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THE WAVEFORM PROCESSING SYSTEM (WPS). VOLUME IV, PART 3.(U)
FEB 77 P K SANYAL F30602-72-C-0193
UNCLASSIFIED PAR-76-6-VOL-4-PT-3 RADC-TR-76-224-4-3 NL

1 OF 4
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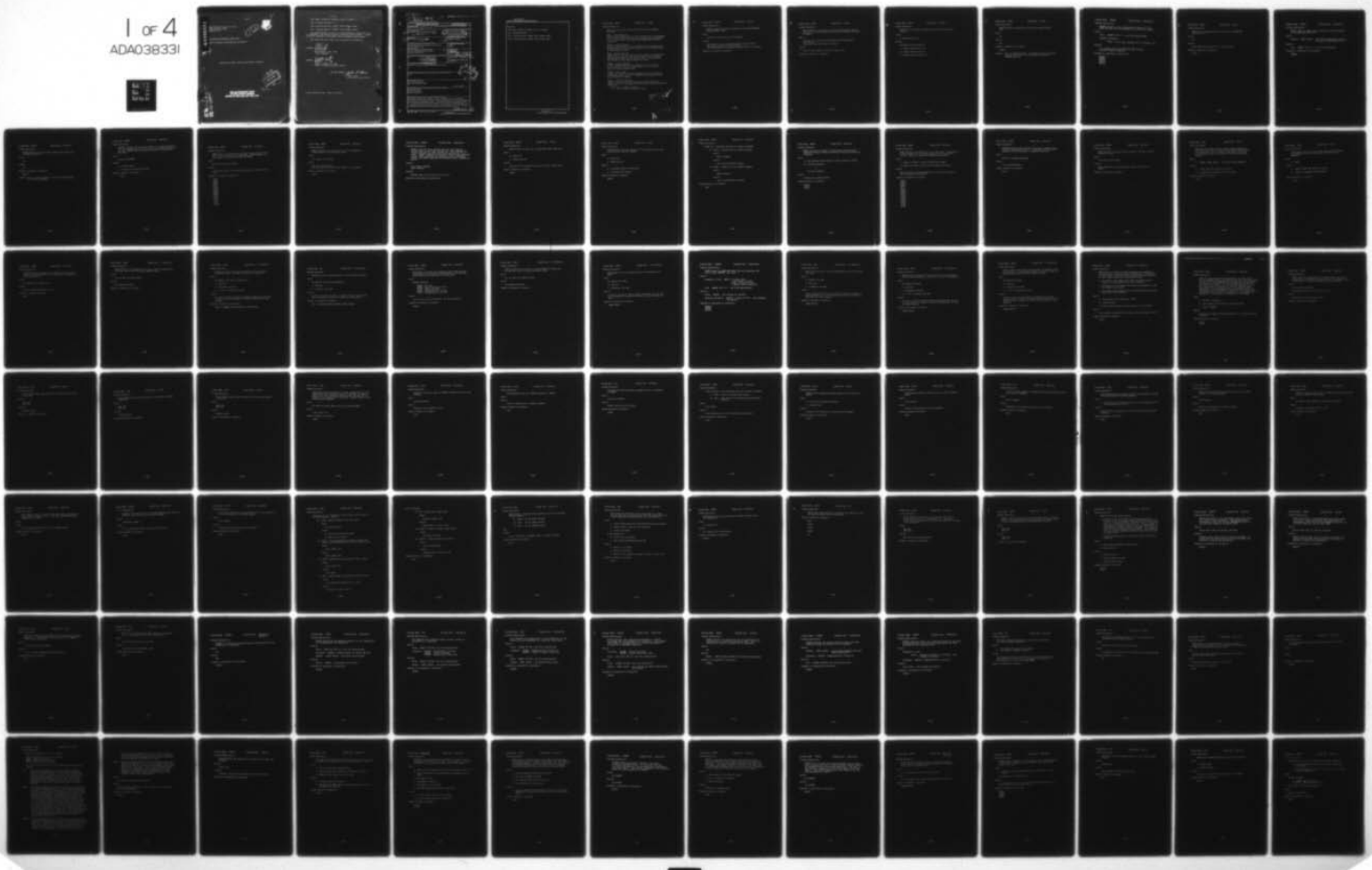

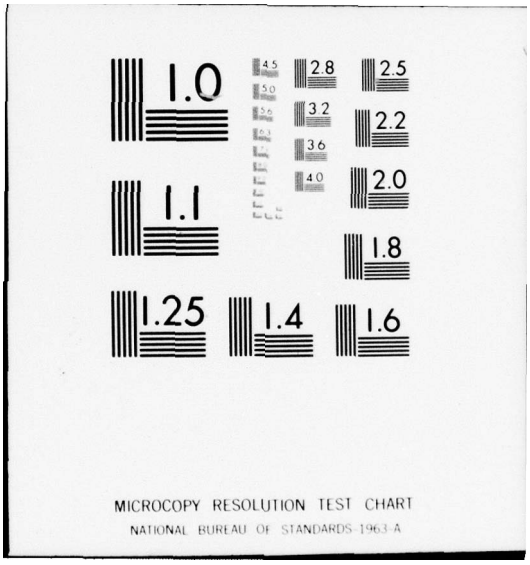
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RADC-TR-76-224, Volume IV, Part 3
Final Technical Report
February 1977

THE WAVEFORM PROCESSING SYSTEM (WPS)

Pattern Analysis and Recognition Corporation

Approved for public release; distribution unlimited.

ROME AIR DEVELOPMENT CENTER
AIR FORCE SYSTEMS COMMAND
GRIFFISS AIR FORCE BASE, NEW YORK 13441

This report consists of Volume IV, Parts 1 through 3.

Part 1 contains Sections 1 - 6.

Part 2 contains Section 7 (pages 7-0001 through 7-0610).

Part 3 contains Section 7 (pages 7-0612 through 7-1184).

This report has been reviewed by the RADC Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS it will be releasable to the general public including foreign nations.

This report has been reviewed and is approved for publication.

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)* This report contains the computer software documentation for the Waveform Processing System (WPS) developed by Pattern Analysis and Recognition Corporation for the Rome Air Development Center. The Waveform Processing System consists of (1) algorithms for performing mathematical operations on waveform data, (2) a language for extracting feature vectors from the waveform, and (3) algorithms for analyzing these vectors to develop pattern classification logic. 390101 B	

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Block 18.

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Program Name: MULTI Program Type: Overlay

Program Description:

MULTI has 6 entry points called via VG light button interrupt, as follows:

DNALL: Display Next All
Reads the next waveform from all data sets which are to be displayed via this light button into a data area, initializes the subroutine, calls in the VG buffer (if needed) and displays those waveforms on the VG.

DNSOME: Display Next Some
Receives position numbers to be displayed via user input and sets the display next bit in the master word in the file control blocks of those positions chosen.

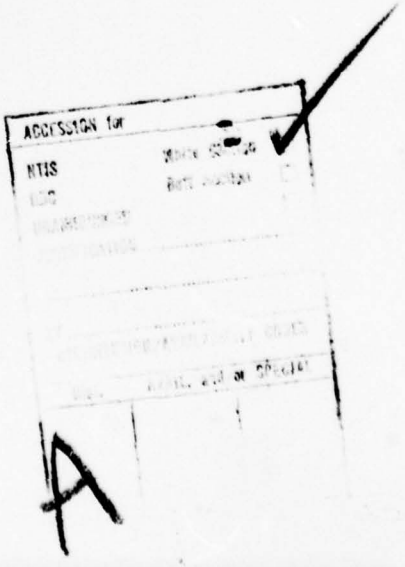
CWALL: Continue Wave All
Slides points in the data buffers of the positions to be continued, reads the next points of those waveforms into the data buffers, and displays the next page of points on the VG. The subroutine calls in the VG buffer are initialized if needed.

CWSOME: Continue Wave Some
Receives position numbers to be continued via user input and sets the continue bit in the master word in the file control blocks of those positions chosen.

DSPSAM: Display Same
Re-reads the currently displayed waveforms into the data buffers and displays them on the VG. It initializes the subroutine calls in the VG buffer if needed.

SCROLL: Scroll All Data Sets
Reads all waveforms in those positions not prohibited by the display next bit in the master word and displays successive waveforms *either by:*

A.) Calls to DNALL if "across"
B.) Calls to DNALL and CWALL if "along"



Program Name: MULTIN Program Type: Overlay

Program Description:

MULTIN is the initialization program for the Multiple Waveform display (MWVDSP) frame.

Inputs:

Current data set may or may not be defined

Outputs:

Nine words at the top of available core space are cleared
The current data set is moved to IN1SAV
The multiple-waveform initialization frame (MINIT) is displayed

Program is contained in overlay(s):

Program Name: MVSCAL Program Type: Overlay

Program Description:

MVSCAL presents a VG display of vertical scaling options and lets the user select whatever options he desires for whichever positions he chooses.

Inputs:

Positions to be scaled and corresponding option numbers, both input by user
Also, grid values may be input if desired

Outputs:

Vertical option numbers in the file control blocks

Program is contained in overlay(s) :

Program Name: NAMSAV Program Type: Overlay

Program Description:

"NAMSAV" will initialize the name and save file on request from the user

Inputs:

a) Name and save file

Outputs:

Depending on used prerogative

a) Display name and save file

b) Destroy name and save file

c) Recreate name and save file

Program Name: NASDEL Program Type: Overlay

Program Description:

NASDEL deletes a user-specified vector from the NAME AND SAVE file.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

NASDEL

Comments: This is a control routine. The program calls other routines to select the vectors to be deleted and to update the NAME AND SAVE file.

Program Name: NASDSP Program Type: Subroutine

Program Description:

NASDSP creates a list containing the entries of the NAME AND SAVE file and displays it on the V.G. screen.

Inputs:

Files: NAMSAV (DT 17.) - see file descriptions

External Variables:

GPNUM - first free location in V.G. display list

Outputs:

V.G. buffer containing NAME AND SAVE entries
Variable GPNUM is updated

Program is contained in overlay(s):

NASDEL
NAMSAV
SELVEC
NASIOP
SELLVC

Program Name: NASKBS Program Type: Overlay

Program Description:

NASKBS lets a user manually enter a vector into the NAME AND SAVE file (DT 17.).

Inputs:

N/A

Outputs:

Update NAME AND SAVE file (DT 17.) with new vector.

Program is contained in overlay(s):

NASIOP

Program Name: NASPLT Program Type: Subroutine

Program Description:

NASPLT stores a basis vector currently being displayed in the NAME AND SAVE file.

Inputs:

Buffers: CSECT buffer - see buffer description for displaying two-dimensional plots

Outputs:

File: NAMSAV (DT 17.) - see file description

Program is contained in overlay(s):

NAMSAV

Program Name: NASPRN Program Type: Subroutine

Program Description:

NASPRN prints on the line printer a user-selected vector from the NAME AND SAVE file.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

NASIOP

Comment: This is a control program; it calls other routines which do the actual processing.

Program Name: NEWPAGE Program Type: Subroutine

Program Description:

NEWPAGE increments the current page number of a one-space histogram plot and determines which classes of the current dataset belong to the new page. NEWPAGE also calculates how much space to allocate for each class.

Inputs:

Output of HISTOGRAM

Outputs:

a) New page number

b) New list of classes for the page

Program contained in overlay(s):

PLT1DA

Program Name: NEWSEC Program Type: Subroutine

Program Description:

NEWSEC calls for the next sector available in the named file and updates the file control block appropriately. NEWSEC supports the main waveform I/O subroutines GETWAV and MORWAV.

Inputs:

The file control block address.

Outputs:

A new sector read to the internal buffer and file control block updates.

Program is contained in overlay(s):

CNGHDR
LINKGO
LODWAV
MRQSTF
MULTI
PLAYBK
PRNHDR
PRNTID
PRTRND
PWAVEC
RQSSTF
SEGMNT
SELSET
SINGLE
SPCEXC
SPCSET

Program Name: NEXTWV Program Type: Subroutine

Program Description:

NEXTWV positions the current file to the next waveform and updates SINGLE's sector and point tables.

Inputs:

File control block address

Outputs:

SCTTBL and PNTTBL updated
Open name table pointing to sector number of next waveform

Program is contained in overlay(s):

SINGLE

Program Name: NMVEVL Program Type: Subroutine

Program Description:

NMVEVL contains three subroutines that are used for nearest mean vector logic evaluation. They compute the distance between the data vector and mean vector of a class. SNMVL1 computes the distance without any weighting values, WVLT1 computes the distance using a weighting vector, and WMLT1 computes the distance using a weighting matrix.

Inputs:

Data vector address
Logic address

Outputs:

Nearest mean vector distance to data vector.

Program is contained in overlay(s):

Program Name: NMVLOG Program Type: Overlay

Program Description:

NMVLOG creates the logic for a nearest mean vector logic node.

Inputs:

a) Logic file

b) Current data set

Outputs:

The logic file is modified to reflect the newly created logic

Program contained in overlay(s):

NMVLOG

Program Name: NMVPEV Program Type: Overlay

Program Description:

NMVPEV performs a partial evaluation of the design set on the nearest mean vector logic just created.

Inputs:

a) Logic file

b) Design data set

Outputs:

a) A confusion matrix of errors made

b) A detailed error listing

Program contained in overlay(s):

NMVPEV

Program Name: NOGENC Program Type: Subroutine

Program Description:

NOGENC has 2 independent subroutines for pass-3 of PARLAN:

(1) P3VCTR - Generates code for a VECTOR statement

Inputs:

VECTOR statement

Outputs:

Code to perform VECTOR statement

(2) P3MTRX - Generates code for a MATRIX statement

Inputs:

MATRIX statement

Outputs:

Code to perform MATRIX statement

Program contained in overlay(s):

PASS3

Program Name: NUMREG Program Type: Subroutine

Program Description:

NUMREG determines the number of display regions that have been defined by one-space histogram thresholds or two-space scatter plot boundaries.

Inputs:

a) Logic argument buffer defined by CR1LOG, CR2LOG, or CL2SPC

b) One-space thresholds

or

two-space boundaries

Outputs:

Modified logic argument buffer

Program contained in overlay(s):

CR1LOG
CR2LOG
C2LSPC

Program Name: NXTBLK Program Type: Subroutine

Program Description:

NXTBLK positions the waveform file to the next block. An appropriate return indicates that the current block is the last one in this waveform. NXTBLK is a waveform I/O supporting subroutine.

Inputs:

1) Address of buffer to contain waveform block header.

2) Address for output location for # of sectors this block.

Outputs:

New file position advancing waveform to its next block of data or return indicating no next block.

Program is contained in overlay(s):

CNGHDR
LINKGO
LODWAV
MRQSTF
MULTI
PLAYBK
PRNHDR
PRNTID
PRTRND
PWAVEC
RQSSTF
SEGMNT
SELSET
SINGLE
SPCEXC
SPCSET

Program Name: NXTLNE Program Type: Subroutine

Program Description:

NXTLNE retrieves the next available class from the dataset of the one-space histogram and plots it. If necessary, the first class displayed on the Vector General is removed to make room.

Inputs:

Outputs of HISTOGRAM and BINCON

Outputs:

A new histogram display

Program contained in overlay(s):

PLT1DA

Program Name: NXTWAV Program Type: Subroutine

Program Description:

NXTWAV positions the current data set points to the next (or first) waveform of a node.

Inputs:

File control block address

Outputs:

Next waveform of the current data set ready to be read in via WAVGET

Program is contained in overlay(s):

Program Name: OLPIN Program Type: Overlay

General Description:

OLPIN saves the current "single" display dataset parameters to facilitate re-entry to the "single" module without destroying previous conditions. Next, it brings in the OLPARS frame on the VG, and returns control to the user for the next user-selected function.

Inputs:

a) IN1TNM, IN1NNM, IN1DTP -- the GLOBAL dataset parameters

Outputs:

a) Current data set information is stored

b) OLPARS frame is displayed on Vector General.

Program contained in overlay(s):

OLPIN

Program Name: OLPOUT

Program Type: Overlay

General Description:

OLPOUT returns the user to the initial frame of the WPS system from OLPARS and restores the previously saved WPS data set parameters.

Inputs:

a) IN1SAV

Outputs:

a) IN1TNM, IN1NNM, and IN1DTP are restored

b) FRAME1 is displayed on Vector General

Program contained in overlay(s):

OLPOUT

Program Name: ONEWAV Program Type: Subroutine

Program Description:

Depending on the entry point called, ONEWAV retrieves the next waveform, the same waveform, or the next page of a waveform into the multi-data area.

Inputs:

File control block address in R4

Outputs:

New or shifted waveform data in core

Program is contained in overlay:

MULTI

Program Name: OPENOD Program Type: I/O Subroutine

Program Description:

OPENOD retrieves the designated node's sector link(s) information and initializes the run-time I/O tables, ONAMT and LSCTBL.

Inputs:

The node name via global address.

Outputs:

See program description.

Program is contained in overlay(s):

Program Name: OPINOD Program Type: I/O Subroutine

Program Description:

OPINOD opens an existing file associated with a tree structure (a node) for input. Any node of a tree may be designated.

Inputs:

The complete node name is designated by:

1) Data type

2) 6 character tree name

3) 5- (or 6-) character node name

Outputs:

An entry in the WPS I/O tables to formally recognize that the node is a file and may be accessed via the WPS I/O routines for input purposes.

Program is contained in overlay(s):

THIS IS A COMMON ROUTINE CONTAINED IN MANY OVERLAYS

Program Name: OPN Program Type: I/O Subroutine

Program Description:

OPN opens a file (not associated with a tree structure) for input.

Inputs:

The complete file name is designated by:

1) Data type

2) 6-character file name

Outputs:

An entry in the WPS I/O tables to formally recognize that the file may be accessed via the WPS I/O routines for input purposes.

Program is contained in overlay(s):

THIS IS A COMMON ROUTINE CONTAINED IN MANY OVERLAYS

Program Name: OPNCRE Program Type: Subroutine

Program Description:

OPNCRE opens a low-order node belonging to the current data set. The program will then create a node belonging to the tree being created which has the same name as the file above.

Inputs:

External Variables:

NEWNNM - Node name
NEWTNM - Name of tree being created
VECTNM - System tree name
NEWDIM - Dimensionality of new data
VECDIM - Dimensionality of old data

Outputs:

Data file (DT 13) will be created. See file descriptions

Program is contained in overlay(s):

FEVCRE

Program Name: OPNFIL Program Type: I/O Subroutine

Program Description:

OPNFIL initializes the run-time I/O tables (ONAMT and LSCTBL) with the name, data type, I/O switch, and sector links.

Inputs:

The file name via external location.

Outputs:

See program description.

Program is contained in overlay(s):

Program Name: OPNFLU Program Type: I/O Subroutine

Program Description:

OPNFLU opens a file (not associated with a tree structure) for update.

Inputs:

The complete file name:

1) Data type

2) 6-character file name

Outputs:

An entry in the WPS I/O tables formally recognizing that the file may be accessed via the WPS I/O routines for input and update purposes.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: OPNNAS Program Type: Subroutine

Program Description:

OPNNAS opens the NAME AND SAVE file and transfers the entry table (NASTBL) into core.

