DOCUMENTATION FOR COMPUTER PROGRAMS USED IN ANALYSIS OF THE LONG-TERM PROFILE NETWORK

TECHNICAL REPORT NO. 9-SRG

By:

Scot M. Graves

Department of Geology
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Kingston, RI 02881

Prepared For:

SEA GRANT COLLEGE PROGRAM
UNIVERSITY of RHODE ISLAND

Research Sponsored By:

OFFICE of SEA GRANT
NATIONAL OCEANIC and ATMOSPHERIC ADMISTRATION
U.S. DEPARTMENT of COMMERCE

Contract No. NA85AA-D-SG094
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TABLE OF CONTENTS

INTRODUCTION

The beaches along the south shore of Rhode Island have been the subject of numerous geological inquiries by a variety of workers at both the Department of Geology and the Graduate School of Oceanography at the University of Rhode Island. Results of the most comprehensive studies to date were presented by Boothroyd et al., (1986) in Sea Grant technical report 6-SRG. McMaster and Friedrich (1986) also presented a summary of shoreline processes affecting Rhode Island's southwestern beaches. Both of these summaries drew extensively upon the long-term beach profile network.

The long-term beach profile network was initiated by McMaster (1961-present). Within this network data have been collected at various localities on a biweekly basis. Four of the eight transects have been monitored since 1962, the remaining 4 were established between 1975 and 1977 (Table 1). Boothroyd established a second set of 2 transect stations which have been monitored on a weekly and biweekly basis (depending on specific profile) since October 1, 1977. A significant difference in spatial resolution among these two survey data sets appears as a result of differing methods employed in the initial gathering of topographic information. Whereas data from the oldest, and longest-running profile locations (McMaster) provide significant information regarding temporal variations in overall beach configuration, the method employed (transit and stadia surveys, with stadia locations taken primarily at slope inflections) does not resolve any spatial detail in the changing berm configurations. The modified Emery method employed in the collection of topographic data at the second set of transect localities (Boothroyd) does provide high spatial resolution of berm and beachface shape adjustments. The weekly, biweekly, and pre- and post-storm survey schedule maintained for the Emery transect locations resolves the higher frequency temporal fluctuations in berm shape as well. These differences in survey method and data format, necessitated the writing of separate yet similar computer programs to treat the respective data sets.

Table 1. - Profile Data Sets (to mid March 1988)

location (W-E)	start date	#profiles	investigator
MIS-01	Jul. 77	203	McMaster
WKG-01	Dec. 62	472	McMaster
EST-01	Dec. 62	472	McMaster
EST-02	Aug. 76	201	McMaster
CHA-BW	Jan. 77	203	McMaster
CHA-EZ	Oct. 77	595	Boothroyd
CHA-TB	Nov. 75	225	McMaster
GRH-01	Dec. 62	473	McMaster
MST-01	Dec. 62	458	McMaster
MAT-SP	Aug. 81	256	Boothroyd
	Total:	3558	

An array of computer programs, originally written by Roger Greenall of ASA/Datajet (formerly at the Univ. Rhode Island Academic Computer Center) have been employed in the reduction and plotting of both types of beach survey data. This report presents in "cook book" format, procedures for entering new survey data and submitting the programs used in the manipulating and plotting the profile information.

DISCUSSION

Documentation is presented here for computer programs used in manipulating the long-term beach profile data sets and plotting the results of calculations performed thereon. The data sets and programs are resident on the IBM mainframe computer located at the Academic Computer Center, University of Rhode Island, Tyler Hall, Kingston. In addition, most recent versions of the data sets are retained on magnetic tape. All work is accomplished through an account entitled "URI.EIL101/password". For immediate video display of program results (plots of comparison profiles and volume time series) sessions should be conducted through the Tectronics terminals located in the Plotting Room in Tyler Hall. The Calcomp drum plotter employed in the generation of finished plots is also located in the Plotting Room in Tyler Hall.

Through the use of the menu driven Interactive System Productivity Facility (ISPF, an IBM product), data files are readily appended and all programs easily accessed and submitted. This user interface provides windowing and true multitasking capabilities. Temporary working files hold all incoming data from recent beach surveys, while master files are best reserverd for thoroughly debugged data and program output.

The guided tour presented in the following pages is a collection of "screen dumps" from an actual session conducted via modem with an Apple Macintosh. For quick reference, graphic flow charts are presented with brief explanatory notes keyed to various operations (on pages 3 and 4). On the flow charts, data sets are identified within rounded boxes, whereas programs lie within squared boxes. The plotted files are depicted at the bottom of the flow charts.

The sample session beginning on page 5 is taken from a run of the Transit data and associated programs. While no sample session is presented for the reduction of Emery data, the two sets of procedures are virtually the same. The flow chart for the reduction and plotting of raw Emery data differs from that of the Transit data flow chart only in the exclusion of the "transit data conversion program" (appearing at the top of the Transit Data Flow Chart), and a different name given for the actual program used in calculating profile volumes. There are minor differences in the FORTRAN code associated with some read/write statements, along with differences in the way that the profiles are plotted and volumes calculated. Be certain you are working with the appropriate data/program combinations.

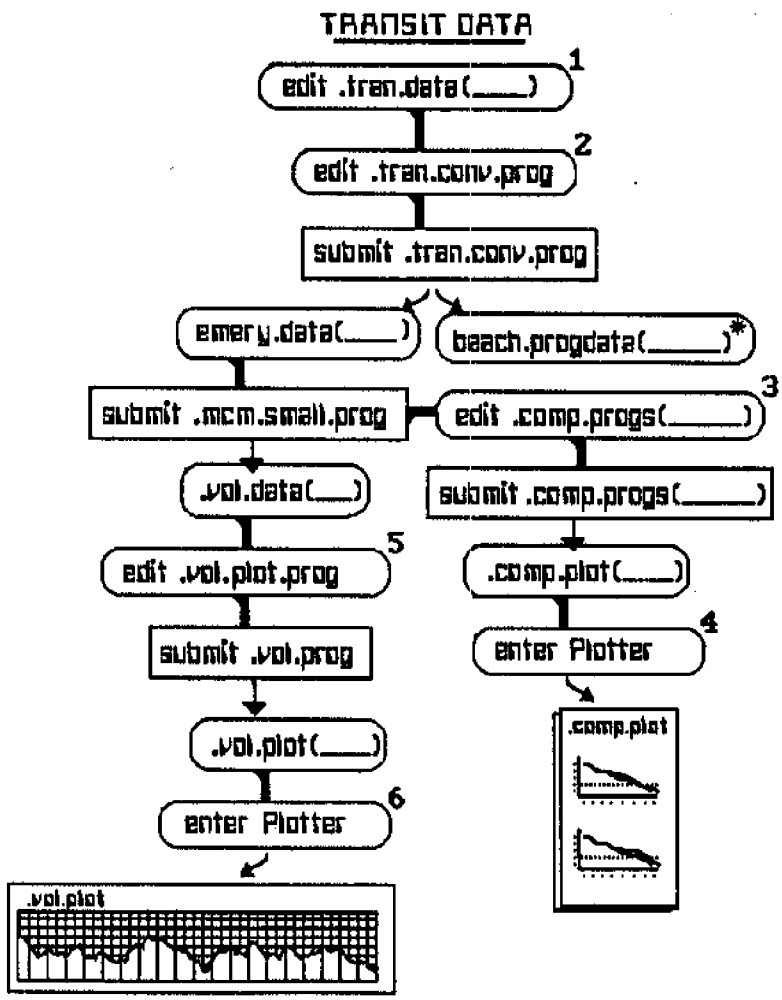
In the sample session each page shows a number of partial screens as they would appear on the Tectronics terminal. Individual screens are separated by a patterned bar across the page. Calls for user input are identified by the presence of an arrow in the left margin (not appearing in the actual sessions). User keyboard entries appear in boldface with a brief note associated.

A listing of the main FORTRAN programs used appears in the appendix.

It is advised that all initial work be done in the files identified with the suffices ".new". Only after extensive editing and proofing should there be any appending or editing of the "master" data files. A "read-me first" file, appearing in the root directory within the account, describes the hierarchy of directories and files along with a brief discussion of common error messages and their remedies. For further assistance the user should consult the ISPF documentation available from User Services at the Academic Computer Center.

Flow Chart of Mainframe Computer Procedures

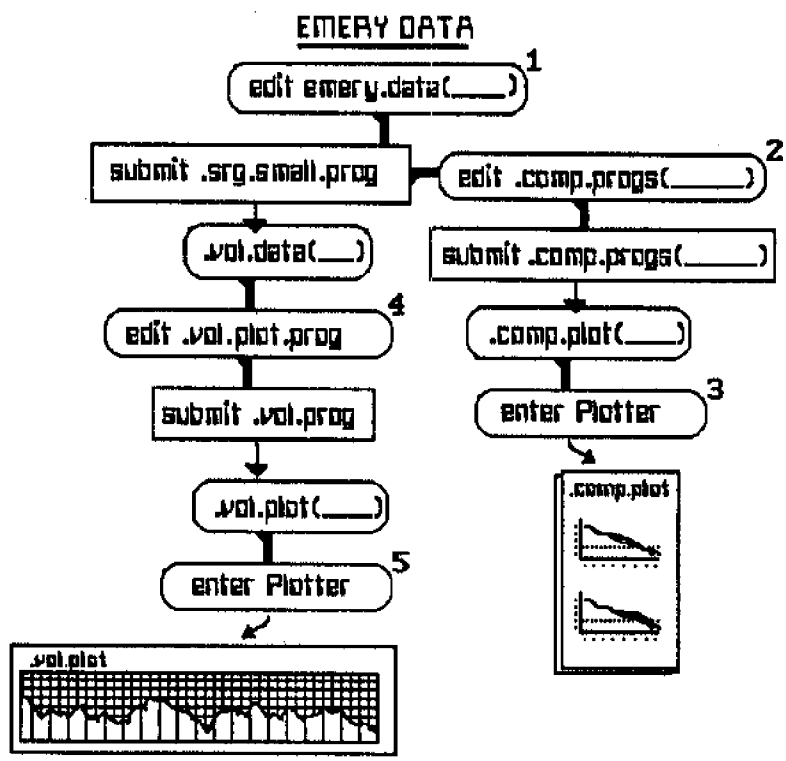
Transit Data



1. edit .tran.data(____) = append or edit tran.data files
2. edit .tran.conv.prog = change "DD" statements to access desired file.
3. edit .comp.progs(____) = append .comp.prog files (paired survey dates)
4. enter Plotter = preview comp.plots, note erroneous points, if need be make adjustments to tran.data and resubmit programs.
5. edit .vol.plot.prog = change "DD" statements to access desired file.
6. enter Plotter = preview vol.plots noting erroneous points, make adjustments (as above) where needed.

* seldom used output = this data set contains profile names and dates which are appended to .comp.prog files.

Flow Chart of Mainframe Computer Procedures
Emery Data



1. edit emery.data(____) = append or edit emery.data files
2. edit .comp.progs(_____) = append .comp.prog files (paired survey dates)
3. enter Plotter = preview comp.plots, note erroneous points, if need be make adjustments to emery.data and resubmit programs.
4. edit .vol.plot.prog = change "DD" statements to access desired file.
5. enter Plotter = preview vol.plots noting erroneous points, make adjustments (as above) where needed.

GUIDED TOUR OF MAINFRAME COMPUTER PROCEDURES

```
          *(ACCESS MAINFRAME FROM TEKTRONICS 4105 IN TYLER HALL)
URI ACCESS MANAGEMENT NETWORK
   VALID SYSTEMS ARE:
ECL1 TSO FST PR1(A-K) PR2(L-V)
⇨ ENTER SYSTEM "fst" <cr>   *(full screen TSO)
Please enter a CARRIAGE RETURN after GO and wait for system prompt.
GO 08/104
⇨ <cr>
```

