National Aeronautics and Space Administration

Computer Management Branch

Goddard Space Flight Center

Greenbelt, Maryland

COMPUTER SCIENCES CORPORATION

September 21, 1978

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: G. Muckel
          Code 664
          Bldg. 2, Rm. S-207

Subject: Contract NAS5-24350
           Task Assignment 593
           LIBGEN Working Paper

Gentlemen:

Enclosed are 10 copies of the working paper entitled "HELIOS A/B Library Generator Program (LIBGEN) Maintenance Programmer's Introduction". This document has been prepared to assist programmers assigned to maintain LIBGEN.

Please let me know if you have any questions regarding the document.

Very truly yours,

COMPUTER SCIENCES CORPORATION

L. P. Gunshol
Section Manager
Science and Applications Program

LPG:kag

Enclosures

HELIOS A/B LIBRARY GENERATOR

PROGRAM (LIBGEN)

MAINTENANCE PROGRAMMER'S INTRODUCTION

WORKING PAPER

Prepared by:

E. Ronish
R. Cuddapah

COMPUTER SCIENCES CORPORATION

September 1978

This working paper has been prepared to assist programmers maintaining the Helios A/B Library Generator Program (LIBGEN). The input and output data set interfaces are identified, and the software architecture is defined. Finally, a computer listing of LIBGEN subroutine prologues is included as an attachment to the document.

1. LIBGEN Data Flow

Please refer to Figure 1. LIBGEN is a routine that copies Experimenter Data Record (EDR) tapes to a set of library (LIB) tapes. The number of EDR tapes that can fit on one LIB tape is a variable which depends on the telemetry bit rate as well as the spacecraft-ground station geometry. The minimum number is 3, while the maximum number is approximately 26. The format and contents of the EDR and LIB tapes is described in Appendix A of Reference 1.

Note that the input (EDR) and output (LIB) tapes are allocated using the LOGIN and LOGOUT utility routines. Details regarding the use of LIBGEN, LOGIN, and LOGOUT can be found in Reference 2.

2. LIBGEN Architecture

LIBGEN is composed of a main program and seven non-IBM S/360 subroutines as shown in the following tree diagram.

```
LBMAIN
        LIBGEN
                DAIO(S/360 ROUTINE)
                MOUNTS
                        REMTIM(S/360 ROUTINE)
                        SERVOL
                        DAIO(S/360 ROUTINE)
                        SERDSN
        COPY
                FTIO(S/360 ROUTINE)
                DISCRM
                UPKLBL
```
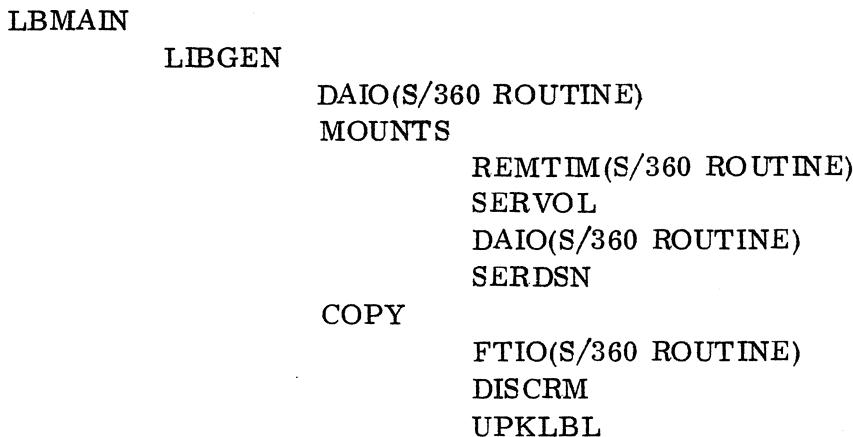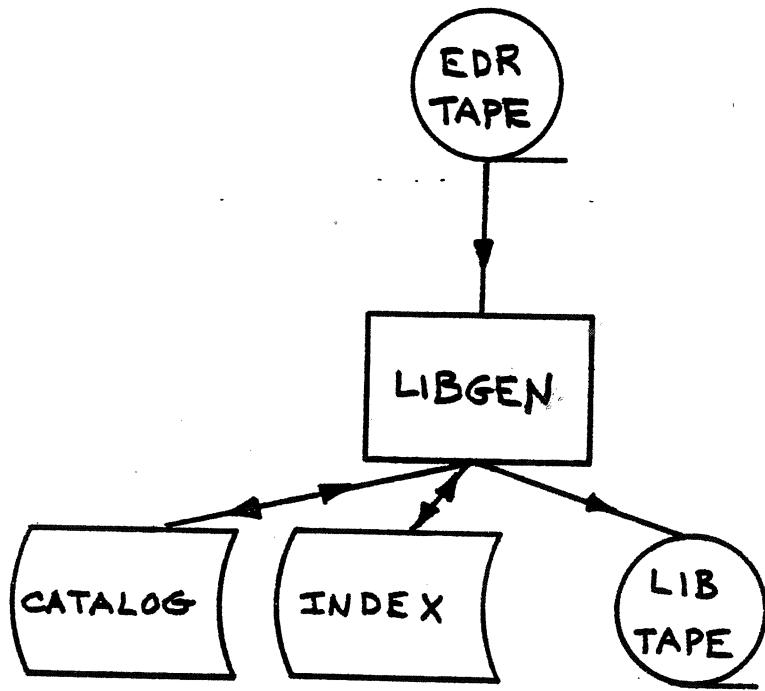
Figure 1. LIBGEN Data Set Interfaces

3. Computer Listings

Attached to this working paper is a listing of prologues that have been prepared to assist programmers maintaining LIBGEN. An alphabetical listing of the seven subroutine prologues is found on page 2.

REFERENCES

1.   Computer Sciences Corporation, Helios A/B Data Reduction
Program (HELDRP) Maintenance Programmer's Introduction
(working paper), E. Ronish, R. Cuddapah, September 1978.

2.   Computer Sciences Corporation, Helios A/B User's Guide
(informal working draft), August 1978.

NAME	PAGE	RECORDS	T T R C	USER INFORMATION (HEX)
COPY	1	90	00030100	
DISCRM	3	177	00000400	
LBMAIN	6	49	00060100	
LIBGEN	7	128	00090100	
LOGIN	9	119	000C0100	
LOGOUT	11	119	000A0300	
MOUNTS	13	93	00040300	
SERDSN	15	57	00070100	
SERVOL	16	65	00080100	
UPKLBL	17	28	000D0300	