Inputs:

Argument in call: MODE = 0 create file
1 put vector in file
2 get a vector in file
3 delete vector from file

File: NAMSAV (DT 17.) - see file descriptions

Outputs:

Table: NASTBL - see program for details

External Variables: NASFLG - status of file. See programs for details

Program is contained in overlay(s):

NAMSAV
NASDEL
SELLVC

Program Name: OPNO Program Type: I/O Subroutine

Program Description:

OPNO creates and opens a file (not associated with a tree structure) for output.

Inputs:

The complete file name:

1) Data type

2) 6-character file name

Outputs:

A newly created data file with an entry in the WPS I/O tables formally recognized it as a file which may be accessed by the WPS I/O subroutines for output purposes.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: OPNODU Program Type: I/O Subroutine

Program Description:

OPNODU opens an existing file associated with a tree structure (a node) for update operations. Any node of a tree may be designated.

Inputs:

The complete node name:

1) Data type

2) 6-character tree name

3) 5- (or 6-) character node name

Outputs:

An entry in the WPS I/O tables formally recognizing that the node is a file and may be accessed via the WPS I/O subroutines for input and update purposes.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: OPONOD Program Type: I/O Subroutine

Program Description:

OPONOD creates a node under an existing node (the immediate senior node), allocates a user-designated number of sectors to that file, and opens the new node (file) for output operations.

Inputs:

The complete node name:

1) Data type

2) 6-character tree name

3) 5- (or 6-) character node name

Outputs:

A newly created (low) node under an existing tree: that node having an entry in the WPS I/O tables formally recognized it as a file which may be accessed by the WPS I/O subroutines for output purposes.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: ORDER1 Program Type: Subroutine

Program Description:

ORDER1 sorts the one-space histogram thresholds into ascending or descending order. (The user selects the direction.) It also loads the logic argument buffer (see CR1LOG) with the following information for each display region which the thresholds define:

1) The number of line segments that define the region (always 1, except for the last region which has no threshold).

2) The address in the VG display list where the instructions to draw the threshold are located.

3) The address in the common buffer of the single precision floating point value of the threshold.

Inputs:

a) Logic argument buffer defined by CR1LOG

b) Threshold values

c) Vector General display draw instructions for the thresholds

Outputs:

Logic argument buffer modified to contain pointers to inputs b) and c)

Program contained in overlay(s):

CR1LOG

Program Name: ORDER Program Type: Subroutine

Program Description:

ORDER is a two-space logic design subroutine. If there is more than one boundary drawn on the current scatter plot, the user is asked to select one of the boundaries with the light pen. This determines that logic will be created first for the display region which the selected boundary defines. For each boundary (there can be one or two), ORDER loads the following into the logic argument buffer (see CR2LOG): 1) The following address in the display list of the commands that draw the boundary, 2) The address in the common area of the boundary itself (the list of end points of its individual line segments) and 3) The number of line segments in the boundary.

Inputs:

a) Two-space scatter plot

b) Logic argument buffer defined by CR2LOG or C2LSPC

c) Output of NUMREG

Outputs:

Modified logic argument buffer defining the order in which logic will be created

Program contained in overlay(s):

CR2LOG
C2LSPC

Program Name: ORGLOD Program Type: Subroutine

Program Description:

ORGLOD loads the origin word(s) of a waveform header into word(s) 15 and/or 14 of a specified file control block. The number of words loaded depends on the mode (time domain or frequency domain).

Inputs:

File control block address

Waveform header address in word #22 of the fcb.

Outputs:

Modification of the file control block

Program is contained in overlay(s):

Program Name: OVAL1 Program Type: Overlay

Program Description:

OVAL1 performs overall logic evaluation of a test data set against a logic file.

Inputs:

Logic tree
Data tree

Outputs:

Confusion matrix

Program is contained in overlay(s)

Program Name: OVAL2 Program Type: Overlay

Program Description:

OVAL2 performs overall logic evaluation of a test data set against a logic file.

Inputs:

Logic tree
Data tree

Outputs:

Confusion matrix

Program is contained in overlay(s)

Program Name: OVAL3 Program Type: Overlay

Program Description:

OVAL3 performs overall logic evaluation of a test data set against a logic file.

Inputs:

Logic tree
Data tree

Outputs:

Confusion matrix

Program is contained in overlay(s)

Program Name: OZOOM Program Type: Subroutine

Program Description:

OZOOM gives the user the ability to expand a selected area of a two-space scatter plot for better viewing. It redefines the range and domain of the plot, recomputes scaling factors, and calls for the display of the current page of vector data. Vectors outside the selected area are eliminated.

Inputs:

The output of SCATTR, PAGE, and PLOT, and possibly OZOOM

Outputs:

A new scatter plot

Program contained in overlay(s):

PLOT2D

Program Name: P3CALL Program Type: Subroutine

Program Description:

P3CALL is a routine in pass-3 of PARLAN to generate code for a CALL statement.

Inputs:

The CALL statement

Outputs:

Generated code to perform the CALL

Program contained in overlay(s):

PASS3

Program Name: P3CTNU Program Type: Subroutine

Program Description:

P3CTNU generates code for a CONTINUE statement in PARLAN.

Inputs:

Outputs:

A NO-OP is generated for a CONTINUE statement

Program contained in overlay(s):

PASS3

Program Name: P3DO Program Type: Subroutine

Program Description:

P3DO generates PDP-11/45 machine language code for a DO statement in PARLAN.

Inputs:

Current DO statement

Outputs:

Machine code for the DO statement

Program contained in overlay(s):

LINKGO

Program Name: P3ERR Program Type: Subroutine

Program Description:

P3ERR performs 2 error processing functions for pass-3 of PARLAN:

(1) P3ERR - outputs the desired error message

(2) ERRTS - Error return to the waveform processing system executive

Inputs:

Error number

Outputs:

Error message output to vector general and line printer

Program contained in overlay(s):

PASS3

Program Name: P3FILL Program Type: Overlay

Program Description:

P3FILL fills in unresolved addresses caused by the third pass of PARLAN.

Inputs:

a) File of input unresolved addresses

b) Generated code

Outputs:

Generated code is modified to contain resolved addresses

Program contained in overlay(s):

P3FILL

Program Name: P3GOTO Program Type: Subroutine

Program Description:

P3GOTO generates PDP-11/45 machine code for a GOTO statement in PARLAN.

Inputs:

GOTO statement

Outputs:

Machine code generated for the GOTO statement

Program contained in overlay(s):

PASS3

Program Name: P3IF Program Type: Subroutine

Program Description:

P3IF is a routine in pass-3 of PARLAN which generates PDP-11/45 source code for an IF statement.

Inputs:

The IF statement

Outputs:

Generated code to perform the action of an IF statement

Program contained in overlay(s):

PASS3

Program Name: P3LET Program Type: Subroutine

Program Description:

P3LET generates PDP-11/45 machine code for a LET statement in PARLAN (the On-Line Waveform Processing Language).

Inputs:

a) The current line of PARLAN code must be a LET statement and the current symbol must be "LET".

Outputs:

P3LET modifies the generated code file to reflect code for the LET statement.

Program contained in overlay(s):

PASS3

Program Name: P3PRNT Program Type: Subroutine

Program Description:

P3PRNT is the executive for the generation of code for a PRINT statement in the PARLAN language.

Inputs:

PRINT statement

Outputs:

Machine code generated for the PRINT statement

Program contained in overlay(s):

PASS3

Program Name: P3PRTY Program Type: Subroutine

Program Description:

P3PRTY is a routine in pass-3 of the PARLAN compiler used to generate code for a PRINT or TYPE statement.

Inputs:

The PRINT or TYPE statement in Polish postfix notation

Outputs:

Generated code to perform PRINT or TYPE

Program contained in overlay(s):

PASS3

Program Name: P3RTS Program Type: Subroutine

Program Description:

P3RTS contains 3 entries: P3STOP, P3END, and P3RTRN. They generate a return "RTS R5" instruction for a STOP, END, and RETURN statement respectively for PARLAN.

Inputs:

Outputs:

Code is generated for the STOP, END, and RETURN statement

Program contained in overlay(s):

PASS3

Program Name: P3SUBR Program Type: Subroutine

Program Description:

P3SUBR is a routine in pass-3 of the PARLAN compiler which generates PDP-11/45 source code for the subroutine statement.

Inputs:

Subroutine statement

Outputs:

Code to perform the action of the subroutine statement

Program contained in overlay(s):

PASS3

Program Name: P3TYPE Program Type: Subroutine

Program Description:

P3TYPE is the executive for the generation of PDP-11/45 machine code for a TYPE statement in the PARLAN language.

Inputs:

TYPE statement

Outputs:

Machine code generated for the TYPE statement

Program contained in overlay(s):

PASS3

Program Name: P3UTIL Program Type: Subroutine

Program Description:

P3UTIL is a set of 7 independent utility routines used by pass-3 of the PARLAN compiler. They are:

(1) OPNALL - Opens all necessary files for pass-3

Inputs:

a) File from Pass-2

Outputs:

a) Input file is opened for input

b) Pass-3 file is created

(2) SORTST - Sorts the symbol table created by pass-1 and creates a new ordered symbol table for the generated code.

Inputs:

Pass-1 symbol table

Outputs:

Sorted symbol table

(3) GETSYM - Retrieves the next symbol from Pass-2 output.

Inputs:

Pass-2 output file

Outputs:

Next symbol

(4) PRLD - Outputs PARLAN's relocatable dictionary to disk.

Inputs:

A relocatable dictionary sector to output

Outputs:

The sector is output to disk

P3UTIL (Continued)

(5) PST - Outputs pass-3 symbol table.

Inputs:

Address of symbol table

Outputs:

Symbol table is output to disk

(6) CLSALL - Closes all of pass-3 output files.

Outputs:

All files are closed

(7) GENCOD - Outputs generated code to disk.

Inputs:

Code to be generated

Outputs:

Generated code is output to disk

Program contained in overlay(s):

PASS3

Program Name P3WSV Program Type: Subroutine

Program Description:

P3WSV contains 3 subroutines which generate code for the following PARLAN statements:

(1) P3WAVE - for the WAVEND statement

(2) P3VEC - for the VCEND statement

(3) P3SEG - for the SEGEND statement

Input:

Outputs:

Code is created for the WAVEND, VCEND, or SEGEND statements

Program contained in overlay(s):

PASS 3

Program Name: PAGE Program Type: Subroutine

Program Description:

PAGE locates all the vectors on the current page of a 2-space plot and reads their projected values from their headers into core. It also calculates the page-dependent local scaling factors.

Inputs:

a) Current OLPARS vector data with SCATTR modified vector headers

b) Number of pages in the plot (set by SCATTR)

c) Current page number

In logic design only:

d) Current logic node number

e) Class symbols associated with the node

Outputs:

a) Buffer of (x,y) pairs

b) Buffer of vector IDs

c) Buffer of class symbols and number of vectors in each class

Program contained in overlay(s):

PLOT2D

Program Name: PAGPRN Program Type: Subroutine

Program Description:

PAGPRN puts out onto the line printer the current contents of the V.G. display list.

Inputs:

V.G. display list

Outputs:

V.G. display list on line printer

Program is contained in overlay(s):

FEVPRN

Program Name: PARCOR Program Type: N/A

Program Description:

PARCOR, when linked properly to an overlay, will describe the free core area that may be used for buffer space.

Program contained in overlay(s):

PASS3

LINKED

LINKGO

KLENUP

PGC

Program Name: PARCOV Program Type: Subroutine

Program Description:

PARCOV computes the mean vector and covariance matrix of the vectors in one class of the current data set. Only those vectors which are located at the current logic node will contribute to the calculations.

Inputs:

Data set
Logic node

Outputs:

Mean vector and covariance matrix

Program is contained in overlay(s):

Program Name: PARMOD Program Type: Overlay

Program Description:

PARMOD is the initial overlay for pairwise modification. The user selects a pairwise logic node and the evaluation node number located in each vector associated with the pairwise logic is reset.

Inputs:

Logic tree
Data set

Outputs:

Logic tree
Data set

Program is contained in overlay(s)

Program Name: PARTEV Program Type: Subroutine

Program Description:

PARTEV has two logic design functions:

1) To perform a partial evaluation of the dataset against the new level of one- or two-space OLPARS logic that has been created in core. It maps every dataset vector that exists at the current logic node to a new node in the next level. It also compares the class symbol of a vector with the list of class symbols that are associated with the node to which it is mapped. If it cannot be found, the vector is flagged as misclassified. (This evaluation is called a partial evaluation because it involves only one level of a logic tree.)

2) Prints on the line printer a list of all vectors that were misclassified.

Inputs:

a) Logic created by CR1LOG or CR2LOG in core

b) Current data set

Outputs:

a) Modified data set

b) Confusion matrix (in core)

c) Detailed error listing

Program contained in overlay(s):

CR1LOG
CR2LOG

Program Name: PARTIO Program Type: Overlay

Program Description:

PARTIO partitions a user-designated vector data node into two or three subclasses. The subclasses are determined on-line via the SET THRESHOLDS option in the structure analysis histogram frame.

Inputs:

Vector data files of current tree/node

Outputs:

Updated vector data files of current tree/node (i.e. vector data for node selected for partitionment are altered to reflect new subclasses)

Program is contained in overlay(s):

PARTIO

Program Name: PARTIT Program Type: Overlay

Program Description:

PARTIT partitions a user-designated vector data node into two or three subclasses. The subclasses are determined on-line via the DRAW BOUNDRY option in the structure analysis scatter plot frame.

Inputs:

Vector data files of current tree/node

Outputs:

Updated vector data files of current tree/node (i.e. vector data for node selected for partitionment are altered to reflect new subclasses)

Program is contained in overlay(s):

PARTIT

Program Name: PASS2 Program Type: Overlay

Program Description:

PASS2 is the second pass for PARLAN (the On-Line Waveform Processing Language). It converts infix expressions (generated in pass-1) to Polish notation expressions.

Inputs:

Output file from pass-1 (SYNTAX)

Outputs:

A file is created containing the postfix notation

Program contained in overlay(s):

PASS2

Program Name: PASS3 Program Type: Overlay

Program Description:

PASS3 is the executive routine which controls the third pass (i.e., code generation pass) of the PARLAN compiler.

Inputs:

Polish postfix notation file of PASS2

Outputs:

Generated code for the PARLAN program

Program contained in overlay(s):

PASS3

Program Name: PCCORE

Program Type: Subroutine (Buffer)

Program Description:

PCCORE is a buffer area used during the computation of the probability of confusion.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

PCEVAL

Program Name: PCHIS Program Type: Subroutine

Program Description:

PCHIS creates the histograms necessary for the computation of the probability of confusion.

Inputs:

Files: data file (DT 13.) see file descriptions

Variables: VECDIM - dimensionality of system data set

Buffers: CSECT buffer - see buffer descriptions

Outputs:

Buffer: HISBUF - see program for details

Program is contained in overlay(s):

PCEVAL

Program Name: PCI Program Type: Subroutine

Program Description:

PCI computes the classwise figure of merit using the probability of confusion.

Inputs:

Files: MEASIJ (DT 88.) see file descriptions

Variables: VECDIM - dimensionality of data
VECTNM - system tree name
VECNNM - system senior node name

Outputs:

Files: MEASII (DT 88.) see file descriptions

Buffer: CSECT buffer - see buffer descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: PCIJ Program Type: Subroutine

Program Description:

PCIJ controls the computation of the probability of confusion for each dimension on a pairwise class basis.

Inputs:

Files: SCRACH (DT 88.) see file descriptions

Variables: VECDIM - dimensionality of data set
NUMNOD - number of nodes in data set

Outputs:

Files: MEASIJ (DT 88.) see file descriptions

Buffer: CSECT buffer - see buffer descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: PCINIT Program Type: Subroutine

Program Description:

PCINIT performs the computations necessary to create histograms for the probability of confusion. The program also finds the minimum number of vectors contained in a class for a specified tree/node.

Inputs:

Variables: VECTNM - system tree name
VECNNM - system senior node name

Files: data file (DT 13.) see file descriptions

Outputs:

Files: SCRACH (DT 88.) see file description

Buffer: CSECT buffer - see program and buffer descriptiens for details

Program is contained in overlay(s):

PCEVAL

Program Name: PCONF Program Type: Overlay

Program Description:

PCONF controls the computation of the probability of confusion for a selected tree/senior node. This is a controlling routine; no major I/O is performed.

Inputs:

N/A

Outputs:

Buffer: CSECT buffer (FEVFLG) see buffer descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: PCOVER Program Type: Subroutine

Program Description:

PCOVER computes the overall figure of merit for each dimension using the probability of confusion.

Inputs:

Buffers: CSECT buffer - see program documentation and buffer description

Variables: VECDIM - dimensionality of data set

Outputs:

File: MEASOV (DT0130) see file descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: PCSORT Program Type: Subroutine

Program Description:

PCSORT transfers values in a formatted buffer to an array. The program then sorts this array and places the rank position into the original list.

Inputs:

Arguments to call:

Buffer - address of buffer to be sorted. See program for details

Variables: VECDIM - dimensionality of data set

Outputs:

User buffer - see program for details

Program is contained in overlay(s):

PCEVAL

Program Name: PFR Program Type: Subroutine

Program Description:

PFR writes a frequency resolution to a waveform in conjunction with the WPS language (PARLAN) I/O.

Inputs:

1. The waveform file control block address
2. The requested frequency resolution

Outputs:

The frequency resolution is divided into the waveform sampling rate, and the power of 2 of that result (an integer) is stored in the extension block for pick-up by program WAVEND.

Program is contained in overlay(s):

Program Name: PGC Program Type: Overlay

Program Description:

PGC prints a disassembled listing of the code generated by the PARLAN compiler for a PARLAN program.

Inputs:

Generated code file of the selected program

Outputs:

A disassembled listing (on the line printer) of the selected program

Program contained in overlay(s):

PGC

Program Name: PGGLBL Program Type: Subroutine

Program Description:

PGGLBL checks if a page-global mode of vertical scaling is among the multi-file control blocks, and computes the page global minimum and maximum values if one is found.

Inputs:

Vertical scale modes in the multi-file control blocks for the Multiple Wave Display frame

Outputs:

Minimum and maximum on page filled in the FCB's

Program is contained in overlay(s):

MULTI

Program Name: PLACE Program Type: Subroutine

Program Description:

Subroutine PLACE will load either the begin mark or the end mark into buffer.

Inputs:

Outputs:

Program is contained in overlay(s):

SEGMNT

Program Name: PLAYBK Program Type: Overlay

Program Description:

There are 4 separate entry points in PLAYBK:

SCPB - screen playback or wave page playback
SCWVPB - screen wave playback
NWSTPB - new wave (select) playback
LIGPEN - light pen (select) playback

The user can choose any of the 16 D/A converters on the AD-5 analog computer.

SCPB - Screen Playback assumes the user has displayed a waveform or portion of a waveform on the V.G. screen through the Single Wave Display Module (SINGLE). The data stored in SINGLE buffer is output to the D.A converter at a speed corresponding to the preset effective sampling rate (ESR). Since all data points being displayed are core resident, the output rate is only limited by the D/A converter*. User has the option to repeat the playback at the end of calculation by simply hitting the "CR" key.

