

PURDUE UNIVERSITY

inter office memorandum

To Distribution
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Date July 16, 1979
Subject Compatibility Programs for LARSYS and EOD-LARSYS

The attached document describes a set of Fortran programs which were developed for SR&T Task 2A, Landsat Crop Inventory.

The purpose of these programs is to permit the use of certain aspects of LARSYS and EOD-LARSYS in the same analysis procedure. Statistics decks and results files from each system can be converted to files compatible with the other system.

Two examples of usage are as follows. Statistics developed in EOD-LARSYS could be used by another classifier, such as ECHO or minimum distance. Results files from a LARSYS classification could be converted to EOD-LARSYS format so that a stratified area estimate could be made.

The programs reside on a disk on LARS' IBM 370/148 which may be accessed by any system user.

MMH/CJ:ja

Attachments

PURDUE-LARSYS ↔ EOD-LARSYS
CONVERSION PROGRAMSCarol Jobusch
May 1979

This memo documents a set of four FORTRAN programs to allow communication between PURDUE-LARSYS and EOD-LARSYS data analysis systems, by converting a statistics deck (statdeck) or a results file produced by one system into a format which can be read and used by the other.

LARSJSCS - converts PURDUE-LARSYS statistics deck to EOD-LARSYS format

JSCLARSS - converts EOD-LARSYS statistics deck to PURDUE-LARSYS format

LARSJSCR - converts PURDUE-LARSYS results file to EOD-LARSYS format

JSCLARSR - converts EOD-LARSYS results file to PURDUE-LARSYS format

I. Statistics Deck Conversion Programs

1. Descriptions of Statistics Decks

See LARSYS SYSTEM MANUAL, pp. 5-7 to 5-12, for a description of a PURDUE-LARSYS statistics deck [1].

See EOD-LARSYS USER DOCUMENTATION, Vol. I, pp. 3-8 to 3-14, for a description of the variables in an EOD-LARSYS statdeck [2]. The EOD-LARSYS USER GUIDE for the IBM 370/148 Vol. II-USER'S REFERENCE MANUAL [3] repeats the same description in section 3.1.4.1. The structure of the EOD-LARSYS statistics deck has changed since the documentation was written. The current structure is given below. It is now written as binary variable-length spanned records of length 320. Some "card types" have been combined, and the order of some variables has changed. In particular, the covariance matrix for a subclass is written before the means. The format used for EOD-LARSYS statdecks by the conversion programs was decided upon by examining hex printouts of some sample EOD-LARSYS statdecks.

1.1 Structure of an EOD-LARSYS Statdeck

Variable-length spanned records (RECFM VS BLOCK 320)

Unformatted (binary) I/O.

All variables have length 4 bytes (one full word).

Variables marked '*' were given dummy values during PURDUE-LARSYS to EOD-LARSYS conversion. Values of all other variables were derived from information in the PURDUE-LARSYS statdeck.

Record 1

<u>No. of Words</u>	<u>Variable Type</u>	<u>Definition</u>
1	Integer	NCLAS Number of training subclasses from STAT or ISOCLS
1	Integer	NCLUS Number of training subclasses from STAT (clusters from ISOCLS)
1	Integer	NCHAN Number of channels used in computation of statistics
* 1	Integer	NTRFLD Number of training fields input to STAT or ISOCLS (dummy value=1)
* 1	Integer	NVERT Number of vertices in all the training fields (dummy value=5)
NCHAN	Integer	CHAN Vector (length NCHAN) of channels used in computation of statistics

Record 2 Note: each of the EOD-LARSYS statdecks that we examined had only one "training field." Therefore, we do not know the file structure when there is more than one training field.

<u>No. of Words</u>	<u>Variable Type</u>	<u>Definition</u>
* 1	Alpha	Name of the training field (dummy value = 'AREA')
* 1	Integer	Number of the class associated with this field (dummy value =1)
* 1	Integer	Number of the subclass associated with this field input to STAT (ISOCLS dummies this information by setting it equal to zero)
* 1	Integer	Number of vertices for this field, including closure point (dummy value =5)

Record 3 Vertices for the training field: Up to 10 vertices plus the closure point are allowable for each training field. The coordinates are listed in a clockwise manner, with the coordinate having the smallest sample (i.e., column) number listed first.

<u>No. of Words</u>	<u>Variable Type</u>	<u>Definition</u>
* 1	Integer	Sample number of first vertex
* 1	Integer	Line number of first vertex
		. . .
* 1	Integer	Sample number of closure point
* 1	Integer	Line number of closure point

Record 4

<u>No. of Words</u>	<u>Variable Type</u>	<u>Definition</u>
NCLAS	Alpha	Four-character name for each class
NCLAS	Integer	Number of clusters (or subclasses) in each of the training classes
NCLUS	Alpha	Four-character name for each cluster or subclass

Record 5. One record for each cluster or subclass.

<u>No. of Words</u>	<u>Variable Type</u>	<u>Definition</u>
1	Integer	Number of points in the cluster
<u>NCHAN(NCHAN+1)</u>	Real	Covariance matrix for the cluster, symmetric storage mode
2		
NCHAN	Real	Mean for each channel for this cluster

2. Conversion of PURDUE-LARSYS statdeck to EOD-LARSYS statdeck

Program name: LARSJSCS FORTRAN
LARSJSCS EXEC

The EXEC routine calls the compiled FORTRAN program to read a LARSYS statdeck from the user's A disk, determine the EOD class-subclass structure based on the PURDUE-LARSYS class names, and write an EOD-LARSYS format statdeck on the user's A disk. (To read or write on another disk, change the file definitions in the EXEC.) The program can read either a binary or character format PURDUE-LARSYS deck, and handles a maximum of 30 channels and 60 LARSYS classes.

To execute the program the following sequence of commands should be followed:

```
> I CMS370
> GETDISK JSCDISK 29A 29A E PASS JLK
> LARSJSCS      fn      ft      fn      ft
                input          output
                PURDUE-LARSYS  EOD-LARSYS
                Statdeck       Statdeck
```

Note: LARSJSCS was compiled by the FORTRAN H Extended compiler and therefore cannot be executed in CMS360. The program could be recompiled by the user for CMS360, if desired.

Input Files:

Unit 1 (Disk) PURDUE-LARSYS statdeck (character or binary format)

Output Files:

Unit 20 (Disk) EOD-LARSYS statdeck (unformatted I/O)
Unit 16 (Terminal) error messages

The program writes the dummy value 'AREA' for the EOD-LARSYS field name and dummy values for the number of training fields, number of vertices, and vertex coordinates.

PURDUE-LARSYS classes correspond to EOD-LARSYS subclasses. EOD-LARSYS classes are similar to LARSYS pools. The program constructs EOD-LARSYS classes by grouping LARSYS classes according to the first two characters of the LARSYS class name. The EOD-LARSYS class name will consist of these two characters; the EOD-LARSYS subclass name will consist of the first four characters of the LARSYS class name.

Example: given a LARSYS statdeck with classes

CO01
SY01
CO02
CO03
EL01
SY02,

we would get an EOD-LARSYS statdeck with

<u>EOD-LARSYS CLASSES</u>	<u>SUBCLASSES</u>
CO	CO01 CO02 CO03
SY	SY01 SY02
EL	EL01

If existing PURDUE-LARSYS class names are not in this format, use the PURDUE-LARSYS processor MERGESTATISTICS to rename LARSYS classes before using this conversion program.

3. Conversion of EOD-LARSYS statdeck to PURDUE-LARSYS statdeck

Program name: JSCLARSS FORTRAN
JSCLARSS EXEC

The EXEC routine calls the compiled FORTRAN program to read an EOD-LARSYS statistics deck from the user's A disk, convert it to PURDUE-LARSYS format, and write the resulting statistics deck on the user's A disk, with the same filename as the EOD-LARSYS statdeck and filetype "SAVED". The program can handle a maximum of 30 channels and 60 subclasses.

