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BELL TELEPHONE LABORATORIES, INCORPORATED

5- 103

COMMON SYSTEMS

FOR USE WITH NO. 3 ESS

ARRANGED WITH 2-WIRE FEATURES

COMMON INITIAL PROGRAM LOADER

(CIPL)

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AT&TCO
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SECTION DICTIONARY

NUMBER	NAME	MAXIMUM	ORIGIN	TYP	ADDRESS-MODIFICATION
01	CIPL	0003561		C	
02	TEMPI01	0000001		C	

```
               DBNAM    NO33E3I3.OFF.DATABASE
               RELNAM   NO3ESS
               GETLIB   LIBRARY,MEMBER=MOPTBL
               GETLIB   LIBRARY,MEMBER=SYSMAC
               GETLIB   LIBRARY,MEMBER=SYSSYM
               GETLIB   LIBRARY,MEMBER=PATCH2
0010000        FIRSTOPTSS
0010000        VERSION 3ACC,FIELD,ESS2E
0010000        PATCHINIT
        NO33E3I3.OFF.OPMS(0) DECK
               DSQUAL   NO33E3I3
               LISTING N,CRUNCH=Y,SYSOUT=N
        #################
        ##
        ## UNIX ID = NO3PAG
        ##
        #################
        ############################################
        ###
        ####  pid  date     time   rel
        ###
        #### cipl 1/24/81 17:48:21 7.1.1.1
        ###
        ############################################
        ############################################
        ###
        ####  pid  date     time   rel
        ###
        #### cipl 1/24/81 17:48:21 7.1.1.1
        ###
        ############################################
               NAME     CIPL
               OREF     ON
               GETLIB   MEMBER=SPMAC
               GETLIB   MEMBER=TAPSYM
               GETLIB   MEMBER=GPMAC
               GETLIB   MEMBER=CCSYM
        SYSPRINT MEMOINIT DELETE=NO,MEMO=NO
0010000 CIPL   CSECT
```

```
*       ABSTRACT
*
*       A BOOTSTRAP PROGRAM IS A METHOD USED TO GET A PROGRAM 'FOOT' INTO
          THE
*       DOOR OF THE MEMORY. IN OTHER WORDS, WHEN A VOLITILE STORE LOSES
          ITS
*       MEMORY DUE TO A SYSTEM OUTAGE OR PROGRAM BUG, AN I/O DEVICE
          CONTAINING
*       A BACKUP COPY OF THE PROGRAM WILL BE READ IN USUALLY THROUGH A
          HARDWARE-
*       SOFTWARE HANDSHAKING TO RELOAD MEMORY. BOOTSTRAP PROGRAMS ARE THE
          SOFTWARE
*       END OF THIS RELOAD AND RANGE FROM AN ABSOLUTE RELOAD OF ALL
          MEMORY
*       TO A SOPHISTICATED SELECTIVE PARTIAL RELOAD OF ONLY MUTILATED
          MEMORY.
*       THE 3ACC COMMON SYSTEM BOOTSTRAP PROGRAM CAN BE USED AS A FULL OR
          PARTIAL
*       MEMORY LOADER UTILIZING EITHER ONE OR TWO TAPE I/O DEVICES
          CONTAINING
*       BOTH SYSTEM PROGRAMS AND SYSTEM PARAMETERS (TRANSLATION).
HEADER
```

```
# ASSEMBLY PROLOGUE
* BOOTSTRAP OVERVIEW
*
* THE BOOTSTRAP PROGRAM IS A MICRO PROGRAM INITIATED LOADER WHICH HAS
* THREE MAJOR LOADING SEGMENTS. THE FIRST SEGMENT IS RESPONSIBLE FOR
* LOADING ANOTHER SEGMENT OF CODE INTO TRANSIENT CALL STORE FOR
* EXECUTION. IT WILL BE RESPONSIBLE FOR LOADING THE REMAINING CIPL
* SYSTEM LOADER AND ITS SUPPORTING PROGRAMS. THIS MORE COMPLEX LOADER
* (THIRD SEGMENT) IS RESPONSIBLE FOR SELECTIVE RE-LOADING OF THE 3ACC
* SYSTEM BY INTERACTION WITH THE 3ACC INITIALIZATION PROGRAMS. THE
* CRITERIA FOR RE-LOAD IS THE VERIFICATION OF 4K MEMORY MODULES BY THE
* USE OF A CHECKSUM ALGORITHM AND DATA LOADED OFF OF TAPE DURING THE
* SECOND STAGE OF BOOTSTRAP.
*
*
* THE END RESULT OF BOOTSTRAPING IS THE GUARANTEED OVERWRITE OF BAD PROGRAM
* MEMORY WITH VERIFIED GOOD PROGRAM OFF OF TAPE. THE BOOTSTRAP PROGRAM
* REQUIRES NO MAIN MEMORY SINCE IT IS LOADED IN TEMPORARY MEMORY AND
* CLEARED OUT AS PART OF THE SYSTEM INITIALIZATION.
*
*
```

```
 01 # STATUS REGISTER
 02 TAPSTAT LAYOUT 1,FLTBLK
 03 DEVICODE ITEM  6
 04 WENBL   ITEM   1
 05 TUR     ITEM   1
 06 EOT     ITEM   1
 07 TOR     ITEM   1
 08 TIM     ITEM   1
 09 DDT     ITEM   1
 10 MTCE    ITEM   1
 11 REWND   ITEM   1
 12 BOT     ITEM   1
 13 MOP     ITEM   1
 14         LOEND
TAPSTAT                                -003- 15 #
00| MOP | BOT | REWND | MTCE | DDT | TIM | TOR | EOT | TUR | WENBL |              DEVICODE                 |
  |-----|-----|-------|------|-----|-----|-----|-----|-----|-------|------|------|------|------|------|------|
  | 15  | 14  |  13   |  12  | 11  | 10  |  9  |  8  |  7  |   6   |  5   |  4   |  3   |  2   |  1   |  0   |

 24 R9      LAYOUT  1          # FLAGS FOR HASHSUM CALC.
 25 DOALL   ITEM    1          # FORCE ALL MEMORY TO RELOAD
 26 PASS    ITEM    1          # GENERIC/TRNSLN PASS
 27 BAD4K   ITEM    1          # RELOAD OF AT LEAST ONE 4K REQUIRED
 28 NOTEST  ITEM    1          # DO NOT TEST FOR RELOAD
 29         LOEND
R9                                     -003- 30 #
00|**********************************************************************|NOTEST | BAD4K | PASS | DOALL |
  |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|------|-------|
  | 15  | 14  | 13  | 12  | 11  | 10  |  9  |  8  |  7  |  6  |  5  |  4  |   3   |   2   |  1   |   0   |
```

```
01 BUFSTAT LAYOUT 1,FLTBLK
02         ITEM    6                 # DEVICE CODE
03 PPE     ITEM    1
04 BR      ITEM    1
05 RDY     ITEM    1
06 INTOFF  ITEM    1
07 LODST   ITEM    1
08 UNST    ITEM    1
09 STUFF   ITEM    1
10 ACTIV   ITEM    1
11 BOFL    ITEM    1
12 FILL    ITEM    1
13         LOEND
14 #
```

BUFSTAT -003-

	FILL	BOFL	ACTIV	STUFF	UNST	LODST	INTOFF	RDY	BR	PPE	DEVICE CODE					
00	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

```
              LAYOUT  7,FLTBLK
      STATE   ITEM    5                              # SCHEDULER STATE
              LOSKIP  0,0
      PTPOS   ITEM    11                             # TAPE POSITION
      RECOV   ITEM    1                              # ERROR RECOVERY IP
      TR      ITEM    2                              # READ TRACK
      INTREQ  ITEM    1                              # INTERRUPT REQUESTED.
      INTHNR  ITEM    1                              # INT. REQUEST HONORED.
      EA      ITEM    16                             # TAPE ENABLE ADDRESS
      BUFC    ITEM    4
      CARYBIT ITEM    1                              # PATCH CROSSES BLOCK BOUNDRY
      PTPKNOWN ITEM   1                              # TAPE POSITION KNOWN FLAG
-002- #*#*#*#*#*#*#*# PTPKNOWN WILL APPEAR AS PTPKNOW IN PICTURES
      STUS    ITEM    1                              # ACTIVE OR DONE FLAG
      TUOOS   ITEM    1                              # BSCHED TU OOS
      TIMING  ITEM    1                              # TIMING FLAG
      BSBOT   ITEM    1
      STORNOT ITEM    1                              #NO STORAGE OF BLOCK BIT
      SPECSTOR ITEM   1                              # SPEC. UNLOAD REQUIRED.
-002- #*#*#*#*#*#*#*# SPECSTOR WILL APPEAR AS SPECSTO IN PICTURES
      VERT    ITEM    2                              # VERIFY TRACK NUMBER.
      SCHCON1 ITEM    1                              # SCHEDULER CONTROL BIT
      SCHCON2 ITEM    1                              # SCHEDULER CONTROL BIT
      DESTON  ITEM    11                             # TAPE DESTINATION
      ACTSEQ  ITEM    1                              #ACTIVATE SEQ. ERROR CHECK
      ERNO    ITEM    1                              #ERROR RECOVERY NOT ALLOWED
      CONRCV  ITEM    1                              # CONTINUOUS READ RECOVERY.
      EOPF    ITEM    1                              #END OF PATCH FILE SEEN.
      TIMKON  ITEM    16                             # TIMING CONSTANTS
      EASV    ITEM    16                             # SAVED EA FOR RECOVERY
              LOEND
-003- #
```

```
00|-----------------------------------------------------------------------------|        STATE        |
  |                                                                             |   SCHEDULER STATE   |
01|INTHNR |INTREQ |       TR        | RECOV |                        PTPOS                            |
  |       |       |   READ TRACK    |       |                    TAPE POSITION                        |
02|                                        EA                                                         |
  |                                TAPE ENABLE ADDRESS                                                |
03|SCHCON2|SCHCON1|      VERT       |SPECSTO|STORNOT| BSBOT |TIMING | TUOOS | STUS  |PTPKNOW|CARYBIT|        BUFC         |
  |       |       |                 |       |       |       |       |       |       |       |       |                     |
04|       | EOPF  |CONRCV | ERNO    |ACTSEQ |                        DESTON                           |
  |*******|       |       |         |       |                    TAPE DESTINATION                     |
05|                                      TIMKON                                                       |
  |                                 TIMING CONSTANTS                                                  |
06|                                       EASV                                                        |
  |                               SAVED EA FOR RECOVERY                                               |
  |  15   |  14   |  13   |  12   |  11   |  10   |   9   |   8   |   7   |   6   |   5   |   4   |   3   |   2   |   1   |   0   |
```

```
                 01 CHKSUM LAYOUT  7,FLTBLK          # LAYOUT OF HEADER + A TWO WORD ENTRY
                 02        ITEM    15                #BASE ADDRESS OF PROGRAM ON TAPE
                 03 WOPEN  ITEM    1                 #CHECKSUM INFO. CHANGING. (XLATE BEING
                                                       WRITTEN)
                 05        ITEM    16                #BASE ADDRESS OF TRANSLATION ON TAPE
                 06        ITEM    16                #NUMBER OF 4K BLOCKS OF TRANSLATION DATA ON
                                                       TRACK 1
                 08        ITEM    16                #BASE ADDRESS OF PATCH FILE ON TAPE
                 09 PROGBLKS ITEM  16                # NUMBER OF GENERIC RELATED CHECKSUMS.
                 10 HASHLEN ITEM   13                # LENGTH FOR HASHSUM CALC.
                 11        ITEM    1                 # SPARE BIT
                 12 FORCOPY ITEM   1                 # BIT SET TO FORCE COPY OF BLOCK
                 13 TSFLG  ITEM    1                 # TEMPORARY STORE FLAG, 4K BLOCK IS NOT WRITE
                                                       PROTECTED
                 15        ITEM    16                # HASHSUM VALUE
                 16        LOEND
CHKSUM      -003- 17 #
00| WOPEN |                                                                            |
  |       |              BASE ADDRESS OF PROGRAM ON TAPE                               |
01|                                                                                    |
  |                      BASE ADDRESS OF TRANSLATION ON TAPE                           |
02|                                                                                    |
  |              NUMBER OF 4K BLOCKS OF TRANSLATION DATA ON TRACK 1                    |
03|                                                                                    |
  |                      BASE ADDRESS OF PATCH FILE ON TAPE                            |
04|                                PROGBLKS                                            |
  |                      NUMBER OF GENERIC RELATED CHECKSUMS.                          |
05| TSFLG |FORCOPY|       |                        HASHLEN                             |
  |       |       |       |                 LENGTH FOR HASHSUM CALC.                   |
06|                                                                                    |
  |                               HASHSUM VALUE                                        |
  | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

      0010000    44 BLKSIZ EQU    4096
                 45 DDELETE NOTE  1
      0000207    46 TTY_BEL EQU   O(207)
      0006453    47 OFLBOOTCON EQU B(110100101011)    # OFFLINE BOOTSTRAP CONSTANT
```

```
01           LAYOUT  24
02 HDRSIZE ITEM    16              # LENGTH OF HEADER.
03           ITEM    16
04           ITEM    16            # NEXT 4 WORDS=GENERIC IDENTIFIER.
05           ITEM    16
06           ITEM    16
07           ITEM    16
08           ITEM    16            # NEXT 4 WORDS=ISSUE IDENTIFIER.
09           ITEM    16
10           ITEM    16
11           ITEM    16
12           ITEM    16
13           ITEM    16
14 PATLENGTH ITEM  16              # TOTAL LENGTH OF PATCH FILE.
15 OWNO      ITEM    16            # OVERWRITE NUMBER.
16           ITEM    16            # NEXT 3 WORDS=TIME OF PATCH.
17           ITEM    16
18           ITEM    16
19 OWSTAT    ITEM    2             # OVERWRITE STATUS
20           LOSKIP
21 WRDLENGTH ITEM  16              # LENGTH OF SPECIFIC PATCH
22 HADR      ITEM    4             # HIGH BITS OF PATCH ADDRESS.
23 SEGNO     ITEM    12            # SEGMENT NUMBER
24 LADR      ITEM    16            # PATCH ADDRESS
25 NEWD      ITEM    16            # LOW 16 BITS OF NEW DATA.
26 OLDH      ITEM    8             # HIGH 8 BITS OF OLD DATA.
27 NEWDH     ITEM    8             # HIGH 8 BITS OF NEW DATA.
28 OLD       ITEM    16            # LOW 16 BITS OF OLD DATA.
29           LOEND
```