SCWVPB - This option assumes the user wants to play back a whole waveform but he has only displayed part of it on the screen through SINGLE. In order not to offset the current status of SINGLE, the current data set is renamed and then the pointer in the file control block for SINGLE data retrieving is bypassed backward to point at the beginning of the waveform. The regular WPS I/O routines are used to retrieve the waveform data and a new consecutive file is created on the RP02 disk with any header information stripped off. To achieve high speed playback, a double buffering scheme is used to read data back into core and transfer data from core to the D/A converter (DAC). Speed here is limited by the double buffering scheme (mainly because of buffer size) to 20K samples/sec. At the end of calculation, the user is asked whether he wants to listen to the signal again. If yes, data in the created consecutive file will be dumped out to the DAC again. If no, the renamed file will be dumped out to the DAC again. If no, the renamed file and the newly created file are both deleted and control is returned to the WPS Executive.

NWSTPB - This option allows the user to play back any existing waveform under any node under any tree. The user must enter the tree name, node name and waveform ID to identify the particular waveform to be played back. Then the specified node is opened and search is performed under the node to find the specified waveform. When the waveform is found, the header information associated with it is stripped off and a temporary file is created for the raw data.

The same double buffering scheme as in Screen Wave Playback is used for dumping the data out to the DAC. Again, the user has the option to repeat the playback and upon exit, the temporary file is deleted and the opened node is closed.

LIGPEN - Light Pen Playback assumes the user has displayed a waveform or portion of a waveform on the V.G. screen through SINGLE. This option allows the user to play back any portion of the waveform that he sees on the screen. This is done by marking, with a light pen, the end points of the wave portion that he wants to play back. The program searches the SINGLE buffer for the designated portion and outputs the data to the DAC at ESR. Option to repeat is also available here.

Inputs:

See individual entry point descriptions.

Outputs:

An audio signal reproduction. (WPS I/O status and Filing System entries are unchanged).

Program is contained in overlay(s):

PLAYBK

Program Name: PLOGIC Program Type: Overlay

Program Description:

PLOGIC prints the contents of a logic file on the line printer.

Inputs:

Logic file

Outputs:

Contents of logic file listed on the line printer

Program is contained in overlay(s)

Program Name: PLOT Program Type: Subroutine

Program Description:

PLOT creates a two-space Vector General display from a list of floating point x and y pairs and their associated alphanumeric symbols.

Inputs:

a) Buffer of (x,y) pairs created by PAGE

b) Scaling factors for conversion to VG display coordinates

c) Buffer of class symbols and vector counts

Outputs:

a) Two-space scatter plot display

b) Modified class symbol buffer containing display list and starting address of each class

Program contained in overlay(s):

PLOT2D

Program Name: **PLOTCLASS** Program Type: Subroutine

Program Description:

PLOTCLASS is called exclusively from PROCESS to generate a Vector General display list for a bar graph. The bar graph is a one space histogram of the bin counts of a given class of the dataset.

Inputs:

a) Address of next available word in the Vector General display list

b) The y coordinate on the display where the histogram is to be drawn

c) The number of bins

d) The address of the bins

e) The address of the node name

f) The PROCESS generated vertical scaling factor

Outputs:

a) A Vector General display of the histogram

b) The last address used in the display list

Program contained in overlay(s):

PLT1DA
PLT1DB

Program Name: PNTSM1 Program Type: Subroutine

Program Description:

PNTSM1 labels the display regions of one-space logic design plots. It then asks the user to associate class symbols with each region. Each region represents a new node for the logic tree. The class symbols determine which vectors of the dataset will be considered correctly classified if they reach the given node (see CR1LOG).

Inputs:

a) The logic argument buffer defined by CR1LOG

b) The output of NUMREG and ORDER1

c) The thresholds which define the regions

d) The one-space plot scaling factors

Outputs:

a) The logic argument buffer modified to contain the associated symbols and the unscaled midpoints of all but the last display region.

Program contained in overlay(s):

CR1LOG

Program Name: PNTSMH Program Type: Subroutine

Program Description:

PNTSMH labels the display regions of one-space structural analysis plots. It then asks the user to input node names for the new subclasses associated with each region. Each region represents a new subclass under the node designated in PARTIO.

Inputs:

See PNTSM1

Outputs:

See PNTSM1

Program is contained in overlay(s):

PARTIO

Program Name: PNTSYM Program Type: Subroutine

Program Description:

PNTSYM is a two-space logic design plot routine which asks the user to indicate which display regions are enclosed by user-drawn boundaries. The user is then asked to associate class symbols with each region. Each region represents a new node for the logic tree. The class symbols determine which data set vectors will be considered correctly classified if they reach a given node (see CR2LOG).

Inputs:

a) Logic argument buffer defined by CR2LOG

b) List of available class symbols

c) Display boundaries

Outputs:

Modified logic argument buffer

Program contained in overlay(s):

CR2LOG

Program Name: PNTSYT Program Type: Subroutine

Program Description:

PNTSYT is a two-space structural analysis plot routine which requests the user to indicate which display regions are enclosed within user-drawn boundaries. The user is then asked to associate new subclass symbols with each region. Each region represents a new subclass for the node designated in PARTIT.

Inputs:

See PNTSYM

Outputs:

See PNTSYM

Program is contained in overlay(s):

PARTIT

Program Name: POINTV

Program Type: Vector I/O Subroutine

Program Description:

POINTV computes the address (within the page-file associate buffer) of the next available vector slot from the information in the vector file control block.

Inputs:

R1 - the address of the file associate buffer

Outputs:

R5 - the address of the current (next available) vector slot

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: POPTBL Program Type: Subroutine

Program Description:

POPTBL permits the removal of a one-word value from a user-constructed circular stack. POPTBL is used with STKTBL in that STKTBL enters values to the stack.

Inputs:

1) Address of the user constructed table. (First word is size in bytes).

2) Address for the returned value

Outputs:

The returned value in the location specified and the values in the table graduated one word toward the top.

Program is contained in overlay(s):

PTRETL
SELSET
SINGLE
TRNBAK

Program Name: PPGL

Program Type: Overlay

Program Description:

PPGL prints the source program listing of a user-selected PARLAN program.

Inputs:

Program name

Outputs:

Source program is printed on line printer

Program contained in overlay(s):

PPGL

Program Name: PRINT Program Type: Subroutine

Program Description:

PRINT prints a PARLAN variable value onto the line printer.

Inputs:

a) Variable name

b) Variable address

Outputs:

Prints on line printer the current value of a variable.

Program contained in overlay(s):

LINKGO

Program Name: PRNCOR Program Type: Subroutine

Program Description:

PRNCOR prints out on the line printer the following information:

A) The current data tree name and the name of the data tree just created.

B) The corresponding positions in the old tree of each dimension used in the new tree.

Inputs:

External Variables:

A) NEWTNM - Name of new tree
B) VECTNM - Name of system data tree

CSECT buffer - See buffer description

Outputs:

Output on line printer

Program is contained in overlay(s):

FEVCRE

AD-A038 331 PATTERN ANALYSIS AND RECOGNITION CORP ROME N Y F/G 9/2
THE WAVEFORM PROCESSING SYSTEM (WPS). VOLUME IV, PART 3,(U)
FEB 77 P K SANYAL F30602-72-C-0193
UNCLASSIFIED PAR-76-6-VOL-4-PT-3 RADC-TR-76-224-4-3 NL

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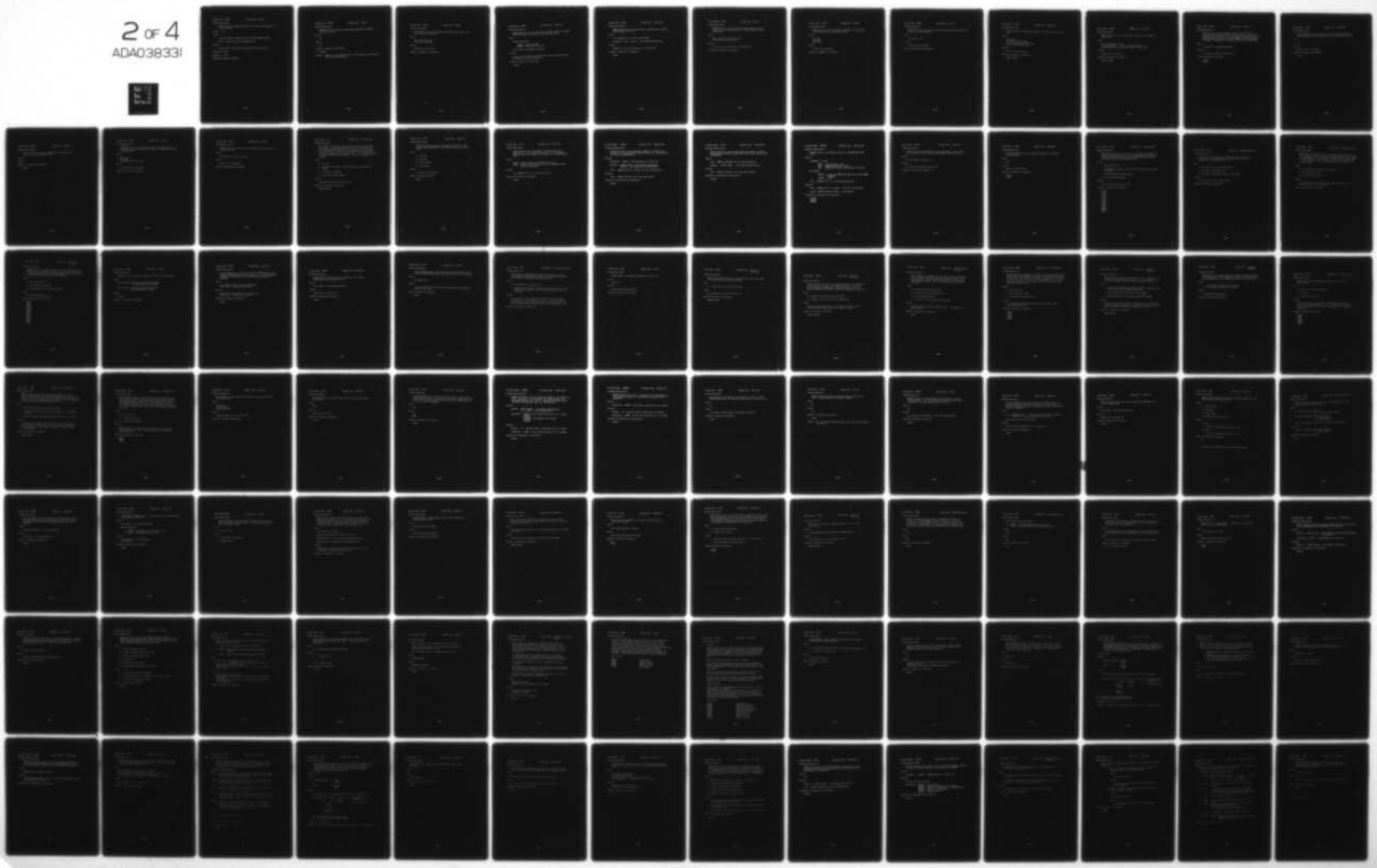
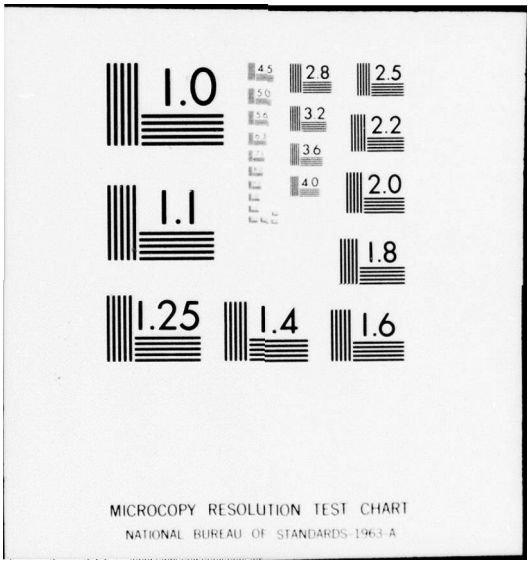



1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Program Name: PRNCOV Program Type: Overlay

Program Description:

PRNCOV prints the covariance matrix for the node name designated by the on-line user.

Library: None

Inputs:

External Variables - LOWCOR, TOPCOR, VECDIM, VECNNM, VECTNM

Files: Covariance file for designated node

Outputs:

Covariance file is printed (See listing for sample output.)

Limitations: None

Comments: None

Program contained in overlay(s):

Program Name: PRNDSP Program Type: Overlay

Program Description:

PRNDSP prints out on the line printer the information displayed on the V.G. screen.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

FEVPRN

Comments: PRNDSP is a controlling routine. This program calls subroutines to do the actual printing.

Program Name: PRNHDR Program Type: Overlay

Program Description:

PRNHDR prints out waveform header information from a node or set of nodes from an input tree.

Inputs:

User enters tree name
User enters node names

Outputs:

Printout on line printer

Program is contained in overlay(s)

Program Name: PRNHED Program Type: Subroutine

Program Description:

PRNHED prints out on the line printer the metric used in the feature evaluation frame and the current data tree/senior node.

Inputs:

External Variables:

VECTNM - System tree name
VECNNM - System senior node name

CSECT buffer - See buffer description

Outputs:

Outputs on line printer the tree/senior node names and the metric being used in feature evaluation

Program is contained in overlay(s):

FEVPRN

Program Name: PRNNAS Program Type: Subroutine

Program Description:

PRNNAS prints out on the line printer a selected vector from the NAME AND SAVE file (DT 17.)

Inputs:

File - NAMSAV (DT 17.) See file description

Arguments to call: Entry No. - See program documentation

Outputs:

Elements of a vector printed out on a line printer

Program is contained in overlay(s):

NASIOP

Program Name: PRNTBL Program Type: Overlay

Program Description:

PRNTBL outputs to the line printer the data directory and, if requested, the overlay directory, the USAG11 tables, and the sector table.

Inputs:

Octal or decimal reply by the user
"All tables" reply by the user

Outputs:

Print-out on the line printer of system tables

Program is contained in overlay(s):

Program Name: PRNTID Program Type: Overlay

Program Description:

PRNTID prints out all ID numbers of waveforms or vectors from user-selected nodes on the line printer.

Inputs:

Data type
Tree name
Node names

Outputs:

Printout on line printer

Program is contained in overlay(s)

Program Name: PRNTRE Program Type: Overlay

Program Description:

PRNTRE lists all tree names with their data types and tree texts that exist in the data directory.

Inputs:

Light-button call

Outputs:

Printout on line printer

Program is contained in overlay(s):

Program Name: PRNTVC Program Type: Subroutine

Program Description:

PRNTVC prints any user-requested vector or vectors from a particular node.

Inputs:

Data type
Tree symbol and node name
Q for all vectors, not Q for one
Vector identification number

Outputs:

Printout on line printer

Program is contained in overlay(s):

PWAVEC, PRTRND

Program Name: PRNTWV Program Type: Subroutine

Program Description:

PRNTWV prints out on the line printer either one or all waveforms from a node.

Inputs:

File control block address
Q = all waveforms not Q = only one (see ID)
Waveform identification number in double integer format

Outputs:

Printout on line printer

Program is contained in overlay(s):

PRTRND, PWAVEC

Program Name: PROCESS Program Type: Subroutine

Program Description:

PROCESS is the one-space histogram subroutine which controls the conversion of real data into a representational Vector General display. Its main task is to set the pointers to areas of core that PLOTCLASS requires to create a single **class** associated histogram (bar graph). Secondarily, it describes the plot by calling LDBOXH.

Inputs:

The outputs of HISTOGRAM and BINCON

Outputs:

The complete one-space histogram plot

Program contained in overlay(s):

PLT1DA
PLT1DB

Program Name: PRSIZE Program Type: SUBROUTINE

Program Description:

Subroutine PRSIZE will ask the user for the size of a prototype waveform needed by the selected criterion for threshold calculation.

Inputs:

Size

Outputs:

PRSIZE Size of prototype

Program is contained in Overlay(s):

SEGOPT

Program Name: PRTPAR Program Type: ENTRY #5

Program Description:

This section has not yet been implemented; its purpose will be to print the current parameter list.

Inputs:

Outputs:

Program is contained in overlay(s):

SEGMNT

Program Name: PRTRND Program Type: Overlay

Program Description:

PRTRND prints out a list of all low nodes in the selected tree followed by each node's waveforms or vectors. Headers are included along with data.

Inputs:

Data type
Tree name
Node names response by user

Outputs:

Printout on the line printer

Program is contained in overlay(s)

Program Name: PTRETL Program Type: Overlay

Program Description:

PTRETL prints out a map of a tree table with each node level in a particular column.

Inputs:

Data type and tree name from user

Outputs:

Printout on line printer

Program is contained in overlay(s)

Program Name: PUT Program Type: I/O Subroutine

Program Description:

PUT transfers a specified number of words from a specified buffer to the RP02. If the number of words is not an even multiple of 256, the remainder of the last sector written will be all zeros. Subsequent calls to PUT will start the transfer at the first word at the next sequential sector for the file. If all sectors are used, a sufficient number will be appended to the file to complete the transfer.

Inputs:

1) Data type

2) 6-character file name. The file must have been opened for output.

3) # of words to transfer

4) The (source) buffer address

Outputs:

The buffer written to the output file.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: PUTCIF Program Type: Subroutine

General Description:

PUTCIF will write the single core image file on disk. This allows display parameters to be saved when leaving the display frame.

Inputs:

a) file name

b) data type

c) buffer address

d) word count

Outputs:

a) Updated core image file

Program contained in over(s):

SINOUT

Program Name: PUTFIL Program Type: Subroutine

Program Description:

PUTFIL destroys and then recreates the NAME AND SAVE file (NAMSAV DT 17). The program then inputs all of the selected NAME AND SAVE vectors stored in core back into the NAME AND SAVE file.

Inputs:

DELBUF - Buffer containing the NAME AND SAVE files
ENTBUF - Buffer indicating which vectors in the NAME AND SAVE file are to be saved

Outputs:

File NAMSAV (DT 17.) - See file descriptions

Program is contained in overlay(s):

NASDEL

Program Name: PUTHIS Program Type: Subroutine

Program Description:

PUTHIS converts the histograms computed in PCHIS into probability histograms and stores these in a scratch file for use in program CALIJ.

Inputs:

Variables: VECDIM - dimensionality of data set

Buffers: CSECT buffer - see buffer description
HISBUF - see program for description

File: SCRACH (DT 88.) opened see file description

OUtputs:

File: SCRACH (DT 88.) see file description

Program is contained in overlay(s):

PCEVAL

Program Name: PUTIJ Program Type: Subroutine

Program Description:

PUTIJ creates a vector containing the figure of merit between two selected classes and stores this vector into file MEASIJ.

Inputs:

File: MEASIJ (DT0130) see file descriptions

Buffers: CSECT buffer - see buffer descriptions

Outputs:

File: MEASIJ (DT0130) see file descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: PUTNAS Program Type: Subroutine

Program Description:

PUTNAS stores a specified vector in the NAME AND SAVE file.