PURDUE-LARSYS needs information on channel wavelengths which is not available from the EOD-LARSYS statdeck. There is a set of default wavelengths—seven cycles of the four Landsat bands; i.e., channels 1,5,9 . . . are .5-.6 μm , channels 2,6,10 . . . are .6-.7 μm , channels 3,7,11 . . . are .7-.8 μm , and channels 4,8,12 . . . are .8-1.1 μm . If the EOD-LARSYS statdeck has used a sample of Landsat MSS bands (e.g., contains only bands 2 and 4 from a number of dates) or was derived from non-Landsat data, then a special file should be prepared on the user's A disk giving low and high ends of the channels actually in the statdeck. The name and type of file will be input as parameters in execution.

If the default set of wavelength bands is used, the resulting statistics deck will be in binary format. If a character format deck is desired, then the wavelength band file must be user input with character format specified.

To execute the program, type

```
> I CMS370
> GETDISK JSCDISK 29A 29A E PASS JLK
> JSCLARSS   fn   ft   run-number   fn   ft
              input EOD   Optional input
              Statdeck   wavelengths
```

Note: JSCLARSS was compiled by the FORTRAN H Extended compiler and therefore cannot be executed in CMS360. However, the user could recompile the Fortran program in CMS360 if desired.

Input Files:

Unit 20 (Disk) EOD-LARSYS statdeck
Unit 5 (Disk) Optional - wavelength file

Line 1. Col 1-5, low end of wavelength for first channel
Col 6-10, high end of wavelength for first channel
Col 12-15, write 'CHAR' if you want PURDUE-LARSYS statistics
in character format. Otherwise, leave blank.

Line 2. Col 1-5, low end of wavelength for second channel
Col 6-10, high end of wavelength for second channel

Line 3,4 . . . wavelengths for 3rd, 4th, . . . channels

Unit 15 (Terminal) reads LARS run number from EXEC parameter

Output Files:

Unit 2 (Disk) PURDUE-LARSYS statdeck
Unit 16 (Terminal) error messages

II. Results File Conversion Programs

1. Conversion of PURDUE-LARSYS results file to EOD-LARSYS results file

Program Name: LARSJSCR FORTRAN
LARSJSCR EXEC

The EXEC routine calls the compiled FORTRAN program to read a PURDUE-LARSYS results file from tape, convert it to EOD-LARSYS format, and write an EOD-LARSYS format results file on a temporary disk. It then backs up the temporary disk to tape. For details about the conversion, see the documentation for program LARSJSCR (statistics deck conversion).

To execute the program:

> I CMS370

> GETDISK JSCDISK 29A 29A E PASS JLK

> LARSJSCR	<u>tape-no.</u>	<u>file-no.</u>	<u>tape-no.</u>	<u>file-no.</u>
input:	PURDUE-LARSYS	results file	output:	EOD-LARSYS
				results file

LARSJSCR was compiled by the FORTRAN H Extended compiler and therefore cannot be executed in CMS360.

It allows up to 16 channels, 60 LARSYS classes, and 200 points per line in the area classified. To allow more channels, or more points per line, change the dimensions of certain arrays (as specified by comments in the program), and recompile. For details on results file format see:

- (1) LARSYS System Manual, pages 5-33 to 5-44 [1].
- (2) EOD-LARSYS User Documentation, Appendix C [2].

Input Files:

Unit 12 (Tape) PURDUE-LARSYS Results file
Unit 15 (Terminal) reads stacked information provided by the EXEC to check that the correct tape was mounted.

Output Files:

Unit 2 (Temp Disk) EOD-LARSYS Results File
Unit 16 (Terminal) error messages

The program writes dummy values for

- (1) date of classification
- (2) training field information
- (3) Cholesky factorization of covariance matrices
- (4) likelihood that the classified data point belongs to the assigned EOD-LARSYS subclass.

Note that "Thresholding" is not possible with the EOD-LARSYS results file due to the dummy values for likelihood.

2. Conversion of EOD-LARSYS results file to PURDUE-LARSYS results file

Program name: JSCLARSR FORTRAN
JSCLARSR EXEC

The EXEC routine calls the compiled FORTRAN program to read an EOD-LARSYS results file from a D disk, convert it to PURDUE-LARSYS format, and write a PURDUE-LARSYS results file onto tape.

PURDUE-LARSYS needs information on channel wavelengths which is not available from the EOD-LARSYS results file. There is a set of default wavelengths or the user may prepare a special file on his A disk. See documentation on JSCLARSS, statdeck conversion, for further detail.

A normal PURDUE-LARSYS results file contains a copy of the header record from the LARSYS data tape. The conversion program provides dummy values for most of the variables in this header, since the EOD-LARSYS results file does not contain this information. A LARSYS run-number is a required input parameter. If a real run-number doesn't exist (i.e., if there is no LARSYS format data tape), then use any convenient eight-digit number (e.g., 12345678) as a dummy run-number. Use the same dummy run-number on any test field description cards that will be used with the results file.

If a LARSYS format data tape does exist, you may wish to specify its tape and file number for documentation purposes. (This is normally included in the data tape identification record.) This can be done by specifying tape and file numbers as part of the first line of the wavelength file (Unit 5). See below for format details. The wavelength file should include only the channels used in classification (often a subset of the channels in the original data, especially in the case of a multitemporal data set).

To execute the program:

```
>I CMS370
```

```
>GETDISK JSCDISK 29A 29A E PASS JLK
```

```
>JSCLARSR      filename      tape-no file-no run-number fn ft
                input: EOD-LARSYS      output:      optional
                results file           PURDUE-LARSYS input
                                      results file      wavelenghts
```

JSCLARSR was compiled by the FORTRAN H Extended Compiler and therefore cannot be executed in CMS360.

The program allows up to 16 channels, 60 LARSYS classes, and 200 points per line in the area classified. To allow more channels, or more points per line, change the dimensions of certain arrays (as specified by comments in the program) and recompile. For details on results file format see:

- (1) LARSYS System Manual, pages 5-33 to 5-44 [1].
- (2) EOD-LARSYS User Documentation, Appendix C [2].

Input Files:

Unit 2 (TempDisk) EOD-LARSYS Results File
 Unit 5 (Disk) optional - wavelength file

```
Line 1.  Col 1-5, low end of wavelength for first channel
         Col 6-10, high end of wavelength for first channel
         Col 11-15, blank
         Col 16-19 } tape and file number of LARSYS data
         Col 20-22 } file (right justified in field)
```

```
Line 2, 3, . . . wavelenghts for 2nd, 3rd, . . . channels in the same
                  format
```

Unit 15 (Terminal) reads LARS run-number from EXEC parameter

Output Files:

Unit 12 (Tape) PURDUE-LARSYS results file
 Unit 16 (Terminal) error messages

III. References

1. Hunt, Kay, ed. 1974. LARSYS System Manual. Laboratory for Applications of Remote Sensing, Purdue University, West Lafayette, Indiana, second edition.
2. Minter, R.T., B.E. Wills, and C.T. Gardner. 1977. User Documentation, EOD-LARSYS. NASA Johnson Space Center, Houston, Texas. Fourth Revision. (JSC-12504) (LEC-3984)
3. Stewart, J., and P.J. Aucoin. 1978. EOD-LARSYS User Guide for the IBM 370/148, Vol. II-User's Reference Manual. NASA Johnson Space Center, Houston, Texas. (JSC-13821) (LEC-12564)

APPENDIX.

