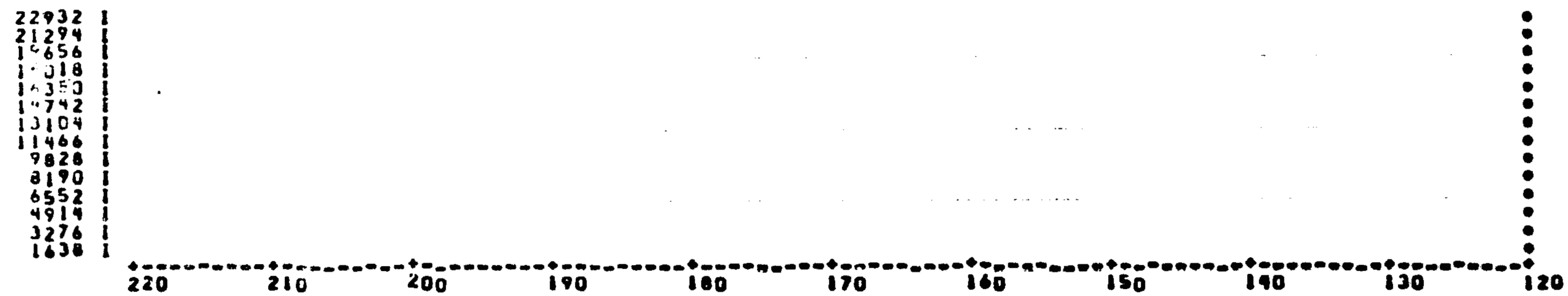
CHANNEL 11

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 12

EACH • REPRESENTS 1638 POINT(S).



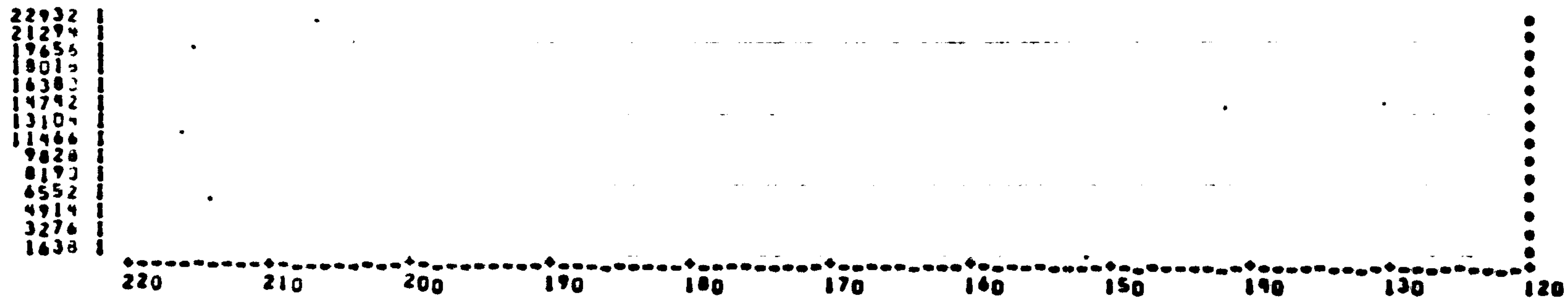
RUN TO MAKE SURE THE CHANGES DIDN'T EFFE THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

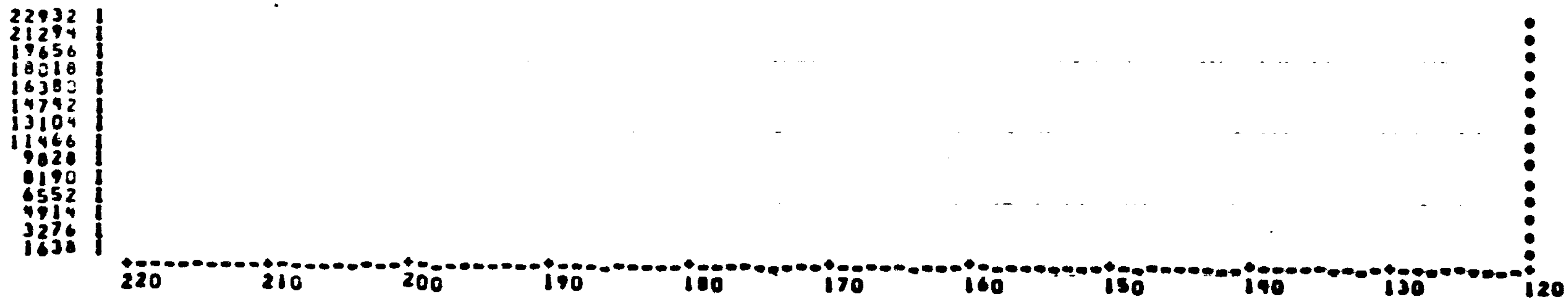
CHANNEL 13

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 14

EACH • REPRESENTS 1638 POINT(S).



223

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

CHANNEL 15

EACH • REPRESENTS 1638 POINT(S).

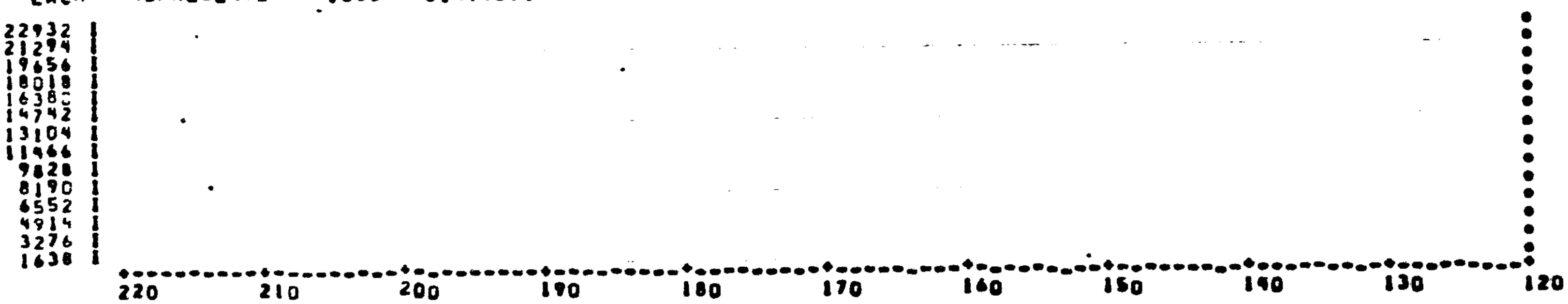
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SBAR

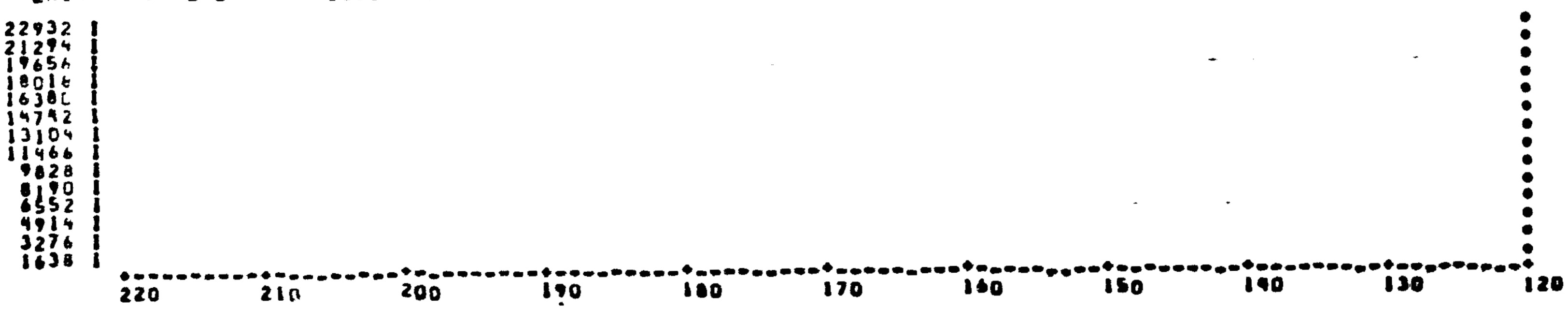
CHANNEL 15

EACH • REPRESENTS 1638 POINT(S).



CHANNEL 16

EACH • REPRESENTS 1638 POINT(S).



224

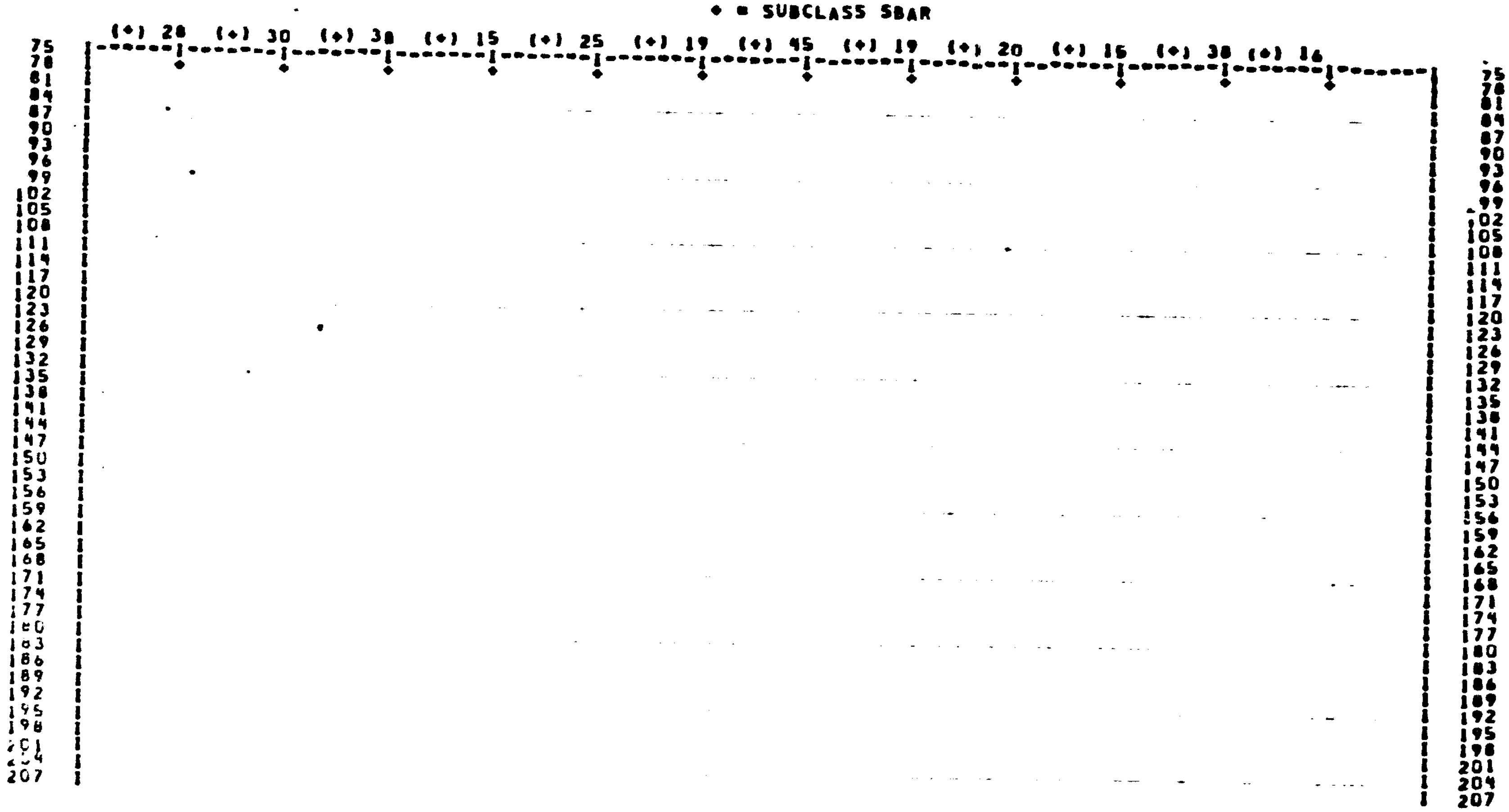
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

COMPOSITE SPECTRAL PLOT (MEAN,PLUS AND MINUS ONE STD. DEV.) FOR:

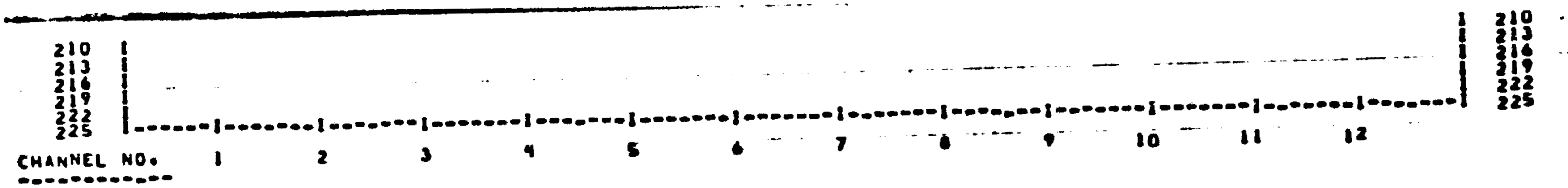
TRAINING SUBCLASS(ES) 1

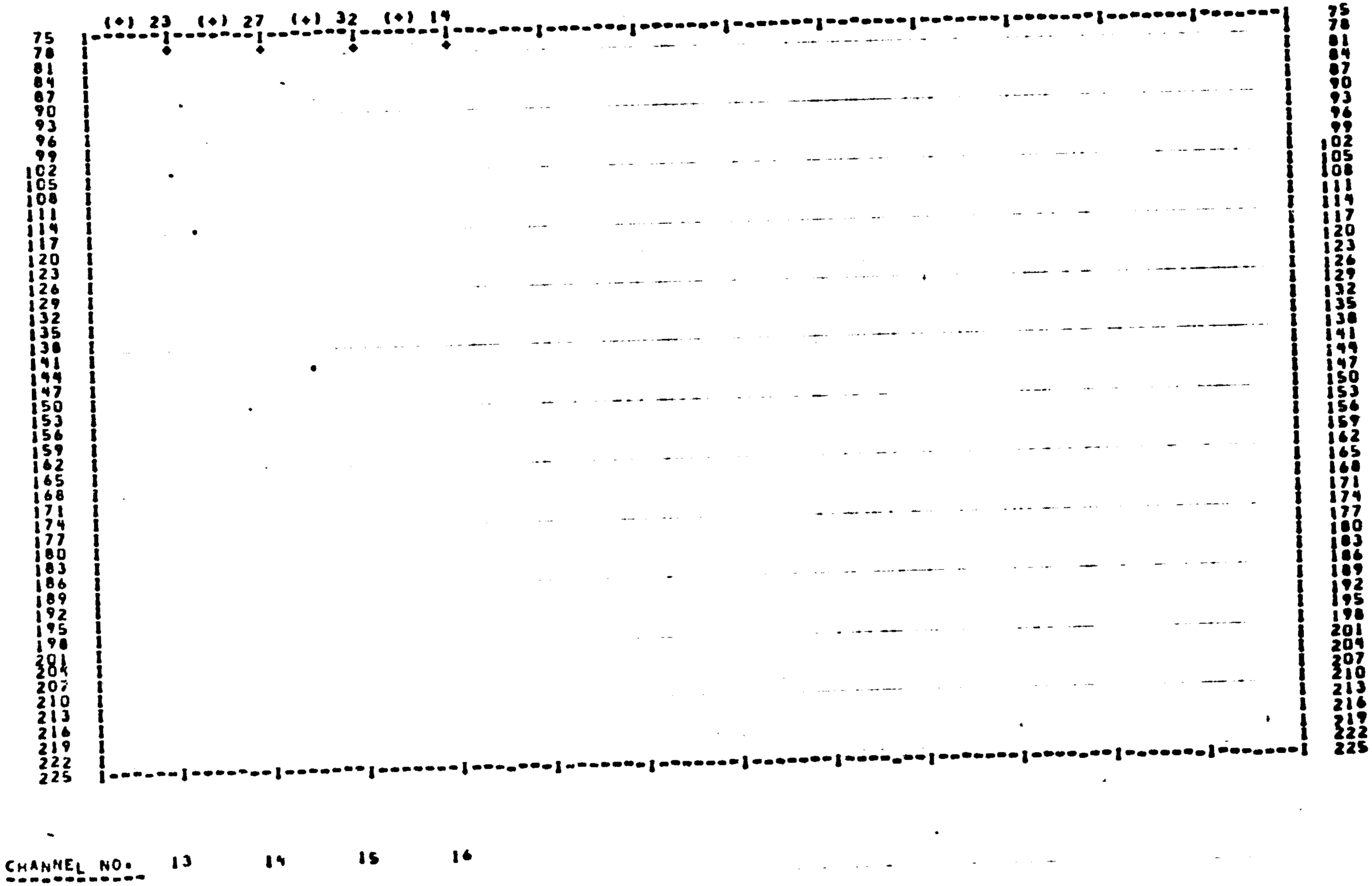
PLOT LEGEND:

* = SUBCLASS SBAR

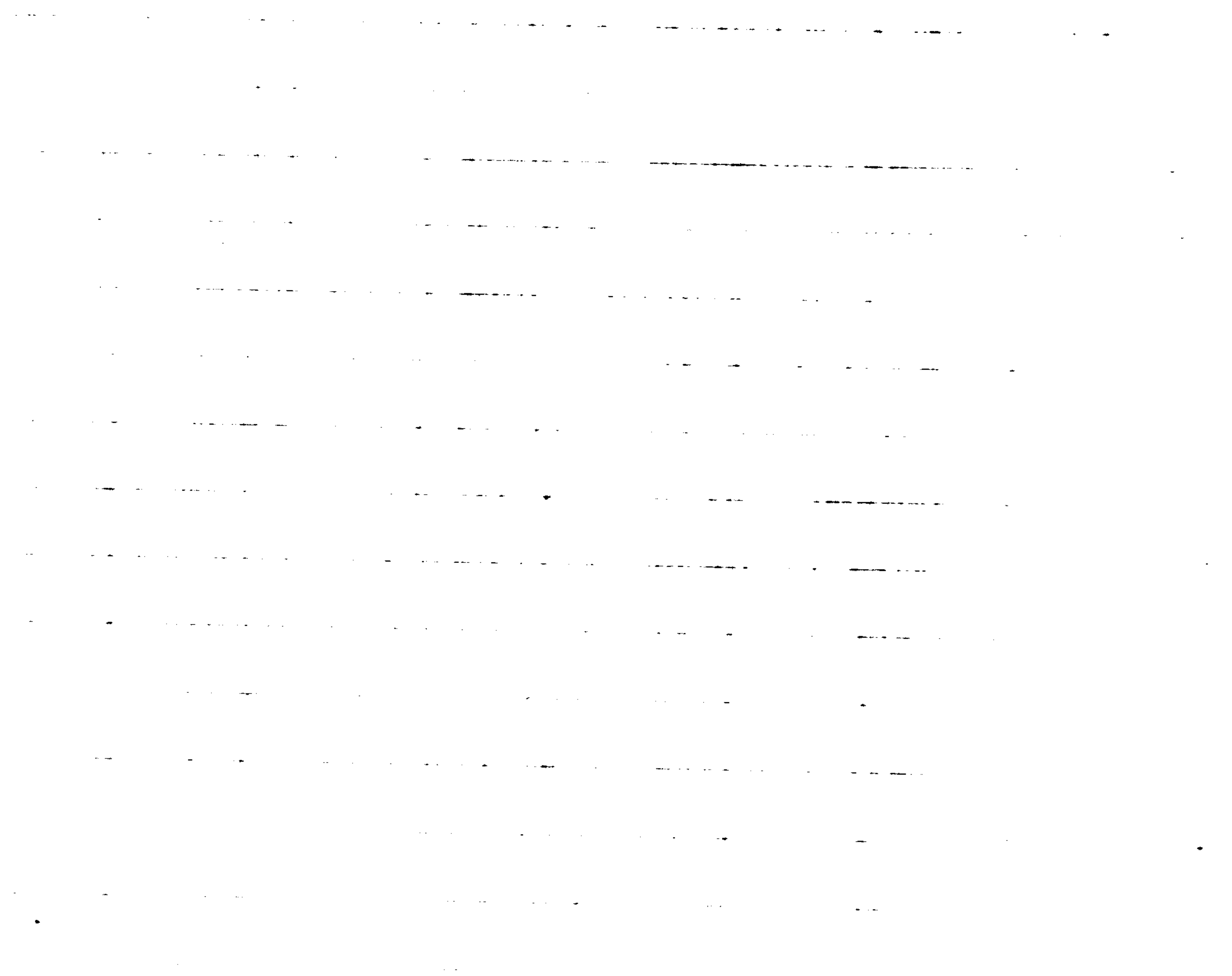


225


210
213
216
219
222
225
CHANNEL NO.
1 2 3 4 5 6 7 8 9 10 11 12


(+) 23 (+) 27 (+) 32 (+) 14
75
78
81
84
87
90
93
96
99
102
105
108
111
114
117
120
123
126
129
132
135
138
141
144
147
150
153
156
159
162
165
168
171
174
177
180
183
186
189
192
195
198
201
204
207
210
213
216
219
222
225
CHANNEL NO.
13 14 15 16

CHANNEL NO. 13 14 15 16



227

*** SSTAT - COMPLETED ***

TIME FOR STAT 5.973

ORIGINAL PAGE IS OF POOR QUALITY

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

SDATA-TR

INPUT IMAGE DATA TAPE INFORMATION

FORMAT UNIVERSAL
NO. OF CHANNELS 16

```
                    RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL                23 FEB 78
                                                     HOUSTON,TEXAS

SDATA-IR
                                                                                          TEST RUN 3

INPUT IMAGE DATA TAPE INFORMATION
   FORMAT                        UNIVERSAL
   NO. OF CHANNELS                  16
   NO. OF PIXELS/LINE              196
   FIRST SCAN LINE NO.               1
   FIRST PIXEL REFERENCE PT          1
  RESCAL
  DATAFI      FILE=6
  TRFORM      OUTPUT/FILE=3
  STATFI      FILE=1
  B-MATR      CARDS
  FORMAT      OUTPUT=UNIVERSAL
  OPTION      GREEN,PCG
  *END*
```

236

LINEAR TRANSFORMATION (B) MATRIX

NO. LINEAR COMB. = 4
NO. CHANNELS = 16

LIN. CMB.	CH(1)	CH(2)	CH(3)	CH(4)	CH(5)	CH(6)	CH(7)	CH(8)	CH(9)	CH(10)	CH(11)	CH(12)
1	-.2900+00	-.5620+00	.6000+00	.4910+00	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	-.2900+00	-.5620+00	.6000+00	.4910+00	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	-.2900+00	-.5620+00	.6000+00	.4910+00
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000

LIN. CMB.	CH(13)	CH(14)	CH(15)	CH(16)
1	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000
4	-.2900+00	-.5620+00	.6000+00	.4910+00

THE INPUT MATRIX TO PCMMAT IS

67.755363	-1.296438	-4.081439	3.723611
-1.296438	204.071314	126.473337	31.593011
-4.081439	126.473337	113.564596	26.827166
3.723611	31.593011	26.827166	19.572757

MATRIX OF EIGENVECTORS =

THE TRANSPOSE OF - PCM MATRIX - IS

-.012248	.995889	-.028554	-.085085
.807569	.031684	.586067	.057913
.671323	-.042226	-.752973	-.323789
.145853	.073606	-.297895	.940514

230

VECTOR OF EIGEN VALUES C(I) =

299.272
68.1624
25.5843
11.9455

VECTOR OF RADII R(I) =

```
VECTOR OF EIGEN VALUES C(I) =

  299.272
  68.1629
  25.5843
  11.9455

    VECTOR OF RADII R(I) =

  .199319-04
  .858788-05
  .147275-05
  .209874-05

INPUT IMAGE DATA TAPE INFORMATION

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

THE PARAMETERS FROM TRHIST

THE MAX IS
  26.89    44.37    31.26    13.77

THE MIN IS
  -8.09    -3.71    -3.71    -3.71

THE CON IS
  7.29     5.30     7.29     14.58

THE PCG SCALING PARAMETERS ARE

THE MAX IS
  55.37    27.88    -2.40     3.11

THE MIN IS
  -5.56    -8.29     1.96    -1.82

THE CON IS
  10.49     8.19    -6.93    11.04
```

ORIGINAL PAGE IS
OF POOR QUALITY

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL — HOUSTON, TEXAS — 23 FEB 78

FIELDNAME	NO. OF VERTICES	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
BI-01	4	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

GREEN IMAGE

* OUTPUT FILE 3 *

*** TRANSFORMED VALUES RESCALED TO A RANGE 0 - 255 ***
(HISTOGRAM METHOD)

*** ORIGINAL TRANSFORMED DATA RANGE ***

MIN	MAX	(BIAS)
-14.0000	62.0000	(.0000)
-11.0000	60.0000	(.0000)
-14.0000	49.0000	(.0000)
-9.0000	27.0000	(.0000)

ORIGINAL PAGE IS OF POOR QUALITY

*** TRANSFORMED DATA RANGE, AFTER APPLICATION OF PEROUT ***

MIN	MAX	CON = 255/(MAX-MIN)
-8.0865	26.8875	7.2911
-3.7148	44.3745	5.3026
-3.7148	31.2592	7.2911
-3.7148	13.7722	14.5823

DATA 1[illegible]

EACH * REPRESENTS 187 POINT(S).