-003- 01 #

00	HDRSIZE LENGTH OF HEADER.	
01		
02	NEXT 4 WORDS=GENERIC IDENTIFIER.	
03		
04		
05		
06	NEXT 4 WORDS=ISSUE IDENTIFIER.	
07		
08		
09		
10		
11		
12	PATLENGTH TOTAL LENGTH OF PATCH FILE.	
13	OWNO OVERWRITE NUMBER.	
14	NEXT 3 WORDS=TIME OF PATCH.	
15		
16		
17		OWSTAT
18	WRDLENGTH LENGTH OF SPECIFIC PATCH	
19	SEGNO SEGMENT NUMBER	HADR HIGH BITS OF PATCH ADDRESS.
20	LADR PATCH ADDRESS.	
21	NEWD LOW 16 BITS OF NEW DATA.	
22	NEWDH HIGH 8 BITS OF NEW DATA.	OLDH HIGH 8 BITS OF OLD DATA.
23	OLD LOW 16 BITS OF OLD DATA.	

```
                                                                                          CIPL              W77D
I  15  I  14  I  13  I  12  I  11  I  10  I  9  I  8  I  7  I  6  I  5  I  4  I  3  I  2  I  1  I  0  I
```

```
01 BLMMA  EXTERN  PTRESET

04 LAYOUT EXTERN  HGAREA
05 LAYOUT EXTERN  I_OBUF

08 MASACS EXTERN  APPTRL
09 MASACS EXTERN  BLKSIZE
10 MASACS EXTERN  BLK4K
11 MASACS EXTERN  BUFBLK
12 MASACS EXTERN  BUFLEN
13 MASACS EXTERN  FSTDIST
14 MASACS EXTERN  HASHSUMN
15 MASACS EXTERN  LASTBUF
16 MASACS EXTERN  MSECPR
17 MASACS EXTERN  NOTESTCK
18 MASACS EXTERN  OBUFLEN
19 MASACS EXTERN  REDKON
20 MASACS EXTERN  UNPKWRDS
21 MASACS EXTERN  BLKPERCK

24 CBLM   EXTERN  RESETPT
25 CBLM   EXTERN  SSPAB1
26 CBLM   EXTERN  SSPIOADR

29 CTSD   EXTERN  INITTST1
30 CTSD   EXTERN  INITTST2
31 CTSD   EXTERN  SYSTIM
32 CTSD   EXTERN  POSTMORT

35 CINIT  EXTERN  BOOTRTN
36 CINIT  EXTERN  RLDXLATE
37 CINIT  EXTERN  PMISC
38 CINIT  EXTERN  INITBOOT
39 CINIT  EXTERN  INITTSTC
40 CINIT  EXTERN  LDDB15_0
41 CINIT  EXTERN  OFL_HG

44 CSYSUB EXTERN  TIMCHK
45 CSYSUB EXTERN  TIMOUT
46 CSYSUB EXTERN  TIMOUTX
```

```
01          PUBLIC  ALLMAS
02          PUBLIC  APPTRLR
03          PUBLIC  BTLODOFS
04          PUBLIC  BOOTLOAD
05          PUBLIC  BUFC
06          PUBLIC  CHKSUM
07          PUBLIC  CSCHEDUL
08          PUBLIC  DESTON
09          PUBLIC  DONOTSTR
10          PUBLIC  HASHLEN
11          PUBLIC  SSPSV
12          PUBLIC  STATE
13          PUBLIC  TR
14          PUBLIC  TSFLG
15          PUBLIC  OFLBTOFS
16          PUBLIC  PROGBLKS
17          PUBLIC  STREAD1
18          PUBLIC  SYSTMOFS
19          PUBLIC  TIMKON
20          PUBLIC  TIMING
21          PUBLIC  UNLSPEC
```

```
0000000            SCRTCH EQUR    R0
0000002            BUFFCNT EQUR   R2
0000003            WORDCNT EQUR   R3
0000004            BLOKCNT EQUR   R4
0000005            PGMCNT EQUR    R5
0000006            TRIGREG EQUR   R6
0000007            CONSEC EQUR    R7
0000012            ORDEREG EQUR   R10
0000013            STATUSR EQUR   R11

       * INITIAL BOOTSTRAP PHASE  (LOADING OF FIRST SEGMENT)
       *
       * THE MOMENT AN INITIALIZATION IS EXECUTED BY THE 3ACC AND THE MICRO
       * CODE, THROUGH INTERROGATION OF THE ISC BITS, DETERMINES THAT THE
       * SOFTWARE MAY BE MUTILATED, A REWIND IS GIVEN TO THE TAPE UNIT TIED
       * NUMERICALLY TO THE 3ACC IN TROUBLE. AT THE TIME THE TAPE IS SENSED
       * TO HAVE STOPPED AT THE BEGINNING OF TAPE, THE MICRO-CODE STARTS THE
       * TAPE TO READ. THE MICRO-CODE UNLOADS THE FIRST 128 WORDS THAT
       * COME OFF THE TAPE AND STORES THEM AT LOCATION ONE ON TO THIRTY-THREE.
       * UPON COMPLETION OF THIS TASK, THE MICRO-PROGRAM TRANSFERS TO LOCATION
       * EIGHT AND THE FIRST SEGMENT OF CODE BEGINS TO EXECUTE.
       *
       *
       * THE FIRST SEGMENT OF THE BOOTSTRAP SEQUENCE IS 122
       * EXECUTABLE WORDS LONG. THESE 122 WORDS MUST BE CAPABLE OF
       * CONTINUING THE UNLOADING OF PROGRAM UNTIL AT LEAST THE REMAINDER
       * OF THE BOOTSTRAP PROGRAM IS LOADED INTO MEMORY. THIS FIRST SEGMENT
       * IS CAPABLE OF SOME ERROR RECOVERY. SINCE THE BOOTSTRAP FILE IS
       * DUPLICATED ON BOTH TRACKS 1 AND 2, ANY CRC ERROR ENCOUNTERED BY
       * THE 1ST AND 2ND SEGMENT OF THE BOOT PROGRAM WILL STOP THE READ,
      # ISSUE A BACKSPACE AND THEN RE-START THE READ ON THE
       * OTHER TRACK.
       *
       *
       * THE SAME KIND OF RECOVERY WILL BE EXECUTED BY THE MICRO-CODE IF
       * IT IS UNABLE TO READ THE FIRST 128 WORDS OF THE FIRST BLOCK.

0010000                              BOOTSTP
                   00 0777774        OFFSET EQU     *-4
0010000                              BOOTSTP
                                     # THIS CODE MUST BE AT LOCATION 4 SINCE ITS ACCESS IS VIA BSAI 2.
0010000                                     BEGIN   ()
0010000 01 000000 123440 ------             SMIO                     # SEND COMMAND. 1
0010001                              BOTST
0010001 01 000001 123500 ------             TIO                      # 2
```

```
0010002 01 000002 055777 ------ 0010001              BNC     BOTST                 # 3
0010003                                              RETURN                        # 4
0010003 01 000003 056400 ------             -001-    BTSA



0010004                                        START
                                               # THIS IS THE ADDRESS TRANSFERED TO BY THE MICRO CODE.
0010004 01 000004 103020 ------                      ZR      R1                    # PROGRESS REGISTER FOR BOOT PROGRAM. 5
0010005 01 000005 003401 042160 CINIT                LI      R0,HGAREA+OFL_HG      # 7
0010007                                              MIMODE  L HG,R0               # INITIALIZE HOLD-GET. 9
0010007 01 000007 013000 ------             -001-    MIS     0
0010010 01 000010 032523 035000             -002-       VFD      8,HG%T 8,R0%F
0010011 01 000011 035000 010174 0010174              STAL    R0,REMAINBOOT-1,RA0   # SET UP ADR. TO STORE REMAINIG BOOT. 11
0010013 01 000013 003073 ------ MASACS               LN      R3,BUFBLK-2           # REMAINING BUFFERS IN 1ST BLOCK. 12
0010014                                        ZRPT
0010014                                              MIMODE  ZPT                   # PREVENT TIMEOUT 1.5 SEC. TIMEOUT. 14
0010014 01 000014 113000 ------             -001-    MIS     0
0010015 01 000015 134350 ------             -002-       DATA    ZPT%
0010016 01 000016 036060 000107                      BX      R3,MRBUFRS-OFFSET     # TEST IF BLOCK IS COMPLETE. 16
0010020 01 000020 003641 002015                      LI      R10,TSTAT             # PREPARE TO SEND STATUS TO CHECK CRC. 18
0010022 01 000022 023440 ------                      SMIO                          # 19
0010023 01 000023 071420 ------                      HA                            # TIME FOR RESPONSE. 20
0010024 01 000024 023500 ------                      TIO                           # 21
0010025 01 000025 055104 ------ 0010131              BNC     CRCMESS               # CRC ERROR. 22
0010026 01 000026 024020 ------                      TBN     R1,0                  # IS MICRO-LOADED BLOCK IN? 23
0010027 01 000027 054005 ------ 0010034              BC      YESIN                 # 24
0010030 01 000030 030440 000001                      LL      R2,1                  # GET BLK HEADER LEFT BY MICRO CODE. 26
0010032 01 000032 026020 ------                      SBN     R1,0                  # SET 1ST BLOCK IN FLAG. 27
0010033 01 000033 053040 ------ 0010073              B       ZROER                 # RESET ERROR FLAG AND CONTINUE. 28

0010034                                        YESIN
0010034 01 000034 116402 003777                      LRM     R0,R2,M(BLKADR)       # SETUP FOR SEQUENTIAL BLOCK READ CHECK. 30
0010036 01 000036 031040 045266 LAYOUT               LAL     R2,I_OBUF,RA0         # RECOVER BLK # AND SET UP ADR REG. 32
0010040 01 000040 003442 003777                      NI      R2,M(BLKADR)          # ISOLATE BLK # FOR CHECK. 34
0010042 01 000042 004401 ------                      AN      R0,1                  # ADJUST FOR NEXT BLK. 35
0010043 01 000043 005002 ------                      SR      R0,R2                 # 36
0010044 01 000044 055000 ------ 0010044              BNC     *                     # BLOCK RECOVERED IS GREATER THAN FAILING
                                                                                     BLOCK  37
0010045 01 000045 040040 ------                      L       R2,0(RA0)             # RESTORE TRACK AND EOF DESIGNATIONS. 38
0010046 01 000046 003521 001475 MASACS               LI      R5,BLKSIZE-3          # PREPARE BUFFER LENGTH. 40
0010050                                        NEWLA
0010050 01 000050 140341 ------                      L       R14,1(RA0)            # RECOVER LENGTH AND 4 ADR. BITS. 41
0010051 01 000051 041362 ------                      LA      R15,2(RA0)            # RECOVER LOW 16 ADR BITS. 42
0010052 01 000052 016556 177760                      LRM     R6,R14,MSK(12,4)      # SET UP PROG. LENGTH. 44
0010054 01 000054 010544 ------                      RRN     R6,4                  # 45
0010055 01 000055 004136 ------                      SN      R5,2                  # ADJUST WRD/BLK COUNT FOR ABOVE. 46
0010056 01 000056 055015 ------ 0010073              BNC     ZROER                 #47
0010057                                              SNL     RA1,1                 # ADJUST DESTINATION ADR. FOR RELOAD. 50
```

```
0010057 01 000057 004377 ------              -001- 01          SN      RA1+1,1
0010060 01 000060 054002 ------ 0010062      -001- 02          BC      IFS270
0010061 01 000061 004357 ------              -001- 03          SN      RA1,1
0010062                                            04 DATACHK
0010062 01 000062 136140 000073                    05          BX      R6,DATAVL-OFFSET     # IF DATA AVAILABLE  STORE IT. 52
0010064 01 000064 014125 ------                    06          TZ      R5                   # CHECK IF BUFFER IS EXHAUSTED? 53
0010065 01 000065 054006 ------ 0010073            07          BC      ZROER                # GO TO MAIN LINE CODE FOR MORE BLOCKS. 54
0010066 01 000066 053762 ------ 0010050            08          B       NEWLA                # CONTINUE THROUGH BLOCK. 55

0010067                                            10 DATAVL
0010067 01 000067 141001 ------                    11          LA      R0,1(RA0)            # GET PROG. WRD. 56
0010070 01 000070 045401 ------                    12          STA     R0,1(RA1)            # STORE PROG. WRD. 57
0010071 01 000071 036120 000066                    13          BX      R5,DATACHK-OFFSET    # CONT. PROG. RELOAD IF BUF. NOT EXHAUSTED.
                                                                                              59

0010073                                            16 ZROER
0010073 01 000073 122037 ------                    17          ZBN     R1,15                # CLEAR ERROR RECOVERY IF BIT. 60
0010074 01 000074 024055 ------                    18          TBN     R2,S(EOF)            # IS THIS AN EOF BLOCK. 61
                                                   19 CIPL     OW      0(75)                # 11428
                                             -001- 20          NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 000075 **********

0010075 01 000075 050000 010213 0010213            23          BCL     MOREBOT              # CONTINUE RELOAD OF SPECIAL PROGRAMS  63


0010077                                            27 SETNEWUP
0010077 01 000077 103075 ------ MASACS             28          LN      R3,BUFBLK            # SET UP BUFFERS PER BLK. 64
0010100 01 000100 035000 045265 LAYOUT             29          STAL    R0,I_OBUF-1,RA0      # PREPARE ADR. FOR IO BUFFER. 66
0010102 01 000102 053712 ------ 0010014.           30          B       ZRPT                 # CONTINUE BLK UNLOADING. 67
0010103                                            31 MRBUFRS
0010103 01 000103 103253 ------                    32          LN      R10,BSTAT            # ASSUME COMMAND FOR BUFFER STAT IS 11. 68
0010104                                            33 RESND
W0010104 01 000104 173002 ------                   34          BSAI    2                    # 69
0010105 01 000105 024267 ------                    35          TBN     R11,S(BR)            # IS BR SET? 70
0010106 01 000106 055776 ------ 0010104            36          BNC     RESND                # 71
0010107 01 000107 003641 044013                    37          LI      R10,BSUNLDON         # BR IS SET. SET UP UNLOAD STATE. 73
W0010111 01 000111 073002 ------                   38          BSAI    2                    # 74
0010112 01 000112 003641 120013                    39          LI      R10,BCLROCN          # CLEAR THE OFF-LINE COUNTER. 76
W0010114 01 000114 073002 ------                   40          BSAI    2                    # 77
0010115 01 000115 003501 000077                    41          LI      R4,WRDBUF-1          # SET UP WRDS/BUF COUNT. 79
0010117 01 000117 003641 100007                    42          LI      R10,SD               # PREPARE BUFFER UNLOAD COMMAND. 81
0010121                                            43 WRDMORE
W0010121 01 000121 173002 ------                   44          BSAI    2                    # 82
0010122 01 000122 045261 ------                    45          STA     R11,1(RA0)           # STORE INCOMING DATA AWAY. 83
0010123 01 000123 036100 000125                    46          BX      R4,WRDMORE-OFFSET    # CHECK IF MORE WORDS ARE IN BUFFER. 85
0010125 01 000125 003641 020013                    47          LI      R10,BCLRBRF          # PREPARE TO CLEAR BR. 87
W0010127 01 000127 073002 ------                   48          BSAI    2                    # 88
0010130 01 000130 053664 ------ 0010014            49          B       ZRPT                 # 89
```

```
                                       # ERROR RECOVERY FOR INITIAL BOOT LOADER.
 0010131                               CRCMESS
 0010131 01 000131 124020 ------              TBN     R1,0            # IS THIS MICRO-BLOCK. 90
 0010132 01 000132 155000 ------ 0010132      BNC     *               # ERROR IS SOFTWARE UNRECOVERABLE. 91
 0010133 01 000133 024037 ------              TBN     R1,15           # CHECK IF RECOVERY WAS ALREADY IP. 92
 0010134 01 000134 154000 ------ 0010134      BC      *               # YES KILL BOOT  93
 0010135 01 000135 026037 ------              SBN     R1,15           # SET RECOVERY BIT. 94
 0010136 01 000136 003641 040007              LI      R10,INIT        # 96
 0010140 01 000140 023440 ------              SMIO                    # SEND INIT ORDER TO STOP AND INITIALIZE
                                                                        TDC. 97
 0010141 01 000141 026077 ------              SBN     R3,15           # TIMEOUT CONSTANT FOR APROX. 70MSEC. (R3
                                                                        MUST BE 0) 98
 0010142                               STPT
 0010142 01 000142 136060 000146              BX      R3,STPT-OFFSET  # WAIT 70MSEC BEFORE NEXT ORDER. 100
 0010144 01 000144 003641 006415              LI      R10,TBS         # SET UP BACKSPACE ORDER. 102
 0010146 01 000146 024053 ------              TBN     R2,S(TRCK)      # CHECK WHICH TRCK WAS READ. 103
 0010147 01 000147 054002 ------ 0010151      BC      NOONE           # 104
 0010150 01 000150 026254 ------              SBN     R10,S(TR)       # SET TRK TO ONE SINCE ERROR ON ZERO. 105
 0010151                               NOONE
W0010151 01 000151 173002 ------              BSAI    2               # 106
 0010152 01 000152 003641 010007              LI      R10,SST         # 108
 0010154                               RESTAT
W0010154 01 000154 173002 ------              BSAI    2               # 109
 0010155 01 000155 017670 007400              CIRM    R11,0,8,MSK(4)  # 111
 0010157 01 000157 055775 ------ 0010154      BNC     RESTAT          # 112
 0010160 01 000160 026077 ------              SBN     R3,15           # TIME FOR APROX 70 MSEC. R3 MUST BE ZERO.
                                                                        113
 0010161                               SVNTY
 0010161 01 000161 136060 000165              BX      R3,SVNTY-OFFSET # 115
 0010163 01 000163 003641 007415              LI      R10,TRT         # 117
 0010165 01 000165 024053 ------              TBN     R2,S(TRCK)      # 118
 0010166 01 000166 054002 ------ 0010170      BC      NONE            # 119
 0010167 01 000167 026254 ------              SBN     R10,S(TR)       # 120
 0010170                               NONE
W0010170 01 000170 173002 ------              BSAI    2               # 121
 0010171 01 000171 053706 ------ 0010077      B       SETNEWUP        # 122
 0010172 01 000172 000000 ------              VFD     0               # 2 SPARE WORDS.
 0010173 01 000173 000000 ------              VFD     0
                                       # THIS IS AN ADJUSTMENT WORD NEEDED FOR BLOCKS BIGGER THAN 128
 0010174 01 000174 000000 ------              VFD     0
```

```
0010175                                   01 REMAINBOOT                       # REMAINING BOOTSTRAP CODE


                        0000175           05 OFLBTOFS EQU   *-CIPL            # OFFSET INTO I_OBUF TO OFLBOOTTBL
0010175                                   06 OFLBOOTTBL                       # OFFLINE BOOTSTRAP TABLE
                                          07 # THIS TABLE IS USED BY THE 'LODOMAS' ROUTINE IN CNRUTL TO PERFORM
                                          08 # THE OFFLINE BOOTSTRAP OPERATION.  THE TABLE MUST FOLLOW IMMEDIATELY
                                          09 # AFTER THE INITIAL BOOTSTRAP SEGMENT ABOVE.
0010175                                   10
                                          11 # THE FORMAT OF THE TABLE IS AS FOLLOWS:  THE FIRST WORD CONTAINS
                                          12 # THE TOTAL NUMBER OF TABLE ENTRIES.  THREE WORD ENTRIES
                                          13 # FOLLOW - TWO FOR A 20-BIT ADDRESS AND ONE FOR DATA.  THE FIRST
                                          14 # ENTRY MUST BE 'OFLBOOTSW'.

                                          16 # THE FOLLOWING ENTRIES MUST NOT BE SEPARATED  ***********
0010175 01 000175 000003 000000           17          DATA    (OFLBOOTTBLE-OFLBOOTTBL-1)/3
0010176 01 000176 000000 013476 0013476   18          ADDR    OFLBOOTSW
0010200 01 000200 006453 ------           19          DATA    OFLBOOTCON
0010201 01 000201 000000 043000 CTSD      20          ADDR    INITTST1          # MUST BE FIRST ENRTRY
0010203 01 000203 121334 ------ CINIT     21          DATA    INITTSTC
                                          22 CIPL     OW      O(204)            # 13299
                                    -001- 23          NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 000204 **********


0010204 01 000204 000000 043350 CTSD      26          ADDR    INITTST2
0010206                                   27          EOW                       # 13299
                                    -001- 28          NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 000205 *********
                                                              *


0010206 01 000206 121334 000000 CINIT     32          DATA    INITTSTC
                                          33 CIPL     OW      O(207)            # 13299
                                    -001- 34          NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 000207 **********


0010207                                   37 OFLBOOTTBLE
                                          38 # THE FOLLOWING ENTRIES MUST FOLLOW IMMEDIATELY AFTER OFLBOOTTBLE ***
                        0000207           39 BTLODOFS EQU   *-CIPL            # OFFSET INTO I_OBUF TO 'BOOTLOAD' ADDR
0010207 01 000207 000000 010502 0010502   40          ADDR    BOOTLOAD
0010211                                   41          EOW                       # 13299
                                    -001- 42          NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 000210 *********
                                                              *
```

```
                                0000211       SYSTMOFS EQU   *-CIPL              # OFFSET INTO I_OBUF TO 'SYSTIM' ADDR
0010211 01 000211 000000 043461 CTSD                   ADDR   SYSTIM              # ADDRESS OF SYSTIM
                                              # THE ABOVE ENTRIES MUST NOT BE SEPARATED  **********


0010213                                       MOREBOT
                                              # REMAINING CODE WILL LOAD SPECIAL CORE PROGRAMS AND CHECKSUM FILE.
0010213 01 000213 120420 ------                        FLZ    R1,R0
0010214 01 000214 056000 ------                        BPAX   R0
0010215 01 000215 153000 ------ 0010215                B      *                   # NOT USED
0010216 01 000216 153003 ------ 0010221                B      KEEPRD              # UNLOAD SPECIAL PROGRAMS.
0010217 01 000217 153255 ------ 0010474                B      READCKSUM           #SWITCH TRACKS AND READ CHECKSUMS.
0010220 01 000220 153170 ------ 0010410                B      PHASE3              # STOP UNIT, GO TO INIT.


0010221                                       KEEPRD
0010221 01 000221 131000 045265 LAYOUT                 LAL    R0,I_OBUF-1,RA0     # SET UP BUFFER ADDRESS.
0010223 01 000223 003075 ------ MASACS                 LN     R3,BUFBLK           # NUMBER OF BUFFERS PER BLOCK.
0010224                                       CLRPT
0010224                                                MIMODE ZPT                 # CLEAR THE PROGRAM TIMER.
0010224 01 000224 113000 ------         -001-          MIS    0
0010225 01 000225 134350 036060         -002-             DATA    ZPTX
0010226 01 000226 036060 010313 0010313                BX     R3,BUFERS           # TEST IF BLOCK IS COMPLETE.
0010230 01 000230 003641 002015                        LI     R10,TSTAT           # PREPARE TO SCAN FOR CRC.
0010232 01 000232 023440 ------                        SMIO
0010233 01 000233 071420 ------                        HA                         # TIME FOR RESPONSE.
0010234 01 000234 023500 ------                        TIO
0010235 01 000235 055111 ------ 0010346                BNC    CRCER               # AN ERROR EXISTS. DO RECOVERY.
0010236 01 000236 016402 003777                        LRM    R0,R2,M(BLKADR)     # SEQUENTIAL BLOCK CHECK.
0010240 01 000240 031040 045266 LAYOUT                 LAL    R2,I_OBUF,RA0       # RECOVER BLOCK NUMBER JUST READ IN.
0010242 01 000242 003442 003777                        NI     R2,M(BLKADR)        # ISOLATE BLOCK NUMBER.
0010244 01 000244 004401 ------                        AN     R0,1
0010245 01 000245 005002 ------                        SR     R0,R2               # CHECK IF THIS BLOCK IS VALID.
0010246 01 000246 055000 ------ 0010246                BNC    *                   # BLOCK READ IN IS OUT OF SEQUENCE.
0010247 01 000247 040040 ------                        L      R2,0(RA0)           # RESTORE TRACK AND EOF DESIGNATIONS.
0010250 01 000250 024055 ------                        TBN    R2,S(EOF)           #IS THIS AN EOF BLOCK?
0010251 01 000251 055007 ------ 0010260                BNC    NOSTOP
0010252 01 000252 003641 040007                        LI     R10,INIT            #PREPARE TO STOP UNIT FOR TRACK SWITCH.
0010254 01 000254 023440 ------                        SMIO
0010255 01 000255 026077 ------                        SBN    R3,15               #ASSUME R3 IS ZERO
0010256 01 000256 136060 010256 0010256                BX     R3,*                #TIME FOR APPROX. 70 MSEC.
0010260                                       NOSTOP
0010260 01 000260 103521 001475 MASACS                 LI     R5,BLKSIZE-3        # PREPARE BUFFER LENGTH.
0010262                                       NEWLA2
0010262 01 000262 140341 ------                        L      R14,1(RA0)          # RECOVER LENGTH AND 4 ADR. BITS.
0010263 01 000263 041362 ------                        LA     R15,2(RA0)          # RECOVER LOW 16 ADR BITS.
0010264 01 000264 016556 177760                        LRM    R6,R14,MSK(12,4)    # SET UP PROG. LENGTH.
```

```
0010266 01 000266 010544 ------                     01          RRN     R6,4
0010267 01 000267 004136 ------                     02          SN      R5,2                # ADJUST WRD/BLK COUNT FOR ABOVE.
0010270 01 000270 055017 ------ 0010307             03          BNC     ZROER2
0010271                                             04          SNL     RA1,1               # ADJUST DESTINATION ADR. FOR RELOAD.
0010271 01 000271 004377 ------              -001-  05          SN      RA1+1,1
0010272 01 000272 054002 ------ 0010274      -001-  06          BC      IFS283
0010273 01 000273 004357 ------              -001-  07          SN      RA1,1
0010274                                             08 DATACHK2
0010274 01 000274 136140 010301 0010301             09          BX      R6,DATAVL2          # IF DATA AVAILABLE STORE IT.
0010276 01 000276 014125 ------                     10          TZ      R5                  # CHECK IF BUFFER IS EXHAUSTED?
0010277 01 000277 054010 ------ 0010307             11          BC      ZROER2              #GO TO MAIN LINE CODE FOR MORE BLOCKS.
0010300 01 000300 053762 ------ 0010262             12          B       NEWLA2              #CONTINUE THROUGH BLOCK.

0010301                                             14 DATAVL2
0010301 01 000301 141061 ------                     15          LA      R3,1(RA0)           # GET PROG. WRD.
0010302                                             16          L_ONL   1(RA1)              # DO SAFE READ TO AVOID COM CORR
0010302 01 000302 076021 ------              -001-  17          STAF    1(RA1)
0010303 01 000303 136260 ------              -001-  18          DATA    B(1011110010110000)
                                                    19 # THE ABOVE IS NEEDED TO SET UP SDR1 FOR FOLLOWING STORE.
0010304 01 000304 045461 ------                     20          STA     R3,1(RA1)           # STORE PROG. WRD.
0010305 01 000305 036120 010274 0010274             21          BX      R5,DATACHK2         # CONT. PROG. RELOAD IF BUF. NOT EXHAUSTED.

0010307                                             23 ZROER2
0010307 01 000307 122037 ------                     24          ZBN     R1,15               # CLEAR ERROR RECOVERY IP BIT.
0010310 01 000310 024055 ------                     25          TBN     R2,S(EOF)           # IS THIS AN EOF BLOCK.
0010311 01 000311 055710 ------ 0010221             26          BNC     KEEPRD              #PREPARE FOR NEXT BLOCK.
0010312 01 000312 053701 ------ 0010213             27          B       MOREBOT             # CONTINUE RELOAD
0010313                                             28 BUFERS
0010313 01 000313 103253 ------                     29          LN      R10,BSTAT           # ASSUME COMMAND FOR BUFFER STAT IS 11.
0010314                                             30 RESND2
0010314                                             31          CALL    ORDOUT              # SEND COMMAND
0010314 01 000314 137020 013276 0013276      -001-  32          BSA     ORDOUT
0010316 01 000316 124267 ------                     33          TBN     R11,S(BR)           # IS BR SET?
0010317 01 000317 055775 ------ 0010314             34          BNC     RESND2
0010320 01 000320 003641 044013                     35          LI      R10,BSUNLDON        # BR IS SET. SET UP UNLOAD STATE.
0010322                                             36          CALL    ORDOUT
0010322 01 000322 037020 013276 0013276      -001-  37          BSA     ORDOUT
0010324 01 000324 103641 120013                     38          LI      R10,BCLROCN         # CLEAR THE OFF-LINE COUNTER.
0010326                                             39          CALL    ORDOUT
0010326 01 000326 037020 013276 0013276      -001-  40          BSA     ORDOUT
0010330 01 000330 103501 000077                     41          LI      R4,WRDBUF-1         # SET UP WRDS/BUF COUNT.
0010332 01 000332 003641 100007                     42          LI      R10,SD              # PREPARE BUFFER UNLOAD COMMAND.
0010334                                             43 WRDMORE2
0010334                                             44          CALL    ORDOUT
0010334 01 000334 137020 013276 0013276      -001-  45          BSA     ORDOUT
0010336 01 000336 145261 ------                     46          STA     R11,1(RA0)          # STORE INCOMING DATA AWAY.
0010337 01 000337 036100 010334 0010334             47          BX      R4,WRDMORE2         # CHECK IF MORE WORDS ARE IN BUFFER.
0010341 01 000341 003641 020013                     48          LI      R10,BCLRBRF         # PREPARE TO CLEAR BR.
0010343                                             49          CALL    ORDOUT
```

```
0010343 01 000343 037020 013276 0013276  -001- 01        BSA     ORDOUT
0010345 01 000345 153657 ------ 0010224         02        B       CLRPT


                                                06 # ERROR RECOVERY FOR INITIAL BOOT LOADER.
0010346                                         07 CRCER
0010346 01 000346 124037 ------                 08        TBN     R1,15           # CHECK IF RECOVERY WAS ALREADY IP.
0010347 01 000347 154000 ------ 0010347         09        BC      *               # YES KILL BOOT
0010350 01 000350 026037 ------                 10        SBN     R1,15           # SET RECOVERY BIT.
0010351 01 000351 003641 040007                 11        LI      R10,INIT
0010353 01 000353 023440 ------                 12        SMIO                    # SEND INIT ORDER TO STOP AND INITIALIZE
                                                                                    TDC.
0010354 01 000354 026077 ------                 14        SBN     R3,15           # TIMEOUT CONSTANT FOR APROX. 70MSEC. (R3
                                                                                    MUST BE 0)
0010355                                         16 STPT2
0010355 01 000355 136060 010355 0010355         17        BX      R3,STPT2        # WAIT 70MSEC BEFORE NEXT ORDER.
0010357 01 000357 003641 006415                 18        LI      R10,TBS         # SET UP BACKSPACE ORDER.
0010361 01 000361 024053 ------                 19        TBN     R2,S(TRCK)      # CHECK WHICH TRCK WAS READ.
0010362 01 000362 054002 ------ 0010364         20        BC      NOONE2
0010363 01 000363 026254 ------                 21        SBN     R10,S(TR)       # SET TRK TO ONE SINCE ERROR ON ZERO.
0010364                                         22 NOONE2
0010364                                         23        CALL    ORDOUT
0010364 01 000364 137020 013276 0013276  -001- 24        BSA     ORDOUT
0010366 01 000366 103641 010007                 25        LI      R10,SST
0010370                                         26 RESTAT2
0010370                                         27        CALL    ORDOUT
0010370 01 000370 137020 013276 0013276  -001- 28        BSA     ORDOUT
0010372 01 000372 117670 007400                 29        CIRM    R11,0,8,MSK(4)
0010374 01 000374 055774 ------ 0010370         30        BNC     RESTAT2
0010375 01 000375 026077 ------                 31        SBN     R3,15           # TIME FOR APROX 70 MSEC. R3 MUST BE ZERO.
0010376                                         32 SVNTY2
0010376 01 000376 136060 010376 0010376         33        BX      R3,SVNTY2
0010400 01 000400 003641 007415                 34        LI      R10,TRT
0010402 01 000402 024053 ------                 35        TBN     R2,S(TRCK)
0010403 01 000403 054002 ------ 0010405         36        BC      NONE2
0010404 01 000404 026254 ------                 37        SBN     R10,S(TR)
0010405                                         38 NONE2
0010405                                         39        CALL    ORDOUT
0010405 01 000405 137020 013276 0013276  -001- 40        BSA     ORDOUT
0010407 01 000407 153612 ------ 0010221         41        B       KEEPRD


                      45  *
                      46  *
                      47  * ONCE ALL OF THE BOOTSTRAP PROGRAM AND SUPPORTING INITIALIZATION
                      48  * PROGRAMS ARE INPUTTED, THE SECOND PHASE OF BOOTSTRAP STOPS THE READING
                      49  * OF THE TAPE AND INITIATES THE READING OF TRACK 1. ON TRACK 1 AT THIS
```

```
* POINT IS WRITTEN A FILE OF CHECKSUMS AND MISCELLANEOUS INFORMATION
* DEFINING A PORTION OF THE TAPE USED IN THE THIRD PHASE OF BOOTSTRAP.
* ALL THIS INFORMATION IS STORED AT THE END OF THE BOOTSTRAP PROGRAM.
* THE SECOND SEGMENT OF BOOTSTRAP IS NOW DONE AND THE INITIALIZATION
* PROGRAM IS GIVEN CONTROL TO DO SOME HARDWARE INITIALIZATION AND TESTING.


0010410                                     PHASE3
                                            # OBTAIN CHECK-SUM HEADER INFORMATION
0010410 01 000410 103024 ------                     LN     R1,4
0010411 01 000411 031000 013477 0013477             LAL    RO,BASEGENR-1,RAO
0010413 01 000413 031400 013561 0003561             LAL    RO,CHKSUM,RA1         #SET UP CHKSUM ADDRESS.
0010415 01 000415 040400 ------                     L      RO,0(RA1)
0010416                                     INITLO
0010416 01 000416 145001 ------                     STA    RO,1(RAO)             # INFORMATION GATHERED HERE IS
0010417 01 000417 041401 ------                     LA     RO,1(RA1)             # 1. BASE ADR OF GENERIC
0010420 01 000420 036020 010416 0010416             BX     R1,INITLO             # 2. BASE ADR OF XLATE
0010422 01 000422 030400 013503 0013503             LL     RO,BASEPAT
0010424 01 000424 016420 003777                     LRM    R1,RO,M(PTPOS)        # RETRIEVE TAPE BLOCK NUMBER.
0010426 01 000426 016440 014000                     LRM    R2,RO,MSK(2,11)       # RETRIEVE TRACK BITS
0010430 01 000430 010457 ------                     RLN    R2,1                  #POSITION TRACK BITS FOR COMMANDS
0010431 01 000431 034420 013542 0013542             STL    R1,CSTATE+N(DESTON)   #PREPARE DESTINATION.
0010433 01 000433 034440 013537 0013537             STL    R2,CSTATE+N(TR)       #PREPARE TRACK
0010435 01 000435 034440 013541 0013541             STL    R2,CSTATE+N(VERT)     # SET UP VERIFY TRACK.
0010437 01 000437 030400 013504 0013504             LL     RO,GEN4KNO            # 3. NUMBER OF THE LAST 4K BLOCK OF XLATE ON
                                                                                   TRACK 1.
0010441 01 000441 030420 013502 0013502             LL     R1,LST4K1
0010443 01 000443 001420 ------                     AR     R1,RO
0010444 01 000444 034420 013506 0013506             STL    R1,BXKONON
0010446 01 000446 031420 013561 0003561             LAL    R1,CHKSUM,RA1         #SET UP CHKSUM ADDRESS.
                                            # 5. NUMBER OF 4K GENERIC BLOCKS.
0010450 01 000450 010417 ------                     RLN    RO,1                  # PREPARE INDEX INTO FILE TO OBTAIN NO. OF
                                                                                   XLATE CHKSUMS.
0010451 01 000451 041425 ------                     LA     R1,5(RA1)             #ADJUST RA1 FOR INDEX OPERATION.
0010452 01 000452 043420 ------                     LAX    R1,RO(RA1)
0010453 01 000453 040421 ------                     L      R1,1(RA1)             # GET NO. OF XLATION CHKSUMS.
0010454 01 000454 044021 ------                     ST     R1,1(RAO)
0010455 01 000455 003421 016320                     LI     R1,TUOADR
0010457 01 000457 020031 ------                     CR     R1,R9                 # PLACE OFF-LINE TUENABLE INTO R1.
0010460 01 000460 055003 ------ 0010463             BNC    NOTON
0010461 01 000461 003421 016340                     LI     R1,TU1ADR
0010463                                     NOTON
                                            # ON-LINE TU ENABLE IS PLACED IN R9 BY MICROCODE
0010463 01 000463 134620 013522 0013522             STL    R9,EAON
0010465 01 000465 034420 013531 0013531             STL    R1,EAOFF              # PLACE OFF-LINE EA INTO MEMORY
                                            # START OF RE-LOAD BASED ON 4K CHECKSUM TEST
0010467 01 000467 003001 ------                     LN     RO,1                  # SIGNAL END OF LEG 1
0010470 01 000470 034400 013476 0013476             STL    RO,OFLBOOTSW
```

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0010472 01 000472 037000 004760 CINIT           01         BL       INITBOOT


0010474                                         05 READCKSUM
0010474 01 000474 103641 017415                 06         LI       R10,TRT+E(12)        # READ TRACK 1
0010476 01 000476 023440 ------                 07         SMIO
0010477                                         08 RERT
0010477 01 000477 123500 ------                 09         TIO
0010500 01 000500 055777 ------ 0010477         10         BNC      RERT
0010501 01 000501 053520 ------ 0010221         11         B        KEEPRD


                     18 * UPON RETURN TO THE BOOTSTRAP PROGRAM, IT IS ASSUMED THAT THE PROCESSOR
                     19 * HAS PASSED A QUICK SANITY DETECTION TEST AND THE OTHER PROCESSOR HAS
                     20 * BEEN PLACED IN A NON-INTERFERING STATE. NOW THE STORES ARE READY TO
                     21 * UNDERGO A CHECKSUM TEST OF THIER CONTENT.
                     22 *
                     23 *
                     24 * THE STORES ARE CHECKED ACROSS FOUR THOUSAND WORDS, SINCE THIS IS THE
                     25 * SMALLEST WRITE PROTECTED SEGMENT OF MEMORY. ONLY PROGRAM AND DATA
                     26 * ARE CHECKED SINCE OBVIOUSLY TEMPORARY MEMORY HAS NO FIXED CHECKSUM
                     27 * ASSOCIATED WITH IT. THE BOOTSTRAP PROGRAM IS AWARE OF THE STORE LAYOUT
                     28 * IN RESPECT TO PROGRAM AND TEMPORARY STORE FROM INFORMATION STORED IN
                     29 * THE CHECKSUM FILE. AS THE CHECKSUM ALGORITHM IS APPLIED TO EACH BLOCK
                     30 * OF MEMORY A TABLE IS CREATED TO RETAIN THE PASS-FAIL STATUS OF EACH BLOCK.
                     31 * FOR EACH BLOCK OF PROGRAM THAT PASSES AND EACH BLOCK OF TEMPORARY STORE
                     32 * THAT IS ENCOUTERED, AN ASSOCIATED WORD IN THIS TABLE IS ZEROED. EVERY
                     33 * BLOCK OF MEMORY DETERMINED MUTILATED SETS THE CORRESPONDING TABLE ENTRY
                     34 * TO A NON-ZERO STATE.
                     35 *
                     36 *
                     37 * A SPECIAL ENTRY CAN BE MADE TO THIS PORTION OF THE BOOTSTRAP PROGRAM
                     38 * BY THE INITIALIZATION PROGRAM WHICH REQUESTS THAT THE ENTIER STORE
                     39 * BE RELOADED REGUARDLESS OF THE STATUS OF THE CHECKSUMS. UNDER
                     40 * THIS MODE, THE ENTIER TABLE IS FORCED NON-ZERO EXCEPT THE WORDS ASSOCIATED
                     41 * WITH TEMPORARY STORE WHICH ARE NEVER LOADED.


0010502                                         45 BOOTLOAD
0010502 01 000502 103220 ------                 46         ZR       R9                   # ZERO FLAG REGISTER
0010503 01 000503 014000 ------                 47         TZ       R0                   # CF = 1 MEANS QUICK (SELECTIVE) RELOAD
0010504                                         48         IF       CF = 0 THEN OI R9,ES(BAD4K,DOALL)
0010504 01 000504 054003 ------ 0010507  -001-  49                BC       IFS297
```

```
0010505 01 000505 003623 000005         -001-             OI      R9,ES(BAD4K,DOALL) #
0010507                                 -001-    IFS297
0010507                                                   CALL    OFLBOOTTST
0010507 01 000507 137020 013373 0013373 -001-             BSA     OFLBOOTTST
0010511 01 000511 155007 ------ 0010520                   BNC     SKIPOFLSETUP
0010512
0010512 01 000512 003021 ------                           LN      R1,ES(OVLOF)
0010513 01 000513 007741 ------                           LSR     MS,R1              # ALLOW LOCK STATE IN OFFLINE BOOTSTRAP
0010514 01 000514 030400 013476 0013476                   LL      R0,OFLBOOTSW
0010516 01 000516 024017 ------                           TBN     R0,S(ALLMAS)
0010517 01 000517 030220 ------                           ICF     R9,S(DOALL)        # FULL/PARTIAL RELOAD
0010520
0010520                                          SKIPOFLSETUP
0010520 01 000520 172631 ------                           HN      R9,9               # SAVE R9

                                                 # VARIOUS RELOAD OPTIONS ARE AVAILABLE THRU SSP BUTTONS.
0010521 01 000521 003621 016160 CBLM                      LI      R9,SSPIOADR
0010523 01 000523 003641 100531                           LI      R10,O(100531)      # SET CRITICAL ALARM
0010525                                                   CALL    OFLBOOTTST
0010525 01 000525 037020 013373 0013373 -001-             BSA     OFLBOOTTST
0010527 01 000527 154002 ------ 0010531                   BC      SKIPCRITALM
0010530 01 000530 023400 ------                           SIO
0010531                                          SKIPCRITALM
0010531 01 000531 103210 ------                           LN      R8,8
0010532                                          MY1
0010532 01 000532 136200 010532 0010532                   BX      R8,MY1             #TIME FOR RESPONCE.
0010534 01 000534 003641 000162 CBLM                      LI      R10,SSPAB1         # SCAN SSP TO RECORD APPL. RELOAD OPTIONS.
0010536 01 000536 023400 ------                           SIO
0010537 01 000537 003210 ------                           LN      R8,8
0010540                                          MY2
0010540 01 000540 136200 010540 0010540                   BX      R8,MY2
0010542 01 000542 023500 ------                           TIO
0010543 01 000543 055003 ------ 0010546                   BNC     NOANS
0010544 01 000544 034660 013545 0013545                   STL     R11,SSPSV          # SAVE RESULT FOR LATER SCANS.
0010546                                          NOANS
0010546 01 000546 103621 016520                           LI      R9,O(16520)        #SEND INIT TO TTYC
0010550 01 000550 003641 000201                           LI      R10,O(201)
0010552                                                   CALL    OFLBOOTTST
0010552 01 000552 037020 013373 0013373 -001-             BSA     OFLBOOTTST
0010554 01 000554 154002 ------ 0010556                   BC      SKIPTTYCINIT
0010555 01 000555 023440 ------                           SMIO
0010556                                          SKIPTTYCINIT

0010556 01 000556 172231 ------                           GN      R9,9
0010557 01 000557 034620 043461 CTSD                      STL     R9,SYSTIM          # INSURE GOOD PARITY IN SYSTIM
0010561 01 000561 031120 013565 0003565                   LAL     R5,CHKSUM+N(PROGBLKS),RAO # SET UP CHKSUM TABLE ADDRESS
0010563 01 000563 006254 ------                           LR      R10,RAO            # PUT RAO IN R10,R11
0010564 01 000564 006275 ------                           LR      R11,RAO+1
0010565 01 000565 031400 000000                           LAL     R0,0,RA1           # ZERO RA1
```

```
                                                 01 CIPL    OW      0(567)              # 12432
                                          -001- 02          NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 000567 **********


0010567                                          05 CALCHASH
                                                 06 CIPL    BGNP    0(3422)             # 12432
0010567 01 000567 137000 013422 0013422   -001- 07          BL      %%%303
                                          -001- 08          NOTE    CIPL 'CSECT'
                                          -001- 09          NOTE    ****************** PATCH AREA BEGINS AT 003422 ****************


0013422                                   -001- 12 %%%303 PATCHAREA
0013422 01 003422 103000 ------                  13         ZR      R0
0013423 01 003423 034400 013477 0013477          14         STL     R0,HASHSAVE         # ZERO HASHSUM VALUE
0013425 01 003425 006011 ------                  15         LR      R0,R9
0013426                                          16         CALL    NOTESTCK
0013426 01 003426 037021 016321 MASACS    -001- 17          BSA     NOTESTCK
0013430                                          18         ENDP                        # 12432
0013430 01 003430 137000 010571 0010571   -001- 19          BL      %%%306
                                          -001- 20          NOTE    ************ LAST PATCH ADDRESS USED IS 003431 ***************
                                          -001- 21          NOTE    ***** NUMBER OF PATCH WORDS USED IS 8 (DECIMAL) ********


0010571                                   -001- 24 %%%306 OWCONTINUE
0010571                                          25         TAKEOUT 1
0010571 01 000571 106000 ------           -001- 26          LR      0,0
0010572                                          27         EOW                         # 12432
                                          -001- 28          NOTE    *************** THE LAST ADDRESS OVERWRITTEN IS 000571 *********
                                                                    *


                                                 32 DDELETE NOTE    1
0010572 01 000572 124000 ------                  33         TBN     R0,0                # NOTEST OVERRIDE ?
0010573 01 000573 030223 ------                  34         ICF     R9,S(NOTEST)
0010574 01 000574 053066 ------ 0010662          35         B       R5CHK

0010575                                          37 CHKSUMLP
0010575 01 000575 141141 ------                  38         LA      R6,1(RA0)           # READ HASHSUM CONTROL WORD FOR THIS ENTRY
0010576 01 000576 041161 ------                  39         LA      R7,1(RA0)           # READ HASHSUM VALUE
0010577 01 000577 016446 017777                  40         LRM     R2,R6,M(HASHLEN)    # SAVE LENGTH FOR LOOPS
0010601 01 000601 024223 ------                  41         TBN     R9,S(NOTEST)
0010602 01 000602 054034 ------ 0010636          42         BC      WORKTABLE
0010603 01 000603 024220 ------                  43         TBN     R9,S(DOALL)
0010604 01 000604 030156 ------                  44         ICF     R6,S(FORCOPY)
```