Inputs:

Arguments in call:

NAME - six-character name
DIM - dimensionality of vector
BUF - address of buffer containing the vector

Variables:

NASFLG - status of NAME AND SAVE file (see OPNNAS program)
NASTBL - table

File: NAMSAV (DT 17.) see file description

Outputs:

File - NAMSAV (DT 17.) update. See file description

Flags - NASFLG update status. See program

Program is contained in overlay(s):

NASIOP
NAMSAV
NASDEL

Program Name: PUTPAR Program Type: Subroutine

Program Description:

PUTPAR writes the core-image file to the system disk. The file must already have been created (using GETPAR) before PUTPAR is executed.

Inputs:

The core image file block address

Outputs:

The (disk) file updated from the block

Program is contained in overlay(s):

Program Name: PUTPAR Program Type: SUBROUTINE

Program Description:

Subroutine PUTPAR will save (store) the parameter list (PARLST) on disk storage.

Inputs:

None

Outputs:

PARLST to disk file PARA

Program is contained in overlay(s):

SEGOPT
SEGMNT

Program Name: PUTVEC Program Type: I/O Subroutine

Program Description:

PUTVEC writes vectors to an output file in a sequential manner by placing each requested vector in the corresponding slot of the file associate buffer and writing the entire set of vectors from core (the page) to disk at the appropriate time.

Inputs:

1) Data type of file

2) 6-character file name. The file must have been already opened for output.

3) The file associate buffer address

4) The vector buffer address

Outputs:

A vector written to the vector file

Program is contained in overlay(s):

CRDWPL
DMEVAL
EIGEN
EVSORT
FEVCRE
LINKGO
LODVEC
PARTIO
PARTIT
PASS2
PCEVAL
SYNTAX
TEDDY

Program Name: PUTVP Program Type: Language Subroutine

Program Description:

PUTVP writes the value for the PARLAN expression V1(I2=I3 ; i.e. it writes the I2 measurement for vector V1 in a vector buffer. (The value of the index I2 is I3.)

Inputs:

1) The vector file control block address

2) The index to place the value

3) The value at the index to store to the vector.

Outputs:

The value stored to the vector buffer.

Program is contained in overlay(s):

Program Name: PUTWP Program Type: Language Subroutine

Program Description:

PUTWP writes a waveform value to a specified waveform coordinate. The program takes care of paging the waveform blocks to disk. PUTWP is considered to be the first pass of waveform synthesis; the PARLAN compiler generates a call to PUTWP in response to a statement such as: LET W2(I6)=I3. (I6 is the waveform coordinate and I3 is its assigned value.)

Inputs:

1) The waveform file control block address

2) The coordinate (index)

3) The value at the index

Outputs:

A value deposited in core which will eventually translate to a waveform point in final disk format.

Program is contained in overlay(s):

Program Name: PVEOF

Program Type: Vector I/O Subroutine

Program Description:

PVEOF writes the last page of buffers to the disk and writes the number of vectors created for this file in the directory. PVEOF is a "closing" operation for the PUTVEC sequence, since the write disk time and vector processing times are overlapped.

Inputs:

1) The file data type

2) The 6-character file name

3) The address of the file associate buffer

Outputs:

See general description above.

Program is contained in overlay(s):

CRDWPL
DMEVAL
EIGEN
EVSORT
FEVCRE
LINKGO
LODVEC
PARTIO
PARTIT
PASS 2
PCEVAL
SYNTAX
TEDDY

Program Name: PWAVEC Program Type: Overlay

Program Description:

PWAVEC prints out a specific waveform or vector on the line printer.

Inputs:

For a waveform ; node name preceded by tree symbol
waveform identification number

For a vector: node name preceded by tree symbol
vector identification number

Outputs:

Printout

Program is contained in overlay(s)

Program Name: RCLENT Program Type: Subroutine

Program Description:

For each dimension in the selected data set, RCLENT places a line of ASCII characters into the V.G. display list. Each line contains information indicating the classwise discriminatory powers of a dimension.

Inputs:

File - MEASII $DT130_8$ - See file descriptions
CSECT buffer - See buffer descriptions

Outputs:

Lines of ASCII characters in V.G. display list
CSECT buffer - See buffer descriptions

Program is contained in overlay(s):

FEVDSP

Program Name: RCLHED Program Type: Subroutine

Program Description:

RCLHED places a header in the V.G. display list for ranking dimensions using a classwise metric.

Inputs:

CSECT buffer - See buffer descriptions.

Outputs:

Header in V.G. display list

Program is contained in overlay(s):

FEVDSP

Program Name: RCTIFY Program Type: Overlay

General Description:

RCTIFY performs either half or full wave rectification of a given data set under process control from the algebraic calculus executive.

Inputs:

WPS format node

Outputs:

A new tree with the input tree structure preserved, containing the rectified input data.

Program contained in overlay(s):

RCTIFY

Program Name: READP Program Type: Language Subroutine

Program Description:

READP stores the addresses of the next two sectors for a read disk operation in the extension block of the waveform file control block, and then reads that sector pair into core.

Inputs:

1) The waveform file control block

2) The file's open status. (Includes current sector, # of sectors transacted, # of sectors left this link and entire links information).

Outputs:

The current two sector addresses just read to core and a flag set indicating a sector image is in core. 512 words are always read and to the address specified in the file control block. The sector addresses and the flag are written to the extension block.

Program is contained in overlay(s):

Program Name: REASS Program Type: Overlay

Program Description:

REASS changes the reassociated symbols in a logic file.

Inputs:

Logic file

Outputs:

Reassociated symbols modified

Program is contained in overlay(s)

Program Name: REBUF

Program Type: Vector I/O Subroutine

Program Description:

REBUF initializes the vector file control block to the user format, if it hasn't been so initialized already.

Inputs:

R1 - address of the file associate buffer

Outputs:

An initialized vector file control block

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: REDSET

Program Type: Vector I/O Subroutine

Program Description:

REDSET initiates the next vector input from disk to the user buffer when a vector not in core is requested via GETVEC. If the file has been opened for update and at least one vector is to be updated, the REDSET calls REPLAC to rewrite the appropriate sector(s).

Inputs:

R1 - address of vector file associate buffer

R4 - address of word #5 in the file's ONAMT entry

Outputs:

See general description above. The vector file control block bytes are updated appropriately (see program listing).

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: REMOVE

Program Type: Spectral Analysis Subroutine

Program Description:

REMOVE computes the average value of a source array and subtracts the DC (average) value from each floating point element in the source array; it then stores the resultant values to a floating point destination array. The average value is also returned to the caller.

Inputs:

1) The address of the source array

2) The address of the destination array

3) The array dimensionality

4) The address for the average value computed.

Outputs:

The destination array and the average value. (See general description above.)

Program is contained in overlay(s):

SPCEXC

Program Name: RENAME Program Type: I/O Subroutine

Program Description:

RENAME replaces the designated file name in the open name table with another user-supplied name, so that many I/O pointers may be created for one file. (The sequence, for example, to create two I/O pointers in one file is this: 1) Open file 'A' 2) Rename file 'A' to 'B', and then 3) Open file 'A'. The file names in the open name table entries are then 'A' and 'B'.

Inputs:

1) File data type

2) Original name in table

3) New name to replace original

Outputs:

A new ONPMT entry with 'new' name replacing 'original' name. (see description above).

Program is contained in overlay(s):

PCEVAL
PLAYBK
SEGWAV
SELMUL
TRNFNT

Program Name: REPLAC

Program Type: Vector I/O Subroutine

Program Description:

REPLAC rewrites the vectors designated for update. The combination which designates any vector is a call to GETVEC followed by a call to REPVEC. (The file must be opened for update.)

Inputs:

1) The low and high addresses designated for the current page are taken from locations 'LOWADD' and 'HIADDD'.

2) The file associate buffer address from 'FABADD'.

3) The starting sector of the current page from 'STARSC'.

Outputs:

The section of the current page (corresponding to the vectors designated as update) rewritten to the vector file, and the replace vectors this page flag cleared at completion of update.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: REPORT

Program Type: Language Subroutine

Program Description:

REPORT outputs to the line printer the (output) waveform coordinate not assigned when a PARLAN program is running. Also output are the file name and wave ID as a heading for all undefined coordinates.

Inputs:

1. the waveform file control block address
2. the unassigned coordinate (or index)

Outputs:

See program description above.

Program is contained in overlay(s):

Program Name: REPOST Program Type: I/O Subroutine

Program Description:

REPOST repositions the designated (opened) file to the file starting point.

Inputs:

The complete file name consisting of:

1) data type

2) 6-character file name

Outputs:

The file's entry in the Open File Table (ONAMT) and the Local Sector Table (LSCTBL) reflect the file's I/O disposition as "just opened" or positioned to the file's starting sector...no sectors transacted.

Program is contained in overlay(s):

CNGHDR
DELWAV
LINKGO
PLAYBK
SEGWAV
TRNFNT

Program Name: REPVEC Program Type: I/O Subroutine

Program Description:

REPVEC is called after a vector, read in by GETVEC, has been modified in the buffer and a request to update that vector on disk is made. REPVEC, in effect, marks the location of the vector and in due time, i.e. after a new page has been read in or a file prematurely closed, writes the modified vector onto the disk.

Inputs:

1) The replace vectors this page flag 'VECREP'

2) The address within the file associate buffer of the designated vector.

3) The starting sector this page from the ONOMT entry via 'UPENT'.

Outputs:

A modification of the low and high addresses of the designated vectors so far this page. Also, if first designation this page, the starting sector of this page is recorded to location 'STARSC' in program REPLAC.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: RESETV Program Type: I/O Subroutine

Program Description:

RESETV allows a program to make multiple passes through a vector file (using the vector I/O subroutines) without the time-consuming operations involved in repeatedly closing and opening the file. The program resets the file control block parameters, if need be, and initiates an input vector stream starting from the first sector of the file. RESETV cannot be used for a file which has been opened for output.

Inputs:

1) File data type.

2) 6-character file name

and 3) The data dimensionality

Outputs:

Modifications in the vector file control block and the WPS I/O tables reflecting the file's status as described in the general description above.

Program is contained in overlay(s):

EVSORT
PARTIO
PARTIT

Program Name: RIPLOG Program Type: Subroutine

Program Description:

RIPLOG moves the logic block of the specified logic node to the end of the logic file.

Inputs:

Logic file
Scratch buffer
Logic node number

Outputs:

Logic block moved to end of logic file

Program is contained in overlay(s)

Program Name: RISE Program Type: Subroutine

Program Description:

Subroutine RISE will place the value "RISE" (calculated in RISFAL) into "VALUE".

Inputs:

"BUFI"

Outputs:

"VALUE" contains "RISE"

Program is contained in overlay(s):

SEGMNT

Program Name: RISFAL Program Type: Subroutine

Program Description:

Subroutine RISFAL will calculate both the rise and the fall within a window (Rise=last point - first point, Fall=-Rise). (Subroutines RISE or FALL, when called, will place RISE or FALL into "VALUE" which in turn will be used by THRESHOLD.

Inputs:

BUF1

Outputs:

RISE
FALL

Program is contained in overlay(s):

SEGMNT

Program Name: RNGENT Program Type: Subroutine

Program Description:

RNGENT converts a set of dimension numbers, the number of bins, the range, and the lower and upper bounds of a selected data set into ASCII. The program then places the ASCII information into the display list.

Inputs:

Buffer: CSECT buffer - see buffer descriptions
V.G. buffer - see documentation

Variables: GPNUM - first free location in V.G. buffer
BPOINT)
DPOINT)
DIMPNT) See program for details
DPOINT)

Outputs:

Buffer: V.G. display buffer containing lines of ASCII

Variables: GPNUM - first free location in V.G. buffer

Program is contained in overlay(s):

PCIEVL

Program Name: RNGHED Program Type: Subroutine

Program Description:

RNGHED places into the V.G. display list the header for the variables needed in computing the probability of confusion.

Inputs:

Variables: GPNUM - first free location in V.G. buffer

Outputs:

Buffer: V.G. display buffer containing the header

Variables: GPNUM - first free location in V.G. buffer

Program is contained in overlay(s):

PCIEVL

Program Name: RNKCLS Program Type: Subroutine

Program Description:

RNKCLS displays the ranking of the dimensions in order of their discriminatory power for a specified class versus all other classes.

Inputs:

N/A

Outputs:

Class symbol in CSECT buffer (See program for details)

Program is contained in overlay(s):

FEVDSP

Program Name: RNKOVR Program Type: Overlay

Program Description:

RNKOVR displays the overall measurement evaluation on the V.G. screen. This program has a file name of FEVDSP.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

FEVDSP

Comments: This is a control program calling other routines that generate the display.

Program Name: RNKPAR Program Type: Overlay

Program Description:

RNKPAR displays, for each dimension in the data set, a line of ASCII characters. Each line indicates the discriminatory power of a dimension for a user-specified pair of classes.

Inputs:

N/A

Outputs:

Class symbols in CSECT buffer. (See buffer descriptions.)

Program is contained in overlay(s):

FEVDPB

Program Name: ROVENT Program Type: Subroutine

Program Description:

For each dimension in the selected data set, ROVENT places a line of ASCII characters into the V.G. display list. Each line of characters contains information indicating the overall discriminatory powers of a dimension.

Inputs:

Files - MEASOV (DT 0130) - This file contains overall evaluation information for each dimension in the data set.

CSECT buffer - See file descriptions

Outputs:

Lines of ASCII characters into V.G. display list

Program is contained in overlay(s):

FEVDSP

Program Name: ROVHED Program Type: Subroutine

Program Description:

ROVHED places the header for overall ranking of measurements into the V.G. display list.

Inputs:

CSECT buffer - See buffer descriptions

Outputs:

Header in V.G. display list

Program is contained in overlay(s):

FEVDSP

Program Name: RPØ2 Program Type: Subroutine

General Description:

RPØ2 is the WPS system disk driver and interrupt handler for user-initiated read and write operations.

Inputs:

a) Buffer address

b) Word count

c) Sector number

d) Function code (read or write)

Output:

On a read:

a) Data is transferred from disk to core

On a write:

a) Data is transferred from core to disk

Program is contained in overlay(s):

WPS

* System must be relinked if this subroutine is modified.

Program Name: RP02LK Program Type: Resident Subroutine

Program Description:

RP02LK either retrieves unused sectors or returns sectors to the unused sector pool (USAG11 tables).

Inputs:

For sector retrieval: CRE1 = 0
MQ = number of sectors required

For sector depositing: CRE1 = non-zero
R1 = sector address
R2 = number sectors

NOTES: call via R4 - set CRE2 to non-zero for overlay USAG11

Outputs:

For sector retrieval: R1 = sector address
R2 = number sectors

Program is contained in overlays:

ALL

Program Name: RPRENT Program Type: Subroutine

Program Description:

For each dimension of a selected data set, RPRENT places a line of ASCII characters into the V.G. display list. Each line contains information indicating the pairwise discrimination power of a dimension.

Inputs:

File MEASIJ (DT0130) - See file descriptions

Outputs:

CSECT buffer - See buffer descriptions

Program is contained in overlay(s):

FEVDPB

Program Name: RPRHED Program Type: Subroutine

Program Description:

RPRHED places a header in the V.G. display list for ranking dimensions using pairwise class metrics.

Inputs:

CSECT buffer - See buffer descriptions

External Variables:

a) LPNUM - First page location in display list
b) VECDIM - Dimensionality of data set

Outputs:

V.G. display list containing header
LPNUM updated

Program is contained in overlay(s):

FEVDPB

Program Name:RQSSTF Program Type: Overlay

Program Description:

"RQSSTF" displays a request message and then accepts a starting time or frequency value from a user. The value is loaded into the single file control block.

Inputs:

a) Starting time

Outputs:

a) Time loaded in single FCB

b) Request Bit set

Program Name: RQSTOR Program Type: Subroutine

Program Description:

RQSTOR stores a number equal to the requested starting value found in a particular file control block, minus the origin value found in the same file control block, into a waveform header. The number stored is actually the ordinal number of the waveform of the point corresponding to the requested value.

Inputs:

File control block address

Waveform header address in word #22 of the fcb

Requested value in the sixteenth and seventeenth words

Origin value in the fourteenth and fifteenth words

Outputs:

Modification of waveform header words #5 and/or #4, depending on the mode (only #4 for frequency mode).

Program is contained in overlay(s):

Program Name: RSASFP Program Type: Subroutine

Program Description:

RSASFP converts a random string of ASCII numeric characters to a floating point number.

Inputs:

ASCII floating point number

Outputs:

Binary floating point number

Program is contained in overlay(s):

Program Name: RSTFPS Program Type: Subroutine

Program Description:

RSTFPS restores the floating point processor's status and the floating point accumulators (registers) from the stack. (AC4 and AC5 are not included.)

Inputs:

The floating point processor's status and accumulators on the system stack (R6).

Outputs:

Restoration of the floating point status and accumulators.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: RSTIN1 Program Type: SUBROUTINE

Program Description:

The only function of RSTIN1 is to move the 7-word contents of IN1SAV back to IN1DTP.

Inputs:

Last current data set in IN1SAV

Outputs:

Current data set restored in IN1DTP

Program is contained in overlay(s):

MOUT
OLPOUT

Program Name: RSTPLT Program Type: Subroutine

Program Description:

RSTPLT destroys the level of logic that is created by a one- or two-space logic design. It deletes the new branches of the logic tree that were added by SPLITT. In two-space it also locates the tree table address of the current dataset and moves it to the common area in preparation for restoration of the scatter plot.

Inputs:

a) Current logic tree and node

b) Current vector data set

Outputs:

a) Logic tree minus any nodes inferior to the current node

b) Tree table address of current data set

Program contained in overlay(s):

CR1LOG
CR2LOG

Program Name: RTREEV

Program Type: Vector I/O Subroutine

Program Description:

RTREEV returns a pointer (through a register) to a file's directory entry.

Inputs:

The file name has been pre-loaded (by program LODFIL).

Outputs:

R3-the address of the file's directory entry.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: $FTRAN Program Type: FORTRAN Subroutine

Program Description:

$FTRAN contains three global names which represent FORTRAN error routines. Since WPS handles all error conditions, this section is inserted to the WPS FORTRAN library in place of the normal error routines (as an interceptor) so that the unnecessary code will not be included in any WPS load module making use of the FORTRAN library.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

SPCEXC

Program Name: SAVER Program Type: Resident Subroutine

Program Description:

SAVER consists of two routines:

1.) SAVREG: saves registers R0-R4 on the SP stack
2.) RSTREG: restores registers R4-R0 from the SP stack

Inputs:

None

Outputs:

None

Program is contained in overlays:

ALL

Program Name: SAVFPS Program Type: Subroutine

Program Description:

SAVFPS saves the registers (accumulators) of the floating point processor, along with the floating point status on the stack. (AC4 and AC5 are not included.)

Inputs:

Floating point status. (the registers or accumulators associated with the Floating Point Processor plus the mode of operation)

Outputs:

The floating point status on the stack with the mode topmost.

Program is contained in overlay(s):

THIS IS A COMMON ROUTINE.

Program Name: SAVIN1 Program Type: SUBROUTINE

Program Description:

SAVIN1 saves the 7-word contents of IN1DTP, the currently open data set, on the IN1SAV BUFFER.