⇨ **To emulate vt100 terminal, hit set-up key, type 'CODE EDIT" <cr> , hit 'set-up' key again and <cr>, type "vt100" <cr>. Follow with "logon EIL101/BERN" <cr>.**

```
EIL101 DISK SPACE LIMIT  2,000 TRACKS, CURRENT SPACE    731 TRACKS
EIL101 LOGON IN PROGRESS AT 02:20:57 ON APRIL 24, 1988
NO BROADCAST MESSAGES
READY
⇨ "dsn"<cr>   *(lists all sequential [PS] and partitioned [PO] data sets)
```

```
 LIST OF ALL DATA SETS FOR ACCOUNT NUMBER EIL101 ON URI STORAGE VOLUMES
DATA SET NAME                                VOLUME ORG CREATED TRACKS LASTUSE
EIL101.COMP.PLOT.CHATB                       URI001 PS  20APR88     15 20APR88
EIL101.COMP.PLOT.MST01NEW                    URI001 PS  26FEB88      3 16APR88
EIL101.COMP.PROGS                            URI001 PO  11JUN87     25 21APR88
EIL101.RUN.OUT                               URI001 PS  07MAR88      1 23APR88
EIL101.YANG                                  URI001 PS  08MAR88      1 08MAR88
EIL101.BEACH.VOLDATA                         URI002 PO  11JUN87     18 23APR88
EIL101.COMP.PLOT.GRH01NEW                    URI002 PS  26FEB88      3 21APR88
EIL101.COMP.PLOT.MIS01                       URI002 PS  26FEB88     12 26FEB88
EIL101.SPF8.LIST                             URI002 PS  26JAN88    191 26JAN88
EIL101.VOL.PLOT.MIS01NEW                     URI002 PS  17FEB88      1 23APR88
URI.EIL101.MCM.SMALL.PROG                    URI002 PS  31MAR87      1 21APR88
URI.EIL101.PRIN                              URI002 DA  18JAN88     35 18JAN88
URI.EIL101.TRAN.CONV.PROG                    URI002 PS  31MAR87      1 20APR88
EIL101.BEACH.PLOTS                           URI003 PO  26JAN88      2 26JAN88
EIL101.BEACH.PROGDATA                        URI003 PO  26JAN88      7 20APR88
EIL101.COMP.PLOT.GRH01                       URI003 PS  22MAR88     28 22MAR88
EIL101.COMP.PLOT.MIS01NEW                    URI003 PS  17FEB88      3 20APR88
EIL101.COMP.PLOTS                            URI003 PO  26JAN88     42 05MAR88
EIL101.EMERY.DATA                            URI003 PO  26JAN88     94 21APR88
EIL101.TRAN.DATA                             URI003 PO  26JAN88     71 22APR88
EIL101.VOL.PLOT.CHATBC                       URI003 PS  21APR88      1 23APR88
EIL101.VOL.PLOT.CHATBNEW                     URI003 PS  20APR88     13 22APR88
EIL101.VOL.PLOT.GRH01C                       URI003 PS  21APR88      3 22APR88
EIL101.VOL.PLOT.GRH01NEW                     URI003 PS  26FEB88      2 22APR88
EIL101.VOL.PLOT.MIS01C                       URI003 PS  21APR88      1 23APR88
EIL101.VOL.PLOT.MST01C                       URI003 PS  21APR88      3 23APR88
EIL101.VOL.PLOT.MST01NEW                     URI003 PS  21APR88     31 23APR88
EIL101.VOL.PLOTS                             URI003 PO  26JAN88      3 26FEB88
URI.EIL1.LOAD                                URI003 PO  20MAR87      4 21APR88
URI.EIL101.LOAD                              URI003 PO  15JUL87      1 25FEB88
URI.EIL101.VOL.PLOT.PROG                     URI003 PS  23MAR87      1 23APR88
EIL101.BEACH.PROGS                           URI004 PO  26JAN88     13 14APR88
EIL101.COMP.PLOT.WKG01NEW                    URI004 PS  23FEB88      1 23FEB88
EIL101.ISPF.ISPPROF                          URI004 PO  19MAR87      1 23APR88
EIL101.SPF5.LIST                             URI004 PS  26JAN88     90 26JAN88
EIL101.SPF9.LIST                             URI004 PS  27JAN88      3 01MAR88
URI.EIL101.SMLBEACH                          URI004 PS  06MAR87      1 14APR88
                                        TOTAL FOR ACCOUNT EIL101    722
                                        TOTAL FOR GROUP EIL1(00)      4

PROFILE UPDATED FOR ACCOUNT EIL100
⇨ <cr>
```

```
READY
"ispf" <cr>   *(Interactive System Productivity Facility)
------------------------ ISPF/PDF PRIMARY OPTION MENU ------------------------
OPTION ===> 2 <cr>  *(consult ISPF manual or online help)

                                                          USERID    - EIL101
   0  ISPF PARMS  - Specify terminal and user parameters   TIME      - 02:28
   1  BROWSE      - Display source data or output listings TERMINAL - 3278
   2  EDIT        - Create or change source data           PF KEYS   - 24
   3  UTILITIES   - Perform utility functions
   4  FOREGROUND  - Invoke language processors in foreground
   5  BATCH       - Submit job for language processing
   6  COMMAND     - Enter TSO command or CLIST
   7  DIALOG TEST - Perform dialog testing
   C  CHANGES     - Display summary of changes for this release
   M  MAIL        - Full-Screen UCLA Mail System
   S  SDSF        - Spool Display and Search Facility
   T  TUTORIAL    - Display information about ISPF/PDF
   X  EXIT        - Terminate ISPF using log and list defaults

Enter END command to terminate ISPF.
```

```
------------------------------ EDIT - ENTRY PANEL ------------------------------
COMMAND ===> <cr>   *(to access current member selection)
                    *(or enter call for "partitioned" or "sequential" data set
ISPF LIBRARY:                 or "tab" to next position to enter any other data set)
   PROJECT ===> EIL101
   GROUP   ===> TRAN      ===>          ===>          ===>
   TYPE    ===> DATA
   MEMBER  ===>                  (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
   DATA SET NAME  ===>
   VOLUME SERIAL  ===>          (If not cataloged)

DATA SET PASSWORD ===>          (If password protected)

PROFILE NAME      ===>          (Blank defaults to data set type)

INITIAL MACRO     ===>          LOCK        ===> YES    (YES, NO or NEVER)

FORMAT NAME       ===>          MIXED MODE  ===> NO     (YES or NO)
```

```
EDIT --- EIL101.TRAN.DATA ------------------------------- ROW 00001 OF 00017
COMMAND ===> "tab"                                        SCROLL ===> PAGE
  NAME                VV.MM  CREATED     CHANGED     SIZE  INIT  MOD  ID
 CHABW
 CHABWNEW
 CHATB
 CHATBCOR
 EST01
 EST01NEW
 EST02
 EST02NEW
 GRH01
 GRH01COR
 GRH01NEW
 MIS01
$ MIS01NEW   *("s" = select <cr>)
 MST01
 MST01NEW
 WKG01
 WKG01NEW
 **END**
```

```
EDIT ---- EIL101.TRAN.DATA(MIS01NEW) ------------------------ COLUMNS 001 072
COMMAND ===> "m8"  *(numeric "8" takes you to end of file)   SCROLL ===> HALF
****** ******************************** TOP OF DATA ********************************
000010 454.
000020 MIS-01
015530 11 SEP 1987
015540 0.95
015550 0.04  0.06  0.08
015560 2.07  2.09  2.10
015570 2.92  2.99  3.06
015580 3.03  3.13  3.23
015590 3.22  3.32  3.42
015600 4.15  4.29  4.43
015700 4.53  4.71  4.89
015800 -99
015900 23 SEP 1987
016000 1.04
016100 0.12  0.14  0.16
016200 2.36  2.38  2.40
016300 2.97  3.04  3.12
016400 3.12  3.22  3.31
016500 3.46  3.56  3.66
016600 4.84  5.02  5.19
016700 5.12  5.35  5.59
016800 -99
```

```
EDIT ---- EIL101.TRAN.DATA(MIS01NEW) ------------------------ COLUMNS 001 072
COMMAND ===> "tab"                                           SCROLL ===> HALF
015520 -99
015530 11 SEP 1987
015540 0.95
015550 0.04  0.06  0.08
015560 2.07  2.09  2.10
015570 2.92  2.99  3.06
015580 3.03  3.13  3.23
015590 3.22  3.32  3.42
015600 4.15  4.29  4.43
015700 4.53  4.71  4.89
015800 -99
015900 23 SEP 1987
016000 1.04
016100 0.12  0.14  0.16
016200 2.36  2.38  2.40
016300 2.97  3.04  3.12
016400 3.12  3.22  3.31
016500 3.46  3.56  3.66
016600 4.84  5.02  5.19
016700 5.12  5.35  5.59
I16800 -99          *(type "I" <CR> to begin entering new data)
****** ***************************** BOTTOM OF DATA ****************************
```

```
.....   *(new line opens. begin entry following above format)
016900 DD MON YEAR
017000 elev
017100 LOWR  MIDL  UPPR
017200 LOWR  MIDL  UPPR
017300 ETC..
017400 -99
''''''   *(after "-99" entry, type <CR> on empty line to exit insert mode.
           then hit numeric key 3 to exit & save,
           otherwise type "cancel" on COMMAND line)
```

```
------------------------------ EDIT - ENTRY PANEL ------------------------------
COMMAND ===>

ISPF LIBRARY:
   PROJECT ===> EIL101
   GROUP   ===> TRAN      ===>          ===>          ===>
   TYPE    ===> DATA
⇨  MEMBER  ===> "tab"          (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
⇨  DATA SET NAME  ===> "URI.EIL101.TRAN.CONV.PROG" (or)
   VOLUME SERIAL  ===>          (If not cataloged)

DATA SET PASSWORD ===>          (If password protected)

PROFILE NAME      ===>          (Blank defaults to data set type)

INITIAL MACRO     ===>          LOCK        ===> YES    (YES, NO or NEVER)

FORMAT NAME       ===>          MIXED MODE ===> NO      (YES or NO)
```

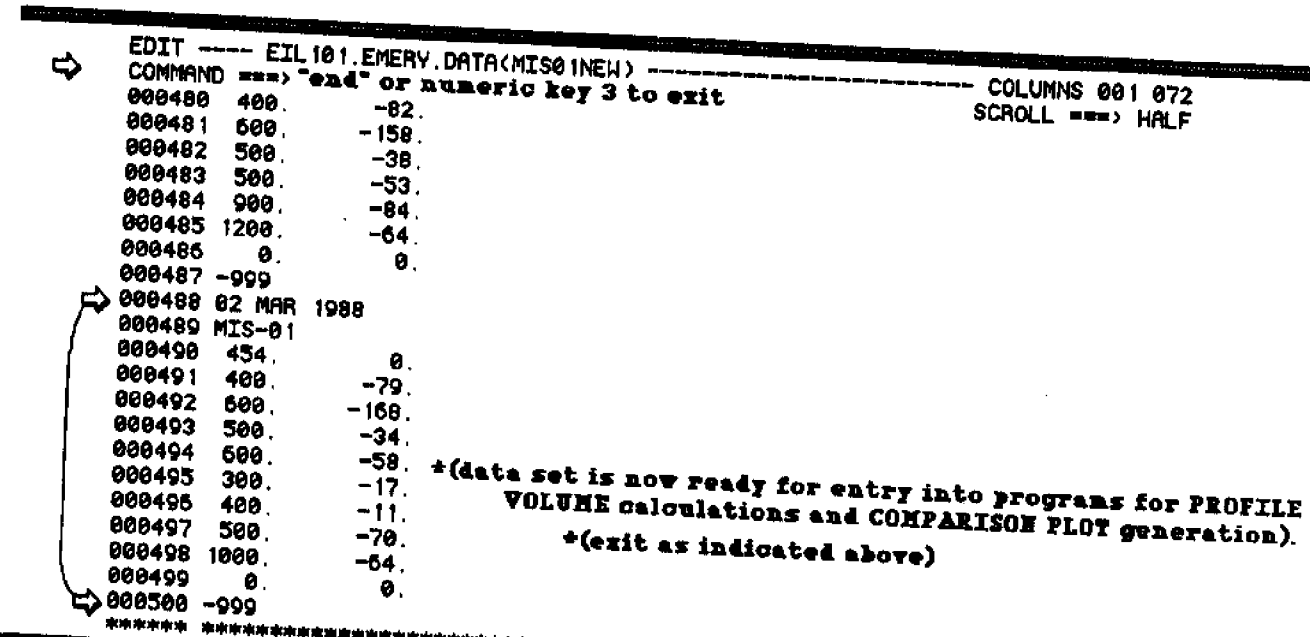
```
EDIT ---- URI.EIL101.TRAN.CONV.PROG ------------------------- COLUMNS 001 072
⇨ COMMAND ===> "m8"   *(to go to last line of program)        SCROLL ===> HALF
****** ***************************** TOP OF DATA ********************************
000010 //EIL101S JOB (EIL101),'CONV',TIME=3,MSGCLASS=W
000030 // EXEC WSF2CLG
000040 //FORT.SYSIN DD *
000050       INTEGER COUNT,I,LAST,NCOUNT
000060       REAL HGTO,INTHT,B(20),M(20),T(20),D(20),HT(20),DSUM,DISO
000070       CHARACTER*12 PROFIL,DATE
000080 C *
000090 C******INPUT DATA
000100 C *
000120       READ (8,1000) HGTO
000130       READ (8,1010) PROFIL
000140 50    READ (8,1010,END=999) DATE
000150       READ (8,1000) INTHT
000160       DO 100 I=1,20
000170          READ (8,1030) B(I),M(I),T(I)
000180          IF (B(I) .LT. 0.) GO TO 200
000190 100   CONTINUE
000200 200   COUNT=I
000210 C*
000220 C******CONVERT FEET TO METRIC, A 1. FOLLOWING THE END FLAG ON THE
000221 C******SAME LINE INDICATES PREVIOUS READINGS IN FEET
```

```
EDIT ---- URI.EIL101.TRAN.CONV.PROG ------------------------- COLUMNS 001 072
⇨ COMMAND ===> "tab"                                          SCROLL ===> HALF
000570 1000  FORMAT (F4.2)
000580 1010  FORMAT (A12)
000590 1030  FORMAT (3(F5.3,1X))   *(input data)
000700 1060  FORMAT (F5.0,5X,F5.0)    *(output data)
000710 1070  FORMAT (I4)                 *(output, names & dates, manually
000720 999   STOP                         reenter into .COMP.PROG(      ) files)
000730       END
000740 /*
⇨ 000750 //GO.FT08F001  DD  DSN=EIL101.TRAN.DATA(His01new),DISP=OLD
⇨ 000760 //GO.FT09F001  DD  DSN=EIL101.EMERY.DATA(His01new),DISP=OLD
⇨ 000770 //GO.FT10F001  DD  DSN=EIL101.BEACH.PROGDATA(His01),DISP=OLD
****** ***************************** BOTTOM OF DATA ********************************
⇨ *(after entry, hit numeric 7, then "m7" to go back to first line. type "save".
   type "submit" to run transit data conversion. output is 'EMERY type' data).
```

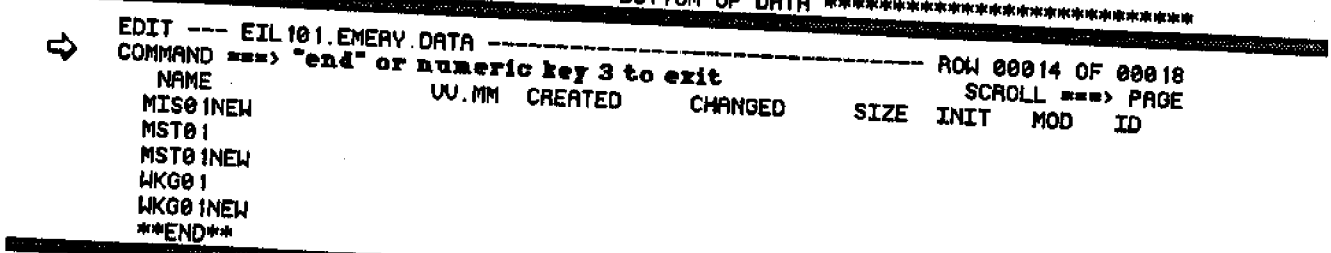
```
------------------------- EDIT - ENTRY PANEL -------------------------------
COMMAND ===>

ISPF LIBRARY:
   PROJECT ===> EIL101
   GROUP   ===> TRAN      ===>          ===>          ===>
   TYPE    ===> DATA
   MEMBER  ===>                  (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
⇨  DATA SET NAME  ===>"EIL101.EMERY.DATA" <cr>
   VOLUME SERIAL  ===>          (If not cataloged)

DATA SET PASSWORD ===>          (If password protected)

PROFILE NAME      ===>          (Blank defaults to data set type)

INITIAL MACRO     ===>          LOCK       ===> YES    (YES, NO or NEVER)

FORMAT NAME       ===>          MIXED MODE ===> NO     (YES or NO)
```

```
EDIT ---- EIL101.EMERY.DATA ------------------------------- ROW 00001 OF 00013
⇨  COMMAND ===>"tab"                                        SCROLL ===> PAGE
     NAME                 VV.MM  CREATED     CHANGED      SIZE  INIT   MOD   ID
     CHABW
     CHATB
     EST01
     EST02
     GRH01
     GRH01NEW
     MATSP
     MIS01
⇨  S MIS01NEW   *(select & open)
     MST01
     MST01NEW
     WKG01
     WKG01NEW
     **END**
```