*** END OF LIBRARY ***   10 MEMBERS PROCESSED WITH A TOTAL OF   925 RECORDS

*** END OF RUN ***   01 LIBRARIES PROCESSED WITH A TOTAL OF   925 RECORDS.   WORKAREA SIZE: 032K,   NEVER USED: 021K

```
Ccccccccccccccccccccccccccccccccccccccccccccccccccccccccc      00000030
C  1.   Routine:                                                00000040
C          COPY                                                 00000050
C  2.   System, Satellite, Version:                             00000060
C          HELDRP     HELIOS A, B           0                   00000070
C  3.   English Name:                                           00000080
C          COPY                                                 00000090
C  4.   Language:                                               00000100
C          FORTRANG or FORTRANH    level 21.6     360/91/75   OS/MVT   00000110
C  5.   Purpose:                                                00000120
C          COPY EDR TAPE TO LIB TAPE                            00000130
C  6.   Calling Sequence:                                       00000140
C        Argument           Type      I/O     Description       00000150
C          SATID      L*1          SATELLITE ID                 00000160
C          INSER      I*4          EDR TAPE NUMBER              00000170
C          INSEQ      I*4          EDR FILE NUMBER              00000180
C          IUNIT      I*4          EDR UNIT NUMBER              00000190
C          OUTSER     I*4          LIB TAPE NUMBER              00000200
C          OUTSEQ     I*4          LIB FILE NUMBER              00000210
C          OUNIT      I*4          LIB UNIT NUMBER              00000220
C          ERROR      I*4          NUMBER OF TAPE ERRORS        00000230
C          FEET       R*4          FEET WRITTEN ON LIB TAPE     00000240
C          CODE       I*4          RETURN CODE                  00000250
C                                  1=UNABLE TO FIND FILE BAD LABEL   00000260
C                                  2=NORMAL RETURN              00000270
C                                  3=END OF LIB TAPE            00000280
C                                  4=I/O ERROR                  00000290
C  7.   Notes:                                                  00000300
C       7a.   Restrictions:                                     00000310
C          NONE                                                 00000320
C       7b.   Special Features:                                 00000330
C          NONE                                                 00000340
C  8.   Variables:                                              00000350
C       8a.   Local                                             00000360
C          Variable            Type      Description            00000370
C          QLABEL     L*1          RECORD LABEL                 00000380
C          DITAPE     R*8          EDR TAPE SERIAL NUMBER       00000390
C          DOTAPE     R*8          LIB TAPE SERIAL NUMBER       00000400
C          INCHES     R*8          INCHES WRITTEN ON LIB TAPE   00000410
C          GAP        R*8          INTER RECORD GAP DISTANCE    00000420
C          MAXNCH     R*8          MAXIMUM INCHES WRITTEN ON LIB TAPE   00000430
C          IDM7       I*4          SORT INDEX                   00000440
C       8b.   COMMON                                            00000450
C          COMMON                  Variables                    00000460
C          LABEL/                                               00000470
C          THIS COMMON AREA IS DESCRIBED IN DISCRM DOCUMENTATION   00000480
C          CDISC/                                               00000490
C          THIS COMMON AREA IS DESCRIBED IN DISCRM DOCUMENTATION   00000500
C  9.   I/O Information:                                        00000510
C       Unit No.          Use Description                       00000520
C          IUNIT        EDR TAPE UNIT                           00000530
C          OUNIT        LIB TAPE UNIT                           00000540
C          UNIT 7       SORTING DATA SET                        00000550
C          UNIT 8       SORTING DATA SET                        00000560
C 10.   Error Handling:                                         00000570
C          LABEL READ ERROR EXIT                                00000580
C          RECORD READ ERROR ABEND 37                           00000590
C 11.   Subroutines Called:                                     00000600
C       Subroutine      Description                             00000610
C          SERVOL       CREATE SERIAL NUMBER                    00000620
C          UPKLBL       UNPACK LABEL                            00000630
C          FTIO         READ, WRITE TAPE                        00000640
C          MOD          MODULO ARITHMETIC                       00000650
C          ABEND        ERROR DUMP                              00000660
C          DISCRM       DM7 DISCRIMINATOR                       00000670
C 12.   Called By:                                              00000680
C       Routine           Description                           00000690
C          LIBGEN       LIBRARY GENERATION                      00000700
C 13.   Method:                                                 00000710
CCOPY     CSECT                                                 00000720
C         READ LABEL                                            00000730
C                   UNPACK LABEL                                00000740
C         IF OUTPUT TAPE NOT FULL                               00000750
C                   IF DM7 FILE                                 00000760
C                             CORRECT USING DISCRM              00000770
C                   ELSE                                        00000780
C                             COPY INPUT TO OUTPUT TAPE         00000790
```

```
C              FI        RETURN CODE=2                                    00000800
C                                                                         00000810
C        ELSE                                                             00000820
C              RETURN CODE=3                                              00000830
C        FI                                                               00000840
CEND COPY                                                                 00000850
C14.  Reference:                                                          00000860
C         NONE                                                            00000870
C15.  Programmer and Date:                                               00000880
C         NAND LAL                                                        00000890
C16.  Modifications:                                                      00000900
C         EWR 5/31/78  MODIFIED TO HANDLE DM7                            00000910
Cccccccccccccccccccccccccccccccccccc cccccccccccccccccccccccc            00000920
```

*** END OF MEMBER ***   90 RECORDS PROCESSED   ***

```
Cccccccccccccccccccccccccccccccccccccccccccccccccccccccc          00000020
C  1.   Routine:                                                   00000030
C          DISCRM                                                  00000040
C  2.   System, Satellite, Version:                                00000050
C          HELDRP     HELIOS A,B            0                      00000060
C  3.   English Name:                                              00000070
C          DISCRIMINATOR                                           00000080
C  4.   Language:                                                  00000090
C          FORTRANG or FORTRANH    level 21.6    360/91/75   OS/MVT 00000100
C  5.   Purpose:                                                   00000110
C          CORRECT DM7 FILES AND COPY THEM TO A LIBRARY TAPE       00000120
C  6.   Calling Sequence:                                          00000130
C          Argument          Type     I/O      Description         00000140
C            SATID           L*1            SATELLITE ID           00000150
C            IUNIT           I*4            EDR INPUT TAPE UNIT     00000160
C            IOUNIT          I*4            LIB OUTPUT TAPE UNIT    00000170
C            DINCH           R*8            INCHES WRITTEN ON LIB TAPE 00000180
C            DGAP            R*8            INTERRECORD GAP DISTANCE  00000190
C            DBPI            R*8            LIB TAPE DENSITY         00000200
C            ICCDE           I*4            CONDITION CODE RETURNED  00000210
C            IREC            I*4            RECORD NUMBER RETURNED   00000220
C  7.   Notes:                                                     00000230
C  7a.    Restrictions:                                            00000240
C          FILES PROCESSED BEFORE 6/17/76 BY IPD ARE COPIED DIRECTLY 00000250
C          LABEL ERRORS OF MORE THAN 180 SECONDS ARE REJECTED      00000260
C  7b.    Special Features:                                        00000270
C          NONE                                                    00000280
C  8.   Variables:                                                 00000290
C  8a.    Local                                                    00000300
C          Variable          Type       Description                00000310
C            QSAVE           L*1        DATA RECORD INPUT          00000320
C            QE              L*1        FLAG PLACED ON LIB LABEL   00000330
C            NWARN           L*4        WARNING FLAG FOR BAD RECORDS 00000340
C            NPROC           L*4        WARNING FLAG FOR FILE PROCESSED BEFORE 00000350
C                                       6/17/76                    00000360
C            HDATA           I*2        DATA RECORD INPUT          00000370
C            QLABEL          L*1        LABEL DATA                 00000380
C            HCLOCK          I*2        S/C CLOCK FROM MINOR FRAME 00000390
C            CASAVE          R*8        HELIOS A LINE INTERCEPTS   00000400
C            DBSAVE          R*8        HELIOS A LINE SLOPES       00000410
C            BSAVE           R*8        HELIOS A LINE SLOPES       00000420
C            ICLOCK          I*4        S/C CLOCK FROM TWO MINOR FRAMES 00000430
C            IBAD            I*4        NUMBER OF BAD MINOR MINOR FRAMES 00000440
C            ICORR           I*4        NUMBER OF CORRECTED MINOR FRAMES 00000450
C            NUNIT           I*4        DATA SET TO HOLD CORRECTED RECORD 00000460
C            TIMBAD          R*4        TOTAL TIME OF BAD MINOR FRAMES 00000470
C            TIMCORR         R*4        TOTAL TIME OF CORRECTED MINOR FRAMES 00000480
C            AID             L*1        HELIOS A ID                00000490
C            BID             L*1        HELIOS B ID                00000500
C            DRESET          R*8        HELIOS A TIMES OF RESET    00000510
C            DRESEB          R*8        HELIOS B TIMES OF RESET    00000520
C            CBSAVE          R*8        HELIOS B LINE INTERCEPTS   00000530
C            DASAVB          R*8        HELIOS B LINE SLOPES       00000540
C            BSAVEB          R*4        HELIOS B LINE SLOPES       00000550
C            NRESET          I*4        HELIOS A NUMBER OF RESETS  00000560
C            NRESEB          I*4        HELIOS B NUMBER OF RESETS  00000570
C            ISEC            I*4        SECONDS PER FRAME          00000580
C            ISEC2           I*4        MILLISECONDS PER MINOR FRAME 00000590
C            HYEAR           I*2        YEAR                       00000600
C            JYEAR           I*4        YEAR                       00000610
C            IDCY            I*4        DAY OF YEAR                00000620
C            IMCNTH          I*4        MONTH                      00000630
C            IDAY            I*4        DAY                        00000640
C            HMCNTH          I*2        MONTH                      00000650
C            HDAY            I*2        DAY                        00000660
C            HMOD            I*2        MODIFIED JULIAN DAY        00000670
C            IREC            I*4        RECORD NUMBER              00000680
C            LEN             I*4        RECORD LENGTH              00000690
C            K               I*4        MINOR FRAME INDEX          00000700
C            KNEXT           I*4        MINOR FRAME TO COMPARE CLOCK WITH 00000710
C            MSEC2           I*4        MILLISECONDS OF NEXT MINOR FRAME 00000720
C            MSECL           I*4        MILLISECONDS OF LAST MINOR FRAME 00000730
C            DEVT            R*8        EVENT TIME                 00000740
C            IEVENT          I*4        EVENT TIME                 00000750
C            DMOD            R*8        EXACT TIME OF MINOR FRAME  00000760
C            ISI             I*4        STATUE WORD                00000770
C            ISHIFT          I*4        DISTRIBUTION MODE          00000780
```