26[illegible] I
26[illegible] I
2[illegible] I

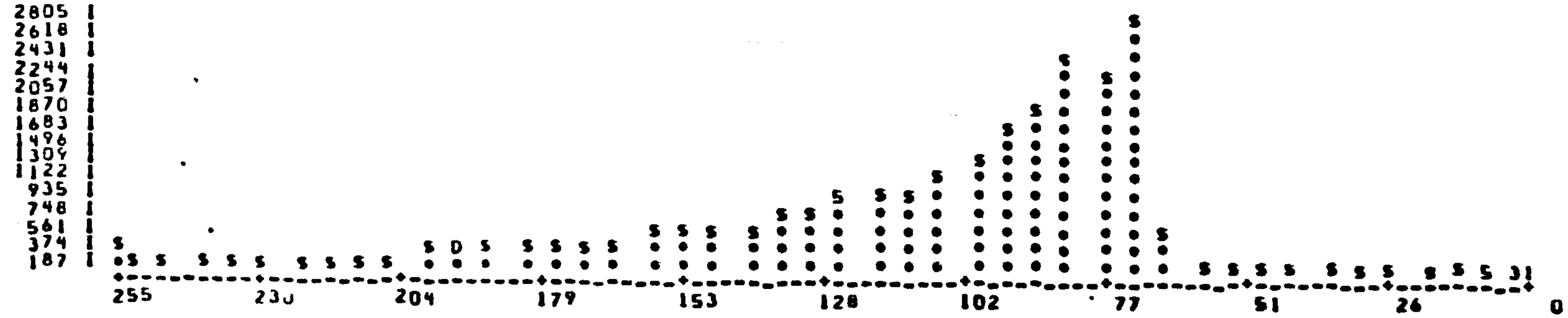
232

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

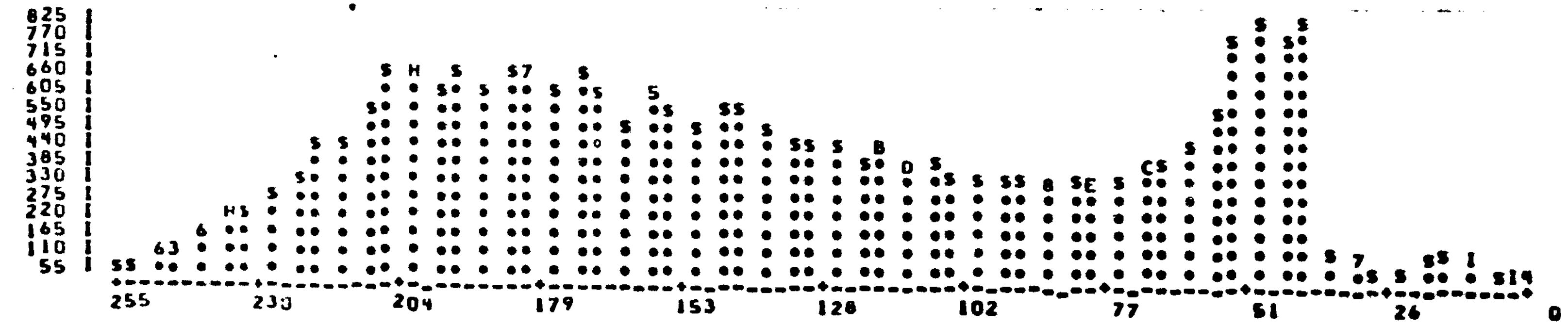
23 FEB 78

DATA TR

EACH • REPRESENTS 187 POINT(S).



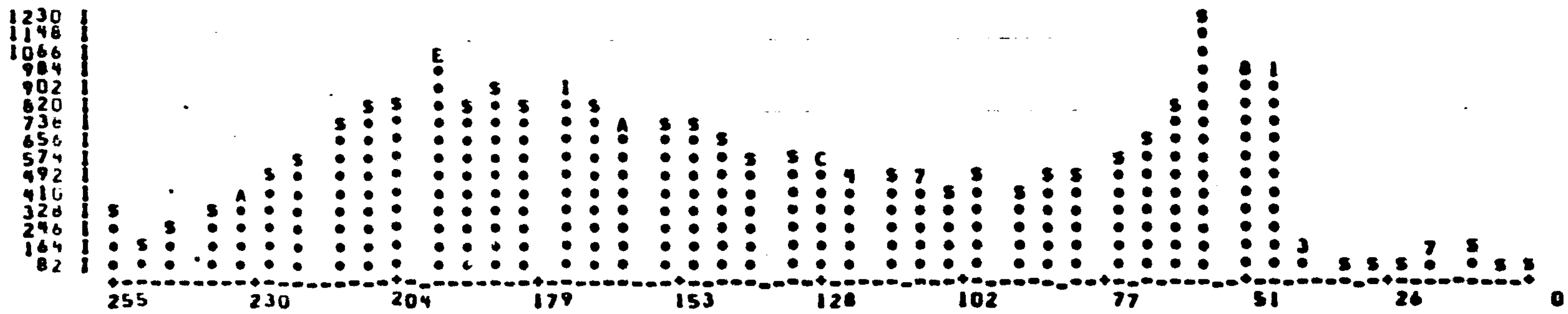
EACH • REPRESENTS 55 POINT(S).



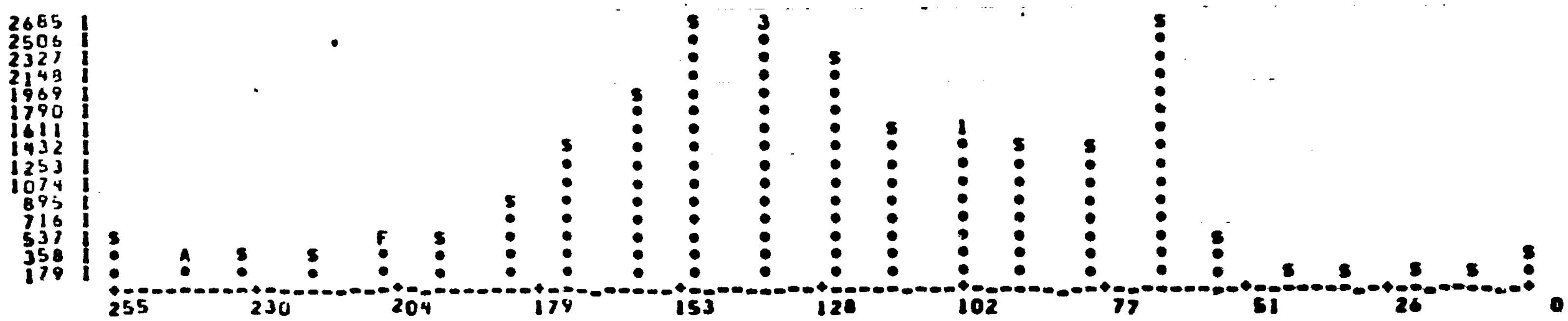
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON,TEXAS

DATA TR

EACH • REPRESENTS 82 POINT(S).



EACH • REPRESENTS 179 POINT(S).



SCALI ARAMETERS USED ON TRANSFORMED VALUES, OUTPUT FILE

	MINIMUM	MAXIMUM	SCALE FACTOR (CON)
COMPONENT 1	-8.087	26.687	7.291
COMPONENT 2	-3.715	44.374	5.303
COMPONENT 3	-3.715	31.259	7.291
COMPONENT 4	-3.715	13.772	14.582

FIELDNAME	NO. OF VERTICES	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
81-01	4	.1	1	(1, 1) (196, 1) (196, 117) (1, 117)

PCG IMAGE

• OUTPUT FILE 4 •

235

IELDNAME	NO. OF VERTICES	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
81-01	4	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

PCG IMAGE

* OUTPUT FILE 4 *

*** TRANSFORMED VALUES RESCALED TO A RANGE 0 - 255 ***
(HISTOGRAM METHOD)

*** ORIGINAL TRANSFORMED DAT. RANGE ***

MIN	MAX	(BIAS)
-14.6387	73.0621	(.0000)
-14.0264	63.1594	(.0000)
-31.1160	32.4544	(.0000)
-12.0557	20.6903	(.0000)

ORIGINAL PAGE IS OF POOR QUALITY

*** TRANSFORMED DATA RANGE, AFTER APPLICATION OF PEROUT ***

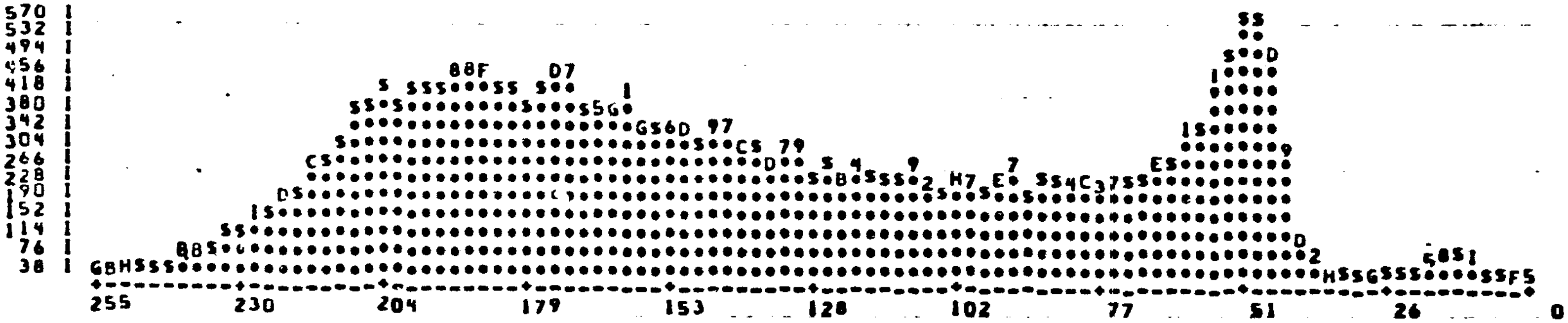
MIN	MAX	CON = 255/(MAX-MIN)
-5.5650	55.3740	10.4854
-3.2875	27.5767	8.1946
-2.4014	1.9575	6.9345
-1.8181	3.1138	11.0408

ORIGINAL PAGE IS OF POOR QUALITY

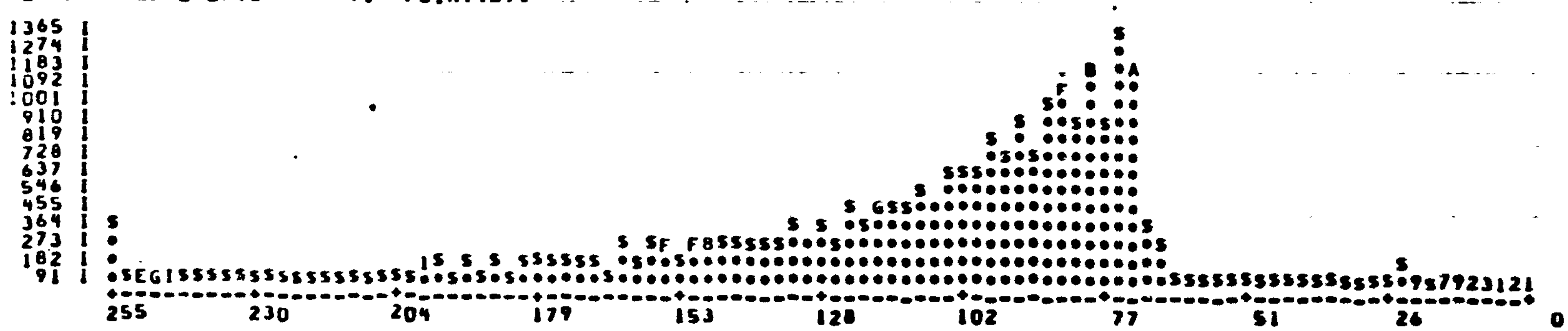
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT ORIGINAL 23 FEB 78
HOUSTON, AS

DATA TR

EACH • REPRESENTS 38 POINT(S).



EACH • REPRESENTS 91 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 23 FEB 78
HOUSTON, TEXAS

257 DATA TR

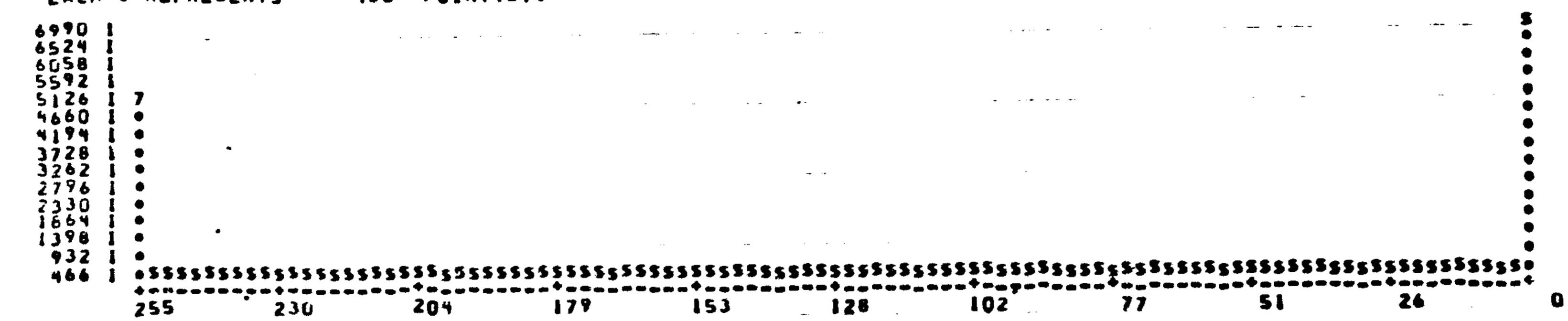
EACH • REPRESENTS 466 POINT(S).

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

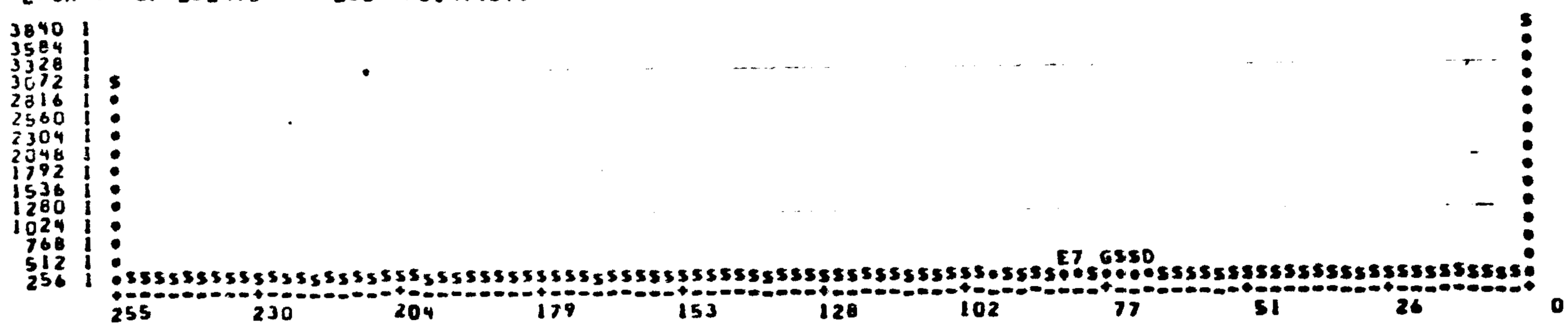
23 FEB 78

DATA TR

EACH • REPRESENTS 466 POINT(S).



EACH • REPRESENTS 256 POINT(S).



238

SCALING PARAMETERS USED ON TRANSFORMED VALUES, OUTPUT FILE 4

	MINIMUM	MAXIMUM	SCALE FACTOR (CON)
COMPONENT 1	-5.565	55.374	10.485
COMPONENT 2	-8.288	27.677	8.195
COMPONENT 3	-2.401	1.958	6.939
COMPONENT 4	-1.818	3.114	11.041

*** SDATA-TR COMPLETED ***

TIME FOR DATA-TRANSFORMATION 6.933

TEST RUN 4

```
$STAT

    DATAFI    FILE=7
    CHANNE    DATA=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
    OPTION    COVAR
    OPTION    HIST
    HISTO     1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
    OPTION    MAXSUM=1
    MEDI      RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
    *END*
```

270

```
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL                03 MAR 78
                                    HOUSTON,TEXAS

YOU HAVE SELECTED THE FOLLOWING  $STAT  PROCESSOR OPTIONS:

   PRINT MEAN AND COVARIANCE FOR EACH FIELD
   PRINT A HISTOGRAM FOR EACH FIELD
   PRINT A HISTOGRAM  FOR EACH SUBCLASS
   PRINT MEAN AND COVARIANCE FOR EACH SUBCLASS

SUPERVISOR INFORMATION:

  UNUSED CORE     28 LOCATIONS
  MAXIMUM NO. OF FIELDS..204
  MAXIMUM NO. OF SUBCLASSES...  1
  CHANNELS SELECTED ARE    1.  2.  3.  4.  5.  6.  7.  8.  9. 10. 11. 12. 13. 14. 15.
                          16.
  HISTOGRAM CHANNELS ARE   1.  2.  3.  4.  5.  6.  7.  8.  9. 10. 11. 12. 13. 14. 15.
                           1..

INPUT IMAGE DATA TAPE INFORMATION

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

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

TRAINING FIELDS

FIELD NO.	FIELD NAME	CLASS	SUBCLASS	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
1	81-01	BARLEY	SWHEAT	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

22932 POINTS WILL BE USED IN THE FIELD MEAN,COVARIANCE CALCULATIONS

ORIGINAL PAGE IS
OF POOR QUALITY

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING FIELD 81-U1

MEAN:	38.43	44.64	53.61	22.36	37.46	43.37	54.38	21.90	38.28	47.08	52.56	20.71
ST DEV:	3.51	5.92	6.93	3.40	5.47	9.18	6.55	3.12	4.07	6.26	6.89	3.14
MEAN:	36.99	47.08	48.74	18.56								
ST DEV:	4.05	7.73	7.92	3.32								

COVARIANCE MATRIX

12.29									
17.88	35.00								
8.93	17.05	48.03							
1.56	3.45	21.56	11.68						
10.50	18.22	-2.33	-4.54	29.94					
17.54	33.48	1.64	-4.85	47.03	84.26				
9.52	19.82	32.25	14.10	9.02	20.67	42.90			
1.87	4.51	16.36	8.13	-3.30	-3.26	17.13	9.76		
7.07	11.74	3.30	-.40	10.09	16.48	6.01	.39	16.54	
9.06	17.65	19.86	7.28	8.06	15.90	20.28	7.85	19.16	39.16

243

7.25	15.08	35.44	16.34	-1.25	3.14	30.47	15.06	8.18	27.65	47.42	
8.00	4.59	16.31	8.04	-2.89	-2.34	13.30	7.19	.73	8.38	19.75	9.87
3.72	6.02	6.86	2.34	2.15	3.07	7.52	3.30	8.22	16.36	11.31	3.45
5.12	10.40	21.81	9.48	-2.55	-1.97	20.84	10.86	10.59	30.57	29.54	11.38
4.24	9.39	30.96	14.72	-7.18	-7.92	27.19	15.15	5.29	25.84	38.09	17.03
1.38	3.61	14.70	7.27	-4.15	-4.57	12.71	7.25	.38	8.60	17.03	8.17

16.42			
27.27	59.70		
23.06	54.36	62.75	
7.44	19.73	24.47	11.03

CORRELATION MATRIX

1.00											
.86	1.00										
.37	.42	1.00									
.13	.17	.91	1.00								
.55	.56	-.06	4.24	1.00							
.64	.62	.03	-.16	.94	1.00						
.41	.61	.71	.63	.25	.34	1.00					
.17	.24	.76	.76	-.19	-.11	.84	1.00				
.50	.49	.12	-.03	.45	.44	.23	.03	1.00			
.41	.48	.46	.34	.24	.28	.49	.40	.75	1.00		
.30	.37	.74	.70	-.03	.05	.68	.70	.29	.64	1.00	
.18	.25	.75	.75	-.17	-.08	.65	.73	.06	.43	.91	1.00
.26	.25	.24	.17	.10	.08	.28	.26	.50	.65	.41	.27
.19	.23	.41	.36	-.06	-.03	.41	.45	.34	.63	.56	.47
.15	.20	.56	.55	-.17	-.11	.52	.61	.16	.52	.70	.68
.12	.16	.64	.64	-.23	-.15	.56	.70	.03	.41	.74	.76

1.00			
.87	1.00		
.72	.89	1.00	
.55	.77	.93	1.00

```
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL                03 MAR 76
                                   HOUSTON,TEXAS

                                     HISTOGRAM
                                  ---------------

                              TRAINING FIELD     61-01

                      (NO. SAMPLES=   22932 , SUBCLASS= WHEAT)
```

ORIGINAL PAGE IS OF POOR QUALITY

```
CHANNEL  1
----------

  EACH * REPRESENTS    1638  POINT(S).