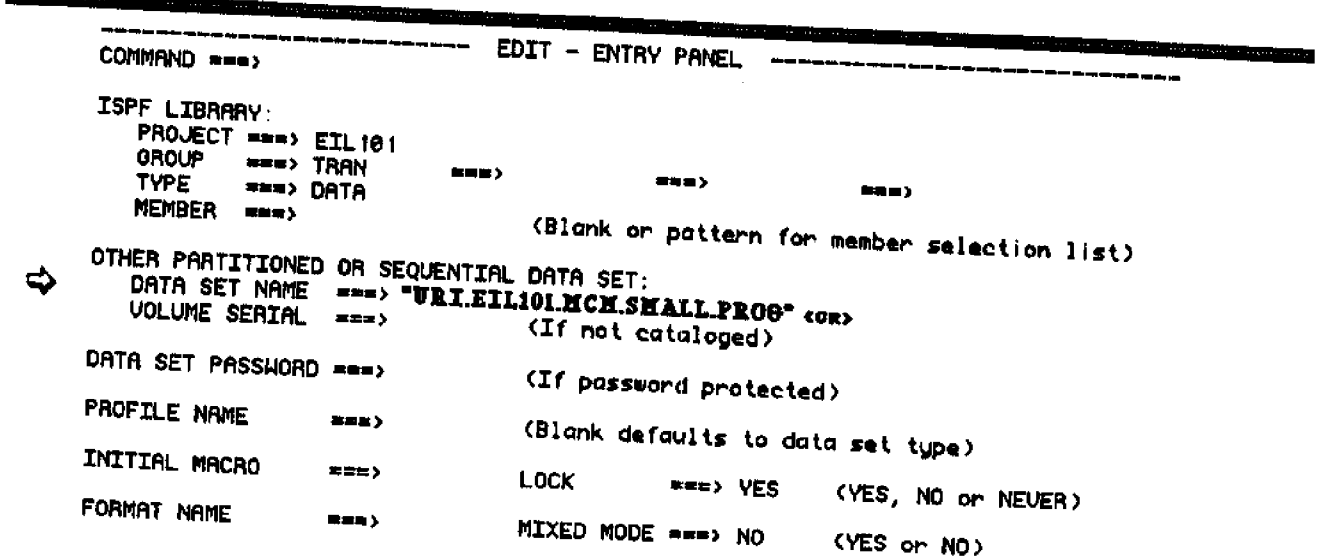
```
EDIT ----- EIL101.EMERY.DATA(MIS01NEW) ------------------------ COLUMNS 001 072
⇨  COMMAND ===>"m8" *(check format of appended data)          SCROLL ===> HALF
****** ***************************** TOP OF DATA ********************************
000001 23 SEP 1985
000002 MIS-01
000003  454.        0.
000004  400.      -89.
000005  700.      -65.
000006  300.     -126.
000007  900.      -41.
000008  500.      -23.
000009  850.       -9.
000010 1400.     -120.
000011    0.        0.
000012 -999
000013 10 OCT 1985
000014 MIS-01
000015  454.        0
000016  400.      -89.
000017  300.     -114.
000018 1000.     -111.
000019  300.      -15.
000020  400.      -38.
000021  400.      -22.
```



```
EDIT ----- EIL101.EMERY.DATA(MIS01NEW) ------------------------ COLUMNS 001 072
COMMAND ===> "end" or numeric key 3 to exit                     SCROLL ===> HALF
000480  400.      -82.
000481  600.     -158.
000482  500.      -38.
000483  500.      -53.
000484  900.      -84.
000485 1200.      -64.
000486    0.        0.
000487 -999
000488 02 MAR 1988
000489 MIS-01
000490  454.        0.
000491  400.      -79.
000492  600.     -168.
000493  500.      -34.
000494  600.      -58.  *(data set is now ready for entry into programs for PROFILE
000495  300.      -17.        VOLUME calculations and COMPARISON PLOT generation).
000496  400.      -11.            *(exit as indicated above)
000497  500.      -70.
000498 1000.      -64.
000499    0.        0.
000500 -999
****** ***************************** BOTTOM OF DATA ****************************
```



```
EDIT --- EIL101.EMERY.DATA ------------------------------------ ROW 00014 OF 00018
COMMAND ===> "end" or numeric key 3 to exit                      SCROLL ===> PAGE
  NAME                 VV.MM  CREATED     CHANGED      SIZE  INIT   MOD    ID
MIS01NEW
MST01
MST01NEW
WKG01
WKG01NEW
**END**
```



```
------------------------- EDIT - ENTRY PANEL ---------------------------
COMMAND ===>

ISPF LIBRARY:
   PROJECT ===> EIL101
   GROUP   ===> TRAN       ===>          ===>          ===>
   TYPE    ===> DATA
   MEMBER  ===>                    (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
   DATA SET NAME  ===> 'URI.EIL101.MCM.SMALL.PROG' <OR>
   VOLUME SERIAL  ===>             (If not cataloged)

DATA SET PASSWORD ===>             (If password protected)

PROFILE NAME      ===>             (Blank defaults to data set type)

INITIAL MACRO     ===>             LOCK        ===> YES    (YES, NO or NEVER)

FORMAT NAME       ===>             MIXED MODE  ===> NO     (YES or NO)
```

*Now begins the real nuts & bolts of the SURVEY DATA MANIPULATION. The first task is to open and submit the .MCM.SMALL.PROG, then return to the .COMP.PROG(_____) JCL/data set, and submit it in turn. These "routines" work together. One has the calculations and plotting subroutines, the other calls the source and target (input & ouput) files.

```
EDIT ---- URI.EIL101.MCM.SMALL.PROG ------------------------- COLUMNS 001 072
COMMAND ===> "submit" <CR>                                    SCROLL ===> HALF
****** ********************************* TOP OF DATA ***********************************
000010 //EIL101  JOB (EIL101),'MCM.SMALL',MSGCLASS=A
000020 //  EXEC  VSF2CL,PARM.FORT='LANGLVL(66)',REGION=2000K,
000030 //  PARM.LKED='NCAL,LET,LIST,XREF'
000040 //FORT.SYSIN DD *
000050           INTEGER COUNT,TITLE(3),DATE(3),PROFIL(3),DATE2(3),RECORD(5),
000060       1      COMP/'COMP'/,COMPAR/0/,COUNT2,COUNT3,Z,ZZ,JDAY,JMO,JYR
000070       1 ,JMOS(12),NMOS,NYRS,NLYR,MARG,LYRF,
000080       1 JM(12)/'JAN','FEB','MAR','APR','MAY','JUN','JUL','AUG','SEP',
000090       1 'OCT','NOV','DEC'/
000100           REAL XMINC(200),XINC(200),YINC(200),X(200),Y(200),
```

***(Nothing need be changed in this program file, simply submit it and exit again) then open and submit the desired .COMP.PROG(_____) JCL/data set.)**

```
------------------------- EDIT - ENTRY PANEL -----------------------------
COMMAND ===>

ISPF LIBRARY:
   PROJECT ===> EIL101
   GROUP   ===> TRAN       ===>          ===>          ===>
   TYPE    ===> DATA
   MEMBER  ===> "tab"            (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
   DATA SET NAME  ===> "EIL101.COMP.PROGS" <CR>
   VOLUME SERIAL  ===>           (If not cataloged)

DATA SET PASSWORD ===>           (If password protected)

PROFILE NAME      ===>           (Blank defaults to data set type)

INITIAL MACRO     ===>           LOCK        ===> YES    (YES, NO or NEVER)

FORMAT NAME       ===>           MIXED MODE  ===> NO     (YES or NO)
```

```
EDIT --- EIL101.COMP.PROGS ------------------------------ ROW 00001 OF 00021
COMMAND ===> "tab"                                          SCROLL ===> PAGE
   NAME                 VV.MM  CREATED      CHANGED          SIZE  INIT  MOD  ID
  CHABW                 01.03 88/01/18 88/02/26 12:38   584   584     0 EIL101
  CHABWNEW              01.06 88/01/18 88/04/29 16:05   155   584     0 EIL101
  CHATB                 01.03 88/01/18 88/04/18 12:25   686   650     0 EIL101
  CHATBNEW              01.04 88/02/26 88/04/29 16:36   152   116     0 EIL101
  COMPROG
  DSN                   01.00 87/08/21 87/08/21 18:14     3     3     0 EIL101
  EST01                 01.02 87/10/26 88/02/26 12:40  1391  1391     0 EIL101
  EST01NEW              01.05 87/10/26 88/04/29 16:06   152  1391     0 EIL101
  EST02                 01.02 87/10/26 88/02/26 12:41   578   578     0 EIL101
  EST02NEW              01.10 87/10/26 88/04/29 15:21   143   578     0 EIL101
  GRH01                 01.03 87/10/26 88/02/26 11:38  1394  1388     0 EIL101
  GRH01NEW              01.08 88/02/26 88/05/18 17:09   155   119     0 EIL101
  MATSP                 01.01 88/01/26 88/02/26 12:42   632   632     0 EIL101
  MATSPNEW              01.01 88/01/26 88/02/26 12:34    56   632     0 EIL101
  MIS01                 01.03 87/10/26 88/02/26 12:43   560   560     0 EIL101
$ MIS01NEW *(select)    01.09 87/10/26 88/04/29 16:07   152   560     0 EIL101
  MST01                 01.02 87/10/26 88/02/26 12:43  1349  1349     0 EIL101
  MST01NEW              01.06 87/10/26 88/04/29 16:07   146  1349     0 EIL101
  WK001                 01.02 87/10/26 88/02/26 12:44  1463  1463     0 EIL101
  WK001NEW              01.05 88/02/23 88/04/29 16:07   152   119     0 EIL101
  YANG                  01.00 88/03/01 88/03/01 13:52     9     9     0 EIL101
```

```
------------------------- EDIT - ENTRY PANEL ---------------------------
⇨ COMMAND ===> =X  *(exit ISPF to run YPLOTTER or type "TSO PLOTTER" on any
                    command line to temporarily break out of ISPF and run PLOTTER)
  ISPF LIBRARY:
     PROJECT ===> EIL101
     GROUP   ===> TRAN      ===>          ===>          ===>
     TYPE    ===> DATA
     MEMBER  ===>                  (Blank or pattern for member selection list)

  OTHER PARTITIONED OR SEQUENTIAL DATA SET:
     DATA SET NAME  ===>
     VOLUME SERIAL  ===>          (If not cataloged)

  DATA SET PASSWORD ===>          (If password protected)

  PROFILE NAME      ===>          (Blank defaults to data set type)

  INITIAL MACRO     ===>          LOCK        ===> YES    (YES, NO or NEVER)

  FORMAT NAME       ===>          MIXED MODE ===> NO      (YES or NO)
```

```
 EIL101.SPFLOG1.LIST HAS BEEN DELETED.
READY
⇨ "PLOTTER"  *(this loads plotting program which can be set to drive the CALCOMP,
                Printronics, or Tektronics devices).
```

```
 YOU ARE ON FST
   **--->  URI/ACC - TSO PLOTTING SYSTEM  <---**
 PLEASE SELECT ONE OF THE FOLLOWING OPTIONS:

  1 =       NOT AVAILABLE
  2 =       NOT AVAILABLE
  3 = PLOT A GRAPHIC ON THE CALCOMP 1051 PLOTTER USING
      WINDOWING, SCALING, AND ROTATION;
      A FULL CLIPPING DRIVER.
  4 = PREVIEW A GRAPHIC ON A PRINTRONIX PRINTER/PLOTTER
      WITH UP TO 5 FRAME RANGE SELECTIONS.
  5 = PREVIEW A COLOR GRAPHIC ON A TEKTRONIX 4105/4107.

⇨ SELECT:"5" <CR>   *(or select other plotter/printer)

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          TSO TEKTRONIX 4105 DRIVER - REV 2.0

⇨ --=> ENTER THE PLOTFILE NAME.....'EIL101.COMP.PLOT.HIS01NEW'   <CR>
```

```
 --=> ENTER THE FRAME RANGE: LOW, HIGH
     (ENTER   N1,N1  FOR FRAME N1 ONLY)
 ?
⇨ "1,2"      *(start inspection and proofing of profile plots)
 .....
 --=> ENTER   VIEWPORT COORDINATES, IN INCHES
 FOR THE RANGE SELECTED: XMIN,YMIN,XMAX,YMAX
              (OR ENTER:  999,   0,   0,   0)
              (TO SEE ALL YOUR VIRTUAL SPACE)
 ?
⇨ "999,0,0,0"    *(you can specify view coordinates after the initial dimensions
                    are given following your first plot.)
                  *(make note of any problematic profiles, return to ISPF to either
                    edit tran.data and rerun conversion and plotting programs, or
                    continue with .vol.plot.prog)
```

```
EDIT ---- EIL101.COMP.PROGS(MIS01NEW) - 01.09 ---------- COLUMNS 001 072
COMMAND ===> "m8"  *(go to end of file to append new dates)  SCROLL ===> HALF
****** ******************************** TOP OF DATA ***************************
000001 //EIL101S JOB (EIL101),'COLE.SMALL BEACH',TIME=1,MSGCLASS=A
000002 /*JOBPARM L=20
000003 //SMALL        EXEC  PGM=LOADER,REGION=512K
000004 //SYSLIN       DD  DSN=URI.EIL1.LOAD(SMLBEACH),DISP=SHR
000005 //SYSLOUT      DD  SYSOUT=A
000006 //SYSLIB       DD  DSN=SYSP.FORTLIB,DISP=SHR
000007 //             DD  DSN=UCC.LC01.CPLOTLIB,DISP=SHR
000008 //FT06F001     DD  SYSOUT=A
000009 //FT07F001     DD  DUMMY
000010 //FT08F001     DD  DSN=EIL101.EMERY.DATA(MIS01NEW),DISP=OLD
000011 //FT09F001     DD  DSN=EIL101.BEACH.VOLDATA(MIS01NEW),DISP=OLD
000012 //FT99F001     DD  DSN=EIL101.COMP.PLOT.MIS01NEW,DISP=OLD
000013 //FT05F001     DD  *
000014 MIS-01  COMP
000015 23 SEP 1985
000016 10 OCT 1985
000017 MIS-01  COMP
000018 10 OCT 1985
000019 08 NOV 1985
000020 MIS-01  COMP
000021 08 NOV 1985
```

```
EDIT ---- EIL101.COMP.PROGS(MIS01NEW) - 01.09 ---------- COLUMNS 001 072
COMMAND ===> "tab"                                      SCROLL ===> HALF
000132 05 NOV 1987
000133 18 NOV 1987
000134 MIS-01  COMP
000135 18 NOV 1987
000136 02 DEC 1987
000137 MIS-01  COMP
000138 02 DEC 1987
000139 16 DEC 1987
000140 MIS-01  COMP
000141 16 DEC 1987
000142 19 JAN 1988
000143 MIS-01  COMP
000144 19 JAN 1988
000145 05 FEB 1988
000146 MIS-01  COMP
000147 05 FEB 1988
000148 17 FEB 1988
000149 MIS-01  COMP
000150 17 FEB 1988
I00151 02 MAR 1988
000152 //
****** ***************************** BOTTOM OF DATA ************************
```

*(This "I" means insert, and results in the opening of a new row for entry; append with new "COMP" dates following the above format exactly. These appear in .beach.progdata files and are generated by .tran.conv.prog. They are simply paired dates of sequential surveys. When done hit a <CR> alone on an empty line to exit entry mode. Hit CNTL "A" to return to the COMMAND line, then type "SAVE"<CR>, "SUBMIT"<CR> and "END" or numeric 3.)