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C          HPROC      I*2      PROCESSED DAY IN MODIFIED JULIAN DAYS       00000790
C          IHALF1     I*4      S/C CLOCK                                   00000800
C          IHALF2     I*4      S/C CLOCK FROM MINOR FRAME                  00000810
C          M          I*4      OFFSET FOR COMPARISON MINOR FRAME           00000820
C          IHALF3     I*4      S/C CLOCK FROM MINOR FRAME                  00000830
C          I32        I*4      MSB FROM THE S/C CLOCK                      00000840
C          DCLOCK     R*8      S/C CLOCK IN SECONDS                        00000850
C          DA         R*8      LINE INTERCEPT                             00000860
C          DB         R*8      LINE SLOPE                                 00000870
C          JDAYS      I*4      START DAY OF RECORD                        00000880
C          MSECS      I*4      START MILLISECONDS OF RECORD               00000890
C          JDAYE      I*4      END DAY OF RECORD                          00000900
C          MSECE      I*4      END MILLISECONDS OF RECORD                 00000910
C          NDM7       I*4      NUMBER OF DM7 MINOR FRAMES                  00000920
C          DHRS       R*8      HOURS OF START OF RECORD                   00000930
C          DMINS      R*8      MINUTES OF START OF RECORD                 00000940
C          DHRE       R*8      HOURS OF END OF RECORD                     00000950
C          DMINE      R*8      MINUTES OF END OF RECORD                   00000960
C    8b.   COMMON                                                         00000970
C          COMMON              Variables                                  00000980
C          LABEL/                                                         00000990
C          JCODE      I*4      TAPE CODE                                  00001000
C          ITPTYP     I*4      TAPE TYPE                                  00001010
C          IDTTYP     I*4      DATA TYPE                                  00001020
C          HFMT       I*2      FORMAT                                     00001030
C          HBTRT      I*2      BITRATE                                    00001040
C          HRECYR     I*2      YEAR OF RECORD                             00001050
C          HSEDR      I*2      DAY,HOUR,MIN,SEC OF RECORD START           00001060
C          HEEDR      I*2      DAY,HOUR,MIN,SEC OF RECORD END             00001070
C          HMRTAP     I*2      MASTER TAPE VOLUME                         00001080
C          HMRFIL     I*2      MASTER TAPE FILE NUMBER                    00001090
C          HGEN       I*2      YEAR,MONTH,DAY OF TAPE GENERATION          00001100
C          HRUN       I*2      IPD RUN NUMBER                             00001110
C          HFILE      I*2      IPD FILE NUMBER                            00001120
C          HREEL      I*2      IDP REEL NUMBER                            00001130
C          HID        I*2      IPD ID NUMBER                              00001140
C          CDISC/                                                         00001150
C          IDATA      I*4      DATA RECORD                                00001160
C          NDM7/      I*4      NUMBER OF DM7 MINOR FRAMES                  00001170
C          DISC/                                                          00001180
C          FOR THIS COMMON BLOCK SEE GETLIB DOCUMENTATION AND             00001190
C          SEE COMMON BLOCK DESCRIPTION IN HELIOS DATA REDUCTION          00001200
C          PROGRAM DESCRIPTION APPENDICES                                 00001210
C  9.  I/O Information:                                                   00001220
C      Unit No.          Use Description                                  00001230
C          IUNIT         EDR INPUT TAPE UNIT                              00001240
C          IOUNIT        LIB OUTPUT TAPE UNIT                             00001250
C          UNIT 14       DATA SET FOR CORRECTED RECORD                    00001260
C 10.  Error Handling:                                                    00001270
C          EXIT ON TAPE READ ERROR                                       00001280
C 11.  Subroutines Called:                                               00001290
C      Subroutine        Description                                     00001300
C          FMOVE         MOVE BYTES INTO AN AREA                         00001310
C          DAIO          READ,WRITE A DATA SET                           00001320
C          YDMD          YEAR,DAY OF YEAR CONVERSION                     00001330
C          CNVDAT        MODIFIED JULIAN CONVERSION                      00001340
C          FTIO          READ,WRITE A TAPE                               00001350
C          SHFTR         RIGHT SHIFT OF WORD                             00001360
C          SHFTL         LEFT SHIFT OF WORD                              00001370
C 12.  Called By:                                                         00001380
C      Routine           Description                                     00001390
C          COPY          COPY A EDR TAPE TO LIB TAPE                     00001400
C 13.  Method:                                                            00001410
CDISCRM  CSECT                                                            00001420
C       DEFINE SLOPE INTERCEPT AND TIME OF RESET FOR CLOCK REGIONS        00001430
C       SAVE LABEL                                                        00001440
C       REF        CALCULATE TIME RELATIVE TO 1972                       00001450
C       READ BLOCK                                                        00001460
C               READ A RECORD                                           00001470
C       END READ                                                         00001480
C       IF RECORD IS DM7 AND PROCESSED BEFORE 6/17/76                    00001490
C               CHECK FOR FRAME SLIP                                     00001500
C               SKIP ZERO FRAMES                                        00001510
C               SAVE FRAME TIME                                          00001520
C               CALCULATE FRAME TIME RELATIVE TO 1972                   00001530
C               GET S/C CLOCK                                           00001540
C               DETERMINE CORRECT REGION                               00001550
C               PREDICT EVENT TIME FROM S/C CLOCK                      00001560
```