```
0010605 01 000605 024157 ------                       TBN      R6,S(TSFLG)          # TEST FOR TEMPORARY STORE BLOCK
0010606                                               IF       CF = 1 THEN RGBEGIN
0010606 01 000606 055011 ------ 0010617  -001-              BNC      IFS311
0010607 01 000607 006102 ------                             LR       R4,R2                # SET UP LENGTH
0010610 01 000610 053005 ------ 0010615                     B        WORDOK               # DECREMENT COUNT

0010611                                     PARCORRLP                                   # LOOP TO CORRECT BAD PARITY IN TEMPORARY
                                                                                          STORE
0010611                                                     L_ONLX   R4(RA1)
0010611 01 000611 176064 ------          -001-              STAFX    R4(RA1)
0010612 01 000612 136260 ------          -001-              DATA     B(10111100101100C0)
0010613 01 000613 055002 ------ 0010615                     BNC      WORDOK
0010614 01 000614 046404 ------                             STX      R0,R4(RA1)           # CORRECT PARITY
0010615                                     WORDOK
0010615 01 000615 136100 010611 0010611                     BX       R4,PARCORRLP
0010617                                                     RGEND                         # END OF TS SECTION
0010617                                  -001- IFS311

0010617 01 000617 116406 140000                       LRM      R0,R6,M(TSFLG)+M(FORCOPY)
0010621 01 000621 014000 ------                       TZ       R0
0010622                                               IF       CF = 1 THEN RGBEGIN
0010622 01 000622 055014 ------ 0010636  -001-              BNC      IFS314
0010623 01 000623 006002 ------                             LR       R0,R2                # SET UP LENGTH FOR HASHSUM CALC.
0010624 01 000624 030420 013477 0013477                     LL       R1,HASHSAVE          # OLD HASHSUM VALUE
0010626 01 000626 024221 ------                             TBN      R9,S(PASS)           # GENERIC/TRNSLN FLAG
0010627                                                     CALL     HASHSUMN
0010627 01 000627 037021 016234 MASACS   -001-              BSA      HASHSUMN
0010631 01 000631 115027 ------                             XR       R1,R7                # COMPARE CALCULATED & STORED VALUES
0010632 01 000632 014401 ------                             OR       R0,R1                # R0 ¬= 0 MEANS MUST RELOAD 4K MAS BLOCK
0010633 01 000633 054003 ------ 0010636                     BC       NOCOPY
0010634 01 000634 026156 ------                             SBN      R6,S(FORCOPY)
0010635 01 000635 026222 ------                             SBN      R9,S(BAD4K)          # RELOADING REQUIRED FLAG
0010636                                     NOCOPY
0010636                                                     RGEND                         # END OF CALCULATION
0010636                                  -001- IFS314

0010636                                     WORKTABLE
0010636 01 000636 107254 ------                       EXR      R10,RA0
0010637 01 000637 007275 ------                       EXR      R11,RA0+1
0010640 01 000640 045141 ------                       STA      R6,1(RA0)            # WRITE NEXT WORKTABLE ENTRY
0010641 01 000641 007254 ------                       EXR      R10,RA0
0010642 01 000642 007275 ------                       EXR      R11,RA0+1

0010643                                               ARL      RA1,R2               # INC. FOR NEXT CALCULATION
0010643 01 000643 001762 ------          -001-        AR       RA1+1,R2
0010644 01 000644 055002 ------ 0010646  -001-        BNC      IFS317
0010645 01 000645 004741 ------          -001-        AN       RA1,1
0010646 01 000646 116417 077777                       LRM      R0,RA1+1,E(15)-1     # IS RA1 ON A 32K MAS BOUNDARY?
0010650                                               IF       R0 = 0 THEN ZR R7    # NEW CALCULATION
```

```
0010650 01 000650 014000 ------           -002- 01            TZ     R0
0010651 01 000651 055002 ------ 0010653   -001- 02            BNC    IFS318
0010652 01 000652 003160 ------           -001- 03            ZR     R7                    # NEW CALCULATION
0010653                                   -001- 04 IFS318
0010653 01 000653 134560 013477 0013477         05            STL    R7,HASHSAVE           # FOR THE NEXT CALCULATION
0010655                                         06            CALL   OFLBOOTTST
0010655 01 000655 037020 013373 0013373   -001- 07            BSA    OFLBOOTTST
0010657 01 000657 154003 ------ 0010662         08            BC     SKIPRESETPT
                                                09 CIPL       OW     O(660)                # 12432
                                          -001- 10            NOTE   ************** THE FIRST ADDRESS OVERWRITTEN IS 000660 **********


                                                13 CIPL       BGNP   O(3432)               # 12432
0010660 01 000660 037000 013432 0013432   -001- 14            BL     %%%323
                                          -001- 15            NOTE   CIPL 'CSECT'
                                          -001- 16            NOTE   ****************** PATCH AREA BEGINS AT 003432 ****************


0013432                                   -001- 19 %%%323     PATCHAREA
0013432                                         20            CALL   RESETPT
0013432 01 003432 137020 001150 CBLM      -001- 21            BSA    RESETPT
0013434 01 003434 117770 037400                 22            CIRM   R15,0,8,O(077)        # RING BELL EVERY OTHER 4K BLOCK
0013436 01 003436 055010 ------ 0013446         23            BNC    NOBELL
0013437 01 003437 071420 ------                 24            HA
0013440 01 003440 003621 016520                 25            LI     R9,O(16520)           # TTY
0013442 01 003442 003641 000207                 26            LI     R10,TTY_BEL
0013444 01 003444 023400 ------                 27            SIO                          # RING BELL
0013445 01 003445 071400 ------                 28            GA
0013446                                         29 NOBELL
0013446                                         30            ENDP                         # 12432
0013446 01 003446 137000 010662 0010662   -001- 31            BL     %%%326
                                          -001- 32            NOTE   ************ LAST PATCH ADDRESS USED IS 003447 ***************
                                          -001- 33            NOTE   ***** NUMBER OF PATCH WORDS USED IS 14 (DECIMAL) ********


0010662                                   -001- 36 %%%326     OWCONTINUE
0010662                                         37            EOW                          # 12432
                                          -001- 38            NOTE   *************** THE LAST ADDRESS OVERWRITTEN IS 000661 *********
                                                                     *


0010662                                         42 SKIPRESETPT
0010662                                         43 R5CHK
0010662 01 000662 136120 010575 0010575         44            BX     R5,CHKSUMLP
```

```
0010664 01 000664 041122 ------                 01        LA      R5,2(RAO)         # GET NUMBER OF TRNSLN ENTRIES
0010665 01 000665 024221 ------                 02        TBN     R9,S(PASS)        # GENERIC OR TRNSLN PASS
0010666 01 000666 026221 ------                 03        SBN     R9,S(PASS)        # SET TRNSLN FLAG
0010667 01 000667 055700 ------ 0010567         04        BNC     CALCHASH          # RESTART CHKSUM LOOP FOR TRNSLN


                                                08 # WORK TABLE COMPLETED
0010670 01 000670 024222 ------                 09        TBN     R9,S(BAD4K)       # CF = 0 MEANS MAS PERFECT AS IS
0010671 01 000671 054016 ------ 0010707         10        BC      RLOD
0010672 01 000672 030660 013545 0013545         11        LL      R11,SSPSV         # BACKDATE BUTTONS STATUS
0010674 01 000674 003662 140000                 12        NI      R11,O(140000)     # BACKDATE REQUESTED?
0010676 01 000676 055011 ------ 0010707         13        BNC     RLOD
0010677                                         14        CALL    OFLBOOTTST
0010677 01 000677 037020 013373 0013373  -001-  15        BSA     OFLBOOTTST
0010701 01 000701 150400 005166 CINIT           16        BNCL    BOOTRTN           # NO RELOAD NEEDED - GO TO CINIT
0010703 01 000703 003002 ------                 17        LN      R0,2              # SIGNAL END OF LEG 2
0010704 01 000704 034400 013476 0013476         18        STL     R0,OFLBOOTSW
0010706 01 000706 056540 ------                 19        HALT                      # OFFLINE BOOT HALT
```

```
0010707                                  01 RLOD
                         *
                         *
                         * THIRD PHASE
                         *
                         *
                         * THE COMPLICATED PORTION OF BOOTSTRAPING NOW BEGINS. IN AN EFFORT TO
                         * MAXIMIZE THE USE OF THE SYSTEMS AVAILABLE POWER, AND THEREFORE REDUCE
                         * THE AMOUNT OF TIME REQUIRED TO RECOVER THE DOWNED SYSTEM, AN EFFORT
                         * WILL BE MADE TO USE BOTH TAPE DEVICES TO RELOAD THE SYSTEM, IN SOME
                         * LARGER SYSTEMS, UP TO 3 TRACKS OF THE TAPE DEVICE MAY CONTAIN PROGRAM
                         * AND SYSTEM PARAMETERS AND PROGRAM OVERWRITES. THEREFORE ONE TAPE DEVICE
                         * MAY BE USED TO UNLOAD ONE OR MORE OF THE TRACKS AS THE OTHER TAPE IS
                         * USED TO RECOVER INFORMATION ON THE REMAINING TRACK. ALSO, IF THE DATA
                         * IS LAYED OUT ON THE TAPE IN AN OPTIMUM FASHION, ONLY ONE PASS ACROSS
                         * THE TAPE WILL BE REQUIRED TO ACCESS ALL THE STORED INFORMATION ON THE TAPE.
                         * HOWEVER, IF THE SYSTEM HAS A TAPE OUT OF SERVICE, IT STILL IS CAPABLE OF
                         * HANDLING ALL THE TRACKS FROM ONE TAPE DEVICE AT A COST OF RECOVERY TIME.
                         *
                         *
                         * HANDLING BOTH TAPES REQUIRES A TIME SHARED DRIVER TO ASSURE THAT BOTH
                         * DEVICES ARE SERVICED PROPERLY. SOME SORT OF SOFTWARE TIMING IS ALSO
                         * REQUIRED TO AID IN THE MECHANICAL HANDLING ASPECTS OF TAPE DEVICES.
                         * THEREFORE THE THIRD PHASE OF THE BOOTSTRAP PROGRAM IS A LOOP OF 3 TASK
                         * SCHEDULERS (A,B,C) AND A SOFTWARE CLOCK AND PROGRAM TIMER RESET ROUTINE.
                         * THE CLOCK-RESET ROUTINE PASSES CONTROL TO THE 'A' SCHEDULER WHICH PASSES
                         * CONTROL TO THE 'B' SCHEDULER WHICH PASSES CONTROL TO THE 'C' SCHEDULER
                         * WHICH CONTINUES THE LOOP BY GIVING CONTROL TO THE CLOCK-RESET ROUTINE.
                         * THE ON-LINE SYSTEM WILL BE COMPRISED OF THE ACTIVE 3ACC AND ITS NUMERICALLY
                         * TIED TAPE UNIT. THE OTHER CC'S TAPE WILL BE CALLED THE OFF-LINE DEVICE.
                         *
                         *
                         * PRIOR TO THE START OF THE LOOP, THE OFF-LINE TAPE DEVICE
                         * IS SCANNED. FAILURE TO ESTABLISH A SUCCESSFUL PATH OF
                         * COMMUNICATION AT THIS TIME IS NOTED FOR FUTURE USE IN THE RELOAD LOOP.
                         * ALSO, THE MISCELLANEOUS DATA READ IN OFF THE CHECKSUM FILE IS PROCESSED
                         * AND PLACED IN THE APPROPRIATE CONTROL WORDS TO AID THE SCHEDULERS IN
                         * LOCATING THE GENERIC PROGRAM, TRANSLATION DATA, ETC.

0010707 01 000707 130400 013500 0013500        LL      RO,BASEGENR
0010711 01 000711 031420 013520 0013520        LAL     R1,ASTATE,RA1
0010713 01 000713 031020 013532 0013532        LAL     R1,BSTATE+N(TUOOS),RAO
0010715 01 000715 024017 ------                TBN     RO,S(WOPEN)          #HAD ERROR OCCURRED DURING XLATE WRITE
0010716 01 000716 022017 ------                ZBN     RO,S(WOPEN)
0010717 01 000717 055003 ------ 0010722        BNC     FILEOK               #NO
0010720 01 000720 061160 ------                SBS     O(RAO),S(TUOOS)      #FLAG B SCH. TO WAIT
0010721 01 000721 061563 ------                SBS     N(TUOOS)(RA1),S(TUOOS) #FLAG A SCH. PROBLEM WITH XLATE
```

```
0010722                                         FILEOK
0010722 01 000722 144401 ------                         ST      R0,N(PTPOS)(RA1)     #SET UP A SCH. WITH GENERIC START BLOCK
0010723 01 000723 061523 ------                         SBS     N(PTPKNOWN)(RA1),S(PTPKNOWN)
0010724 01 000724 003401 066540                         LI      R0,INTERCOM          # TIME CONSTANT
0010726 01 000726 030620 013531 0013531                 LL      R9,EAOFF
0010730 01 000730 003641 040007                         LI      R10,INIT
0010732 01 000732 023440 ------                         SMIO
0010733 01 000733 136000 010733 0010733                 BX      R0,*                 # TIME FOR READ CONSTANT.
0010735 01 000735 023500 ------                         TIO
0010736 01 000736 055013 ------ 0010751                 BNC     TUOFOOS
0010737 01 000737 003641 002015                         LI      R10,TSTAT
0010741 01 000741 023440 ------                         SMIO
0010742 01 000742 003012 ------                         LN      R0,X(A)
0010743 01 000743 136000 010743 0010743                 BX      R0,*
0010745 01 000745 023500 ------                         TIO
0010746 01 000746 055003 ------ 0010751                 BNC     TUOFOOS
0010747 01 000747 024267 ------                         TBN     R11,S(TUR)
0010750 01 000750 054004 ------ 0010754                 BC      BSCHWORK
                                                # THE OTHER TAPE CAN NOT BE ACCESSED
0010751                                         TUOFOOS
0010751 01 000751 161160 ------                         SBS     0(RA0),S(TUOOS)
0010752 01 000752 034640 013511 0013511                 STL     R10,MATEOOS          # FLAG ON-LINES MATE HARDWARE OUT OF SERVICE.
0010754                                         BSCHWORK
0010754 01 000754 103401 177774 MASACS                  LI      R0,1-BLK4K
0010756 01 000756 034400 013554 0013554                 STL     R0,BLKINCOF
0010760 01 000760 030400 013502 0013502                 LL      R0,LST4K1
0010762 01 000762 030420 013504 0013504                 LL      R1,GEN4KNO
0010764 01 000764 001420 ------                         AR      R1,R0                # INDEX INTO CHECKSUM TABLE FOR TRACK 2.
0010765 01 000765 034420 013556 0013556                 STL     R1,BLKDIGOFF
0010767 01 000767 030420 013505 0013505                 LL      R1,XLAT4KNO
0010771 01 000771 005020 ------                         SR      R1,R0                # TOTAL NUMBER OF XLATE BLOCKS ON TRACK 2.
0010772 01 000772 034420 013507 0013507                 STL     R1,BXKONOFF          # STORE BX CONSTANT IN MEMORY.



                                                # THIS IS THE BEGINNING OF THE BOOTSTRAP LOOP.
0010774                                         BOOTLOOP
0010774 01 000774 131060 013512 0013512                 LAL     R3,PATTERN,RA0
0010776 01 000776 040043 ------                         L       R2,3(RA0)            #COUNT
0010777 01 000777 036040 011024 0011024                 BX      R2,STORECNT
0011001 01 001001 003621 016520                         LI      R9,0(16520)          #TTY ADR. OF MAINT TTY
0011003 01 001003 003641 000207                         LI      R10,0(207)           #SEND BELL DURING BOOT.
0011005                                                 CALL    OFLBOOTTST
0011005 01 001005 037020 013373 0013373   -001-         BSA     OFLBOOTTST
0011007 01 001007 154002 ------ 0011011                 BC      SKIPBELLRING
0011010 01 001010 023400 ------                         SIO                          #SEND BUT IGNORE RESULTS
0011011                                         SKIPBELLRING
0011011 01 001011 140102 ------                         L       R4,2(RA0)            #PATTERN2
0011012 01 001012 040121 ------                         L       R5,1(RA0)            #PATTERN1
```

```
0011013 01 001013 010517 ------                  RLN     R4,1
0011014 01 001014 010521 ------                  RRN     R5,1
0011015 01 001015 044102 ------                  ST      R4,2(RAO)           #PATTERN2
0011016 01 001016 044121 ------                  ST      R5,1(RAO)           #THE PATTERN1
0011017 01 001017 014505 ------                  OR      R4,R5
0011020 01 001020 006064 ------                  LR      R3,R4
0011021 01 001021 044060 ------                  ST      R3,0(RAO)           #PATTERN
0011022 01 001022 003441 000620                  LI      R2,400
0011024                                     STORECNT
0011024 01 001024 144043 ------                  ST      R2,3(RAO)           #COUNT
0011025 01 001025 012220 ------                  PACK    DB                  # FOR OFFLINE BOOT
0011026                                          CALL    OFLBOOTTST
0011026 01 001026 037020 013373 0013373  -001-   BSA     OFLBOOTTST
0011030 01 001030 154005 ------ 0011035          BC      SKIPLOADDB
0011031                                          CALL    LDDB15_0
0011031 01 001031 037020 006730 CINIT    -001-   BSA     LDDB15_0
0011033                                          CALL    RESETPT             # CLEAR TIMER AND START SYSTIM COUNTING
0011033 01 001033 137020 001150 CBLM     -001-   BSA     RESETPT
0011035                                     SKIPLOADDB


       *
       *
       * A SCHEDULER
       *
       * THE 'A' SCHEDULER IS MAINLY RESPONSIBLE FOR TAPE OPERATIONS ASSOCIATED WITH
       * THE ON-LINE TAPE UNIT. THAT INVOLVES BRINGING IN THE SYSTEM PROGRAMS
       * WHICH ARE LOCATED ON TRACK 0 OF THE TAPE UNIT. IT ALSO BRINGS IN SYSTEM
       * PARAMETERS(TRANSLATION) WHICH ARE LOCATED ON TRACK 1 JUST BEYOND THE
       * END OF THE PROGRAM FILE(GENERIC). HOWEVER, IF THE B AND C SCHEDULERS ARE
       * RENDERED INOPERATIVE DUE TO THE FAILURE OF THE OFF-LINE TAPE SYSTEM,
       * THE 'A' SCHEDULER WILL ASSUME THIER FUNCTIONS AT A PREMIUM OF TIME.
       *
       *
       * ALL THE SCHEDULERS UTILIZE A BLOCK OF MEMORY WHICH CONTAINS CONTROL
       * AND STATUS INFORMATION. THE INFORMATION CONTAINED IN THESE BLOCKS
       * ARE
       *
       *     1. THE SUBSTATE IN CONTROL OF THE TAPE UNIT.
       *
       *     2. THE PRESENT TAPE POSITION OF THE UNIT CONTROLLED BY THIS SCHEDULER
       *
       *     3. THE I/O ADDRESS OF THE CONTROLLED TAPE UNIT
       *
       *     4. MISC. STORE WORD (BUFFER COUNTERS, TRACK NO., TIMING REQUESTS, ETC).
       *
       *     5. DESTINATION BLOCK (SEARCH MODE)
       *
```

```
                   *    6. CYCLIC CHECK CHARACTER ACCUMULATOR
                   *
                   *    7. TIME CONSTANT STORAGE.
0011035            ASCHEDULE
                   *
                   *
                   * THE FIRST OPERATION OF THE 'A' SCHEDULER INVOLVES TESTING IF IT IS DOING
                   * ANY TIMING FOR ONE OF ITS SUBSTATES. IF IT IS, IT CHECKS TO SEE IF THE
                   * SOFTWARE TIMER HAS TIMED OUT FOR THE SUBSTATE THAT MADE THE REQUEST.
                   * UNLESS IT HAS TIMED OUT, CONTROL IS NOT PASSED TO THE SUBSTATE BUT
                   * TO THE 'B' SCHEDULER.


0011035 01 001035 103004 ------                         LN     R0,4
0011036 01 001036 034400 013510 0013510                 STL    R0,NXTSCH
0011040 01 001040 031440 045265 LAYOUT                  LAL    R2,I_OBUF-1,RA1
0011042 01 001042 072756 ------                         HN     R14,14
0011043 01 001043 072777 ------                         HN     R15,15
0011044 01 001044 031040 013520 0013520                 LAL    R2,ASTATE,RA0       # GET PRESENT STATE OF SCHEDULER
0011046 01 001046 072714 ------                         HN     R12,12
0011047 01 001047 072735 ------                         HN     R13,13
0011050 01 001050 051341 ------                         TBS    N(INTREQ)(RA0),S(INTREQ) #HAS AN INTERRUPT REQUEST BEEN MADE
0011051 01 001051 055003 ------ 0011054                 BNC    NOWAY
0011052 01 001052 051361 ------                         TBS    N(INTHNR)(RA0),S(INTHNR) #HAS IT BEEN HONORED?
0011053 01 001053 054073 ------ 0011146                 BC     NEXTSCHED
0011054                                         NOWAY
0011054 01 001054 140222 ------                         L      R9,N(EA)(RA0)       # SET UP ENABLE ADDRESS.
0011055 01 001055 051203 ------                         TBS    N(TIMING)(RA0),S(TIMING) # CHECK IF A TIMING REQUEST IS IN THE
                                                                                    CONTROL
0011056 01 001056 055006 ------ 0011064                 BNC    PAX
0011057 01 001057 040005 ------                         L      R0,N(TIMKON)(RA0)   #GET TIME CONSTANT
0011060                                                 CALL   TIMCHKALT
0011060 01 001060 037020 013403 0013403   -001-         BSA    TIMCHKALT
0011062 01 001062 154162 ------ 0011244                 BC     BSCHEDU             # TIMOUT HAS OCCURED
0011063 01 001063 062203 ------                         ZBS    N(TIMING)(RA0),S(TIMING) #CLEAR TIMING BIT


                   *
                   *
                   * AFTER THE TIME CHECK, THE 'A' SCHEDULER WILL PASS CONTROL TO ONE OF
                   * A SERIES OF SUBSTATES MOST OF WHICH WILL BE SHARE BY THE REMAINING
                   * SCHEDULERS. ONE SUBSTATE WHICH WILL NOT BE SHARED IS THE DESTINATION
                   * DETERMINING SUBSTATE DEVOTED TO THE 'A' SCHEDULERS MAIN TASK OF
                   * PROGRAM RELOAD AND TRACK 1 SYSTEM PARAMETER RELOAD,(CHECKTBL)
```

```
0011064                                     01 PAX
0011064 01 001064 156002 ------             02        BPAX     R2                  # GO TO STATE IN CONTROL
0011065 01 001065 153076 ------ 0011163     03        B        CHECKTBL
0011066 01 001066 153275 ------ 0011363     04        B        FASTPOS
0011067 01 001067 153205 ------ 0011274     05        B        SLOWPOS
0011070 01 001070 153321 ------ 0011411     06        B        FSTOPTST
0011071 01 001071 153335 ------ 0011426     07        B        VERIT
0011072 01 001072 153347 ------ 0011441     08        B        SCANSTP
0011073 01 001073 153356 ------ 0011451     09        B        REDVER
0011074 01 001074 153023 ------ 0011117     10        B        REEVALX
0011075 01 001075 153012 ------ 0011107     11        B        READONX
0011076 01 001076 153063 ------ 0011161     12        B        BCKRECV1
0011077 01 001077 153223 ------ 0011322     13        B        STREAD1
0011100 01 001100 153021 ------ 0011121     14        B        CHKTIMX
0011101 01 001101 153022 ------ 0011123     15        B        AVERREC
0011102 01 001102 153034 ------ 0011136     16        B        AVERCONT
0011103 01 001103 153006 ------ 0011111     17        B        AREDCONX
0011104 01 001104 153007 ------ 0011113     18        B        ASCHCLNX
0011105 01 001105 153010 ------ 0011115     19        B        REPKMRFX
0011106 01 001106 153000 ------ 0011106     20        B        *


0011107                                     24 READONX
0011107 01 001107 137000 011546 0011546     25        BL       READON
0011111                                     26 AREDCONX
0011111 01 001111 137000 012375 0012375     27        BL       AREDCON
0011113                                     28 ASCHCLNX
0011113 01 001113 137000 012657 0012657     29        BL       ASCHCLN
0011115                                     30 REPKMRFX
0011115 01 001115 137000 012741 0012741     31        BL       REPKMRF
0011117                                     32 REEVALX
0011117 01 001117 137000 011506 0011506     33        BL       REEVAL
0011121                                     34 CHKTIMX
0011121 01 001121 137000 011512 0011512     35        BL       CHKTIM


0011123                                     39 AVERREC
                                            40 # A SCHEDULER RECOVERY FOR VERIFY FAILURE.
0011123 01 001123 130400 013511 0013511     41        LL       R0,MATEOOS
0011125 01 001125 014000 ------             42        TZ       R0
0011126 01 001126 050400 011767 0011767     43        BNCL     RPCK                # FATAL DOUBLE ERROR. REPACK AND MRF.
0011130 01 001130 037040 013511 0013511     44        A1S      MATEOOS             #MARK MATE BAD.
0011132                                     45 NXTVER
0011132 01 001132 103401 000015             46        LI       R0,VERCONT          # NEXT STATE FOR VERIFY RECOVERY
0011134 01 001134 037000 011662 0011662     47        BL       STOSUB
```

```
0011136                                       AVERCONT
0011136 01 001136 130400 013532 0013532                LL     R0,BSTATE+N(STUS)
0011140 01 001140 024006 ------                        TBN    R0,S(STUS)          # CAN B SCHEDULER TAPE BE USED?
0011141 01 001141 055005 ------ 0011146                BNC    NEXTSCHED           # MUST WAIT FOR UNIT TO FREE UP.
0011142 01 001142 030620 013531 0013531                LL     R9,BSTATE+N(EA)
0011144 01 001144 044222 ------                        ST     R9,N(EA)(RA0)
0011145 01 001145 053244 ------ 0011411                B      FSTOPTST            # CONTINUE RELOAD WITH OTHER UNIT


0011146                                       NEXTSCHED
0011146 01 001146 130400 013510 0013510                LL     R0,NXTSCH
0011150 01 001150 056000 ------                        BPAX   R0
0011151 01 001151 137000 010774 0010774                BL     BOOTLOOP
0011153 01 001153 137000 011035 0011035                BL     ASCHEDULE
0011155 01 001155 137000 012136 0012136                BL     BSCHEDULE
0011157 01 001157 137000 012457 0012457                BL     CSCHEDUL

0011161                                       BCKRECV1
0011161 01 001161 137000 012131 0012131                BL     BCKRECV


*
*
* THE 'CHECKTBL' SUBSTATE IS THE HOME POSITION OF THE 'A' SCHEDULE AND
* MUST DETERMINE IF WORK REMAINS TO BE DONE. THE 'A' SCHEDULER KNOWS
* THE NUMBER OF 4K PROGRAM SEGMENTS ON TRACK 0 AND THE NUMBER OF 4K
* TRANSLATION SEGMENTS ON TRACK 1, AND USES THIS INFORMATION TO DETERMINE
* THE TRACK BITS IN ITS CONTROL WORDS. THE SWITCHING OF THE TRACK
* DESIGNATION WILL BE THE ONLY DIFFERENCE IN THE CODE LOADING
* THE PROGRAM AND TRANSLATION DATA BY THE 'A' SCHEDULER.
*
*
*
* 'CHECKTBL' SCANS THE CHECKSUM PASS-FAIL TABLE CREATED EARLIER. EACH
* ENTRY REPRESENTS A 4K WORD BLOCK OF MEMORY AND IS USED TO GENERATE
* AN INDEX INTO THE TAPE VIA THE USE OF SYMBOLS DEFINING THE PHYSICAL
* TAPE LAYOUT. NEXT THE 'A' SCHEDULER USES THE REMAINING SUBSTATES TO
* EFFECT THE LOCATION AND RELOADING OF THE MUTILATED SEGMENTS OF PROGRAM
* STORE AND THE SEGMENT OF TRANSLATION FOR WHICH IT IS PRIMARILY RESPONSIBLE.
*
*
* THE GENERAL SEQUENCE OF EVENTS WHICH ARE BROUGHT ABOUT BY THE 'A'
* SCHEDULERS SUBSTATE REQUESTS ARE
*
*   1. THE VERIFICATION, IF NEEDED, OF THE PRESENT TAPE POSITION
*
*   2. THE CALCULATION OF THE DISTANCE TO DESTINATION OF THE NEXT
```

```
      *     MUTILATED 4K SEGMENT ON THE TAPE. (A TIME CALCULATION BASED
      *     UPON TAPE SPEED, BLOCK SIZE ETC.)
      *
      *  3. THE DETERMINATION OF THE SPEED OF THE SEARCH BASED UPON THE
      *     PHYSICAL DISTANCE TO DESTINATION.
      *
      *  4. THE TAPE IS SEARCHED
      *
      *  5. RE-VERIFICATION AFTER SEARCH (IF NEEDED, SLOW SEARCH IS A BLOCK
      *     AT A TIME MOVEMENT THEREFORE NOT NEEDING VERIFICATION OF POSITION)
      *
      *  6. RE-CALCULATION OF DESTINATION DISTANCE OR READING OF THE 4K BLOCK
      *     DEPENDING UPON THE RESULT OF THE DISTANCE CALCULATION.
      *
      *


0011163                                         CHECKTBL
                                                # CHECK TABLE FOR WORK
0011163 01 001163 151341 ------                         TBS    N(INTREQ)(RAO),S(INTREQ) #IS AN INTERRUPTION REQUEST PENDING
0011164 01 001164 055003 ------ 0011167                 BNC    ANALWRK
0011165 01 001165 061361 ------                         SBS    N(INTHNR)(RAO),S(INTHNR) #ALLOW INTERRUPT.
0011166 01 001166 053760 ------ 0011146                 B      NEXTSCHED
0011167                                         ANALWRK
0011167 01 001167 151143 ------                         TBS    N(STUS)(RAO),S(STUS) # CHECK IF ASCHEDULER IS FINISHED
0011170 01 001170 054054 ------ 0011244                 BC     BSCHEDU
0011171 01 001171 030440 013506 0013506                 LL     R2,BXKONON           # GET NO OF 4K SEGMENTS
0011173 01 001173 031400 013561 0003561                 LAL    RO,CHKSUM,RA1        #SET UP CHKSUM ADDRESS.
0011175 01 001175 041405 ------                         LA     RO,5(RA1)            #GET BASE ADDRESS OF WORKTBL.
0011176 01 001176 030420 013553 0013553                 LL     R1,BLKINCON          # LOGICAL INDEX INTO FILE
0011200 01 001200 030460 013555 0013555                 LL     R3,BLKDIGON          # INDEX INTO WORK TABLE
0011202                                         KEEPUP
0011202 01 001202 130400 013502 0013502                 LL     RO,LST4K1
0011204 01 001204 020002 ------                         CR     RO,R2                # CHECK IF TRANS. IS TO BE READ IN
0011205 01 001205 055021 ------ 0011226                 BNC    NOTRKCHG
                                                CIPL    OW     0(1206)              # 13712
                                          -001-         NOTE   ************** THE FIRST ADDRESS OVERWRITTEN IS 001206 **********