*(Continue hitting numeric "3" to get to main menu for exiting ISPF, or exit at any COMMAND line by typing "=X". You are now ready to view preliminary comparison plots of sequential beach profiles. This is done through the "PLOTTER" program in TSO.)

```
------------------------------ EDIT - ENTRY PANEL ------------------------------
COMMAND ===>

ISPF LIBRARY:
   PROJECT ===> EIL101
   GROUP   ===> TRAN      ===>          ===>          ===>
   TYPE    ===> DATA
⇨  MEMBER  ===> "tab"          (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
⇨  DATA SET NAME  ===> URI.EIL101.VOL.PLOT.PROG <cr>
   VOLUME SERIAL  ===>          (If not cataloged)

DATA SET PASSWORD ===>          (If password protected)

PROFILE NAME      ===>          (Blank defaults to data set type)

INITIAL MACRO     ===>          LOCK        ===> YES    (YES, NO or NEVER)

FORMAT NAME       ===>          MIXED MODE  ===> NO     (YES or NO)
```

```
EDIT ---- URI.EIL101.VOL.PLOT.PROG ---------------------------- COLUMNS 001 072
⇨ COMMAND ===> "m8"   *(to go to last line of program)          SCROLL ===> HALF
****** ******************************** TOP OF DATA ********************************
000010 //EIL101S JOB (EIL101),'VOL.PLOT',TIME=(0,30),MSGCLASS=W,NOTIFY=EIL101
000030 /*JOBPARM L=5
000040 // EXEC USF2CLG,PARM.FORT='LANGLVL(66)',LIB1=CPLOT,REGION=2500K
000050 //FORT.SYSIN  DD  *
000090         REAL DAY(2000),VOL(2000),XLEN,YLEN,FDAY,LDAY,SVOL,BVOL,
000100      *       FX,DX,FY,DY,GRIDX(4),GRIDY(4),S
000110         INTEGER N,TITLE(6),PROF(6),TLEN,SY,MONTH,BDAY,LMONTH
000120 C
000130 C     OPEN GRAPHICS, OUTPUT TO UNIT 8
```

```
EDIT ---- URI.EIL101.VOL.PLOT.PROG ---------------------------- COLUMNS 001 072
⇨ COMMAND ===> "tab"                                           SCROLL ===> HALF
003340         RETURN
003350         END
003360 /*                                   *(replace w/ current files)
003370 //*GO.FT05F001  DD  DSN=EIL101.RUN.OUT,DISP=OLD
⇨ 003380 //GO.FT08F001  DD  DSN=EIL101.VOL.PLOT.Mis01new,DISP=OLD
⇨ 003390 //GO.FT09F001  DD  DSN=EIL101.BEACH.VOLDATA(Mis01new),DISP=OLD
003400 //GO.SYSIN DD DUMMY
****** ***************************** BOTTOM OF DATA ******************************
⇨ * back on "COMMAND" line type "210" and hit numeric key "7" to get to input format line.
```

```
EDIT ---- URI.EIL101.VOL.PLOT.PROG ---------------------------- COLUMNS 001 072
⇨ COMMAND ===>"tab"                                            SCROLL ===> HALF
001090 C     FORMATS
001100 C
001110   100    FORMAT(4(F5.0,1X))          * "COMMENTING" this line allows alternative
001120   105    FORMAT(6A4)                   format (suited to .VOLDATA(_____new)
001130   110    FORMAT(I2,2X,I2,2X,I4,2X,I2)  file) to be used; a "C" on the other line
⇨ 001140 C115   FORMAT(F5.0,18X,F5.1)         however permits .VOLDATA(_____c)
⇨ 001141 C115   FORMAT(6X,F5.0,5X,F5.1)       file to be used.
001150   120    FORMAT(4(F5.0,1X,F5.0))
001160   130    FORMAT(6A4)                 * return to "COMMAND" line, "SAVE",
001170 C135     FORMAT(1X,6A4)                "SUBMIT" and "END".
001180 C140     FORMAT(1X,6A4)
001190 C145     FORMAT(1X,4(F5.0,1X))
001191 C146     FORMAT(I2,2X,I2,2X,I4,2X,I2)
001200 C150     FORMAT(1X,F5.0,1X,F5.1)
001210         STOP
```

```
 ------------------------- EDIT - ENTRY PANEL -------------------------
⇨ COMMAND ===> =X  *(exit ISPF to run PLOTTER or type "TSO PLOTTER" on any
                    command line to temporarily break out of ISPF and run PLOTTER)
   ISPF LIBRARY:
      PROJECT ===> EIL101
      GROUP   ===> TRAN      ===>          ===>          ===>
      TYPE    ===> DATA
      MEMBER  ===>                  (Blank or pattern for member selection list)

   OTHER PARTITIONED OR SEQUENTIAL DATA SET:
      DATA SET NAME  ===>
      VOLUME SERIAL  ===>          (If not cataloged)

   DATA SET PASSWORD ===>          (If password protected)

   PROFILE NAME      ===>          (Blank defaults to data set type)

   INITIAL MACRO     ===>          LOCK        ===> YES    (YES, NO or NEVER)

   FORMAT NAME       ===>          MIXED MODE  ===> NO     (YES or NO)
```

```
 EIL101.SPFLOG1.LIST HAS BEEN DELETED.
READY
⇨ "PLOTTER"  *(this loads plotting program which can be set to drive the CALCOMP,
                Printronics, or Tektronics devices).
```

```
 YOU ARE ON FST
  **--->  URI/ACC - TSO PLOTTING SYSTEM  <---**
 PLEASE SELECT ONE OF THE FOLLOWING OPTIONS:

  1 =      NOT AVAILABLE
  2 =      NOT AVAILABLE
  3 = PLOT A GRAPHIC ON THE CALCOMP 1051 PLOTTER USING
      WINDOWING, SCALING, AND ROTATION;
      A FULL CLIPPING DRIVER.
  4 = PREVIEW A GRAPHIC ON A PRINTRONIX PRINTER/PLOTTER
      WITH UP TO 5 FRAME RANGE SELECTIONS.
  5 = PREVIEW A COLOR GRAPHIC ON A TEXTRONIX 4105/4107.

⇨ SELECT:"5" <CR>  *(or select other plotter/printer)

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          TSO TEKTRONIX 4105 DRIVER - REV 2.0

⇨ --=> ENTER THE PLOTFILE NAME....."EIL101.VOL.PLOT.MIS01NEW" <CR>
```

```
 --=> ENTER THE FRAME RANGE: LOW, HIGH
    (ENTER   N1,N1  FOR FRAME N1 ONLY)
 ?
⇨ "1,1"      *(start inspection and proofing of volume plot)
 .....
 --=> ENTER   VIEWPORT COORDINATES, IN INCHES
 FOR THE RANGE SELECTED: XMIN,YMIN,XMAX,YMAX
              (OR ENTER:  999,   0,   0,   0)
              (TO SEE ALL YOUR VIRTUAL SPACE)
 ?
⇨ "999,0,0,0"    *(you can specify view coordinates after the initial dimensions
                    are given following your first plot.)
                 *(make note of any problematic points, return to ISPF to either
                    edit tran.data and rerun conversion and plotting programs, or
                    continue with next beach transect.)
```

ACKNOWLEDGMENTS

The work involved in accomplishing the goals of this report have provided me with further insight into the tremendous resource available as a result of the initiation, maintenance and continuity of the long-term beach profile network. For the opportunity to delve into the details of the beach profile data base I extend my appreciation to its initiators, Robert L. McMaster and Jon C. Boothroyd. Even greater thanks are due these same gentlemen for their patience, and insights lent during numerous discussions on shoreline processes and coastal landform evolution. I also extend my thanks to Roger Greenall for his deft skill at designing the original FORTRAN programs. To James Gibeaut, whose herculean efforts resulted in the compilation of all the pertinent data sets and appropriate programs , I owe many thanks. This report essentially is a follow-up on Gibeaut's monumental task, with clarifications given with regard to the flow of programming steps. Steve Seldon was indispensible in organizing the CHA-EZ Emery data sets and pertinent programs. Considerable thanks must also go to the numerous survey partners (my coeval graduate students) who assisted in the gathering of further beach profile data. These include, Christopher Galagan, Dave Lawson, Bill Nelson, Carol Gibson, and John Peck. A whole host of other equally dedicated persons, without whose support and patience this report would not have been possible include the entire User Services group at the Academic Computer Center, URI, and especially Charlene Yang, Hilde Gesch, Mark Oliver, Peter Rose, Christian Vye, and Janie Palm. Finally, for her equal patience, I thank Sue Ponte.

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APPENDIX 1

Sample Program: Transit Data Conversion

URI.EIL101.TRAN.CONV.PROG

```
LEVEL 2.2.0 (JUNE 1987)        VS FORTRAN              MAY 12, 1988  16:38:17

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOGOSTMT NODECK SOURCE TERM OBJECT FIXED IRMFLG SRCFLG NOSYM NOPEN
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NODC NOICA NODIRECTIVE
                      OPT(3) LANGLVL(77) NOFIPS   FLAG(I)   NAME(MAIN)    LINECOUNT(60)      CHARLEN(500)

 IF DO    ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

                 1          INTEGER COUNT,I,LAST,NCOUNT                                          00000050
                 2          REAL HGTO,INTHT,B(20),M(20),T(20),D(20),HT(20),DSUM,DISO             00000060
                 3          CHARACTER*12 PROFIL,DATE                                             00000070
                          C *                                                                    00000080
                          C*******INPUT DATA                                                     00000090
                          C *                                                                    00000100
                 4          READ (8,1000) HGTO                                                   00000120
                 5          READ (8,1010) PROFIL                                                 00000130
                 6    50    READ (8,1010,END=999) DATE                                           00000140
                 7          READ (8,1000) INTHT                                                  00000150
                 8          DO 100 I=1,20                                                        00000160
              1  9             READ (8,1030) B(I),M(I),T(I)                                      00000170
              1 10             IF (B(I) .LT. 0.) GO TO 200                                       00000180
              1 11    100    CONTINUE                                                           00000190
                12    200    COUNT=I                                                            00000200
                          C*                                                                     00000210
                          C*******CONVERT FEET TO METRIC, A 1, FOLLOWING THE END FLAG ON THE     00000220
                          C*******SAME LINE INDICATES PREVIOUS READINGS IN FEET                  00000221
                          C*                                                                     00000230
                13          IF (M(COUNT) .EQ. 1.) THEN                                         00000240
              1 14             INTHT=INTHT*.3048                                               00000250
              1 15             NCOUNT=COUNT-1                                                  00000260
              1 16             DO 150 I=1,NCOUNT                                               00000270
              1  1 17             B(I)=B(I)*.3048                                              00000280
              1  1 18             M(I)=M(I)*.3048                                              00000290
              1  1 19             T(I)=T(I)*.3048                                              00000300
              1  1 20    150      CONTINUE                                                     00000310
              1 21             END IF                                                          00000320
                22             DISO=0.                                                         00000330
                23             D(1)=(T(1)-B(1))*10000.                                         00000340
                24             HT(1)=(M(1)-INTHT)*100.                                         00000350
                25             HT(2)=(INTHT-M(2))*100.                                         00000360
                26             D(COUNT)=0.                                                     00000370
                27             HT(COUNT)=0.                                                    00000380
                28             COUNT=COUNT-1                                                   00000390
                29             DSUM=0.                                                         00000400
                          C*                                                                   00000410
                          C*******CALCULATE RELATIVE HTS. AND DISTANCES                        00000420
                          C*                                                                   00000430
                30             DO 300 I=2,COUNT                                              00000440
              1 31                D(I)=((T(I)-B(I))*10000.-DSUM                              00000450
              1 32                DSUM=DSUM+D(I)                                             00000460
              1 33    300    CONTINUE                                                        00000470
                34             DO 350 I=3,COUNT                                              00000480
              1 35                HT(I)=((M(I-1)-INTHT)-(M(I)-INTHT))*100.                   00000490
              1 36    350    CONTINUE                                                        00000500
                          C*                                                                   00000510
                          C*******OUTPUT DATA                                                  00000520
                          C*                                                                   00000530
                37             WRITE (9,1010) DATE                                           00000540
                38             WRITE (10,1010) PROFIL                                        00000550
                39             WRITE (10,1010) PROFIL                                        00000551
```

URI.EIL101.TRAN.CONV.PROG

```
LEVEL 2.2.0 (JUNE 1987)        VS FORTRAN              MAY 19, 1988  16:38:17  NAME:MAIN

 IF DO   TSN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

           40            WRITE (10,1010) DATE                                          00000550
           41            COUNT=COUNT+1                                                 00000560
           42            WRITE(9,1060) HGTO,DISO                                       00000570
           43            DO 400 I=1,COUNT                                              00000580
     1     44               WRITE (9,1060) D(I),HT(I)                                  00000590
     1     45    400     CONTINUE                                                      00000600
           46            LAST = -999                                                   00000610
           47            WRITE (9,1070) LAST                                           00000620
           48            GO TO 50                                                      00000630
                 C*                                                                    00000640
                 C******FORMAT STATEMENTS                                              00000650
                 C*                                                                    00000660
           49    1000    FORMAT (F4.2)                                                 00000670
           50    1010    FORMAT (A12)                                                  00000680
           51    1030    FORMAT (3(F5.3,1X))                                           00000690
           52    1060    FORMAT (F5.0,5X,F5.0)                                         00000700
           53    1070    FORMAT (I4)                                                   00000710
           54    999     STOP                                                          00000720
           55            END                                                           00000730

*STATISTICS*   SOURCE STATEMENTS = 55, PROGRAM SIZE = 2372 BYTES, PROGRAM NAME = MAIN     PAGE:     1.

*STATISTICS*    NO DIAGNOSTICS GENERATED.

**MAIN** END OF COMPILATION 1 ******
```