Program Listings

FILE: LARSJSCS EXEC E1

CONVERSATIONAL MONITOR SYSTEM

```
* LARSJSCS - FORTRAN PROGRAM TO CONVERT PURDUE-LARSYS STATDECK
* TO EOD-LARSYS FORMAT.
*
&CONTROL ERROR
&IF &INDEX LT 4 &GOTO -ERROR
GLOBAL TXLIB FORMOD2 CMSLIB
FI 1 DISK &1 &2 A
FI 20 DISK &3 &4 A4 (RECFM VS LRECL 320 BLOCK 320)
FI 16 TERMINAL
LOAD LARSJSCS (NOMAP)
START
&ERROR &EXIT &RETCODE
&REGTYPE
EXECUTION COMPLETE.
&END
&EXIT
-ERROR
&REGTYPE
PLEASE TRY AGAIN. YOU MUST SPECIFY FOUR ARGUMENTS FOR LARSJSCS:
  1. FILENAME FOR LARSYS STATDECK (ASSUMED TO BE ON YOUR A DISK)
  2. FILETYPE FOR LARSYS STATDECK
  3. FILENAME FOR EOD STATDECK (WHICH WILL BE PUT ON YOUR A DISK)
  4. FILETYPE FOR EOD STATDECK
&END
```

```

C ***** LAR00010
C *** LARSJSCS *** LAR00020
C LAR00030
C PROGRAM TO CONVERT A PURDUE-LARSYS STATDECK TO EOD-LARSYS FORMAT LAR00040
C LAR00050
C SEE LARSYS SYSTEM MANUAL, 5-7 TO 5-12 , FOR A DESCRIPTION OF LAR00060
C THE FORMAT OF A PURDUE-LARSYS STATDECK. LAR00070
C LAR00080
C SEE EOD-LARSYS USER DOCUMENTATION, 3-8 TO 3-13, FOR AN LAR00090
C OUT-OF-DATE DESCRIPTION OF THE FORMAT OF AN EOD-LARSYS STATDECK. LAR00100
C LAR00110
C WRITTEN MARCH 1979 BY CAROL JOBUSCH LAR00120
C LAR00130
C INPUT FILES LAR00140
C UNIT 1. LARSYS STATDECK (DISK) LAR00150
C LAR00160
C OUTPUT FILES LAR00170
C UNIT 20. EOD-LARSYS STATDECK (DISK) LAR00180
C UNIT 16. TERMINAL - ERROR MESSAGES LAR00190
C LAR00200
C ***** LAR00210
C LAR00220
C LAR00230
C LAR00240
C IMPLICIT INTEGER*4 (A-Z) LAR00250
C REAL*4 AVER(30,60),COVAR(465,60) LAR00260
C INTEGER*4 SUBNAM(60),CLSNAM(60),SRBNM(60),NPTS(60),NSUBCL(60), LAR00270
C * CHAN(30) LAR00280
C INTEGER*2 CLNM2(120),SUB2(120),INDX(60),IFLAG(60) LAR00290
C LOGICAL*1 NAME1(4),CHAR(12) LAR00300
C * EQUIVALENCE (NAME,NAME1(1)),(SUBNAM(1),SUB2(1)), LAR00310
C * (CLSNAM(1),CLNM2(1)),(CTEST,CHAR(1)) LAR00320
C DATA LARS,CLAS,BLANK,FLDNAM/'LARS','CLAS',' ','AREA'/ LAR00330
C LAR00340
C K = 0 LAR00350
C READ(1,100,END=200) NAME,BINFLG LAR00360
100 FORMAT(A4,I4,I1) LAR00370
C IF(NAME .NE. LARS) GO TO 210 LAR00380
C LAR00390
C READ CLASS CARDS LAR00400
C LAR00410
C 5 READ(1,110,END=220) ICLAS,CHAR LAR00420
110 FORMAT(A4,2X,I2A1) LAR00430
C IF(ICLAS .EQ. CLAS) GO TO 8 LAR00440
C IF(CTEST .EQ. CLAS) GO TO 25 LAR00450
C GO TO 5 LAR00460
C 8 NAME = BLANK LAR00470
C DO 10 I=1,12 LAR00480
C NAME1(I) = CHAR(I) LAR00490
C IF(NAME .NE. BLANK) GO TO 15 LAR00500
C 10 CONTINUE LAR00510
C 15 DO 20 J=2,4 LAR00520
C 20 NAME1(J) = CHAR(I-1+J) LAR00530
C K = K+1 LAR00540
C SUBNAM(K) = NAME LAR00550
C GO TO 5 LAR00560
C LAR00570
C READ REST OF LARSYS STATDECK LAR00580
C LAR00590
C 25 BACKSPACE 1 LAR00600
C READ(1,120,END=220) NCLUS,NCHAN LAR00610
120 FORMAT(I5,17X,I5) LAR00620
C DO 30 I=1,NCHAN LAR00630
C 30 READ(1,130,END=220) CHAN(I) LAR00640
130 FORMAT(5X,I2) LAR00650
C NCOV = NCHAN*(NCHAN+1)/2 LAR00660
C DO 35 I = 1, NCLUS, 7 LAR00670
C J = I + 6 LAR00680
C IF (J .GT. NCLUS) J = NCLUS LAR00690
C 140 READ(1, 140) (NPTS(II), II = I, J) LAR00700
C 140 FORMAT(8X,7I9) LAR00710
C 35 CONTINUE LAR00720
C LAR00730
C MEAN VECTORS LAR00740
C LAR00750
C IF (BINFLG.NE.0) INT = 17 LAR00760
C IF (BINFLG.EQ.0) INT = 5 LAR00770
C DO 40 J=1,NCLUS LAR00780
C DO 40 II=1,NCHAN,INT LAR00790
C K = II+INT-1

```

```

      IF (K.GT.NCHAN) K = NCHAN
      IF (BINFLG.EQ.0) READ(1,150) (AVER(KK,J),KK=II,K)
      IF (BINFLG.NE.0) READ(1,160) (AVER(KK,J),KK=II,K)
150  FORMAT(2X,5E14.7)
160  FORMAT(2X,17A4)
      40 CONTINUE
C
C COVARIANCE MATRIX
C
      DO 50 J=1,NCLUS
      DO 50 II=1,NCOV,INT
      K = II+INT-1
      IF (K.GT.NCOV) K=NCOV
      IF (BINFLG.EQ.0) READ(1,150) (COVAR(KK,J),KK=II,K)
      IF (BINFLG.NE.0) READ(1,160) (COVAR(KK,J),KK=II,K)
      50 CONTINUE
C
C DETERMINE CLASS-SUBCLASS STRUCTURE FOR EOD-LARSYS STATDECK
C BASED ON THE FIRST TWO CHARACTERS OF THE LARSYS CLASS NAMES
C
      DO 60 I=1,NCLUS
      IFLAG(I) = 0
      60  INDX(I) = 0
      NCLAS = 0
      K = 0
      DO 70 I=1,NCLUS
      IF (IFLAG(I) .NE. 0) GO TO 70
      NCLAS = NCLAS + 1
      K = K+1
      SRSBNM(K) = SUBNAM(I)
      CLSNAM(NCLAS) = BLANK
      CLNM2(2*NCLAS-1) = SUB2(2*I-1)
      NSUBCL(NCLAS) = 1
      IFLAG(I) = 1
      INDX(K) = I
      IF (K .EQ. NCLUS) GO TO 80
      IP1 = I+1
      DO 65 J=IP1,NCLUS
      IF (IFLAG(J) .NE. 0) GO TO 65
      IF (SUB2(2*J-1) .NE. CLNM2(2*NCLAS-1)) GO TO 65
      K = K+1
      NSUBCL(NCLAS) = NSUBCL(NCLAS) + 1
      SRSBNM(K) = SUBNAM(J)
      IFLAG(J) = 1
      INDX(K) = J
      65 CONTINUE
      70 CONTINUE
C
C WRITE EOD-LARSYS STATDECK
C
      80  NTRFLD = 1
      NVERT = 5
      V1 = 1
      V100 = 100
      DUM1 = 1
      DUM0 = 0
      WRITE(20)NCLAS,NCLUS,NCHAN,NTRFLD,NVERT,(CHAN(I),I=1,NCHAN)
      WRITE(20)FLDNAM,DUM1,DUM0,NVERT
      WRITE(20)V1,V1,V100,V1,V100,V100,V1,V100,V1,V1
      WRITE(20)(CLSNAM(I),I=1,NCLAS),(NSUBCL(I),I=1,NCLAS),
      * (SRSBNM(I),I=1,NCLUS)
      DO 90 J=1,NCLUS
      K = INDX(J)
      90  WRITE(20)NPTS(K),(COVAR(I,K),I=1,NCOV),(AVER(I,K),I=1,NCHAN)
      STOP
C
C ERROR STOPS
C
      200 WRITE(16,300)
      300 FORMAT('EMPTY FILE, UNIT 1, SHOULD CONTAIN LARSYS STATDECK')
      STOP
      210 WRITE(16,310)
      310 FORMAT('UNIT 1 SHOULD BE LARSYS STATDECK')
      STOP
      220 WRITE(16,320)
      320 FORMAT('UNEXPECTED EOF, CHECK LARSYS STATDECK')
      STOP
C
      END