 22932 I                                                                                            *
 21294 I                                                                                            *
 19656 I                                                                                            *
 18018 I                                                                                            *
 16380 I                                                                                            *
 14742 I                                                                                            *
 13104 I                                                                                            *
 11466 I                                                                                            *
  9828 I                                                                                            *
  8190 I                                                                                            *
  6552 I                                                                                            *
  4914 I                                                                                            *
  3276 I                                                                                            *
  1638 I                                                                                            *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120

CHANNEL  2
----------

  EACH * REPRESENTS    1638  POINT(S).

 22932 I                                                                                            *
 21294 I                                                                                            *
 19656 I                                                                                            *
 18018 I                                                                                            *
 16380 I                                                                                            *
 14742 I                                                                                            *
 13104 I                                                                                            *
 11466 I                                                                                            *
  9828 I                                                                                            *
  8190 I                                                                                            *
  6552 I                                                                                            *
  4914 I                                                                                            *
  3276 I                                                                                            *
  1638 I                                                                                            *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

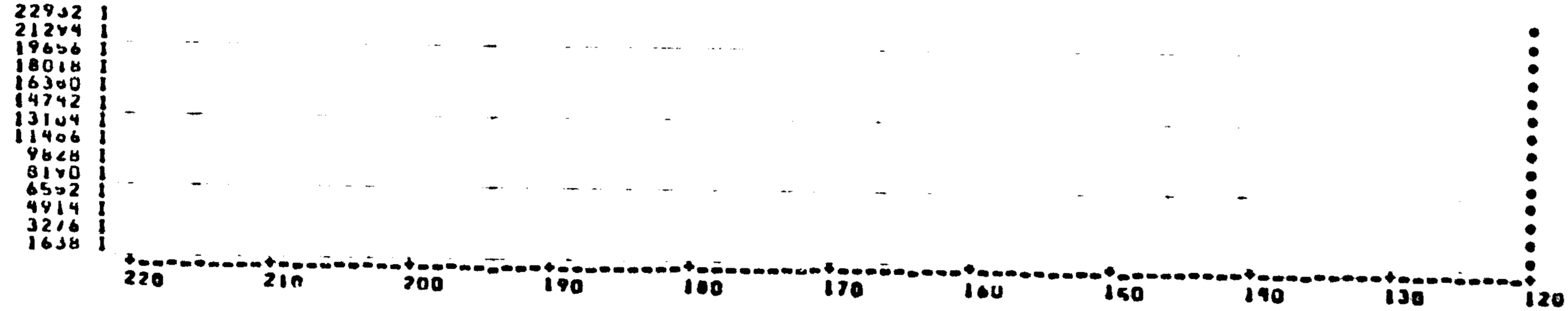
HISTOGRAM

TRAINING FIELD BI-01

(NO. SAMPLES= 22932 , SUBCLASS= SWHEAT)

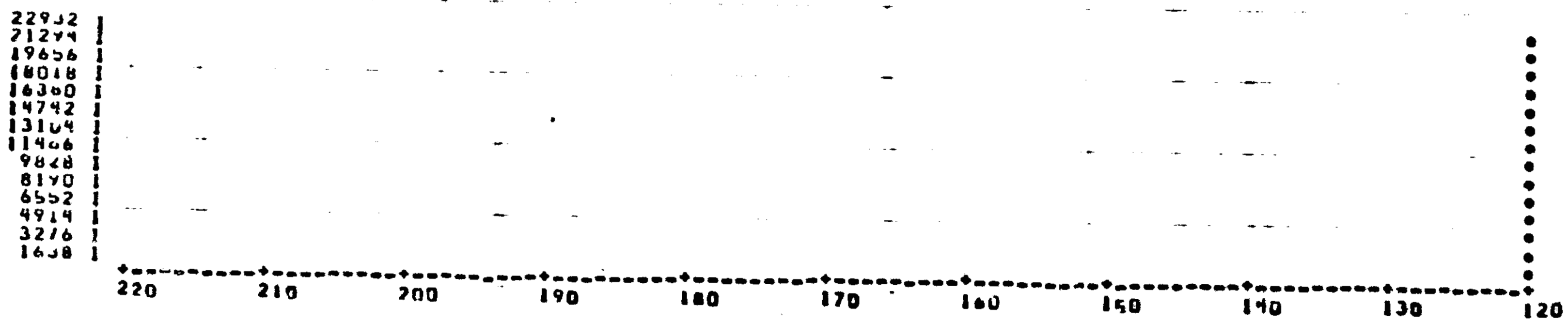
CHANNEL 3

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 4

EACH * REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

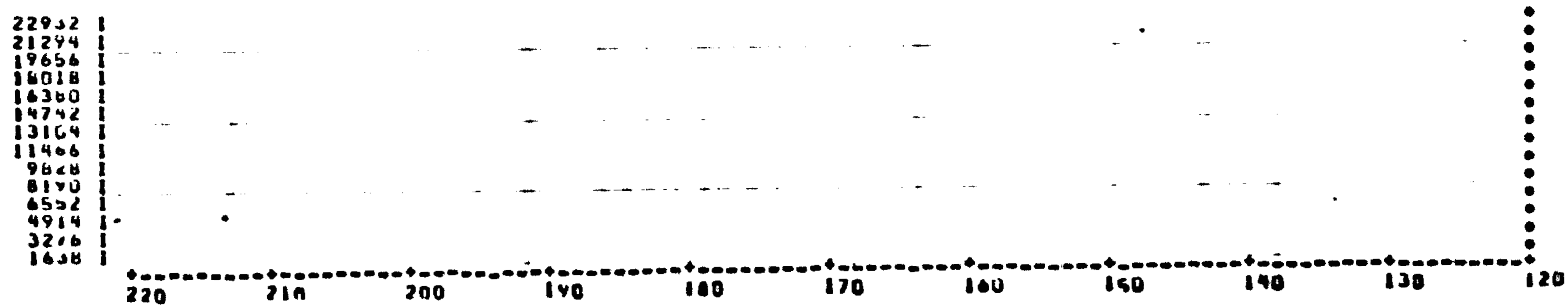
HISTOGRAM

TRAINING FIELD BI-01

(NO. SAMPLES= 22932 , SUBCLASS= WHEAT)

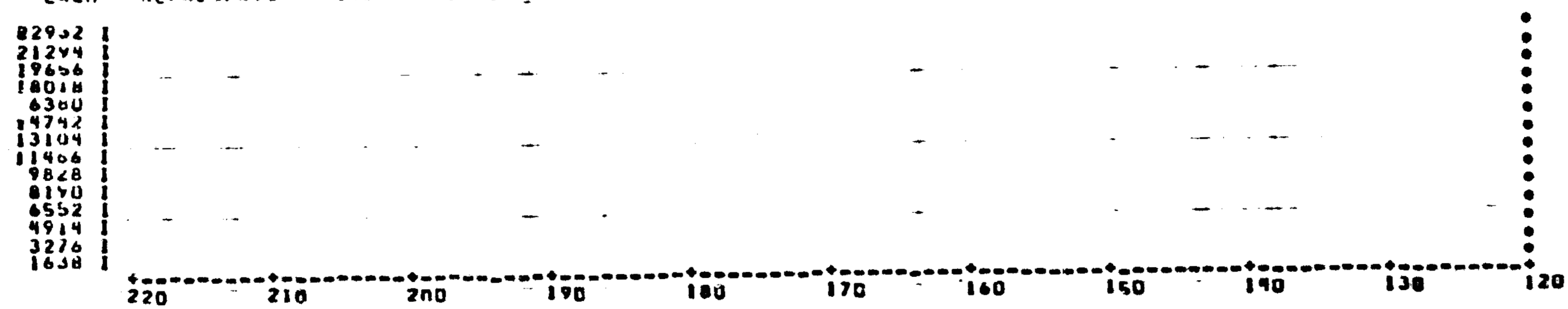
CHANNEL 5

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 6

EACH * REPRESENTS 1638 POINT(S).



248

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL HOUSTON,TEXAS 03 MAR 78

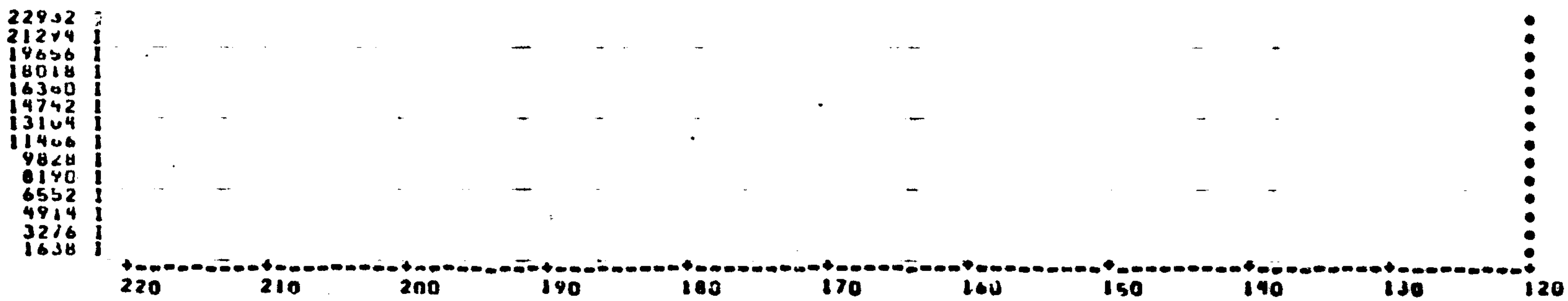
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22932 , SUBCLASS= SWHEAT)

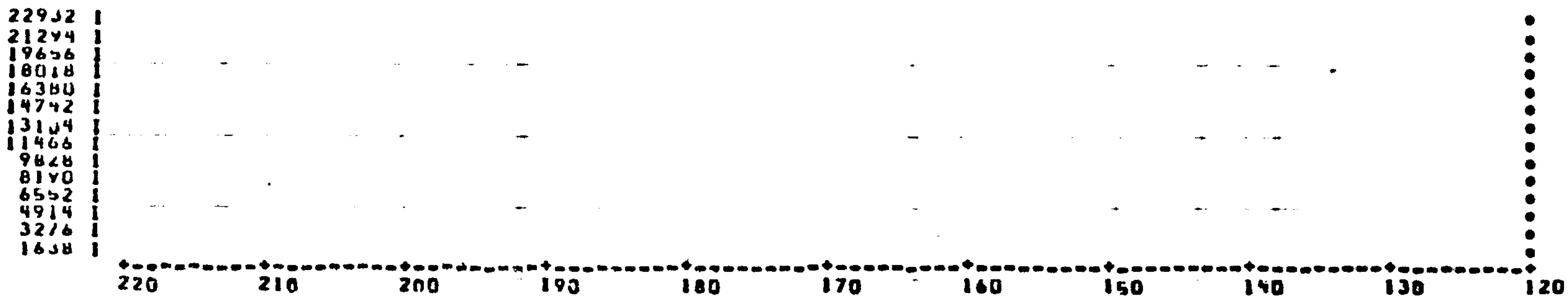
CHANNEL 7

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 8

EACH * REPRESENTS 1638 POINT(S).



```
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL                    03 MAR 78
                              HOUSTON,TEXAS

                                    HISTOGRAM
                                    ---------
                              TRAINING FIELD     81-01

                       (NO. SAMPLES=   22932 , SUBCLASS= SWHEAT)
CHANNEL  9
----------
  EACH * REPRESENTS    1638  POINT(S).

 22932 I
 21294 I                                                                              *
 19656 I                                                                              *
 18018 I                                                                              *
 16380 I                                                                              *
 14742 I                                                                              *
 13104 I                                                                              *
 11466 I                                                                              *
  9828 I                                                                              *
  8190 I                                                                              *
  6552 I                                                                              *
  4914 I                                                                              *
  3276 I                                                                              *
  1638 I                                                                              *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------*
       220       210       200       190       180       170       160       150       140       130       120

CHANNEL 10
----------
  EACH * REPRESENTS    1638  POINT(S).

 22932 I
 21294 I                                                                              *
 19656 I                                                                              *
 18018 I                                                                              *
 16380 I                                                                              *
 14742 I                                                                              *
 13104 I                                                                              *
 11466 I                                                                              *
  9828 I                                                                              *
  8190 I                                                                              *
  6552 I                                                                              *
  4914 I                                                                              *
  3276 I                                                                              *
  1638 I                                                                              *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------*
       220       210       200       190       180       170       160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL HOUSTON,TEXAS   03 MAR 78

HISTOGRAM

TRAINING FIELD 61-01

(NO. SAMPLES= 22932 , SUBCLASS= SWHEAT)

CHANNEL 11

EACH * REPRESENTS 1638 POINT(S).

```
22932 I                                                                          *
21274 I                                                                          *
19656 I                                                                          *
18018 I                                                                          *
16380 I                                                                          *
14742 I                                                                          *
13104 I                                                                          *
11466 I                                                                          *
 9828 I                                                                          *
 8190 I                                                                          *
 6552 I                                                                          *
 4914 I                                                                          *
 3276 I                                                                          *
 1638 I                                                                          *
      +------+------+------+------+------+------+------+------+------+------+------+
     220    210    200    190    180    170    160    150    140    130    120
```

CHANNEL 12

EACH * REPRESENTS 1638 POINT(S).

```
22932 I                                                                          *
21274 I                                                                          *
19656 I                                                                          *
18018 I                                                                          *
16380 I                                                                          *
14742 I                                                                          *
13104 I                                                                          *
11466 I                                                                          *
 9828 I                                                                          *
 8190 I                                                                          *
 6552 I                                                                          *
 4914 I                                                                          *
 3276 I                                                                          *
 1638 I                                                                          *
      +------+------+------+------+------+------+------+------+------+------+------+
     220    210    200    190    180    170    160    150    140    130    120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

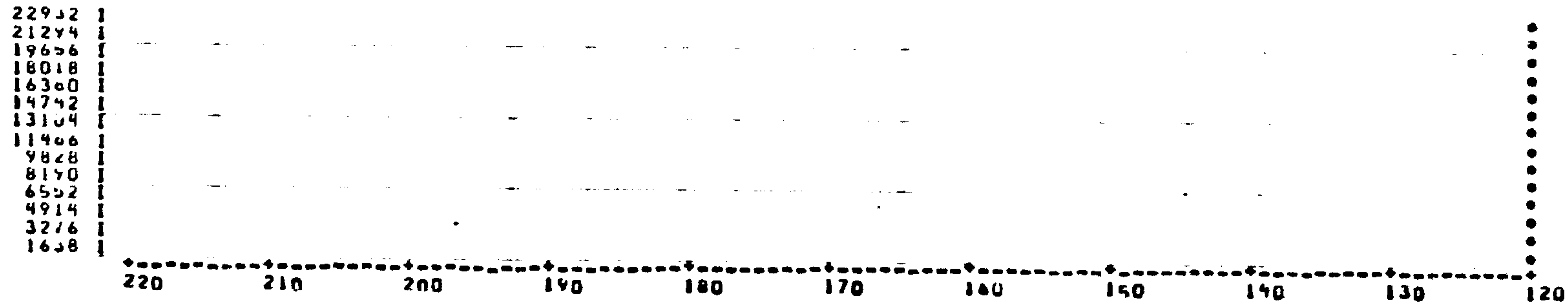
HISTOGRAM

TRAINING FIELD BI-01

(NO. SAMPLES= 22932 , SUBCLASS= SWHEAT)

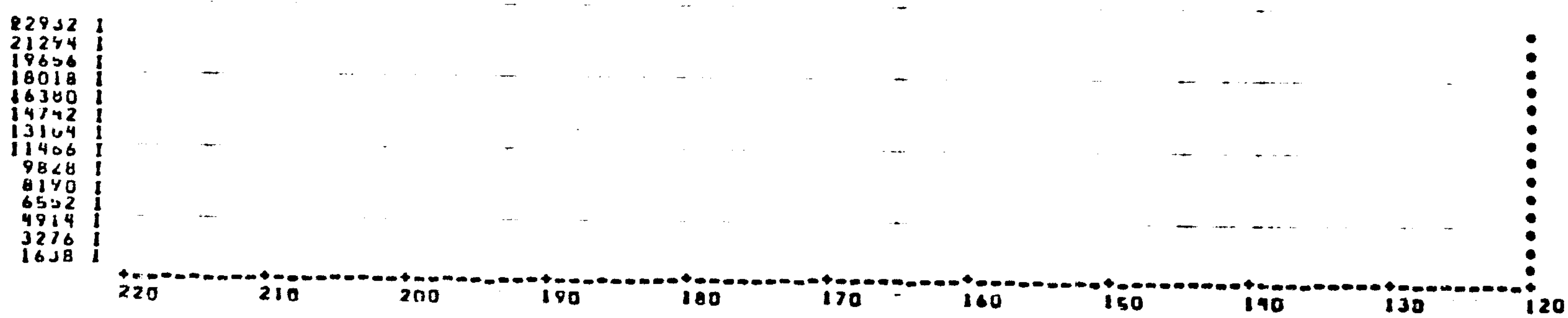
CHANNEL 13

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 14

EACH * REPRESENTS 1638 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD   81-01

(NO. SAMPLES=   22932 , SUBCLASS= SWHEAT)

CHANNEL 15

```
  EACH * REPRESENTS    1638  POINT(S).

 22932 I                                                                                                   *
 21294 I                                                                                                   *
 19656 I                                                                                                   *
 18018 I                                                                                                   *
 16380 I                                                                                                   *
 14742 I                                                                                                   *
 13104 I                                                                                                   *
 11466 I                                                                                                   *
  9828 I                                                                                                   *
  8190 I                                                                                                   *
  6552 I                                                                                                   *
  4914 I                                                                                                   *
  3276 I                                                                                                   *
  1638 I                                                                                                   *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120
```

CHANNEL 16

```
  EACH * REPRESENTS    1638  POINT(S).

 22932 I                                                                                                   *
 21294 I                                                                                                   *
 19656 I                                                                                                   *
 18018 I                                                                                                   *
 16380 I                                                                                                   *
 14742 I                                                                                                   *
 13104 I                                                                                                   *
 11466 I                                                                                                   *
  9828 I                                                                                                   *
  8190 I                                                                                                   *
  6552 I                                                                                                   *
  4914 I                                                                                                   *
  3276 I                                                                                                   *
  1638 I                                                                                                   *
        +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
       220       210       200       190       180       170       160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL HOUSTON,TEXAS   03 MAR 78

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS)   FOR;

TRAINING SUBCLASS   SWHEAT

MEAN:	38.43	44.64	53.61	22.36	37.46	43.37	54.38	21.90	38.28	47.08	52.56	20.71
ST DEV:	3.51	5.92	6.93	3.48	5.47	9.18	6.55	3.12	4.07	6.26	6.89	3.14

MEAN:	36.99	47.08	48.74	18.56
ST DEV:	4.05	7.73	7.92	3.32

COVARIANCE MATRIX

12.29											
17.88	35.00										
8.93	17.05	48.03									
1.56	3.45	21.56	11.58								
10.50	18.22	-2.33	-4.54	29.94							
17.54	33.48	1.64	-4.85	47.03	84.26						
9.52	19.82	32.25	14.10	9.02	20.67	42.90					
1.87	4.51	16.36	8.13	-3.30	-3.26	17.13	9.76				
7.07	11.74	3.30	-.40	10.09	16.48	6.01	.39	16.54			
9.06	17.65	19.86	7.28	8.06	15.90	20.28	7.85	19.16	39.16		
7.25	15.08	35.44	16.34	-1.25	3.14	30.47	15.06	8.18	27.45	47.42	
2.00	4.59	16.31	8.04	-2.89	-2.34	13.30	7.19	.73	8.38	19.76	9.87
3.72	6.02	6.86	2.34	2.15	3.07	7.52	3.30	8.22	16.36	11.31	3.45

5.12	10.48	21.81	9.48	-2.55	-1.97	20.84	10.86	10.59	30.57	29.54	11.38
4.24	9.39	30.96	14.72	-7.18	-7.92	27.19	15.15	5.29	25.84	38.09	17.03
1.38	3.61	14.70	7.27	-4.16	-4.57	12.71	7.25	.38	8.60	17.03	8.17

16.42			
27.27	59.70		
23.06	54.36	62.75	
7.44	19.73	24.47	11.03

CORRELATION MATRIX

255

CORRELATION MATRIX

1.00											
.86	1.[illegible]										
.37	.42	1.00									
.13	.17	.91	1.00								
.55	.56	-.06	-.24	1.00							
.54	.62	.03	-.16	.94	1.00						
.41	.51	.71	.63	.25	.34	1.00					
.17	.24	.76	.76	-.19	-.11	.84	1.00				
.50	.49	.12	-.03	.45	.44	.23	.03	1.00			
.41	.48	.46	.34	.24	.28	.49	.40	.75	1.00		
.30	.37	.74	.70	-.03	.05	.68	.70	.29	.64	1.00	
.18	.25	.75	.75	-.17	-.08	.65	.73	.06	.43	.91	1.00
.26	.25	.24	.17	.10	.08	.28	.26	.50	.65	.41	.27
.19	.23	.41	.36	-.06	-.03	.41	.45	.34	.63	.56	.47
.15	.20	.56	.55	-.17	-.11	.52	.61	.16	.52	.70	.68
.12	.18	.64	.64	-.23	-.15	.58	.70	.03	.41	.74	.78

1.00			
.87	1.00		
.72	.89	1.00	
.55	.77	.93	1.00

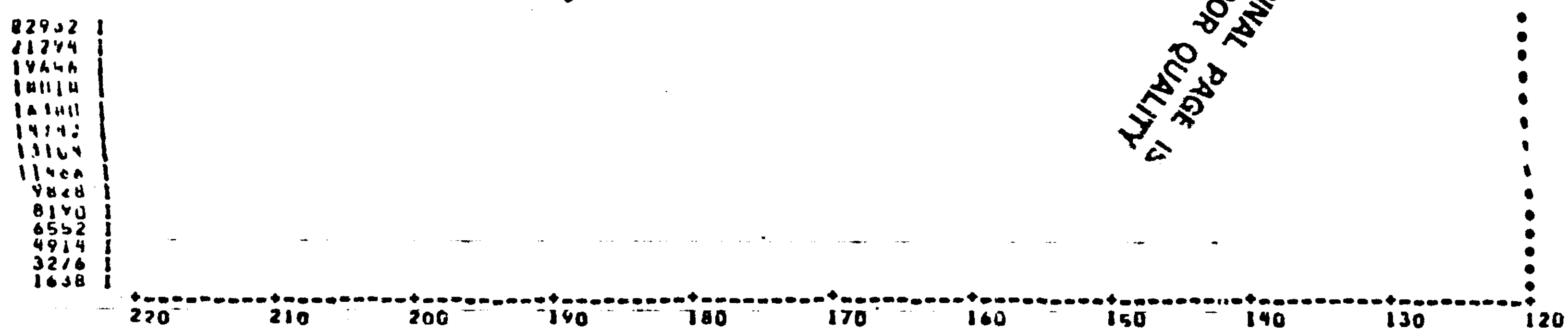
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

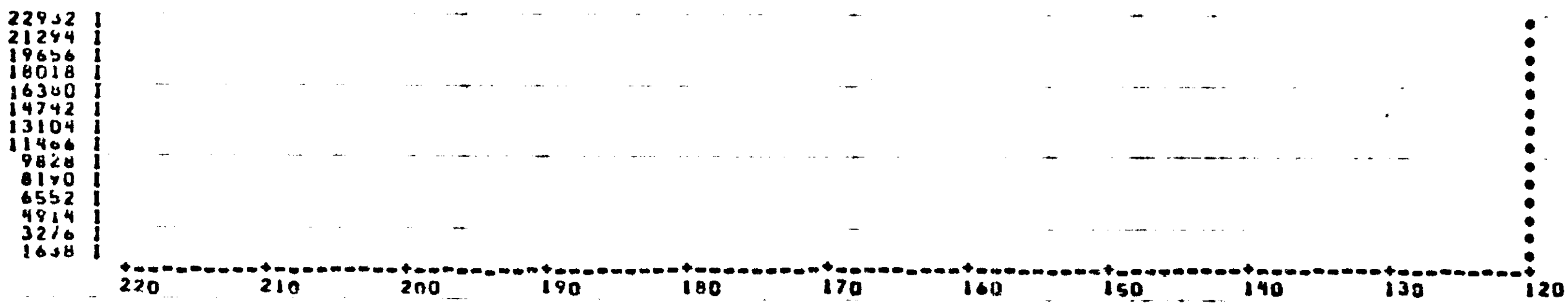
CHANNEL 1

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 2

EACH * REPRESENTS 1638 POINT(S).



257