APPENDIX 2

Sample Program: Profile Plotting and Volume Data Output

URI.EIL101.MCM.SMALL.PROG

```
1       //EIL101SM JOB (EIL101),'MCM,SMALL',MSGCLASS=A                    JOB  539
        ***PASSWORD
2       //   EXEC  USE2CL,PARM.FORT='LANGLVL(66)',REGION=2000K,          00000020
        //   PARM.LKED='NCAL,LCT,LIST,XREF'                              00000030
3       XXFORTUCL PROC LIB1=NULL,LIB2=NULL,LIB3=NULL                     00010001
4       XXFORT    EXEC  PGM=FORTVS2,REGION=2000K                         00020002
5       XXSYSPRINT      DD SYSOUT=A,DCB=BLKSIZE=3429                     00030001
6       XXSYSTERM       DD DUMMY                                         00040001
7       XXSYSPUNCH      DD SYSOUT=B,DCB=BLKSIZE=3440                     00050001
8       XXSYSLIN        DD DSN=&&LOADSET,DISP=(MOD,PASS),UNIT=SYSDA,    +00060001
        XX              SPACE=(3200,(25,6)),DCB=BLKSIZE=3200             00070001
9       //FORT.SYSIN DD *                                                00080040
10      XXLKED    EXEC  PGM=IEWL,COND=(4,LT),                          + 00090001
        XX              PARM='LET,LIST,MAP,XREF'                         00090001
11      XXSYSPRINT      DD SYSOUT=A                                      00100001
12      XXSYSLIB        DD DSN=SYS2.FORTLIB,DISP=SHR                     00110001
13      XX              DD DSN=UCC.LC01.&LIB1.LIB,DISP=SHR               00120001
14      XX              DD DSN=UCC.LC01.&LIB2.LIB,DISP=SHR               00130001
15      XX              DD DSN=UCC.LC01.&LIB3.LIB,DISP=SHR               00140001
16      XXSYSUT1        DD UNIT=SYSDA,SPACE=(1024,(200,20))              00150001
17      //LKED.SYSLMOD  DD  DSN=UP1.EIL1.LOAD,DISP=SHR                   00004740
        X/SYSLMOD       DD DSN=&&GOSET(MAIN),DISP=(,PASS),UNIT=SYSDA,  + 00160001
        XX              SPACE=(TRK,(10,10,1),RLSE)                       00170001
18      XXSYSLIN        DD DSN=&&LOADSET,DISP=(OLD,DELETE)               00180001
19      XX              DD DDNAME=SYSIN                                  00190001
20      //LKED.SYSIN   DD  *                                             00004750
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN                MAY 19, 1988  16:42:15

REQUESTED OPTIONS (EXECUTE): LANGLVL(66)

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOSOSTMT NODECK SOURCE TERM OBJECT FIXED IRMFLG SPCFLG NOSYM NOOPEN
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NODC NOICA NODIRECTIVE
                     OPT(3) LANGLVL(66) NOFIPS   FLAG(I)  NAME(MAIN)     LINECOUNT(60)      CHARLEN(500)

 IF OO   ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

          1               INTEGER COUNT,TITLE(3),DATE(3),PROFIL(3),DATE2(3),RECORD(5),    00000050
                1           COMP/'COMP'/,COMPAR/0/,COUNT2,COUNT3,Z,ZZ,JDAY,JMO,JYR       00000060
                1         ,JMOS(12),NMOS,NYRS,NLYR,MARG,LYRF,                           00000070
                1         JM(12)/'JAN','FEB','MAR','APR','MAY','JUN','JUL','AUG','SEP', 00000080
                1         'OCT','NOV','DEC'/                                            00000090
          2               REAL XMINC(200),XINC(200),YINC(200),X(200),Y(200),            00000100
                1           XDISP,YDISP,YWRLD(200),X2(200),Y2(200),A,B,C,D,M,           00000110
                1           YINT,XINT,XM,YM,XX,XXMINC,XX1,YY,YY1,VDSUM,MDVD,MNVD,VD(999)00000120
                1            ,NUM,JDATE                                                 00000130
          3               CALL PLOTS(0.,0.,99)                                          00000140
          4               CALL FACTOR(0.75)                                             00000150
          5               WRITE(6,2000)                                                 00000160
          6     2000      FORMAT(1X,'PROGRAM LOADED IS MCM.SMALL')                      00000170
                C                                                                       00000180
                C - - - - - - - -  READ PARAMETERS                                      00000190
                C                                                                       00000200
          7                 7=0                                                         00000210
          8                 VDSUM=0.                                                    00000220
          9       %         REWIND 8                                                    00000230
         10                 COMPAR=0                                                    00000240
         11       10        READ(5,100,END=999) PROFIL                                  00000250
         12       100       FORMAT(3A4)                                                 00000260
         13                 READ(5,100) DATE                                            00000270
                C                                                                       00000280
                C - - - - - - - - SCAN DATA FOR TITLE, DATE                             00000290
                C                                                                       00000300
         14                 IF(PROFIL(3).NE.COMP) GO TO 20                              00000310
         15                 COMPAR=1                                                    00000320
         16                 READ(5,100) DATE2                                           00000330
         17       20        READ(8,100,END=902) TITLE                                   00000340
         18                 IF(TITLE(2).NE.PROFIL(2)) GO TO 20                          00000350
         19                 IF (TITLE(1).NE.PROFIL(1)) GO TO 20                         00000360
         20                 BACKSPACE 8                                                 00000370
         21                 BACKSPACE 8                                                 00000380
         22       30        READ(8,200,END=903) RECORD                                  00000390
         23       200       FORMAT(5A4)                                                 00000400
         24                 IF(RECORD(1).NE.DATE(1)) GO TO 30                           00000410
         25                 IF(RECORD(2).NE.DATE(2)) GO TO 30                           00000420
         26                 IF(RECORD(3).NE.DATE(3)) GO TO 30                           00000430
         27                 WRITE(6,550) DATE                                           00000440
         28       550       FORMAT(1X,3A4)                                              00000450
                C                                                                       00000460
                C----------CONVERT DATE TO JULIENNE DATE FOR CORRELATION AND            00000470
                C          VOLUME PLOT PROGRAM , 01 OCT 1961= DAY 1                     00000480
                C                                                                       00000490
         29                 BACKSPACE 8                                                 00000500
         30                 READ(8,101)JDAY,JMO,JYR                                     00000510
         31       101       FORMAT(I2,1X,A3,1X,I4)                                      00000520
         32                 JMOS(1)=0                                                   00000530
         33                 JMOS(2)=31                                                  00000540
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)        US FORTRAN              MAY 19, 1988  16:42:16  NAME:MAIN

 IF DO    ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

          34              JMOS(3)=59                                                          00000550
          35              JMOS(4)=90                                                          00000560
          36              JMOS(5)=120                                                         00000570
          37              JMOS(6)=151                                                         00000580
          38              JMOS(7)=181                                                         00000590
          39              JMOS(8)=212                                                         00000600
          40              JMOS(9)=243                                                         00000610
          41              JMOS(10)=273                                                        00000620
          42              JMOS(11)=304                                                        00000630
          43              JMOS(12)=334                                                        00000640
          44              IF(JMO .EQ. JM(1))NMOS=1                                            00000650
          45              IF(JMO .EQ. JM(2))NMOS=2                                            00000660
          46              IF(JMO .EQ. JM(3))NMOS=3                                            00000670
          50              IF(JMO .EQ. JM(4))NMOS=4                                            00000680
          52              IF(JMO .EQ. JM(5))NMOS=5                                            00000690
          54              IF(JMO .EQ. JM(6))NMOS=6                                            00000700
          56              IF(JMO .EQ. JM(7))NMOS=7                                            00000710
          58              IF(JMO .EQ. JM(8))NMOS=8                                            00000720
          60              IF(JMO .EQ. JM(9))NMOS=9                                            00000730
          62              IF(JMO .EQ. JM(10))NMOS=10                                          00000740
          64              IF(JMO .EQ. JM(11))NMOS=11                                          00000750
          66              IF(JMO .EQ. JM(12))NMOS=12                                          00000760
          68              JDATE=0                                                             00000770
          69              IF(JYR .EQ. 1961) GO TO 415                                         00000780
          70              NYRS=JYR-1961                                                       00000790
          71              NLYR=NYRS/4                                                         00000800
          72              MARG=NYRS+1                                                         00000810
          73              JDATE=365*(NYRS-1)+NLYR+92                                          00000820
          74              IF(NMOS .GT. 2 .AND. MOD(MARG,4) .EQ. 0)JDATE=JDATE+1               00000830
          76              JDATE=JMOS(NMOS)+JDATE+JDAY                                         00000840
          77              GO TO 416                                                           00000850
          78    415       JDATE=JDATE+JDAY                                                    00000860
          79              IF(JMO .EQ. JM(11))JDATE=JDATE+31                                   00000870
          81              IF(JMO .EQ. JM(12))JDATE=JDATE+61                                   00000880
          83    416       CONTINUE                                                            00000890
          84     50       READ(8,100) TITLE                                                   00000900
          85              WRITE(6,550) TITLE                                                  00000910
                C                                                                           00000920
                C - - - - - - - - READ DATA FOR PROFILE                                     00000930
                C                                                                           00000940
          86              READ(8,900)STELEV,SLEVEL                                            00000950
          87     900      FORMAT(2F9.1)                                                       00000960
          88              WRITE(6,666)STELEV,SLEVEL                                           00000970
          89     666      FORMAT(1X,'STAKE ELEVATION=',F9.1,'    STAKE LEVEL=',F9.1)          00000980
                C                                                                           00000990
                C - - - - - - - - FILL X, Y ARRAYS                                          00001000
                C                                                                           00001010
          90     80       DO 90 I=1,200                                                       00001020
     1    91              READ(8,560)XINC(I),YINC(I)                                          00001030
     1    92     560      FORMAT(F5.0,5X,F5.0)                                                00001040
     1    93              IF(XINC(I).LT.-100.)GO TO 95                                        00001050
     1    94     561      FORMAT(1X,2F9.1)                                                    00001070
     1    94     90       CONTINUE                                                            00001080
          96     95       COUNT=I-1                                                           00001090
          97              Y(1)=STELEV-SLEVEL                                                  00001100
          98              X(1)=0.                                                             00001110
```

URI.EIL101.MCM.SMALL.PROG

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LEVEL 2.2.0 (JUNE 1987)        VS FORTRAN              MAY 10, 1988  14:42:16  NAME:MAIN

IF DO   ISN    *....*....1....*....2....*....3....*....4....*....5....*....6....*....7.*.......8

               C                                                                          00001120
               C - - - - - - - -  SUM DATA AND PLACE VERTICAL DISPLACEMENT IN AN ARRAY     00001130
               C                                                                          00001140
         99                    DO 110 I=2,COUNT                                         00001150
    1   100                    Y(I)=Y(I-1)+YINC(I-1)                                    00001160
    1   101                    X(I)=X(I-1)+XINC(I-1)                                    00001170
    1   102      110           CONTINUE                                                 00001180
        103                    Z=Z+1                                                    00001190
        104                    VD(Z)=Y(COUNT)                                           00001200
        105                    VDSUM=VDSUM+VD(Z)                                        00001210
        106      931           FORMAT(1X,'HORIZONTAL DISPLACEMENT =',F14.7,/,           00001220
                  1 1X,'VERTICAL DISPLACEMENT =',F14.7)                                00001230
               C                                                                        00001240
               C - - - - - - - -  CONVERT TO METERS                                     00001250
               C                                                                        00001260
        107                    DO 120 I=1,COUNT                                         00001270
    1   108                    Y(I)=Y(I)*.01                                            00001280
    1   109                    X(I)=X(I)*.01                                            00001290
    1   110                    XINC(I)=XINC(I)*.01                                      00001300
    1   111      120           CONTINUE                                                 00001310
        112      920           FORMAT(1X,2F14.7)                                        00001320
        113                    AMET=0.                                                  00001330
               C                                                                        00001340
               C - - - - - - - -  CALCULATE AREA UNDER CURVE, TRAPEZOID SUMMATION        00001350
               C                                                                        00001360
        114                    DO 170 I=1,COUNT                                         00001370
    1   115                    IF(Y(I),LE,0.) GO TO 69                                  00001380
    1   116      170           YHOLD(I)=Y(I)+2.                                         00001390
               C                                                                        00001400
               C ----------------EXTRAPOLATE SHORT PROFILE                             00001410
               C ----------------FIND  LINE OF LAST 2 POINTS                           00001420
               C                                                                        00001430
        117                    IF((X(COUNT)-X(COUNT-1)) ,EQ, 0.) GO TO 888              00001440
        118                        M=(Y(COUNT)-Y(COUNT-1))/(X(COUNT)-X(COUNT-1))        00001450
        119                    IF(M,GE,0.) GO TO 888                                    00001451
        120                    IF((M,GE,-,01),AND,(Y(COUNT),GE,,5))GO TO 888            00001460
        121                        YINT=Y(COUNT)-M*Y(COUNT)                             00001470
        122                        XINT=-1.*YINT/M                                      00001480
        123                        XX=XINT                                              00001490
        124                        XXMINC=XX-X(COUNT)                                   00001500
        125                    DO 130 I=2,COUNT                                         00001510
    1   126                    AMET=AMET+.5*(YHOLD(I-1)+YHOLD(I))*XMINC(I-1)            00001520
    1   127      130           WRITE(6,777) AMET                                        00001530
        128      777           FORMAT(F14.7)                                            00001540
        129                    AMET=AMET+.5*(COUNT+2.1.0 -.88(YHOLD(COUNT)-2.)*XXMINC   00001550
        130                    WRITE(6,930)AMET                                         00001560
        131      930           FORMAT(' AREA UNDER CURVE =',F14.7)                      00001570
        132                    YY=0                                                     00001580
        133                    WRITE(6,NE,1) GO TO 300                                  00001590
        134                    GO TO 7)                                                 00001600
        135      888           DO 500 I=1,COUNT                                         00001610
    1   136                        AMET=AMET+.5*(YHOLD(I-1)+YHOLD(I))*XMINC(I-1)        00001620
    1   137      500           WRITE(6,931)AMET                                         00001630
        138                    AMET=AMET-(X(COUNT)*2.)                                  00001640
        139                    WRITE(6,931)                                             00001650
        140      887           FORMAT(1X,'**CAUTION, EXTRAPOLATION MAY NOT BE RESONABLE;  00001660
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)        VS FORTRAN              MAY 19, 1988  16:42:16  NAME:MAIN

 IF DO    ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

                 ! VOLUME AND GRAPH ARE CALCULATED TO THE LAST DATA POINT**!          00001690
          141          WRITE(6,930)AMET                                              00001700
          142          XX=X(COUNT)                                                   00001710
          143          YY=Y(COUNT)                                                   00001720
          144          IF (COMPAR .NE. 1 ) GO TO 300                                 00001730
          145          GO TO 71                                                      00001740
          146    69    CONTINUE                                                      00001750
                 C                                                                  00001760
                 C ------------DETERMINE THE LINE OF THE LAST 2 POINTS SPANNING MLW  00001770
                 C------------AND FIND THE X INTERCEPT                             00001780
                 C                                                                  00001790
          147           COUNT3=I-1                                                  00001800
          148          M=(Y(COUNT3)-Y(COUNT3+1))/(X(COUNT3)-X(COUNT3+1))            00001810
          149          YINT=Y(COUNT3)-(M*X(COUNT3))                                 00001820
          150          XM=-1.*YINT/M                                                00001830
          151          YM=0.                                                        00001840
          152          YHOLD(COUNT3+1)=YM+2.                                        00001850
          153          XMINC(COUNT3)=XM-X(COUNT3)                                   00001860
          154          COUNT3=COUNT3+1                                              00001870
          155          DO 152 I=2,COUNT3                                            00001880
    1     156          AMET=AMET+.5*(YHOLD(I-1)+YHOLD(I))*XMINC(I-1)                00001890
    1     157    152   WRITE(6,792) AMET                                            00001900
          158    792   FORMAT(F14.7)                                                00001910
          159          AMET=AMET-(XM*2.)                                            00001920
          160          WRITE(6,935)AMET                                             00001930
          161    935   FORMAT(' AREA UNDER CURVE =',F14.7)                          00001940
          162          XX=X(COUNT)                                                  00001950
          163          YY=Y(COUNT)                                                  00001960
          164          IF(COMPAR.NE.1) GO TO 300                                    00001970
          165    71    CONTINUE                                                     00001980
                 C                                                                  00001990
                 C - - - - - - - - SAVE FIRST PROFILE DATA                          00002000
                 C                                                                  00002010
          166          WRITE(9,104)JDATE,DATE,AMET                                  00002011
          167          DO 133 I=1,COUNT                                             00002020
    1     168          Y2(I)=Y(I)                                                   00002030
    1     169    133   X2(I)=X(I)                                                   00002040
          170          COUNT2=COUNT                                                 00002050
          171          AMET2=AMET                                                   00002060
          172          COMPAR=3                                                     00002070
          173          XX=XX                                                        00002080
          174          YY=YY                                                        00002090
          175          IF(DATE2(1).NE.DATE2(2)) GO TO 40                            00002100
          176          IF(DATE2(2).NE.DATE2(3)) GO TO 40                            00002110
          177          WRITE(6,550) DATE2                                           00002120
                 C                                                                  00002130
                 C - - - - - - - - CALCULATE AREA CHANGE                            00002140
                 C                                                                  00002150
                 C - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  00002160
          178          AREA=AMET2-AMET                                              00002170
          179          AMET=AMET2                                                   00002180
          180          WRITE(6,*)AREA                                               00002190
                 C - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  00002200
                 C - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  00002210
                 C - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  00002220
                 C - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  00002230
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)          V9 FORTRAN              MAY 19, 1988  15:42:16  NAME=MAIN