Inputs:

Current data set in IN1DTP

Outputs:

IN1SAV contains the current data set

Program is contained in overlay(s):

MULTIN
OLPIN

Program Name: SCALE Program Type: Subroutine

Program Description:

SCALE computes the scale factors necessary for the creation of the histograms for probability of confusion.

Inputs:

Buffers: CSECT buffer - see buffer description and program for details

Variables: VECDIM - dimensionality of data set

Outputs:

Buffers: CSECT buffers - see buffer descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: SCANER Program Type: Subroutine

Program Description:

SCANER is a routine used by pass 1 of the PARLAN compiler to separate a PARLAN program's source statements into its basic words or symbols (identifiers, reserved words, integers, delimiters such as *, +, <, >, =).

Inputs:

Current line of source code

Outputs:

Internal representation of the current symbol

Program contained in overlay(s):

SYNTAX

Program Name: SCATTR Program Type: Overlay

Program Description:

SCATTR is the main entry to the two-space plotting overlay. It passes an entire data set against the user-chosen projection vectors, determines GLOBL scaling factors, calls for the plotting of the first page of data and requests an appropriate frame.

Inputs:

a) Current OLPARS vector data

b) Two N-dimensional projection vectors

c) Type of projection vector flag

In logic design only:

d) Current logic node number

e) Class symbols associated with the node

Outputs:

a) (x,y) pair in each vector header

b) Number of pages in plot (maximum 500. vectors per page)

c) Display of first page of vectors

Program contained in overlay(s):

PLOT2D

Program Name: SCLSBS Program Type: Subroutine

Program Description:

SCLSBS consists of three subroutines to be called by the SCROLL option in the MULTI overlay:

1. CLSCRL: clears a flag in all file control blocks

2. ALLDON: tests to see if all positions have reached an end condition

3. GOTOGT: checks if any position requires further paging

Inputs:

CLSCRL requires TOPC-MULS = number of positions and
TOPC-MULFCB = first file control block address
ALLDON requires the same as above
GOTOGT requires the above and the SCROLP flag set for any simulated Display Next's

Outputs:

CLSCRL clears all SCROLP flags
ALLDON returns to the branch error instruction if all positions have ended
GOTOGT returns to the branch error instruction if all positions need Display Next

Program is contained in overlay(s)

Program Name: SCOPS Program Type: Subroutine

Program Description:

SCOPS controls scale changes and paging for two-space scatter plots. Paging automatically gets the next page. Scale changes depend on user input.

Inputs:

a) The outputs of SCATTR, PAGE, and PLOT

Outputs:

a) A re-scaled plot

or

b) A new page of data

Program contained in overlay(s):

PLOT2D

Program Name: SEGAPR Program Type: ENTRY #8

Program Description:

(Note: Execution is not implemented for this version.)

SEGAPR will create a new tree of segmented waves using the manually-created markers in edit.

Exit from this section is to ENDMRK (entry point #3).

Inputs:

Output treename

Outputs:

Parameters to PARLST

Program is contained in overlay(s):

SEGOPT

Program Name: SEGASS

Program Type: ENTRY #7 FOR OVERLAY "SEGOPT"

Program Description:

SEGASS will use the marker tree created from the "begin" and "end" parameters and criteria to segment a waveform. This section first checks to see if any (not necessarily one with the correct tree structure) marker tree has been created. If the marker tree had not been created, a message instructs the user to create one.

The segment tree (a tree containing new shorter waveforms) will have data type 77, however, it must be named by the user. If the name selected already exists, a message will be displayed.

The marker tree that will be used for segmentation must also be selected.

Since more than one segment can be created from any one waveform, this segment provides input so that ID numbers can be sequentially updated according to the user's choice.

Exit from this overlay is to BEGMRK (entry point #2). This will segment the waveform using the marker tree.

Inputs:

Segmented tree name
Marker tree name and which digits to update

Outputs:

New waveform (segmented) tree
Parameters to PARLST

Program is contained in overlay(s):

SEGOPT

Program Name: SEGMNT Program Type: OVERLAY

Program Description:

The overlay SEGMNT handles the execution part of the segmentation module. It will create a marker tree (new data type = 132) of "begin" and "end" marks that can in turn be used to segment waveforms of another tree. Tree structure is preserved in all cases. The node text for the marker tree gives information pertaining to the tree and node from which it was originally created. The marker tree can be used to segment any data tree (type = 77). However, the user should be careful that the tree structures are the same. (Segmentation assumes that the tree structures match.)

Entry points:

CRMARK	create marks
SEGASS	segment assigned
SEGAPR	segment a priori
CPROTO	create prototype
PRTPAR	print PARLST

Program Name: SEGOPT Program Type: OVERLAY

Program Description:

Function:

SEGOPT overlay handles questions and answers for options available under segmentation. It handles as much of the error checking and user messages as possible before passing control to the executive or execution overlay (SEGMNT). Selecting the segmentation light button will cause SEGOPT to start execution at entry point one (1).

Program Initialization SEGINT Entry 1 of SEGOPT:

The program initialization section will initialize parameters in PARLST, retrieve the PARLST file and load the PARLST buffer with old or current values. If the PARLST file does not exist, it will be created.

Program Initialization also displays the general instructions on the VG display, and displays the frame options available.

Note that exit from the section is to frame options handler SEGMNT and that the last call is to PUTPAR, which will save the current PARLST on the disk until the next light button is picked.

Special Comments:

PARLST contains current parameters used in segmentation. Both in this overlay and in SEGMNT.
As parameters are updated/changed they are saved in a file named PARA. This feature allows the user to go into segmentation anytime without resetting parameters and use the same functions as specified in the previous session. This feature also eliminates variable conflicts with other overlays.

Entry Points:

SEGINT	Initialization
BEGMRK	Begin mark parameters
ENDMRK	End mark parameters
THOPBG	Begin mark optimization
THOPED	End mark optimization
CRMARK	Create marker tree
SEGASS	Segment assigned
SEGAPR	Segment apriori
CPROTO	Create a prototype

Program Name: SEGWAV Program Type: Overlay

General Description:

SEGWAV segments a given waveform displayed under the "Single" module into two distinct data sets.

Inputs:

a) A "Single Wave Display" data set, currently displaying on the VG

b) "Single" file control block

Outputs:

Two separate waveforms

Program contained in overlay(s):

SEGWAV

Program Name: SELCUT Program Type: Subroutine

Program Description:

SELCUT is operational only if all dimensions in the data set are displayed. This option will select all dimensions above a user-specified dimension for feature reduction.

Inputs:

N/A

Outputs:

Modification of display, indicating the selected dimensions for feature reduction
CSECT buffer - See buffer and program descriptions

Program is contained in overlay(s):

FEVSEL

Program Name: SELLOG Program Type: Overlay

Program Description:

SELLOG requests the user to select a current logic tree. If the logic tree doesn't exist, it is created. If the logic tree does exist, the vectors of the current data set are evaluated according to the logic in the logic tree. In either case, the logic tree becomes the current logic tree.

Inputs:

Data set

Outputs:

Logic tree

Program is contained in overlay(s)

Program Name: SELLVC Program Type: Overlay

Program Description:

SELLVC provides the capability for the on-line user to designate one or two basis vectors for the histogram or scatter plot display in the distribution free module. SELVEC computes or retrieves the designated vector(s) and stores them in the CSECT buffer at address BASISV for use by the plotting routines.

Library: None

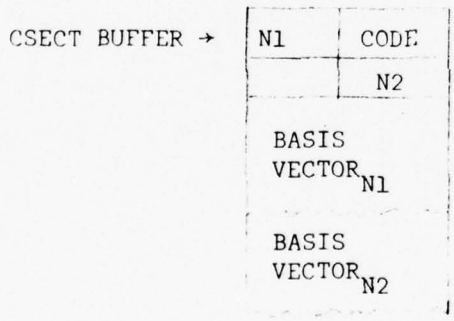
Inputs:

External Variables - VECDIM
- VPOINT

Files - EIGENF
- NAMSAV

Outputs:

SELVEC writes the following information into the CSECT BUFFER:



Code = Ø - Coordinate vectors
1 - Eigenvectors
2 -
3 - Arbitrary vectors

N1 - identifier for first vector selected
N2 - identifier for second vector selected

Limitations: VECDIM $\leq$ 100

Comments: Fisher vectors are handled separately by a call to overlay GETFIS.

Program Name: SELMUL Program Type: Overlay

Program Description:

SELMUL is the initialization section for the multiple waveform display. It is the section that allows the user to specify the number of positions and the data sets to be displayed. The user may pick from one of three initialization modes:

1) Select data sets: User specifies tree and node for each position.
2) Multiple page initialization: Waveforms from specified tree and node displayed 1-5, 6-10, 11-15, etc.
3) Multiple scroll initialization: Waveforms from specified tree and node displayed 1-5, 2-6, 3-7, etc.

Inputs:

VG light-button call

Outputs:

File control blocks initialized for Multiple Wave display

Program is contained in overlay(s)

Program Name: SELNOD Program Type: Subroutine

Program Description:

SELNOD asks the user to choose a logic node and calls a logic creation overlay based on the light button selected.

Inputs:

Current logic tree name

Outputs:

Sets current logic node (SELNOD).

Program is contained in overlay(s)

Program Name: SELPAR Program Type: Subroutine

Program Description:

SELPAR returns a value to the calling program which is the relative pair number of the class pairs entered in the criterion description region of a pairwise logic node.

Inputs:

Symbols of selected class pair

Outputs:

Relative pair number within criterion description region of pairwise logic node.

Program is contained in overlay(s):

Program Name: SELSEQ Program Type: Overlay

Program Description:

SELSEQ presents questions to the user at the bottom of the VG and allows him to enter either nth wave values or start sequence values for the waveform positions he selects.

Inputs:

Position numbers to receive nth wave values
Nth wave numbers corresponding to the pos. no.'s selected
Position numbers to receive start sequence values
Start sequence values corresponding to position no.'s slected

Outputs:

Modifications to file control blocks

Program is contained in overlay(s)

Program Name: SELSET Program Type: Overlay

Program Description:

'SELSET' contains 5 entry points, 4 of which are active. Each of the 4 entries are accessible to the WPS user (via function key) or each can be called using program 'OVRLAY'. All entry points have in common the task of identifying a system data set.

INDIVIDUAL ENTRY POINTS ARE:

SELSET - The user is asked to declare a data set by giving a data type, tree name and (5-character) node name. This set is then known to the system as the current data set.

SELWAV - The user is asked to identify a specific waveform ID by entering a 10 digit number. The routine then positions the waveform file (previously selected) to the desired ID.

SINSET - The user is asked to declare a waveform data set by giving tree name and (5-character) node name. This set is then known to the system as the current (waveform) data set.

SELVEC - The user is asked to identify a specific vector ID by entering a 10 digit number. The routine then positions the vector file (previously selected) to the desired ID. This option is inactive at this time.

VELSET - The user is asked to declare a vector data set by giving tree name and (5 character) node name. This set is then known to the system as the current (vector) data set. In addition, the vector dimensionality is retrieved and stored to a global location for program usage.

Inputs:

See individual entry descriptions.

Outputs:

See individual entry descriptions.

Program is contained in overlay(s):

SELSET

Program Name: SELVEC Program Type: Overlay

Program Description:

SELVEC provides the capability for the on-line user to designate one or two basis vectors for the histogram or scatter plot display in the structure analysis module. SELVEC computes or retrieves the designated vector(s) and stores them in the CSECT buffer at address BASISV for use by the plotting routines.

Library: None

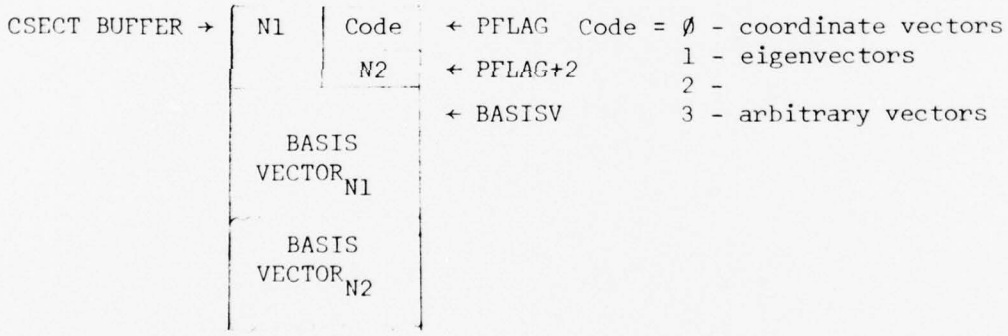
Inputs:

External Variables - VECDIM
- VPOINT

FILES - EIGENF
- NAMSAV

Outputs:

SELVEC writes the following information into the CSECT BUFFER.



N1 - identifier for first vector selected
N2 - identifier for second vector selected

Limitations: VECDIM $\leq$ 100

Comments: Fisher vectors are handled separately by a call to overlay GETFIS.

Program Name: SET Program Type: Subroutine

Program Description:

Subroutine SET will update the ID number in the digital fields specified

Inputs:

Outputs:

New ID number

Program is contained in overlay(s):

SEGMNT

Program Name: SETHS Program Type: Subroutine

Program Description:

SETHS sets the horizontal scaling values for the single waveform display frame and loads the sampling rate of the current data set.

Inputs:

Horizontal node option in the SINGLE file control block

Outputs:

Points per line and point sequence value set in the FCB

Program is contained in overlay(s):

SINGLE

Program Name: SETHSM Program Type: Subroutine

Program Description:

SETHSM computes the points per line to be displayed and the point sequence for a specific position in the Multiple Waveform Display frame.

Inputs:

File control block address
Horizontal scaling mode
For scaling mode 1): time/freq. per line
For scaling mode 3): total points in the waveform

Outputs:

TOPC-PH1 is the point sequence
Points per line loaded in the FCB

Program is contained in overlay(s):

MULTI

Program Name: SETID Program Type: Subroutine

Program Description:

SETID takes as input a waveform ID (a long integer word, which shows as ten decimal ASCII digits) and two numbers which specify the ID generation field, and returns as output the starting ID value, the increment value and the final value for an ID-spawning scheme when the waveform transformation involved is polymorphic.

Inputs:

1) Waveform file control block address...to address the ID.

2) Right field specifier (byte address).

3) Left field specifier (byte address).

4) Address for (output) increment value.

5) Address for (output) terminal ID value.

Outputs:

1) The starting ID value (rewritten in the header addressed from the waveform file control block).

2) The increment value (a long integer) to the address specified in the calling list.

3) The final ID value (a long integer) to the specified address.

Program is contained in overlay(s):

LINKGO

Program Name: SETIJ Program Type: Subroutine

Program Description:

SETIJ creates the file MEASIJ (DT0130) and sets up the necessary buffers for use during the calculation of the probability of confusion.

Inputs:

N/A

Outputs:

Buffers: CSECT buffer - see buffer descriptions

File: MEASIJ (DT0130) see file descriptions

Program is contained in overlay(s):

PCEVAL

Program Name: SETPAG Program Type: Subroutine

Program Description:

SETPAG computes and stores the pointers and counters needed in order to build a display using subroutine RNGENT.

Inputs:

Variables: VECDIM - dimensionality of data set

Outputs:

See program for details

Variables: BPOINT - bin pointer
DIMPNT - beginning dimension of display
DPOINT - number of dimensions to be displayed
PAGNUM - page to be displayed
RNGPNT - range pointer

Program is contained in overlay(s):

PCIEVL

Program Name: SETRAT

Program Type: Spectral Analysis Subroutine

Program Description:

SETRAT writes the waveform sampling rate to the waveform file directory of the senior node.

Inputs:

1) The address of the tree name. (the data type is implied...waveform data).

2) The waveform sampling rate is extracted from the file control block which is located in the common I/O buffer.

Outputs:

The sampling rate is written to the tree's directory entry.

Program is contained in overlay(s):

SPCEXC

Program Name: SETUP Program Type: Subroutine

Program Description:

SETUP contains 2 independent subroutines in the link phase of PARLAN. They are:

(1) WSETUP - creates the file control block (fcb) extension and buffer space for a waveform variable

Inputs:

Variable description

Outputs:

fcb, extension, and buffer space are created in core for the variable

(2) VSETUP - creates the file control block (fcb) and buffer space for a vector variable

Inputs:

Variable description

Outputs:

fcb and buffer space are created for the variable

Program contained in overlay(s):

LINKGO

Program Name: SHAND Program Type: Resident Subroutine

Program Description:

SHAND consists of subroutines that alter the sector table and read or write the directory, sector, or tree table.

1.) GETSEC - reads sector table into core

2.) LINKS - builds a sector table entry
Input - 0 = link two entries 1 = Initialize a SECTBL entry
Output - sector 3 on RP02 = updated SECTBL

3.) LOCENT - sets SECNUM equal to the offset of an empty entry in SECTBL

4.) LOCLST - locates the last entry in a linked set of entries in SECTBL and sets NUM to total number of entries in the set, PNT to the absolute address of last entry, PNTN to absolute address of next to last entry

5.) PUTSEC - writes SECTBL on RP02 sector 3

6.) REWRIT - writes existing page of directory table in core on RP02

7.) RTNLNK - returns sectors to the USAG11 table and deletes SECTBL entries when necessary
Input - NRTN = # sectors to return
PNT = address of last SECTBL entry

8.) SECKNT - sets MAXNUM to # sectors in largest USAG11 slot

9.) TMANIP - reads or writes TRETBL on RP02
Inputs - TREADD = sector address, TREBUF = core address
TREFUN (105 = read 115 = write)

Program is contained in Executive.

Program Name: SHIFT Program Type: Subroutine

General Description:

SHIFT corrects data to the highest scale factor in the wave, in conjunction with isomorphic tree transformations under the Algebraic Calculus Executive.

Inputs:

Process control block

Outputs:

Input tree, modified so that each wave has a common scale factor.