```
C              CHECK LABEL                                          00001570
C                        IF LABEL LESS THAN 180 SECONDS OFF         00001580
C                              CORRECT LABEL                        00001590
C                              CORRECT EVENT TIME                   00001600
C                        ELSE BAD LABEL                             00001610
C                              NDM7=2                               00001620
C                              COPY FILE DIRECTLY                   00001630
C                              EXIT                                 00001640
C                        FI                                         00001650
C              COPY CORRECTED FILE                                  00001660
C                                                                   00001670
C         ELSE                                                      00001680
C              NDM7=0                                               00001690
C              COPY FILE DIRECTLY                                   00001700
C         FI                                                        00001710
C14.   Reference:                                                   00001720
C         NONE                                                      00001730
C15.   Programmer and Date:                                         00001740
C         ED RONISH 5/31/78                                         00001750
C16.   Modifications:                                               00001760
C                                                                   00001770
Ccccccccccccc ccccccc ccccc cccc ccccc ccccc cccc cccccccccccccccccc 00001780
```

*** END OF MEMBER ***   177 RECORDS PROCESSED   ***

```
Cccccccccccccccccccccccccccccccccccccccccccccccccccccc        00000020
C 1.  Routine:                                                00000030
C        LBMAIN                                                00000040
C 2.  System, Satellite, Version:                             00000050
C        LIBGEN     HELIOS A,B           0                    00000060
C 3.  English Name:                                           00000070
C        LIBRARY GENERATION MAIN PROGRAM                      00000080
C 4.  Language:                                               00000090
C        FORTRANG or FORTRANH    level 21.6    360/91/75   OS/MVT   00000100
C 5.  Purpose:                                                00000110
C        CALL LIBGEN AND SET UP ALTERNATE RETURNS AND ERROR MESSAGES  00000120
C 6.  Calling Sequence:                                       00000130
C     Argument            Type    I/O    Description          00000140
C        NONE                                                 00000150
C 7.  Notes:                                                  00000160
C     7a.  Restrictions:                                      00000170
C        NONE                                                 00000180
C     7b.  Special Features:                                  00000190
C        NONE                                                 00000200
C 8.  Variables:                                              00000210
C     8a.  Local                                              00000220
C          Variable          Type    Description              00000230
C          SATID       L*1     SATELLITE ID                   00000240
C     8b.  COMMON                                             00000250
C          COMMON            Variables                        00000260
C        NONE                                                 00000270
C 9.  I/O Information:                                        00000280
C     Unit No.           Use Description                      00000290
C        5               INPUT CARDS                          00000300
C        6               OUTPUT MESSAGES                      00000310
C10.  Error Handling:                                         00000320
C        ALL ALTERNATE RETURNS END WITH A MESSAGE             00000330
C11.  Subroutines Called:                                     00000340
C     Subroutine         Description                          00000350
C        LIBGEN      LIBRARY GENERATOR                        00000360
C12.  Called By:                                              00000370
C     Routine            Description                          00000380
C        MAIN PROGRAM CALLED BY USER                          00000390
C13.  Method:                                                 00000400
C        LBMAIN     CSECT                                     00000410
C                   CALL LIBGEN                               00000420
C        END LBMAIN                                           00000430
C14.  Reference:                                              00000440
C        NONE                                                 00000450
C15.  Programmer and Date:                                    00000460
C        NAND LAL                                             00000470
C16.  Modifications:                                          00000480
Ccccccccccccccccccccccccccccccccccccccccccccccccccccc         00000490
                                                              00000500
```

*** END OF MEMBER ***   49 RECORDS PROCESSED   **

```
*ccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc                      00000020
* 1.  Routine:                                                                     00000030
*        LIBGEN                                                                    00000040
* 2.  System, Satellite, Version:                                                  00000050
*        LIBGEN    HELIOS A,B           0                                          00000060
* 3.  English Name:                                                                00000070
*        LIBRARY GENERATOR                                                         00000080
* 4.  Language:                                                                    00000090
*        ASMG    level G     release 21MAR76   360/91/75   OS/MVT                  00000100
* 5.  Purpose:                                                                     00000110
*        GENERATE CATALOG OF FILE HISTORY FOR LIBRARY TAPES                        00000120
* 6.  Calling Sequence:                                                            00000130
*        Argument         Type     I/O      Description                           00000140
*          SATID          L*1      SATELLITE ID                                    00000150
*          &210                    ALTERNATE RETURN FOR BAD ID                     00000160
*          &220                    ALTERNATE RETURN FOR NO INPUT VOLUME            00000170
*          &230                    ALTERNATE RETURN FOR NO OUTPUT VOLUME           00000180
*          &240                    ALTERNATE RETURN FOR END OF INPUT VOLUME        00000190
*          &250                    ALTERNATE RETURN FOR END OF OUTPUT              00000200
*          &260                    ALTERNATE RETURN FOR CATALOG OVERFLOW           00000210
* 7.  Notes:                                                                       00000220
*     7a.  Restrictions:                                                           00000230
*        NONE                                                                      00000240
*     7b.  Special Features:                                                       00000250
*        NONE                                                                      00000260
* 8.  Variables:                                                                   00000270
*     8a.  Local                                                                   00000280
*        Variable             Type     Description                                 00000290
*          OUTUNIT    I*4        OUTPUT UNIT NUMBER 12                             00000300
*          INUNIT     I*4        INPUT UNIT NUMBER 11                              00000310
*     8b.  COMMON                                                                  00000320
*        COMMON                  Variables                                         00000330
*        LABEL/                                                                    00000340
*          LFORMAT    I*2        FORMAT                                            00000350
*          LBITRATE   I*2        BITRATE                                           00000360
*          LYEAR      I*2        YEAR OF RECORD                                    00000370
*          LSDAY      I*2        DAY OF START OF RECORD                            00000380
*          LSHOUR     I*2        HOUR OF START OF RECORD                           00000390
*          LSMIN      I*2        MIN OF START OF RECORD                            00000400
*          LSSEC      I*2        SEC OF START OF RECORD                            00000410
*          LEDAY      I*2        DAY OF END OF RECORD                              00000420
*          LEHOUR     I*2        HOUR OF END OF RECORD                             00000430
*          LEMIN      I*2        MIN OF END OF RECORD                              00000440
*          LESEC      I*2        SEC OF END OF RECORD                              00000450
*          LMTAPE     I*2        NEXT EDR TAPE IN CATALOG                          00000460
*          LMFILE     I*2        NEXT EDR FILE IN CATALOG                          00000470
*        INDEX/                                                                    00000480
*        INDEX VARIABLES ARE DOCUMENTED IN THE CSECT INDEX                         00000490
*        FENTRY/                                                                   00000500
*        FENTRY VARIABLES ARE DOCUMENTED IN THE CSECT INDEX                        00000510
*        VENTRY/                                                                   00000520
*        VENTRY VARIABLES ARE DOCUMENTED IN THE CSECT INDEX                        00000530
* 9.  I/O Information:                                                             00000540
*        Unit No.         Use Description                                          00000550
*          11             INPUT UNIT FOR EDR TAPE                                  00000560
*          12             OUTPUT UNIT FOR LIB TAPE                                 00000570
*          39             HELIOS A INDEX                                           00000580
*          40             HELIOS A CATALOG                                         00000590
*          49             HELIOS B INDEX                                           00000600
*          50             HELIOS B CATALOG                                         00000610
*10.  Error Handling:                                                             00000620
*        ALL ERRORS ARE HANDLED WITH ALTERNATE RETURNS                            00000630
*        DOCUMENTED IN LBMAIN                                                      00000640
*11.  Subroutines Called:                                                         00000650
*        Subroutine        Description                                            00000660
*          MOUNTE         MOUNT EDR TAPE                                          00000670
*          MOUNTL         MOUNT LIBRARY TAPE                                      00000680
*          DAIO           READ, WRITE INDEX AND CATALOG DATA SETS                 00000690
*          FTIO           READ, WRITE EDR, LIBRARY TAPES                          00000700
*          COPY           COPY EDR TO LIB TAPE                                    00000710
*12.  Called By:                                                                  00000720
*        Routine           Description                                            00000730
*          LBMAIN         LIBRARY MAIN CALL                                       00000740
*13.  METHOD:                                                                     00000750
*LIBGEN   CSECT                                                                   00000760
*        GETNDX       NDXUNIT=INDEX UNIT(39 FOR A, 49 FOR B)                      00000770
*                     CATUNIT=1+NDXUNIT=CATALOG UNIT                              00000780
```