 IF DO    ISN    *....*...1.........2.........3.........4.........5.........6.........7.b.......8

          183     220    IF(COMPAR.EQ.0)WRITE(9,104)JDATE,DATE,AMET                          00002240
          185     104    FORMAT(F5.0,3X,3A4,3X,F5.1)                                         00002250
          186            CALL PROPLT(X,Y,X2,Y2,COUNT,COUNT2,TITLE,DATE,DATE2,AMET,           00002260
                        *AAAA,DIFF,COMPAR,XX,XX1,YY,YY1)                                     00002270
          187              GO TO 5                                                           00002280
                  C                                                                         00002290
                  C----------FIND MEAN AND MEDIAN V.D.                                     00002300
                  C                                                                         00002310
          188     999      MNVD=VDSUM/Z                                                     00002320
          189              ZZ=Z                                                             00002330
          190              DO 315 I=1,ZZ                                                    00002340
     1    191                Z=Z-1                                                          00002350
     1    192                DO 316 J=1,Z                                                   00002360
     2    193                  IF(VD(J).LT.VD(J+1)) GO TO 316                               00002370
     2    194                  DUM=VD(J)                                                    00002380
     2    195                  VD(J)=VD(J+1)                                                00002390
     2    196                  VD(J+1)=DUM                                                  00002400
     2    197     316        CONTINUE                                                       00002410
     1    198     315      CONTINUE                                                         00002420
          199                DO 147 I=1,ZZ                                                00002421
     1    200                  WRITE (6,148) VD(I)                                        00002422
     1    201     148          FORMAT (1X,F7.1)                                           00002423
     1    202     147        CONTINUE                                                     00002424
          203              IF (MOD(ZZ,2) .EQ. 0) GO TO 318                              00002430
          204              MNVD=VD(ZZ/2+1)                                              00002441
          205              GO TO 319                                                    00002452
          206     318      MDVD=(VD(ZZ/2)+VD(ZZ/2+1))/2.                                00002460
          207                WRITE (6,111) ZZ,VD(ZZ/2),VD(ZZ/2+1),VDSUM                 00002470
          208     111        FORMAT(1X,I4,2X,3(F7.1,2X))                                00002480
          209     319      WRITE(6,317) ZZ,MNVD,MDVD                                    00002481
          210     317      FORMAT(1X,'# PROFILES = ',I4,3X,'MEAN V.D. = ',F5.1,3X,      00002482
                  1          'MEDIAN V.D. = ',F5.1)                                    00002490
                  C                                                                     00002500
                  C - - - - - - - - ERROR MESSAGES                                      00002510
                  C                                                                     00002520
          211              CALL PLOT(-9.25,0.,999)                                      00002530
          212              WRITE(6,9011)                                                00002540
          213     9011     FORMAT(' END OF RUN.....')                                   00002550
          214              STOP                                                         00002560
          215     902      WRITE(6,9022)                                                00002570
          216     9022     FORMAT(' ERR OR DATA: SEARCHING FOR PROFILE TITLE.')         00002580
          217              STOP 333                                                     00002590
          218     903      WRITE(6,9033)                                                00002600
          219     9033     FORMAT(' END OF DATA: SEARCHING FOR DATE 1.')                00002610
          220              STOP 333                                                     00002620
          221     904      WRITE(6,9044)                                                00002630
          222     9044     FORMAT(' END OF DATA, SEARCHING FOR DATE 2.')                00002640
          223              STOP 333                                                     00002650
          224              END                                                          00002660

*STATISTICS*  SOURCE STATEMENTS = 224, PROGRAM SIZE = 20692 BYTES, PROGRAM NAME = MAIN     PAGE:     1.

*STATISTICS*  NO DIAGNOSTICS GENERATED.

*ERRORS* END OF COMPILATION: 1 ERRORS.
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN                    MAY 19, 1989  16:42:20

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOGOSTMT NODECK SOURCE TERM OBJECT FIXED TRMFLG SRCFLG NOSYM NOREN
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NOOC NOICA NODIRECTIVE
                      OPT(3) LANGLVL(66) NOFIPS   FLAG(I)  NAME(MAIN)     LINECOUNT(60)       CHARLEN(500)

IF DO   ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

         1                SUBROUTINE PROPLT(X,Y,X2,Y2,COUNT,COUNT2,TITLE,DATE,DATE2,AMET,00002670
                         1    AAAA,DIFF,COMPAR,XX,XX1,YY,YY1)
         2                REAL X(200),Y(200),XORG/0.0/,NWXORG,XLEN,X2(200),Y2(200)          00002680
                         1   ,XX,YY,YY1,XX1                                                00002690
         3                INTEGER COUNT,DATE(3),TITLE(3),COUNT2,DATE2(3),COMPAR             00002700
         4          1     NWXORG=0.0                                                        00002710
                    C                                                                      00002720
                    C - - - - - - - -  FIND LENGTH OF X AXIS                               00002730
                    C                                                                      00002740
         5                IF ((COMPAR .EQ. 2) .AND. (XX1 .GT. XX)) GO TO 4000               00002750
         6                  IF(X(1).GE.0.) GO TO 100                                        00002760
         7                  XLEN=(XX-X(1))/5 + 1                                            00002770
         8                  XORG=X(1)/5 - 1                                                 00002780
         9                  NWXORG=XORG*(-1.)                                               00002790
        10                  CALL PLOT(NWXORG,0.0,-3)                                        00002800
        11                  GO TO 101                                                       00002810
        12           100    XLEN=XX/5 + 1                                                   00002820
        13                  GO TO 101                                                       00002830
        14           4000   CONTINUE                                                        00002840
        15                  IF (X(1) .GE. 0.) GO TO 4010                                    00002850
        16                  XLEN=(XX1-X(1))/5 + 1                                           00002860
        17                  XORG=X(1)/5 -1                                                  00002870
        18                  NWXORG=XORG*(-1.)                                               00002880
        19                  CALL PLOT(NWXORG,0.0,-3)                                        00002890
        20                  GO TO 101                                                       00002900
        21           4010   XLEN=XX1/5 + 1                                                  00002910
                    C                                                                      00002920
                    C - - - - - - - -  SCALE DATA                                          00002930
                    C                                                                      00002940
        22             101     X(COUNT+1)=0.                                               00002950
        23                     X(COUNT+2)=5.                                               00002960
        24                     Y(COUNT+1) = -1.                                            00002970
        25                     Y(COUNT+2) = 1.                                             00002980
        26                     IF(COMPAR.EQ.3) GO TO 107                                   00002990
                    C                                                                      00003000
                    C - - - - - - - -  PLOT AXES                                           00003010
                    C                                                                      00003020
        27                     CALL AXIS(XORG,0.0,'METERS ABOVE MLW',16,7.,90.,            00003030
                         1        Y(COUNT+1),Y(COUNT+2))                                   00003040
        28                     CALL AXIS(XORG,0.0,'METERS FROM DATUM STAKE',-23,XLEN,0.,   00003050
                         1        X(COUNT+1),X(COUNT+2))                                   00003060
                    C                                                                      00003070
                    C - - - - - - - -  PLOT SCALE OF PROFILE                               00003080
                    C                                                                      00003090
        29                     CALL SYMBOL(.5,.4,.22,'VE= 5:1',0.0,7)                      00003100
                    C                                                                      00003101
                    C - - - - - - - -  PLOT T.D. AND                                       00003190
                    C                                                                      00003200
        30                     CALL SYMBOL((XLEN-9.75),7.0,.48,TITLE,0.,12)                00003210
        31                     CALL SYMBOL((XLEN-6.75),6.7,.25,1,0.,-1)                    00003220
        32                     CALL SYMBOL((XLEN-5.4),6.6,.25,45,0.,-1)                    00003230
        33                     CALL SYMBOL((XLEN-5.1),6.6,.25,DATE,0.,12)                  00003240
                               RETURN                                                      00003250
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)        US FORTRAN              MAY 19, 1988  15:42:20  NAME:PROPLT

IF DO   TSN    *....*...+.........2.........3.........4.........5.........6.........7.*.......8

               IF(COMPAR.NE.0) GO TO 102                                              00003260
               CALL SYMBOL((XLEN-6.75),5.8,.23,'AREA IN SQ METERS=',0.,18)            00003270
               GO TO 103                                                              00003280
     102       CALL SYMBOL((XLEN-5.75),6.3,.25,2,0.,-1)                               00003290
               CALL NUMBER((XLEN-1.9),6.6,.25,DIFF,0.,1)                              00003300
               CALL CHARS                                                             00003301
              1((XLEN-.7),6.6,.25,'$M"3<+M"-M!',0.0,11)                               00003302
               CALL SYMBOL((XLEN-5.4),6.2,.25,45,0.,-1)                               00003320
               CALL SYMBOL((XLEN-5.1),6.2,.25,DATE2,0.,12)                            00003330
               CALL NUMBER((XLEN-1.9),6.2,.25,AAAA,0.,1)                              00003340
               CALL CHARS((XLEN-.7),5.8,.25,'$M"3<+M"-M!',0.0,11)                     00003341
               CALL CHARS                                                             00003342
              1((XLEN-4.75),5.4,.23,'VOLUME CHANGE',                                  00003343
              1     0.,13)                                                           00003370
     103       CALL NUMBER((XLEN-1.9),5.4,.25,AMET,0.,1)                              00003380
               CALL CHARS((XLEN-.7),5.8,.25,'$M"3<+M"-M!',0.0,11)                     00003390
               CALL RECT((XLEN-5.4),5.6,2.0,7.4,0.,3)                                 00003391
     C                                                                                00003400
     C - - - - - - - - - - PLOT MLW LINE                                              00003410
     C                                                                                00003420
     104       00=0.1                                                                 00003430
               DO 105 I=1,200                                                         00003440
     1         Q=Q+.2                                                                 00003450
     1         CALL PLTLN(Q,1.0,(Q+.1),1.0)                                           00003460
     1         IF(Q.GT.(XLEN+1.0)) GO TO 106                                          00003470
     1   105   CONTINUE                                                             00003480
         106   CALL SYMBOL((Q-.25),1.0,.2,'MLW',0.,3)                                 00003490
     C                                                                                00003500
     C - - - - - - - - - - PLOT PROFILE                                               00003510
     C                                                                                00003520
     107   DO 1072 COUNT=1                                                          00003530
           DX=X(COUNT+2)                                                            00003540
           FY=Y(COUNT+1)                                                            00003550
           DY=Y(COUNT+2)                                                            00003560
     C                                                                              00003570
           IF(COMPAR.EQ.2) GO TO 1072                                               00003580
     C                                                                              00003590
     C - - - - - - - COMPAR = 0 OR 1, SYMBOL # 1                                    00003600
     C                                                                              00003610
           CALL SYMBOL((X(1)-FX)/DX,(Y(1)-FY)/DY,0.2,1,0.0,-1)                      00003620
           IF(COUNT.EQ.1) GO TO 1073                                                00003630
     1     CALL SYMBOL((X(1)-FX)/DX,(Y(1)-FY)/DY,0.2,1,0.0,-2)                      00003640
     1     IF(COUNT.EQ.2) GO TO 1073                                                00003650
           CALL PLOT ((X(COUNT)-FX)/DX,(Y(COUNT)-FY)/DY,3)                          00003660
           CALL PLOT ((XX-FX)/DX,(YY-FY)/DY,2)                                      00003670
           CALL SYMBOL ((XX-FX)/DX,(YY-FY)/DY,0.2,1,0.0,-1)                         00003680
     C                                                                              00003690
     C - - - - - - - COMPAR = 0 OR 2, SYMBOL # 2                                    00003700
     C                                                                              00003710
     C                                                                              00003720
           CALL SYMBOL((X(1)-FX)/DX,(Y(1)-FY)/DY,0.2,2,0.0,-1)                      00003730
           DO 1073 I=2,COUNT                                                        00003740
     1     CALL SYMBOL((X(I)-FX)/DX,(Y(I)-FY)/DY,0.2,2,0.0,-2)                      00003750
     1 1073 CONTINUE                                                                00003760
           CALL PLOT ((X(COUNT)-FX)/DX,(Y(COUNT)-FY)/DY,3)                          00003770
           CALL DASHP ((XX-FX)/DX,(YY-FY)/DY,.1)                                    00003780
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)          US FORTRAN              MAY 19, 1988  16:42:20  NAME:PROPLT

 IF DO    ISN    *....*....1....+....2....+....3....+....4....+....5....+....6....+....7..*.....8

            74              CALL SYMBOL ((XX-FX)/DX,(YY-FY)/DY,0.2,2,0.0,-1)                  00003790
                C                                                                             00003800
            75      1074 IF((COMPAR.EQ.0) .OR. (COMPAR.EQ.3)) GO TO 109                       00003810
                C                                                                             00003820
                C - - - - - - - - PROCESS DATA FROM OTHER PROFILE                             00003830
                C                                                                             00003840
            76                DO 108 I=1,COUNT2                                               00003850
     1      77                X(I)=X2(I)                                                      00003860
     1      78          108   Y(I)=Y2(I)                                                      00003870
            79                XX=XX1                                                          00003880
            80                YY=YY1                                                          00003890
            81                COUNT=COUNT2                                                    00003900
            82                COMPAR=3                                                        00003910
            83                GO TO 100                                                       00003920
                C                                                                             00003930
                C - - - - - - - - REDEFINE ORIGIN FOR NEXT PLOT                               00003940
                C                                                                             00003950
            84          109   CALL PLOT(0.,-9.25,-3)                                          00003960
            85                RETURN                                                          00003970
            86                END                                                             00003980

*STATISTICS*    SOURCE STATEMENTS = 86, PROGRAM SIZE = 4024 BYTES, PROGRAM NAME = PROPLT     PAGE:     6.

*STATISTICS*     NO DIAGNOSTICS GENERATED.