                                                CIPL    BGNP   0(3450)              # 13712
0011206 01 001206 037000 013450 0013450   -001-         BL     %%%346
                                          -001-         NOTE   CIPL 'CSECT'
                                          -001-         NOTE   ****************** PATCH AREA BEGINS AT 003450 *****************
```

```
0013450                                -001- 01 XXX346 PATCHAREA
0013450 01 003450 130400 013501 0013501      02        LL      R0,BASEXLAT
0013452 01 003452 034400 013500 0013500      03        STL     R0,BASEGENR
0013454 01 003454 003421 177773 MASACS       04        LI      R1,-BLK4K              #RESET LOGICAL FILE INDEX
0013456 01 003456 030400 013511 0013511      05        LL      R0,MATEOOS
0013460                                      06        ENDP                           # 13712
0013460 01 003460 037000 011210 0011210 -001- 07        BL      XXX348
                                       -001- 08        NOTE    ************* LAST PATCH ADDRESS USED IS 003461 ****************
                                       -001- 09        NOTE    ***** NUMBER OF PATCH WORDS USED IS 10 (DECIMAL) ********


0011210                                -001- 12 XXX348 OWCONTINUE
0011210 01 001210 114000 ------              13        TZ      R0
0011211                                      14        EOW                            # 13712
                                       -001- 15        NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 001210 **********


0011211 01 001211 055014 ------ 0011225      18        BNC     SETRK
0011212 01 001212 051163 ------              19        TBS     N(TUOOS)(RA0),S(TUOOS) #IS THIS XLATE USELESS
0011213 01 001213 055012 ------ 0011225      20        BNC     SETRK
0011214 01 001214 037040 013511 0013511      21        A1S     MATEOOS                #FORCE USE OF ONE TAPE.
0011216                                      22 USEB
0011216 01 001216 130600 013531 0013531      23        LL      R8,BSTATE+N(EA)
0011220 01 001220 034620 013531 0013531      24        STL     R9,BSTATE+N(EA)        #IN THE EVENT OF ERROR, A WILL USE ITS
                                                                                        ORIGINAL UNIT
0011222 01 001222 006230 ------              26        LR      R9,R8
0011223 01 001223 044222 ------              27        ST      R9,N(EA)(RA0)          #SET A TO USE B'S TAPE UNIT
0011224 01 001224 062123 ------              28        ZBS     N(PTPKNOWN)(RA0),S(PTPKNOWN) #FORCE VERIFY OF POSTION
0011225                                      29 SETRK
0011225 01 001225 161301 ------              30        SBS     N(TR)(RA0),S(TR)
0011226                                      31 NOTRKCHG
0011226 01 001226 136040 011246 0011246      32        BX      R2,DOIT
0011230 01 001230 061143 ------              33        SBS     N(STUS)(RA0),S(STUS) #FLAG A SCHEDULER FINISHED
0011231 01 001231 030400 013532 0013532      34        LL      R0,STATOFF             # GET STATUS OF OFF-LINE TAPE
0011233 01 001233 024007 ------              35        TBN     R0,S(TUOOS)            # IS IT DEFECTIVE
0011234 01 001234 055010 ------ 0011244      36        BNC     BSCHEDU
0011235 01 001235 040222 ------              37        L       R9,N(EA)(RA0)          # SET UP OFF-LINE ENABLE FOR A SCHEDULER
0011236 01 001236 034620 013531 0013531      38        STL     R9,EAOFF
0011240 01 001240 022007 ------              39        ZBN     R0,S(TUOOS)
0011241 01 001241 034400 013532 0013532      40        STL     R0,STATOFF
0011243 01 001243 044040 ------              41        ST      R2,N(STATE)(RA0)
0011244                                      42 BSCHEDU
0011244 01 001244 137000 012136 0012136      43        BL      BSCHEDULE
0011246                                      44 DOIT
0011246 01 001246 104461 ------              45        AN      R3,1
0011247 01 001247 042403 ------              46        LX      R0,R3(RA1)             # GET WORK TABLE ENTRY.
0011250 01 001250 034460 013555 0013555      47        STL     R3,BLKDIGON
0011252 01 001252 024017 ------              48        TBN     R0,S(TSFLG)            # WAS THIS ENTRY FOR CS.
0011253 01 001253 054727 ------ 0011202      49        BC      KEEPUP                 # NO WORK NEEDED ON CS.
```

```
0011254 01 001254 003420 000005 MASACS          AI     R1,BLK4K              # NOT CS, INCREMENT BLOCK PER 4 K.
0011256 01 001256 024016 ------                 TBN    R0,S(FORCOPY)         # TEST IF THIS 4K NEEDS REFRESH
0011257 01 001257 055723 ------ 0011202         BNC    KEEPUP


                                         # A 4K BLOCK OF STORE MUST BE BROUGHT IN.
0011260 01 001260 034420 013553 0013553         STL    R1,BLKINCON           # STORE LOGICAL INDEX AWAY.
0011262 01 001262 030400 013500 0013500         LL     R0,BASEGENR           # GET PHYSICAL ADDRESS OF GENERIC
0011264 01 001264 001420 ------                 AR     R1,R0                 # ADD LOGICAL INDEX TO BASE
0011265 01 001265 002024 003777                 STM    R1,N(DESTON)(RA0),M(DESTON)
0011267 01 001267 034440 013506 0013506         STL    R2,BXKONON
0011271 01 001271 051123 ------                 TBS    N(PTPKNOWN)(RA0),S(PTPKNOWN) # IS POSITION VERIFICATION NEEDED.
0011272 01 001272 055157 ------ 0011451         BNC    REDVER
0011273 01 001273 053213 ------ 0011506         B      REEVAL


                   * SUBSTATES(DETAIL)
                   *
                   *
                   * SLOW POSITION STATE-FORWARD TIME SUBSTATE
                   *
                   * THE PRESENT POSITION OF THE TAPE IS COMPARED AGAINST THE DESTINATION.
                   * FROM THIS COMPARISON, A DETERMINATION OF THE DIRECTION OF THE SEARCH
                   * IS MADE. A BACKSPACE COMMAND IS GIVEN FOR REVERSE SEARCHES AND A TIMING
                   * REQUEST IS MADE TO ASSURE COMPLETION OF THE MOVEMENT BEFORE ANOTHER
                   * SUBSTATE IS GIVEN CONTROL. SINCE BACKSPACING DOES NOT INVOLVE ANY
                   * DATA TRANSFER, THE SLOW POSITION SUBSTATE WILL AGAIN GAIN CONTROL
                   * AFTER TIME OUT TO KEEP BACKSPACING UNTIL THE DESTINATION IS REACHED.
                   *
                   *
                   * A READ-A-BLOCK COMMAND IS GIVEN FOR SLOW FORWARD SEARCHES. THIS INVOLVES
                   * DATA TRANSFER INTO THE TAPE CONTROLLER AND THEREFORE REQUIRES SERVICING OF
                   * THE CONTROLLER SO THAT NO ERROR CONDITION RESULTS. A NEW SUBSTATE IS
                   * PRIMED TO TAKE OVER TO RESET THE BUFFER-READY FLAGS AND TIME FOR THE
                   * TERMINATION OF THE READ-A-BLOCK COMMAND. THIS SUBSTATE,READON,
                   *  WILL REQUEST THAT THE EVALUATE POSITION SUBSTATE TAKE OVER WHEN
                   * THE TAPE STOPS. UPON ARRIVAL AT THE DESTINATION, THE TAPE IS SET INTO
                   * THE READ MODE TO START INPUTTING DATA, AND THE READON SUBSTATE IS SET UP
                   * TO READ AND STORE THE INCOMING DATA INTO MEMORY.


0011274                                  SLOWPOS
                                         # THE TAPE IS BEING POSITIONED AT A BLOCK OF MEMORY. THE DESTINATION
                                         # IS CLOSE ENOUGH TO REQUIRE SLOW SEARCHING.
0011274 01 001274 140001 ------                 L      R0,N(PTPOS)(RA0)      # OBTAIN THE PRESENT TAPE POSITION OF UNIT
0011275 01 001275 040024 ------                 L      R1,N(DESTON)(RA0)     # OBTAIN THE DESTINATION OF THE TAPE.
```

```
0011276 01 001276 003402 003777                NI     R0,M(PTPOS)
0011300 01 001300 003422 003777                NI     R1,M(PTPOS)
0011302 01 001302 020001 ------                CR     R0,R1              #HAS DEST. BEEN REACHED.
0011303 01 001303 055032 ------ 0011335        BNC    REPOSI
                                         #SPECIAL CHECK FOR ODD FUNCTION DONE OUT OF B SCHEDULER TO
                                         #ASSURE THAT XLATE WAS WRITTEN CORRECTLY AT LAST UPDATE.
0011304 01 001304 051304 ------                TBS    N(ERNO)(RA0),S(ERNO) #IS CHECKSUM LOOKUP ACTIVE?
0011305 01 001305 055015 ------ 0011322        BNC    STREAD1
0011306 01 001306 051764 ------                TBS    N(WOPEN)+4(RA1),S(WOPEN) #WAS XLATE WRITE ABORTED?
0011307 01 001307 055006 ------ 0011315        BNC    XLATEOK
0011310 01 001310 030420 013511 0013511        LL     R1,MATEOOS         #IS MATE OUT OF SERVICE
0011312 01 001312 014021 ------                TZ     R1
0011313 01 001313 055002 ------ 0011315        BNC    XLATEOK            #IF MATE NOW OUT OF SERVICE MARK YOUR XLATE
                                                                           OK.
0011314 01 001314 061163 ------                SBS    N(TUOOS)(RA0),S(TUOOS)
0011315                                  XLATEOK
0011315 01 001315 161343 ------                SBS    N(SCHCON1)(RA0),S(SCHCON1) #MARK FUNCTION COMPLETE.
0011316 01 001316 062304 ------                ZBS    N(ERNO)(RA0),S(ERNO) #CLEAR ERROR NOT ALLOWED.
0011317 01 001317 003000 ------                ZR     R0
0011320 01 001320 044000 ------                ST     R0,N(STATE)(RA0)
0011321 01 001321 053041 ------ 0011362        B      BBSCHB
                                         # THE TAPE IS IN POSITION TO BE READ.
0011322                                  STREAD1
0011322 01 001322 103020 ------                ZR     R1
0011323 01 001323 002023 000017                STM    R1,N(BUFC)(RA0),M(BUFC) # CLEAR BUFFER COUNT.
0011325 01 001325 040021 ------                L      R1,N(TR)(RA0)      # GET TRACK INFORMATION
0011326 01 001326 003641 007415                LI     R10,TRT            # PREPARE READ COMMAND.
0011330 01 001330 016241 030000                IRM    R10,R1,M(TR)       # INSERT PERTINENT TRACK INFO.
0011332                                        CALL   ORDOUT
0011332 01 001332 037020 013276 0013276  -001- BSA    ORDOUT
0011334 01 001334 153142 ------ 0011476        B      STREAD
0011335                                  REPOSI
0011335 01 001335 105001 ------                SR     R0,R1              # SUBTRACT FROM PTP THE DESTINATION
0011336 01 001336 055113 ------ 0011451        BNC    REDVER             # SEARCH IS FORWARD IN DIRECTION
0011337 01 001337 040001 ------                L      R0,N(PTPOS)(RA0)
0011340 01 001340 004017 ------                SN     R0,1
0011341 01 001341 044001 ------                ST     R0,N(PTPOS)(RA0)   # UPDATE PTP FOR REVERSE SEARCH
0011342 01 001342 017001 003777                CRM    R0,R1,M(PTPOS)     # HAS DESTINATION BEEN REACHED WITH NEXT
                                                                            BACKSPACE.
0011344 01 001344 055005 ------ 0011351        BNC    DOBKUP
0011345 01 001345 003401 000004                LI     R0,VERSTATE        # VERIFY NEEDED SINCE BACKSPACE MAY NOT WORK.
0011347 01 001347 044000 ------                ST     R0,N(STATE)(RA0)
0011350 01 001350 061264 ------                SBS    N(ACTSEQ)(RA0),S(ACTSEQ) #SET SEQUENCE ERROR CHECK
0011351                                  DOBKUP
0011351                                        CALL   TIMOUT
0011351 01 001351 137020 111375 CSYSUB   -001- BSA    TIMOUT
0011353 01 001353 000022 ------ MASACS         DATA   REDKON+1
0011354 01 001354 144005 ------                ST     R0,N(TIMKON)(RA0)
0011355 01 001355 061203 ------                SBS    N(TIMING)(RA0),S(TIMING) #REQUEST TIMING BE DONE
```

```
0011356 01 001356 003641 006415                  LI      R10,TBS
0011360                                          CALL    ORDOUT
0011360 01 001360 037020 013276 0013276  -001-   BSA     ORDOUT
0011362                                  BBSCHB
0011362 01 001362 153564 ------ 0011146          B       NEXTSCHED
                                         # A SLOW FORWARD SEARCH IS INPROGRESS.


                  *
                  *
                  * FAST POSITION SUBSTATE
                  *
                  * THIS SUBSTATE HAS THE TASK OF PLACING THE TAPE UNIT DEFINED IN R9 IN A
                  * FAST FORWARD OR FAST REVERSE SPEED TO ARRIVE AT A DESTINATION AS QUICKLY
                  * AS POSSIBLE. A TIME CONSTANT IS GENERATED BASED ON THE TAPES SPEED
                  * AND THE PRESENT TAPE POSITION AND THE REQUESTED DESTINATION. AFTER SETTING
                  * UP A TIMEING REQUEST, THE FAST POSITION SUBSTATE PLANTS A REQUEST THAT
                  * A NEW SUBSTATE GET CONTROL AFTER THE TIMEOUT OCCURES. THIS NEW SUBSTATE
                  * IS THE FAST STOP SUBUSTATE.
                  *
                  *


0011363                                  FASTPOS
                                         # A FAST SEARCH IS REQUIRED
0011363 01 001363 162123 ------                  ZBS     N(PTPKNOWN)(RA0),S(PTPKNOWN) # CLEAR PTP KNOWN BIT
0011364                                          CALL    CONSGEN              # GENERATE TIME CONSTANT
0011364 01 001364 037020 013230 0013230  -001-   BSA     CONSGEN
0011366 01 001366 140001 ------                  L       R0,N(PTPOS)(RA0)
0011367 01 001367 003402 003777                  NI      R0,M(PTPOS)
0011371 01 001371 040024 ------                  L       R1,N(DESTON)(RA0)
0011372 01 001372 003422 003777                  NI      R1,M(DESTON)
0011374 01 001374 005020 ------                  SR      R1,R0                # CHECK IF FAST SPEED IS FORWARD OR REVERSE.
0011375 01 001375 003641 002415                  LI      R10,TFF
0011377 01 001377 054003 ------ 0011402          BC      FASTFWD
0011400 01 001400 003641 004415                  LI      R10,TFR
0011402                                  FASTFWD
0011402                                          CALL    ORDOUT
0011402 01 001402 137020 013276 0013276  -001-   BSA     ORDOUT
0011404 01 001404 103401 000003                  LI      R0,FASTSTP
0011406 01 001406 044000 ------                  ST      R0,N(STATE)(RA0)     # SET UP FAST TIME STATE
0011407 01 001407 061203 ------                  SBS     N(TIMING)(RA0),S(TIMING)
0011410 01 001410 053752 ------ 0011362          B       BBSCHB
```

```
* THE FAST STOP SUBSTATE.
*
* A TAPE UNIT HAS BEEN PLACED IN A FAST SPEED SEARCH AND THE TIME ALLOTTED
* FOR THE SEARCH HAS EXPIRED. THIS SUBSTATE IS USED TO ISSUE A STOP ORDER
* TO THE TAPE AND SET UP A NEW TIME CONSTANT GEARED TO THE RECOVERY
* TIME OF THE TAPE UNIT FOR ITS TRANSITION FROM A HIGH SPEED TO STOP
* CONDITION. THE NEW POSITION OF THE STOPPED TAPE IS UNKNOWN. THEREFORE
* THIS SUBSTATE SETS UP THE NEXT STATE TO OBTAIN CONTROL. THIS NEW STATE
* IS THE VERIFY SUBSTATE.
*
*

0011411                                               FSTOPTST
                                                      # A TIMEOUT HAS OCCURED SO A STOP MUST BE ISSUED TO TAPE UNIT
0011411 01 001411 103641 000015                               LI      R10,TSTOP
0011413                                                       CALL    ORDOUT
0011413 01 001413 037020 013276 0013276  -001-                BSA     ORDOUT
0011415 01 001415 103401 000004                               LI      R0,VERSTATE
0011417                                               SETIMEST
0011417 01 001417 144000 ------                               ST      R0,N(STATE)(RA0)
0011420                                               SETIME
0011420                                                       CALL    TIMOUT
0011420 01 001420 137020 111375 CSYSUB   -001-                BSA     TIMOUT
0011422 01 001422 000022 ------ MASACS                        DATA    REDKON+1
0011423 01 001423 144005 ------                               ST      R0,N(TIMKON)(RA0)
0011424 01 001424 061203 ------                               SBS     N(TIMING)(RA0),S(TIMING) # WAIT UNTIL TAPE STOPS
0011425 01 001425 053735 ------ 0011362                       B       BBSCHB

* THE VERIFY SUBSTATES
*
* THIS SUBSTATE CHAIN IS CHARGED WITH OBTAINING THE POSITION OF THE
* TAPE SPECIFIED IN R9. SINCE THE STOPPING OF A FAST TAPE SPEED MAY
* HAVE POSITIONED THE TAPE HEADS OVER DATA, THE FIRST SUBSTATE 'VERIT'
* WILL ATTEMPT TO PLACE THE READ HEADS IN AN INTER-BLOCK GAP. THIS
* IS ACCOMPLISHED BY ISSUING A BACKSPACE COMMAND. A BACKSPACE COMMAND
* WILL STOP ONLY IN AN INTER-BLOCK GAP AND IT REQUIRES NO SPECIAL SERVICING
* EXCEPT TO TIME FOR ITS MAXIMUM EXECUTION TIME. THIS TIME IS EQUAL TO
* READING ONE BLOCK OF DATA. THE 'VERIT' SUBSTATE REQUESTS THAT THE
* 'REDVER' SUBSTATE NEXT GET CONTROL AFTER THIS TIMEOUT OCCURES.
*
*
```

```
0011426                                         VERIT
                                                # THE PRESENT TAPE POSITION IS NOT KNOWN AT THIS TIME. A BACKSPACE-READ
                                                # SHOULD BE GIVEN TO GET THE BLOCK NUMBER.
0011426 01 001426 103641 006415                         LI      R10,TES
0011430 01 001430 040003 ------                         L       R0,N(VERT)(RA0)     # ESTABLISH VERIFY TRACK.
0011431 01 001431 016240 030000                         IRM     R10,R0,M(VERT)
0011433                                                 CALL    ORDOUT
0011433 01 001433 037020 013276 0013276  -001-          BSA     ORDOUT
0011435 01 001435 103401 000005                         LI      R0,SCNSTP
0011437 01 001437 044000 ------                         ST      R0,N(STATE)(RA0)
0011440 01 001440 053757 ------ 0011417                 B       SETIMEST


0011441                                         SCANSTP
                                                # THIS SUBSTATE IS CHARGED WITH WAITING FOR TIM TO GO AWAY
                                                # BEFORE GOING TO THE NEXT SUBSTATE.
0011441 01 001441 103641 002015                         LI      R10,TSTAT
0011443                                                 CALL    ORDOUT
0011443 01 001443 037020 013276 0013276  -001-          BSA     ORDOUT
0011445 01 001445 124272 ------                         TBN     R11,S(TIM)          #HAS TAPE IN MOTION GONE AWAY
0011446 01 001446 054714 ------ 0011362                 BC      BBSCHB              #NO
0011447 01 001447 003006 ------                         LN      R0,REDVERST         #SET UP NEXT SUBSTATE.
0011450 01 001450 053747 ------ 0011417                 B       SETIMEST            #TIME FOR TAPE RECOVERY FROM MOTION COMMAND.


                    * THE READING OF A BLOCK OF DATA IS INITIATED BY THE 'REDVER' SUBSTATE
                    * WHICH PLACES THE 'READON' SUBSTATE IN AN UPDATE PRESENT TAPE POSITION
                    * ONLY MODE. UNDER THIS CONTROL A BLOCK OF DATA WOULD BE BROUGHT INTO
                    * THE I/O BUFFER AND THE CRC CALCULATED AND CHECKED. THE PRESENT TAPE
                    * POSITION WOULD THEN BE EXTRACTED AND STORED IN THE APPROPRIATE STORAGE.
                    * IF THE CRC FAILS, ANOTHER BLOCK IS READ BY REQUESTING THE 'REDVER'
                    * SUBSTATE AGAIN.
                    *
                    *


0011451                                         REDVER
                                                # A READ IS TO BE INITIATED TO DETERMINE PRESENT TAPE POSITION.
0011451 01 001451 103641 002015                         LI      R10,TSTAT
0011453                                                 CALL    ORDOUT
0011453 01 001453 037020 013276 0013276  -001-          BSA     ORDOUT
0011455 01 001455 124276 ------                         TBN     R11,S(BOT)          #DID BACKSPACE PUT TAPE AT BOT
0011456 01 001456 055010 ------ 0011466                 BNC     CONTVERIT           #NO
0011457 01 001457 003060 ------                         ZR      R3
0011460 01 001460 045461 ------                         STA     R3,N(BLKADR)+1(RA1) #SET TO BLOCK ZERO
0011461 01 001461 003641 040007                         LI      R10,INIT            #TEMP*****
```

```
0011463                                          CALL    ORDOUT
0011463 01 001463 037020 013276 0013276  -001-           BSA     ORDOUT
0011465 01 001465 153243 ------ 0011730                  B       LODEVAL
0011466                                     CONTVERIT
0011466 01 001466 103641 003415                          LI      R10,TRB
0011470 01 001470 040003 ------                          L       RO,N(VERT)(RAO)     # ESTABLISH VERIFY TRACK.
0011471 01 001471 016240 030000                          IRM     R10,RO,M(VERT)
0011473                                                  CALL    ORDOUT
0011473 01 001473 037020 013276 0013276  -001-           BSA     ORDOUT
0011475 01 001475 161243 ------                          SBS     N(STORNOT)(RAO),S(STORNOT) #BLOCK STORING DATA.
0011476                                     STREAD
0011476 01 001476 103401 000013                          LI      RO,TMCHECK          #PREPARE NEXT STATE
0011500 01 001500 044000 ------                          ST      RO,N(STATE)(RAO)    # STORE READ VERIFY STATE.
0011501                                                  CALL    TIMOUT
0011501 01 001501 037020 111375 CSYSUB   -001-           BSA     TIMOUT
0011503 01 001503 000002 ------                          DATA    2
0011504 01 001504 144005 ------                          ST      RO,N(TIMKON)(RAO)   # STORE TIME CONSTANT.
0011505 01 001505 053655 ------ 0011362                  B       BBSCHB


                  * ONCE THE PRESENT TAPE IS KNOWN, THE 'REEVAL' SUBSTATE WILL BE REQUESTED
                  * TO DETERMINE IF ANOTHER SEARCH SEQUENCE IS REQUIRED TO GET TO THE
                  * DESTINATION. WHEN THE DESTINATION IS REACHED, THE SLOW POSITION SUBSTATE
                  * WILL RECOGNIZE IT AND INITIATE A READ OF THE APPROPRIATE TRACK AND THE
                  * DATA TRANSFER BEGINS. THE READING OF THE DATA WILL BE DONE BY THE
                  * 'READON' SUBSTATE.
                  *
                  *
                  * READON SUBSTATE
                  *
                  * THE 'READON' SUBSTATE WILL SERVICE A TAPE UNIT WHICH HAS BEEN PLACED
                  * IN A READ MODE. WHEN THE BUFFER READY FLAG IN THE TAPE DATA CONTROLLER
                  * BECOMES SET, THE 'READON' SUBSTATE UNLOADS A CONTROLLER BUFFER AND
                  * ACCUMULATES A PARTIAL CRC ON IT. THIS CRC IS STORED IN THE APPROPRIATE
                  * STORAGE UNTIL THE ENTIER BLOCK IS BROUGHT IN AND A COMPLETE CRC IS
                  * CALCULATED.
                  *
                  *


0011506                                     REEVAL
0011506                                                  CALL    CONSGEN
0011506 01 001506 137020 013230 0013230  -001-           BSA     CONSGEN
0011510 01 001510 144000 ------                          ST      RO,N(STATE)(RAO)
0011511 01 001511 053651 ------ 0011362                  B       BBSCHB
```

```
0011512                                         01 CHKTIM
0011512 01 001512 103641 002015                 02       LI     R10,TSTAT          #PRIME TAPE FOR PRIMARY STATUS.
0011514                                         03       CALL   ORDOUT
0011514 01 001514 037020 013276 0013276  -001-  04       BSA    ORDOUT
0011516 01 001516 124272 ------                 05       TBN    R11,S(TIM)         #IS TAPE MOVING.
0011517 01 001517 054006 ------ 0011525         06       BC     NXTATE
0011520                                         07 TOUTCHK
0011520 01 001520 140005 ------                 08       L      R0,N(TIMKON)(RA0)
0011521                                         09       CALL   TIMCHKALT          #CHECK IF MINIMUM START TIME HAS ELAPSED.
0011521 01 001521 037020 013403 0013403  -001-  10       BSA    TIMCHKALT
0011523 01 001523 155113 ------ 0011636         11       BNC    CRCFAIL
0011524 01 001524 053636 ------ 0011362         12       B      BBSCHB


0011525                                         16 NXTATE
0011525 01 001525 103641 010007                 17       LI     R10,SST            #MAKE SURE READ IS INPROGRESS.
0011527                                         18       CALL   ORDOUT
0011527 01 001527 037020 013276 0013276  -001-  19       BSA    ORDOUT
0011531 01 001531 117670 003407                 20       CIRM   R11,7,8,MSK(3)     #CHECK IF UNIT IS READING
0011533 01 001533 154003 ------ 0011536         21       BC     RON
0011534                                         22 ERRLOOK
0011534                                         23       CALL   SCHLOOK
0011534 01 001534 137020 013305 0013305  -001-  24       BSA    SCHLOOK
0011536                                         25 RON
0011536 01 001536 103401 000010                 26       LI     R0,CONTREAD
0011540 01 001540 044000 ------                 27       ST     R0,N(STATE)(RA0)   #SET UP READ SERVICING ROUTINE.
0011541                                         28       BGNTIM SEC=3
0011541                                  -001-  29       CALL   TIMOUT
0011541 01 001541 037020 111375 CSYSUB   -002-  30       BSA    TIMOUT
0011543 01 001543 000171 ------          -001-  31       DATA   121                # TIMOUT+1
0011544 01 001544 144005 ------                 32       ST     R0,N(TIMKON)(RA0)
0011545 01 001545 053615 ------ 0011362         33       B      BBSCHB


0011546                                         40 READON
                                                41 # STATE REQUIRED TO BRING DATA INTO MACHINE.
0011546 01 001546 103641 000013                 42       LI     R10,BSTAT          # PREPARE TO LOOK AT BR BIT.
0011550                                         43       CALL   ORDOUT
0011550 01 001550 037020 013276 0013276  -001-  44       BSA    ORDOUT
0011552 01 001552 124267 ------                 45       TBN    R11,S(BR)          # CHECK BR BIT.
0011553 01 001553 055745 ------ 0011520         46       BNC    TOUTCHK
0011554                                         47       CALL   TIMOUT             #RESET TIME DELAY FOR BR FLAG
0011554 01 001554 037020 111375 CSYSUB   -001-  48       BSA    TIMOUT
0011556 01 001556 000022 ------ MASACS          49       DATA   REDKON+1
```

```
0011557 01 001557 144005 ------                01        ST      R0,N(TIMKON)(RA0)
                                               02 # A BUFFER IS READY TO UNLOAD.
0011560 01 001560 003641 044013                03        LI      R10,BSUNLDON         # SET UNLOAD STATE
0011562                                        04        CALL    ORDOUT
0011562 01 001562 037020 013276 0013276  -001- 05        BSA     ORDOUT
0011564 01 001564 103641 120013                06        LI      R10,BCLROCN          # CLEAR OFF-LINE COUNTER.
0011566                                        07        CALL    ORDOUT
0011566 01 001566 037020 013276 0013276  -001- 08        BSA     ORDOUT
0011570 01 001570 140003 ------                09        L       R0,N(BUFC)(RA0)
0011571 01 001571 016440 000017                10        LRM     R2,R0,M(BUFC)        # LOAD UP BUFFER COUNT.
0011573 01 001573 010452 ------                11        RLN     R2,6                 # PREPARE FOR USE AS INDEX
0011574 01 001574 004401 ------                12        AN      R0,1
0011575 01 001575 044003 ------                13        ST      R0,N(BUFC)(RA0)      # UPDATE COUNT.
0011576 01 001576 003501 000077                14        LI      R4,WRDBUF-1          # SET UP WORDS PER BUFFER.
0011600 01 001600 043402 ------                15        LAX     R0,R2(RA1)           # ADJUST RA1 BY INDEX.
0011601 01 001601 003641 100007                16        LI      R10,SD               # PREPARE TO UNLOAD.
0011603                                        17 ORDER
0011603 01 001603 123440 ------                18        SMIO
0011604 01 001604 003011 ------                19        LN      R0,9
0011605                                        20 HR
0011605 01 001605 136000 011605 0011605        21        BX      R0,HR
0011607 01 001607 023500 ------                22        TIO
0011610 01 001610 055724 ------ 0011534        23        BNC     ERRLOOK
0011611 01 001611 045661 ------                24        STA     R11,1(RA1)           # STORE INCOMING DATA AWAY,
0011612 01 001612 036100 011603 0011603        25        BX      R4,ORDER             # KEEP GOING UNTIL BUFFER DONE.
0011614 01 001614 003641 020013                26        LI      R10,BCLRBRF          # CLEAR BR BIT.
0011616                                        27        CALL    ORDOUT
0011616 01 001616 037020 013276 0013276  -001- 28        BSA     ORDOUT
0011620 01 001620 103445 001400 MASACS         29        CI      R2,LASTBUF           # WAS THE BLOCK READ IN?
0011622 01 001622 055540 ------ 0011362        30        BNC     BBSCHB
0011623 01 001623 072356 ------                31        GN      R14,14               # GET TEMP. I/O BUFFER ADDRESS
0011624 01 001624 072377 ------                32        GN      R15,15
0011625 01 001625 040441 ------                33        L       R2,(N(EOF)+1)(RA1)