```
 6552 I
 4914 I
 3276
 1638
      --------+---------+---------+---------+---------+---  ---+---------+---------+---------+---------+
     20      210       200       190       180       170      160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

HISTOGRAM

TRAINING SUBCLASS SWHEAT

CHANNEL 3

EACH * REPRESENTS 1638 POINT(S).

```
22932 I
21294 I
19656 I
18018 I
16380 I
14742 I
13104 I
11466 I
 9828 I
 8190 I
 6552 I
 4914 I
 3276 I
 1638 I
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
     220       210       200       190       180       170       160       150       140       130       120
```

CHANNEL 4

EACH * REPRESENTS 1638 POINT(S).

```
22932 I
21294 I
19656 I
18018 I
16380 I
14742 I
13104 I
11466 I
 9828 I
 8190 I
 6552 I
 4914 I
 3276 I
 1638 I
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
     220       210       200       190       180       170       160       150       140       130       120
```

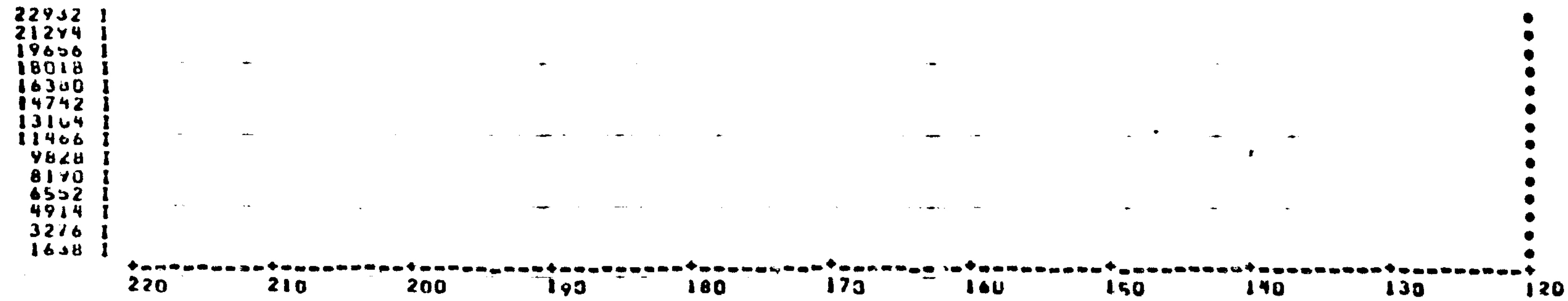
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL HOUSTON,TEXAS 03 MAR 78

HISTOGRAM

TRAINING SUBCLASS SWHEAT

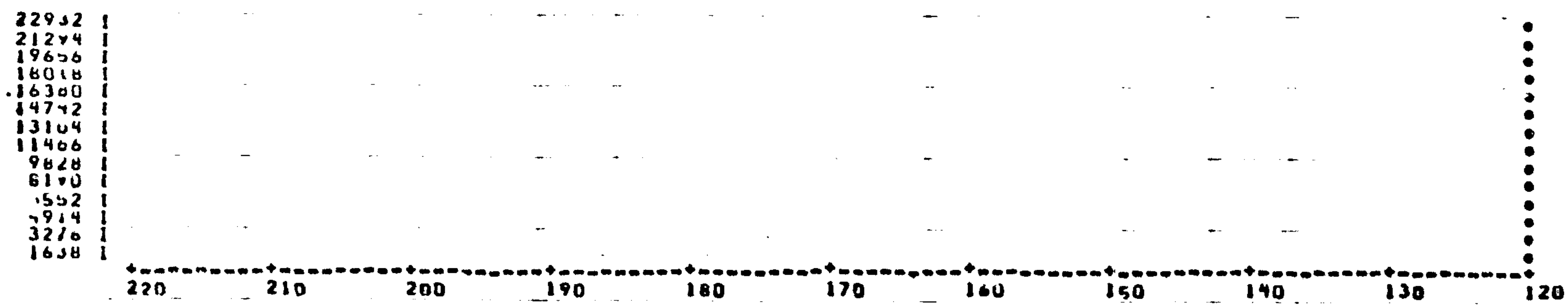
CHANNEL 5

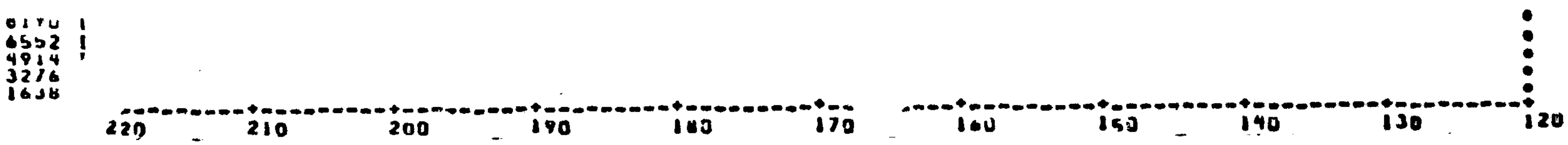
EACH * REPRESENTS 1638 POINT(S).



CHANNEL 6

EACH * REPRESENTS 1638 POINT(S).





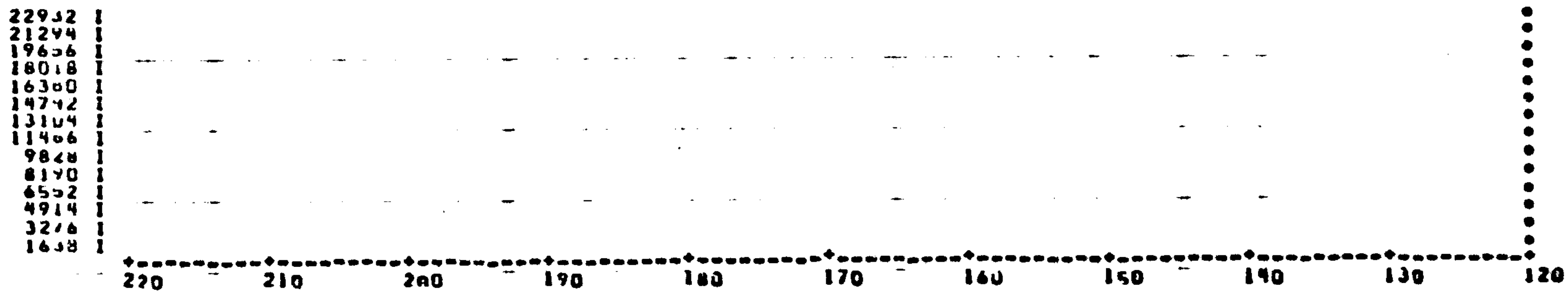
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS S*HEAT

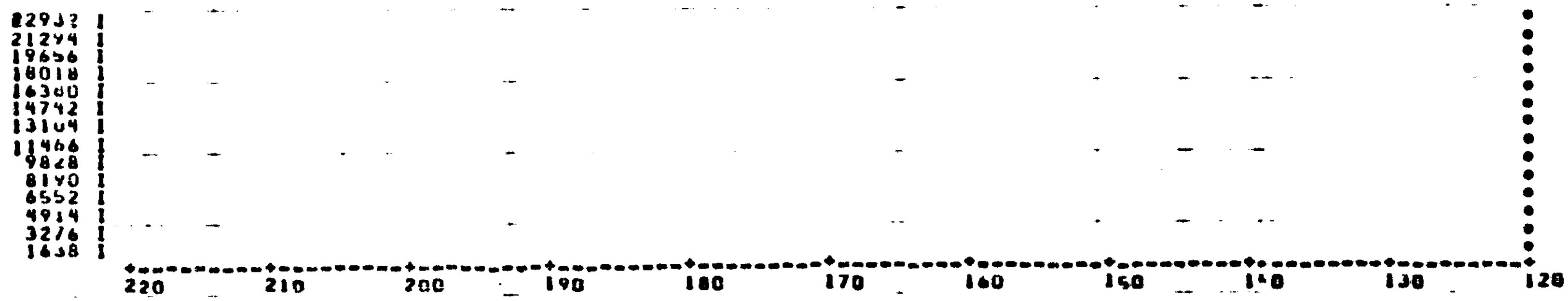
CHANNEL 7

EACH * REPRESENTS 1638 POINT(S).



CHANNEL 8

EACH * REPRESENTS 1638 POINT(S).



260

HISTOGRAM

TRAINING SUBCLASS   SWHEAT

```
CHANNEL  9
----------

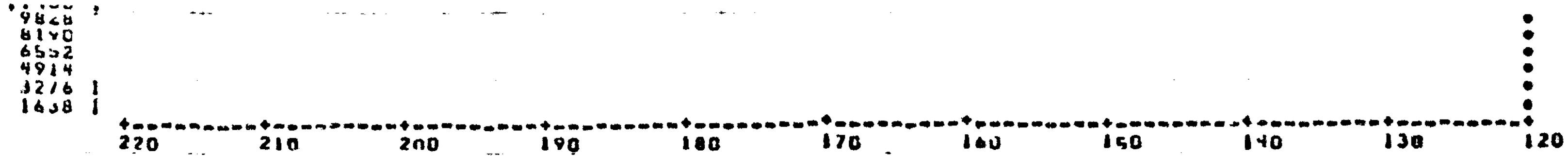
   EACH * REPRESENTS    1638  POINT(S).

  22932 I                                                                                                    *
  21294 I                                                                                                    *
  19656 I                                                                                                    *
  18018 I                                                                                                    *
  16380 I                                                                                                    *
  14742 I                                                                                                    *
  13104 I                                                                                                    *
  11466 I                                                                                                    *
   9828 I                                                                                                    *
   8190 I                                                                                                    *
   6552 I                                                                                                    *
   4914 I                                                                                                    *
   3276 I                                                                                                    *
   1638 I                                                                                                    *
         +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
        220       210       200       190       180       170       160       150       140       130       120

CHANNEL 10
----------

   EACH * REPRESENTS    1638  POINT(S).

  22932 I                                                                                                    *
  21294 I                                                                                                    *
  19656 I                                                                                                    *
  18018 I                                                                                                    *
  16380 I                                                                                                    *
  14742 I                                                                                                    *
  13104 I                                                                                                    *
  11466 I                                                                                                    *
   9828 I                                                                                                    *
   8190 I                                                                                                    *
   6552 I                                                                                                    *
   4914 I                                                                                                    *
   3276 I                                                                                                    *
   1638 I                                                                                                    *
         +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
        220       210       200       190       180       170       160       150       140       130       120
```



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

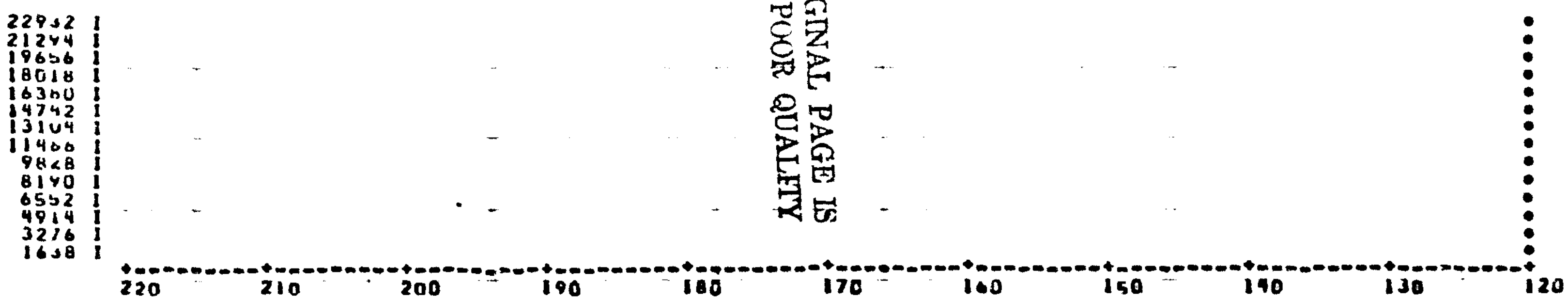
03 MAR 78

HISTOGRAM

TRAINING SUBCLASS SWHEAT

CHANNEL 11

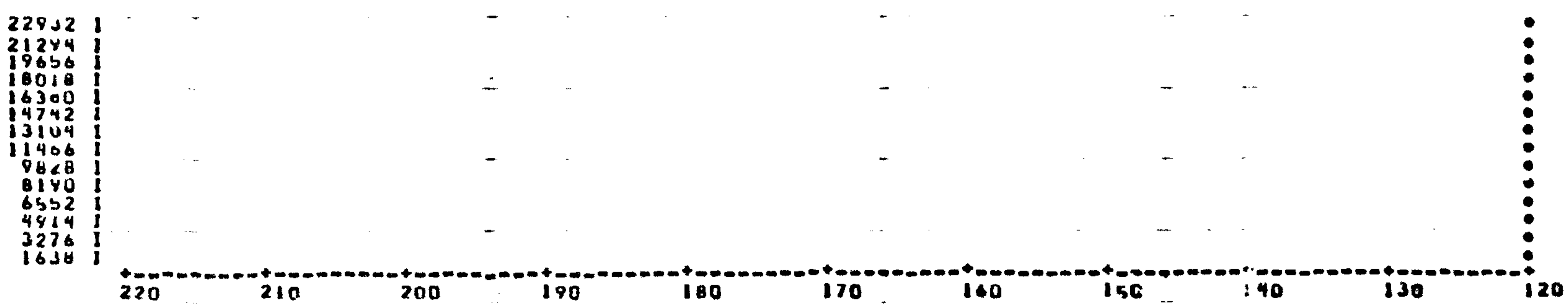
EACH * REPRESENTS 1638 POINT(S).



ORIGINAL PAGE IS
OF POOR QUALITY

CHANNEL 12

EACH * REPRESENTS 1638 POINT(S).



```
                                  HISTOGRAM
                                  ---------

                          TRAINING SUBCLASS   SWHEAT
                          ------------------------

CHANNEL 13
----------

  EACH * REPRESENTS    1638  POINT(S).

 22932 I                                                                         *
 21294 I                                                                         *
 19656 I                                                                         *
 18018 I                                                                         *
 16380 I                                                                         *
 14742 I                                                                         *
 13104 I                                                                         *
 11466 I                                                                         *
  9828 I                                                                         *
  8190 I                                                                         *
  6552 I                                                                         *
  4914 I                                                                         *
  3276 I                                                                         *
  1638 I                                                                         *
       +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------*
      220     210     200     190     180     170     160     150     140     130     120

CHANNEL 14
----------

  EACH * REPRESENTS    1638  POINT(S).

 22932 I                                                                         *
 21294 I                                                                         *
 19656 I                                                                         *
 18018 I                                                                         *
 16380 I                                                                         *
 14742 I                                                                         *
 13104 I                                                                         *
 11466 I                                                                         *
  9828 I                                                                         *
  8190 I                                                                         *
  6552 I                                                                         *
  4914 I                                                                         *
  3276 I                                                                         *
  1638 I                                                                         *
       +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------*
      220     210     200     190     180     170     160     150     140     130     120
```

```
 9828 I                                                                                                    *
 8190                                                                                                      *
 6552                                                                                                      *
 4914                                                                                                      *
 3276                                                                                                      *
 1638 I                                                                                                    *
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
     220       210       200       190       180       170       160       150       140       130       120
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 75
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS   SWHEAT

CHANNEL 15

EACH * REPRESENTS   1638 POINT(S).

```
22932 I                                                                                                    *
21294 I                                                                                                    *
19656 I                                                                                                    *
18018 I                                                                                                    *
16380 I                                                                                                    *
14742 I                                                                                                    *
13104 I                                                                                                    *
11466 I                                                                                                    *
 9828 I                                                                                                    *
 8190 I                                                                                                    *
 6552 I                                                                                                    *
 4914 I                                                                                                    *
 3276 I                                                                                                    *
 1638 I                                                                                                    *
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
     220       210       200       190       180       170       160       150       140       130       120
```

CHANNEL 16

EACH * REPRESENTS   1638 POINT(S).

```
22932 I                                                                                                    *
21294 I                                                                                                    *
19656 I                                                                                                    *
18018 I                                                                                                    *
16380 I                                                                                                    *
14742 I                                                                                                    *
13104 I                                                                                                    *
11466 I                                                                                                    *
 9828 I                                                                                                    *
 8190 I                                                                                                    *
 6552 I                                                                                                    *
 4914 I                                                                                                    *
 3276 I                                                                                                    *
 1638 I                                                                                                    *
      +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
     220       210       200       190       180       170       160       150       140       130       120
```

264

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

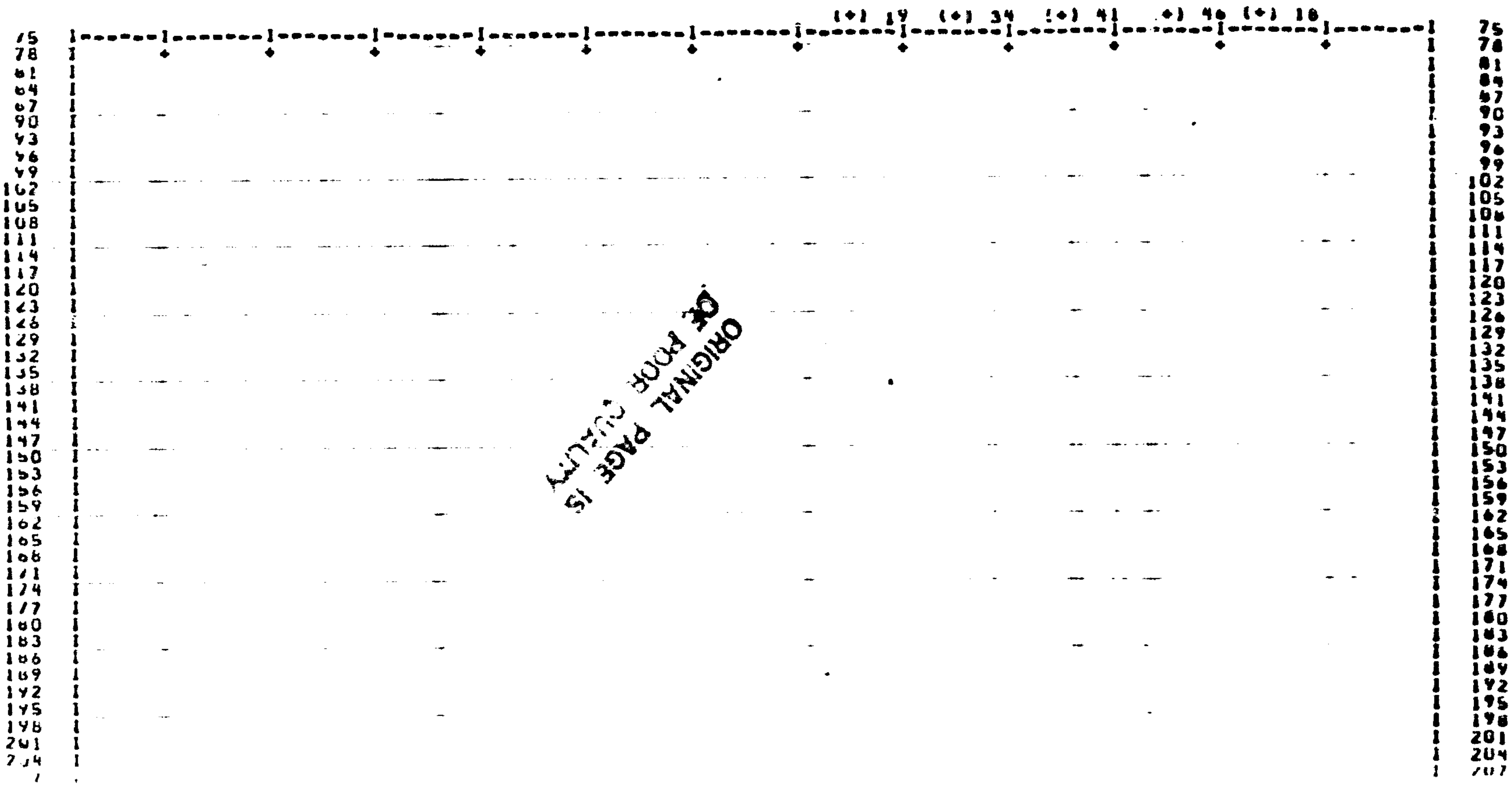
COMPOSITE SPECTRAL PLOT (MEAN,PLUS AND MINUS ONE STD. DEV.) FOR:

TRAINING SUBCLASS(ES) 1

PLOT LEGEND:

+ = SUBCLASS S=HEAT

(+) 35 (+) 39 (+) 47 (+) 19 (+) 32 (+) 34



```
210  I                                                                                                    I  210
213  I                                                                                                    I  213
216  I                                                                                                    I  216
219  I                                                                                                    I  219
222  I                                                                                                    I  222
225  I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I  225