**PROPLT** END OF COMPILATION 2 ******
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)        VS FORTRAN              MAY 19, 1999  16:42:22

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOGOSTMT NODECK SOURCE TERM OBJECT FIXED TRMFLG SRCFLG NOSYM NOREF
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NODC NOICA NODIRECTIVE
                     OPT(3) LANGLVL(66) NOFIPS    FLAG(I)  NAME(MAIN)    LINECOUNT(60)      CHARLEN(500)

IF NO   ISN    *....*....1....+....2....+....3....+....4....+....5....+....6....+....7.*.......*

          1            SUBROUTINE AXIS(XX,YY,IBCD,NCHAR,AXLEN,ANGLE,FIRSTV,DELTAV)          00003990
          2            DIMENSION IBCD(2)                                                    00004000
          3            XPAGE=XX                                                             00004010
          4            YPAGE=YY                                                             00004020
          5            KN=NCHAR                                                             00004030
          6            A=1.0                                                                00004040
          7            IF (KN) 1,2,2                                                        00004050
          8       1    A=-A                                                                 00004060
          9            KN=-KN                                                               00004070
         10       2    EX=0.0                                                               00004080
         11            ADX= ABS  (DELTAV)                                                   00004090
         12            IF (ADX) 3,7,3                                                       00004100
         13       3    IF (ADX- .01,0) 6,4,4                                                00004110
         14       4    ADX=ADX/10.0                                                         00004120
         15            EX=EX+1.0                                                            00004130
         16            GO TO 3                                                              00004140
         17       5    ADX=ADX*10.0                                                         00004150
         18            EX=EX-1.0                                                            00004160
         19       6    IF (ADX-0.01) 5,7,7                                                  00004170
         20       7    XVAL=FIRSTV*10.0**(-EX)                                              00004180
         21            ADX= DELTAV*10.0**(-EX)                                              00004190
         22            STH=ANGLE*0.0174533                                                  00004200
         23            CTH=COS(STH)                                                         00004210
         24            STH=SIN(STH)                                                         00004220
         25            DXR=-0.09                                                            00004230
         26            DYB=0.35*A-0.05                                                      00004240
         27            XN=XPAGE+DXR*CTH-DYB*STH                                             00004250
         28            YN=YPAGE+DYB*CTH+DXR*STH                                             00004260
         29            NTIC=AXLEN+1.0                                                       00004270
         30            NI=NTIC/2                                                            00004280
         31            DO 20 I=1,NTIC                                                       00004290
  1      32            IF(I.EQ.1) GO TO 15                                                  00004300
  1      33            IF(ABS(I-2*NI).EQ.0 .AND. ANGLE.EQ.0.0) GO TO 15                     00004310
  1      34            IF(ANGLE.EQ.0.0) CALL NUMBER(XN+.044,YN,0.21,XVAL,0.0,-1)            00004320
  1      35            IF(ANGLE.NE.0.0)                                                     00004330
  1                *      CALL NUMBER(XN-.06,YN+.13,.21,XVAL,0.0,-1)                       00004340
  1      36            XVAL=XVAL+ADX                                                        00004350
  1      37            XN=XN+CTH                                                            00004360
  1      38            YN=YN+STH                                                            00004370
  1      39            IF (NI) 20,11,20                                                     00004380
  1      40       10   XN=XN                                                                00004390
  1      41            IF (EX) 12,13,12                                                     00004400
  1      42       11   IF(ANGLE.EQ.0.0)                                                     00004410
  1      43       13   DXR=-.07+2*AXLEN+0.5                                                 00004420
  1      44            IF(ANGLE.NE.0.0)                                                     00004430
  1      45            XT=XPAGE+DXR*CTH-DYB*STH                                             00004440
  1      46            YT=YPAGE+DXR*STH+DYB*CTH                                             00004450
  1      47            IF(ANGLE.EQ.0.0) CALL SYMBOL(XT,YT-.1,0.21,IBCD(1),ANGLE,KN)         00004460
  1      48            IF(ANGLE.NE.0.0)                                                     00004470
  1                *      CALL SYMBOL(XT-.01,YT,0.21,IBCD(1),ANGLE,KN)                     00004480
  1      49       14   IF(KN.EQ.1) RETURN                                                   00004490
  1      50            Z=KN+2                                                               00004500
```

URI.EIL101.MCM.SMALL.PROG

```
LEVEL 2.2.0 (JUNE 1987)        US FORTRAN              MAY 19, 1988  16:42:22  NAME:AXIS

 IF DO    ISN    *....4....1.........2.........3.........4.........5.........6.........7.*.......8

      1     55                 XT=XT+Z*CTH*0.14                                          00004510
      1     56                 YT=YT+Z*STH*0.14                                          00004520
      1     57                 CALL SYMBOL(XT,YT,0.14,3H*10,ANGLE,3)                     00004530
      1     58                 XT=XT+(3.0*CTH-0.8*STH)*0.14                              00004540
      1     59                 YT=YT+(3.0*STH+0.8*CTH)*0.14                              00004550
      1     60                 CALL NUMBER(XT,YT,0.07,EX,ANGLE,-1)                       00004560
      1     61     20    NT=NT-1                                                        00004570
            62           CALL PLOT(XPAGE+AXLEN*CTH,YPAGE+AXLEN*STH,3)                  00004580
            63           DXB=-0.07*A*STH                                               00004590
            64           DYB=+0.07*A*CTH                                               00004600
            65           A=NTIC-1                                                      00004610
            66           XN=XPAGE+A*CTH                                                00004620
            67           YN=YPAGE+A*STH                                                00004630
            68           DO  30  I=1,NTIC                                              00004640
      1     69             CALL PLOT(XN,YN,2)                                          00004650
      1     70             CALL PLOT(XN+DXB,YN+DYB,2)                                  00004660
      1     71             CALL PLOT(XN,YN,2)                                          00004670
      1     72             XN=XN-CTH                                                   00004680
      1     73             YN=YN-STH                                                   00004690
      1     74     30    CONTINUE                                                       00004700
            75           RETURN                                                        00004710
            76           END                                                           00004720

*STATISTICS*   SOURCE STATEMENTS = 72, PROGRAM SIZE = 2752 BYTES, PROGRAM NAME = AXIS     PAGE:     9.

*STATISTICS*     NO DIAGNOSTICS GENERATED.

**AXIS** END OF COMPILATION 3 ******
```

APPENDIX 3

Sample Program: Profile Volume Time Series Plotting

URI.EIL101.VOL.PLOT.PROG

```
LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN                    MAY 20, 1988  12:39:53

REQUESTED OPTIONS (EXECUTE): LANGLVL(66)

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOOPTSTMT NOOFFCK SOURCE FREE OBJECT FIXED TRMFLG SRCFLG NOSYM NOREF
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NOOC NOICA NODIRECTIVE
                      OPT(2) LANGLVL(66) NOETPS   FLAG(I)   NAME(MAIN)    LINECOUNT(60)       CHARLEN(500)

IF OO   TSN    *....A....B....+....C....+....D....+....E....+....F....+....G....+....H....+....I....+....J....+....K....+....L....M

                1              REAL  DAY(2000),VOL(2000),XLEN,YLEN,FDAY,LDAY,SVOL,BVOL,                    00000090
                              *     FX,DX,FY,DY,GRIDX(4),GRIDY(4),S                                        00000100
                2              INTEGER N,TITLE(6),PROF(4),TLEN,SY,BMONTH,BDAY,LMONTH                      00000110
                C                                                                                         00000120
                C     OPEN GRAPHICS, OUTPUT TO UNIT 8                                                     00000130
                C                                                                                         00000140
                3              CALL PLOTS(0,0,8)                                                          00000150
                4              CALL FACTOR (0.5)                                                          00000160
                C                                                                                         00000170
                C     READ PROFILE TITLE AND DESIGNATION                                                  00000180
                C                                                                                         00000190
                5              READ (9,105) TITLE                                                         00000200
                6              READ (9,170) PROF                                                          00000210
                C              WRITE (6,135) TITLE                                                        00000220
                C              WRITE (6,140) PROF                                                         00000230
                C                                                                                         00000240
                C     READ FIRST AND LAST DAYS, THE BIGGEST AND SMALLEST VOLUMES, AND                     00000250
                C     THE # OF THE STARTING MONTH, DAY, AND YEAR , AND THE LAST MONTH #                   00000260
                C                                                                                         00000270
                7              READ (9,100) FDAY,LDAY,SVOL,BVOL                                           00000280
                C              WRITE(6,144)FDAY,LDAY,SVOL,BVOL                                            00000290
                8              READ (9,110) MONTH,BDAY,SY,LMONTH                                          00000300
                C              WRITE(6,144)MONTH,BDAY,SY,LMONTH                                           00000301
                C                                                                                         00000310
                C     READ IN DAYS AND VOLUMES                                                            00000320
                C                                                                                         00000330
                9              DO 4 N=1,1000                                                              00000340
           I    10                READ (9,115,END=999) DAY(N),VOL(N)                                      00000350
                C                 WRITE (6,190) DAY(N),VOL(N)                                             00000360
           I    11         5      CONTINUE                                                               00000370
           I    12         4   CONTINUE                                                                  00000380
                C                                                                                         00000390
                C     SET FIRSTV AND DELTAV                                                               00000400
                C                                                                                         00000410
                13             FX=DAY(1)-BDAY                                                             00000420
                14             DX=30.4375                                                                 00000430
                15             FY=SVOL                                                                    00000440
                16             DY=10.                                                                     00000450
                17             NN=(N+1)*10                                                                00000460
                18             DAY(N+1)=DX                                                                00000470
                19             VOL(N+1)=FY                                                                00000480
                20             VOL(N+2)=DY                                                                00000490
                C                                                                                         00000500
                C     SCALE AND DRAW X AXIS                                                               00000510
                C                                                                                         00000520
                21             TLEN=-.0644*(LDAY-(FDAY-BDAY))/DX                                          00000530
                22             CALL SCALE(DAY,TLEN,N+1,1)                                                 00000540
                23             CALL GAXIS (MONTH,SY,XLEN)                                                 00000550
                C                                                                                         00000560
                C     SCALE AND DRAW Y AXES AND DRAW TOP LINE OF GRAPH                                    00000570
```

URI.EIL101.VOL.PLOT.PROG

```
LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN              MAY 20, 1988   12:39:53   NAME:MAIN
 IF DO    ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8
                 C
          24          YLEN=(BVOL-SVOL)/DY
          25          CALL AXIS(0.0,0.0,'VOLUME IN CUBIC METERS',22,YLEN,90.,FY,DY)
          26          CALL AXIS(XLEN,0.0,' ',-1,YLEN,90.0,FY,DY)
          27          CALL PLTLN(XLEN,YLEN,0.0,YLEN)
                 C
                 C     PLOT DATA POINTS
                 C
          28          DX= 50.72917
          29          DAY(N+2)=DX
          30          CALL CHARS((DAY(1)-FX)/DX,(VOL(1)-FY)/DY,0.4,19,0.0,-1)
          31          DO 10 I=2,N
  1       32              CALL CHARS((DAY(I)-FX)/DX,(VOL(I)-FY)/DY,0.4,19,0.0,-2)
  1       33      10  CONTINUE
          34           GRIDX(1)=FX
          35          GRIDX(3)=FX
          36          GRIDX(4)=DX
          37          GRIDY(3)=FY
          38          GRIDY(4)=DY
                 C
                 C     DRAW LINES FOR THE SEASONS
                 C
          39          S=1.6
          40          IF (LMONTH.EQ.1.OR.LMONTH.EQ.4.OR.LMONTH.EQ.7.OR.LMONTH.EQ.10)
                 *         S=1.0
          42          IF (LMONTH.EQ.2.OR.LMONTH.EQ.5.OR.LMONTH.EQ   .8.OR.LMONTH.EQ.11)
                 *         S=.4
          44           GRIDX(2)=DX*(XLEN+S)+FX
          45          GRIDY(1)=SVOL
          46          GRIDY(2)=SVOL
          47          CALL SHADE (DAY,VOL,GRIDX,GRIDY,1.8,90.0,N,1,2,1)
                 C
                 C     DRAW GRID
                 C
          48          GRIDX(2)=DX*XLEN+FX
          49          GRIDY(1)=BVOL
          50          GRIDY(2)=BVOL
          51          CALL SHADE
                 *          (DAY,VOL,GRIDX,GRIDY,.5,90.0,N,1,2,1)
          52          CALL ASHADE
                 *          (DAY,VOL,GRIDX,GRIDY,1.0,0.0,N,1,2,1,XLEN)
                 C
                 C     LABEL PLOT
                 C
          53          CALL SYMBOL (.5,(YLEN+1.3),.5,TITLE,0.0,24)
          54          CALL SYMBOL (.5,(YLEN+.4),.4,PROF,0.0,24)
                 C
                 C     CLOSE GRAPHICS
                 C
          55          CALL PLOT(0.0,0.0,999)
                 C
                 C     FORMATS
                 C
          56     100  FORMAT(4(F5.0,1X))
          57     105  FORMAT(5A4)
          58     110  FORMAT(I2,2X,I2,2X,I4,2X,I2)
```

URI.EIL101.VOL.PLOT.PROG

```
LEVEL 2.7.0 (JUNE 1987)        VS FORTRAN              MAY 20, 1988  12:39:57  NAME:MAIN

IF DD    ISN    *....*...1.........2.........3.........4.........5.........6.........7.*.......8

          59      115     FORMAT(F5.0,18X,F5.1)                                          00001140
                C115      FORMAT(6X,F5.0,5X,F5.1)                                      00001141
          60      120     FORMAT(4(F5.0,1X,F5.0))                                        00001150
          61      130     FORMAT(6A4)                                                    00001160
                C135      FORMAT(1X,A4)                                                00001170
                C140      FORMAT(1X,6A4)                                               00001180
                C145      FORMAT(1X,4(F5.0,1X))                                        00001190
                C146      FORMAT(I2,2X,I2,2X,I4,2X,I2)                                 00001191
                C150      FORMAT(1X,F5.0,1X,F5.1)                                      00001200
          62                STOP                                                       00001210
          63                END                                                        00001220

*STATISTICS*    SOURCE STATEMENTS = 61, PROGRAM SIZE = 21548 BYTES, PROGRAM NAME = MAIN     PAGE:     1.

*STATISTICS*     NO DIAGNOSTICS GENERATED.

**MAIN** END OF COMPILATION 1 **********
```

URI.EIL101.VOL.PLOT.PROG

```
LEVEL 2.2.0 (JUNE 1987)        VS FORTRAN              MAY 20, 1988  12:19:54

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOGOSTMT NODECK SOURCE TERM OBJECT FIXED IMPLG SRCFLG NOSYM NOREF
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NODC NOICA NODIRECTIVE
                     OPT(3) LANGLVL(66) NOFIPS   FLAG(I)  NAME(MAIN)     LINECOUNT(60)      CHARLEN(500)

IF DO   ISN    *....*...1.....2.....3.....4.....5.....6.....7.*.....8

          1          SUBROUTINE AXIS(XX,YY,IBCD,NCHAR,AXLEN,ANGLE,FIRSTV,DELTAV)                    00001230
          2          DIMENSION IBCD(2)                                                              00001240
          3          XPAGE=XX                                                                       00001250
          4          YPAGE=YY                                                                       00001260
          5          KN=NCHAR                                                                       00001270
          6          A=1.0                                                                          00001280
          7          IF (KN) 1,2,2                                                                  00001290
          8     1    A=-A                                                                           00001300
          9          KN=-KN                                                                         00001310
         10     2    EX=0.0                                                                         00001320
         11          ADX= ABS  (DELTAV)                                                             00001330
         12          IF (ADX) 3,7,3                                                                 00001340
         13     3    IF (ADX- 99.0) 6,4,4                                                           00001350
         14     4    ADX=ADX/10.0                                                                   00001360
         15          EX=EX+1.0                                                                      00001370
         16          GO TO 3                                                                        00001380
         17     5    ADX=ADX*10.0                                                                   00001390
         18          EX=EX-1.0                                                                      00001400
         19     6    IF (ADX-0.01) 5,7,7                                                            00001410
         20     7    XVAL=FIRSTV*10.0**(-EX)                                                        00001420
         21          ADX= DELTAV*10.0**(-EX)                                                        00001430
         22          STH=ANGLE*0.0174533                                                            00001440
         23          CTH=COS(STH)                                                                   00001450
         24          STH=SIN(STH)                                                                   00001460
         25          DXR=-0.25                                                                      00001470
         26          DYR=0.35*A-0.05                                                                00001480
         27          XN=XPAGE+DXR*CTH-DYR*STH                                                       00001490
         28          YN=YPAGE+DYR*CTH+DXR*STH                                                       00001500
         29          NTIC=AXLEN+1.0                                                                 00001510
         30          NT=NTIC/2                                                                      00001520
         31          DO  20  I=1,NTIC                                                               00001530
  1      32          IF(I.EQ.1) GO TO 15                                                            00001540
  1      33          IF(MOD(I,2).EQ.0 .AND. ANGLE.EQ.90.0) GO TO 15                                 00001550
  1      34            IF(ANGLE.EQ.0.0) CALL NUMBER(XN+.044,YN,0.21,XVAL,0.0,-1)                    00001560
  1      35            IF(ANGLE.NE.0.0 .AND. NCHAR .NE. -1)                                         00001570
  1     35A      *       CALL NUMBER(XN-.76,YN+.09,.32,XVAL,0.0,-1)                                 00001580
  1      36            IF(ANGLE-.NE. 0.0 .AND. NCHAR .EQ. -1)                                       00001590
  1     36A      *       CALL NUMBER(XN-.2,YN+.09,.32,XVAL,0.0,-1)                                  00001600
  1      37       15   XVAL=XVAL+ADX                                                                00001610
  1      38            XN=XN+CTH                                                                    00001620
  1      39            YN=YN+STH                                                                    00001630
  1      40            IF (NT) 20,11,20                                                             00001640
  1      41       11     Z=KN                                                                       00001650
  1      42              IF (EX)  12,13,12                                                          00001660
  1      43       12     Z=Z**EX                                                                    00001670
  1      44       13     DXB=-.07*Z+AXLEN*0.5                                                       00001680
  1      45              DYB=0.70*A-0.075                                                           00001690
  1      46              XT=XPAGE+DXB*CTH-DYB*STH                                                   00001700
  1      47              YT=YPAGE+DYB*CTH+DXB*STH                                                   00001710
  1      48            IF(ANGLE.EQ.0.0) CALL SYMBOL(XT,YT-.1,0.21,IBCD(1),ANGLE,KN)               00001720
  1      49            IF(ANGLE.NE.0.0 .AND. YT .EQ. 0.0)                                         00001730
  1     49A      *       CALL CHARS(XT-.94,YT,0.24,'VOLUME  #%%3(+##-#1',ANGLE,19)                  00001740
```

URI.EIL101.VOL.PLOT.PROG