```

```

LAR00800
LAR00810
LAR00820
LAR00830
LAR00840
LAR00850
LAR00860
LAR00870
LAR00880
LAR00890
LAR00900
LAR00910
LAR00920
LAR00930
LAR00940
LAR00950
LAR00960
LAR00970
LAR00980
LAR00990
LAR01000
LAR01010
LAR01020
LAR01030
LAR01040
LAR01050
LAR01060
LAR01070
LAR01080
LAR01090
LAR01100
LAR01110
LAR01120
LAR01130
LAR01140
LAR01150
LAR01160
LAR01170
LAR01180
LAR01190
LAR01200
LAR01210
LAR01220
LAR01230
LAR01240
LAR01250
LAR01260
LAR01270
LAR01280
LAR01290
LAR01300
LAR01310
LAR01320
LAR01330
LAR01340
LAR01350
LAR01360
LAR01370
LAR01380
LAR01390
LAR01400
LAR01410
LAR01420
LAR01430
LAR01440
LAR01450
LAR01460
LAR01470
LAR01480
LAR01490
LAR01500
LAR01510
LAR01520
LAR01530
LAR01540
LAR01550
LAR01560
LAR01570
LAR01580

```

```

* JSCLARSS - FORTRAN PROGRAM TO CONVERT EOD-LARSYS STATDECK
* TO PURDUE-LARSYS FORMAT.
*
&CONTROL ERROR
&IF &INDEX LT 3 &GOTO -ERROR
GLOBAL TXTLIB FORTMOD2 CMSLIB
&ERROR &EXIT
FI 2 DISK &1 SAVED A (RECFM F LRECL 80 BLOCK 80
FI 5 DISK WAVE LENGTHS E
FI 15 TERMINAL
FI 20 DISK &1 &2 A4 (RECFM VS LRECL 320 BLOCK 320
FI 16 TERMINAL
&STACK &3
&IF &INDEX = 4 &GOTO -ERROR
&IF &INDEX = 5 FI 5 DISK &4 &5 A
LOAD JSCLARSS (NOMAP
START
&ERROR &EXIT &RETCODE
&REGTYPE
EXECUTION COMPLETE.
&END
&EXIT
-ERROR
&REGTYPE
PLEASE TRY AGAIN. YOU MUST SPECIFY THREE ARGUMENTS FOR JSCLARSS;
1. FILENAME FOR EOD-LARSYS STATDECK (ASSUMED TO BE ON YOUR A DISK)
2. FILETYPE FOR EOD-LARSYS STATDECK
3. PURDUE-LARSYS RUN NUMBER
-----
PURDUE-LARSYS NEEDS INFO ON CHANNEL WAVELENGTHS NOT AVAILABLE FROM
THE EOD-LARSYS STATDECK. THERE IS A DEFAULT SET OF WAVELENGTHS -
SEVEN CYCLES OF THE FOUR LANDSAT BANDS. IF THE EOD-LARSYS STATDECK HAS
SAMPLED CHANNELS, THEN A SPECIAL FILE SHOULD BE PREPARED GIVING
LOW AND HIGH ENDS OF THE BANDS ACTUALLY IN THE STATDECK. THIS
FILE SHOULD BE ON YOUR A-DISK AND ITS FILENAME AND FILETYPE
SPECIFIED AS ARGUMENTS 4 AND 5 FOR JSCLARSS.
-----
THE LARSYS STATDECK WILL BE PUT ON YOUR A DISK WITH THE SAME
FILENAME AS THE EOD-LARSYS STATDECK AND FILETYPE = SAVED.
&END