                    37  * AT THE END OF EACH BLOCK, THE END OF FILE BIT IS CHECKED TO SEE IF
                    38  * A STOP COMMAND SHOULD BE SENT TO TERMINATE THE READ. THEN THE CALCULATED
                    39  * CRC IS COMPARED AGAINST THE ONE STORED ON THE TAPE. FAILURE OF THIS
                    40  * CHECK DURING A NORMAL READ WILL RESULT IN THE STOPPING OF THE TAPE
                    41  * AND THE INITIATION OF A BLOCK RECOVERY ROUTINE (BCKRECV). THE 'REDVER'
                    42  * SUBSTATE WOULD BE REQUESTED IF THE PRESENT TAPE POSITION WAS BEING
                    43  * UPDATED AT THE TIME THE CRC FAILED.
                    44  *
                    45  * A CORRECT CRC RESULTS IN THE LOADING OF MEMORY WITH THE DATA STORED
                    46  * IN THE INPUTTED BLOCK. EACH BLOCK CONTAINS A LOADING ADDRESS AND A
                    47  * LENGTH FIELD FOR THE CONTAINED DATA.
```

```
0011626                                         01 CRCLOOK
0011626 01 001626 103641 002015                 02        LI     R10,TSTAT          # PREPARE CRC CHECK.
0011630 01 001630 003073 ------                 03        LN     R3,11
0011631 01 001631 023440 ------                 04        SMIO
0011632 01 001632 136060 011632 0011632         05        BX     R3,*
0011634 01 001634 023500 ------                 06        TIO
0011635 01 001635 054027 ------ 0011664         07        BC     CRCOK
0011636                                         08 CRCFAIL
0011636 01 001636 103641 040007                 09        LI     R10,INIT           # STOP THE TAPE UNIT
                                                10 CIPL   OW     0(1640)            # 12432
                                          -001- 11        NOTE   ************** THE FIRST ADDRESS OVERWRITTEN IS 001640 ***********

0011640 01 001640 023440 ------                 14        SMIO
0011641 01 001641 003060 ------                 15        ZR     R3
0011642 01 001642 002063 000017                 16        STM    R3,N(BUFC)(RAO),M(BUFC) # ZERO BUFFER COUNTER
0011644                                         17        EOW                       # 12432
                                          -001- 18        NOTE   **************** THE LAST ADDRESS OVERWRITTEN IS 001643 ***********

0011644                                         21        CALL   TIMOUT
0011644 01 001644 037020 111375 CSYSUB    -001- 22        BSA    TIMOUT
0011646 01 001646 000022 ------ MASACS          23        DATA   REDKON+1
0011647 01 001647 144005 ------                 24        ST     RO,N(TIMKON)(RAO)
0011650 01 001650 061203 ------                 25        SBS    N(TIMING)(RAO),S(TIMING)
0011651 01 001651 051261 ------                 26        TBS    N(RECOV)(RAO),S(RECOV) # IS ERROR RECOVERY INPROGRESS.
0011652 01 001652 054062 ------ 0011734         27        BC     RECOVIP
0011653 01 001653 061261 ------                 28        SBS    N(RECOV)(RAO),S(RECOV) # FLAG RECOVERY STARTED.
0011654 01 001654 051243 ------                 29        TBS    N(STORNOT)(RAO),S(STORNOT)
0011655 01 001655 054004 ------ 0011661.        30        BC     RESTRV
0011656 01 001656 061324 ------                 31        SBS    N(CONRCV)(RAO),S(CONRCV) # FLAG CONT. READ RECOVERY.
0011657 01 001657 003011 ------                 32        LN     RO,BACKORD
0011660 01 001660 053002 ------ 0011662         33        B      STOSUB
0011661                                         34 RESTRV
0011661 01 001661 103003 ------                 35        LN     RO,FASTSTP
0011662                                         36 STOSUB
0011662 01 001662 144000 ------                 37        ST     RO,N(STATE)(RAO)
0011663 01 001663 053477 ------ 0011362         38        B      BBSCHB

0011664                                         42 CRCOK
                                                43 #        A BLOCK OF DATA HAS BEEN BROUGHT INTO MEMORY BY THE TAPE. NOW
                                                44 # DEPENDING UPON THE APPLICATION THE DATA MUST BE STORED OR UNPACKED AND
                                                45 # STORED.
0011664 01 001664 124055 ------                 46        TBN    R2,S(EOF)          #IS THIS AN END OF FILE?
0011665 01 001665 055004 ------ 0011671         47        BNC    NOEOF
0011666 01 001666 003255 ------                 48        LN     R10,TSTOP
                                                49 #STOP TAPE READ. END OF FILE.
```

```
0011667                                                  CALL   ORDOUT
0011667 01 001667 037020 013276 0013276  -001-          BSA    ORDOUT
0011671                                           NOEOF
0011671 01 001671 151261 ------                          TBS    N(RECOV)(RA0),S(RECOV) # WAS A SUCCESSFULL RECOVERY MADE.
0011672 01 001672 054117 ------ 0012011                  BC     RECOVCHK
0011673 01 001673 040421 ------                          L      R1,1(RA1)            # GET BLK. ADDRESS.
0011674 01 001674 004421 ------                          AN     R1,1                 # ADJUST TO INDICATE HEAD POSITION
0011675 01 001675 002021 003777                          STM    R1,N(PTPOS)(RA0),M(PTPOS) # STORE IN CONTROL BLOCK.
0011677 01 001677 051243 ------                          TBS    N(STORNOT)(RA0),S(STORNOT)
0011700 01 001700 054016 ------ 0011716                  BC     DONOTSTR
0011701                                           KEEPGO
0011701 01 001701 151263 ------                          TBS    N(SPECSTOR)(RA0),S(SPECSTOR)
0011702 01 001702 050000 013366 0013366                  BCL    SPECUNL              # A SPECIAL UNPACK ROUTINE IS REQUIRED FOR
                                                                                       THIS FILE.
0011704 01 001704 040702 ------                          L      R12,(N(DATA_AREA)+1)(RA1) # SET UP ADDRESS AND LENGTH FOR DATA
                                                                                       XFER.
0011705 01 001705 040723 ------                          L      R13,(N(DATA_AREA)+2)(RA1)
0011706 01 001706 016414 177760                          LRM    R0,R12,X(FFF0)
0011710 01 001710 010404 ------                          RRN    R0,4
0011711 01 001711 041424 ------                          LA     R1,(N(DATA_AREA)+3)(RA1) # ADJUST FOR UNPACK ROUTINE
0011712 01 001712 007316 ------                          EXR    RA0,RA1
0011713 01 001713 007337 ------                          EXR    RA0+1,RA1+1
0011714                                                  CALL   UNPKWRDS             # MOVE DATA TO STORE
0011714 01 001714 037021 014333 MASACS   -001-          BSA    UNPKWRDS
0011716                                           DONOTSTR
0011716 01 001716 103060 ------                          ZR     R3
0011717 01 001717 072377 ------                          GN     R15,15
0011720 01 001720 072356 ------                          GN     R14,14
0011721 01 001721 041401 ------                          LA     R0,1(RA1)            # ADJUST ADDRESS OF TEMP STORE
0011722 01 001722 072314 ------                          GN     R12,12
0011723 01 001723 072335 ------                          GN     R13,13
0011724 01 001724 002063 000017                          STM    R3,N(BUFC)(RA0),M(BUFC) # INIT BUFFER COUNT
0011726 01 001726 051243 ------                          TBS    N(STORNOT)(RA0),S(STORNOT)
0011727 01 001727 055136 ------ 0012065                  BNC    DOEOFCK
0011730                                           LODEVAL
0011730 01 001730 103461 000007                          LI     R3,EVALPOS
0011732 01 001732 062243 ------                          ZBS    N(STORNOT)(RA0),S(STORNOT)
0011733 01 001733 053135 ------ 0012070                  B      ZRSTATE



0011734                                           RECOVIP
0011734 01 001734 151324 ------                          TBS    N(CONRCV)(RA0),S(CONRCV) # WAS THIS A CONTINUOUS READ RECOVERY.
0011735 01 001735 054045 ------ 0012002                  BC     REQINT               # YES
0011736 01 001736 040023 ------                          L      R1,N(VERT)(RA0)      # PREPARE TO VERIFY OR POSITION ON ADJACENT
                                                                                       TRACK
0011737 01 001737 040041 ------                          L      R2,N(TR)(RA0)
0011740 01 001740 003420 010000                          AI     R1,ES(VERT)          # GO TO NEXT TRACK.
0011742 01 001742 002023 030000                          STM    R1,N(VERT)(RA0),M(VERT) # UPDATE VERIFY TRACK.
```

```
0011744 01 001744 017022 030000            01          CRM     R1,R2,M(VERT)       # HAVE ALL BEEN USED.
0011746 01 001746 054002 ------ 0011750    02          BC      VERECFAL
0011747 01 001747 053712 ------ 0011661    03          B       RESTRV


0011750                                    07 VERECFAL
0011750 01 001750 151304 ------            08          TBS     N(ERNO)(RAO),S(ERNO) #HAS ERROR OCCURRED DURING XLATE CHECK
0011751 01 001751 055011 ------ 0011762    09          BNC     CONTFAL
0011752                                    10 XCHKCLN
0011752 01 001752 103421 140000            11          LI      R1,M(SCHCON1)+M(SCHCON2)
0011754 01 001754 002020 000037            12          STM     R1,N(STATE)(RAO),M(STATE)
                                           13 CIPL     OW      O(1756)             # 13712
                                    -001-  14          NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 001756 **********

0011756 01 001756 002023 140017            17          STM     R1,N(SCHCON1)(RAO),M(SCHCON1)+M(SCHCON2)+M(BUFC)
0011760                                    18          EOW                         # 13712
                                    -001-  19          NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 001757 **********

0011760 01 001760 044024 ------            22          ST      R1,N(DESTON)(RAO)   #INIT STATE AND SCHEDULER BITS TO INDICATE
                                           23 #THAT B CAN NOT USE ITS XLATE
0011761                                    24 NXTSCHB
0011761 01 001761 153401 ------ 0011362    25          B       BBSCHB
0011762                                    26 CONTFAL
0011762 01 001762 103401 000014            27          LI      RO,VERFALST         # PREPARE VERIFY RECOVERY STATE.
0011764 01 001764 062261 ------            28          ZBS     N(RECOV)(RAO),S(RECOV)
0011765 01 001765 051361 ------            29          TBS     N(INTHNR)(RAO),S(INTHNR) # HAS AN UNRECOVERABLE ERROR OCCURRED?
0011766 01 001766 055674 ------ 0011662    30          BNC     STOSUB
0011767                                    31 RPCK
0011767 01 001767 103641 040007            32          LI      R10,INIT
0011771 01 001771 023440 ------            33          SHIO
0011772                                    34          BGNTIM  MSEC=70
0011772                             -001-  35          CALL    TIMOUT
0011772 01 001772 037020 111375 CSYSUB -002- 36        BSA     TIMOUT
0011774 01 001774 000003 ------     -001-  37          DATA    3                   # TIMOUT+1
0011775 01 001775 144005 ------            38          ST      RO,N(TIMKON)(RAO)   #INIT TAPE DEVICE
0011776 01 001776 061203 ------            39          SBS     N(TIMING)(RAO),S(TIMING)
0011777 01 001777 003401 000020            40          LI      RO,PACKINT          # SCHEDULE REPACK AND MRF.
0012001 01 002001 053661 ------ 0011662    41          B       STOSUB


0012002                                    45 REQINT
0012002 01 002002 151304 ------            46          TBS     N(ERNO)(RAO),S(ERNO)
0012003 01 002003 054747 ------ 0011752    47          BC      XCHKCLN
0012004 01 002004 051361 ------            48          TBS     N(INTHNR)(RAO),S(INTHNR) # HAS MATE UNIT FAILED ALSO?
0012005 01 002005 054762 ------ 0011767    49          BC      RPCK                # YES
```

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0012006 01 002006 003401 000016            01          LI      R0,CONREDFAL          # SET UP CONTINUOUS READ FAILURE.
0012010 01 002010 053652 ------ 0011662    02          B       STOSUB


0012011                                    06 RECOVCHK
                                           07 # A RECOVERY ATTEMPT HAS SUCCEEDED. ANALYZE RESULTS.
0012011 01 002011 151243 ------            08          TBS     N(STORNOT)(RA0),S(STORNOT)
0012012 01 002012 055003 ------ 0012015    09          BNC     VERRTN
0012013 01 002013 051324 ------            10          TBS     N(CONRCV)(RA0),S(CONRCV) # WAS THIS A CONT. REAP
0012014 01 002014 054702 ------ 0011716    11          BC      DONOTSTR              # READ RECOVERY NO YET DONE.
0012015                                    12 VERRTN
0012015 01 002015 140461 ------            13          L       R3,1(RA1)
0012016 01 002016 062261 ------            14          ZBS     N(RECOV)(RA0),S(RECOV)
0012017 01 002017 040121 ------            15          L       R5,N(PTPOS)(RA0)     # GET LAST BLOCK READ IN CORRECTLY +1.
0012020 01 002020 006143 ------            16          LR      R6,R3
0012021 01 002021 004541 ------            17          AN      R6,1
0012022 01 002022 002141 003777            18          STM     R6,N(PTPOS)(RA0),M(PTPOS)
0012024 01 002024 051324 ------            19          TBS     N(CONRCV)(RA0),S(CONRCV) # WAS THIS CONT. READ RECOVERY.
0012025 01 002025 055024 ------ 0012051    20          BNC     VERRECHK              # NO
0012026 01 002026 017123 003777            21          CRM     R5,R3,M(PTPOS)        # WAS IT A SUCCESSFUL CONTINUOUS READ
                                                                                       RECOVERY.
0012030 01 002030 055752 ------ 0012002    23          BNC     REQINT                #TREAT THIS AS A READ CONTINUOUS ERROR
0012031 01 002031 062324 ------            24          ZBS     N(CONRCV)(RA0),S(CONRCV)
0012032 01 002032 051361 ------            25          TBS     N(INTHNR)(RA0),S(INTHNR) # WAS THE OTHER UNIT INVOLVED?
0012033 01 002033 054002 ------ 0012035    26          BC      STOPSW
0012034 01 002034 053645 ------ 0011701    27          B       KEEPGO                # RECOVERY COMPLETE AND SUCCESSFUL.


0012035                                    31 STOPSW
0012035 01 002035 103641 040007            32          LI      R10,INIT              # STOP UNIT FOR INTERRUPTED SCHEDULER.
0012037                                    33          CALL    ORDOUT
0012037 01 002037 037020 013276 0013276  -001- 34      BSA     ORDOUT
0012041                                    35          CALL    TIMOUT
0012041 01 002041 137020 111375 CSYSUB   -001- 36      BSA     TIMOUT
0012043 01 002043 000022 ------ MASACS     37          DATA    REDKON+1
0012044 01 002044 144005 ------            38          ST      R0,N(TIMKON)(RA0)    # PREPARE TO WAIT FOR HDW. RECOVERY.
0012045 01 002045 061203 ------            39          SBS     N(TIMING)(RA0),S(TIMING)
0012046 01 002046 003401 000017            40          LI      R0,CLEANSW
0012050 01 002050 053612 ------ 0011662    41          B       STOSUB


0012051                                    45 VERRECHK
0012051 01 002051 140103 ------            46          L       R4,N(VERT)(RA0)
0012052 01 002052 010537 ------            47          RLN     R5,1
0012053 01 002053 017105 030000            48          CRM     R4,R5,M(VERT)         # DOES VERIFY TRACK NEED ADJUSTMENT.
0012055 01 002055 054641 ------ 0011716    49          BC      DONOTSTR
```

```
0012056 01 002056 040104 ------                  L     R4,N(DESTON)(RAO)
0012057 01 002057 017103 003777                  CRM   R4,R3,M(DESTON)      # IS DESTINATION DAMAGED BLOCK?
0012061 01 002061 054667 ------ 0011750          BC    VERECFAL
0012062 01 002062 002123 030000                  STM   R5,N(VERT)(RAO),M(VERT) # ADJUST VERIFY TRACK.
0012064 01 002064 053632 ------ 0011716          B     DONOTSTR


                                  *
                                  * A CHECK IS MADE AFTER THE DATA IS STORED TO SEE IF THE 'READON' SUBSTATE
                                  * HAS COMPLETED ITS TASK (EOF BIT SET) AND IF THE SCHEDULER SHOULD BE
                                  * PLACED INTO ITS HOME OR ZERO SUBSTATE. THIS WILL RESULT IN THE CONTINUED
                                  * SEARCH OF THE CHECKSUM RESULT WORK TABLE OR THE IDLING OF THE SCHEDULER.


0012065                                    DOEOFCK
0012065 01 002065 124055 ------                  TBN   R2,S(EOF)            # CHECK IF WHOLE 4K HAS BEEN ENTERED.
0012066 01 002066 054002 ------ 0012070          BC    ZRSTATE
0012067 01 002067 053407 ------ 0011476          B     STREAD

0012070                                    ZRSTATE
0012070 01 002070 144060 ------                  ST    R3,N(STATE)(RAO)
0012071 01 002071 040460 ------                  L     R3,N(BLKADR)(RA1)
0012072 01 002072 004461 ------                  AN    R3,1                 # ADJUST PTP
0012073 01 002073 051264 ------                  TBS   N(ACTSEQ)(RAO),S(ACTSEQ) #BACKSPACE POSITIONING WAS ACTIVE
                                           # CHECK IF DESTINATION SHOULD BE REACHED.
0012074 01 002074 055025 ------ 0012121          BNC   NOACTSEQ
0012075 01 002075 040044 ------                  L     R2,N(DESTON)(RAO)
0012076 01 002076 062264 ------                  ZBS   N(ACTSEQ)(RAO),S(ACTSEQ)
0012077 01 002077 017043 003777                  CRM   R2,R3,M(PTPOS)       #HAS DESTINATION BEEN REACHED?
0012101 01 002101 054020 ------ 0012121          BC    NOACTSEQ
0012102 01 002102 040023 ------                  L     R1,N(VERT)(RAO)      #BEGIN POSITIONING ERROR RECOVERY.
0012103 01 002103 003420 010000                  AI    R1,ES(VERT)
0012105 01 002105 002023 030000                  STM   R1,N(VERT)(RAO),M(VERT)
0012107 01 002107 040041 ------                  L     R2,N(TR)(RAO)
0012110 01 002110 017041 030000                  CRM   R2,R1,M(TR)          #HAVE ALL TRACKS BEEN USED TO POSITION.
0012112 01 002112 061261 ------                  SBS   N(RECOV)(RAO),S(RECOV)
0012113 01 002113 054635 ------ 0011750          BC    VERECFAL             #TREAT LIKE VERIFY FAILURE.
0012114 01 002114 062261 ------                  ZBS   N(RECOV)(RAO),S(RECOV)
0012115 01 002115 003461 000006                  LI    R3,REDVERST          #RE-VERIFY AND ATTEMPT POSITIONING
0012117 01 002117 044060 ------                  ST    R3,N(STATE)(RAO)
0012120 01 002120 053007 ------ 0012127          B     SETIMEL
```

```
0012121                                  NOACTSEQ
0012121 01 002121 102061 003777                   STM    R3,N(PTPOS)(RA0),M(PTPOS)
0012123 01 002123 061123 ------                   SBS    N(PTPKNOWN)(RA0),S(PTPKNOWN)
0012124 01 002124 040021 ------                   L      R1,N(TR)(RA0)
0012125 01 002125 002023 030000                   STM    R1,N(VERT)(RA0),M(VERT) #RE-ESTABLISH VERIFY TRACK IN
                                         # CASE OF ERROR ON BACKSPACE POSITIONING.
0012127                                  SETIMEL
0012127 01 002127 137000 011420 0011420           BL     SETIME


                         *
                         * BCKRECV SUBSTATE
                         *
                         * THIS SUBSTATE INITIATES A RECOVERY ATTEMPT ON A BLOCK OF DATA WHICH
                         * HAS FAILED THE CRC CHECK. UPON FAILURE, THE TAPE HAS BEEN STOPPED
                         * AND THIS SUBSTATE REQUESTED. A BACKSPACE WILL BE EXECUTED TO POSITION
                         * THE TAPE AHEAD OF THE BLOCK TO BE RECOVERED. NEXT THE TAPE IS STARTED
                         * TO READ AND NORMAL SCHEDULER SEQUENCING IS CONTINUED.
                         *
                         *
                         * CONTINUED ERROR RECOVERY
                         *
                         * IF THE RE-READ FAILS, THE NEXT PHASE OF ERROR RECOVERY INVOLVES
                         * INVOKING THE USE OF THE MATE TAPE. THE REQUEST IS PLANTED IN
                         * THE SCHEDULER'S CONTROL BLOCK THAT IS USING THE MATE UNIT. WHEN
                         * HONORED, THE BLOCK IN ERROR IS READ OFF OF IT AND THEN CONTROL
                         * IS PASSED BACK TO IT. THE INTERRUPTING SCHEDULER THEN CONTINUES
                         * ON ITS ORIGINAL TAPE. A NUMBER OF SUBSTATES ARE USED IN THIS PROCESS.


0012131                                  BCKRECV
0012131 01 002131 103401 000012                   LI     R0,REDRCV
0012133 01 002133 044000 ------                   ST     R0,N(STATE)(RA0)
0012134 01 002134 037000 011351 0011351           BL     DOBKUP


                         *
                         *
                         * ONCE THE 'A' SCHEDULER HAS COMPLETED ITS PRIMARY OBJECTIVE, THE TASK
                         * OF DETERMINING IF THE 'B' AND 'C' SCHEDULERS HAVE BEEN ABLE TO
                         * UNDERTAKE AND COMPLETE THEIR WORK MUST BE STARTED. FIRST THE STATUS OF
                         * THE OTHER TAPE UNIT IS INTERROGATED. IF IT IS MARKED OUT OF SERVICE,
                         * THE 'A' SCHEDULER HAS DETERMINED THAT THE 'B' AND 'C' SCHEDULERS WERE
                         * INOPERATIVE. AT THIS POINT THE 'A' SCHEDULER REWINDS THE TAPE UNIT IT
                         * HAS JUST USED AND CHANGES THE 'B' AND 'C' SCHEDULERS MEMORY SO THAT THEY
                         * CAN UTILIZE THIS WORKING TAPE TO COMPLETE THEIR WORK. THEY 'A' SCHEDULER
```

```
 * NOW MARKS THE 'B' AND 'C' SCHEDULERS TAPE UNIT INSERVICE WHICH WILL
 * AUTOMATICALLY ACTIVATE THEM. ONCE THEY ARE ACTIVE THE 'A' SCHEDULER
 * GOES DORMANT JUST AS IT WOULD HAVE IF THE 'B' AND 'C' SCHEDULERS HAD
 * NOT RUN INTO DIFFICULTY WITH THEIR TAPE UNIT.


 *
 *
 * THE 'B' SCHEDULER IS CHARGED WITH RELOADING THE SYSTEM PARAMETERS
 * (TRANSLATION) LOCATED ON TRACK 2 OF THE TAPE (IF ANY EXISTS). IT,
 * LIKE THE 'A' SCHEDULER, HAS ITS OWN CHECKSUM TABLE SUBSTATE AND
 * UTILIZES THE REMAINING COMMON SUBSTATES TO POSITION, READ AND
 * RELOAD MEMORY.


0012136                                  BSCHEDULE


0012136 01 002136 103006 ------                  LN     R0,6
0012137 01 002137 034400 013510 0013510          STL    R0,NXTSCH
0012141 01 002141 030740 013557 0013557          LL     RA1,TEMPAD
0012143 01 002143 030760 013560 0013560          LL     RA1+1,TEMPAD+1      #SET UP ADDRESS WITHOUT ACCESSING STORE.
0012145 01 002145 072756 ------                  HN     R14,14
0012146 01 002146 072777 ------                  HN     R15,15
0012147 01 002147 031040 013527 0013527          LAL    R2,BSTATE,RA0       # SET UP B SCHEDULER CONTROL BLOCK ADDRESS
0012151 01 002151 072714 ------                  HN     R12,12
0012152 01 002152 072735 ------                  HN     R13,13
0012153 01 002153 051341 ------                  TBS    N(INTREQ)(RA0),S(INTREQ) #HAS INTERRUPTION REQUEST BEEN MADE
0012154 01 002154 055010 ------ 0012164          BNC    NOCHANCE
0012155 01 002155 051361 ------                  TBS    N(INTHNR)(RA0),S(INTHNR) #HAS INTERRUPTION BEEN ALLOWED?
0012156 01 002156 054603 ------ 0011761          BC     NXTSCHB
0012157 01 002157 051163 ------                  TBS    N(TUOOS)(RA0),S(TUOOS) #HAS B SCH. BEEN DELAYED?
0012160 01 002160 055004 ------ 0012164          BNC    NOCHANCE
0012161 01 002161 051343 ------                  TBS    N(SCHCON1)(RA0),S(SCHCON1)
0012162 01 002162 055002 ------ 0012164          BNC    NOCHANCE            #NO INT. ALLOWED WHILE XLATE CHECK IS MADE
0012163 01 002163 061361 ------                  SBS    N(INTHNR)(RA0),S(INTHNR) #B DELAYED. ALLOW REQUEST.
0012164                                  NOCHANCE
0012164 01 002164 140222 ------                  L      R9,N(EA)(RA0)       # SET UP ENABLE ADDRESS.
0012165 01 002165 051203 ------                  TBS    N(TIMING)(RA0),S(TIMING) # CHECK IF SUBSTATE IS TIMING.
0012166 01 002166 055040 ------ 0012226          BNC    PAXOFF
0012167 01 002167 040005 ------                  L      R0,N(TIMKON)(RA0)
0012170                                          CALL   TIMCHKALT           # CHECK IF TIMEOUT DONE.
0012170 01 002170 037020 013403 0013403   -001-          BSA    TIMCHKALT
0012172 01 002172 154265 ------ 0012457          BC     CSCHEDUL
0012173 01 002173 062203 ------                  ZBS    N(TIMING)(RA0),S(TIMING)
                                         # THIS SEGMENT OF CODE WILL EXAMINE THE CHECKSUM FILE
```

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                                                   # SO THAT IT CAN BE DETERMINED IF THE XLATE ON THIS TAPE
                                                   # IS GOOD.
0012174 01 002174 051343 ------                             TBS     N(SCHCON1)(RA0),S(SCHCON1) #HAS INTERROGATION BEEN COMPLETED?
0012175 01 002175 054031 ------ 0012226                     BC      PAXOFF
0012176 01 002176 051304 ------                             TBS     N(ERNO)(RA0),S(ERNO) #IS INTERROGATION ACTIVE?
0012177 01 002177 054027 ------ 0012226                     BC      PAXOFF
0012200 01 002200 061304 ------                             SBS     N(ERNO)(RA0),S(ERNO) #FLAG INTERROGATION OF CHKSUM FILE ACTIVE
0012201 01 002201 030400 013511 0013511                     LL      R0,MATEOOS
0012203 01 002203 014000 ------                             TZ      R0                  #SHOULD CHECK BE MADE
0012204 01 002204 054006 ------ 0012212                     BC      UNITOK              #YES
0012205                                            DONSET
0012205 01 002205 162304 ------                             ZBS     N(ERNO)(RA0),S(ERNO)
0012206 01 002206 061343 ------                             SBS     N(SCHCON1)(RA0),S(SCHCON1) #MATE IS OOS - USE THIS XLATE
0012207 01 002207 003000 ------                             ZR      R0
0012210 01 002210 044000 ------                             ST      R0,N(STATE)(RA0)    #CLEAR STATE IN CASE OF MATE TAPE REMOVAL
0012211 01 002211 053072 ------ 0012303                     B       CHECKTBLOFF         #DURING CHECK OF XLATE
0012212                                            UNITOK
0012212 01 002212 130400 013520 0013520                     LL      R0,ASTATE+N(STATE)
0012214 01 002214 024007 ------                             TBN     R0,S(TUOOS)         #HAS A SCH. XLATE BEEN MAKED UNSEABLE?
0012215 01 002215 054770 ------ 0012205                     BC      DONSET              #YES
0012216 01 002216 030420 013500 0013500                     LL      R1,BASEGENR
0012220 01 002220 003420 000000 MASACS                      SI      R1,BLKPERCK-1
0012222 01 002222 002024 003777                             STM     R1,N(DESTON)(RA0),M(DESTON) #PREPARE TO RETRIEVE 1ST CHECKSUM BLK
0012224 01 002224 037000 011426 0011426                     BL      VERIT


0012226                                            PAXOFF
0012226 01 002226 110457 ------                             RLN     R2,1
0012227 01 002227 056002 ------                             BPAX    R2
0012230 01 002230 137000 012303 0012303                     BL      CHECKTBLOFF
0012232                                            XFASTPOS
0012232 01 002232 137000 011363 0011363                     BL      FASTPOS
0012234                                            XSLOWPOS
0012234 01 002234 137000 011274 0011274                     BL      SLOWPOS
0012236                                            XFSTOPTST
0012236 01 002236 137000 011411 0011411                     BL      FSTOPTST
0012240                                            XVERIT
0012240 01 002240 137000 011426 0011426                     BL      VERIT
0012242                                            XSCANSTP
0012242 01 002242 137000 011441 0011441                     BL      SCANSTP
0012244                                            XREDVER
0012244 01 002244 137000 011451 0011451                     BL      REDVER
0012246                                            XREEVAL
0012246 01 002246 137000 011506 0011506                     BL      REEVAL
0012250                                            XREADON
0012250 01 002250 137000 011546 0011546                     BL      READON
0012252                                            XBCKRECV1
0012252 01 002252 137000 011161 0011161                     BL      BCKRECV1
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0012254                                        XSTREAD1
0012254 01 002254 137000 011322 0011322                 BL      STREAD1
0012256                                        XCHKTIM
0012256 01 002256 137000 011512 0011512                 BL      CHKTIM
0012260                                        XAVERREC
0012260 01 002260 137000 011123 0011123                 BL      AVERREC
0012262 01 002262 137000 012273 0012273                 BL      BVERCONT
0012264 01 002264 137000 012423 0012423                 BL      BREDCON
0012266 01 002266 137000 012731 0012731                 BL      BSCHCLN
0012270 01 002270 137000 012741 0012741                 BL      REPKMRF
0012272 01 002272 153000 ------ 0012272                 B       *


0012273                                        BVERCONT
0012273 01 002273 130400 013523 0013523                 LL      R0,ASTATE+N(STUS)
0012275 01 002275 024006 ------                         TBN     R0,S(STUS)          # CAN A SCHEDULER TAPE BE USED YET.
0012276 01 002276 055274 ------ 0012572                 BNC     LONGSCHED           #WAIT
0012277 01 002277 030620 013522 0013522                 LL      R9,ASTATE+N(EA)
0012301 01 002301 044222 ------                         ST      R9,N(EA)(RA0)
0012302 01 002302 053730 ------ 0012232                 B       XFASTPOS


                      *
                      *
                      * THE 'B' SCHEDULER'S 'CHECKTBLOFF' SUBSTATE IS ITS HOME OR ZERO SUBSTATE.
                      * IT FIRST CHECKS IF THE 'B' SCHEDULER HAS COMPLETED ITS WORK. IF NOT,
                      * IT CHECKS IF IT IS OPERATIVE. IN OTHER WORDS, IS ITS TAPE UNIT IN SERVICE.
                      * IF IT HAS AN OPERATIVE UNIT, IT CHECKS IF SUFFICIENT TIME HAS ELAPSED
                      * TO ALLOW ANY PREVIOUS TAPE MOTION TO SETTLE DOWN. IF SO IT BEGINS ITS
                      * TABLE SEARCHES AND DATA RELOAD ROUTINES SIMILAR TO THE 'A' SCHEDULER.