CHANNEL NO.  1       2       3       4       5       6       7       8       9       10      11      12
-----------


      (+) 33  (+) 39  (+) 41  (+) 15
 75  I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I  75
 78  I       +       +       +       +                                                                    I  78
 81  I                                                                                                    I  81
 84  I                                                                                                    I  84
 87  I                                                                                                    I  87
 90  I                                                                                                    I  90
 93  I                                                                                                    I  93
 96  I                                                                                                    I  96
 99  I                                                                                                    I  99
102  I                                                                                                    I  102
105  I                                                                                                    I  105
108  I                                                                                                    I  108
111  I                                                                                                    I  111
114  I                                                                                                    I  114
117  I                                                                                                    I  117
120  I                                                                                                    I  120
123  I                                                                                                    I  123
126  I                                                                                                    I  126
129  I                                                                                                    I  129
132  I                                                                                                    I  132
135  I                                                                                                    I  135
138  I                                                                                                    I  138
141  I                                                                                                    I  141
144  I                                                                                                    I  144
147  I                                                                                                    I  147
150  I                                                                                                    I  150
153  I                                                                                                    I  153
156  I                                                                                                    I  156
159  I                                                                                                    I  159
162  I                                                                                                    I  162
165  I                                                                                                    I  165
168  I                                                                                                    I  168
171  I                                                                                                    I  171
174  I                                                                                                    I  174
177  I                                                                                                    I  177
180  I                                                                                                    I  180
183  I                                                                                                    I  183
186  I                                                                                                    I  186
189  I                                                                                                    I  189
192  I                                                                                                    I  192
195  I                                                                                                    I  195
198  I                                                                                                    I  198
201  I                                                                                                    I  201
204  I                                                                                                    I  204
207  I                                                                                                    I  207
210  I                                                                                                    I  210
213  I                                                                                                    I  213
216  I                                                                                                    I  216
219  I                                                                                                    I  219
222  I                                                                                                    I  222
225  I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I-------I  225
```

177
180
183

195
198
201
204
207
210
213
216
219
222
225

CHANNEL NO. 13 14 15 16

267

```
***  $STAT = COMPLETED  ***

TIME FOR STAT     5.502
```

NAL PAGE
POOR QUALITY

TEST RUN 5

```
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL          03 MAR 78
                                   HOUSTON,TEXAS

$STAT

    SUNANG     TAPE
    CHANNE     DATA=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16  FILTER=5,6,7,8
    HISTO      1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
    B-MATR     CARDS
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON,TEXAS

LINEAR TRANSFORMATION (6) MATRIX

NO. LINEAR COMB. = 4
NO. CHANNELS = 4

LIN. CMB.	CH(5)	CH(6)	CH(7)	CH(8)
1	.4330+00	.6320+00	.5860+00	.2640+00
2	-.2900+00	-.5620+00	.6000+00	.4910+00
3	-.8290+00	.5220+00	-.3900-01	.1940+00
4	.2230+00	.1200-01	-.5430+00	.8100+00
BIAS	0.0.16.0.25.0.20.0			

```
THE BIAS ARE
     .00     16.00     25.00     20.00
   OPTION    TASSEL
   OPTION    COVAR
   OPTION    HIST
   DATAFI    FILE=7
   STATFI    FILE=2
   OPTION    MAXSUB=1
   HEDI      RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
   *END*
```

371

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL　　　　03 MAR 78
HOUSTON,TEXAS

YOU HAVE SELECTED THE FOLLOWING SSTAT PROCESSOR OPTIONS:

PRINT MEAN AND COVARIANCE FOR EACH FIELD
PRINT A HISTOGRAM FOR EACH FIELD
PRINT A HISTOGRAM FOR EACH SUBCLASS
PRINT MEAN AND COVARIANCE FOR EACH SUBCLASS

SUPERVISOR INFORMATION:

UNUSED CORE 28 LOCATIONS
MAXIMUM NO. OF FIELDS..204
MAXIMUM NO. OF SUBCLASSES... 1
CHANNELS SELECTED ARE 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.
16.
HISTOGRAM CHANNELS ARE 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.
16.

INPUT IMAGE DATA TAPE INFORMATION

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

SUN ANGLES

60 60 60 60 60 60 60 60

CORRECTIONS FOR SUN ANGLES

CH(1)	CH(2)	CH(3)	CH(4)	CH(5)	CH(6)	CH(7)	CH(8)	CH(9)	CH(10)	CH(11)	CH(12)	CH(13)	CH(14)	CH(15)	CH(16)
THE SUN ANGLE GAIN FACTORS ARE															
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
THE SUN ANGLE BIAS FACTORS ARE															
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON,TEXAS

TRAINING FIELDS

FIELD NO.	NAME	CLASS	SUBCLASS	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
1	B1-01	BARLEY	SWHEAT	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

22169 POINTS WILL BE USED IN THE FIELD MEAN,COVARIANCE CALCULATIONS

ORIGINAL PAGE IS
OF POOR QUALITY

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

03 MAR 78

THE MEAN, STANDARD DEVIATION, COVARIANCE, AND CORRELATION (16 CHANNELS) FOR:

TRAINING FIELD BI-01

MEAN:	38.40	46.17	55.46	23.12	38.75	44.86	56.26	22.65	39.60	48.70	54.37	21.42
ST DEV:	3.43	5.89	7.26	2.41	4.36	4.49	7.81	2.64	5.92	6.20	7.62	2.25
MEAN:	38.26	48.70	50.42	19.20								
ST DEV:	5.63	4.14	4.44	.99								

COVARIANCE MATRIX

11.77									
20.09	-34.74								
11.09	-67.57	-52.65							
2.39	-31.96	-20.37	-5.82						
12.16	-40.69	-73.91	-34.51	-18.99					
19.64	-34.30	-81.08	-39.53	-9.19	20.19				
11.73	-65.93	-70.45	-28.70	-63.20	-62.60	-60.92			
2.69	-30.13	-24.87	-9.02	-32.61	-37.18	-24.67	-6.97		
8.63	-48.69	-69.66	-30.88	-40.62	-42.06	-67.91	-29.44	-35.06	
11.00	-56.57	-69.33	-29.95	-54.45	-56.26	-70.19	-28.59	-44.36	-38.42

9.32	-67.93	-63.67	-24.93	-71.39	-77.90	-70.25	-25.39	-63.17	-59.51	-49.30	
2.79	-28.17	-22.66	-8.16	-30.61	-34.39	-26.34	-8.70	-27.48	-26.05	-18.32	-5.06
5.13	-52.56	-63.51	-27.02	-47.10	-53.94	-63.84	-25.42	-41.91	-45.08	-57.51	-23.70
6.92	-63.99	-67.30	-27.67	-65.43	-74.73	-69.60	-25.47	-53.21	-47.30	-57.56	-22.94
6.07	-67.75	-61.01	-23.56	-72.43	-83.45	-66.24	-22.32	-60.96	-54.98	-51.80	-18.32
2.07	-25.77	-20.22	-7.26	-29.05	-33.39	-22.80	-6.97	-24.91	-22.22	-17.13	-5.24

-31.72			
-33.79	-17.17		
-40.33	-25.47	-19.67	
-16.75	-10.70	-6.90	-.86

CORRELATION MATRIX

1.00											
.99	-1.00										
.45	-1.58	-1.00									
.29	-2.25	-1.16	-1.00								
.81	-1.58	-2.34	-3.28	-1.00							
1.27	-1.29	-2.49	-3.65	-.47	1.00						
.44	-1.43	-1.24	-1.52	-1.86	-1.78	-1.00					
.30	-1.94	-1.30	-1.42	-2.83	-3.13	-1.20	-1.00				
.43	-1.40	-1.62	-2.14	-1.57	-1.58	-1.47	-1.88	-1.00			
.52	-1.55	-1.54	-2.00	-2.02	-2.02	-1.45	-1.75	-1.21	-1.00		
.39	-1.64	-1.25	-1.47	-2.33	-2.47	-1.24	-1.37	-1.52	-1.37	-1.00	
.36	-2.12	-1.39	-1.50	-3.12	-3.40	-1.50	-1.47	-2.06	-1.87	-1.16	-1.00
.27	-1.58	-1.55	-1.99	-1.92	-2.13	-1.45	-1.71	-1.26	-1.29	-1.45	-1.87
.49	-2.62	-2.24	-2.77	-3.62	-4.01	-2.15	-2.33	-2.17	-1.84	-1.96	-2.46
.40	-2.59	-1.90	-2.20	-3.75	-4.19	-1.91	-1.91	-2.32	-2.00	-1.66	-1.84
.65	-4.71	-3.00	-3.24	-7.18	-8.00	-3.14	-2.84	-4.53	-3.86	-2.63	-2.51

-1.00			
-1.45	-1.00		
-1.61	-1.39	-1.00	
-3.2[illegible]	-2.78	-1.67	-1.00

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

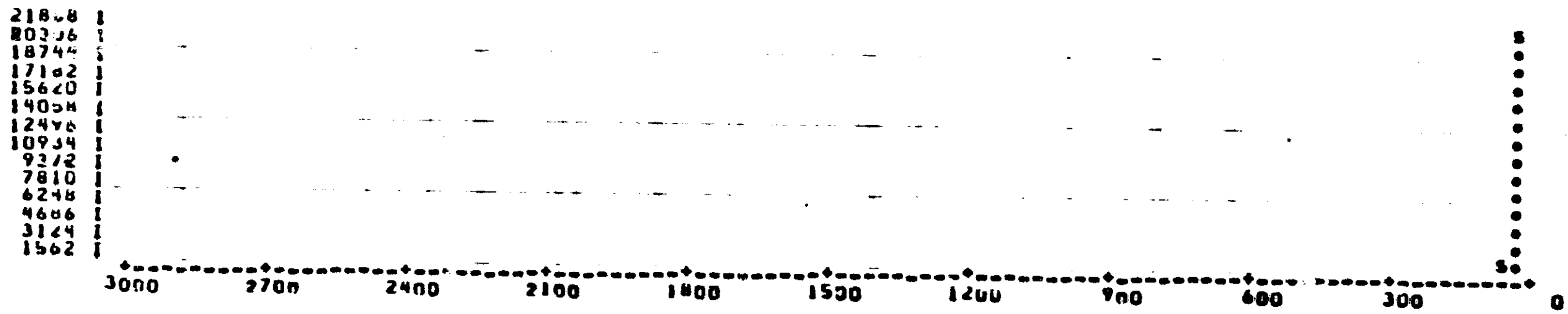
HISTOGRAM

TRAINING FIELD BI-01

(NO. SAMPLES= 22169 , SUBCLASS= WHEAT)

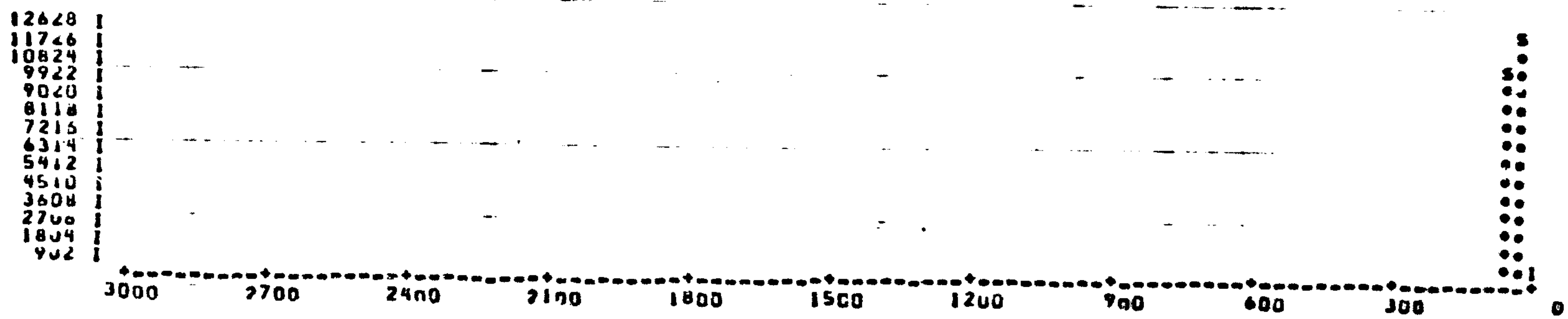
CHANNEL 1

EACH * REPRESENTS 1562 POINT(S).



CHANNEL 2

EACH * REPRESENTS 902 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

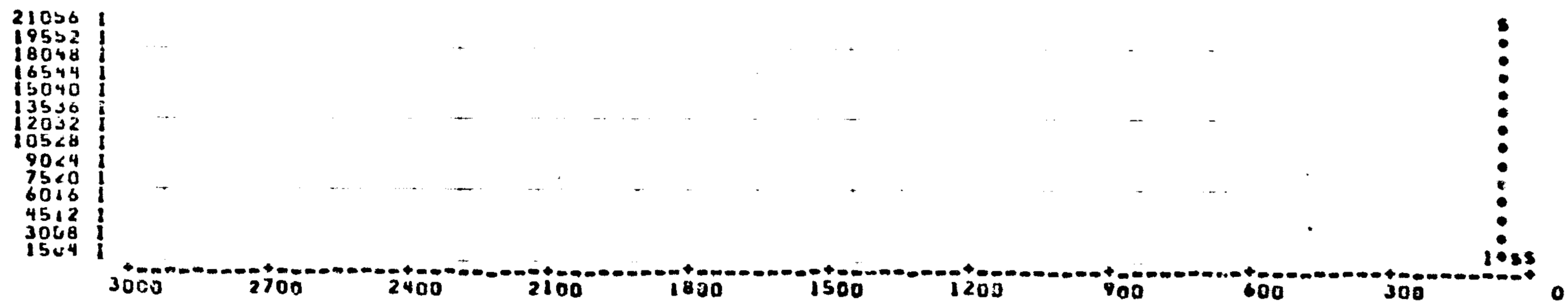
HISTOGRAM

TRAINING FIELD 8I-01

(NO. SAMPLES= 22169 , SUBCLASS= SWHEAT)

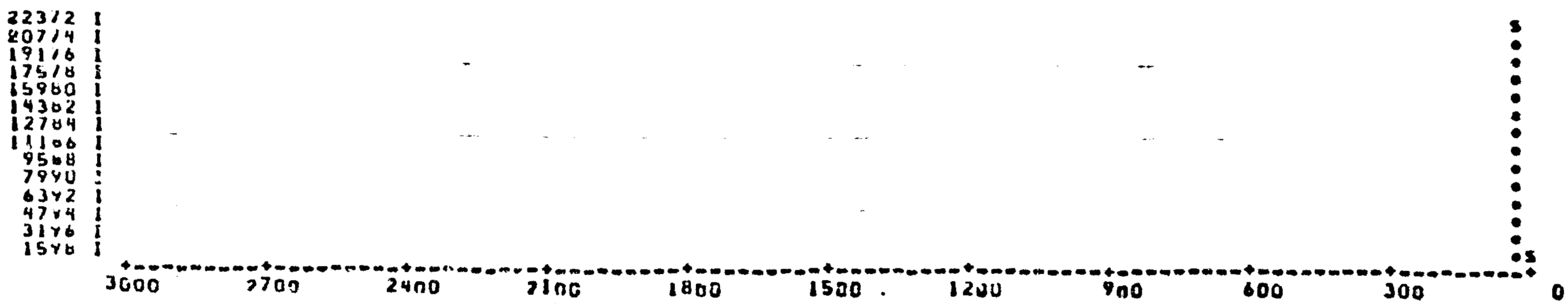
CHANNEL 3

EACH * REPRESENTS 1504 POINT(S).



CHANNEL 4

EACH * REPRESENTS 1598 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING FIELD   81-01

(NO. SAMPLES= 22169 , SUBCLASS= SWHEAT)

```
CHANNEL  7
----------

  EACH * REPRESENTS    1520  POINT(S).

 21280 I
 19760 I                                                                       S
 18240 I                                                                       *
 16720 I                                                                       *
 15200 I                                                                       *
 13680 I                                                                       *
 12160 I                                                                       *
 10640 I                                                                       *
  9120 I                                                                       *
  7600 I                                                                       *
  6080 I                                                                       *
  4560 I                                                                       *
  3040 I                                                                       *
  1520 I                                                                       *
                                                                             3*SS
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+--*-+
     3000      2700      2400      2100      1800      1500      1200       900       600       300         0

CHANNEL  8
----------

  EACH * REPRESENTS    1593  POINT(S).

 22302 I
 20709 I                                                                       S
 19116 I                                                                       *
 17523 I                                                                       *
 15930 I                                                                       *
 14337 I                                                                       *
 12744 I                                                                       *
 11151 I                                                                       *
  9558 I                                                                       *
  7965 I                                                                       *
  6372 I                                                                       *
  4779 I                                                                       *
  3186 I                                                                       *
  1593 I                                                                       *
                                                                               *S
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+----+
     3000      2700      2400      2100      1800      1500      1200       900       600       300         0
```

279

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

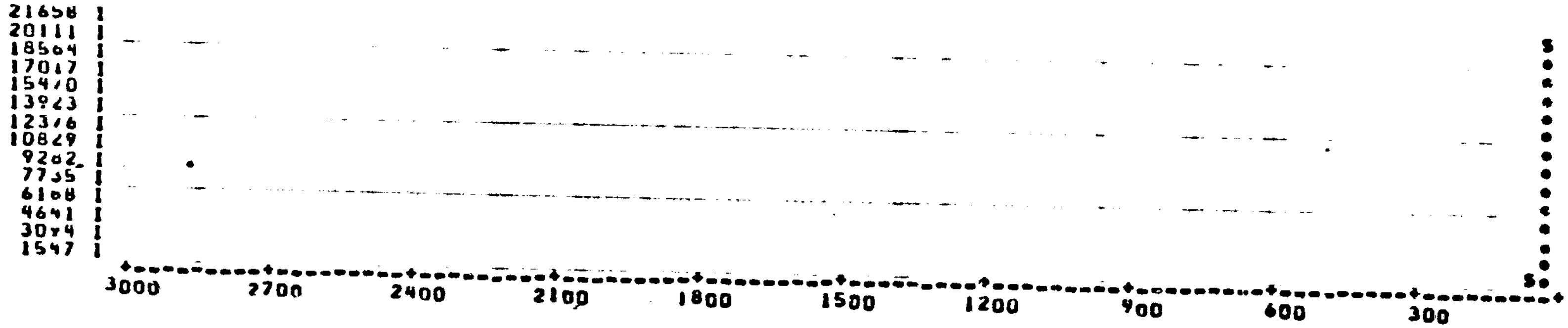
HISTOGRAM

TRAINING FIELD   81-01

(NO. SAMPLES= 22169 , SUBCLASS= WHEAT)

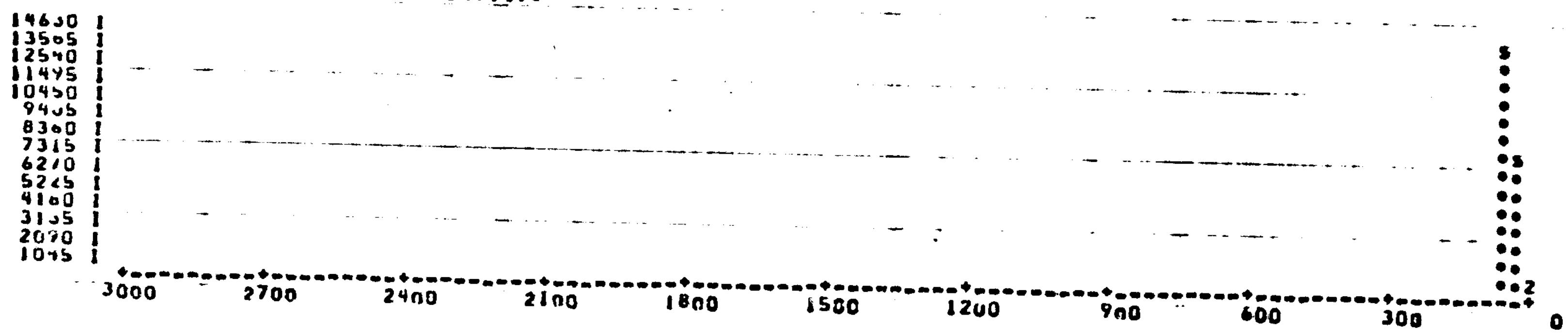
CHANNEL 9

EACH * REPRESENTS   1547 POINT(S).



CHANNEL 10

EACH * REPRESENTS   1045 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINA_ 03 MAR 78
HOUSTON,TEXAS

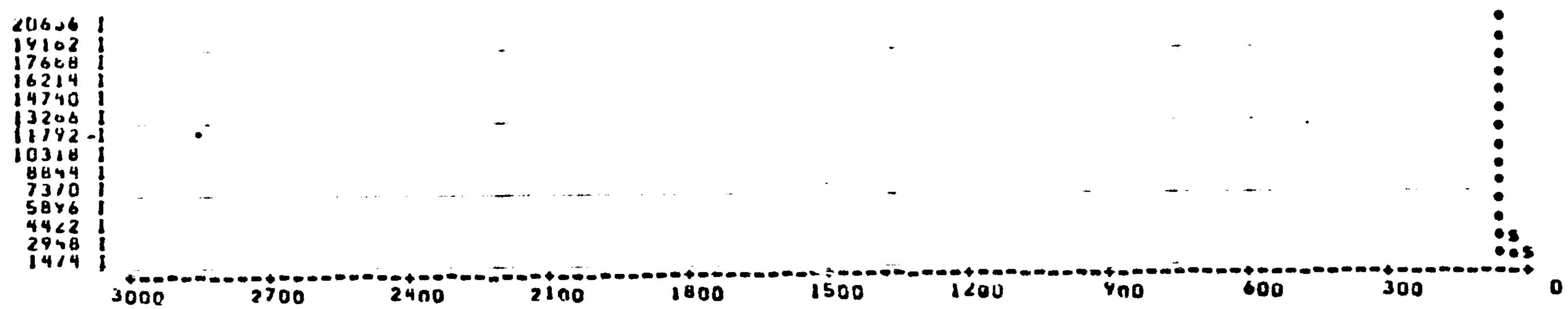
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22169 , SUBCLASS= SWHEAT)

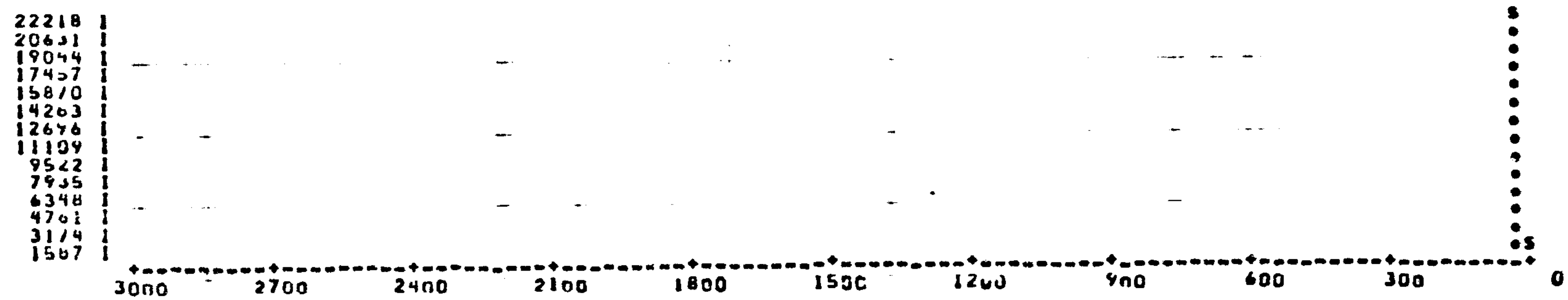
CHANNEL 11

EACH * REPRESENTS 1474 POINT(S).