```

FILE: WAVE LENGTHS E1

CONVERSATIONAL MONITOR SYSTEM

0.5	0.6
0.6	0.7
0.7	0.8
0.8	1.1
0.5	0.6
0.6	0.7
0.7	0.8
0.8	1.1
0.5	0.6
0.6	0.7
0.7	0.8
0.8	1.1
0.5	0.6
0.6	0.7
0.7	0.8
0.8	1.1
0.5	0.6
0.6	0.7
0.7	0.8
0.8	1.1
0.5	0.6
0.6	0.7
0.7	0.8
0.8	1.1


```

C*****JSC00010
C      *** JSCLARSS ***JSC00020
C      PROGRAM TO CONVERT AN EOD-LARSSYS STATDECK TO STANDARDJSC00030
C      PURDUE-LARSSYS FORMAT.JSC00040
C      WRITTEN JANUARY 1979 BY CAROL JOBUSCHJSC00050
C      INPUT FILES JSC00060
C      UNIT 20. EOD-LARSSYS STATDECK (VARIABLE LENGTH RECORDS) JSC00070
C      UNIT 5. ADDITIONAL INFORMATION NEEDED FOR PURDUE-LARSSYS STATDECK JSC00080
C      LINE 1. COLS 1-5, LOW END OF WAVELENGTH FOR FIRST CHANNEL JSC00090
C      COLS 6-10, HIGH END OF WAVELENGTH FOR FIRST CHANNEL JSC00100
C      COLS 12-15, WRITE 'CHAR' IF YOU WANT PURDUE-LARSSYS JSC00110
C      STATISTICS IN CHARACTER FORMAT. OTHERWISE, JSC00120
C      LEAVE BLANK. JSC00130
C      LINE 2. COLS 1-5, LOW END OF WAVELENGTH FOR SECOND CHANNEL JSC00140
C      COLS 6-10, HIGH END OF WAVELENGTH FOR SECOND CHANNEL JSC00150
C      LINE 3,4,... WAVELENGTHS FOR 3RD, 4TH, ... CHANNELS JSC00160
C      UNIT 15. TERMINAL - READS RUN NUMBER FROM EXEC JSC00170
C      OUTPUT FILES JSC00180
C      UNIT 2. PURDUE-LARSSYS STATDECK JSC00190
C      UNIT 16. TERMINAL - ERROR MESSAGES JSC00200
C*****JSC00210
C      VARIABLES READ FROM EOD-LARSSYS STATDECK JSC00220
C      NCLAS NUMBER OF TRAINING CLASSES JSC00230
C      NCLUS TOTAL NUMBER OF TRAINING SUBCLASSES (CLUSTERS) JSC00240
C      NCHAN NUMBER OF CHANNELS USED JSC00250
C      NTRFLD NUMBER OF TRAINING FIELDS JSC00260
C      NVERT NUMBER OF VERTICES IN ALL TRAINING FIELDS JSC00270
C      CHAN ACTUAL CHANNELS USED JSC00280
C      CLSNAM CLASS NAMES JSC00290
C      NSUBCL NUMBER OF SUBCLASSES (CLUSTERS) IN EACH CLASS JSC00300
C      SUBNAM SUBCLASS (CLUSTER) NAMES JSC00310
C      AVER MEAN FOR EACH CHANNEL IN EACH SUBCLASS JSC00320
C      COVAR LOWER TRIANGULAR PORTION OF COVARIANCE MATRIX FOR JSC00330
C      EACH SUBCLASS JSC00340
C      VARIABLES READ FROM UNIT 5 JSC00350
C      ICHAR INDICATOR VARIABLE FOR PURDUE-LARSSYS FORMAT (CHAR OR BIN) JSC00360
C      FRQCAL WAVELENGTH (LOW AND HIGH ENDS) FOR EACH CHANNEL JSC00370
C*****JSC00380
C      INTEGER*4 BINFLG,RUNUM,CHAN(30),NPTS(60) JSC00390
C      INTEGER*4 CLSNAM(60),NSUBCL(60),SUBNAM(60) JSC00400
C      REAL*4 FRQCAL(2,30),AVER(30,60),COVAR(465,60) JSC00410
C      DATA NCHAR/'CHAR'/ JSC00420
C      READ EOD-LARSSYS STATDECK JSC00430
C      READ(20,END=200) NCLAS,NCLUS,NCHAN,NTRFLD,NVERT, JSC00440
C      1 (CHAN(I),I=1,NCHAN) JSC00450
C      DO 10 J=1,NTRFLD JSC00460
C      10 READ(20,1010,END=210) DUMMY1,DUMMY2 JSC00470
C      1010 FORMAT(A4/A4) JSC00480
C      READ(20,END=210) (CLSNAM(I),I=1,NCLAS),(NSUBCL(I),I=1,NCLAS), JSC00490
C      1 (SUBNAM(I),I=1,NCLUS) JSC00500
C      NCOV = NCHAN*(NCHAN+1)/2 JSC00510
C      DO 20 J=1,NCLUS JSC00520
C      20 READ(20,END=210) NPTS(J),(COVAR(I,J),I=1,NCOV), JSC00530
C      1 (AVER(I,J),I=1,NCHAN) JSC00540
C      READ RUN NUMBER, FORMAT FLAG, AND WAVELENGTHS FROM FT05F001 JSC00550
C      (USER PREPARED INPUT FILE) JSC00560
C      BINFLG = 1 JSC00570
C      READ(15,5000) RUNUM JSC00580
C      5000 FORMAT(18) JSC00590
C      READ(5,5010,END=230) FRQCAL(1,1),FRQCAL(2,1),ICHR JSC00600
C      IF(ICHR.EQ.NCHAR) BINFLG = 0 JSC00610
C      DO 30 J=2,NCHAN JSC00620
C      30 READ(5,5010,END=230) FRQCAL(1,J),FRQCAL(2,J) JSC00630
C      5010 FORMAT(2F5.2,1X,A4) JSC00640
C      JSC00650
C      JSC00660
C      JSC00670
C      JSC00680
C      JSC00690
C      JSC00700
C      JSC00710
C      JSC00720
C      JSC00730
C      JSC00740
C      JSC00750
C      JSC00760
C      JSC00770
C      JSC00780
C      JSC00790

```

```

C WRITE PURDUE-LARSSYS STATDECK
C
  KOUNT = 1
  WRITE (2, 2000) BINFLG, KOUNT
2000 FORMAT ('LARSSYS VERSION 3 STATISTICS FILE', T43, I2, T73, I8)
  KOUNT = KOUNT + 1
  DO 40 I = 1, NCLUS
  WRITE (2, 2010) SUBNAM(I), KOUNT
2010 FORMAT ('CLASS ', A4, T73, I8)
  KOUNT = KOUNT + 1
  WRITE (2, 2020) RUNUM, I, NCLUS, KOUNT
2020 FORMAT (I8, I3X, '9999 9999 9 9999 9999 9', I3, '/',
1 I2, T73, I8)
  KOUNT = KOUNT + 1
  40 CONTINUE
  WRITE (2, 2030) NCLUS, NCLUS, NCHAN, KOUNT
2030 FORMAT (I5, ' CLASS', I5, ' FIELD', I5, ' CHANNELS', T73, I8)
  DO 50 I = 1, NCHAN
  KOUNT = KOUNT + 1
  WRITE (2, 2040) CHAN(I), FRQCAL(1, I), FRQCAL(2, I), KOUNT
2040 FORMAT ('CHAN', I3, ' WAVELENGTH', F5.2, '-', F5.2,
1 ' CODE 1 C0 0.0 C1 0.0 C2 0.0', T73, I8)
  50 CONTINUE
  DO 60 I = 1, NCLUS, 7
  J = I + 6
  IF (J .GT. NCLUS) J = NCLUS
  KOUNT = KOUNT + 1
  WRITE (2, 2050) KOUNT, (NPTS(II), II = I, J)
2050 FORMAT (T73, I8, T1, 'NO. PTS.', T19)
  60 CONTINUE
C
C MEAN VECTORS
C
  IF (BINFLG.NE.0) INT = 17
  IF (BINFLG.EQ.0) INT = 5
  DO 80 J=1,NCLUS
  DO 80 II=1,NCHAN,INT
  K = II*INT-1
  IF (K.GT.NCHAN) K = NCHAN
  KOUNT = KOUNT + 1
  IF (BINFLG.EQ.0) WRITE (2,2060) KOUNT, (AVER(KK,J), KK=II,K)
  IF (BINFLG.NE.0) WRITE (2,2070) KOUNT, (AVER(KK,J), KK=II,K)
2060 FORMAT (T73, I8, T1, 'MN', 5E14.7)
2070 FORMAT (T73, I8, T1, 'MN', 17A4)
  80 CONTINUE
C
C COVARIANCE MATRIX
C
  DO 90 J=1,NCLUS
  DO 90 II=1,NCOV,INT
  K = II*INT-1
  IF (K.GT.NCOV) K=NCOV
  KOUNT = KOUNT + 1
  IF (BINFLG.EQ.0) WRITE (2,2080) KOUNT, (COVAR(KK,J), KK=II,K)
  IF (BINFLG.NE.0) WRITE (2,2090) KOUNT, (COVAR(KK,J), KK=II,K)
2080 FORMAT (T73, I8, T1, 'CV', 5E14.7)
2090 FORMAT (T73, I8, T1, 'CV', 17A4)
  90 CONTINUE
C
C WRITE THE END-OF-STAT-DECK RECORD
C
  KOUNT = KOUNT + 1
  WRITE (2, 2100) KOUNT
2100 FORMAT ('EOS', T16, '***** LAST CARD OF STATISTICS DECK ',
1 '*****', T73, I8)
  STOP
C
C ERROR STOPS
C
  200 WRITE (16, 6000)
6000 FORMAT (' EMPTY FILE, UNIT 1, SHOULD CONTAIN EOD-LARSSYS STATDECK')
  STOP
  210 WRITE (16, 6010)
6010 FORMAT (' UNEXPECTED END-OF-FILE, CHECK EOD-LARSSYS STATDECK')
  STOP
  220 WRITE (16, 6020)
6020 FORMAT (' EMPTY INPUT FILE, UNIT 5, SHOULD CONTAIN WAVELENGTHS')
  STOP
  230 WRITE (16, 6030) NCHAN