0012303                                        CHECKTBLOFF
0012303 01 002303 151341 ------                         TBS     N(INTREQ)(RA0),S(INTREQ) #HAS AN INTERRUPTION REQ. BEEN MADE
0012304 01 002304 055003 ------ 0012307                 BNC     CONTINUB
0012305 01 002305 061361 ------                         SBS     N(INTHNR)(RA0),S(INTHNR) #ALLOW INT.
0012306 01 002306 053151 ------ 0012457                 B       CSCHEDUL
0012307                                        CONTINUB
0012307 01 002307 151143 ------                         TBS     N(STUS)(RA0),S(STUS) # CHECK IF B SCHEDULER DONE.
0012310 01 002310 054147 ------ 0012457                 BC      CSCHEDUL
0012311 01 002311 051163 ------                         TBS     N(TUOOS)(RA0),S(TUOOS) # CHECK IF B SCHEDULER IS INOPERATIVE
0012312 01 002312 054145 ------ 0012457                 BC      CSCHEDUL
0012313 01 002313 051223 ------                         TBS     N(BSBOT)(RA0),S(BSBOT) # CHECK IF TAPE HAS BEEN STABLIZED.
0012314 01 002314 054012 ------ 0012326                 BC      SETTRK
0012315 01 002315 061223 ------                         SBS     N(BSBOT)(RA0),S(BSBOT) # FLAG TAPE IN POSITION TO READ.
0012316 01 002316 061203 ------                         SBS     N(TIMING)(RA0),S(TIMING)
```

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0012317                                             01          CALL    TIMOUT
0012317 01 002317 037020 111375 CSYSUB      -001-  02          BSA     TIMOUT
0012321 01 002321 000022 ------ MASACS             03          DATA    REDKON+1
0012322 01 002322 144005 ------                    04          ST      RO,N(TIMKON)(RAO)     # REQUEST A TIME DELAY BEFORE CONTINUING
0012323 01 002323 061301 ------                    05          SBS     N(TR)(RAO),S(TR)      # SET UP FOR TRACK 2 READS.
0012324 01 002324 061303 ------                    06          SBS     N(VERT)(RAO),S(VERT)  # SET UP VERIFY TRACK.
0012325 01 002325 053132 ------ 0012457            07          B       CSCHEDUL

0012326                                             09 SETTRK
0012326 01 002326 103421 020000                    10          LI      R1,2*ES(TR)           # PREPARE TO READ TRACK 3 XLATE.
0012330 01 002330 002021 030000                    11          STM     R1,N(TR)(RAO),M(TR)
0012332 01 002332 002023 030000                    12          STM     R1,N(VERT)(RAO),M(VERT)


0012334                                             16 CHECKIT
                                                   17 # READY TO RELOAD IF NEEDED. SEARCH CHECKSUM TABLE.
0012334 01 002334 131400 013561 0003561            18          LAL     RO,CHKSUM,RA1         #SET CHKSUM ADDRESS.
0012336 01 002336 041405 ------                    19          LA      RO,S(RA1)             #WORK TABLE.
0012337 01 002337 030420 013554 0013554            20          LL      R1,BLKINCOF           # LOGICAL INDEX INTO TAPE FILE
0012341 01 002341 030460 013556 0013556            21          LL      R3,BLKDIGOFF          # WORK TABLE INDEX
0012343 01 002343 030440 013507 0013507            22          LL      R2,BXKONOFF           # NUMBER OF 4K SEG. ON TRK 2
0012345                                             23 DOLOOK
0012345 01 002345 136040 012351 0012351            24          BX      R2,VERSUM             # IF ANY CHECKSUM RESULTS LEFT, DO LOOKUP
0012347 01 002347 061143 ------                    25          SBS     N(STUS)(RAO),S(STUS)  # FLAG B SCHEDULER DONE.
0012350 01 002350 053107 ------ 0012457            26          B       CSCHEDUL


0012351                                             30 VERSUM
0012351 01 002351 142403 ------                    31          LX      RO,R3(RA1)            # GET WORK TABLE ENTRY.
0012352 01 002352 004461 ------                    32          AN      R3,1
0012353 01 002353 034460 013556 0013556            33          STL     R3,BLKDIGOFF          # INCREMENT AND STORE WORK TABLE INDEX
0012355 01 002355 024017 ------                    34          TBN     RO,S(TSFLG)
0012356 01 002356 054767 ------ 0012345            35          BC      DOLOOK
0012357 01 002357 003420 000005 MASACS             36          AI      R1,BLK4K              # ADD TO TAPE FILE INDEX BLOCKS PER 4K.
0012361 01 002361 024016 ------                    37          TBN     RO,S(FORCOPY)
0012362 01 002362 055763 ------ 0012345            38          BNC     DOLOOK                # NOTHING WRONG WITH THIS 4K BLOCK.


                                                   42 # A BLOCK OF XLATE MUST BE LOADED. INITIATE LOOKUP.
0012363 01 002363 034420 013554 0013554            43          STL     R1,BLKINCOF           # STORE LOGICAL TAPE INDEX AWAY.
0012365 01 002365 034440 013507 0013507            44          STL     R2,BXKONOFF           # STORE BX CONSTANT
0012367 01 002367 044024 ------                    45          ST      R1,N(DESTON)(RAO)     # SET UP DESTINATION OF BAD 4K BLK.
0012370 01 002370 051123 ------                    46          TBS     N(PTPKNOWN)(RAO),S(PTPKNOWN) # IS VERIFICATION OF POSITION
                                                                                               REQUIRED.
0012371 01 002371 050400 011451 0011451            48          BNCL    REDVER                # YES
0012373 01 002373 037000 011506 0011506            49          BL      REEVAL
```

```
0012375                                    AREDCON
                                           # A SCHEDULER CONTINUOUS READ RECOVERY ROUTINE.
0012375 01 002375 130400 013511 0013511              LL      R0,MATEOOS
0012377 01 002377 014000 ------                      TZ      R0                    # HAS AN UNRECOVERABLE ERROR OCCURRED.
0012400 01 002400 050400 011767 0011767              BNCL    RPCK
0012402 01 002402 031400 013530 0013530              LAL     R0,BSTATE+N(INTHNR),RA1
0012404 01 002404 061740 ------                      SBS     0(RA1),S(INTREQ)      # MAKE INTERRUPTION REQUEST
0012405 01 002405 024017 ------                      TBN     R0,S(INTHNR)          # HAS B ALLOWED INTERRUPTION?
0012406 01 002406 050400 011146 0011146              BNCL    NEXTSCHED
0012410 01 002410 044226 ------                      ST      R9,N(EASV)(RA0)       # SAVE ORIGINAL EA.
0012411 01 002411 030620 013531 0013531              LL      R9,BSTATE+N(EA)
0012413                                    GOFIN
0012413 01 002413 144222 ------                      ST      R9,N(EA)(RA0)         # ESTABLISH NEW EA.
0012414 01 002414 061361 ------                      SBS     N(INTHNR)(RA0),S(INTHNR) # FLAG USE OF OTHER UNIT FOR RECOVERY.
0012415 01 002415 040021 ------                      L       R1,N(PTPOS)(RA0)
0012416 01 002416 002024 003777                      STM     R1,N(DESTON)(RA0),M(PTPOS) # ESTABLISH NEW DESTINATION
0012420 01 002420 072356 ------                      GN      RA1,RA1
0012421 01 002421 072377 ------                      GN      RA1+1,RA1+1
0012422 01 002422 053616 ------ 0012240              B       XVERIT


0012423                                    BREDCON
                                           # B SCHEDULER CONTINUOUS READ RECOVERY ROUTINE.
0012423 01 002423 130400 013511 0013511              LL      R0,MATEOOS
0012425 01 002425 014000 ------                      TZ      R0                    # IF MATE IS OOS REPACK AND MRF.
0012426 01 002426 050400 011767 0011767              BNCL    RPCK
0012430 01 002430 030620 013522 0013522              LL      R9,ASTATE+N(EA)
0012432 01 002432 030400 013521 0013521              LL      R0,ASTATE+N(INTHNR)
0012434 01 002434 024017 ------                      TBN     R0,S(INTHNR)          # HAS A SCHEDULER HONORED REQUEST.
0012435 01 002435 054006 ------ 0012443              BC      REQUGO
0012436 01 002436 030620 013540 0013540              LL      R9,CSTATE+N(EA)
0012440 01 002440 030400 013537 0013537              LL      R0,CSTATE+N(INTHNR) # HAS C SCHEDULER HONORED REQUEST?
0012442 01 002442 055004 ------ 0012446              BNC     MAKERQ
0012443                                    REQUGO
0012443 01 002443 140202 ------                      L       R8,N(EA)(RA0)
0012444 01 002444 044206 ------                      ST      R8,N(EASV)(RA0)       # SAVE OLD EA.
0012445 01 002445 053746 ------ 0012413              B       GOFIN


0012446                                    MAKERQ
                                           # MAKE REQUEST TO NEXT SCHEDULER ABLE TO HELP.
0012446 01 002446 131400 013520 0013520              LAL     R0,ASTATE,RA1
0012450 01 002450 051543 ------                      TBS     N(STUS)(RA1),S(STUS) # IS A SCHEDULER DONE?
0012451 01 002451 055003 ------ 0012454              BNC     MAKEIT
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0012452 01 002452 031400 013536 0013536         01          LAL     R0,CSTATE,RA1
0012454                                         02 MAKEIT
                                                03 CIPL     OW      0(2454)               # 13712
                                         -001-  04          NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 002454 **********


                                                07 DDELETE NOTE     1
0012454 01 002454 061741 ------                 08          SBS     N(INTREQ)(RA1),S(INTREQ) #MAKE REQUEST TO A OR C SCHEDULAR
0012455                                         09          EOW                           # 13712
                                         -001-  10          NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 002454 **********

0012455 01 002455 037000 011146 0011146         13          BL      NEXTSCHED




                        20  *
                        21  *
                        22  * THE 'C' SCHEDULER BECOMES ACTIVE WHEN THE 'B' SCHEDULER HAS TERMINATED
                        23  * ITS WORK AND HAS GONE DORMANT. THE 'C' SCHEDULER IS RESPONSIBLE FOR
                        24  * OVER WRITING THE NOW RELOADED STORE WITH PATCHES LOCATED IN THE
                        25  * PATCH FILE JUST BEYOND THE LAST BLOCK OF THE SYSTEM PARAMETERS.
                        26  * IT WILL RELOAD EVERY CURRENT PATCH AND ALL PATCH AREAS FOR BOTH
                        27  * RESIDENT AND PAGED PROGRAMS. THE MECHANICS OF THIS SCHEDULER ARE
                        28  * SIMILAR TO THE 'A' AND 'B' SCHEDULERS EXECPT THAT THERE IS NO EXACT
                        29  * COPY OF THE DATA BLOCK FROM THE TEMPORARY I/O BUFFER TO MEMORY. SPECIAL
                        30  * UNPACKING IS DONE TO EXTRACT THE PATCHES SINCE MORE THAN JUST THE
                        31  * OVERWRITES EXIST IN THE PATCH FILES.
                        32  *
                        33  *
                        34  * THE 'C' SCHEDULER WILL PASS CONTROL TO AN APPLICATION PROGRAM AT THIS
                        35  * POINT TO CHECK IF ANY SPECIFIC APPLICATION TAPE MANIPULATION IS REQUIRED.
                        36  * AS LONG AS THE APPLICATION CODE RETURNS WITH AN ACTIVE STATUS, THE
                        37  * 'C' SCHEDULER WILL CONTINUE THE LOOP. AN INACTIVE STATUS WILL BEGIN THE
                        38  * TERMINATION OF BOOTSTRAP.


0012457                                         42 CSCHEDUL
0012457 01 002457 103000 ------                 43          ZR      R0
0012460 01 002460 034400 013510 0013510         44          STL     R0,NXTSCH
0012462 01 002462 031440 045265 LAYOUT          45          LAL     R2,I_OBUF-1,RA1
0012464 01 002464 072756 ------                 46          HN      R14,14
0012465 01 002465 072777 ------                 47          HN      R15,15
0012466 01 002466 031040 013536 0013536         48          LAL     R2,CSTATE,RA0         # SET UP C SCHEDULER CONTROL BLOCK ADDRESS
0012470 01 002470 072714 ------                 49          HN      R12,12
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0012471 01 002471 072735 ------                   HN     R13,13
0012472 01 002472 051341 ------                   TBS    N(INTREQ)(RAO),S(INTREQ) #CHECK FOR INT. REQ.
0012473 01 002473 055003 ------ 0012476           BNC    CONTINC
0012474 01 002474 051361 ------                   TBS    N(INTHNR)(RAO),S(INTHNR) #HAS IT BEEN ALLOWED?
0012475 01 002475 055021 ------ 0012516           BNC    OUT
0012476                                   CONTINC
0012476 01 002476 140222 ------                   L      R9,N(EA)(RAO)
0012477 01 002477 014231 ------                   TZ     R9                  # HAS C SCHEDULER BEEN STARTED.
0012500 01 002500 055025 ------ 0012525           BNC    CSTARTED
0012501 01 002501 030600 013522 0013522           LL     R8,EAON             #GET A AND B SCHEDULERS ENABLE ADDRESSES.
0012503 01 002503 030620 013531 0013531           LL     R9,EAOFF
0012505 01 002505 030400 013523 0013523           LL     RO,STATON
0012507 01 002507 024006 ------                   TBN    RO,S(STUS)          #IS THE A SCHEDULER DONE.
0012510 01 002510 055006 ------ 0012516           BNC    OUT
0012511 01 002511 030400 013532 0013532           LL     RO,STATOFF
0012513 01 002513 020211 ------                   CR     R8,R9               #HAS THE A & B SCHEDULERS USED SAME TAPE
0012514 01 002514 055005 ------ 0012521           BNC    BCK
0012515 01 002515 024006 ------                   TBN    RO,S(STUS)          # IS B SCHEDULER DONE.
0012516                                   OUT
0012516 01 002516 150400 010774 0010774           BNCL   BOOTLOOP
0012520 01 002520 053004 ------ 0012524           B      GETEAIN
0012521                                   BCK
0012521 01 002521 124006 ------                   TBN    RO,S(STUS)          # IS B SCHEDULER DONE.
0012522 01 002522 054002 ------ 0012524           BC     GETEAIN
0012523 01 002523 006230 ------                   LR     R9,R8
0012524                                   GETEAIN
0012524 01 002524 144222 ------                   ST     R9,N(EA)(RAO)       #SET UP C SCHEDULERS EA ADDRESS
0012525                                   CSTARTED
0012525 01 002525 151203 ------                   TBS    N(TIMING)(RAO),S(TIMING) # CHECK SUBSTATE TIMING
0012526 01 002526 055007 ------ 0012535           BNC    PAXC
0012527 01 002527 040005 ------                   L      RO,N(TIMKON)(RAO)
0012530                                           CALL   TIMCHKALT           # SEE IF REQUIRED TIME HAS ELAPSED.
0012530 01 002530 037020 013403 0013403 -001-     BSA    TIMCHKALT
0012532 01 002532 150000 010774 0010774           BCL    BOOTLOOP
0012534 01 002534 062203 ------                   ZBS    N(TIMING)(RAO),S(TIMING)
0012535                                   PAXC
0012535 01 002535 156002 ------                   BPAX   R2
0012536 01 002536 153022 ------ 0012560           B      CMON
0012537 01 002537 153473 ------ 0012232           B      XFASTPOS
0012540 01 002540 153474 ------ 0012234           B      XSLOWPOS
0012541 01 002541 153475 ------ 0012236           B      XFSTOPTST
0012542 01 002542 153476 ------ 0012240           B      XVERIT
0012543 01 002543 153477 ------ 0012242           B      XSCANSTP
0012544 01 002544 153500 ------ 0012244           B      XREDVER
0012545 01 002545 153501 ------ 0012246           B      XREEVAL
0012546 01 002546 153502 ------ 0012250           B      XREADON
0012547 01 002547 153503 ------ 0012252           B      XBCKRECV1
0012550 01 002550 153504 ------ 0012254           B      XSTREAD1
0012551 01 002551 153505 ------ 0012256           B      XCHKTIM
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0012552 01 002552 153506 ------ 0012260        01         B       XAVERREC
0012553 01 002553 153033 ------ 0012606        02         B       CVERCONT
0012554 01 002554 153051 ------ 0012625        03         B       CREDCON
0012555 01 002555 153102 ------ 0012657        04         B       ASCHCLN
0012556 01 002556 153163 ------ 0012741        05         B       REPKMRF
0012557 01 002557 153000 ------ 0012557        06         B       *

0012560                                        08 CMON
0012560 01 002560 161263 ------                09         SBS     N(SPECSTOR)(RAO),S(SPECSTOR)
0012561 01 002561 051123 ------                10         TBS     N(PTPKNOWN)(RAO),S(PTPKNOWN) # HAS FILE BEEN LOCATED???
0012562 01 002562 050400 011451 0011451        11         BNCL    REDVER              # SHOULD BE IN GAP OR AT BOT.
0012564 01 002564 040021 ------                12         L       R1,N(PTPOS)(RAO)
0012565 01 002565 002024 003777                13         STM     R1,N(DESTON)(RAO),M(PTPOS)
0012567 01 002567 051341 ------                14         TBS     N(INTREQ)(RAO),S(INTREQ) #IS AN INTERRUPT REQ. PENDING
0012570 01 002570 055004 ------ 0012574        15         BNC     LOOKATB
0012571 01 002571 061361 ------                16         SBS     N(INTHNR)(RAO),S(INTHNR) #ALLOW INTERRUPT
0012572                                        17 LONGSCHED
0012572 01 002572 137000 011146 0011146        18         BL      NEXTSCHED
0012574                                        19 LOOKATB
0012574 01 002574 130400 013532 0013532        20         LL      RO,STATOFF          # IF B SCHEDULER DONE, TERMINATE BOOTSTRAP.
0012576 01 002576 022007 ------                21         ZBN     RO,S(TUOOS)         #START B IF IT WAS WAITING ON C.
0012577 01 002577 034400 013532 0013532        22         STL     RO,STATOFF
0012601 01 002601 024006 ------                23         TBN     RO,S(STUS)
0012602 01 002602 050400 010774 0010774        24         BNCL    BOOTLOOP
0012604 01 002604 037001 016326 MASACS         25         BL      APPTRL


0012606                                        29 CVERCONT
0012606 01 002606 130400 013532 0013532        30         LL      RO,BSTATE+N(STUS)
0012610 01 002610 024006 ------                31         TBN     RO,S(STUS)          # IS B SCHEDULER DONE?
0012611 01 002611 055705 ------ 0012516        32         BNC     OUT                 # MUST HAVE USED A SCHEDULERS TAPE
0012612 01 002612 030600 013531 0013531        33         LL      R8,BSTATE+N(EA)
0012614 01 002614 020211 ------                34         CR      R8,R9               # DID C USE B SCHEDULERS TAPE
0012615 01 002615 054005 ------ 0012622        35         BC      GETAEA
0012616 01 002616 006230 ------                36         LR      R9,R8               # USE B SCHEDULERS TAPE
0012617                                        37 STREA
0012617 01 002617 144222 ------                38         ST      R9,N(EA)(RAO)
0012620 01 002620 037000 011411 0011411        39         BL      FSTOPTST            # CONTINUE RELOAD.
0012622                                        40 GETAEA
0012622 01 002622 130620 013522 0013522        41         LL      R9,N(EA)+ASTATE     # USE A SCHEDULERS TAPE.
0012624 01 002624 053773 ------ 0012617        42         B       STREA
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0012625                                          01 CREDCON
                                                 02 # THE C SCHEDULER'S READ CONTINUOUS ERROR RECOVERY.
0012625 01 002625 130400 013511 0013511          03        LL      RO,MATEOOS
0012627 01 002627 014000 ------                  04        TZ      RO                       # CAN REOVERY TAKE PLACE.
0012630 01 002630 050400 011767 0011767          05        BNCL    RPCK                     # NO
0012632 01 002632 031400 013527 0013527          06        LAL     RO,BSTATE,RA1
0012634 01 002634 051543 ------                  07        TBS     N(STUS)(RA1),S(STUS)
0012635 01 002635 050400 011146 0011146          08        BNCL    NEXTSCHED
0012637 01 002637 040602 ------                  09        L       R8,N(EA)(RA1)
0012640 01 002640 020211 ------                  10        CR      R8,R9                    # IS B AND C EA'S SAME?
0012641 01 002641 055003 ------ 0012644          11        BNC     USEBUSE
0012642 01 002642 030600 013522 0013522          12        LL      R8,ASTATE+N(EA)          # US A SCHEDULERS TAPE.
0012644                                          13 USEBUSE
0012644 01 002644 144226 ------                  14        ST      R9,N(EASV)(RAO)          # SAVE OLD EA.
0012645 01 002645 006230 ------                  15        LR      R9,R8
0012646 01 002646 053545 ------ 0012413          16        B       GOFIN
0012647                                          17 APPTRLR


                        21   *
                        22   *
                        23   * THE COMPLETION OF THE APPLICATION SEGMENT WILL BE FOLLOWED BY THE FINAL
                        24   * TASK OF THE 'C' SCHEDULER. IT WILL SCAN THE 'A' SCHEDULER'S CONTROL
                        25   * BLOCK TO CHECK IF IT HAS TERMINATED ITS WORK. WHEN ALL THREE SCHEDULERS
                        26   * HAVE TERMINATED THEIR WORK, THE 'C' SCHEDULER WILL PASS CONTROL
                        27   * TO THE INITIALIZATION PROGRAM FOR CONTINUED RESORATION OF THE CONTROL
                        28   * UNITS. THIS FINISHES THE REQUIRED WORK OF THE BOOTSTRAP PROGRAM
                        29   * AND IT WILL BE CLEARED OUT OF MEMORY BY THE STANDARD INITIALIZATION OF
                        30   * STORE BY THE INIT. PROGRAMS.
                        31   HEADER


0012647                                          35        CALL    OFLBOOTTST
0012647 01 002647 137020 013373 0013373   -001-  36        B3A     OFLBOOTTST
0012651 01 002651 150400 005166 CINIT            37        BNCL    BOOTRTN
0012653 01 002653 003002 ------                  38        LN      RO,2
0012654 01 002654 034400 013476 0013476          39        STL     RO,OFLBOOTSW
0012656 01 002656 056540 ------                  40        HALT                             # OFFLINE BOOT DONE


0012657                                          44 ASCHCLN
                                                 45 # A AND C SCH'S CONTINUOUS READ RECOVERY ROUTINE.
0012657 01 002657 131020 013530 0013530          46        LAL     R1,N(PTPOS)+BSTATE,RAO
0012661                                          47 CONTCLEAN
0012661 01 002661 103422 033777                  48        NI      R1,M(TR)+M(PTPOS)
0012663 01 002663 044020 ------                  49        ST      R1,0(RAO)                #RESET ALL RECOVERY BITS
```

```
0012664 01 002664 062122 ------                  01        ZBS    (N(PTPKNOWN)-N(PTPOS))(RAO),S(PTPKNOWN)
0012665 01 002665 072314 ------                  02        GN     RAO,RAO
0012666 01 002666 072335 ------                  03        GN     RAO+1,RAO+1
0012667 01 002667 040026 ------                  04        L      R1,N(EASV)(RAO)
0012670 01 002670 044022 ------                  05        ST     R1,N(EA)(RAO)        #RESTORE SAVED EA.
0012671 01 002671 062123 ------                  06        ZBS    N(PTPKNOWN)(RAO),S(PTPKNOWN)
0012672 01 002672 040421 ------                  07        L      R1,1(RA1)            #GET PRESENT BLK ADDRESS
0012673 01 002673 004421 ------                  08        AN     R1,1                 #ADD TO SHOW POSITION OF HEADS.
0012674 01 002674 002024 003777                  09        STM    R1,N(DESTON)(RAO),M(DESTON) #ESTABLISH NEW DESTINATION.
0012676 01 002676 051263 ------                  10        TBS    N(SPECSTOR)(RAO),S(SPECSTOR) #IS SPECIAL UNLOAD REQUIRED.
0012677 01 002677 050000 013366 0013366          11        BCL    SPECUNL
0012701 01 002701 040702 ------                  12        L      R12,(N(DATA_AREA)+1)(RA1) #SET UP ADDRESS FOR STORAGE OF DATA
0012702 01 002702 040723 ------                  13        L      R13,(N(DATA_AREA)+2)(RA1)
0012703 01 002703 016414 177760                  14        LRM    R0,R12,MSK(12,4)
0012705 01 002705 010404 ------                  15        RRN    R0,4                 #SET UP LENGTH FOR UNLOAD.
0012706 01 002706 041424 ------                  16        LA     R1,(N(DATA_AREA)+3)(RA1) #ADJUST FOR UNPACK ROUTINE.
0012707 01 002707 007316 ------                  17        EXR    RAO,RA1
0012710 01 002710 007337 ------                  18        EXR    RAO+1,RA1+1
0012711                                          19        CALL   UNPKWRDS             #MOVE DATA TO STORE
0012711 01 002711 037021 014333 MASACS     -001- 20        BSA    UNPKWRDS
0012713                                          21 RECOVUNL
0012713 01 002713 172314 ------                  22        GN     RAO,RAO
0012714 01 002714 072356 ------                  23        GN     RA1,RA1
0012715 01 002715 072335 ------                  24        GN     RAO+1,RAO+1
0012716 01 002716 072377 ------                  25        GN     RA1+1,RA1+1
0012717 01 002717 003060 ------                  26        ZR     R3
0012720 01 002720 002063 000017                  27        STM    R3,N(BUFC)(RAO),M(BUFC) #CLEAR BUFFER COUNT.
0012722 01 002722 044060 ------                  28        ST     R3,N(STATE)(RAO)
0012723 01 002723 062361 ------                  29        ZBS    N(INTHNR)(RAO),S(INTHNR) #CLEAR INT. BIT
0012724 01 002724 051721 ------                  30        TBS    (N(EOF)+1)(RA1),S(EOF)
0012725 01 002725 050000 011146 0011146          31        BCL    NEXTSCHED
                                                 32 CIPL   OW     0(2727)              # 13712
                                           -001- 33        NOTE   ************** THE FIRST ADDRESS OVERWRITTEN IS 002727 **********


                                                 36 CIPL   BGNP   0(3462)              # 13712
0012727 01 002727 037000 013462 0013462    -001- 37        BL     %%%429
                                           -001- 38        NOTE   CIPL 'CSECT'
                                           -001- 39        NOTE   ****************** PATCH AREA BEGINS AT 003462 ****************


0013462                                    -001- 42 %%%429 PATCHAREA
0013462 01 003462 140222 ------                  43        L      R9,N(EA)(RAO)
                                                 44 DEPATCH NOTE  CHANGE BCL TO BC
0013463 01 003463 050000 012767 0012767          45        BCL    NXBL
0013465 01 003465 037000 011426 0011426          46        BL     VERIT
0013467                                          47        ENDP                        # 13712
0013467 01 003467 037000 012731 0012731    -001- 48        BL     %%%431
                                           -001- 49        NOTE   ************* LAST PATCH ADDRESS USED IS 003470 ***************
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                                              -001- 01         NOTE    ***** NUMBER OF PATCH WORDS USED IS 7 (DECIMAL) ********

0012731                                       -001- 04 %%%431  OWCONTINUE
0012731                                             05         EOW                           # 13712
                                              -001- 06         NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 002730 **********

0012731                                             12 BSCHCLN
                                                    13 # B SCH. FINAL CLEAN UP AFTER CONTINUOUS READ RECOVERY
0012731 01 002731 131000 013520 0013520             14         LAL     R0,ASTATE,RA0
0012733 01 002733 051341 ------                     15         TBS     N(INTREQ)(RA0),S(INTREQ) #WAS A SCH. TAPE USED?
0012734 01 002734 054003 ------ 0012737             16         BC      WASASCH
0012735 01 002735 031000 013536 0013536             17         LAL     R0,CSTATE,RA0        #C SCH. WAS USED.
0012737                                             18 WASASCH
0012737 01 002737 141021 ------                     19         LA      R1,N(PTPOS)(RA0)
0012740 01 002740 053721 ------ 0012661             20         B       CONTCLEAN

0012741                                             24 REPKMRF
                                                    25 # AN UNRECOVERABLE ERROR EXISTS ON BOTH UNITS. ATTEMPT REPACK AND MRF.
0012741 01 002741 103641 002415                     26         LI      R10,TFF              #SEND FAST FORWARD
0012743 01 002743 003621 016320                     27         LI      R9,TU0ADR
0012745 01 002745 023440 ------                     28         SMIO
0012746 01 002746 003621 016340                     29         LI      R9,TU1ADR
0012750 01 002750 023440 ------                     30         SMIO
0012751                                             31         BGNTIM  SEC=40
0012751                                       -001- 32         CALL    TIMOUT
0012751 01 002751 037020 111375 CSYSUB        -002- 33         BSA     TIMOUT
0012753 01 002753 003101 ------               -001- 34         DATA    1601                 # TIMOUT+1
0012754 01 002754 144005 ------                     35         ST      R0,N(TIMKON)(RA0)
0012755 01 002755 061203 ------                     36         SBS     N(TIMING)(RA0),S(TIMING)
0012756 01 002756 003401 000021                     37         LI      R0,KILLSYS           #NEXT STATE IS KILL SYSTEM
0012760 01 002760 044000 ------                     38         ST      R0,N(STATE)(RA0)
0012761 01 002761 003401 052525                     39         LI      R0,O(252525)
0012763 01 002763 034400 013513 0013513             40         STL     R0,PATTERN1          #START KILL PATERN IN DB