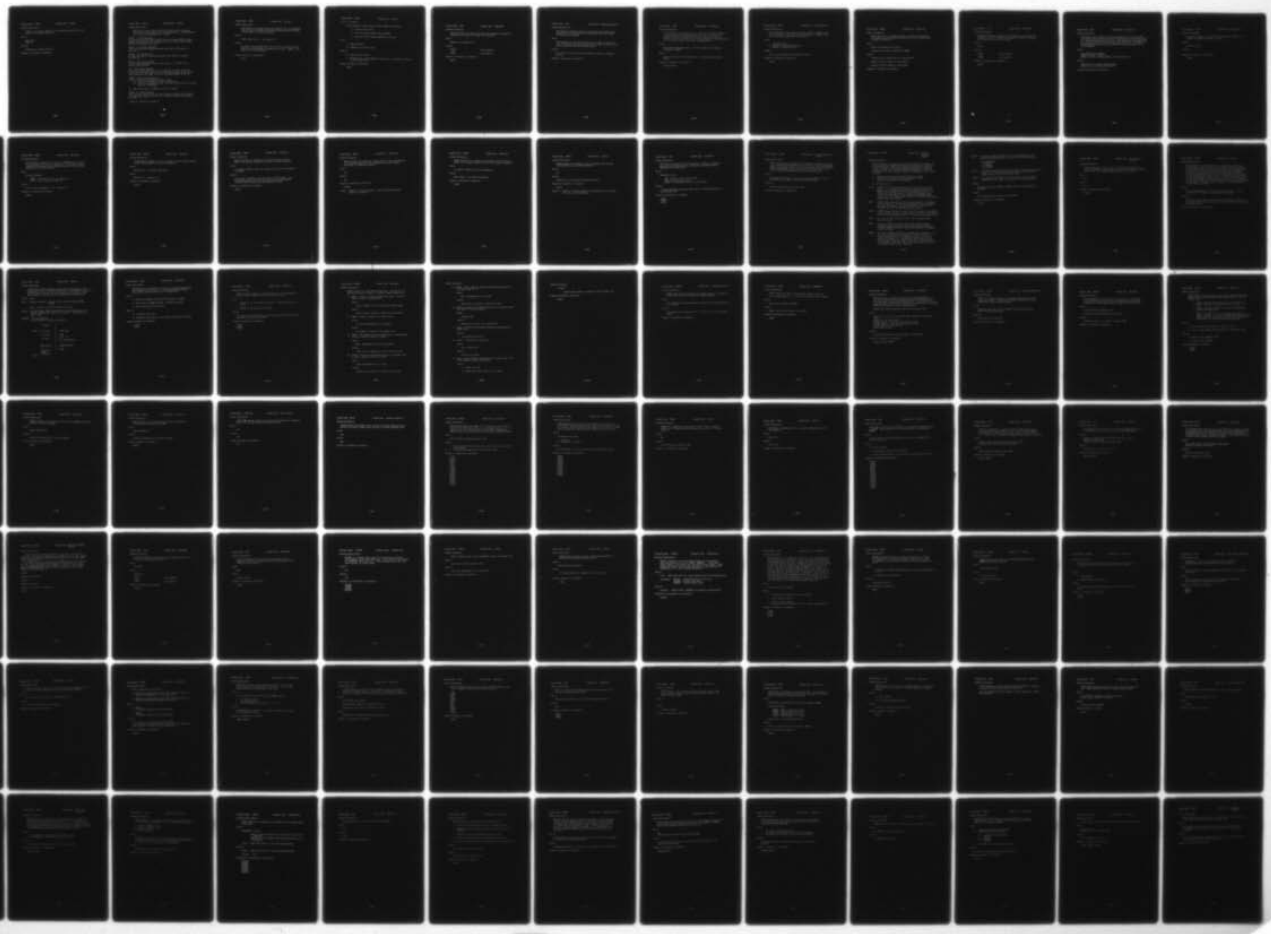
Program contained in overlay(s):

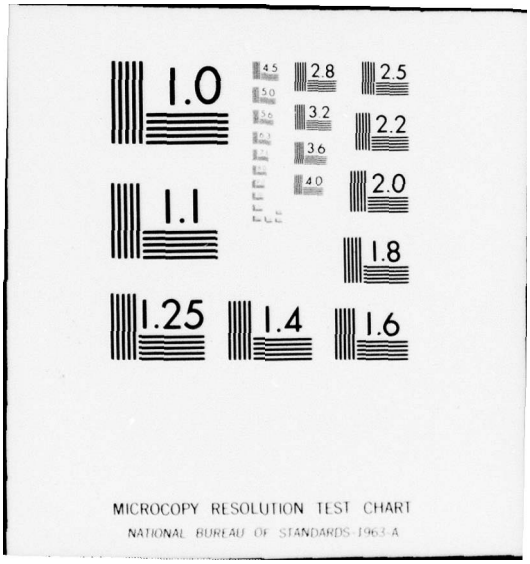
LIMITR

* More to be added

AD-A038 331 PATTERN ANALYSIS AND RECOGNITION CORP ROME N Y F/G 9/2
THE WAVEFORM PROCESSING SYSTEM (WPS). VOLUME IV, PART 3.(U)
FEB 77 P K SANYAL F30602-72-C-0193
UNCLASSIFIED PAR-76-6-VOL-4-PT-3 RADC-TR-76-224-4-3 NL

3 OF 4
ADA038331




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Program Name: SILEVA Program Type: Overlay

Program Description:

SILEVA is the control program for evaluating the current data set against the selected logic tree.

Inputs:

Logic tree
Data set

Outputs:

Evaluation of current data set

Program is contained in overlay(s)

Program Name: SINGLE Program Type: Overlay

Program Description:

SINGLE has 6 entry points called via VG light button interrupt and one entry point called via the SELSET overlay. The functions of the 6 light button entries are as follow:

GETNXT: Get Next Waveform
initializes the sector table (SCTTBL) and point table (PNTTBL), reads the next waveform from the current data set into SINGLE's input buffer (SBUFR), and displays it on the VG.

GETPRE: Get Previous Waveform
reads the previously displayed waveform into SBUFR and displays it on the VG.

GETSAM: Get Same Waveform
re-reads the currently displayed waveform into SBUFR and displays it on the VG.

GETSEQ: Get Sequence Number
requests sequence number from user and stores it in SINGLE's file control block (SINFCB).

PGE: Page Current Waveform
slides the undisplayed points to the beginning of SBUFR, reads more points from the current waveform into the remaining part of the buffer, and displays the next page of points starting at SBUFR on the VG.

SCROLL: Scroll Current Data Set
reads and displays successive waveforms either:

A.) Across the waveforms by calls to GETNXT or
B.) Along the waveforms by calls to PGE and GETNXT until the current data set is exhausted.

The common entry point in SINGLE is called via SELSET:

GETNAM: Get Named Waveform
reads the next waveform from the current data set positioned by SELSET into SBUFR and displays it on the VG. SCTTBL and PNTTBL are initiated by SELSET.

Program is contained in overlay(s)

Program Name: SININ Program Type: Overlay

Program Description:

SININ opens and restores any previous dataset file and parameters when entering the SINGLE display module and brings up the SINGLE display frame on the Vector General.

Inputs:

Single, data type 2 -- core image file

Outputs:

Previously opened SINGLE data file (if any) is restored to open name table, and bypassed to appropriate position. FRAME1 is displayed on the Vector General.

Program contained in overlay(s):

SININ

Program Name: SINOUT Program Type: Overlay

General Description:

When leaving the single display frame, SINOUT is called to:

a) close all open files

b) save the single display data parameters

c) bring up the next frame requested by the user

Input:

a) Open name table

b) "SINGLE" file control block

Outputs:

a) Clear open name table

b) Parameter file called "SINGLE," data type 2, is created or updated on the waveform disk

Program contained in overlay(s):

SINOUT

Program Name: SIZE Program Type: SUBROUTINE

Program Description:

Subroutine SIZE will ask for the window size needed to perform the calculation for either the "begin" or "end" mark.

Inputs:

Address of the window size

Outputs:

WIDTHB or WIDTHE	begin parameter end parameter

Program is contained in overlay(s):

SEGOPT

Program Name: SKIP Program Type: Language Subroutine

Program Description:

SKIP skips the requested number of sectors for the (output) file designated in the extension block and updates the sector offset for the current waveform.

Inputs:

The waveform file control block address (the number of sectors to skip is loaded to the control block at byte offset 62_8 and the file name is extracted from the extension block).

Outputs:

The file's I/O table entries are modified to reflect a change in position.

Program is contained in overlay(s):

Program Name: SKIPS Program Type: Subroutine

Program Description:

SKIPS positions the named file plus or minus the designated numbers of sectors from its current position. The direct on to skip is given by the sign of the input, so that to skip -27 sectors, for example, is to position the file 27 sectors behind its current position, i.e. 27 sectors closer to the file's starting sector.

Inputs:

The number of sectors to skip. (The file name is pre-loaded by subroutine 'LODNAM'.)

Outputs:

A new I/O position for the named file. (See general description above).

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: SKIPTO Program Type: I/O Subroutine

Program Description:

SKIPTO positions a file opened for input, undate or output to the sector requested. (The sector requested should be a member of the set of all sectors which make up the file.)

Inputs:

1. File data type
2. Address of 6-character file name
3. Address of requested sector

Outputs:

The file is positioned to the requested sector.

Program is contained in overlay(s):

LINKGO

Program Name: SKPWAV Program Type: Subroutine

Program Description:

SKPWAV skips over a designated number of waveforms and positions the current data set at the first sector of the next waveform that is ready to be read in.

Inputs:

Number of waveforms to be skipped

Current data set name in WAVFIL and SKPNAM

Outputs:

Current data set repositioned to next waveform

Number of points skipped in GLOBL WAVPTS

Number of sectors skipped in GLOBL NSECS

Program is contained in overlay(s):

Program Name: SLID Program Type: Subroutine

Program Description:

Subroutine SLID will ask how far the window is to slide (into the waveform) to the next position in waveform if current calculation and threshold fails to meet criteria.

Inputs:

SLIDEX

Outputs:

SLIDEB	Begin Parameter
or	
SLIDEE	End Parameter

Program is contained in overlay(s):

SEGOPT

Program Name: SLIDE Program Type: Subroutine

Program Description:

SLIDE drops points (number in second parameter) out of a user's buffer and updates the waveform header (words #5 and/or #4) by the number dropped out. The remaining points are slid up to the beginning of the buffer and their number is loaded in the waveform header (word #3). The address of the word following the last point loaded is returned indirectly to the third parameter.

Inputs:

File control block address
Number of points to drop out
Address of word to receive address of new loading point

Outputs:

Modification of a user's waveform buffer
Address of new loading point returned

Program is contained in overlay(s):

Program Name: SLIDOT Program Type: Subroutine

Program Description:

Subroutine SLIDOT will slide out X points from the buffer in preparation for MORWAV to refill the buffer.

Inputs:

Number of points

Outputs:

Program is contained in overlay(s):

SEGMNT

Program Name: SMCENT Program Type: Subroutine

Program Description:

For each class in the selected data set, SMCENT places a line of ASCII characters into the V.G. display list. Each line contains information indicating the discriminatory powers of the selected dimension for the class in question.

Inputs:

CSECT buffer - See program and buffer definitions

Outputs:

ASCII character lines indicating the discriminatory power of a selected dimension

Program is contained in overlay(s):

FEVDPB

Program Name: SMCHED Program Type: Subroutine

Program Description:

SMCHED places a header in the V.G. display list for the ranking of classes discriminated by a selected dimension.

Inputs:

CSECT buffer - See buffer descriptions

Outputs:

Header in V.G. display list

Program is contained in overlay(s):

FEVDPB

Program Name: SMPENT Program Type: Subroutine

Program Description:

For each pair of classes on the data set, SMPENT places a line of ASCII characters into the V.G. display list. Each line contains information indicating the discriminatory powers of the selected dimension for a pair of classes.

Inputs:

External Variables:

GPNUM - First free location in display list
NCLASS - No. of classes in data set

Outputs:

Lines of ASCII characters in V.G. display list

Program is contained in overlay(s):

FEVDPC

Program Name: SMPHED Program Type: Subroutine

Program Description:

SMPHED places a header in the V.G. display list for ranking pairwise classes discriminated by a selected dimension.

Inputs:

CSECT buffer - See buffer description

Outputs:

Header in V.G. display list.

Program is contained in overlay(s):

FEVDPC

Program Name: SMPINT Program Type: Subroutine

Program Description:

SMPINT retrieves all pairwise discriminatory values from file MEASIJ (the pairwise evaluation file) for a selected dimension.

Inputs:

File MEASIJ (DT0130) This file contains all of the class pairwise evaluations

Outputs:

User selects a dimension which is placed in CSECT buffer. The program then stores the discriminatory values in CSECT buffer. See CSECT buffer descriptions and program for detail.

Program is contained in overlay(s):

FEVDPC

Program Name: SMRCLS Program Type: Subroutine

Program Description:

SMRCLS displays the ranking of classes which are best discriminated for a selected dimension. This program controls the display generation by calling subroutines.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

FEVDPB

Comment: SMRCLS is a control program. Other subroutines actually generate the display.

Program Name: SMRINT Program Type: Subroutine

Program Description:

SMRINT retrieves all classwise discriminatory values from file MEASII (the classwise evaluation file) for a selected dimension.

Inputs:

File MEASII (DT0130) see file descriptions

Outputs:

CSECT buffer - See buffer descriptions

Program is contained in overlay(s):

FEVDPB

Program Name: SMRPAR Program Type: Overlay

Program Description:

SMRPAR displays the ranking of pairs of classes which are best discriminated using a selected dimension.

Inputs:

N/A

Outputs:

Display list of pairwise discrimination values

Program is contained in overlay(s):

FEVDPC

Comments: SMRPAR is a control program. The generation of the display is done by called subroutines.

Program Name: SORT Program Type: Subroutine

Program Description:

SORT places a specified list of values into a buffer. The program then sorts this buffer in either descending or ascending order, depending on the flag FEVFLG.

Inputs:

Arguments of call:

LIST - Address of list to be sorted.
ELM - No. of values in list
BUFFER - Buffer where sorting is to take place

Outputs:

A buffer containing the sorted values and its original position in the specified list.

Program is contained in overlay(s):

FEVDPC
FEVDPB
FEVDSP

Program Name: SPCEXC

Program Type: Program-Controlled Overlay

Program Description:

SPCEXC arranges for and executes the waveform window inputs according to the user-specified parameters set in SPCOPT. It calls the spectral analysis routine(s), which in turn call the output data routine CCPUT. SPCEXC also arranges for the output trees and output files. The spectral analysis transformations preserve tree structure.

Inputs:

The spectral parameters. (See File section and Common I/O buffer descriptions with regard to Spectral Analysis Module).

Outputs:

Desired transformations in output trees.

Program is contained in overlay(s):

Program Name: SPCOPT

Program Type: Spectral Analysis Overlay

Program Description:

"SPCOPT" contains 9 separate entry points (callable via function key) which provide the communication between the user and the spectral analysis executive. Most of the spectral parameters are deposited to the core image file "SPCTRM" through these programs. With the exception of the first program, SPCINT, all programs take the following form:

1. read the spectral analysis core image file "SPCTRM"
2. converse with the user, gathering parameter values
3. update the core image file and return

The entry points are:

SPCINT - "SPCINT" is the initialization code for the spectral analysis module. The introductory sub-menu is delivered, and the core image file is created with the default parameter values if the file has not yet been created. The user may initialize the values or he may choose to leave the set of parameter values as they are. The final task of "SPCINT" is to deliver the spectral analysis main menu (frame).

INPUT - "INPUT" allows the user to select the input data set to undergo spectral analysis. The data set chosen may be real or complex... two trees for complex. The system current data set may be designated with the conventional carriage return.

OUTPUT - "OUTPUT" allows the user to select any one or many of the available output options. The user is also asked to associate a tree name to each of the designated outputs...2 trees for each complex output.

PSEQN - The user is asked to declare a point input sequence number. (One is default).

WSEQN - The user is asked to declare a wave input sequence number. Carriage return or Ø implies that the current waveform (last waveform displayed from the Single Display Module) is designated as the sole input.

WINDOW - The user is asked to declare a few window input parameters. He must state the window size, whether or not the process is a sliding window and if so, the number of points to slide, the numbers of windows, etc. The user may also choose to select the data points from the segmented portion of the wave or from any designated start time. Also, for sliding window process, an ID generation field must be specified.

WEIGHT - The user is asked to declare the code corresponding to the desired weighting function to be applied to each input window:

Ø is rectangular
1 is Hanning
2 is Hamming
3 is Blackman

ZROFIL - The user is asked to declare his intentions on window fill options. He may fill at the end or both sides and he may fill with the average value or with any specified value.

SEEPAR - This option will display all of the current spectral analysis parameters for the user. (This option is not yet available).

Inputs:

The current spectral analysis parameter values in core image file "SPCTRM"

Outputs:

The updated parameter values in file SPCTRM

Program is contained in overlay(s):

SPCOPT

Program Name: SPCPAR

Program Type: Core Image File Section

Program Description:

SPCPAR contains the initial values of the spectral analysis core image file SPCTRM. These values are written to the disk upon the very first access to the spectral analysis module for the disk.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

SPCOPT

Program Name: SPCSET Program Type: Overlay

Program Description:

SPCSET reads the spectral analysis core image file, creates the internal input tree if the input is the current waveform, requests the associated tree text blocks, and sets up the tree control blocks for each of the output trees. SPCSET also performs the FIRNOD operation for each of the output trees, which causes creation of all of the user-designated output trees with associated text and opens the input file(s) and the output files. In addition, SPCSET requests certain final parameter values, such as "yes or no" for DC removal on each input window, and an epsilon value if any log-involved outputs are requested. The final task for SPCSET is to call the spectral analysis executive SPCEXC.

Inputs:

The spectral parameters. (See file section and common I/O buffer descriptions with regard to Spectral Analysis Module).

Outputs:

Creation of trees (senior node and first low-order node only) and associated text blocks and delivery of overlay 'SPCEXC'. (See general description above).

Program is contained in overlay(s):

Program Name: SPLITT Program Type: Subroutine

Program Description:

SPLITT adds a new level to the current OLPARS logic tree; that is, it splits the current logic node into two or more sub-nodes. The number of new nodes depends on the number of display regions defined on the current plot.

Inputs:

a) Logic argument buffer defined by CR1LOG or CR2LOG

b) Output of NUMREG

c) current logic tree

Output:

a) Logic argument buffer modified to contain new node numbers

b) New branches on the logic tree

Program contained in overlay(s):

CR1LOG
CR2LOG

Program Name: SQRT Program Type: Subroutine

Program Description:

SQRT calculates the square root of a floating point number.

Inputs:

Floating point number

Outputs:

Square root of floating point number

Program is contained in overlay(s):

Program Name: STATS Program Type: Overlay

Program Description:

STATS prints minimum, maximum, range, mean, and variance for each measurement in the current vector data tree. The statistics are given for the current node and all lowest nodes under that node. Class pairs having no overlap along any measurement are also printed.

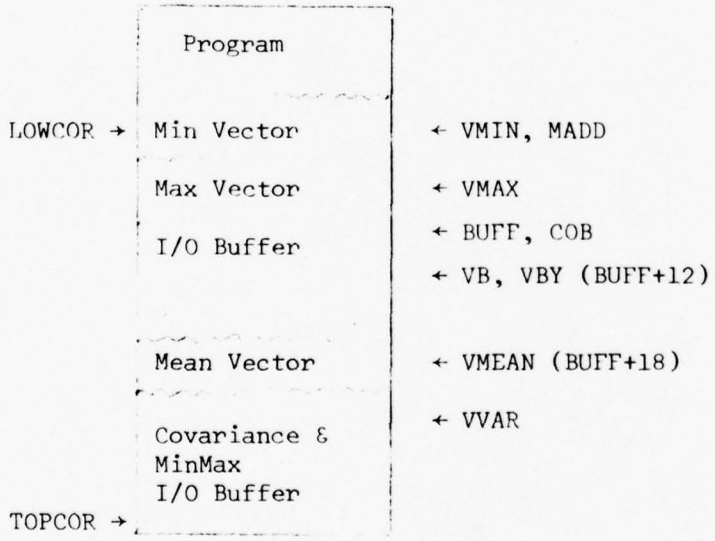
Library: None

Inputs: External variables: LOWCOR, TOPCOR, VECDIM, VECNNM, VECTNM, VPOINT

Files: Vector data files for current tree/node

Outputs: MIN, MAX, RANGE, MEAN, and VARIANCE for each measurement in the current tree/node are output to the printer. See listing for sample output.