```

FILE: JSCLARSS FORTRAN E1

CONVERSATIONAL MONITOR SYSTEM

```
6030 FORMAT(' UNEXPECTED EOF, UNIT 5, SHOULD CONTAIN WAVELENGTHS FOR', JSC01590  
1 I3,' CHANNELS') JSC01600  
STOP JSC01610  
END JSC01620
```

```
* LARSJSCR - FORTRAN PROGRAM TO CONVERT PURDUE-LARSYS RESULTS FILE  
* TO EOD-LARSYS FORMAT.  
*
```

```
&CONTROL ERROR  
&IF &INDEX LT 3 &GOTO -ERROR  
GLOBAL TXTLIB FORTMOD2 CMSLIB  
GETDISK LARSLIB 29C  
&ERROR &EXIT  
GETDISK TEMP 25CYL CLEAR  
&ERROR &EXIT  
&FNL = &2 - 1  
TAPMOUNT &1 TAP1 RO  
&ERROR &EXIT  
TAPE FSF &FNL  
&S1 = &1  
&LEN1 = &LENGTH &1  
&IF &LEN1 = 3 &S1 = &CONCAT 0 &1  
&IF &LEN1 = 2 &S1 = &CONCAT 00 &1  
&S2 = &2  
&LEN2 = &LENGTH &2  
&IF &LEN2 = 1 &S2 = &CONCAT 0 &2  
&STACK &S1 &S2  
FI 12 TAP1 (RECFM VS BLOCK 1500 LRECL 1500  
FI 2 DISK FILE FT02F001 D4 (RECFM VS BLOCK 320 LRECL 320  
FI 15 TERMINAL  
FI 6 PRINTER (RECFM FA PERM  
LOAD LARSJSCR (NOMAP  
START  
DET 181  
&ERROR &EXIT &RETCODE  
&REGTYPE  
EXECUTION COMPLETE.  
&END  
&IF &INDEX LT 4 GO TO -NEXT  
BACKUP &3 D (FILE &4  
&EXIT  
-NEXT  
BACKUP &3 D  
&EXIT  
-ERROR  
&REGTYPE  
PLEASE TRY AGAIN, REMEMBER TO INCLUDE ARGUMENTS FOR  
1. PURDUE-LARSYS RESULTS FILE TAPE NUMBER  
2. PURDUE-LARSYS RESULTS FILE FILE NUMBER  
3. EOD-LARSYS RESULTS FILE, BACKUP TAPE NUMBER  
4. EOD-LARSYS RESULTS FILE, BACKUP TAPE FILE NUMBER  
ARGUMENT 4 IS OPTIONAL. IF OMITTED, THE NEXT AVAILABLE FILE  
WILL BE USED.  
&END
```

```

*****
C *** LARSJSCR ***
C
C PROGRAM TO CONVERT A PURDUE-LARSYS RESULTS FILE TO AN EOD-LARSYS
C RESULTS FILE.
C
C SEE THE LARSYS SYSTEM MANUAL, PAGE 5-33, FOR A DESCRIPTION OF A
C LARSYS CLASSIFICATION RESULTS FILE.
C SEE EOD-LARSYS USER DOCUMENTATION MANUAL, APPENDIX C, FOR A
C DESCRIPTION OF AN EOD RESULTS FILE.
C
C WRITTEN APRIL 1979 BY CAROL JOBUSCH.
C
C INPUT FILES
C   UNIT 12. PURDUE-LARSYS RESULTS FILE (TAPE)
C   UNIT 15. TERMINAL (READS STACKED INFORMATION PROVIDED BY
C             THE EXEC TO CHECK THAT THE CORRECT TAPE WAS MOUNTED)
C
C OUTPUT FILES
C   UNIT 2. EOD-LARSYS RESULTS FILE (TEMP DISK)
C   UNIT 16. TERMINAL - ERROR MESSAGES
C *****
C
C IMPLICIT INTEGER*4(A-Z)
C
C ASSUME A MAXIMUM OF 16 CHANNELS IN CLASSIFICATION. IF YOU HAVE MORE,
C CHANGE 16 TO 30 AND 136 TO 465 IN THE REAL*4 STATEMENT BELOW.
C ASSUME A MAXIMUM OF 200 POINTS PER LINE. IF THERE ARE MORE,
C INCREASE THE SIZE OF LLINE AND PLINE.
C
C   REAL*4 AVFRL(16,60),COVARL(136,60),AVERP(16,60),COVARP(136,60)
C   REAL*4 RLONE
C   INTEGER*4 CHAN4(24),PLINE(200)
C   INTEGER*2 CHAN2(24),LLINE(200)
C   INTEGER*4 SUBNAM(60),CLSNAM(60),SRBNSM(60),NPTS(60),NSUBCL(60),
C   *   CHAN(30),CLASNO(60)
C   INTEGER*2 CLNM2(120),SUB2(120),INDX(60),IFLAG(60)
C   LOGICAL*1 NAME1(4),CHAR(12)
C   EQUIVALENCE (NAME,NAME1(1)),(SUBNAM(1),SUB2(1)),
C   *   (CLSNAM(1),CLNM2(1)),(CTEST,CHAR(1))
C   DATA LARS,CLAS,BLANK,FLDNAM/'LARS','CLAS',' ','AREA'/
C   DATA RLONE,ZERO,ONE,FIVE/1.0,0,1,5/
C   DATA EOS/'EOS'/
C   DATA PLINE/200*0/
C
C READ FIRST PART OF LARSYS RESULTS FILE
C PURDUE-LARSYS RECORD TYPE 1
C
C   READ(15,1500) TAPENO,FILENO
C   1500 FORMAT(I4,I3)
C   READ(12) TYPE,TR,LTAPE,LFILE,DUMMY,DUMMY2,SERIAL
C   IF(TAPENO.EQ.LTAPE) GO TO 1
C   WRITE(16,1600) LTAPE,TAPENO
C   1600 FORMAT('WRONG TAPE MOUNTED','IS,' INSTEAD OF',IS)
C   STOP
C   1 IF(FILENO.EQ.LFILE) GO TO 2
C   WRITE(16,1610) LFILE,FILENO
C   1610 FORMAT('TAPE IS POSITIONED AT WRONG FILE','I3,' INSTEAD OF',
C   *   I3)
C   STOP
C   2 READ(12) TYPE,TR,NCLASC,NCHANC,NTRFLD,NPOOLS,
C   *   (CHAN2(I),I=1,NCHANC)
C   IF(NCLASC.EQ.NPOOLS) GO TO 3
C   WRITE(16,1620)
C   1620 FORMAT('PURDUE-LARSYS CLASSIFICATION USED POOLING - '
C   *   'CONVERSION NOT POSSIBLE')
C   STOP
C   3 NCOVC = NCHANC*(NCHANC+1)/2
C   DO 4 I=1,NCHANC
C   4 CHAN4(I) = CHAN2(I)
C
C READ PURDUE-LARSYS STATDECK (RECORD TYPE 3 OF RESULTS FILE)
C
C   K = 0
C   READ(12,100) NAME,BINFLG