CHANNEL 12

EACH * REPRESENTS 1587 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

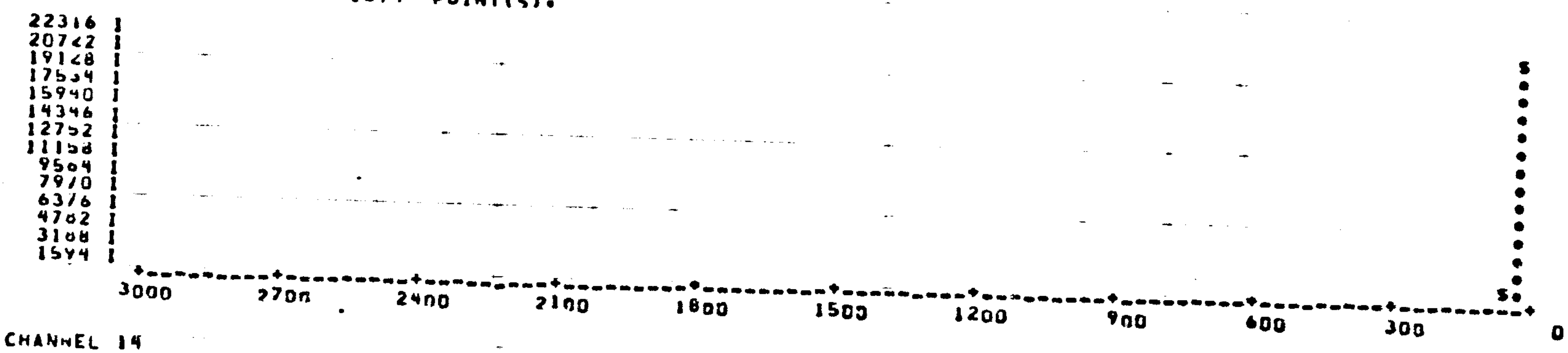
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22169 , SUBCLASS= SWHEAT)

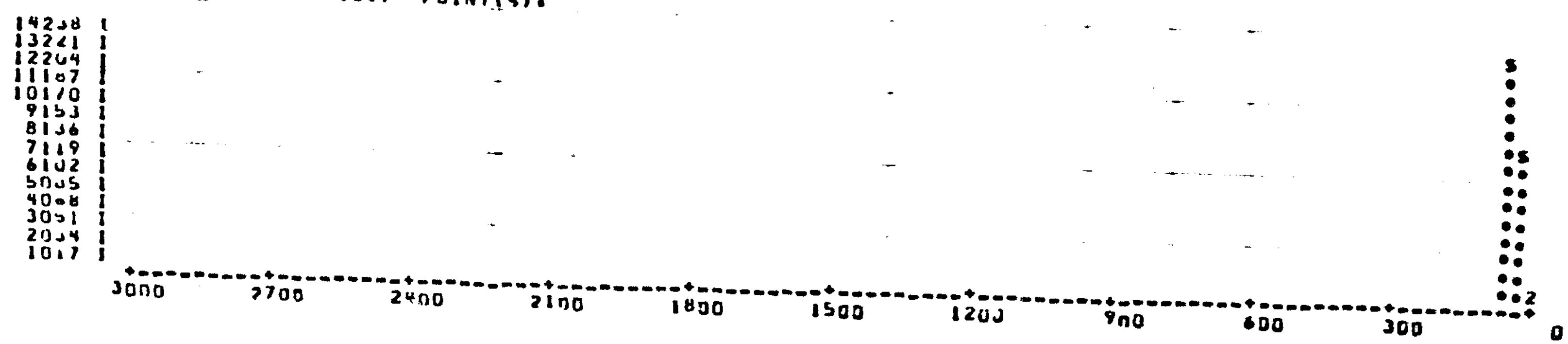
CHANNEL 13

EACH * REPRESENTS 1594 POINT(S).



CHANNEL 14

EACH * REPRESENTS 1017 POINT(S).



284

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

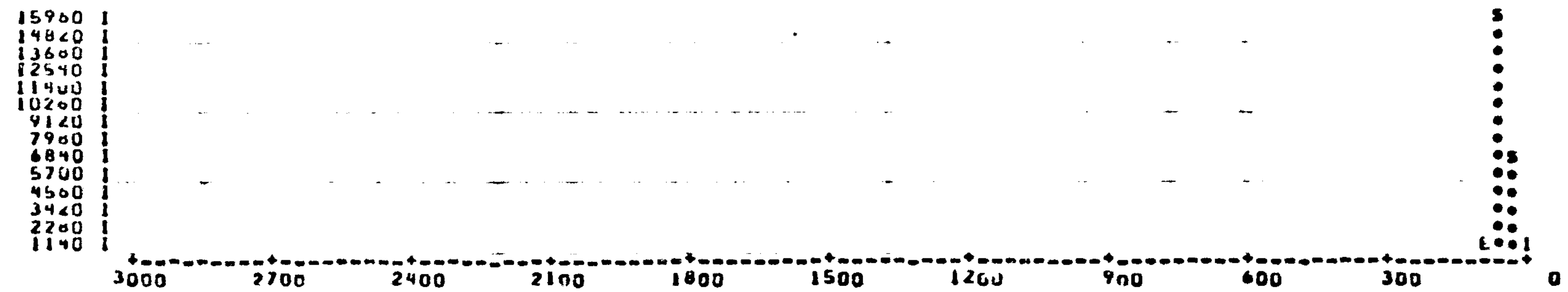
HISTOGRAM

TRAINING FIELD 81-01

(NO. SAMPLES= 22169 , SUBCLASS= SWHEAT)

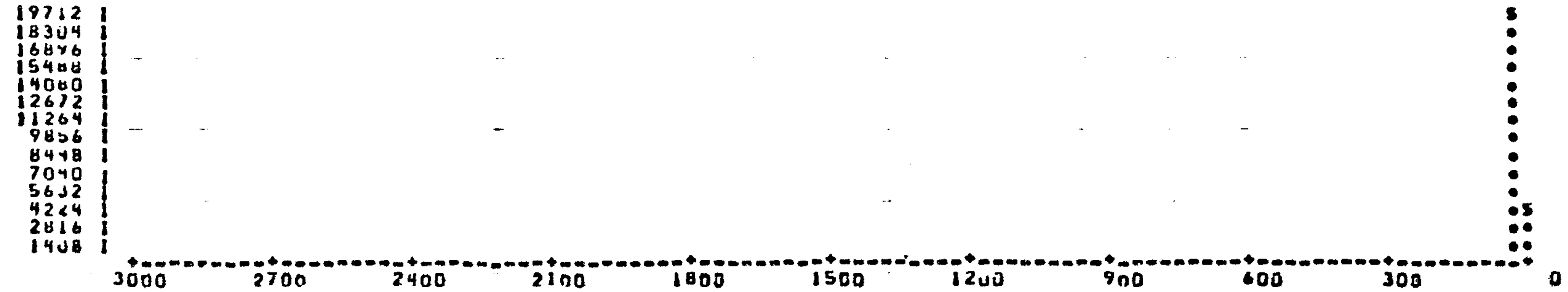
CHANNEL 15

EACH * REPRESENTS 1140 POINT(S).



CHANNEL 16

EACH * REPRESENTS 1408 POINT(S).



RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

THE MEAN,STANDARD DEVIATION,COVARIANCE,AND CORRELATION (16 CHANNELS) FOR:

TRAINING SUBCLASS SWHEAT

MEAN:	38.40	46.17	55.46	23.12	38.75	44.86	56.26	22.65	39.60	48.70	54.37	21.42
ST DEV:	3.43	5.89	7.26	2.41	4.36	4.49	7.81	2.64	5.92	6.20	7.02	2.25
MEAN:	38.26	48.70	50.42	19.20								
ST DEV:	5.63	4.14	4.44	.93								

COVARIANCE MATRIX

11.77											
20.04	-34.74										
11.09	-67.57	-52.65									
2.39	-31.96	-20.37	-5.82								
12.16	-40.69	-73.91	-34.51	-18.99							
19.64	-34.30	-81.08	-39.53	-9.19	20.19						
11.73	-65.93	-70.45	-28.70	-63.20	-62.60	-60.92					
2.69	-30.13	-24.87	-9.02	-32.61	-37.18	-24.67	-6.97				
8.63	-48.69	-69.66	-30.88	-40.62	-42.06	-67.91	-29.44	-35.06			
11.00	-56.57	-69.33	-29.95	-54.45	-56.26	-70.19	-28.59	-44.36	-38.42		
9.32	-67.93	-63.67	-24.93	-71.39	-77.90	-70.25	-25.39	-63.17	-59.51	-49.30	
2.79	-28.17	-22.66	-8.16	-30.61	-34.39	-26.34	-8.70	-27.48	-26.05	-18.32	-5.06
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-61.84	-25.42	-41.91	[illegible]	-57.51	-23.70

6.92	-63.99	-67.30	-27.67	-65.43	-74.73	-69.60	-25.47	-53.21	-47.30	-57.55	-22.94
6.07	-67.75	-61.01	-23.56	-72.43	-83.45	-66.24	-22.32	-60.96	-54.98	-51.80	-18.32
2.07	-25.77	-20.22	-7.26	-29.05	-33.39	-22.80	-6.97	-24.71	-22.22	-17.13	-5.29

-31.72			
-33.79	-17.17		
-40.33	-25.47	-19.67	
-16.75	-10.70	-6.90	-.86

285

CORRELATION MATRIX

1.00											
.99	-1.00										
.45	-1.58	-1.00									
.29	-2.25	-1.16	-1.00								
.81	-1.58	-2.34	-3.28	-1.00							
1.27	-1.29	-2.49	-3.65	-.47	1.00						
.44	-1.43	-1.24	-1.52	-1.86	-1.78	-1.00					
.30	-1.94	-1.30	-1.42	-2.83	-3.13	-1.20	-1.00				
.43	-1.40	-1.62	-2.16	-1.57	-1.58	-1.47	-1.88	-1.00			
.52	-1.55	-1.54	-2.00	-2.02	-2.02	-1.45	-1.75	-1.21	-1.00		
.39	-1.64	-1.25	-1.47	-2.33	-2.47	-1.28	-1.37	-1.52	-1.37	-1.00	
.36	-2.12	-1.39	-1.50	-3.12	-3.40	-1.50	-1.47	-2.06	-1.87	-1.16	-1.00
.27	-1.56	-1.55	-1.99	-1.92	-2.13	-1.45	-1.71	-1.26	-1.29	-1.45	-1.87
.49	-2.62	-2.24	-2.77	-3.62	-4.01	-2.15	-2.33	-2.17	-1.84	-1.96	-2.46
.40	-2.59	-1.90	-2.20	-3.75	-4.19	-1.91	-1.91	-2.32	-2.00	-1.66	-1.84
.65	-4.71	-3.00	-3.24	-7.18	-8.00	-3.14	-2.84	-4.53	-3.86	-2.63	-2.51

-1.00			
-1.45	-1.00		
-1.61	-1.39	-1.00	
-3.20	-2.78	-1.67	-1.00

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL — 03 MAR 78

HOUSTON, TEXAS

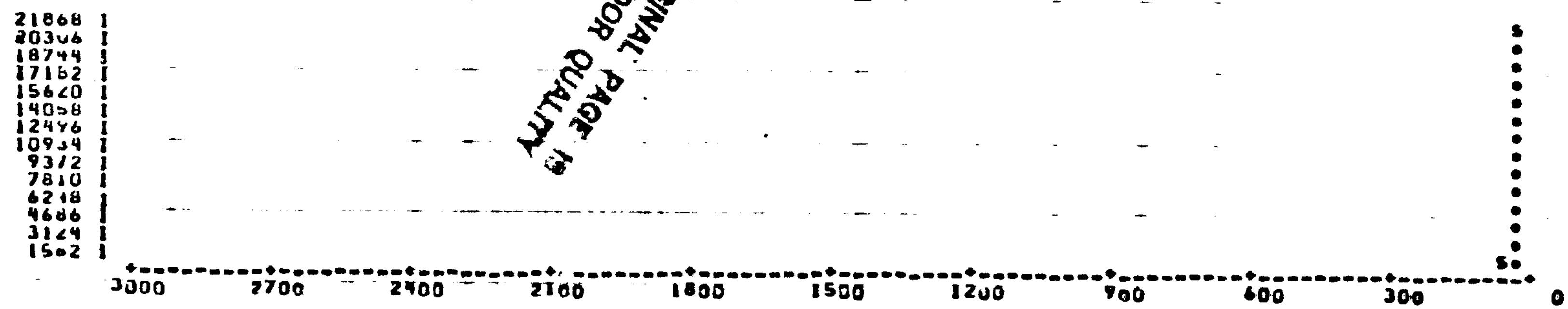
HISTOGRAM

TRAINING SUBCLASS SWHEAT

ORIGINAL PAGE IS OF POOR QUALITY

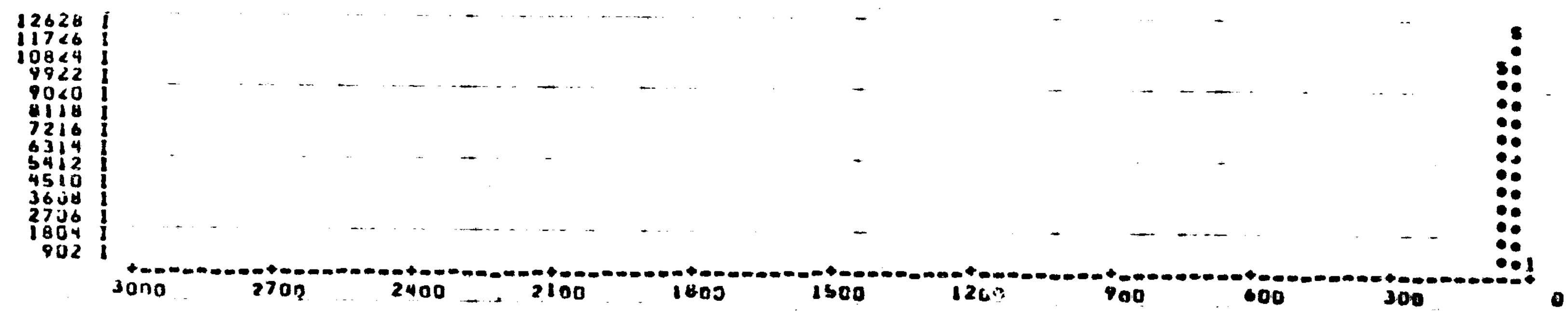
CHANNEL 1

EACH * REPRESENTS 1562 POINT(S).



CHANNEL 2

EACH * REPRESENTS 902 POINT(S).



287

```
 9922 I                                                                                     ..
 9020 I                                                                                     ..
 811'                                                                                       ..
 72                                                                                         ..
 63                                                                                         ..
 54.                                                                                        ..
 4510 I                                                                                     ..
 3608 I                                                                                     ..
 2706 I                                                                                     ..
 1804 I                                                                                     ..
  902 I                                                                                     ..1
      +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+
     3000    2700    2400    2100    1800    1500    1200     900     600     300           0
```

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS   SWHEAT

CHANNEL 3

EACH * REPRESENTS   1504 POINT(S).

```
21056 I                                                                                    5
19552 I                                                                                    .
18048 I                                                                                    .
16544 I                                                                                    .
15040 I                                                                                    .
13536 I                                                                                    .
12032 I                                                                                    .
10528 I                                                                                    .
 9024 I                                                                                    .
 7520 I                                                                                    .
 6016 I                                                                                    .
 4512 I                                                                                    .
 3008 I                                                                                    .
 1504 I                                                                                    1*55
      +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+
     3000    2700    2400    2100    1800    1500    1200     900     600     300           0
```

CHANNEL 4

EACH * REPRESENTS   1598 POINT(S).

```
22372 I                                                                                    5
20774 I                                                                                    .
19176 I                                                                                    .
17578 I                                                                                    .
15980 I                                                                                    .
14382 I                                                                                    .
12784 I                                                                                    .
11186 I                                                                                    .
 9588 I                                                                                    .
 7990 I                                                                                    .
 6392 I                                                                                    .
 4794 I                                                                                    .
 3196 I                                                                                    .
 1598 I                                                                                    .5
      +-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+-------+
     3000    2700    2400    2100    1800    1500    1200     900     600     300           0
```

288

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL — 03 MAR 78

HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

```
CHANNEL  5
----------
   EACH * REPRESENTS    1558  POINT(S).

 21812 I                                                                     S
 20254 I                                                                     *
 18696 I                                                                     *
 17138 I                                                                     *
 15580 I                                                                     *
 14022 I                                                                     *
 12464 I                                                                     *
 10906 I                                                                     *
  9348 I                                                                     *
  7790 I                                                                     *
  6232 I                                                                     *
  4674 I                                                                     *
  3116 I                                                                     *
  1558 I                                                                    S*
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+--+
      3000      2700      2400      2100      1800      1500      1200       900       600       300        0

CHANNEL  4
----------
   EACH * REPRESENTS     941  POINT(S).

 13174 I                                                                     S
 12233 I                                                                     *
 11292 I                                                                     *
 10351 I                                                                    S*
  9410 I                                                                    **
  8469 I                                                                    **
  7528 I                                                                    **
  6587 I                                                                    **
  5646 I                                                                    **
  4705 I                                                                    **
  3764 I                                                                    **
  2823 I                                                                    **
  1882 I                                                                    **
   941 I                                                                    **1
       +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+--+
      3000      2700      2400      2100      1800      1500      1200       900       600       300        0
```

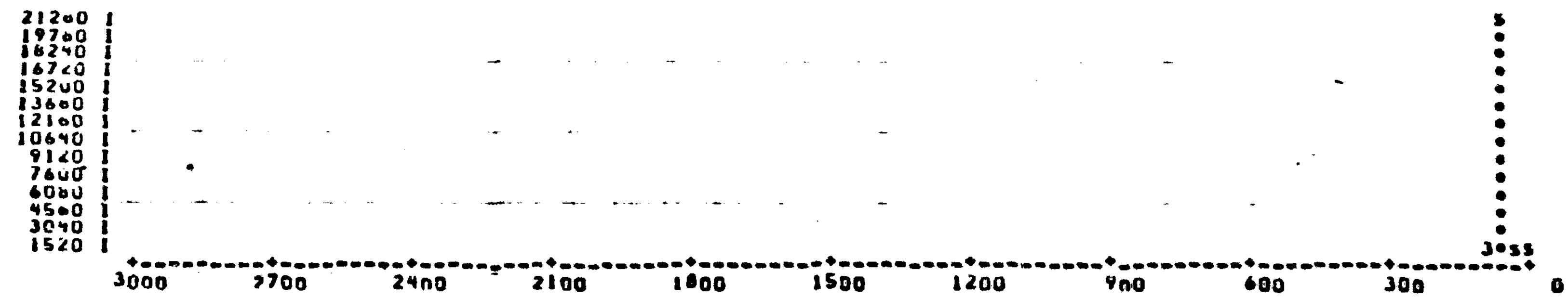
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS   SWHEAT

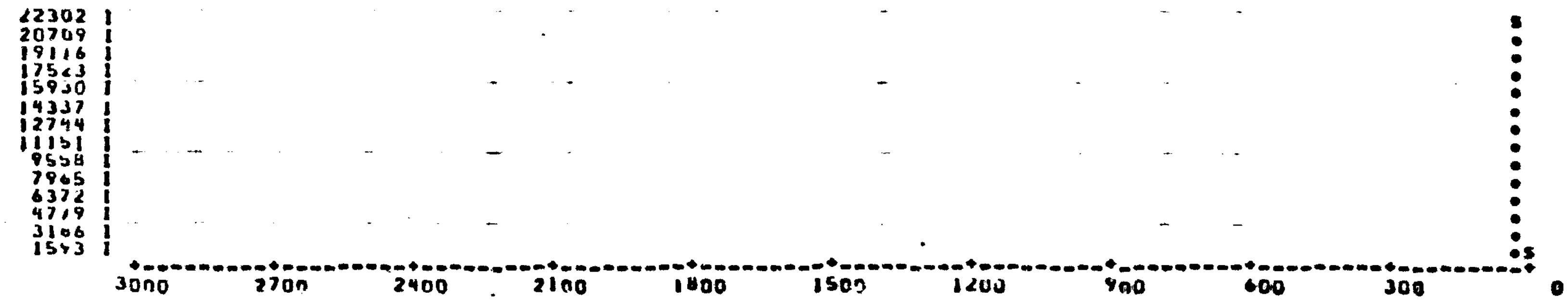
CHANNEL 7

EACH * REPRESENTS   1520 POINT(S).



CHANNEL 8

EACH * REPRESENTS   1593 POINT(S).



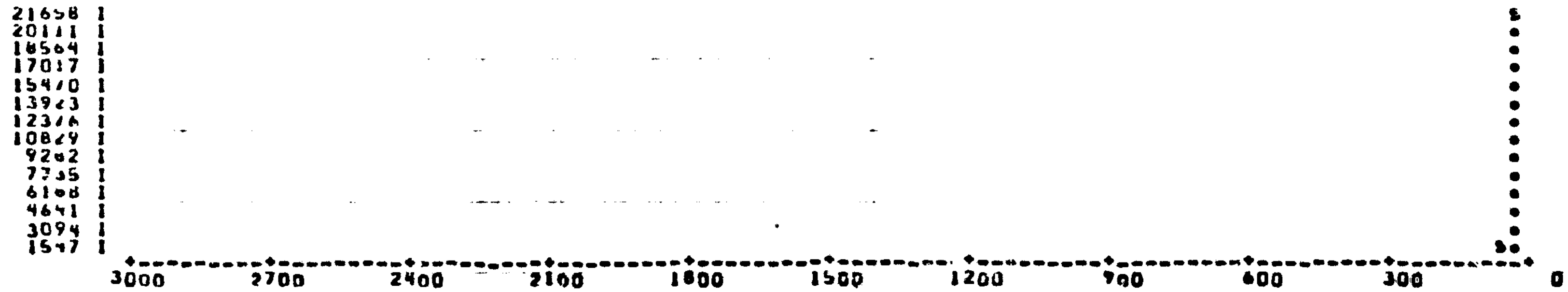
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

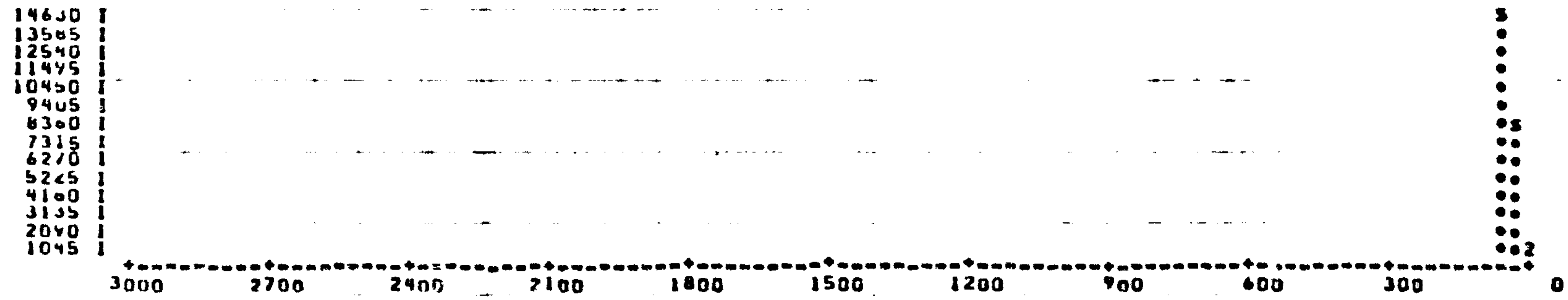
CHANNEL 9

EACH * REPRESENTS 1547 POINT(S).