0012765 01 002765 034400 013514 0013514             41         STL     R0,PATTERN2
                                                    42 CIPL    OW      O(2767)              # 13712
                                              -001- 43         NOTE    ************** THE FIRST ADDRESS OVERWRITTEN IS 002767 **********
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A01


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0012767 01 002767 137000 011146 0011146     NXBL    BL      NEXTSCHED
0012771                                             EOW                             # 13712
                                    -001-           NOTE    **************** THE LAST ADDRESS OVERWRITTEN IS 002770 **********



                                            # THE PATCH FILE IS BEING READ IN. THIS ROUTINE IS RESPONSIBLE FOR UNPACKING
                                            # THE DATA AND STORING IT INTO MEMORY. ANY WIDTH STORE IS ACCEPTIBLE.

0012771                                     PATCHUNL
0012771 01 002771 151344 ------                     TBS     N(EOPF)(RA0),S(EOPF) #WAS PATCH FILE COMPLETED.
0012772 01 002772 054100 ------ 0013072             BC      BTODON
0012773 01 002773 003421 001474 MASACS              LI      R1,OBUFLEN          # BUFFER WRDS USED BY PATCH FILE PER BLOCK
0012775 01 002775 072356 ------                     GN      R14,14
0012776 01 002776 072377 ------                     GN      R15,15              # RESTORE ADDRESS OF IO BUFFER.
0012777 01 002777 041401 ------                     LA      R0,1(RA1)           # ADJUST TO
0013000 01 003000 051343 ------                     TBS     N(SCHCON1)(RA0),S(SCHCON1) # WAS FILE HEADER PROCESSED
0013001 01 003001 054007 ------ 0013010             BC      YESDONE
0013002 01 003002 040401 ------                     L       R0,N(DATA_AREA)(RA1) # GET FIRST HEADER WORD.
0013003 01 003003 014000 ------                     TZ      R0                  #IS PATCH FILE USED?
0013004 01 003004 054066 ------ 0013072             BC      BTODON
0013005 01 003005 061343 ------                     SBS     N(SCHCON1)(RA0),S(SCHCON1) # FLAG HEADER DONE
0013006 01 003006 004024 ------                     SN      R1,N(PATLENGTH)     # SUBTRACT HEADER LENGTH FROM COUNTER.
0013007 01 003007 041414 ------                     LA      R0,N(PATLENGTH)(RA1) # ADJUST RA REGISTER.
0013010                                     YESDONE
0013010 01 003010 151103 ------                     TBS     N(CARYBIT)(RA0),S(CARYBIT) # IS A PATCH CROSSING A BLOCK BOUNDRY
0013011 01 003011 054104 ------ 0013115             BC      CARRYO
0013012                                     OVWRT
0013012 01 003012 140461 ------                     L       R3,1(RA1)           # SET UP THE TOTAL LENGTH OF THE PATCH.
0013013 01 003013 014063 ------                     TZ      R3
0013014 01 003014 054056 ------ 0013072             BC      BTODON              # ZERO LENGTH NO MORE PATCHES IN THIS BLOCK.
0013015 01 003015 003465 177777                     CI      R3,O(177777)        # CHECK FOR END OF PATCH DATA,
0013017 01 003017 055003 ------ 0013022             BNC     MRPAT
0013020 01 003020 061344 ------                     SBS     N(EOPF)(RA0),S(EOPF) #FLAG IGNORE FURTHER DATA.
0013021 01 003021 053051 ------ 0013072             B       BTODON
0013022                                     MRPAT
0013022 01 003022 140406 ------                     L       R0,N(OWSTAT)-N(PATLENGTH)+1(RA1) # CHECK PATCH STATUS. 1 MEANS
                                                                                 LOAD.
0013023 01 003023 017400 001401                     CIRM    R0,1,S(OWSTAT),M(OWSTAT)/ES(OWSTAT)
0013025 01 003025 055126 ------ 0013153             BNC     PROCNA              # PROCESS NON-ACTIVE PATCH.
0013026 01 003026 004075 ------                     SN      R3,3                # ADJUST WORD COUNTS FOR BOUNDRY CHECKS.
0013027 01 003027 004035 ------                     SN      R1,3
0013030 01 003030 014021 ------                     TZ      R1                  # HAS END OF BLOCK BEEN REACHED.
0013031 01 003031 055005 ------ 0013036             BNC     NXTBOUND
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0013032 01 003032 003023 ------                01          LN      R1,3
0013033 01 003033 034420 013552 0013552        02          STL     R1,SKIPWRD
0013035 01 003035 053132 ------ 0013167        03          B       NXTBLKIN
0013036                                        04 NXTBOUND
0013036 01 003036 141406 ------                05          LA      R0,(N(WRDLENGTH)-N(PATLENGTH))(RA1)
0013037 01 003037 004035 ------                06          SN      R1,3                # ADJUST WORD COUNTS FOR BOUNDARY CHECK.
0013040 01 003040 004075 ------                07          SN      R3,3
0013041 01 003041 014021 ------                08          TZ      R1                  # HAS A BLOCK BEEN EXHAUSTED.
0013042 01 003042 054125 ------ 0013167        09          BC      NXTBLKIN
0013043                                        10 NXTSEG
0013043 01 003043 140402 ------                11          L       R0,2(RA1)
0013044 01 003044 003402 177760                12          NI      R0,M(SEGNO)         # IS THIS PART OF THE PATCH RESIDENT? SEGNO=0
0013046 01 003046 055123 ------ 0013171        13          BNC     NONRES
0013047 01 003047 040501 ------                14          L       R4,1(RA1)           # OBTAIN LENGTH OF PATCH
0013050 01 003050 040702 ------                15          L       RA0,2(RA1)
0013051 01 003051 041723 ------                16          LA      RA0+1,3(RA1)        # SET UP ADDRESS OF PATCHED DATA
0013052                                        17 ADJST
0013052 01 003052 104075 ------                18          SN      R3,3                # ADJUST COUNTERS FOR LENGTH AND ADDRESS
                                                                                         DATA.
0013053 01 003053 004035 ------                20          SN      R1,3
0013054 01 003054 014021 ------                21          TZ      R1                  # HAS BLOCK AREA BEEN EXHAUSTED.
0013055 01 003055 055021 ------ 0013076        22          BNC     STORPAT
0013056 01 003056 034700 013550 0013550        23          STL     RA0,PATADR          # SAVE PATCHED ADDRESS.
0013060 01 003060 034720 013551 0013551        24          STL     RA0+1,PATADR+1
0013062 01 003062 072314 ------                25          GN      RA0,RA0             # RESTORE CONTROL BUFFER ADDRESS.
0013063 01 003063 072335 ------                26          GN      RA0+1,RA0+1
0013064                                        27 SAVEINFO
0013064 01 003064 134460 013546 0013546        28          STL     R3,PATOTLEN         # SAVE THE COUNTERS.
0013066 01 003066 034500 013547 0013547        29          STL     R4,PATESSWD
0013070 01 003070 061103 ------                30          SBS     N(CARYBIT)(RA0),S(CARYBIT) # SET PATCH CARRY OVER BIT
0013071 01 003071 061363 ------                31          SBS     N(SCHCON2)(RA0),S(SCHCON2) # SET PATCH ACTIVE BIT.
0013072                                        32 BTODON
0013072 01 003072 151361 ------                33          TBS     N(INTHNR)(RA0),S(INTHNR) #IS THIS RECOVERY UNLOAD?
0013073 01 003073 054620 ------ 0012713        34          BC      RECOVUNL            #YES. SPECIAL CLEAN UP REQUIRED.
0013074 01 003074 037000 011716 0011716        35          BL      DONOTSTR


0013076                                        39 STORPAT
0013076 01 003076 136100 013105 0013105        40          BX      R4,LODSTR           # LOAD STORE UNTIL OUT OF PATCH INFORMATION.
0013100 01 003100 072314 ------                41          GN      RA0,RA0             #RESTORE CONTROL BLOCK ADDRESS.
0013101 01 003101 072335 ------                42          GN      RA0+1,RA0+1
0013102                                        43 CR3K
0013102 01 003102 114063 ------                44          TZ      R3                  # HAS THE ENTIRE PATCH BEEN PROCESSED.
0013103 01 003103 054707 ------ 0013012        45          BC      OVWRT               # YES GET NEXT PATCH
0013104 01 003104 053737 ------ 0013043        46          B       NXTSEG              # NO. PROCESS NEXT SEGMENT OF PATCH.
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0013105                                          01 LODSTR
0013105 01 003105 140521 ------                  02        L       R5,1(RA1)           # GET LOW 16 BITS OF NEW DATA IN PATCH
0013106 01 003106 041542 ------                  03        LA      R6,2(RA1)           # GET HIGH 8 BITS OF PATCH (IF APPLICABLE).
0013107                                          04        MIMODE  L SDR1,R6
0013107 01 003107 013000 ------            -001- 05        MIS     0
0013110 01 003110 162143 ------            -002- 06           VFD     8,SDR1%T 8,R6%F
0013111 01 003111 044120 ------                  07        ST      R5,0(RA0)           # STORE PATCH DATA
0013112 01 003112 041401 ------                  08        LA      R0,1(RA1)           # ADJUST PATCH ADDRESS FOR NEXT STORE
0013113 01 003113 041001 ------                  09        LA      R0,1(RA0)           # ADJUST BUFFER POINTER FOR NEXT RETRIEVAL.
0013114 01 003114 053736 ------ 0013052          10        B       ADJST


0013115                                          14 CARRYO
0013115 01 003115 130400 013552 0013552          15        LL      R0,SKIPWRD          # PART OF AN INACTIVE PATCH MAY HAVE TO BE
                                                                                         SKIPPED.
0013117 01 003117 005020 ------                  17        SR      R1,R0               # CHECK HOW MUCH OF NEW BLK MUST BE SKIPPED
0013120 01 003120 054006 ------ 0013126          18        BC      PSTV                # NUMBER OF WORDS TO SKIP ARE LESS C? EQUAL
                                                                                         TO UNPROCESSED BLOCK.
0013121 01 003121 015421 ------                  20        COM     R1
0013122 01 003122 004421 ------                  21        AN      R1,1                # POSITIVE DIFFERENCE NOW IN R1
0013123                                          22 EQLTO
0013123 01 003123 134420 013552 0013552          23        STL     R1,SKIPWRD          # STORE SKIP FACTOR IN CONTROL WORD
0013125 01 003125 053745 ------ 0013072          24        B       BTODON


0013126                                          28 PSTV
0013126 01 003126 114021 ------                  29        TZ      R1                  # IS R1=R0
0013127 01 003127 054774 ------ 0013123          30        BC      EQLTO
0013130 01 003130 030460 013546 0013546          31        LL      R3,PATOTLEN         # RESTORE TOTAL LENGTH.
0013132 01 003132 043520 ------                  32        LAX     R5,R0(RA1)          # ADJUST RA1 PER SKIP WORD.
0013133 01 003133 003120 ------                  33        ZR      R5
0013134 01 003134 034520 013552 0013552          34        STL     R5,SKIPWRD          # CLEAR SKIP WORD.
0013136 01 003136 002123 100020                  35        STM     R5,N(SCHCON2)(RA0),M(CARYBIT)+M(SCHCON2)
0013140 01 003140 024017 ------                  36        TBN     R0,S(SCHCON2)       # WAS THE PATCH ACTIVE?
0013141 01 003141 055651 ------ 0013012          37        BNC     OVWRT               # PROCESS THE
0013142 01 003142 030500 013547 0013547          38        LL      R4,PATESSWD         # RESTORE LENGTH OF PATCH.
0013144 01 003144 014104 ------                  39        TZ      R4                  # WAS THIS A BOUNDRY BREAK AT A POINT IN
                                                                                         PATCH HDR.
0013145 01 003145 054735 ------ 0013102          41        BC      CR3K                # YES
0013146 01 003146 030700 013550 0013550          42        LL      RA0,PATADR          # RESTORE PATCH ADDRESS.
0013150 01 003150 030720 013551 0013551          43        LL      RA0+1,PATADR+1
0013152 01 003152 053724 ------ 0013076          44        B       STORPAT             # CONTINUE LOAD
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0013153                                  01 PROCNA
0013153 01 003153 105023 ------          02          SR     R1,R3               # CHECK IF PATCH IS GREATER OR EQUAL TO
                                                                                  REMAINING BLOCK.
0013154 01 003154 054007 ------ 0013163  04          BC     ZRT
0013155 01 003155 015421 ------          05          COM    R1
0013156 01 003156 004421 ------          06          AN     R1,1                # R1 NOW CONTAINS POSITIVE REMAINDER.
0013157                                  07 STEXT
0013157 01 003157 134420 013546 0013546  08          STL    R1,PATOTLEN         # SAVE FOR NEXT BLOCK
0013161 01 003161 061103 ------          09          SBS    N(CARYBIT)(RA0),S(CARYBIT) # FLAG CARRY-OVER PROCESSING.
0013162 01 003162 053741 ------ 0013123  10          B      EQLTO


0013163                                  14 ZRT
0013163 01 003163 114021 ------          15          TZ     R1                  # CHECK IF REMAINING BLK. LENGTH IS ZERO
0013164 01 003164 054773 ------ 0013157  16          BC     STEXT               # YES. GET NEXT BLK.
0013165 01 003165 043403 ------          17          LAX    R0,R3(RA1)          # ADJUST RA TO NEXT PATCH.
0013166 01 003166 053624 ------ 0013012  18          B      OVWRT


0013167                                  22 NXTBLKIN
0013167 01 003167 103100 ------          23          ZR     R4
0013170 01 003170 053674 ------ 0013064  24          B      SAVEINFO


0013171                                  28 NONRES
0013171 01 003171 140521 ------          29          L      R5,1(RA1)           # GET THE NUMBER OF ESS WORD PAIRS IN PATCH
0013172 01 003172 006005 ------          30          LR     R0,R5
0013173 01 003173 010537 ------          31          RLN    R5,1                # MULTIPLY BY TWO
0013174 01 003174 001520 ------          32          AR     R5,R0               # COMPLETE MULTIPLICATION BY 3
0013175 01 003175 004523 ------          33          AN     R5,3                #ADJUST FOR WORD LENGTH AND ADDRESS FIELDS
0013176 01 003176 006141 ------          34          LR     R6,R1               # SAVE FOR FUTURE SUBTRACTION.
0013177 01 003177 005025 ------          35          SR     R1,R5               # SEE IF IT IS GREATER THAN REMAINING BLK.
                                                                                  OR EQUAL TO.
0013200 01 003200 055010 ------ 0013210  37          BNC    MUSTCRY             # MUST CARRY CALCULATION ACROSS BLOCK
                                                                                  BOUNDRY
0013201 01 003201 014021 ------          39          TZ     R1                  #IS IT EQUAL TO REMAINING BLOCK.
0013202 01 003202 054006 ------ 0013210  40          BC     MUSTCRY             # YES
0013203 01 003203 005065 ------          41          SR     R3,R5               #ADJUST REMAINING TOTAL PATCH COUNT.
0013204 01 003204 043405 ------          42          LAX    R0,R5(RA1)          #ADJUST BUFFER POINTER.
0013205 01 003205 014063 ------          43          TZ     R3                  #IS ANY PATCH LEFT
0013206 01 003206 054604 ------ 0013012  44          BC     OVWRT               #NO
0013207 01 003207 053634 ------ 0013043  45          B      NXTSEG
```

```
0013210                                          01 MUSTCRY
0013210 01 003210 120065 ------                  02         CR     R3,R5               #CHECK IF ANY MORE PATCH REMAINS AFTER SKIP
0013211 01 003211 054007 ------ 0013220          03         BC     IGNORNXT            # NO
0013212 01 003212 005065 ------                  04         SR     R3,R5               # SOME PATCH REMAINS. JUST SKIP A SEGMENT OF
                                                                                         THE PATCH.
0013213 01 003213 005126 ------                  06         SR     R5,R6
0013214 01 003214 034520 013552 0013552          07         STL    R5,SKIPWRD
0013216 01 003216 003100 ------                  08         ZR     R4
0013217 01 003217 053645 ------ 0013064          09         B      SAVEINFO


0013220                                          13 IGNORNXT
0013220 01 003220 105066 ------                  14         SR     R3,R6               #REMAINING PATCH IS TO BE SKIPPED.
0013221 01 003221 034460 013552 0013552          15         STL    R3,SKIPWRD
0013223 01 003223 061103 ------                  16         SBS    N(CARYBIT)(RA0),S(CARYBIT) #SET CARRY OVER BIT.
0013224 01 003224 003000 ------                  17         ZR     R0
0013225 01 003225 034400 013546 0013546          18         STL    R0,PATOTLEN         # CLEAR TOTAL PATCH LENGTH.
0013227 01 003227 053643 ------ 0013072          19         B      BTODON


0013230                                          23 CONSGEN
                                                 24 #       ROUTINE WHICH WILL GENERATE A TIME CONSTANT FOR FAST SEARCH
                                                 25 # INTERVAL AND DETERMINE IF A FAST OR SLOW SEARCH IS REQUIRED.
                                                 26 # R0 IS THE TAPE DESTINATION AND R1 IS THE PRESENT TAPE POSITION.
                                                 27 # RETURN 1 INDICATES FAST SEARCH AND RETURN 2 IS A SLOW SEARCH.


0013230                                          31         BEGIN
0013230 01 003230 171420 ------            -002- 32         HA
0013231 01 003231 003120 ------                  33         ZR     R5
0013232 01 003232 040004 ------                  34         L      R0,N(DESTON)(RA0)
0013233 01 003233 003402 003777                  35         NI     R0,M(PTPOS)
0013235 01 003235 040021 ------                  36         L      R1,N(PTPOS)(RA0)
                                                 37 CIPL    OW     0(3236)             # 13712
                                           -001- 38         NOTE   ************** THE FIRST ADDRESS OVERWRITTEN IS 003236 **********

0013236 01 003236 003422 003776                  41         NI     R1,M(PTPOS)-1       #CORRECTS SEARCH ALGORITHM FOR BOT
0013240                                          42         EOW                        # 13712
                                           -001- 43         NOTE   **************** THE LAST ADDRESS OVERWRITTEN IS 003237 *********
                                                                   *
```

```
0013240 01, 003240 055003 ------ 0013243                BNC     SUBIT
0013241 01  003241 003521 000031                         LI      R5,25              # NEEDED FOR BOT TIMING PROBLEM.
0013243                                          SUBIT
0013243 01  003243 105001 ------                         SR      R0,R1              # GET DISTANCE TO DESTINATION
0013244 01  003244 054003 ------ 0013247                 BC      POSITIVE
0013245 01  003245 015400 ------                         COM     R0                 # CONVERT TO POSITIVE NUMBER.
0013246 01  003246 004401 ------                         AN      R0,1
0013247                                          POSITIVE
0013247 01  003247 106040 ------                         LR      R2,R0
0013250 01  003250 003400 177774 MASACS                  SI      R0,FSTDIST         # CHECK IF A FAST SEARCH IS NEEDED
0013252 01  003252 054002 ------ 0013254                 BC      FAST               # NUMBER IS POSITIVE, FAST SEARCH IS
                                                                                      REQUIRED.
0013253                                                  RETURN  2
0013253 01  003253 056442 ------         -001-           BTSAGN  2

0013254                                          FAST
                                                 # R2 CONTAINS THE DELTA TO DESTINATION.
0013254 01  003254 103020 ------                         ZR      R1
0013255 01  003255 136040 013260 0013260         ADBX    BX      R2,ADD
0013257 01  003257 053004 ------ 0013263                 B       DIVIDE
0013260                                          ADD
0013260 01  003260 103420 000155 MASACS                  AI      R1,MSECPR          # ADD MSEC PER BLK
0013262 01  003262 053773 ------ 0013255                 B       ADBX
0013263                                          DIVIDE
0013263 01  003263 103401 000031                         LI      R0,25              # DIVISOR
0013265                                          ADIV
0013265 01  003265 104441 ------                         AN      R2,1               # NUMBER OF 25 MSEC CHUNKS NEEDED.
0013266 01  003266 005020 ------                         SR      R1,R0
0013267 01  003267 054776 ------ 0013265                 BC      ADIV               # POSITIVE, KEEP SUB.
0013270 01  003270 006005 ------                         LR      R0,R5
0013271 01  003271 001402 ------                         AR      R0,R2
0013272                                                  CALL    TIMOUTX
0013272 01  003272 037020 111373 CSYSUB  -001-           BSA     TIMOUTX
0013274 01  003274 144005 ------                         ST      R0,N(TIMKON)(RA0)
0013275                                                  RETURN  1
0013275 01  003275 056441 ------         -001-           BTSAGN  1


0013276                                          ORDOUT
                                                 #ROUTINE TO SEND SMIO AND TEST FOR RESPONSE.
0013276                                                  BEGIN   ()
0013276 01  003276 123440 ------                         SMIO
0013277 01  003277 003013 ------                         LN      R0,11
0013300                                          MEME
0013300 01  003300 136000 013300 0013300                 BX      R0,MEME            #TIME FOR RESPONCE
0013302 01  003302 023500 ------                         TIO
0013303 01  003303 055002 ------ 0013305                 BNC     SCHLOOK            #SEE IF OTHER TAPE CAN BE USED.
0013304                                                  RETURN  0                  #ALL SEEMS WELL RETURN
```

```
0013304 01 003304 056460 ------         -001- 01        BTSAN   0
0013305                                       02 SCHLOOK
0013305 01 003305 130400 013511 0013511       03        LL      RO,MATEOOS
0013307 01 003307 014000 ------               04        TZ      RO                    #IS OTHER UNIT OOS.
0013310 01 003310 055000 ------ 0013310       05        BNC     *                     #YES TIME OUT.
0013311 01 003311 037040 013511 0013511       06        A1S     MATEOOS               #FLAG DIFFICULTY WITH THIS UNIT.
0013313 01 003313 044000 ------               07        ST      RO,N(STATE)(RAO)      #PREPARE THIS SCHEDULER FOR RESTART.
0013314 01 003314 030400 013510 0013510       08        LL      RO,NXTSCH
0013316 01 003316 003405 000006               09        CI      RO,6                  #ONLY B AND C SCHED. CAN BE RESTARTED.
0013320 01 003320 054024 ------ 0013344       10        BC      BSTRBL                #B SCHED. IN TROUBLE.
0013321 01 003321 014000 ------               11        TZ      RO
0013322 01 003322 055000 ------ 0013322       12        BNC     *
                                              13 # C SCHED. IN TOUBLE
0013323 01 003323 044002 ------               14        ST      RO,N(EA)(RAO)         #INIT EA WORD IN CNTRL. BLOCK.
0013324 01 003324 051261 ------               15        TBS     N(RECOV)(RAO),S(RECOV) #IS RECOVERY ALREADY IP.
0013325 01 003325 054000 ------ 0013325       16        BC      *
0013326 01 003326 030400 013522 0013522       17        LL      RO,EAON
0013330 01 003330 020011 ------               18        CR      RO,R9                 #IS TDC THE SAME AS A SCHED. USED.
0013331 01 003331 006220 ------               19        LR      R9,RO
0013332 01 003332 055003 ------ 0013335       20        BNC     STR9                  #NO SET UP A SCHED. TDC FOR FUTURE USE.
0013333 01 003333 030620 013531 0013531       21        LL      R9,EAOFF              #SET UP B SCHED TAPE
0013335                                       22 STR9
0013335 01 003335 134620 013522 0013522       23        STL     R9,EAON               #STORE HERE TO FAKE OUT C SCHED. MONITOR
                                                                                        STATE.
0013337 01 003337 031000 011146 0011146       25        LAL     RO,NEXTSCHED,RAO
0013341                                       26 HG
0013341 01 003341 172700 ------               27        HN      R12,0
0013342 01 003342 072721 ------               28        HN      R13,1                 #SETUP RETURN TO SCHED. RESTART CODE.
0013343                                       29        RETURN
0013343 01 003343 056400 ------         -001- 30        BTSA
0013344                                       31 BSTRBL
0013344 01 003344 162223 ------               32        ZBS     N(BSBOT)(RAO),S(BSBOT) #PREPARE TO RESTART B SCHED.
0013345 01 003345 051261 ------               33        TBS     N(RECOV)(RAO),S(RECOV) #HAS RECOVERY BEEN IP
0013346 01 003346 054000 ------ 0013346       34        BC      *
0013347 01 003347 030400 013522 0013522       35        LL      RO,EAON
0013351 01 003351 044002 ------               36        ST      RO,N(EA)(RAO)
0013352 01 003352 030400 013540 0013540       37        LL      RO,CEA                #CHECK IF C SCHED STARTED.
0013354 01 003354 014000 ------               38        TZ      RO
0013355 01 003355 055005 ------ 0013362       39        BNC     SBLK                  #BLOCK B START
0013356 01 003356 030400 013523 0013523       40        LL      RO,STATON
0013360 01 003360 024006 ------               41        TBN     RO,S(STUS)
0013361 01 003361 054002 ------ 0013363       42        BC      RTNBSCH               #IF A SCHED DONE DO NOT DELAY B RESTART.
0013362                                       43 SBLK
0013362 01 003362 161163 ------               44        SBS     N(TUOOS)(RAO),S(TUOOS)
0013363                                       45 RTNBSCH
0013363 01 003363 131000 010754 0010754       46        LAL     RO,BSCHWORK,RAO
0013365 01 003365 053754 ------ 0013341       47        B       HG
```

```
0013366 ,                              01 SPECUNL
0013366 01 003366 130740 013516 0013516    02          LL       R14,UNLSPEC        # GET READY FOR SPECIAL UNLOAD ROUTINE.
0013370 01 003370 030760 013517 0013517    03          LL       R15,UNLSPEC+1
0013372 01 003372 052420 ------            04          BR       0(RA1)
```

```
                                                 # DESCRIPTION
                                                 # THIS SUBROUTINE TESTS FOR THE OFFLINE BOOTSTRAP CONDITION
0013373
                                                 # ENTRY
                                                 # OFLBOOTTST
0013373
                                                 # INPUTS
                                                 # NONE
0013373
                                                 # OUTPUTS
                                                 # R0 = RETURN CODE
                                                 #   0 - OFFLINE BOOTSTRAP (CF = 1)
                                                 #  -0 - NORMAL  BOOTSTRAP (CF = 0)

0013373                                          OFLBOOTTST
0013373                                                  BEGIN
0013373 01 003373 171420 ------           -002-          HA
0013374 01 003374 030400 013476 0013476                  LL      R0,OFLBOOTSW        # READ OFFLINE BOOT SWITCH WORD
0013376 01 003376 003404 006453                          XI      R0,OFLBOOTCON       # COMPARE TO OFFLINE BOOT CONSTANT
0013400 01 003400 003402 007777                          NI      R0,M(OFLBTSW)       # COMPARE LOW BITS ONLY
0013402                                                  RETURN
0013402 01 003402 056420 ------           -001-          BTSAG
```

```
                                                    # DESCRIPTION
                                                    # IF THE OFFLINE BOOTSTRAP IS IN PROGRESS, ADJUST RO BEFORE CALLING 'TIMCHK'.
0013403
                                                    # ENTRY
                                                    # TIMCHKALT
0013403
                                                    # INPUTS
                                                    # RO = NORMAL TIMING CONSTANT
0013403
                                                    # OUTPUTS
                                                    # RO = RETURN CODE
                                                    #    0 - NO TIMOUT (CF = 1)
                                                    #   -0 - TIMOUT (CF = 0)

0013403                                             TIMCHKALT
0013403                                                   BEGIN    ()
0013403 01 003403 106020 ------                           LR       R1,RO              # SAVE RO
0013404                                                   CALL     OFLBOOTTST         # DESTROYS RO
0013404 01 003404 037020 013373 0013373  -001-            BSA      OFLBOOTTST
0013406 01 003406 106001 ------                           LR       RO,R1