```
*                      READ INDEX
*                              GET OUTSER NUMBER                              00000790
*                      END READ                                              00000800
*         END GETNDX                                                         00000810
*         DOFILE          .                                                  00000820
*                                                                            00000830
*                      NEXTIN                                                 00000840
*                              GET INSER AND INSEQ FROM INDEX                00000850
*                      END NEXTIN                                            00000860
*                      NEXTOUT                                               00000870
*                              GET OUTSER,OUTSEQ AND FEET FROM INDEX         00000880
*                      END NEXTOUT                                           00000890
*                      CALL MOUNTE TO MOUNT EDR                              00000900
*                      CALL COPY                                             00000910
*                      DISP                                                  00000920
*                          IF RETCOD=1 END OF INPUT TAPE                     00000930
*                                  GET NEXT INPUT VOLUME                     00000940
*                                  PUTNDX                                    00000950
*                                          WRITE PARAMETERS                  00000960
*                                          TO INDEX                         00000970
*                                  END PUTNDX                               00000980
*                          FI                                               00000990
*                          IF RETCOD=2      NORMAL RETURN                   00001000
*                                  GETFIL                                   00001010
*                                      FINDFILE                             00001020
*                                          GETVOL                           00001030
*                                              READ CATALOG                 00001040
*                                          END GETVOL                       00001050
*                                                                           00001060
*                                          PUTNDX WRITE INDEX               00001070
*                                          GETVOL READ CATALOG              00001080
*                                          PUTVOL WRITE CATALOG             00001090
*                                                                           00001100
*END FINDFILE                                                               00001110
*                                      END GETFIL                           00001110
*                          FI                                               00001120
*                          IF RETCOD=3 END OF OUTPUT TAPE                    00001130
*                                  INCREASE OUTSER BY 1                     00001140
*                                  CALL PUTNDX WRITE INDEX                  00001150
*                          FI                                               00001160
*                          IF RETCOD=4  I/O ERROR                          00001170
*                                  GETFIL GET NEXT FILE                     00001180
*                                  PUTVOL WRITE CATALOG                     00001190
*                                  PUTNWRITE INDEX                          00001200
*                          FI                                               00001210
*END LIBGEN                                                                 00001220
*14.   Reference:                                                           00001230
*          NONE                                                             00001240
*15.   Programmer and Date:                                                 00001250
*          NAND LAL                                                         00001260
*16.   Modifications:                                                       00001270
*                                                                           00001280
*cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc               00001290
```

*** END OF MEMBER ***   128 RECORDS PROCESSED   **

```
*ccccccccccccccccccccccccccccccccccccccccccccccccccccccc          00000020
*  1.  Routine:                                                    00000030
*         LOGIN                                                    00000040
*  2.  System, Satellite, Version:                                 00000050
*         LIBGEN     HELIOS A,B          0                         00000060
*  3.  English Name:                                               00000070
*         LOG IN INPUT TAPES                                       00000080
*  4.  Language:                                                   00000090
*         ASMG    level G    release 21MAR76   360/91/75   OS/MVT  00000100
*  5.  Purpose:                                                    00000110
*         LOG IN EDR (INPUT)       TAPES INTO INDEX AREA           00000120
*  6.  Calling Sequence:                                           00000130
*         Argument        Type    I/O    Description               00000140
*         // EXEC PGM=ZB2NLHIN,PARM='SATID,SERIAL,COUNT'           00000150
*         SATID       L*1        SATELLITE ID                      00000160
*         SERIAL      I*4        START SERIAL NUMBER,              00000170
*                                MUST BE FOUR CHARACTERS           00000180
*         COUNT       I*4        NUMBER OF TAPES TO ALLOCATE       00000190
*                                MUST BE FOUR CHARACTERS           00000200
*  7.  Notes:                                                      00000210
*       7a.   Restrictions:                                        000C0220
*         MAXIMUM CF 3088 TAPES                                    00000230
*       7b.   Special Features:                                    00000240
*         NONE                                                     00000250
*  8.  Variables:                                                  00000260
*       8a.   Local                                                00000270
*         Variable            Type     Description                 00000280
*         DWORD       R*8        WORK AREA FOR CONVERTING TO DECIMAL 00000290
*         SIX         I*4        NUMBER 6 FOR PARM LIST            00000300
*         ELEVEN      I*4        NUMBER 11 FOR PARM LIST COMPARISON 00000310
*         NDXUNIT     I*4        UNIT NUMBER OF INDEX              00000320
*         RECORD#     I*4        RECORD NUMBER                     00000330
*         READLIST    I*4        LIST OF CALL ARGUMENTS FOR INDEX  00000340
*         @ MSG       I*4        LIST OF ERROR MESSAGES            00000350
*         NCERROR     I*4        ERROR MESSAGE                     00000360
*         TOOMANY  I*4                   "                         00000370
*         BADSAT      I*4                 "                        00000380
*         BADLEN      I*4                 "                        00000390
*         BADSTART    I*4                 "                        00000400
*         ZERO#       I*4                 "                        00000410
*         SYSPRINT    I*4                   OUTPUT DCB             00C00420
*       8b.   COMMON                                               00000430
*         COMMON              Variables                            00000440
*         INDEX/                                                   00000450
*         INDEX COMMON VARIABLES ARE DOCUMENTATED IN INDEX CSECT   00000460
*         IHADCB/                                                  00000470
*         IBM SYSTEM COMMON AREA                                   00000480
*  9.  I/O Information:                                            00000490
*         Unit No.         Use Description                         00000500
*         39               HELIOS A INDEX                          00000510
*         49               HELIOS B INDEX                          00000520
*10.  Error Handling:                                              00000530
*         ERRORS ARE HANDLED BY REG 15                             00000540
*         R15=8        TOO MANY INPUT SERIAL NUMBERS               00000550
*         R15=12       WRONG SATELLITE ID                          00000560
*         R15=16       WRONG LENGTH OF PARM LIST                   00000570
*         R15=20       INCORRECT SERIAL NUMBER                     00000580
*         R15=24       INCORRECT COUNT NUMBER IN PARM LIST         00000590
*11.  Subroutines Called:                                          00000600
*         Subroutine        Description                            00000610
*         DAIO         READ,WRITE INDEX DATA SET                   00000620
*12.  Called By:                                                   00000630
*         Routine           Description                            00000640
*         USER CALLED                                              00000650
*13.  Method:                                                      00000660
*LOGIN   CSECT                                                     00000670
*         OPEN SYSPRINT                                            00000680
*         IF SYSPRINT OPENED SUCCESSFULLY                          00000690
*                 GET NUMBER OF PARAMETERS IN PARM LIST            00000700
*                 IF TWO OR THREE NUMBERS                          00000710
*                         DO CASE                                  00000720
*                                 CASE 1 HELIOS A                  00000730
*                                         INDEX=39                 00000740
*                                 CASE 2 HELIOS B                  00000750
*                                         INDEX=49                 00000760
*                                 CASE 3 MISC                      00000770
*                                         ERROR CODE=8             00000780
```