Comments: Core configuration
(See listing for variable description)



Program Name: STFLOG Program Type: Subroutine

Program Description:

STFLOG stores in the logic file the one- or two-space logic which was created in core by DOLOG. It also permanently associates class symbols with each new node of the logic tree.

Inputs:

a) The logic argument buffer defined by CR1LOG or CR2LOG

b) The outputs of NUMREG, PNTSM1, or PNTSYM, and DOLOG

c) The current logic tree and file

Outputs:

a) A modified logic file

b) Permanent association of class symbols with logic tree nodes

Program contained in overlay(s):

CR1LOG
CR2LOG

Program Name: STKTBL Program Type: Subroutine

Program Description:

STKTBL allows the entry of a one-word value to a user-constructed circular stack. POPTBL is used to remove this value.

Inputs:

1. Address of the user-constructed table. (First word is size in bytes).

2. Address of the value to be stacked.

Outputs:

The value to be input stacked on the table with all previous values graduated one word down the table.

Program is contained in overlay(s):

PTRETL
SELSET
SINGLE

Program Name: STOMAN Program Type: Subroutine

Program Description:

STOMAN consists of 9 independent subroutines. Each has its own function in relation to pass-1 of PARLAN. These routines are:

(1) VARRET - Locates a variable symbol table entry. If none is found, an entry is created for it.

Inputs:

Global variable "A" must contain the variable name

Outputs:

Symbol table is updated to reflect the new variable

(2) NUMRET - Inserts a number in the symbol table.

Inputs:

The ASCII representation of the number

Outputs:

The number is inserted in the symbol table

(3) RTNRET - This finds the symbol table entry of a routine name. If none is found, an entry is created.

Inputs:

ASCII representation of the routine name

Outputs:

Symbol table is updated to reflect the new routine

(4) LBLGET - Finds the symbol table entry of a referenced label. If none is found, an entry is created.

Inputs:

ASCII representation of the label

Outputs:

Symbol table is updated to reflect the new label

(5) LBLPUT - When a label is defined, LBLPUT creates an entry in the symbol table for it.

Inputs:

ASCII representation of the label

Outputs:

Symbol table is updated to reflect the label

(6) VARSET - Inserts in the symbol table an M or V variable caused by a MATRIX or VECTOR statement.

Inputs:

Variable name

Outputs:

Variable is inserted in the symbol table

(7) OPNALL - Performs initialization operations and opens pass-1 output file.

Outputs:

Opens pass-1 output file

(8) CLSALL - Closes pass-1 output file.

Inputs:

pass-1 output file

Outputs:

This file is closed

(9) OPUT - Outputs internal representation of symbols used in the PARLAN program to pass-1 output file.

Inputs:

a) Symbol to output

b) Symbol table entry number of this symbol

STOMAN (Continued)

Output:

Current output symbol is inserted in pass-1 output file

Program contained in overlay(s):

SYNTAX

Program Name: STRNAM Program Type: Language Subroutine

Program Description:

STRNAM loads the file name from the extension block to the name slot in the GET calling list in READP for common reference.

Inputs:

The 6-character file name addressed indirectly from the waveform file control block.

Outputs:

The 6-character file name stored to the 'GET' call list in program 'READP'

Program is contained in overlay(s):

Program Name: STRTXT Program Type: SUBROUTINE

Program Description:

STRTXT writes 60_{10} bytes of text data out onto the text file of the current data set. If no text file exists, one is created.

Inputs:

Current data set name in IN1NNM

Outputs:

Updated text file that exists on the RP02

Program is contained in overlay(s):

LODWAV

Program Name: SUBPOS Program Type: Subroutine

Program Description:

SUBPOS displays a message which begins "FOR POSITION NUMBER(S)..." and fills in the rest of the message with position numbers which have been found in the keyboard input buffer. The position of these position numbers in the buffer correspond to the position of the option number to be searched for in the search buffer.

SUBPOS then loads a specified buffer with the user's input.

Inputs:

Address of the count of the option number existing in the search buffer
Address of the search buffer
Message address if more than one option is found
Message address if only one option number is found
Option number to be searched for
Input buffer address

Outputs:

Displayed message with user's response to that message

Program is contained in overlay(s):

MHSCAL, MVSCAL, MRQSTF

Program Name: SUBTBL Program Type: RESIDENT SUBROUTINE

Program Description:

SUBTBL is a subroutine table of subroutine names and entry points called by the EXEC. This enables the EXEC to execute one of the subroutines without an RP02 retrieval.

Inputs:

Subroutine entry must exist in SUBTBL and the frame card must have a "2" for the type code

Outputs:

Execution of the subroutine

Program is contained in overlay(s):

Program Name: SUBTIM Program Type: Subroutine

Program Description:

SUBTIM subtracts two file control block values (the origin from the requested value) and returns the difference to a specified address as a 3-byte integer (single integer for frequency mode).

Inputs:

File control block address in R4

Address to receive difference (high order)

Outputs:

Difference output as a 3-byte or single integer

Program is contained in overlay(s):

Program Name: SYMCON Program Type: Subroutine

Program Description:

SYMCON contains three subroutines used by one- and two-space logic design to associate class symbols with display regions. The subroutines are:

1. LSTSYM. Replaces option menu with a list of the class symbols that exist at the current level of logic.

2. KILSYM. Destroys the symbol list created by LSTSYM and restores the option menu.

3. FNSYM. Asks the user to select symbols from the list created by LSTSYM. The selected symbols are associated with display regions. (The regions represent new nodes for the logic tree.) The selection is done by light pen.

Inputs:

a) Logic argument buffer defined by CR1LOG or CR2LOG

b) List of class symbols associated with the current logic node

Outputs:

a) Modified logic argument buffer

b) Display list of symbols

Program contained in overlay(s):

CR1LOG
CR2LOG

Program Name: SYMLIS Program Type: Subroutine

Program Description:

SYMLIS is a buffer used to store in core one page of the class symbol file.

Inputs:

None

Outputs:

None

Program is contained in overlay(s)

Program Name: SYMSET Program Type: Subroutine

Program Description:

SYMSET asks the user to indicate which display regions on a pairwise modification two-space plot (discriminant plane) the user-drawn boundaries are meant to define. The user is then asked to associate each of the two Fisher pair symbols with a region. (In the case of three regions, one is declared a reject region. That is, OLPARS vectors within that region are unclassifiable).

Inputs:

a) Logic argument buffer defined by C2LSPC

b) The Fisher pair

c) Display boundaries

Outputs:

a) Modified logic argument buffer

Program contained in overlay(s):

C2LSPC

Program Name: SYNTAX Program Type: Subroutine

Program Description:

SYNTAX is Pass 1 of the syntax analysis pass of PARLAN (the On-Line Waveform Processing Language).

Inputs:

Source program file

Outputs:

Internal representation of source statements

Program contained in overlay(s):

SYNTAX

Program Name: SYNTAZ Program Type: Subroutine

Program Description:

SYNTAZ is pass 1 of the syntax analysis pass of PARLAN (the On-Line Waveform Processing Language).

Inputs:

Source program file

Outputs:

Internal representation of source statements

Program contained in overlay(s):

SYNTAX

Program Name: SYSMAC.SML Program Type: Macro Library

Program Description:

SYSMAC.SML defines certain macros which are necessary for assembling many of the one- and two-space plotting routines.

Inputs:

N/A

Outputs:

N/A

Program contained in overlay(s):

N/A

Program Name: SYSTBL Program Type: Resident Subroutine

Program Description:

SYSTBL contains only system tables used by the filing system and by the executive to read in frames and by overlays to receive keyboard input.

Inputs:

None

Outputs:

None

Program is contained in overlay(s):

Program Name: TANLNK Program Type: Subroutine

Program Description:

TANLNK checks whether the named file is entered as being opened (in the open file name table), and, if so, enters the address of the address of the file control block into the ONAMT entry word #9. TANLNK supports the main waveform I/O subroutines GETWAV and MORWAV.

Inputs:

The file name in external location 'DTP'.

Outputs:

1. Open file table entry for the file loaded with the file control block address

or 2. A return indicating the file has not been opened.

Program is contained in overlay(s):

CNGHDR
LINKGO
LODWAV
MRQSTF
MULTI
PLAYBK
PRNHDR
PRNTID
PRTRND
PWAVEC
RQSSTF
SEGMNT
SELSET
SINGLE
SPCEXC
SPCSET

Program Name: TDRAW Program Type: Subroutine

Program Description:

TDRAW displays the structure of the designated tree on the V. G. Each node is labeled (five characters), and the associated tree text is delivered; for each low node, the number of data vectors is shown, with the cumulative number displayed alongside the senior node.

Inputs:

The complete tree name:

1. data type
2. 6-character tree name

Outputs:

The VG display of the tree structure. (See description above).

Program is contained in overlay(s):

CMBNDS
CRETRE
DELNOD
DELSUB
FEVDPB
FEVDSP
LODVEC
LODWAV
SPCOPT
SPCSET
TDRAWR

Program Name: TDRAWR Program Type: Overlay

Program Description:

TDRAWR calls TDRAW after requesting the user to input a specific system tree. (TDRAW draws the designated tree on the V. G. display screen.)

Inputs:

N/A

Outputs:

See description of program TDRAW.

Program is contained in overlay(s):

Program Name: TEDDY Program Type: Overlay

Program Description:

TEDDY edits a PARLAN source file, or inputs a PARLAN source file from keyboard.

Inputs:

Source file

Outputs:

Source file

Program is contained in overlay(s):

Program Name: TEOF Program Type: Subroutine

Program Description:

TEOF tests the end-of-file condition of the current file being searched by GTONMT. TEOF supports one of the main waveform I/O subroutines, MORWAV.

Inputs:

Register 4 (R4) contains the address of word #4 of the ONAMT entry for the named file.

Outputs:

One of two returns:

1. first return -→ end of file condition

2. second (normal return) -→ not end of file condition for this file

Program is contained in overlay(s):

CNGHDR
LINKGO
LODWAV
MKQSTF
MULTI
PLAYBK
PRNTID
PRTRND
PWAVEC
RQSSTF
SEGMNT
SELSET
SINGLE
SPCEXC
SPCSET

Program Name: TFLOAT Program Type: Subroutine

Program Description:

TFLOAT is a subroutine to convert an ASCII string into a double precision floating point number in ACD. There must exist one and only one label at the end of the string, either: M(10^6), k(10^3), H or s (10^0), m(10^{-3}), mu(special character (Greek)) (10^{-6}) or n(10^{-9}).

Inputs:

Address of ASCII string (first byte = byte count)
Floating number (double precision) address

Outputs:

Double-precision floating point number

Program is contained in overlay(s):

RQSSTF, MRQSTF

Program Name: TFLT Program Type: Subroutine

Program Description:

TFLT converts a list of numeric ASCII values (comma delimited in a string) into a list of double precision floating values.

Inputs:

Address of ASCII string (each number must have a label)
Address of output list
Address to receive number of values output

Outputs:

Double-precision floating number list

Program is contained in overlay(s):

MHSCAL, MRQSTF

Program Name: TFSKIP Program Type: Subroutine

Program Description:

TFSKIP computes the number of points which need to be skipped to reach the requested value of a waveform, backs up the current data set to its beginning and skips over points until the last block containing the requested value is read. The number of points to skip within the block to arrive at the requested value is returned.

Inputs:

File control block address (loaded appropriately)
Address of points to be skipped

Outputs:

Points to be skipped loaded

Program is contained in overlay(s):

Program Name: TFSUBS Program Type: Subroutine

Program Description:

TFSUBS is a collection of 5 subroutines used for computations and checks involving time and frequency values within the Multiple Waveform display:

STRTPG loads the double-word PGSTRT in a specified file control block with the ordinal count of the first point displayed on the VG on one line. Also, PGSTF is loaded with that point's time or frequency value.

STRTP2 computes the new ordinal count by adding # of points read in to the number in the waveform header; then PGSTRT and PGSTF are loaded as in STRTPG.

TFCHK sets STDFLT with 0, 1, or 2, representing respectively, request time already on default, request time greater than or equal to origin. In last case, request time is set with default.

STRTIM sets TOTIM in a specified FCB with the start time or frequency computed from the numerical value in the origin.

SETVAL sets T2TNUM in a specified FCB with the time or frequency range on one display line (covering APTSL-1 number of points.)

Program is contained in overlay:

MULTI

Program Name: THOPBG

Program Type: ENTRY #4 TO OVERLAY "SEGOPT"

General Description:

THOPBG will display the "begin" menu; it will then allow the user selectively to change any parameter or criterion, one at a time. Typing a carriage return without any input will return the user to the segment frame "light buttons."

If THOPBG were to be selected before BEGMRK (that is, if the full complement of begin parameters haven't been set), this section will give the user a warning message to pick BEGMRK. If there is a full complement of BEGMRK parameters, this section will remind the user to pick ENDMRK if he has not done so.

Inputs:

Parameter corrections

Outputs:

Parameters to PARLST

Program is contained in overlay(s):

SEGOPT

Program Name: THOPED

Program Type: ENTRY #5 TO OVERLAY "SEGOPT"

General Description:

THOPED will display the "end" menu; it then will allow the user selectively to change any parameter or criterion, one at a time. Typing a carriage return without any input will return the user to the segment frame "light buttons".

If THOPED were to be selected before ENDMRK (that is, if a full complement of "end" parameters hasn't been set), this section will give the user a warning message to pick ENDMRK. If there is a full complement of ENDMRK parameters, this section will remind the user to pick BEGMRK if he has not done so.

Inputs:

Parameter corrections

Outputs:

Parameters to PARLST

Program is contained in overlay(s):

SEGOPT

Program Name: THRES Program Type: SUBROUTINE

Program Description:

Subroutine THRES will ask the user what threshold value is to be used for the current criterion.

Inputs:

Criterion

Outputs:

Threshold:

THRESB	begin parameter
or	
THRESE	end parameter

Program is contained in overlay(s):

SEGOPT

Program Name: TMAX Program Type: SUBROUTINE

Program Description:

Subroutine TMAX will ask the user for the maximum length of segment to be used if a "begin" criterion is found and an "end" criterion can't be found.

Inputs:

None

Outputs:

Maximum length

Program is contained in overlay(s):

SEGOPT

Program Name: TPCORE Program Type: Subroutine

Program Description:

TPCORE is a buffer area used for computing statistics and reading vector data from tape. The size of the buffer is dependent upon the link. This program should be the last routine in link stream.

Inputs:

N/A

Outputs:

N/A

Program is contained in overlay(s):

COUARF
FEVCRE
LODVEC
KLENUP

Program Name: TPTODK Program Type: Overlay

Program Description:

TPTODK transfers logic trees from magnetic tape to the system disk.

Inputs:

Logic tree located on magnetic tape

Outputs:

Logic tree transferred to the system disk

Program is contained in overlay(s):

Program Name: TRANS Program Type: Overlay

Program Description:

TRANS enables the user to control the physical position of a waveform under the MULTI display option.

Inputs:

MULTI wave data structure

Output:

The chosen waveform is translated in the X-Y plane.

Program contained in overlay(s):

TRANS

Program Name: TRESIG Program Type: Subroutine

Program Description:

TRESIG computes the three-sigma range of the selected data and places it into a buffer (RNGBUF). The three-sigma range is the mean plus and minus three-sigma, sigma being the square root of the variance of the data for a dimension (i.e. the standard deviation.)

Inputs:

File: STAT FILE (DT 14.) see program and file documentation

Variables: VECDIM - dimensionality of data set
VECTNM - system tree name
VECNNM - system senior node

Outputs:

Buffers: CSECT buffer (RNGBUF) see buffer descriptions

Program is contained in overlay(s):

PCIEVL

Program Name: TREX Program Type: I/O Subroutine

Program Description:

TREX contains two I/O subroutines which aid in the transformation of an input tree to an output tree. Given a starting node of an input tree, FIRNOD creates the output tree and associated tree text if the output tree does not yet exist. NXTNOD then opens the first low node of the input tree for input and the corresponding output node for output. The result of using FIRNOD and NXTNOD is an output tree with the identical structure of the input tree (with respect to the starting node). If the senior node is designated, the structure of the input and the output tree will be identical. Should a node other than the senior node be designated as the starting node, the I/O subroutines will create the output tree in such a manner as to leave open the possibility of transforming the nodes not processed for a later time with the tree-structure-preserving qualities.

Inputs:

A tree control block address.

Outputs:

1. A newly created tree with tree text possibly
2. A node opened for input
3. A node opened for output
   (see tree control block description in software documentation).

Program is contained in overlay(s):

LINKGO
SEGMNT
SPCEXC
SPCSET

Program Name: TRNBAK Program Type: Overlay

General Description:

TRNBAK truncates the back of a waveform displayed in a "single wave display" mode. The exact location of the truncation point is determined by using software-generated cross hairs displayed on the VG.

Inputs:

a) "Single Wave Display" waveform data file, currently displaying on the VG

b) "Single" file control block

Outputs:

A shortened waveform

Program contained in overlay(s):

TRNBAK

Program Name: TRNFNT Program Type: Overlay

Program Description

TRNFNT truncates the front of a waveform displayed under the **single** wave display subsystem.

Inputs:

Current waveform data

Outputs:

Shortened waveform

Program contained in overlay(s):

TRNFNT

Program Name: TSTBLK Program Type: Subroutine

Program Description:

TSTBLK checks an array for all ASCII blank bytes and returns a decision (all blanks or not) by taking one of its two returns.

Inputs:

1. array address

2. array dimensionality (bytes)

Outputs:

A decision return indicating whether or not the entire array is blanks.

Program is contained in overlay(s):

SPCOPT
SPCSET

Program Name: TTYIN Program Type: RS11 UTILITY SUBROUTINE

Program Description:

TTYIN allows a user to enter characters from the Tektronix keyboard, and loads a specified buffer with the input.

Inputs:

Address of buffer to receive characters (first byte = # of characters to be input)

Outputs:

Keyed-in characters in the buffer (R4 = actual # of characters input which can be less than the # specified)

Program is contained in overlay(s):

BLDMOD
MODISK
INITLZ

Program Name: TTYOUT Program Type: RS11 UTILITY SUBROUTINE

Program Description:

TTYOUT outputs a user message to the Tektronix at the current cursor position.

Inputs:

Message address (first byte = # characters)

Outputs:

Tektronix display altered

Program is contained in overlay(s):

BLDMOD
IN1TLZ
MODISK
DSKMAG
MAGDSK

Program Name: TXDISK Program Type: Overlay

General Description:

TXDISK transfers from magtape to disk the tree which is stored on tape in TXDISK-TXTAPE format.

Inputs:

Properly formatted magtape mounted on Unit #1.

Outputs:

A WPS format tree on the waveform disk.

Program is contained in overlay(s):

TXDISK

Program Name: TXTAPE Program Type: Overlay

Program Description:

"TXTAPE" transfers a user-specified tree to magnetic tape, and stores it there in a format which is compatible with overlay "TXDISK".