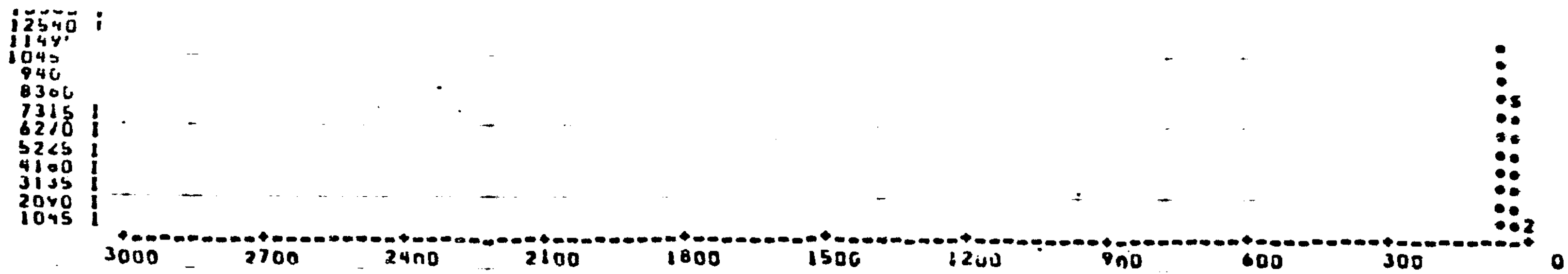


CHANNEL 10

EACH * REPRESENTS 1045 POINT(S).



241



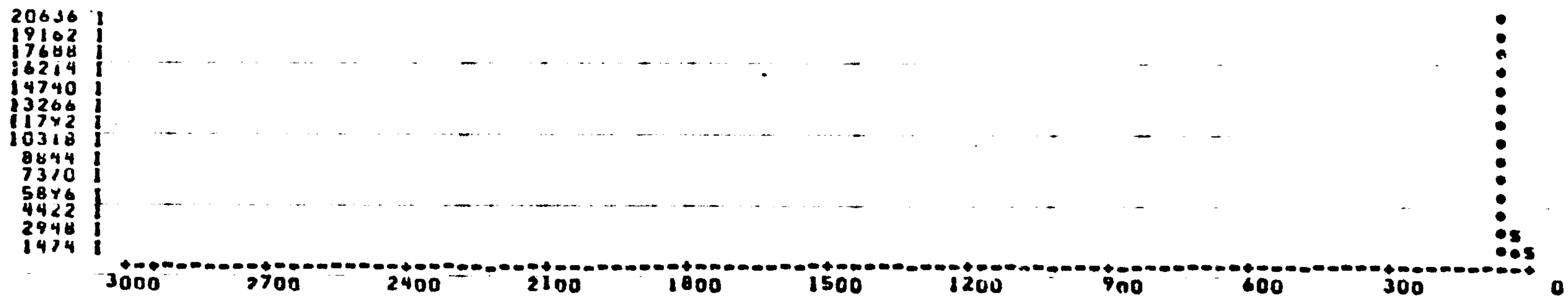
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

HISTOGRAM

TRAINING SUBCLASS SWHEAT

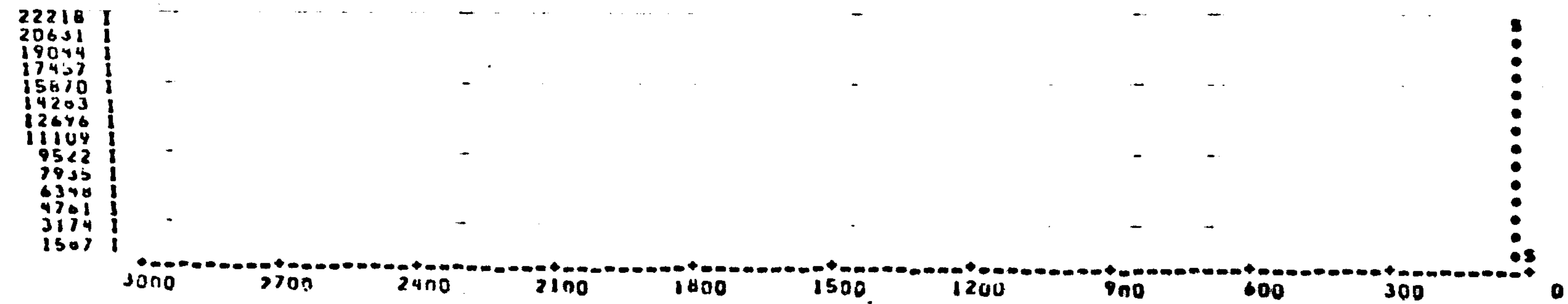
CHANNEL 11

EACH * REPRESENTS 1474 POINT(S).



CHANNEL 12

EACH * REPRESENTS 1587 POINT(S).



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RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

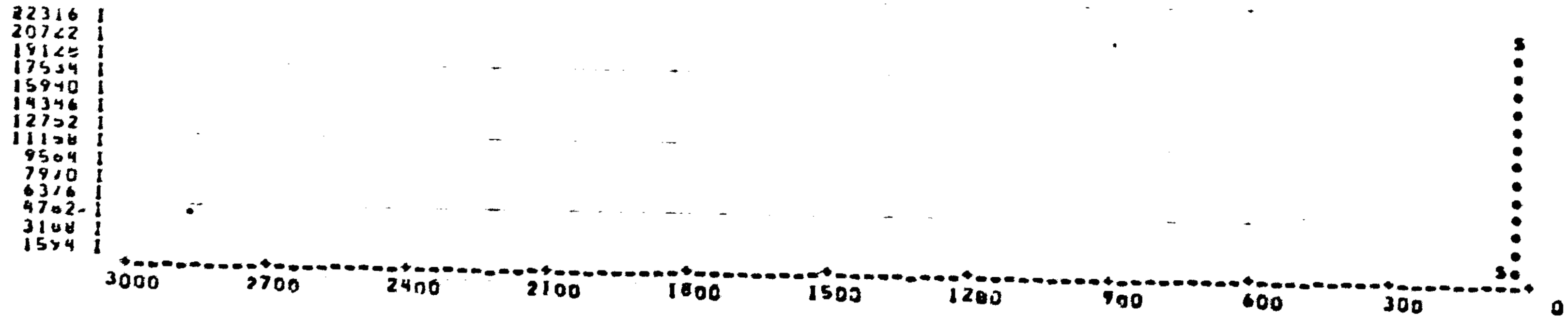
03 MAR 78

HISTOGRAM

TRAINING SUBCLASS SWHEAT

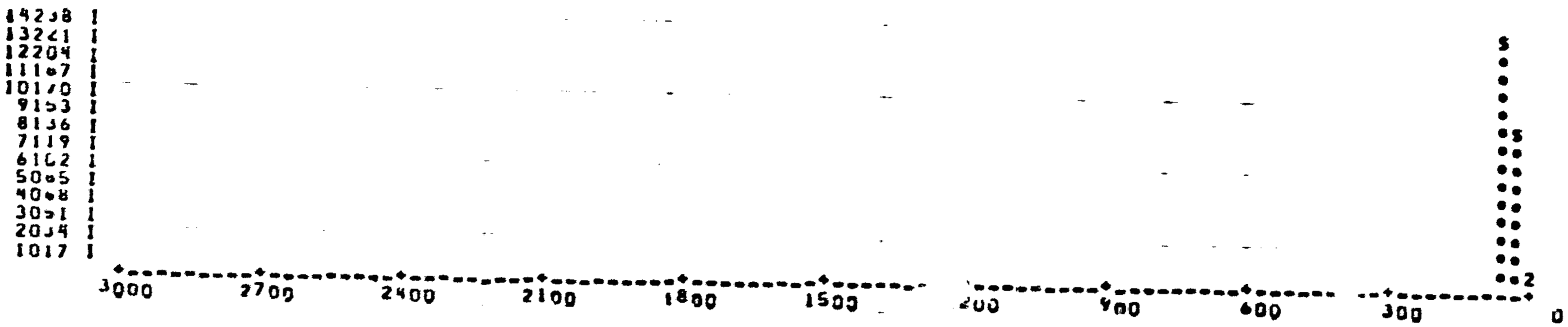
CHANNEL 13

EACH * REPRESENTS 1594 POINT(S).



CHANNEL 14

EACH * REPRESENTS 1017 POINT(S).



243

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

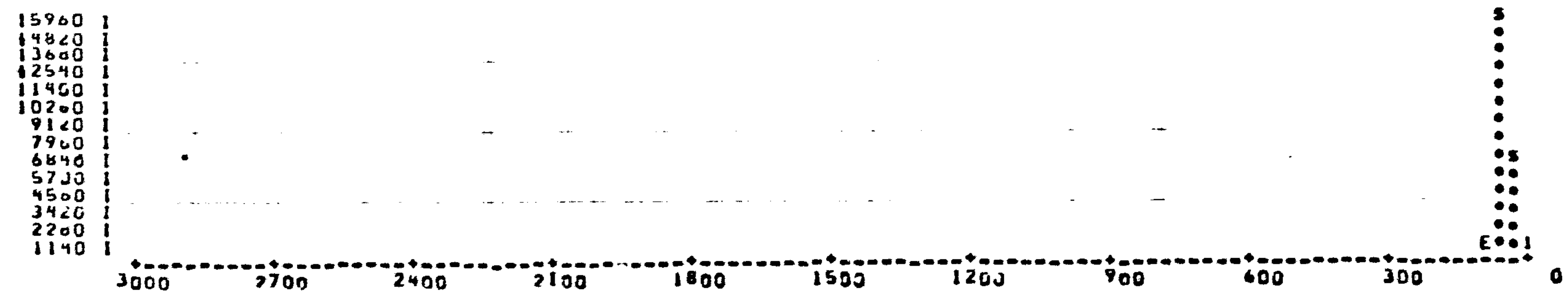
03 MAR 78

HISTOGRAM

TRAINING SUBCLASS SWHEAT

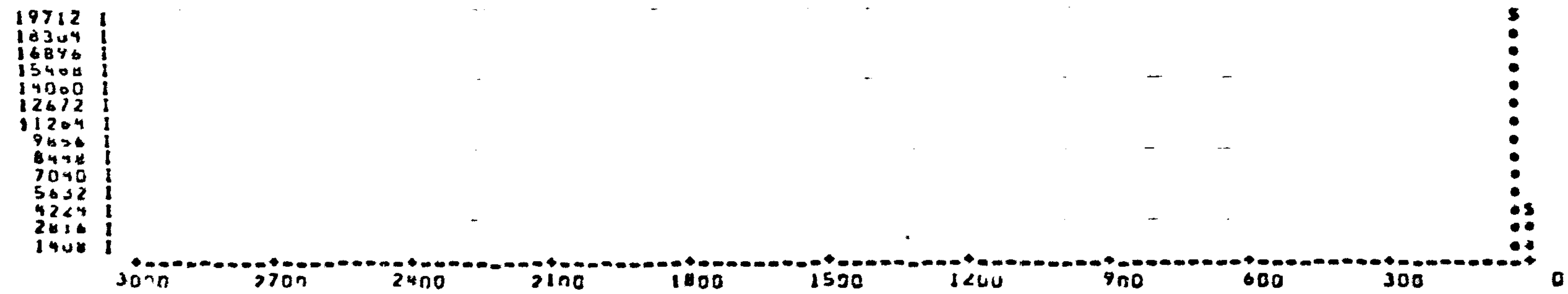
CHANNEL 15

EACH * REPRESENTS 1140 POINT(S).



CHANNEL 16

EACH * REPRESENTS 1408 POINT(S).



244

RUN ?) MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL HOUSTON,TEXAS 03 MAR 76

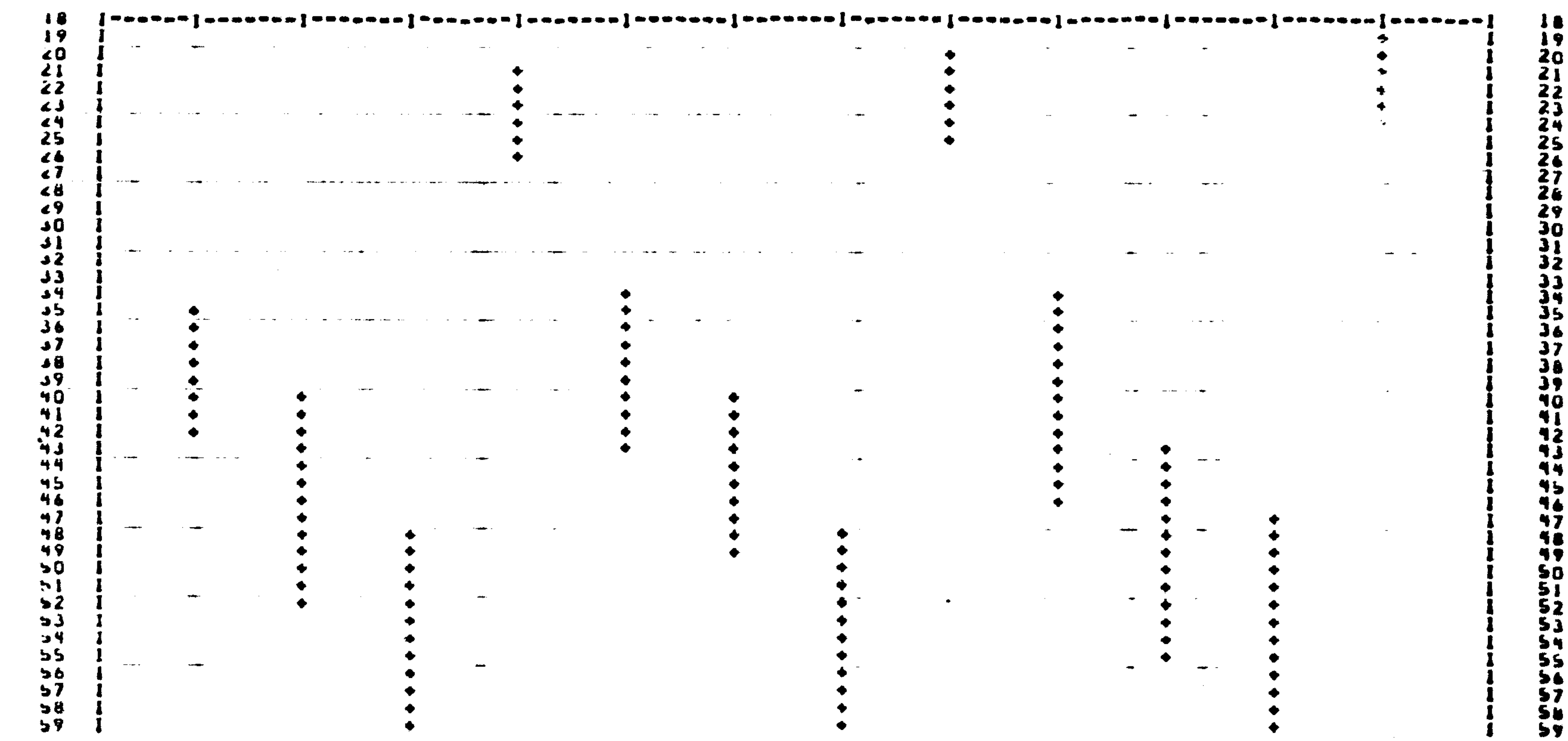
COMPOSITE SPECTRAL PLOT (MEAN,PLUS AND MINUS ONE STD. DEV.) FOR

TRAINING SUBCLASS(ES) 1

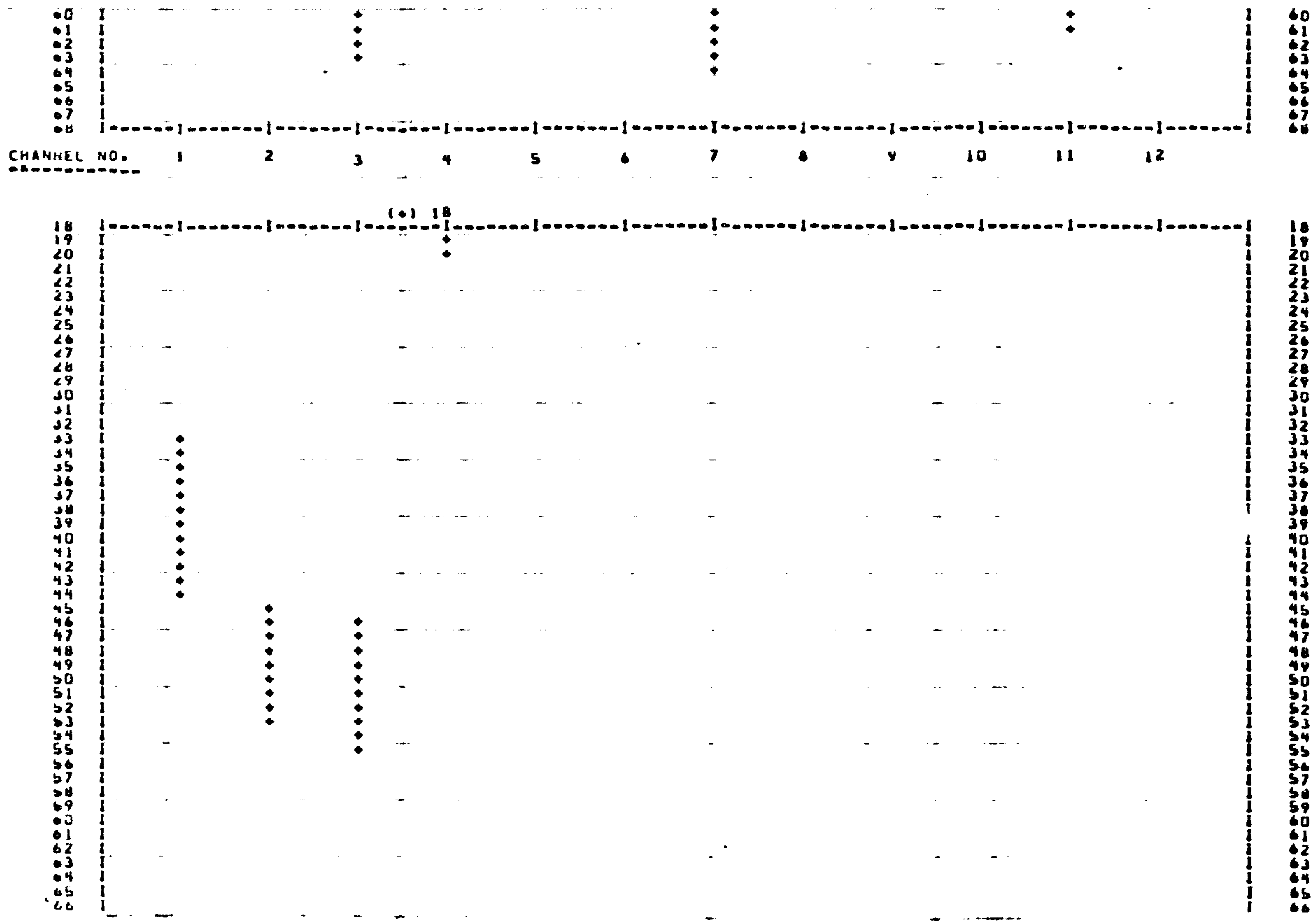
PLOT LEGEND:

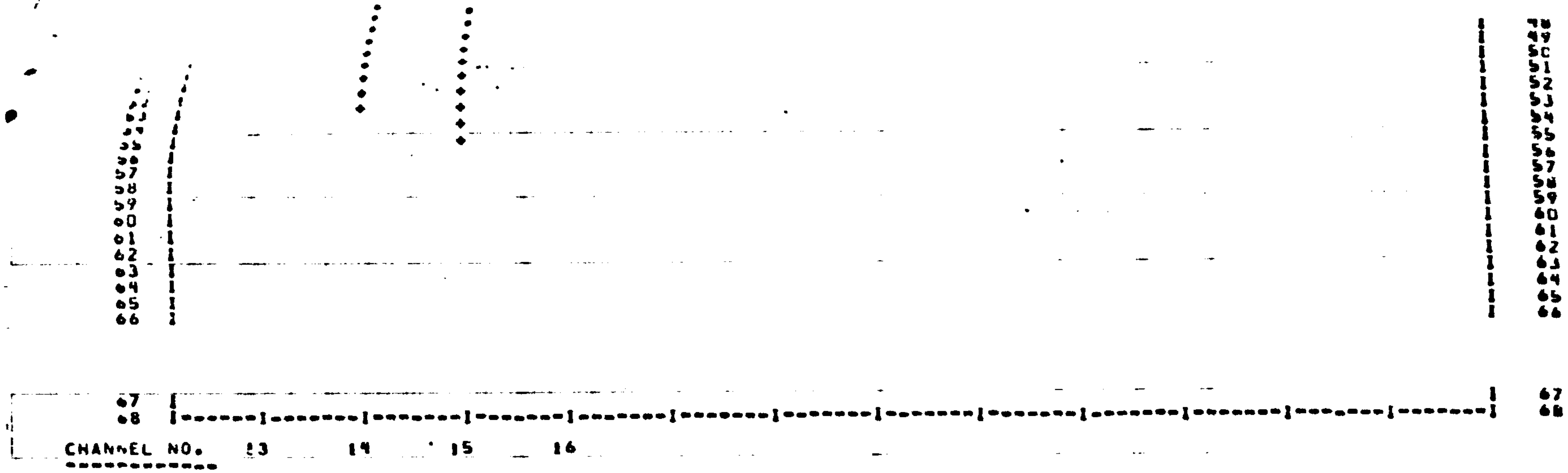
* = SUBCLASS SWHEAT

MAXV= 65 SPCBAS= 18 INCR= 1.00



295


CHANNEL NO.
1 2 3 4 5 6 7 8 9 10 11 12
(+) 18



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```
***  $STAT - COMPLETED  ***