```
*                         ESACOD                                    00000790
*             ELSE ONLY ONE PARM SATID                              00000800
*                         ERROR CODE=12                             00000810
*             FI                                                    00000820
*             IF NO ERROR CODE                                      00000830
*                         STORE INDEX IN NDXUNIT                    00000840
*                         CONVERT SERIAL TO BINARY                  00000850
*                         IF SERIAL NOT POSITIVE OR GT 1000         00000860
*                                     ERROR CODE=16                 00000870
*                         FI                                        00000880
*             FI                                                    00000890
*             IF NO ERROR CODE                                      00000900
*                         IF PARM HAS TWO NUMBERS                   00000910
*                                     SET INCREMENT                 00000920
*                         ELSE                                      00000930
*                                     IF PARM HAS ONLY SATID        00000940
*                                                 ERROR CODE =20    00000950
*                                     ELSE PARM HAS THREE NUMBERS   00000960
*                                                 CONVERT COUNTS    00000970
*                                                 TO BINARY         00000980
*                                                 IF COUNTS=0       00000990
*                                                     ERROR CODE=24 00001000
*                                                 FI                00001010
*                                                                   00001020
*                                     FI                            00001030
*                         FI                                        00001040
*             FI                                                    00001050
*             IF NO ERROR CODE                                      00001060
*                         READ INDEX                                00001070
*                         ALLOCATE INPUT  TAPES                     00001080
*                         WRITE INDEX                               00001090
*             FI                                                    00001100
*             WRITE MESSAGE ACCORDING TO ERROR CODE                 00001110
*         FI                                                        00001120
*END    LOGIN                                                       00001130
*14.    Reference:                                                  00001140
*             NONE                                                  00001150
*15.    Programmer and Date:                                        00001160
*             NAND LAL                                              00001170
*16.    Modifications:                                              00001180
*                                                                   00001190
*cccccc cccccc cc ccc cc ccccccccc ccccc ccccc ccccccccc cccccccccc 00001200
```

*** END OF MEMBER ***   119 RECORDS PROCESSED   **

```
*cccccccccccccccccccccccccccccccccccccccccccccccccccccccc          00000020
* 1.  Routine:                                                       00000030
*          LOGOUT                                                    00000040
* 2.  System, Satellite, Version:                                    00000050
*          LIBGEN      HELIOS A,B            0                       00000060
* 3.  English Name:                                                  00000070
*          LOG IN OUTPUT TAPES                                       00000080
* 4.  Language:                                                      00000090
*          ASMG     level G     release 21MAR76    360/91/75  OS/MVT 00000100
* 5.  Purpose:                                                       00000110
*          LOG IN LIBRARY (OUTPUT) TAPES INTO INDEX AREA             00000120
* 6.  Calling Sequence:                                              00000130
*          Argument          Type    I/O    Description             00000140
*          // EXEC PGM=ZB2NLHOU,PARM='SATID,SERIAL,COUNT'           00000150
*          SATID      L*1            SATELLITE ID                    00000160
*          SERIAL     I*4            START SERIAL NUMBER,            00000170
*                                    MUST BE FOUR CHARACTERS         00000180
*          COUNT      I*4            NUMBER OF TAPES TO ALLOCATE      00000190
*                                    MUST BE FOUR CHARACTERS         00000200
* 7.  Notes:                                                         00000210
*     7a.  Restrictions:                                             00000220
*          MAXIMUM OF 1000 TAPES                                     00000230
*     7b.  Special Features:                                         00000240
*          NONE                                                      00000250
* 8.  Variables:                                                     00000260
*     8a.  Local                                                     00000270
*          Variable             Type    Description                 00000280
*          DWCRD      R*8         WORK AREA FOR CONVERTING TO DECIMAL 00000290
*          SIX        I*4         NUMBER 6 FOR PARM LIST              00000300
*          ELEVEN     I*4         NUMBER 11 FOR PARM LIST COMPARISON  00000310
*          NDXUNIT    I*4         UNIT NUMBER OF INDEX                00000320
*          RECORD#    I*4         RECORD NUMBER                       00000330
*          READLIST   I*4         LIST OF CALL ARGUMENTS FOR INDEX    00000340
*          @ MSG      I*4         LIST OF ERROR MESSAGES              00000350
*          NOERROR    I*4         ERROR MESSAGE                       00000360
*          TOOMANY    I*4              "                              00000370
*          BADSAT     I*4              "                              00000380
*          BADLEN     I*4              "                              00000390
*          BADSTART   I*4              "                              00000400
*          ZERO#      I*4              "                              00000410
*          SYSPRINT   I*4                   OUTPUT DCB                00000420
*     8b.  COMMON                                                    00000430
*          COMMON           Variables                                00000440
*          INDEX/                                                    00000450
*          INDEX COMMON VARIABLES ARE DOCUMENTATED IN INDEX CSECT    00000460
*          IHADCB/                                                   00000470
*          IBM SYSTEM COMMON AREA                                    00000480
* 9.  I/O Information:                                               00000490
*          Unit No.         Use Description                          00000500
*          39               HELIOS A INDEX                           00000510
*          49               HELIOS B INDEX                           00000520
*10.  Error Handling:                                                00000530
*          ERRORS ARE HANDLED BY REG 15                              00000540
*          R15=8        TOO MANY INPUT SERIAL NUMBERS                00000550
*          R15=12       WRONG SATELLITE ID                           00000560
*          R15=16       WRONG LENGTH OF PARM LIST                    00000570
*          R15=20       INCORRECT SERIAL NUMBER                      00000580
*          R15=24       INCORRECT COUNT NUMBER IN PARM LIST          00000590
*11.  Subroutines Called:                                            00000600
*          Subroutine        Description                             00000610
*          DAIO         READ,WRITE INDEX DATA SET                    00000620
*12.  Called By:                                                     00000630
*          Routine           Description                             00000640
*          USER CALLED                                               00000650
*13.  Method:                                                        00000660
*LOGOUT CSECT                                                        00000670
*          OPEN SYSPRINT                                             00000680
*          IF SYSPRINT OPENED SUCCESSFULLY                           00000690
*                       GET NUMBER OF PARAMETERS IN PARM LIST        00000700
*                       IF TWO OR THREE NUMBERS                      00000710
*                            DO CASE                                 00000720
*                                 CASE 1 HELIOS A                    00000730
*                                      INDEX=39                      00000740
*                                 CASE 2 HELIOS B                    00000750
*                                      INDEX=49                      00000760
*                                 CASE 3 MISC                        00000770
*                                      ERROR CODE=8                  00000780
```