```
1SUBR  2.2.0 (JUNE 1977)        OS FORTRAN              MAY 20, 1999  12:29:54  NAME:AXIS

IF DO   ISN    *....*....1....*....2....*....3....*....4....*....5....*....6....*....7.*....*8
      1     55                IF (FX)  14,20,14                                          00001750
      1     56     14           Z=KN+2                                                   00001760
      1     57                  XT=XT+Z*CTH+0.14                                         00001770
      1     58                  YT=YT+Z*STH+0.14                                         00001780
      1     59                  CALL SYMBOL(XT,YT,0.14,3H#10,ANGLE,3)                    00001790
      1     60                  XT=XT+(3.0*CTH-0.8*STH)*0.14                             00001800
      1     61                  YT=YT+(3.0*STH+0.8*CTH)*0.14                             00001810
      1     62                  CALL NUMBER(XT,YT,0.07,FX,ANGLE,-1)                      00001820
      1     63     20       NT=NT-1                                                      00001830
            64              CALL PLOT(XPAGE+AXLEN*CTH,YPAGE+AXLEN*STH,3)                00001840
            65              DXB=-0.07*A*STH                                             00001850
            66              DYB=+0.07*A*CTH                                             00001860
            67              A=NTIC-1                                                    00001870
            68              XN=XPAGE+A*CTH                                              00001880
            69              YN=YPAGE+A*STH                                              00001890
            70              DO  30  I=1,NTIC                                            00001900
      1     71                CALL PLOT(XN,YN,2)                                        00001910
      1     72                CALL PLOT(XN+DXB,YN+DYB,2)                                00001920
      1     73                CALL PLOT(XN,YN,2)                                        00001930
      1     74                XN=XN-CTH                                                 00001940
      1     75                YN=YN-STH                                                 00001950
      1     76     30       CONTINUE                                                    00001960
            77              RETURN                                                      00001970
            78              END                                                         00001980

*STATISTICS*    SOURCE STATEMENTS = 73, PROGRAM SIZE = 2900 BYTES, PROGRAM NAME = AXIS     PAGE:     4.

*STATISTICS*     NO DIAGNOSTICS GENERATED.

**AXIS** END OF COMPILATION 2 ******
```

URI.EIL101.VOL.PLOT.PROG

```
LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN                MAY 20, 1988  12:39:56

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOGOSTMT NODECK SOURCE FREE OBJECT FIXED IMPLICIT SRCFLG NOSYM NOREF
                   SOURCE(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NODC NOICA NODIRECTIVE
                     OPT(3) LANGLVL(66) NOFIPS   FLAG(I)   NAME(MAIN)     LINECOUNT(60)      CHARLEN(500)

 IF DO    ISN    *....*....1.........2.........3.........4.........5.........6.........7.*.......8

                   SUBROUTINE ASHADE (X1,Y1,X2,Y2,N,TH,N1,J1,N2,J2,YLEN)                    00001990
                   DIMENSION X1(2000), Y1(2000), X2(2000), Y2(2000), TS(40),YY(2000),00002000
                  *YY(2000)                                                                00002010
                   R(C1,C2)=C1*C+C2*S                                                      00002020
                   RC(PX,PY,XM,YM,DX,DY) =R((PX-XM)/DX,(PY-YM)/DY)                         00002030
                   DO 433 I=1,N1                                                           00002040
 1      6            XX(I+1)=X1(I)                                                        00002050
 1      7            YY(I+1)=Y1(I)                                                        00002060
 1      8     433    CONTINUE                                                             00002070
                   XX(1)=X1(N1+1)                                                          00002080
                   XX(N1+2)=X1(N1+2)+YLEN*X1(N1+1)                                         00002090
                   XX(N1+3)=X1(N1+1)                                                       00002100
                   XX(N1+4)=Y1(N1+2)                                                       00002110
                   YY(1)=Y1(1)                                                             00002120
                   YY(N1+2)=Y1(N1)                                                         00002130
                   YY(N1+3)=Y1(N1+1)                                                       00002140
                   YY(N1+4)=Y1(N1+2)                                                       00002150
                   N1=N1+2                                                                 00002160
                   J=N1+2                                                                  00002170
                   DO 533 I=1,J                                                            00002180
 1      20           X1(I)=XX(I)                                                          00002190
 1      21           Y1(I)=YY(I)                                                          00002200
 1      22    533    CONTINUE                                                             00002210
                   K1=J1                                                                   00002220
                   K2=J2                                                                   00002230
                   N3=K1*(N1-1)+1                                                          00002240
                   N4=K2*(N2-1)+1                                                          00002250
                   T1=TH*.0174533                                                          00002260
                   C=COS(T1)                                                               00002270
                   S=SIN(T1)                                                               00002280
                   M=N3+K1                                                                 00002290
                   YM1=Y1(M)                                                               00002300
                   XM1=X1(M)                                                               00002310
                   M=M+K1                                                                  00002320
                   DY1=Y1(M)                                                               00002330
                   DX1=X1(M)                                                               00002340
                   M=N4+K2                                                                 00002350
                   YM2=Y2(M)                                                               00002360
                   XM2=X2(M)                                                               00002370
                   M=M+K2                                                                  00002380
                   DY2=Y2(M)                                                               00002390
                   DX2=X2(M)                                                               00002400
                   RYMIN=-RC(Y1(1),X1(1),YM1,XM1,DY1,-DX1)                                 00002410
                   RYMIN=0.0                                                               00002420
                   RYMAX=RYMIN                                                             00002430
                   KK=1+K1                                                                 00002440
                   KJ=1+K2                                                                 00002450
                   DO 2 I=KK,N3,K1                                                         00002460
 1      48           T1=RC(Y1(I),X1(I),YM1,XM1,DY1,-DX1)                                  00002470
 1      49           RYMIN=AMIN1(RYMIN,T1)                                                00002480
 1      50           RYMAX=AMAX1(RYMAX,T1)                                                00002490
 1      61        2  CONTINUE                                                             00002500
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URI.EIL101.VOL.PLOT.PROG

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LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN              MAY 29, 1988  12:32:55  NAME:ASHADE

IF DO   ISN    *....*....1....*....2....*....3....*....4....*....5....*....6....*....7.*.....8

               DO 9 I=1,N4,K2                                                        00002510
     1    53     T1=RC(Y2(I),X2(I),XM2,YM2,DY2,-DX2)                                00002520
     1    54     RYMIN=AMIN1(RYMIN,T1)                                              00002530
     1    55     RYMAX=AMAX1(RYMAX,T1)                                              00002540
     1    56   9 CONTINUE                                                           00002550
          57     ZZZ=(Y1(I)-Y1(N1+1))/Y1(N1+2)                                      00002560
          58     M=0                                                                00002570
          59     IP=3                                                               00002580
          60     JU=-1                                                              00002590
          61     RXD=RC(X1(N3),Y1(N3),XM1,YM1,DX1,DY1)                              00002600
          62     YD=RC(X2(N4),Y2(N4),XM2,YM2,DX2,DY2)                               00002610
          63     RYD=RC(Y1(N3),X1(N3),YM1,XM1,DY1,-DX1)                             00002620
          64     YD=RC(Y2(N4),X2(N4),YM2,YM2,DY2,-DX2)                              00002630
          65     CALL STACK (XD,YD,RXD,RYD,RYMIN,TS,M)                              00002640
          66  10 RXD = RC(X1(I),Y1(I),XM1,YM1,DX1,DY1)                              00002650
          67     XD = RC(X2(I),Y2(I),XM2,YM2,DX2,DY2)                               00002660
          68     RYD = RC(Y1(I),X1(I),YM1,XM1,DY1,-DX1)                             00002670
          69     YD = RC(Y2(I),X2(I),YM2,XM2,DY2,-DX2)                              00002680
          70     CALL STACK (XD,YD,RYD,RYD,RYMIN,TS,M)                              00002690
          71   11 DO 5 I=KK,N3,K1                                                    00002700
     1    72     K=I-K1                                                             00002710
     1    73     RXD=RC(X1(I),Y1(I),XM1,YM1,DX1,DY1)                                00002740
     1    74     YD=RC(X1(K),Y1(K),XM1,YM1,DX1,DY1)                                 00002750
     1    75     RYD=RC(Y1(I),X1(I),YM1,XM1,DY1,-DX1)                               00002760
     1    76     YD=RC(Y1(K),X1(K),YM1,XM1,DY1,-DX1)                                00002770
     1    77     CALL STACK (XD,YD,RXD,RYD,RYMIN,TS,M)                              00002780
     1    78   5 CONTINUE                                                           00002790
          79     DO 8 I=KJ,N4,K2                                                    00002800
     1    80     K=I-K2                                                             00002810
     1    81     RXD=RC(X2(I),Y2(I),XM2,YM2,DX2,DY2)                                00002820
     1    82     YD=RC(X2(K),Y2(K),XM2,YM2,DX2,DY2)                                 00002830
     1    83     RYD=RC(Y2(I),X2(I),YM2,XM2,DY2,-DX2)                               00002840
     1    84     YD=RC(Y2(K),X2(K),YM2,XM2,DY2,-DX2)                                00002850
     1    85     CALL STACK (XD,YD,RXD,RYD,RYMIN,TS,M)                              00002860
     1    86   8 CONTINUE                                                           00002870
          87     M=M/2+2                                                            00002880
          88     IF(M)12,12,20                                                      00002890
          89  20 IF(N1)21,13,21                                                     00002900
          90  21 N1=0                                                            00002910
          91     GO TO 14                                                           00002920
          92  12 N1=N1+1                                                         00002930
          93  14 DO 6 J=1,M                                                      00002940
     1    94     I=IABS(N1-J)                                                       00002950
     1    95     CALL PLOT (R(TS(I),-RYMIN),R(RYMIN,TS(I)),IP)                      00002960
     1    96     IP=IP*JU                                                           00002970
     1    97   6 JU=-JU                                                           00002980
          98  17 RYMIN=RYMIN*4.                                                  00002990
          99     IF(RYMIN-RYMAX)3,22,22                                             00003000
         100  22 RETURN                                                           00003010
         101     END                                                                00003020

*STATISTICS*  SOURCE STATEMENTS = 101, PROGRAM SIZE = 23432 BYTES, PROGRAM NAME = ASHADE     PAGE:     6.

*STATISTICS*  NO DIAGNOSTICS GENERATED.

**ASHADE** END OF COMPILATION 3 ******
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URI.EIL101.VOL.PLOT.PROG

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LEVEL 2.2.0 (JUNE 1987)          VS FORTRAN                MAY 20, 1988  12:39:56

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOOBJSTAT NODECK SOURCE TERM OBJECT FIXED TRMFLG SRCFLG NOSYM NOREF
                   SDUMP(ISN) AUTODBL(NONE) NOSXM NOVECTOR IL NOTEST NOOC NOICA NODIRECTIVE
                      OPT(3) LANGLVL(66) NOFIPS   FLAG(I)   NAME(MAIN)     LINECOUNT(60)      CHARLEN(500)

 IF DO    ISN    A....*....1.........2.........3.........4.........5.........6.........7.*.......8

                 C                                                                              00003030
                 CCCCCCCC                                                                       00003040
                 C                                                                              00003050
            1          SUBROUTINE GAXIS (SM,SY,XLEN)                                          00003060
            2          INTEGER MO(12)/'JAN','FEB','MAR','APR','MAY','JNE','JUL','AUG'         00003070
                      1     ,'SEP','OCT','NOV','DEC'),SM,SY,COUNT1                           00003080
            3          REAL COUNT,XLEN,TX                                                     00003090
            4          CALL PLOT (0.0,0.0,3)                                                  00003100
            5          TX= 0.0                                                                00003110
            6          SM= SM-1                                                               00003120
            7     25   COUNT= 0.0                                                             00003130
            8          DO 5 I=SM,12                                                           00003140
     1      9             COUNT = COUNT + 1.0                                                 00003150
     1     10             IF (TX .GE. (XLEN)) GO TO 999                                       00003160
     1     11             CALL PLOT (TX,0.0,2)                                                00003170
     1     12             IF (I .EQ. 12 ) CALL PLOT (TX,-.88,2)                               00003180
     1     14             CALL PLOT (TX,-.2,2)                                                00003190
     1     15             IF (COUNT .GT. 1.0 .OR. COUNT1 .EQ. 1 )                             00003200
     1                   1    CALL CHARS ((TX-.47),-.5,.20,MO(I),0.0,3)                       00003210
     1     17             CALL PLOT (TX,0.0,3)                                                00003220
     1     18             TX= TX + .6                                                         00003230
     1     19        5    CONTINUE                                                            00003240
           20             IF (COUNT .GT. 2.)                                                  00003250
                         1    CALL NUMBER((TX-((COUNT+.61/2.+1.3))),-1.33,.4,FLOAT(SY),0.0,-1)00003260
           22             SY = SY + 1                                                         00003270
           23             CALL PLOT ((TX-.6),0.0,3)                                           00003280
           24             SM = 1                                                              00003290
           25             COUNT1 = 1                                                          00003300
           26             GO TO 25                                                            00003310
           27        999  IF (COUNT .GT. 2.)                                                  00003320
                         1    CALL NUMBER((TX-((COUNT+.61/2.+1.3))),-1.77,.4,FLOAT(SY),0.0,-1)00003330
           29             RETURN                                                              00003340
           30             END                                                                 00003350

**STATISTICS**    SOURCE STATEMENTS = 26, PROGRAM SIZE = 1488 BYTES, PROGRAM NAME = GAXIS     PAGE:    8.

**STATISTICS**     NO DIAGNOSTICS GENERATED.

**GAXIS** END OF COMPILATION 4 ******
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