TIME FOR STAT      7.004
```

298

TEST RUN 6

03 MAR 78

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

SDATA-TR

INPUT IMAGE DATA TAPE INFORMATION

```
   FORMAT                         UNIVERSAL
   NO. OF CHANNELS                   16
   NO. OF PIXELS/LINE               196
   FIRST SCAN LINE NO.                1
   FIRST PIXEL REFERENCE PT           1
  DATAFI     FILE=7
  SUNANG     5.10.15.20
  MODULE     FILE
  OPTION     ORIG.TRANSF
  OPTION     GREEN.PCG
  STATFI     FILE=1
  TRFORM     OUTPUT/FILE=1,UNIT=16
  B-MATR     CARDS
  RESCAL
  FORMAT     OUTPUT=UNIVERSAL
  .END.
```

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RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

... ORIGINAL STATISTICS ...

SUBCLASS SWHEAT

MEAN	38.43	44.64	53.61	22.34	37.46	43.37	54.38	21.90	38.28	47.08	52.56	20.71
MEAN	36.99	47.08	48.74	18.56								

COVARIANCE MATRIX

12.29											
17.88	35.00										
8.93	17.05	48.03									
1.56	3.45	21.56	11.58								
10.50	18.22	-2.33	-4.54	29.94							
17.54	33.48	1.64	-4.85	47.03	84.26						
9.52	19.82	32.25	14.10	9.02	20.67	42.90					
1.87	4.51	16.36	8.13	-3.30	-3.26	17.13	9.76				
7.07	11.74	3.30	-.40	10.09	16.48	6.01	.39	16.54			
9.06	17.65	19.86	7.28	8.06	15.90	20.28	7.85	19.16	39.16		
7.25	15.08	35.44	16.34	-1.25	3.14	30.47	15.06	8.18	27.65	47.42	
2.00	4.59	14.31	8.04	-2.89	-2.34	13.30	7.19	.73	8.30	19.75	9.87
3.72	6.02	6.86	2.34	2.15	3.07	7.52	3.30	8.22	16.36	11.31	3.45
5.12	10.48	21.81	9.48	-2.55	-1.97	20.84	10.86	10.59	30.57	29.54	11.38
4.24	9.39	30.96	14.72	-7.18	-7.92	27.19	15.15	5.29	25.84	38.09	17.03
1.38	3.61	14.70	7.27	-4.15	-4.57	12.71	7.25	.38	8.60	17.03	8.17

16.42			
27.27	59.70		
23.06	54.36	62.75	
7.44	19.73	24.47	11.03

16.42			
27	69.70		
-3.05	54.36	62.75	
7.44	19.73	24.47	11.03

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RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

03 MAR 78

LINEAR TRANSFORMATION (B) MATRIX

NO. LINEAR COMB. = 4
NO. CHANNELS = 16

LIN. CMB.	CH(1)	CH(2)	CH(3)	CH(4)	CH(5)	CH(6)	CH(7)	CH(8)	CH(9)	CH(10)	CH(11)	CH(12)
1	-.2900+00	-.5620+00	.6000+00	.4910+00	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	-.2900+00	-.5620+00	.6000+00	.4910+00	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	-.2900+00	-.5620+00	.6000+00	.4910+00
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000

LIN. CMB.	CH(13)	CH(14)	CH(15)	CH(16)
1	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000
4	-.2900+00	-.5620+00	.6000+00	.4910+00

SUN ANGLES

5 10 15 20 60 60 60 60

CORRECTIONS FOR SUN ANGLES

	CH(1)	CH(2)	CH(3)	CH(4)	CH(5)	CH(6)	CH(7)	CH(8)	CH(9)	CH(10)	CH(11)	CH(12)	CH(13)	CH(14)	CH(15)	CH(16)
THE SUN ANGLE GAIN FACTORS ARE	16.41	14.89	14.09	13.40	6.88	6.43	6.19	5.97	4.16	3.96	3.85	3.76	2.95	2.85	2.79	2.74
THE SUN ANGLE BIAS FACTORS ARE	10.28	16.43	43.78	16.79	-12.21	-4.36	10.64	5.20	-10.80	-4.91	4.46	2.62	-7.82	-3.50	2.78	1.68

THE INPUT MATRIX TO PCMMAT IS

22.865461	27.589824	14.633116	10.004507
27.589825	57.647354	20.563041	13.477083
14.633116	20.563041	25.013398	13.101498
10.004506	13.477083	13.101498	11.429339

MATRIX OF EIGENVECTORS =

THE TRANSPOSE OF - PCM MATRIX - IS

.443882	.038479	-.881933	.153841
.760696	-.543629	.353029	-.034345
.398155	.731024	.312305	.457757
.256482	.410579	-.005535	-.874992

VECTOR OF EIGEN VALUES C(I) =

69.0535
17.8543
6.70251
3.34522

VECTOR OF RADII R(I) =

.591739-05
.303685-05
.471463-05
.791341-06

... TRANSFORMED STATISTICS ...

SUBCLASS SWHEAT
MEAN 66.20 49.79 18.60 6.26
COVARIANCE MATRIX

6877.89			
2879.15	2363.92		
906.91	512.25	374.56	
396.75	227.20	138.16	86.11

THE SCALING PARAMETERS FROM KBTRAN ARE

THE MAX IS
232.06 147.01 57.30 24.82

THE MIN IS
-99.67 -47.45 -20.11 -12.30

THE CON IS
.77 1.31 3.29 6.87

THE PCG SCALING PARAMETERS ARE

THE MAX IS
244.03 -18.87 -135.00 35.17

THE MIN IS
-91.50 2.19 64.93 -12.15

THE CON IS
4.41 4.55 .78 -4.43

INPUT IMAGE DATA TAPE INFORMATION

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

363

FIELDNAME	NO. OF VERTICES	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
81-01	4	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

GREEN IMAGE

• OUTPUT FILE 1 •

••• TRANSFORMED VALUES RESCALED TO A RANGE 0 - 255 •••
(STATISTICS METHOD)

••• ORIGINAL TRANSFORMED DATA RANGE •••

MIN	MAX	(BIAS)
-316.0000	392.0000	(.0000)
-160.0000	207.0000	(.0000)
-104.0000	118.0000	(.0000)
-66.0000	69.0000	(.0000)

••• TRANSFORMED DATA RANGE, AFTER APPLICATION OF PEROUT •••

MIN	MAX	CON = 255/(MAX-MIN)
-33.3212	207.1847	1.0603
-8.5575	132.4409	1.8085
-3.0610	45.6902	5.1470
-4.4130	18.7865	10.9916

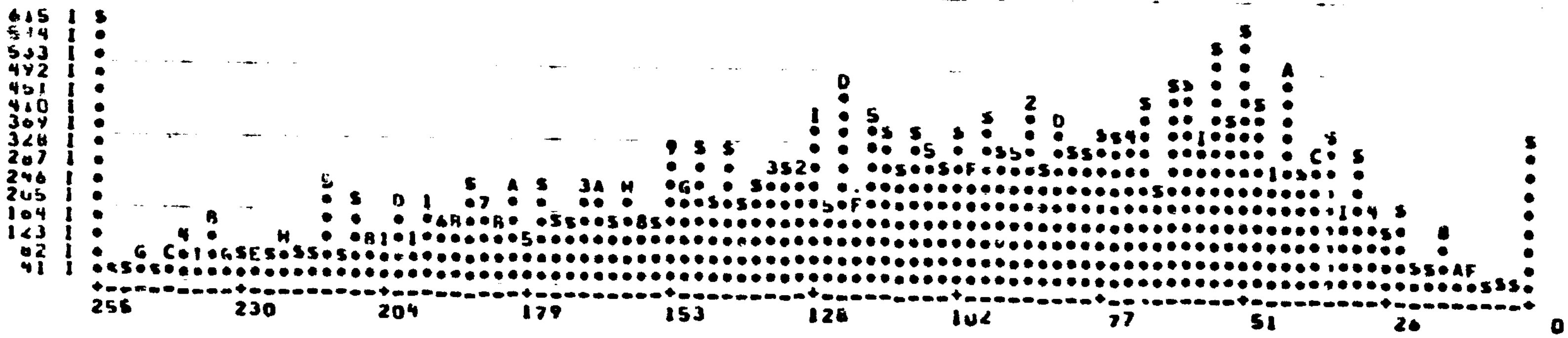
304

ORIGINAL PAGE IS
OF POOR QUALITY

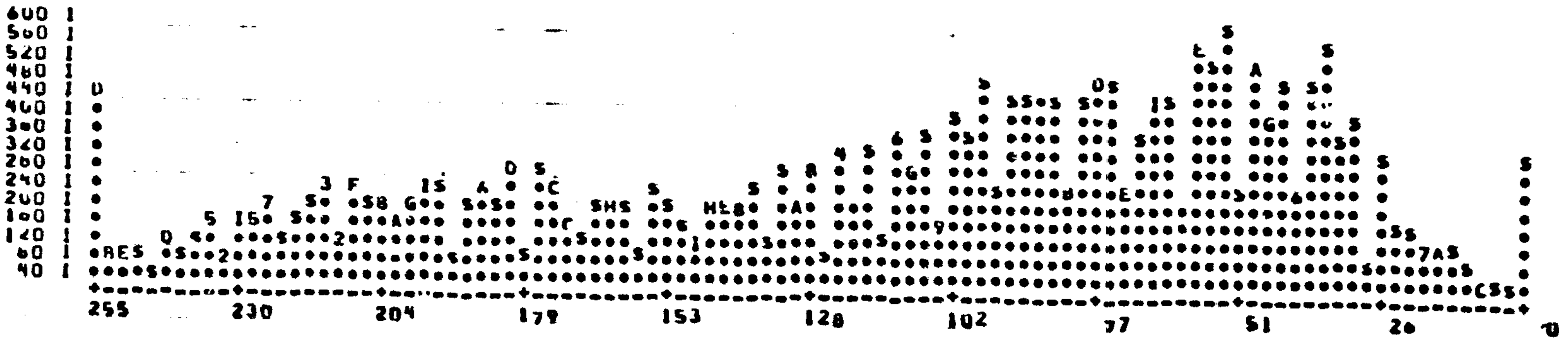
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL   03 MAR 78
HOUSTON, TEXAS

DATA TR

EACH * REPRESENTS 41 POINT(S).



EACH * REPRESENTS 40 POINT(S).



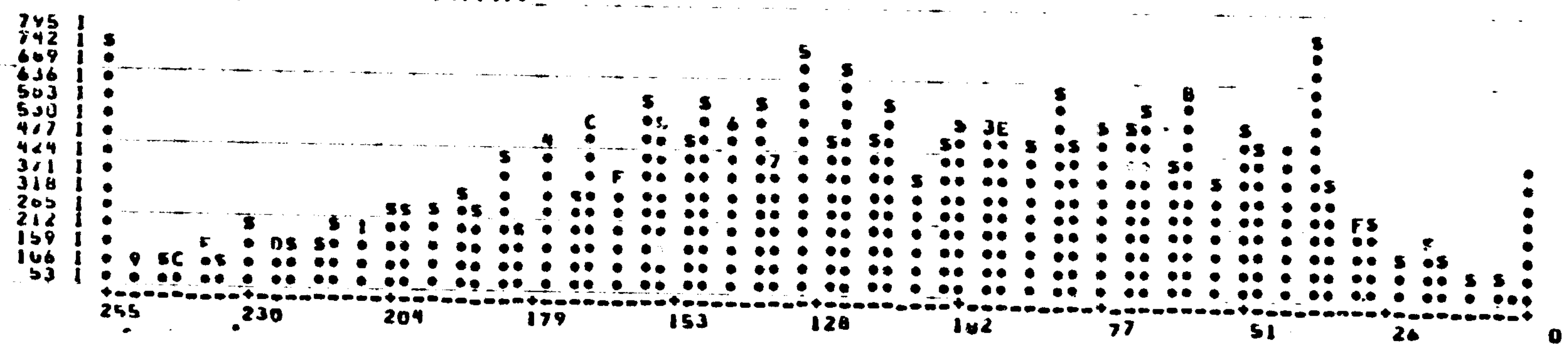
315

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON,TEXAS

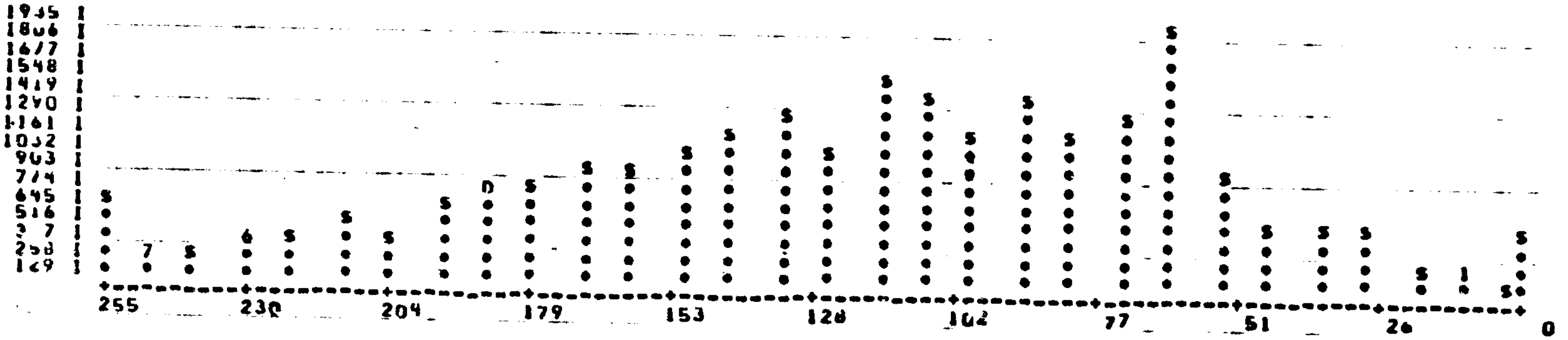
03 MAR 78

DATA TR

EACH • REPRESENTS 53 POINT(S).



EACH • REPRESENTS 129 POINT(S).



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306

SCALING PARAMETERS USED ON TRANSFORMED VALUES. OUTPUT FILE 1

	MINIMUM	MAXIMUM	SCALE FACTOR (CON)
COMPONENT 1	-33.321	207.185	1.060
COMPONENT 2	-8.558	132.441	1.809
COMPONENT 3	-3.661	45.690	5.167
COMPONENT 4	-4.413	18.787	10.992

INPUT IMAGE DATA TAPE INFORMATION

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

FIELDNAME	NO. OF VERTICES	SAMPLE INC	LINE INC	VERTICES(SAMPLE,LINE)
B1-01	4	1	1	(1, 1) (196, 1) (196, 117) (1, 117)

PCG IMAGE

• OUTPUT FILE 2 •

••• TRANSFORMED VALUES RESCALED TO A RANGE 0 - 255 •••
(STATISTICS METHOD)

••• ORIGINAL TRANSFORMED DATA RANGE •••

MIN	MAX	(BIAS)
-297.5990	340.1382	(.0000)
-92.8081	101.6274	(.0000)
-290.7617	265.2945	(.0000)
-71.4373	64.2937	(.0000)

••• TRANSFORMED DATA RANGE, AFTER APPLICATION OF PEROUT •••

MIN	MAX	CON = 255/(MAX-MIN)
-11.8116	197.8969	1.2160
-21.2422	4.5592	9.8832
-140.0006	39.9427	1.4171
-7.4150	35.1661	5.9886

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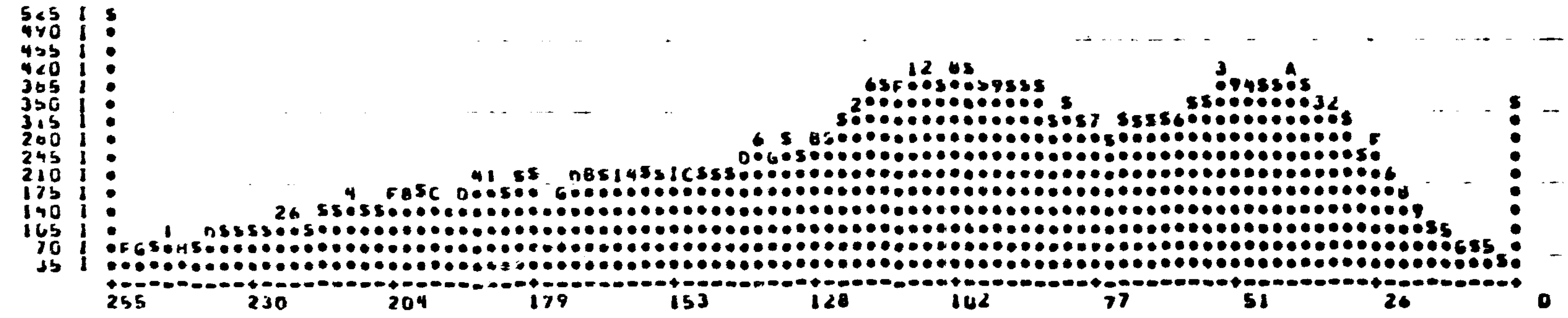
OF POOR QUALITY

308

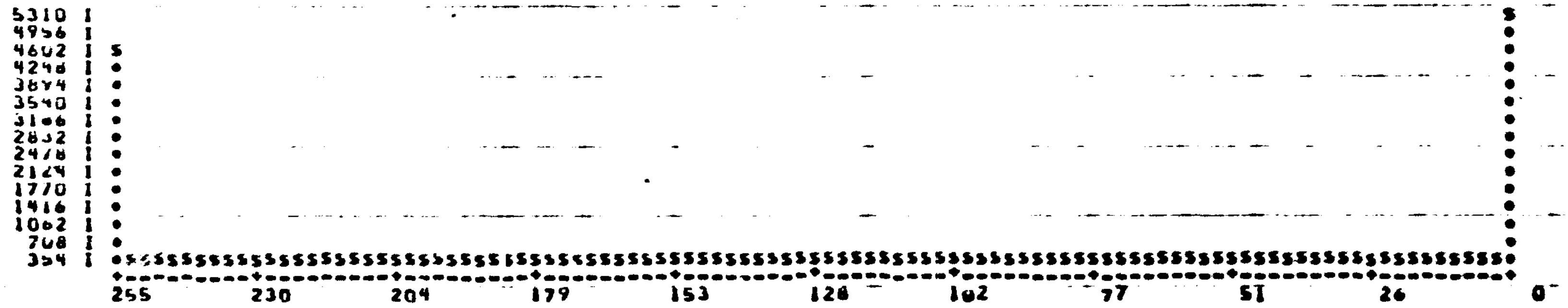
RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

DATA TR

EACH * REPRESENTS 35 POINT(S).



EACH * REPRESENTS 354 POINT(S).



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RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL 03 MAR 78
HOUSTON,TEXAS

DATA TR

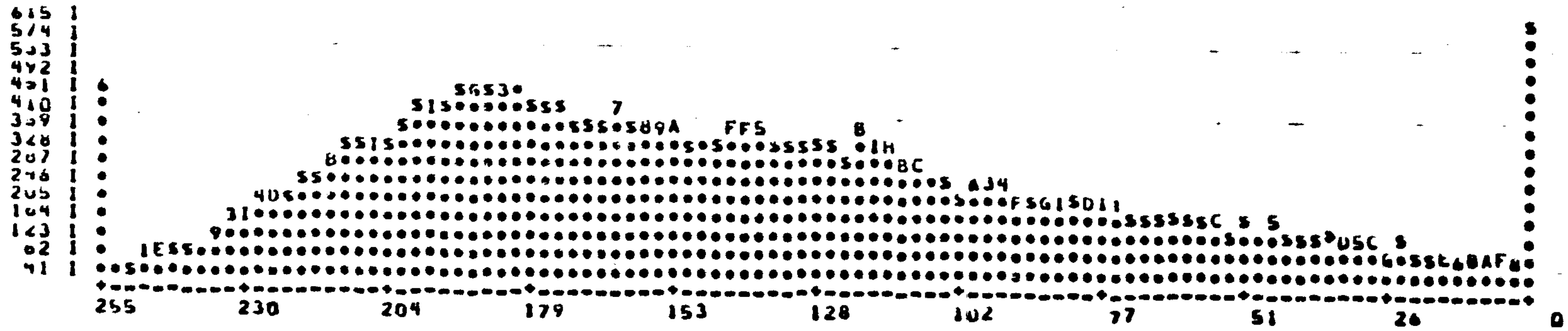
EACH * REPRESENTS 41 POINT(S).

RUN TO MAKE SURE THE CHANGES DIDN'T EFFECT THE ORIGINAL
HOUSTON, TEXAS

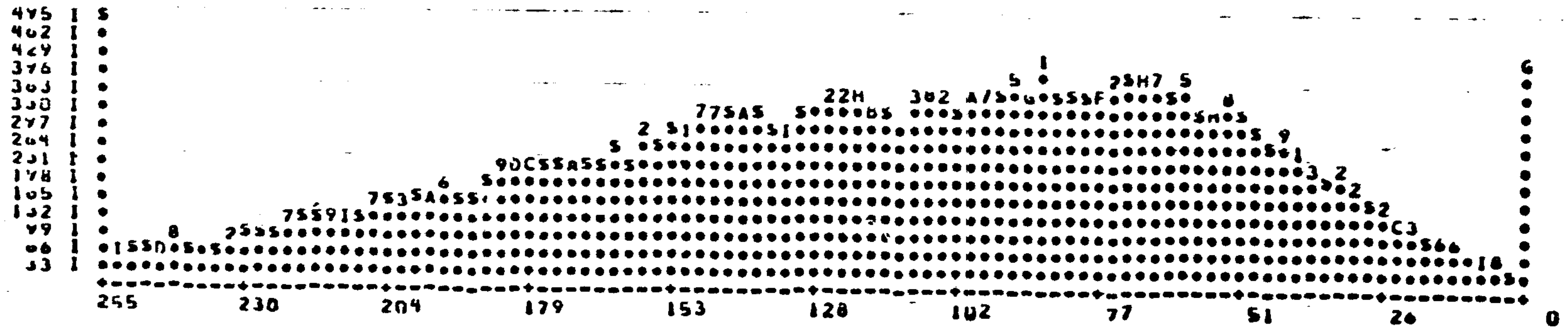
03 MAR 78

DATA TR

EACH • REPRESENTS 41 POINT(S).



EACH • REPRESENTS 33 POINT(S).



310

SCALING PARAMETERS USED ON TRANSFORMED VALUES, OUTPUT FILE 2

	MINIMUM	MAXIMUM	SCALE FACTOR (CON)
COMPONENT 1	-11.812	197.897	1.216
COMPONENT 2	-21.242	4.559	9.883
COMPONENT 3	-140.001	39.943	1.417
COMPONENT 4	-7.415	35.166	6.969

*** SDATA-TR COMPLETED ***

TIME FOR DATA-TRANSFORMATION 13.117