```
*                       ESACOD                                00000790
*               ELSE ONLY ONE PARM SATID                      00000800
*                       ERROR CODE=12                         00000810
*                   FI                                        00000820
*                   IF NO ERROR CODE                          00000830
*                       STORE INDEX IN NDXUNIT                00000840
*                       CONVERT SERIAL TO BINARY              00000850
*                       IF SERIAL NOT POSITIVE OR GT 1000     00000860
*                           ERROR CODE=16                     00000870
*                       FI                                    00000880
*                   FI                                        00000890
*                   IF NO ERROR CODE                          00000900
*                       IF PARM HAS TWO NUMBERS               00000910
*                           SET INCREMENT                     00000920
*                       ELSE                                  00000930
*                           IF PARM HAS ONLY SATID            00000940
*                               ERROR CODE =20                00000950
*                           ELSE PARM HAS THREE NUMBERS       00000960
*                               CONVERT COUNTS                00000970
*                               TO BINARY                     0C000980
*                               IF COUNTS=0                   00000990
*                                   ERROR CODE=24             0CC01000
*                               FI                            00001010
*                                                             0C001020
*                           FI                                00001030
*                       FI                                    00001040
*                   FI                                        0C001050
*                   IF NO ERROR CODE                          00001060
*                       READ INDEX                            00001070
*                       ALLOCATE OUTPUT TAPES                 00001080
*                       WRITE INDEX                           00001090
*                   FI                                        00001100
*                   WRITE MESSAGE ACCORDING TO ERROR CODE     00001110
*               FI                                            00001120
*END     LOGOUT                                               00001130
*14.    Reference:                                            00001140
*           NONE                                              00001150
*15.    Programmer and Date:                                 00001160
*           NAND LAL                                          00001170
*16.    Modifications:                                        00001180
*                                                             00001190
*ccc ccc ccccccccccccc cccccccccc ccccc ccccc cccccccccccccccccccccc  00001200
```

*** END OF MEMBER ***   119 RECORDS PROCESSED   ***

```
Ccccccccccccccccccccccccccccccccccccccccccccccccccccccccc          00000020
C  1.  Routine:                                                     00000030
C         MOUNTE / MOUNTL                                           00000040
C  2.  System, Satellite, Version:                                  00000050
C         LIBGEN    HELIOS A,B           0                          00000060
C  3.  English Name:                                                00000070
C         MOUNT EDR TAPE / MOUNT LIB TAPE                           00000080
C  4.  Language:                                                    00000090
C         FORTRANG or FORTRANH    level 21.6      360/91/75   OS/MVT  00000100
C  5.  Purpose:                                                     00000110
C         MOUNT EDR TAPE / MOUNT LIB TAPE                           00000120
C  6.  Calling Sequence:                                            00000130
C         Argument           Type    I/O    Description            00000140
C           MOUNTE                                                  00000150
C           SATID      L*1          SATELLITE ID                    00000160
C           SERIAL     I*4          EDR TAPE NUMBER                 00000170
C           SEQ        I*4          EDR FILE NUMBER                 00000180
C           UNIT       I*4          EDR UNIT NUMBER                 00000190
C           MOUNTS     I*4          NUMBER OF TAPE MOUNTS           00000200
C           &100                    ALTERNATE RETURN                00000210
C           MOUNTL                                                  00000220
C           SATID      L*1          SATELLITE ID                    00000230
C           IOTYPE     I*4          I/O TYPE                        00000240
C           SERIAL     I*4          LIB TAPE NUMBER                 00000250
C           SEQ        I*4          LIB FILE NUMBER                 00000260
C           UNIT       I*4          LIB UNIT NUMBER                 00000270
C           MOUNTS     I*4          NUMBER OF TAPE MOUNTS           00000280
C           INSER      I*4          EDR TAPE NUMBER                 00000290
C           INSEQ      I*4          EDR FILE NUMBER                 00000300
C           *,*                     TWO ALTERNATE RETURNS           00000310
C  7.  Notes:                                                       00000320
C      7a.  Restrictions:                                           00000330
C             NONE                                                  00000340
C      7b.  Special Features:                                       00000350
C             NONE                                                  00000360
C  8.  Variables:                                                   00000370
C      8a.  Local                                                   00000380
C             Variable          Type    Description                00000390
C             OLDSER     I*R          LAST MOUNT                    00000400
C             TYPE       I*4          FTIO TYPE                     00000410
C             REMCPU     I*4          REMAINING CPU TIME            00000420
C             CPUTOL     I*4          TOTAL CPU TIME                00000430
C             IOTOL      I*4          TOTAL I/O TIME                00000440
C             DSNAME     I*4          DATA SET NAME                 00000450
C      8b.  COMMON                                                  00000460
C             COMMON                 Variables                      00000470
C             NO COMMON BLOCKS USED                                 00000480
C  9.  I/O Information:                                             00000490
C      Unit No.          Use Description                            00000500
C         UNIT           TAPE UNIT                                  00000510
C 10.  Error Handling:                                              00000520
C         NONE                                                      00000530
C 11.  Subroutines Called:                                          00000540
C      Subroutine          Description                              00000550
C         REMTIM     REMAINING TIME                                 00000560
C         SERDSN     DSN OF LIB TAPE                                00000570
C         SERVOL     SERIAL VOLUME NUMBER                           00000580
C         MOUNT      FTIO MOUNT A TAPE                              00000590
C         POSN       FTIO POSITION OF TAPE                          00000600
C 12.  Called By:                                                   00000610
C      Routine             Description                              00000620
C         LIBGEN     LIBRARY GENERATION                             00000630
C 13.  Method:                                                      00000640
CMOUNTE  CSECT        EDR VOLUME                                    00000650
C         TYPE=1 MOUNT EDR VOLUME                                   00000660
C         CHECK REMAINING TIME TO SEE IF ENOUGH                     00000670
C         IF ENOUGH TIME REMAINS                                    00000680
C                    IF NEW VOLUME                                  00000690
C                          CALL SERVOL TO CONSTRUCT VOLUME NAME     00000700
C                          MOUNT TAPE                               00000710
C                    ELSE                                           00000720
C                          POSITION TO NEXT FILE                    00000730
C                    FI                                             00000740
C         ELSE EXIT                                                 00000750
CEND MOUNTE                                                         00000760
CMOUNTL  ENTRY LIBRARY VOLUME                                       00000770
C         IF ENOUGH TIME REMAINS                                    00000780
```

```
C                     CALL SERDSN TO CONSTRUCT DATA SET NAME         00000790
C                     IF NEW VOLUME                                  00000800
C                            CALL SERVOL TO CONSTRUCT VOLUME NAME     00000810
C                            MOUNT TAPE                              00000820
C                     ELSE                                          00000830
C                            POSITION TO NEXT FILE                   00000840
C                     FI                                            00000850
C          FI                                                       00000860
CEND MOUNTL                                                         00000870
C14.   Reference:                                                   00000880
C          NONE                                                     00000890
C15.   Programmer and Date:                                         0C000900
C          NAND LAL                                                 00000910
C16.   Modifications:                                               00000920
C                                                                   00000930
Ccccccccccccccccccccccccccccccccccccccccc ccccccccccccccccccccc     00000940
```

*** END OF MEMBER ***   93 RECORDS PROCESSED   ***