```

```

100 FORMAT(8X,A4,39X,I1)
    IF(NAME.EQ.LARS) GO TO 5
    WRITE(16,1625)
1625  FORMAT(' DID NOT FIND EXPECTED PURDUE-LARSYS STATDECK')
    STOP
C
C  READ CLASS CARDS
C
    5 READ(12,110) ICLAS,CHAR
110  FORMAT(8X,A4,2X,12A1)
    IF(ICLAS.EQ.CLAS) GO TO 8
    IF(CTEST.EQ.CLAS) GO TO 25
    GO TO 5
    8 NAME = BLANK
    DO 10 I=1,12
      NAME1(I) = CHAR(I)
    IF(NAME.NE.BLANK) GO TO 15
10  CONTINUE
15  DO 20 J=2,4
20  NAME1(J) = CHAR(I-1+J)
    K = K+1
    SUBNAM(K) = NAME
    GO TO 5
C
C  READ REST OF PURDUE-LARSYS STATDECK
C
    25 BACKSPACE 12
    READ(12,120) NCLUS,NCHAN
120  FORMAT(8X,I5,17X,I5)
    DO 30 I=1,NCHAN
30  READ(12,130) CHAN(I)
130  FORMAT(8X,5X,I2)
    NCOV = NCHAN*(NCHAN+1)/2
    DO 35 I = 1, NCLUS, 7
      J = I + 6
      IF (J.GT.NCLUS) J = NCLUS
    READ(12,140) (NPPTS(II), II = I, J)
140  FORMAT(8X,8X,7I9)
35  CONTINUE
C
C  SKIP OVER MEANS AND COVARIANCE MATRICES
C
    INT = 17
    IF (BINFLG.EQ.0) INT = 5
    NCARDS = NCLUS*(1 + (NCHAN-1)/INT)
    DO 40 I=1,NCARDS
40  READ(12) DUMMY
    CONTINUE
    NCARDS = NCLUS*(1 + (NCOV-1)/INT)
    DO 50 I=1,NCARDS
50  READ(12) DUMMY
    CONTINUE
    READ(12,150) ENDFLG
150  FORMAT(8X,A4)
    IF(ENDFLG.EQ.EOS) GO TO 55
    WRITE(16,1635)
1635  FORMAT(' DID NOT FIND EXPECTED EOS-LARSYS STATDECK')
    STOP
C
C  DETERMINE CLASS-SUBCLASS STRUCTURE FOR E00-LARSYS
C  BASED ON THE FIRST TWO CHARACTERS OF THE PURDUE-LARSYS CLASS NAMES
C
    55 DO 60 I=1,NCLUS
60  IFLAG(I) = 0
    INDX(I) = 0
    NCLAS = 0
    K = 0
    DO 70 I=1,NCLUS
70  IF(IFLAG(I).NE.0) GO TO 70
    NCLAS = NCLAS + 1
    K = K+1
    SRSRNM(K) = SUBNAM(I)
    CLASNO(K) = NCLAS
    CLSNAM(NCLAS) = BLANK
    CLNM2(2*NCLAS-1) = SUB2(2*I-1)
    NSUBCL(NCLAS) = 1
    IFLAG(I) = 1
    INDX(K) = I

```

LAR00800
LAR00810
LAR00820
LAR00830
LAR00840
LAR00850
LAR00860
LAR00870
LAR00880
LAR00890
LAR00900
LAR00910
LAR00920
LAR00930
LAR00940
LAR00950
LAR00960
LAR00970
LAR00980
LAR00990
LAR01000
LAR01010
LAR01020
LAR01030
LAR01040
LAR01050
LAR01060
LAR01070
LAR01080
LAR01090
LAR01100
LAR01110
LAR01120
LAR01130
LAR01140
LAR01150
LAR01160
LAR01170
LAR01180
LAR01190
LAR01200
LAR01210
LAR01220
LAR01230
LAR01240
LAR01250
LAR01260
LAR01270
LAR01280
LAR01290
LAR01300
LAR01310
LAR01320
LAR01330
LAR01340
LAR01350
LAR01360
LAR01370
LAR01380
LAR01390
LAR01400
LAR01410
LAR01420
LAR01430
LAR01440
LAR01450
LAR01460
LAR01470
LAR01480
LAR01490
LAR01500
LAR01510
LAR01520
LAR01530
LAR01540
LAR01550
LAR01560
LAR01570
LAR01580