Inputs:

A WPS formatted tree, located on the waveform disk

Outputs:

A "TXTAPE" formatted nine-track magtape

Program is contained in overlay(s):

Program Name: UNION Program Type: Subroutine

Program Description:

UNION is composed of two routines:

1) UNBCLS will automatically select those dimensions which are the best discriminators on a classwise basis.

2) UNBPAR will automatically select those dimensions which are the best discriminators between two classes.

Inputs:

A) UNBCLS
File MEASII (DTO130) see file description

B) UNBPAR
File MEASIJ (DTO130) see file description

Outputs:

CSECT buffer - See buffer description (SELBUF)
If all dimensions of the selected data set are being displayed, modify display to indicate selected dimensions.

Program is contained in overlay(s):

FEVSEL

Program Name: UPDATE Program Type: I/O Subroutine

Program Description:

UPDATE will rewrite the last buffer read (page) via a GET call, usually after the user has modified the buffer. The file must have been opened for update rather than input.

Inputs:

The last entry in the Open File table (ONAMT) contains:

1. # of words to write
2. the source address
3. the I/O pointer words (words 5, 6, 7, & 8)

Outputs:

An updated page of the (one) file opened for update...the page last retrieved via "GET".

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: UPTORF Program Type: Subroutine

Program Description:

UPTORF updates words #5 and/or #4, depending on mode, of a waveform header by the number equal to the product of the number of points read into core (word #3) times the previous pth point value (word #27)

Inputs:

File control block address

Waveform header address in word #22 of the fcb

Previous pth point value in word #27 of the fcb

Outputs:

Modification of waveform header words #5 and/or #4

Program is contained in overlay(s):

Program Name: UTILS Program Type: Subroutine

Program Description:

UTILS contains dummy (as yet unspecified) routines needed by the linker of PARLAN. The routines contained here are:

GETSP
GETMP
GETUP
PUTSP
PUTMP
PUTUP
PNPT
PSF
PMINV
PMAXV
TYPE
SEGEND

Program contained in overlay(s):

LINKGO

Program Name: VBUF Program Type: SUBROUTINE

Program Description:

VBUF is a collection of buffers used for the computation of the mean and covariance file by VSTAT.

Inputs:

VBUF must be linked last so that free core space follows it

Outputs:

None

Program is contained in overlay(s):

CMBNDS
DELNOD
CRETRE

Program Name: VDRAW Program Type: Subroutine

Program Description:

VDRAW contains a set of subroutines that allows the user to draw lines and output characters in the general purpose region of the Vector General display.

Inputs:

Outputs:

VG buffer modified

Program is contained in overlay(s)

Program Name: VECCRE Program Type: Subroutine

Program Description:

VECCRE gets a vector from a selected tree/node. The program then takes selected dimensions from the vector, creating a new vector which is stored in a different tree/node.

Inputs:

Vectors from a selected data file (DT 13) opened in OPNCRE

External Variables:

NEWNNM - Name of node being created
VECTNM - Name of system data tree
NEWDIM - Dimensionality of new data
VECDIM - Dimensionality of old data

CSECT buffer - See buffer descriptions

Outputs:

Vectors in a data file (DT 13) opened in OPNCRE

Program is contained in overlay(s):

FEVCRE

Program Name: VECEND Program Type: Subroutine

Program Description:

VECEND outputs a vector into the vector's associated vector file. This is executed as a result of a VCEND statement in a PARLAN program.

Inputs:

a) Vector address

b) File associated buffer address

Outputs:

A vector is created in its output file.

Program contained in overlay(s):

LINKGO

Program Name: VGDD1 Program Type: Subroutine

Program Description:

"VGDD1" handles all vector general display requirements, including interrupts, initializing and display functions.

For full information see WPS document SP-006-0, Appendix A, "VGDD1 device driver.

Program Name: VGDIR Program Type: Overlay

Program Description:

VGDIR lists the active entries of the data directory along with their SECTBL offsets on the Vector General display screen.

Inputs:

Data directory starting on sector 1 of the RP02
SECTBL table on sector 3 of the RP02

Outputs:

VG display buffer modified

Program contained in overlay:

VGDIR

Program Name: VGSTOR Program Type: Resident Subroutine

Program Description:

VGSTOR creates a Tektronix hardcopy of a Vector General display.

Inputs:

VG display buffer starting at 61616

Outputs:

Hardcopy

Program is contained in Executive.

Program Name: VINIT

Program Type: Vector I/O Subroutine

Program Description:

VINIT initializes the vector file control block for the specific file's requirements. All but the number of sectors to be paged in are written to the control block.

Inputs:

1. R1 - address of the file associate buffer
2. flag indicating where call was made from Ø -- from GETVEC and 1 -- from PUTVEC

Outputs:

Modified vector file control block

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: VPLY Program Type: RS11 UTILITY SUBROUTINE

Program Description:

Two entry points exist in VPLY:

1. VPLYN - Displays a user message on the Tektronix, accepts 1-5 numeric characters from the keyboard, converts them into a 16-bit 2's complement value, and stores the value in a designated word.

2. VPLYS - Displays a user message on the Tektronix, accepts a designated number of characters from the keyboard, and stores them in a designated buffer.

Inputs:

VPLYN: message address (first byte = # characters)
address of word to store the 16-bit binary value

VPLYS: message address (first byte = # characters)
address of character buffer (will be filled with ASCII blanks prior to loading of characters)

Outputs:

VPLYN: 16-bit 2's complement value

VPLYA: ASCII characters in buffer (R4 = actual number of characters entered)

Program is contained in overlay(s):

INITLZ

Program Name: VREADY

Program Type: Vector I/O Subroutine

Program Description:

VREADY monitors the disk read or write transfers in accordance with individual vector retrievals or creations. Since the vector I/O routines surrender the CPU to the main caller, it is imperative that a requested vector not be partially in core or that a vector designated for output (via PUTVEC) not be placed in a page slot which has not yet been transferred to the disk (the previous page of vectors).

Inputs:

R1 - the address of the vector file associate buffer
R5 - the address of the requested vector's page slot

Outputs:

A return which implies that the slot is now available.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: VSCALE Program Type: Overlay

Program Description:

VSCALE presents a VG display and allows a user to select one of four vertical scaling modes for the Single Waveform display:

0) Scale to maximum on page
1) Scale to maximum on line
2) Explicit scaling
3) Fit to N lines

Inputs:

VG light button selection, followed by further keyboard input for options "2" and "3". For "2" - minimum and maximum; for "3" N = N lines on frame into which to fit waveform.

Outputs:

Modification of the SINGLE file control block

Program is contained in overlay(s):

Program Name: VSTAT Program Type: Subroutine

Program Description:

VSTAT computes the mean and covariance for a given vector tree/node.

Inputs:

Arguments in call:

Name of node for which the statistics are to be computed
Name of tree for which the statistics are to be computed

Files: DATA FILE (DT 13.) see file description

Outputs:

Files: STAT FILE (DT 14.) see file descriptions

Library: LIB

Program is contained in overlay(s):

FEVCRE
CRETRE
COVARF
CMBNOS
KLENUP
DELNOD
LODVEC

Program Name: WAIT Program Type: Subroutine

Program Description:

WAIT causes the CPU to delay for about five seconds.

Inputs:

None

Outputs:

None

Program is contained in overlay(s)

Program Name: WAVE1 Program Type: Subroutine

Program Description:

WAVE1 performs five functions for the single display:

1) Finds minimum and maximum values for the page and line.

2) Computes the Vector General coordinates for each line to be displayed.

3) Scales and outputs waveform data points to the VG.

4) Outputs text lines beneath each waveform display line.

5) Outputs scaled grid lines and grid marks for each display line.

Inputs:

File control block in CSECT buffer

Outputs:

Modification of VG display buffer

Program is contained in overlay:

SINGLE

Program Name: WAVEND Program Type: Language Subroutine

Program Description:

WAVEND is the final pass of waveform operation in the WPS language facility PARLAN. WAVEND formats the raw (floating point data and coordinate check header and tail) sector pairs to one sector block of integer data in disk waveform format. WAVEND also serves as recorder of missing waveform coordinates, i.e., coordinates less than the maximum coordinate which were never assigned a value at run time.

Inputs:

The waveform file control block address which supplies the information in the main of the extension blocks.

Outputs:

A formatted waveform to the output file specified in the control block.

Program is contained in overlay(s):

Program Name: WAVGET Program Type: Subroutine

Program Description:

WAVGET reads the next sector (256 words) of the designated waveform file. An end-of-file return indicates to the main caller (GETWAV or MORWAV) that no more waveforms are available in this file.

Inputs:

None
(File name was pre-loaded by subroutine LODNAM)

Outputs:

The file's next sector to the internal buffer used by most of the waveform I/O subroutines.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: WAVSEC Program Type: Subroutine

Program Description:

WAVSEC computes the total number of points and the total number of sectors per waveform. WAVSEC supports the main waveform I/O subroutines GETWAV and MORWAV.

Inputs:

1. the first waveform block header
2. the address for (output) total sectors this waveform
3. the address for (output) total points this waveform

Outputs:

Return of the total # of sectors and total # of points this waveform.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: WBKUP Program Type: Subroutine

Program Description:

"WBKUP" backs up the WPS I/O pointers a specified number of sectors

Inputs:

a) Number of sectors to back up

Outputs:

a) Updated I/O pointers

Program Name: WEIGHT Program Type: Subroutine

Program Description:

WEIGHT applies either Hanning, Hamming, Blackman or rectangular weighting functions to a single-precision floating-point valued array (e.g., a waveform window).

Inputs:

1. source of destination array address
2. weighting function code address

   Ø -- rectangular (no weighting)
   1 -- Hanning
   2 -- Hamming
   3 -- Blackman

3. the address of the array dimensionality

Outputs:

The array transformed by the weighting function.

Program is contained in overlay(s):

SPCEXC

Program Name: WIDOUT Program Type: Subroutine

Program Description:

WIDOUT outputs in ASCII a waveform or vector identification number.

Inputs:

Address of ID
Address of ASCII character buffer

Outputs:

ASCII representation of an ID

Program is contained in overlay(s):

PRTRND, PRNHDR, PWAVEC

Program Name: WPOSIT

Program Type: Language Subroutine

Program Description:

WPOSIT positions the output file to the beginning of the current wave. Output file control block contains starting sector.

Inputs:

The waveform file control block address. The starting sector of the current wave is located in the extension block. (See program listing.)

Outputs:

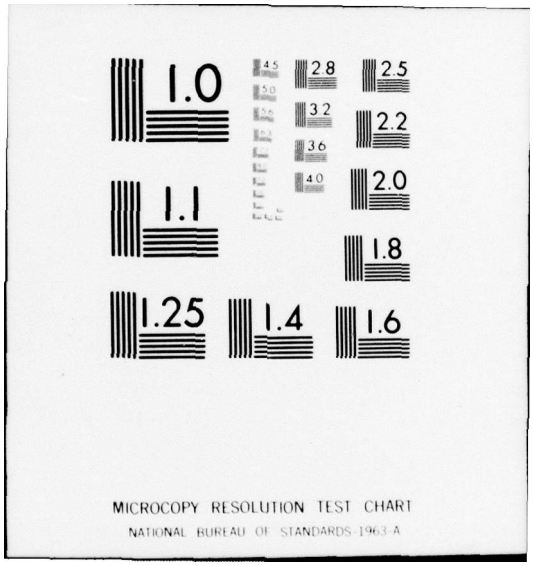
The file is positioned to the starting sector of the current waveform via the modification of the WPS I/O tables.

Program is contained in overlay(s):

AD-A038 331 PATTERN ANALYSIS AND RECOGNITION CORP ROME N Y F/G 9/2
THE WAVEFORM PROCESSING SYSTEM (WPS). VOLUME IV, PART 3.(U)
FEB 77 P K SANYAL F30602-72-C-0193
UNCLASSIFIED PAR-76-6-VOL-4-PT-3 RADC-TR-76-224-4-3 NL

4 OF 4
ADA038331

END
DATE FILMED
5-77


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Program Name: WPSERR Program Type: Subroutine

Program Description:

WPSERR is the subroutine which is called when a WPS program wishes to issue an error message and exit to the executive: in almost all cases, a fatal error. The advantages of using WPSERR are:

1. Common messages (residing in a separate overlay) are used and reference to a message is made by number association.

2. WPSERR may be called from any level. This is to say that there is no need to return to the main program level by adjusting the stack or incorporating walk-back returns at every level routine. A clean return is always guaranteed.

3. Error conditions are readily diagnosed, since any message issued is prefixed by the name of the overlay plus the absolute address of the call. In addition, any message can be issued using no more than two instruction words, so that a 'JMP' instruction may be replaced by a '.CALL @RØ,11', where RØ was pre-loaded with the address of WPSERR and 11 is the eleventh message in the message table of overlay ERRORS. In this way, the cost of distributing error message issues is minimal.

Inputs:

The message number corresponding to the desired message to be issued.

Outputs:

A message on the VG screen (the communications region) and the message "Select Light Button" from the executive.

Program is contained in overlay(s):

COMMON ROUTINE

Program Name: WPSTAP Program Type: Overlay

General Description:

WPSTAP allows the user to write a specified tree on magnetic tape. In doing so, it transforms the tree from disk format to WPS tape format, making it LODWAV compatible.

Inputs:

A WPS format waveform disk file

Outputs:

A WPS format tape

Program contained in overlay(s):

WPSTAP

Program Name: WRITE1 Program Type: Language Subroutine

Program Description:

WRITE1 writes the integer data page to the output waveform in the second pass of waveform synthesis. (See WAVEND.)

Inputs:

The waveform file control block address for:

1. The name of the output file
and 2. The buffer address

Outputs:

A one-sector block of waveform data written to the output file designated in the extension block.

Program is contained in overlay(s):

Program Name: WRITEB

Program Type: Vector I/O Subroutine

Program Description:

WRITEB writes the current vector page to disk in collaboration with PUTVEC and PVEOF.

Inputs:

R1 - the address of the vector file associate buffer
R4 - the address of word #5 of the file's ONAMT entry

Outputs:

See program description above.

Program is contained in overlay(s):

CRDWPL
DMEVAL
EIGEN
EVSORT
FEVCRE
LINKGO
LODVEC
PARTIO
PARTIT
PASS2
PCEVAL
SYNTAX
TEDDY

Program Name: WRITEP *Program Type:* Language Subroutine

Program Description:

WRITEP writes the current 512-word (two-sector) page of the output waveform being synthesized by the language subroutine PVTWP.

Inputs:

The sector addresses (of the 2 sectors currently in core) addressed from the waveform file control block. The buffer address is also taken from the control block.

Outputs:

The 2 sector page of the file updated.

Program is contained in overlay(s):

Program Name: XTRACT Program Type: Language Subroutine

Program Description:

XTRACT contains several entry points, each of which returns single-precision information from the extension file control block used in conjunction with PARLAN waveform I/O.

Inputs:

The waveform file control block

Outputs:

1. for 'GID', the waveform ID
2. for 'GMAXV', the wave maximum value
3. for 'GMINV', the wave minimum value
4. for 'GNPT', the # of points in the waveform
5. for 'GSM1', the first marker coordinate (begin marker)
6. for 'GSM2', the second marker coordinate (end marker)
7. for 'GSR', the waveform sampling rate
8. for 'GST', the start units (time or frequency) of this waveform

Program is contained in overlay(s):

Program Name: ZEROX Program Type: Subroutine

Program Description:

Subroutine ZEROX will find the number of zero crossings in "BUF1" and place the results in "VALUE".

Inputs:

A call to ZEROX assumes the data is in BUF1, the number of points is in "NUM", and that the number of zero crossings is returned to "VALUE".

Outputs:

"VALUE" contains the number of zero crossings

Program is contained in overlay(s):

SEGMNT

METRIC SYSTEM

BASE UNITS:

Quantity	Unit	SI Symbol	Formula
length	metre	m	...
mass	kilogram	kg	...
time	second	s	...
electric current	ampere	A	...
thermodynamic temperature	kelvin	K	...
amount of substance	mole	mol	...
luminous intensity	candela	cd	...

SUPPLEMENTARY UNITS:

plane angle	radian	rad	...
solid angle	steradian	sr	...

DERIVED UNITS:

Acceleration	metre per second squared	...	m/s
activity (of a radioactive source)	disintegration per second	...	(disintegration)/s
angular acceleration	radian per second squared	...	rad/s
angular velocity	radian per second	...	rad/s
area	square metre	...	m
density	kilogram per cubic metre	...	kg/m
electric capacitance	farad	F	A·s/V
electrical conductance	siemens	S	A/V
electric field strength	volt per metre	...	V/m
electric inductance	henry	H	V·s/A
electric potential difference	volt	V	W/A
electric resistance	ohm		V/A
electromotive force	volt	V	W/A
energy	joule	J	N·m
entropy	joule per kelvin	...	J/K
force	newton	N	kg·m/s
frequency	hertz	Hz	(cycle)/s
illuminance	lux	lx	lm/m
luminance	candela per square metre	...	cd/m
luminous flux	lumen	lm	cd·sr
magnetic field strength	ampere per metre	...	A/m
magnetic flux	weber	Wb	V·s
magnetic flux density	tesla	T	Wb/m
magnetomotive force	ampere	A	...
power	watt	W	J/s
pressure	pascal	Pa	N/m
quantity of electricity	coulomb	C	A·s
quantity of heat	joule	J	N·m
radiant intensity	watt per steradian	...	W/sr
specific heat	joule per kilogram-kelvin	...	J/kg·K
stress	pascal	Pa	N/m
thermal conductivity	watt per metre-kelvin	...	W/m·K
velocity	metre per second	...	m/s
viscosity, dynamic	pascal-second	...	Pa·s
viscosity, kinematic	square metre per second	...	m/s
voltage	volt	V	W/A
volume	cubic metre	...	m
wavenumber	reciprocal metre	...	(wave)/m
work	joule	J	N·m

SI PREFIXES:

Multiplication Factors	Prefix	SI Symbol
1 000 000 000 000 = 10^{12}	tera	T
1 000 000 000 = 10^{9}	giga	G
1 000 000 = 10^{6}	mega	M
1 000 = 10^{3}	kilo	k
100 = 10^{2}	hecto*	h
10 = 10^{1}	deka*	da
0.1 = 10^{-1}	deci*	d
0.01 = 10^{-2}	centi*	c
0.001 = 10^{-3}	milli	m
0.000 001 = 10^{-6}	micro	μ
0.000 000 001 = 10^{-9}	nano	n
0.000 000 000 001 = 10^{-12}	pico	p
0.000 000 000 000 001 = 10^{-15}	femto	f
0.000 000 000 000 000 001 = 10^{-18}	atto	a

* To be avoided where possible.

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Rome Air Development Center

RADC plans and conducts research, exploratory and advanced development programs in command, control, and communications (C^3) activities, and in the C^3 areas of information sciences and intelligence. The principal technical mission areas are communications, electromagnetic guidance and control, surveillance of ground and aerospace objects, intelligence data collection and handling, information system technology, ionospheric propagation, solid state sciences, microwave physics and electronic reliability, maintainability and compatibility.