```
*cccccccccccccccccccccccccccccccccccccccccccccccccccc           00000020
*  1.   Routine:                                                 00000030
*          SERDSN                                                00000040
*  2.   System, Satellite, Version:                              00000050
*          LIBGEN      HELIOS A,B              0                 00000060
*  3.   English Name:                                            00000070
*          SERIAL DATA SET NAME                                  00000080
*  4.   Language:                                                00000090
*          ASMG     level G     release 21MAR76   360/91/75  OS/MVT   00000100
*  5.   Purpose:                                                 00000110
*          CONSTRUCT DATA SET NAME FOR LIBRARY TAPE FILE         00000120
*  6.   Calling Sequence:                                        00000130
*        Argument              Type    I/O     Description       00000140
*          SATID       L*1             SATELLITE ID              00000150
*          INSER       I*4             EDR SERIAL NUMBER         00000160
*          INSEQ       I*4             EDR FILE NUMBER           00000170
*          DSNAME      R*8             DSN (SERIAL-FILE) RETURNED 00000180
*  7.   Notes:                                                   00000190
*        7a.   Restrictions:                                     00000200
*                NONE                                            00000210
*        7b.   Special Features:                                 00000220
*                NONE                                            00000230
*  8.   Variables:                                               00000240
*        8a.   Local                                             00000250
*                Variable            Type    Description         00000260
*                DWORD       R*8     WORK AREA TO UNPACK SERIAL NUMBERS   00000270
*        8b.   COMMON                                            00000280
*                COMMON              Variables                   00000290
*                NONE                                            00000300
*  9.   I/O Information:                                         00000310
*        Unit No.         Use Description                        00000320
*                NONE                                            00000330
* 10.   Error Handling:                                          00000340
*                NONE                                            00000350
* 11.   Subroutines Called:                                      00000360
*        Subroutine         Description                          00000370
*                NONE                                            00000380
* 12.   Called By:                                               00000390
*        Routine            Description                          00000400
*          GETLIB     GET LIBRARY TAPE                           00000410
*          MOUNTL     MOUNT LIBRARY TAPE                         00000420
* 13.   Method:                                                  00000430
*SERDSN  CSECT                                                   00000440
*          PLACE 'H' IN BYTE 1 OF DSNAME                         00000450
*          PLACE SATID IN BYTE 2                                 00000460
*          CONVERT INSER TO ZONED DECIMAL                        00000470
*                PLACE IN BYTE 3-6                                00000480
*          CONVERT INSEQ TO ZONED DECIMAL                        00000490
*                PLACE IN BYTE 7-8                                00000500
*END SERDSN                                                      00000510
* 14.   Reference:                                               00000520
*                NONE                                            00000530
* 15.   Programmer and Date:                                     00000540
*          NAND LAL                                              00000550
* 16.   Modifications:                                           00000560
*                                                                00000570
*cccccccccccccccccccccccccccccccccccccccccccccccccccc           00000580
```

```
*** END OF MEMBER ***      57 RECORDS PROCESSED   ****************************************************************************
```

```
*ccccccccccccccccccccccccccccccccccccccccccccccccccccc          00000020
* 1.   Routine:                                                  00000030
*           SERVOL                                               00000040
* 2.   System, Satellite, Version:                               00000050
*           LIBGEN      HELIOS A,B           0                   00000060
* 3.   English Name:                                             00000070
*           SERIAL VCLUME                                        00000080
* 4.   Language:                                                 00000090
*           ASMG    level G    release 21MAR76    360/91/75   OS/MVT   00000100
* 5.   Purpose:                                                  00000110
*           CONSTRUCT SERIAL VOLUME NAME FROM VOLUME NUMBER      00000120
*           AND VOLUME ID                                        00000130
* 6.   Calling Sequence:                                         00000140
*      Argument         Type      I/O      Description           00000150
*         SATID       L*1        SATELLITE ID                    00000160
*         TYPE        I*4        FTIO TYPE 1=FORWARD READ        00000170
*                                          2=FORWARD WRITE       00000180
*         SERIAL      I*4        VOLUME SERIAL NUMBER            00000190
*         VSN         R*8        VOLUME SERIAL NAME RETURNED      00000200
* 7.   Notes:                                                    00000210
*      7a.   Restrictions:                                       00000220
*            NONE                                                00000230
*      7b.   Special Features:                                   00000240
*            NONE                                                00000250
* 8.   Variables:                                                00000260
*      8a.   Local                                               00000270
*            Variable          Type    Description               00000280
*         DWCRD        R*8        WORK AREA TO CONVERT NUMBERS    00000290
*         EDR          I*4        FLAG TO DETERMINE IF EDR (1) OR NOT   00000300
*      8b.   COMMON                                              00000310
*            COMMON            Variables                         00000320
*            NONE                                                00000330
* 9.   I/O Information:                                          00000340
*      Unit No.          Use Description                         00000350
*         NONE                                                   00000360
*10.   Error Handling:                                           00000370
*         NONE                                                   00000380
*11.   Subroutines Called:                                       00000390
*      Subroutine        Description                             00000400
*         NONE                                                   00000410
*12.   Called By:                                                00000420
*      Routine           Description                             00000430
*         MOUNTE       MOUNT EDR TAPE                            00000440
*         MOUNTL       MOUNT LIBRARY TAPE                        00000450
*         GETLIB       GET LIBRARY TAPE                          00000460
*13.   Method:                                                   00000470
*                                                                00000480
*SERVOL   CSECT                                                  00000490
*         PLACE 'H' IN BYTE 1 OF VSN                             00000500
*         PLACE SATID IN BYTE 2                                  00000510
*         CONVERT SERIAL TO ZONED DECIMAL                        00000520
*         IF TYPE IS EDR VOLUME                                  00000530
*              PLACE SERIAL IN BYTE 3-5                          00000540
*         ELSE TYPE IS LIBRARY VOLUME                            00000550
*              PLACE 'L' IN BYTE 3                               00000560
*              PLACE SERIAL IN BYTE 4-5                          00000570
*         FI                                                     00000580
*         END                                                    00000590
*14.   Reference:                                                00000600
*         NONE                                                   00000610
*15.   Programmer and Date:                                      00000620
*         NAND LAL                                               00000630
*16.   Modifications:                                            00000640
*                                                                00000650
*ccccccccccccccccccccccccccccccccccccccccccccccccccccccc         00000660

*** END OF MEMBER ***      65 RECORDS PROCESSED     *********************************************************************
```

```
C*********************************************************************************
C   1.   NAME: UPKLBL                                                    00000010
C   2.   IDENTIFICATION: HELDRP HELIOS A,B                               00000020
C   3.   ENGLISH NAME: UNPACK LABEL                                      00000030
C   4.   LANGUAGE: FORTRANH OS/MVT 360/91/75                            00000040
C   5.   PURPOSE: TO RETRIEVE THE LABEL INFORMATION IN USABLE FORM      00000050
C   6.   CALLING SEQUENCE:                                              00000060
C        CALL UPKLBL(QLABEL)
C        SEE BELOW FOR DESCRIPTION OF CALLING ARGUMENTS                 00000080
C   7.   NOTES: NONE                                                    00000090
C   8.   VARIABLES: COMMON BLOCK VARIABLES USED ARE DESCRIBED IN        00000100
C        APPENDICES OF HELIOS DATA REDUCTION PROGRAM DESCRIPTION        00000110
C   9.   I/O: INPUT IS THE EDR LABEL                                    00000120
C        OUTPUT IS THE LABEL CONVERTED IN TO USABLE FORM AND PLACED     00000130
C        IN COMMON BLOCK WRITES OUT ON UNIT 99                          00000140
C   10.  ERROR HANDLING: RETCOD SETS THE CONDITION RESULTING FROM SEARCH 00000150
C   11.  CALLS: NONE.                                                   00000160
C   12.  CALLED BY: HELDRP                                              00000170
C   13.  METHOD: A FORMATED WRITE STATEMENT REFERING TO UNIT 99 PLACES  00000180
C        LABEL STRING OF OUTPUT CHARACTERS IN TO BUFFER.                00000190
C        A FORMATTED READ STATEMENT REFERING TO UNIT 99 USES THE        00000200
C        BUFFER AS INPUT CONVERTS IN TO USABLE FORMAT PLACES IN         00000210
C        COMMON BLOCK LABEL.                                            00000220
C   14.  REFERENCE: NONE.                                               00000230
C   15.  PROGRAMMER: GERRY MARINDINO                                    00000240
C   16.  MODIFIED:                                                      00000250
C*********************************************************************************00000410
C*********************************************************************************00000420
                                                                        00000430
*** END OF MEMBER ***        28 RECORDS PROCESSED              00000440
```