FILE: LARSJSCR FORTRAN E1

CONVERSATIONAL MONITOR SYSTEM /

C

WRITE(2) (ZERO,I=1,20)
END FILE 2
STOP
END

LAR02380
LAR02390
LAR02400
LAR02410
LAR02420


```
* JSCLARSR - FORTRAN PROGRAM TO CONVERT EOD-LARSYS RESULTS FILE  
* TO PURDUE-LARSYS FORMAT.  
*
```

```
&CONTROL OFF  
&IF &INDEX LT 4 &GOTO -ERROR  
GLOBAL TXTLIB FORTMOD2 CMSLIB  
GETDISK LARSLIB 29C  
&ERROR &EXIT  
&FNL = &3 - 1  
TAPMOUNT &2 TAP1 RI  
&ERROR &EXIT  
TAPE FSP &FNL  
&S2 = &2  
&LEN2 = &LENGTH &2  
&IF &LEN2 = 3 &S2 = &CONCAT 0 &2  
&IF &LEN2 = 2 &S2 = &CONCAT 00 &2  
&S3 = &3  
&LEN3 = &LENGTH &3  
&IF &LEN3 = 1 &S3 = &CONCAT 0 &3  
&STACK &4  
&STACK &S2 &S3  
FI 2 DISK &1 FT02F001 D4 (RECFM VS BLOCK 320 LRECL 320  
FI 5 DISK WAVE LENGTHS E  
&IF &INDEX = 6 FI 5 DISK &5 &6 A  
FI 12 TAP1 (RECFM VS BLOCK 1500 LRECL 1492  
FI 15 TERMINAL  
FI 6 PRINTER (RECFM FA PERM  
LOAD JSCLARSR (NOMAP  
START  
DET 181  
&ERROR &EXIT &RETCODE  
&BEGTYPE  
EXECUTION COMPLETE.  
&END  
&EXIT  
-ERROR  
&REGTYPE  
PLEASE TRY AGAIN. REMEMBER TO INCLUDE ARGUMENTS FOR  
1. EOD-LARSYS RESULTS FILE NAME (ASSUMED TO BE ON  
A TEMP 'D' DISK WITH FILETYPE = FT02F001)  
2. PURDUE-LARSYS RESULTS FILE TAPE-NUMBER  
3. PURDUE-LARSYS RESULTS FILE FILE-NUMBER  
4. PURDUE-LARSYS RUN NUMBER  
5. (OPTIONAL) WAVELENGTH INFO FILE NAME  
6. (OPTIONAL) WAVELENGTH INFO FILE TYPE  
&END
```

```

C***** JSC00010
C      *** JSCLARSR *** JSC00020
C      PROGRAM TO CONVERT AN EOD-LARSYS RESULTS FILE TO A PURDUE-LARSYS JSC00030
C      RESULTS FILE. JSC00040
C      SEE THE LARSYS SYSTEM MANUAL, PAGE 5-33, FOR A DESCRIPTION OF A JSC00050
C      LARSYS CLASSIFICATION RESULTS FILE. JSC00060
C      SEE EOD-LARSYS USER DOCUMENTATION MANUAL, APPENDIX C, FOR A JSC00070
C      DESCRIPTION OF AN EOD RESULTS FILE. JSC00080
C      WRITTEN MAY 1979 BY CAROL JOBUSCH JSC00090
C      INPUT FILES JSC00100
C      UNIT 2. EOD-LARSYS RESULTS FILE (TEMP DISK) JSC00110
C      UNIT 5. WAVE LENGTH INFO FILE JSC00120
C      UNIT 15. TERMINAL (READS STACKED INFORMATION PROVIDED BY JSC00130
C      EXEC FOR RUN-NUMBER, TAPE AND FILE NUMBERS.) JSC00140
C      OUTPUT FILES JSC00150
C      UNIT 12. PURDUE-LARSYS RESULTS FILE (TAPE) JSC00160
C      UNIT 16. TERMINAL - ERROR MESSAGES JSC00170
C***** JSC00180
C      IMPLICIT INTEGER*4(A-Z) JSC00190
C      ASSUME A MAXIMUM OF 16 CHANNELS IN CLASSIFICATION. IF YOU HAVE MORE, JSC00200
C      CHANGE 16 TO 30 AND 136 TO 465 IN THE REAL*4 STATEMENT BELOW. JSC00210
C      ASSUME A MAXIMUM OF 200 POINTS PER LINE. IF THERE ARE MORE, JSC00220
C      INCREASE THE SIZE OF LLINE AND PLINE. JSC00230
C      REAL*4 AVER(16,60),COVAR(136,60),LWAVE(30),UWAVE(30) JSC00240
C      REAL*4 ILWAVE(30),IUWAVE(30) JSC00250
C      INTEGER*4 PLINE(200),DATE(3),UNKNWN(4) JSC00260
C      INTEGER*2 CHAN2(30),LLINE(200),CALIB(30),POLPTR(2,60),POLSTK(60) JSC00270
C      INTEGER*2 ZERO2/0/ JSC00280
C      INTEGER*4 SUBNAM(60),CLSNAM(60),NPTS(60),NSUBCL(60), JSC00290
C      * CHAN(30),CLASNO(60) JSC00300
C      DATA ILWAVE,IUWAVE/30*0.0,30*0.0/ JSC00310
C      DATA ZERO,ONE,THREE/0,1,3/ JSC00320
C      DATA LLINE/200*0/ JSC00330
C      DATA UNKNWN/'NOT ','KNOW','N ',' ' // JSC00340
C      DATA CALIB/30*1/ JSC00350
C      DATA TIME/'9999'// JSC00360
C      DATA BLANK/' ' // JSC00370
C      READ FIRST PART OF EOD-LARSYS RESULTS FILE JSC00380
C      EOD-LARSYS HEADER RECORD 1 JSC00390
C      READ(2) (DUMMY,I=1,5),NCLAS,NTRFLD,NCLUS,NCHAN,NTVERT, JSC00400
C      * NCAT,NCOV,(CHAN(I),I=1,NCHAN) JSC00410
C      IF(NCLAS.NE.NCAT) GO TO 300 JSC00420
C      NX = 4*NTRFLD JSC00430
C      NTV = 2*NTVERT JSC00440
C      READ EOD-LARSYS HEADER RECORD 2 JSC00450
C      READ(2) (DUMMY,I=1,NCAT),(CLSNAM(I),I=1,NCLAS), JSC00460
C      * (NSUBCL(I),I=1,NCLAS),(SUBNAM(I),I=1,NCLUS), JSC00470
C      * (DUMMY,I=1,NX),(DUMMY,I=1,NTV), JSC00480
C      * (DUMMY,I=1,NCLUS),(CLASNO(I),I=1,NCLUS), JSC00490
C      * (DUMMY,I=1,NCLAS),(NPTS(I),I=1,NCLUS) JSC00500
C      READ EOD-LARSYS HEADER RECORD 3 JSC00510
C      READ(2) ((COVAR(I,J),I=1,NCOV),J=1,NCLUS), JSC00520
C      * ((AVER(I,J),I=1,NCHAN),J=1,NCLUS) JSC00530
C      READ EOD-LARSYS HEADER RECORD 4 - INFO WILL NOT BE USED JSC00540
C      READ(2) DUMMY JSC00550
C      READ RUN-NUMBER, TAPE AND FILE NUMBERS FROM TERMINAL JSC00560
C      ALSO, READ WAVELENGTHS FROM FT05F001. JSC00570
C      JSC00580
C      JSC00590
C      JSC00600
C      JSC00610
C      JSC00620
C      JSC00630
C      JSC00640
C      JSC00650
C      JSC00660
C      JSC00670
C      JSC00680
C      JSC00690
C      JSC00700
C      JSC00710
C      JSC00720
C      JSC00730
C      JSC00740
C      JSC00750
C      JSC00760
C      JSC00770
C      JSC00780
C      JSC00790

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2060 FORMAT (2A4,T81,I8,T9,'MN',5E14.7)
2070 FORMAT (2A4,T81,I8,T9,'MN',17A4)
80 CONTINUE
C
C COVARIANCE MATRIX
C
DO 90 J=1,NCLUS
DO 90 II=1,NCOV,INT
K = II+INT-1
IF (K.GT.NCOV) K=NCOV
KOUNT = KOUNT + 1
IF (BINFLG.EQ.0) WRITE (12,2080) TYPE,ZERO,KOUNT,(COVAR(KK,J),KK=II,K)
IF (BINFLG.NE.0) WRITE (12,2090) TYPE,ZERO,KOUNT,(COVAR(KK,J),KK=II,K)
2080 FORMAT (2A4,T81,I8,T9,'CV',5E14.7)
2090 FORMAT (2A4,T81,I8,T9,'CV',17A4)
90 CONTINUE
C
C WRITE THE END-OF-STAT-DECK RECORD
C
KOUNT = KOUNT + 1
WRITE (12,2100) TYPE,ZERO,KOUNT
2100 FORMAT (2A4,'EOS',T24,'***** LAST CARD OF STATISTICS DECK ',
1 '*****',T81,I8)
C
C WRITE PURDUE-LARSYS RECORD TYPE 4
C
TYPE = 4
WRITE (12) TYPE,ZERO,((COVAR(I,J),I=1,NCOV),J=1,NCLUS),
* ((AVER(I,J),I=1,NCHAN),J=1,NCLUS)
AREANO = 1
LCHAN = CHAN(NCHAN)
DO 92 I=1,NCHAN
J = CHAN(I)
ILWAVE(J) = LWAVE(I)
92 IUWAVE(J) = UWAVE(I)
C
C READ EOD-LARSYS FIELD HEADER RECORD
C
95 READ(2) LINSRT,LINSTP,LININT,COLSRT,COLSTP,COLINT,
* PTS,LINES,FLDNAM
IF (PTS .EQ. 0) GO TO 110
C
C WRITE RECORD TYPE 5
C
TYPE = 5
ALT = 999999
GDHEAD = 99
N99 = 99
N30 = 30
WRITE (12) TYPE,AREANO,PTS,LINES,RUNUM,FLDNAM,BLANK,LINSRT,LINSTP,
* LININT,COLSRT,COLSTP,COLINT,(BLANK,I=1,8),MSITAP,MSIFIL,
* RUNUM,ZERO,N30,PTS,(UNKNWN(I),I=1,4),ONE,ONE,N99,
* TIME,ALT,GDHEAD,(UNKNWN(I),I=1,3),LINES,(ZERO,I=1,30),
* (ILWAVE(I),IUWAVE(I),ZERO,ZERO,ZERO,I=1,30),
* (ZERO,I=1,90)
C
C READ, CONVERT, AND WRITE DATA RECORDS
C
TYPE = 6
DO 100 NL=1,LINES
READ(2) ILINE,(PLINE(I),I=1,PTS)
CALL MOVBYT(PLINE,3,4,LLINE,1,2,PTS)
WRITE (12) TYPE,AREANO,ILINE,(LLINE(I),I=1,PTS)
100 CONTINUE
C
C READ AND WRITE END-OF-FIELD RECORD
C
READ(2) ILINE
IF (ILINE .NE. 0) GO TO 320
TYPE = 7
WRITE (12) TYPE,AREANO,ZERO,(ZERO2,I=1,PTS)
AREANO = AREANO + 1
GO TO 95
C
C WRITE RECORD TYPE 8
C
110 TYPE = 8
WRITE (12) TYPE,ZERO,(ZERO,I=1,309)
END FILE 12

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JSC01590
JSC01600
JSC01610
JSC01620
JSC01630
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JSC01990
JSC02000
JSC02010
JSC02020
JSC02030
JSC02040
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JSC02370

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	STOP	JSC02380
C		JSC02390
C	ERROR STOPS	JSC02400
C		JSC02410
	300 WRITE(16,1600)	JSC02420
	1600 FORMAT('EOD-LARSYS HAS FEWER CATEGORIES THAN CLASSES - ',	JSC02430
	* 'CONVERSION NOT POSSIBLE')	JSC02440
	STOP	JSC02450
C		JSC02460
	310 WRITE(16,1610)	JSC02470
	1610 FORMAT('UNEXPECTED EOF, UNIT 5, WAVELENGTH FILE')	JSC02480
	STOP	JSC02490
C		JSC02500
	320 WRITE(16,1620) ILINE	JSC02510
	1620 FORMAT('ERROR - END-OF-FIELD REC, ILINE =',I4)	JSC02520
	STOP	JSC02530
C		JSC02540
	END	JSC02550