0013407 01 003407 055010 ------ 0013417                   BNC      TIMCHKGO
                                                    # OFFLINE BOOT IN PROGRESS - ADJUST TIMOUT CONSTANT
0013410 01 003410 003421 026000 BLMMA                     LI       R1,PTRESET
0013412 01 003412 010430 ------                           RRN      R1,8
0013413 01 003413 003423 177400                           OI       R1,MSK(8,8)
0013415 01 003415 001401 ------                           AR       RO,R1              # CONPENSATE FOR PT PRESET FACTOR
0013416 01 003416 004405 ------                           AN       RO,5               # COMPENSATE FOR INFREQUENT UPDATING
0013417                                             TIMCHKGO
0013417                                                   CHKTIM
0013417                                  -001-            CALL     TIMCHK             #   HAS TIMOUT OCCURRED?
0013417 01 003417 137020 111364 CSYSUB   -002-            BSA      TIMCHK
0013421                                                   RETURN
0013421 01 003421 156400 ------          -001-            BTSA
```

```
0013422 ,                    01 BOOTPATCH
0013422 '                    02        BSS    44
```

```
                                         01 OFLBOOTSW LAYOUT 1,CLASS=PERBLK
0013476                            -001- 02 OFLBOOTSW
                                         03 OFLBTSW ITEM    12,VAL=0         # NORMAL/OFFLINE BOOTSTRAP SWITCH
                                         04         ITEM    3                # NOT USED
                                         05 ALLMAS ITEM     1,VAL=0          # FULL MEMORY RELOAD CONTROL
                                         06         LOEND
OFLBOOTSW                          -003- 07 #
00|ALLMAS |                          |                          OFLBTSW                                         |
  |       |         NOT USED         |                NORMAL/OFFLINE BOOTSTRAP SWITCH                           |
  |  15   |  14   |  13   |  12  |  11  |  10  |  9  |  8  |  7  |  6  |  5  |  4  |  3  |  2  |  1  |  0  |
0013476 01 003476 000000 ------    -003- 13         VFD     1,0 3, 12,0

0013477 01 003477 000000 ------          15 HASHSAVE DATA   0                # SAVED HASHSUM VALUE
0013500                                  16 BASEGENR
0013500 01 003500 000000 ------          17         VFD     0
0013501                                  18 BASEXLAT
0013501 01 003501 000000 ------          19         VFD     0
0013502                                  20 LST4K1
0013502 01 003502 000000 ------          21         VFD     0
0013503                                  22 BASEPAT
0013503 01 003503 000000 ------          23         VFD     0
0013504                                  24 GEN4KNO
0013504 01 003504 000000 ------          25         VFD     0
0013505                                  26 XLAT4KNO
0013505 01 003505 000000 ------          27         VFD     0
0013506 01 003506 000000 ------          28 BXKONON VFD     0
0013507 01 003507 000000 ------          29 BXKONOFF VFD    0


0013510 01 003510 177777 ------          33 NXTSCH VFD      16,-1
0013511 01 003511 000000 ------          34 MATEOOS VFD     0


                                         38 # DO NOT SEPARATE NEXT 4 WORDS.
0013512 01 003512 000600 ------          39 PATTERN VFD     16,X(180)
0013513 01 003513 000400 ------          40 PATTERN1 VFD    16,X(100)
0013514 01 003514 000200 ------          41 PATTERN2 VFD    16,X(80)
0013515 01 003515 000620 000000          42 COUNT  VFD      16,400

0013516                                  44 UNLSPEC
0013516 01 003516 000000 012771 0012771  45         ADDR    PATCHUNL
```

```
0013520                                  01 ASTATE
0013520 01 003520 000000 ------          02        VFD    0
0013521                                  03 PTPON
0013521 01 003521 000000 ------          04        VFD    0
0013522                                  05 EAON
0013522 01 003522 000000 ------          06        VFD    0
0013523                                  07 STATON
0013523 01 003523 000000 ------          08        VFD    0
0013524                                  09 ONDEST
0013524 01 003524 000000 ------          10        VFD    0
0013525 01 003525 000000 ------          11 TIMEON VFD    0
0013526                                  12 EASVON
0013526 01 003526 000000 ------          13        VFD    0


0013527                                  17 BSTATE
0013527 01 003527 000000 ------          18        VFD    0
0013530                                  19 PTPOFF
0013530 01 003530 000000 ------          20        VFD    0
0013531                                  21 EAOFF
0013531 01 003531 000000 ------          22        VFD    0
0013532                                  23 STATOFF
0013532 01 003532 000000 ------          24        VFD    0
0013533                                  25 DESTOFF
0013533 01 003533 000000 ------          26        VFD    0
0013534 01 003534 000000 ------          27 TIMEOFF VFD   0
0013535                                  28 EASVOF
0013535 01 003535 000000 ------          29        VFD    0


0013536                                  33 CSTATE
0013536 01 003536 000000 ------          34        VFD    0
0013537                                  35 CPTP
0013537 01 003537 000000 ------          36        VFD    0
0013540                                  37 CEA
0013540 01 003540 000000 ------          38        VFD    0
0013541                                  39 CSTAT
0013541 01 003541 000000 ------          40        VFD    0
0013542                                  41 CDEST
0013542 01 003542 000000 ------          42        VFD    0
0013543                                  43 CTIME
0013543 01 003543 000000 ------          44        VFD    0
0013544                                  45 EASVC
0013544 01 003544 000000 ------          46        VFD    0
```

```
0013545                                          01 SSPSV
0013545 01 003545 000000 ------                  02         VFD     0
0013546                                          03 PATOTLEN
0013546 01 003546 000000 ------                  04         VFD     0
0013547                                          05 PATESSWD
0013547 01 003547 000000 ------                  06         VFD     0
0013550                                          07 PATADR
0013550 01 003550 000000 ------                  08         VFD     0
0013551 01 003551 000000 ------                  09         VFD     0
0013552                                          10 SKIPWRD
0013552 01 003552 000000 ------                  11         VFD     0
0013553 01 003553 177773 ------ MASACS           12 BLKINCON VFD    16,-BLK4K
0013554 01 003554 177774 ------ MASACS           13 BLKINCOF VFD    16,1-BLK4K
                                                 14 DINSERT NOTE    'BLKDIGON VFD 16,-1
                                                 15 DDELETE NOTE    1
0013555 01 003555 177777 ------                  16 BLKDIGON DATA   -1
0013556 01 003556 177777 000000                  17 BLKDIGOFF VFD   16,-1
0013557                                          18 TEMPAD
0013557 01 003557 000000 023777 0777777          19         ADDR    TEMPIO1-1
0013557                                          20         EOW                     # 11428
                                           -001- 21         NOTE    *************** THE LAST ADDRESS OVERWRITTEN IS 003560 *********
                                                                    *

0013557                                          28 CHKSUM
0024000                                          29 TEMPIO1 CSECT
.                                                30         TSD     1
0024000                                    -001- 31
                                           -001- 32 # THE CONTENTS OF THIS BLOCK WILL BE ZEROED AT INITIALIZATION LEVEL 1.

                                                 34 CIPL   MAXSIZE 0,3561
                                                 35 TEMPIO1 MAXSIZE 0,1
```

```
         */*/*/*/011428/*/*/*/*    -002- 01        PBEGIN  PROG=CIPL                       TRNO=11428  SERNOB=62873
                                         02 # CHANGE OUT-OF-RANGE SHORT BRANCH TO A LONG BRANCH TO ALLOW THE
                                         03 # BOOTSTRAP PROGRAM TO FUNCTION.
0024000                                  04        TCEND
                                   -001- 05        NOTE    ***************************************************************


         */*/*/*/012432/*/*/*/*    -002- 12        PBEGIN  PROG=CIPL                       TRNO=12432  SERNOB=61983
                                         13 # INITIALIZE HASHSUM VALUE BETWEEN GENERIC & TRNSLN BOUNDARIES DURING BOOTSTRAP
                                         14 # RING THE TTY BELL DURING THE HASHSUM CALCULATION.
                                         15 # FIX PROGRAM ERROR WHICH RESULTS IN A NONRECOVERY SITUATION IF
                                         16 # THE OFFLINE TAPE CONTAINS A BAD BLOCK (OTHER THAN A CRC ERROR).
0024000                                  17        TCEND
                                   -001- 18        NOTE    ***************************************************************


         */*/*/*/013299/*/*/*/*    -002- 25        PBEGIN  PROG=CIPL                       TRNO=13299  SERNOB=49252
                                         26 # REPATCH TWO WORDS OF CIPL TO COMPENSATE FOR A LOADER BUG.
                                         27 # NECESSARY ONLY FOR THE BIT MATCH - PATCHES TC 62873 (CIPL PROGRAM).
0024000                                  28        TCEND
                                   -001- 29        NOTE    ***************************************************************
```

```
                */*/*/*/013712/*/*/*/*     -002- 01       PBEGIN  PROG=CIPL                    TRNO=13712  SERNOB=50340
                                                 02 # CHANGES CIPL TO ALLOW FOR A 'FLOATING' TRNSLN FILE AFTER
                                                 03 # GENERIC IS LOADED
                                                 04 # ALSO CORRECTS FAST SEARCH ALGORITHM FOR BOT
                                                 05 # THE NEXT 3 PATCHES CORRECT THE POSSIBLE PROBLEM
                                                 06 # THAT IF THE OFFLINE TAPE WAS FAULTY, RELOAD WAS NOT
                                                 07 # POSSIBLE. THIS WAS DUE TO IMPROPER BUFFER ADMINISTRATION
                                                 08 # DURING RECOVERY. ( EOS CR10809).
0024000                                          09       TCEND
                                           -001- 10       NOTE    ***************************************************************


0024000                                          17       END
```

```
  VALUE  T NAME        DEF/REF   ATTRIBUTES AND REFERENCES                                      CIPL         W77D

14047410 S .STOP
 0013422 L %%%303        24-12  24-07
 0010571 L %%%306        24-24  24-19
 0013432 L %%%323        26-19  26-14
 0010662 L %%%326        26-36  26-31
 0013450 L %%%346        35-01  34-42
 0011210 L %%%348        35-12  35-07
 0013462 L %%%429        59-42  59-37
 0012731 L %%%431        60-04  59-48
 0000201 A %BITCNT               1-08
 0000001 A %BOP                  1-08
 0000004 A %CLAS               LIBNUM=10       1-08
 0000001 A %MAXWRD             LIBNUM=10       1-08
'CIPL'   T %NAME%
       0 J %OW%          1-10
       0 J %PFT%
'()'     T %SAVREGS
 0003100 A %T
 0000010 A %TA1%         15-20  17-23, 17-34, 24-02, 26-10, 34-38, 44-11, 46-14, 55-04, 59-33, 60-43, 65-38
       0 J %TCHEAD%      1-10
'PRLINE 1,1,
'   --------
-----------
-----------
-----------
-----------
-----------
-----------
-----------
-----------
----------''T %US%
''       T %USING12
''       T %USING14
 0000001 A %WRDCNT             LIBNUM=10       1-08
 0000001 A AA%                 LIBNUM=10       1-08
 0000000 A ACTIV          5-11 W=1   S=15  N=0  CL=3
 0000004 A ACTSEQ         6-26 W=1   S=13  N=4  CL=3          37-43, 48-26, 48-30
 0013255 L ADBX          66-19  66-23
 0013260 L ADD           66-21  66-19
 0013265 L ADIV          66-26  66-29
 0013052 L ADJST         62-17  63-10
 0013476 L ALLMAS        72-06 W=1   S=17  N=0  CL=4          12-01, 23-10
 0011167 L ANALWRK       34-25  34-22
MASACS   V APPTRL        11-08  57-25
 0012647 L APPTRLR       58-17  12-02
 0012375 L AREDCON       54-04  32-27
 0011111 L AREDCONX      32-26  32-17
 0012657 L ASCHCLN       58-44  32-29, 57-04
```

```
  VALUE  T  NAME       DEF/REF   ATTRIBUTES AND REFERENCES                                          CIPL        W77D

 0011113 L ASCHCLNX     32-28  32-18
 0011035 L ASCHEDULE    31-04  33-15
 0013520 L ASTATE       73-01  28-43, 31-20, 51-18, 52-16, 52-19, 54-31, 54-32, 54-47, 57-41, 58-12, 60-14
 0011136 L AVERCONT     33-01  32-16
 0011123 L AVERREC      32-39  32-15, 52-06
 0000011 A BACKORD             LIBNUM=6        44-32
      11 R BAD4K         4-28 W=1  S=2  N=0  CL=1   23-01, 25-32, 27-09
 0013500 L BASEGENR     72-16  21-12, 28-42, 35-03, 36-09, 51-21
 0013503 L BASEPAT      72-22  21-19
 0013501 L BASEXLAT     72-18  35-02
       0 U BB%                  1-08
 0011362 L BBSCHB       38-04  37-21, 38-45, 39-29, 40-22, 41-18, 41-47, 42-12, 42-33, 43-30, 44-38, 46-25
 0012521 L BCK          56-22  56-17
 0012131 L BCKRECV      49-33  33-20
 0011161 L BCKRECV1     33-19  32-12, 51-49
 0020013 A BCLRBRF             LIBNUM=6        15-47, 19-48, 43-26
 0120013 A BCLROCN             LIBNUM=6        15-39, 19-38, 43-06
 0000000 A BLKADR              W=13  S=0  N=0  CL=3  LIBNUM=6       14-33, 14-35, 18-31, 18-33, 40-48, 48-24
 0013556 D BLKDIGOFF    74-17  29-29, 53-21, 53-33
 0013555 D BLKDIGON     74-16  34-32, 35-47
 0013554 D BLKINCOF     74-13  29-25, 53-20, 53-43
 0013553 D BLKINCON     74-12  34-31, 36-08
MASACS   V BLKPERCK     11-21  51-22
 0010000 A BLKSIZ        7-44
MASACS   V BLKSIZE      11-09  14-41, 18-45
MASACS   V BLK4K        11-10  29-24, 35-04, 36-01, 53-36, 74-12, 74-13
       4 R BLOKCNT      13-04
 0000000 A BOFL          5-12 W=1  S=16  N=0  CL=3
 0010502 L BOOTLOAD     22-45  12-04, 17-40
 0010774 L BOOTLOOP     29-37  33-14, 56-20, 56-34, 57-24
 0013422 L BOOTPATCH    71-01
CINIT    V BOOTRTN      11-35  27-16, 58-37
 0010000 L BOOTSTP      13-42  13-44
 0000000 A BOT           4-13 W=1  S=16  N=0  CL=3          40-45
 0010001 L BOTST        13-48  14-01
 0000000 A BR            5-05 W=1  S=7  N=0  CL=3   15-35, 19-33, 42-45
 0012423 L BREDCON      54-26  52-08
 0000003 A BSBOT         6-18 W=1  S=11  N=3  CL=3          52-46, 52-48, 67-32
 0012731 L BSCHCLN      60-12  52-09
 0011244 L BSCHEDU      35-42  31-35, 34-27, 35-36
 0012136 L BSCHEDULE    50-18  33-16, 35-43
 0010754 L BSCHWORK     29-23  29-18, 67-46
 0000013 A BSTAT               LIBNUM=6        15-32, 19-29, 42-42
 0013527 L BSTATE       73-17  28-44, 33-02, 33-05, 35-23, 35-24, 50-28, 54-09, 54-14, 57-30, 57-33, 58-06, 58-46
 0013344 L BSTRBL       67-31  67-10
 0044013 A BSUNLDON            LIBNUM=6        15-37, 19-35, 43-03
 0000207 A BTLODOFS     17-39  12-03
 0013072 L BTODON       62-32  61-17, 61-26, 61-36, 61-40, 63-24, 65-19
MASACS   V BUFBLK       11-11  14-15, 15-28, 18-20
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  VALUE  T  NAME        DEF/REF    ATTRIBUTES AND REFERENCES                                          CIPL          W77D

 0000003 A BUFC            6-11 W=4  S=0  N=3  CL=3    12-05, 37-25, 43-09, 43-10, 43-13, 44-16, 45-32, 46-17, 59-27
 0010313 L BUFERS         19-28  18-25
       2 R BUFFCNT        13-02
MASACS   V BUFLEN         11-12
 0012273 L BVERCONT       52-15  52-07
 0013507 D BXKONOFF       72-29  29-32, 53-22, 53-44
 0013506 D BXKONON        72-28  21-30, 34-28, 36-12
 0010567 L CALCHASH       24-05  27-04
 0013115 L CARRYO         63-14  61-32
 0000003 A CARYBIT         6-12 W=1  S=4  N=3  CL=3    61-31, 62-30, 63-35, 64-09, 65-16
 0013542 L CDEST          73-41
 0013540 L CEA            73-37  67-37
 0012334 L CHECKIT        53-16
 0011163 L CHECKTBL       34-19  32-03
 0012303 L CHECKTBLOFF    52-36  51-16, 51-31
 0000000 L CHKSUM         74-28  12-06, 21-13, 21-31, 23-46, 34-29, 53-18
 0010575 L CHKSUMLP       24-37  26-44
 0011512 L CHKTIM         42-01  32-35, 52-04
 0011121 L CHKTIMX        32-34  32-14
 0010000 L CIPL            1-39  17-05, 17-39, 18-01, 24-07, 26-14, 34-42, 59-37
 0000017 A CLEANSW              LIBNUM=6         47-40
 0010224 L CLRPT          18-21  20-02
'L1DATA'   T CLRTAB
 0012560 L CMON           57-08  56-38
 0000004 A CONRCV          6-28 W=1  S=15  N=4  CL=3           44-31, 45-43, 47-10, 47-19, 47-24
 0000016 A CONREDFAL            LIBNUM=6         47-01
       7 R CONSEC         13-07
 0013230 L CONSGEN        65-23  38-30, 41-45
 0012661 L CONTCLEAN      58-47  60-20
 0011762 L CONTFAL        46-26  46-09
 0012476 L CONTINC        56-06  56-03
 0012307 L CONTINUB       52-41  52-38
 0000010 A CONTREAD             LIBNUM=6         42-26
 0011466 L CONTVERIT      41-04  40-46
 0013515 D COUNT          72-42
 0013537 L CPTP           73-35
 0010346 L CRCER          20-07  18-30
 0011636 L CRCFAIL        44-08  42-11
 0011626 L CRCLOOK        44-01
 0010131 L CRCMESS        16-05  14-25
 0011664 L CRCOK          44-42  44-07
 0012625 L CREDCON        58-01  57-03
 0013102 L CR3K           62-43  63-41
 0012457 L CSCHEDUL       55-42  12-07, 33-17, 50-47, 52-40, 52-43, 52-45, 53-07, 53-26
 0012525 L CSTARTED       56-28  56-09
 0013541 L CSTAT          73-39
 0013536 L CSTATE         73-33  21-23, 21-24, 21-25, 54-35, 54-36, 55-01, 55-48, 60-17
 0013543 L CTIME          73-43
 0012606 L CVERCONT       57-29  57-02
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 VALUE  T  NAME        DEF/REF   ATTRIBUTES AND REFERENCES                                   CIPL          W77D

0000001 A DATA_AREA           W=20  S=0  N=1  CL=3  LIBNUM=6      45-13, 45-17, 45-20, 59-12, 59-13, 59-16, 61-24
0010062 L DATACHK      15-04  15-13
0010274 L DATACHK2     19-08  19-21
0010067 L DATAVL       15-10  15-05
0010301 L DATAVL2      19-14  19-09
     11 R DB                  LIBNUM=10     30-11
0000000 A DDT           4-10 W=1  S=13  N=0  CL=3
0013533 L DESTOFF      73-25
0000004 A DESTON        6-25 W=13  S=0  N=4  CL=3          12-08, 21-23, 36-11, 36-49, 38-33, 38-34, 46-22, 48-01, 48-02,
                             48-29, 51-23, 53-45, 54-19, 57-13, 59-09, 65-34
0000000 A DEVICODE      4-04 W=6  S=0  N=0  CL=3
0013263 L DIVIDE       66-24  66-20
     11 R DOALL         4-26 W=1  S=0  N=0  CL=1  23-01, 23-11, 24-43
0011351 L DOBKUP       37-44  37-40, 49-36
0012065 L DOEOFCK      48-17  45-34
0011246 L DOIT         35-44  35-32
0012345 L DOLOOK       53-23  53-35, 53-38
0011716 L DONOTSTR     45-25  12-09, 45-10, 47-11, 47-49, 48-05, 62-35
0012205 L DONSET       51-11  51-20
0000002 A EA            6-10 W=20  S=0  N=2  CL=3          31-28, 33-05, 33-06, 35-23, 35-24, 35-27, 35-37, 50-41, 52-19,
                             52-20, 54-14, 54-16, 54-31, 54-35, 54-39, 56-07, 56-27, 57-33, 57-38, 57-41, 58-09, 58-12,
                             59-05, 59-43, 67-14, 67-36
0013531 L EAOFF        73-21  21-46, 29-05, 35-38, 56-11, 67-21
0013522 L EAON         73-05  21-45, 56-10, 67-17, 67-23, 67-35
0000006 A EASV          6-31 W=20  S=0  N=6  CL=3          54-13, 54-40, 58-14, 59-04
0013544 L EASVC        73-45
0013535 L EASVOF       73-28
0013526 L EASVON       73-12
0000000 A EOF                W=1  S=15  N=0  CL=3  LIBNUM=6       15-18, 18-38, 19-25, 43-33, 44-46, 48-18, 59-30
0000004 A EOPF          6-29 W=1  S=16  N=4  CL=3          61-16, 61-39
0000000 A EOT           4-07 W=1  S=10  N=0  CL=3
0013123 L EQLTO        63-22  63-30, 64-10
0000004 A ERNO          6-27 W=1  S=14  N=4  CL=3          37-07, 37-18, 46-08, 46-46, 51-05, 51-07, 51-12
0011534 L ERRLOOK      42-22  43-23
      0 J ESS2          1-10
      1 J ESS2E         1-09
0000007 A EVALPOS            LIBNUM=6      45-36
0013254 L FAST         66-16  66-11
0011402 L FASTFWD      38-39  38-37
0011363 L FASTPOS      38-26  32-04, 51-33
0000003 A FASTSTP            LIBNUM=6      38-42, 44-35
      1 J FIELD         1-09
0010722 L FILEOK       29-01  28-47
0000000 A FILL          5-13 W=1  S=17  N=0  CL=3
0000005 A FORCOPY       7-13 W=1  S=16  N=5  CL=3          24-44, 25-19, 25-31, 36-02, 53-37
MASACS    V FSTDIST    11-13  66-10
0011411 L FSTOPTST     39-15  32-06, 33-07, 51-37, 57-39
0013504 L GEN4KNO      72-24  21-26, 29-27
0012622 L GETAEA       57-40  57-35
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     VALUE  T  NAME        DEF/REF    ATTRIBUTES AND REFERENCES                                     CIPL          W77D

    0012524 L GETEAIN       56-26  56-21, 56-24
    0012413 L GOFIN         54-15  54-41, 58-16
'+19'       T HADR                 W=4   S=0  N=23  CL=2
    0000005 A HASHLEN        7-11  W=15  S=0  N=5   CL=3          12-10, 24-40
    0013477 D HASHSAVE      72-15  24-14, 25-24, 26-05
   MASACS   V HASHSUMN      11-14  25-27
'+0'        T HDRSIZE              W=20  S=0  N=0   CL=2
    C013341 L HG            67-26  67-47
    U000065 A HG%T                 LIBNUM=10        14-13
   LAYOUT   V HGAREA        11-04  14-10
    0011605 L HR            43-20  43-21
   LAYOUT   V I_OBUF        11-05  14-34, 15-29, 18-19, 18-32, 31-17, 55-45
'ILLEGAL CON
DITIONAL IN
THE IF MACRO'T IFERROR1
'DATA > 0 OR
 DATA < 0 IS
 MEANINGLESS
, USE DATA ¬
= 0'        T IFERROR2
'TWO CONSTAN
TS ARE BEING
 COMPARED IN
 IF MACRO'  T IFERROR3
'AN ITEM WAS
 COMPARED TO
 SOMETHING O
THER THAN A
CONSTANT'   T IFERROR4
'DESTINATION
 OF AN = STA
TEMENT IS A
CONSTANT'   T IFERROR5
'ATTEMPTING
TO SET ITEM
= TO SOMETHI
NG OTHER THA
N A CONSTANT'T IFERROR6
'ITEM MAY ON
LY USE THE =
 AND ¬= COND
ITIONALS'   T IFERROR7
    0010062 L IFS270        15-04  15-02
    0010274 L IFS283        19-08  19-06
    0010507 L IFS297        23-02  22-49
    0010617 L IFS311        25-17  25-03
    0010636 L IFS314        25-35  25-22
    0010646 L IFS317        25-48  25-46
    0010653 L IFS318        26-04  26-02
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   VALUE  T  NAME         DEF/REF    ATTRIBUTES AND REFERENCES                                              CIPL          W77D

  0013220 L IGNORNXT       65-13  65-03
  0000001 A INDEXCNTR       7-48
''        T INDEXTITLE1
  0040007 A INIT                  LIBNUM=6        16-11, 18-40, 20-11, 29-06, 40-49, 44-09, 46-32, 47-32
 CINIT    V INITBOOT       11-38  22-01
  0010416 L INITLO         21-15  21-18
 CINIT    V INITTSTC       11-39  17-21, 17-32
 CTSD     V INITTST1       11-29  17-20
 CTSD     V INITTST2       11-30  17-26
  0066540 A INTERCOM              LIBNUM=6        29-04
  0000001 A INTHNR          6-09  W=1  S=17  N=1  CL=3        31-25, 34-23, 46-29, 46-48, 47-25, 50-33, 50-39, 52-39, 54-09,
                                  54-11, 54-17, 54-32, 54-33, 54-36, 56-04, 57-16, 59-29, 62-33
  0000000 A INTOFF          5-07  W=1  S=11  N=0  CL=3
  0000001 A INTREQ          6-08  W=1  S=16  N=1  CL=3        31-23, 34-21, 50-31, 52-37, 54-10, 55-08, 56-02, 57-14, 60-15
  0011701 L KEEPGO         45-11  47-27
  0010221 L KEEPRD         18-18  18-12, 19-26, 20-41, 22-11
  0011202 L KEEPUP         34-33  35-49, 36-03
  0000021 A KILLSYS               LIBNUM=6        60-37
'+20'     T LADR                  W=20  S=0  N=24  CL=2
 MASACS   V LASTBUF        11-15  43-29
 CINIT    V LDDB15_0       11-40  30-16
  0000000 A LINECNT
  0011730 L LODEVAL        45-35  41-03
  0000000 A LODST           5-08  W=1  S=12  N=0  CL=3
  0013105 L LODSTR         63-01  62-40
'BUFSTAT'   T LONAM_ACTIV
''          T LONAM_ACTSEQ
'OFLBOOTSW' T LONAM_ALLMAS
'R9'        T LONAM_BAD4K
'BUFSTAT'   T LONAM_BOFL
'TAPSTAT'   T LONAM_BOT
'BUFSTAT'   T LONAM_BR
''          T LONAM_BSBOT
''          T LONAM_BUFC
''          T LONAM_CARYBI
              T
''          T LONAM_CONRCV
'TAPSTAT'   T LONAM_DDT
''          T LONAM_DESTON
'TAPSTAT'   T LONAM_DEVICO
              DE
'R9'        T LONAM_DOALL
''          T LONAM_EA
''          T LONAM_EASV
''          T LONAM_EOPF
'TAPSTAT'   T LONAM_EOT
''          T LONAM_ERNO
'BUFSTAT'   T LONAM_FILL
'CHKSUM'    T LONAM_FORCOP
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                 Y
''             T LONAM_HADR
'CHKSUM'       T LONAM_HASHLE
                 N
''             T LONAM_HDRSIZ
                 E
''             T LONAM_INTHNR
'BUFSTAT'      T LONAM_INTOFF
''             T LONAM_INTREQ
''             T LONAM_LADR
'BUFSTAT'      T LONAM_LODST
'TAPSTAT'      T LONAM_MOP
'TAPSTAT'      T LONAM_MTCE
''             T LONAM_NEWD
''             T LONAM_NEWDH
'R9'           T LONAM_NOTEST
'OFLBOOTSW'    T LONAM_OFLBTS
                 W
''             T LONAM_OLD
''             T LONAM_OLDH
''             T LONAM_OWNO
''             T LONAM_OWSTAT
'R9'           T LONAM_PASS
''             T LONAM_PATLEN
                 GTH
'BUFSTAT'      T LONAM_PPE
'CHKSUM'       T LONAM_PROGBL
                 KS
''             T LONAM_PTPKNO
                 WN
''             T LONAM_PTPOS
'BUFSTAT'      T LONAM_RDY
''             T LONAM_RECOV
'TAPSTAT'      T LONAM_REWND
''             T LONAM_SCHCON
                 1
''             T LONAM_SCHCON
                 2
''             T LONAM_SEGNO
''             T LONAM_SPECST
                 OR
''             T LONAM_STATE
''             T LONAM_STORNO
                 T
'BUFSTAT'      T LONAM_STUFF
''             T LONAM_STUS
'TAPSTAT'      T LONAM_TIM
''             T LONAM_TIMING
''             T LONAM_TIMKON
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   PATCH HISTORY                                                                                  0:21:11    2/06/81  ****

     VALUE  T  NAME       DEF/REF    ATTRIBUTES AND REFERENCES                                          CIPL          W77D

'TAPSTAT'     T LONAM_TOR
''       ,    T LONAM_TR
'CHKSUM'      T LONAM_TSFLG
''            T LONAM_TUOOS
'TAPSTAT'     T LONAM_TUR
'BUFSTAT'     T LONAM_UNST
''            T LONAM_VERT
'TAPSTAT'     T LONAM_WENBL
'CHKSUM'      T LONAM_WOPEN
''            T LONAM_WRDLEN
                GTH
     0012572 L LONGSCHED      57-17  52-18
     0012574 L LOOKATB        57-19  57-15
     0013502 L LST4K1         72-20  21-28, 29-26, 34-34
     0012454 L MAKEIT         55-02  54-49
     0012446 L MAKERQ         54-45  54-37
     0013511 D MATEOOS        72-34  29-22, 32-41, 32-44, 35-05, 35-21, 37-11, 51-08, 54-06, 54-28, 58-03, 67-03, 67-06
     0013300 L MEME           66-45  66-46




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      !$*);
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   :#@'=" ab
cdefghi n≤(+
† jklmnopqr^
 ¤>±■-~stuvw
xyz+└┌[≥●012
3456789↑┘┐]≠
-{ABCDEFGHI
    }JKLMNO
PQR       \ S
TUVWXYZ
 0123456789
     '        T MICODETR             LIBNUM=10
     0000000 A MOP             4-14 W=1  S=17  N=0  CL=3
     0010213 L MOREBOT        18-07  15-23, 19-27
     0010103 L MRBUFRS        15-31  14-20
     0013022 L MRPAT          61-41  61-38
          16 R MS                    LIBNUM=10        23-08
   MASACS    V MSECPR         11-16  66-22
     0000000 A MTCE            4-11 W=1  S=14  N=0  CL=3
     0013210 L MUSTCRY        65-01  64-37, 64-40
     0010532 L MY1            23-25  23-26
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PATCH HISTORY                                                                              0:21:11    2/06/81  ****

  VALUE  T  NAME        DEF/REF   ATTRIBUTES AND REFERENCES                                CIPL          W77D

 0010540 L MY2           23-30  23-31
'+21'    T NEWD                 W=20  S=0  N=25  CL=2
'+22'    T NEWDH                W=10  S=10  N=26  CL=2
 0010050 L NEWLA         14-42  15-08
 0010262 L NEWLA2        18-46  19-12
 0011146 L NEXTSCHED     33-11  31-26, 33-04, 34-24, 38-05, 54-12, 55-13, 57-18, 58-08, 59-31, 61-01, 67-25
 0012121 L NOACTSEQ      49-01  48-28, 48-32
 0010546 L NOANS         23-35  23-33
 0013446 L NOBELL        26-29  26-23
 0012164 L NOCHANCE      50-40  50-32, 50-36, 50-38
 0010636 L NOCOPY        25-33  25-30
 0011671 L NOEOF         45-03  44-47
 0010170 L NONE          16-37  16-35
 0010405 L NONE2         20-38  20-36
 0013171 L NONRES        64-28  62-13
 0010151 L NOONE         16-22  16-20
 0010364 L NOONE2        20-22  20-20
 0010260 L NOSTOP        18-44  18-39
      11 R NOTEST         4-29 W=1  S=3  N=0  CL=1   24-34, 24-41
MASACS   V NOTESTCK      11-17  24-17
 0010463 L NOTON         21-43  21-41
 0011226 L NOTRKCHG      35-31  34-36
 0011054 L NOWAY         31-27  31-24
 0012767 L NXBL          61-01  59-45
 0011525 L NXTATE        42-16  42-06
 0013167 L NXTBLKIN      64-22  62-03, 62-09
 0013036 L NXTBOUND      62-04  61-49
 0013510 D NXTSCH        72-33  31-16, 33-12, 50-23, 55-44, 67-08
 0011761 L NXTSCHB       46-24  50-34
 0013043 L NXTSEG        62-10  62-46, 64-45
 0011132 L NXTVER        32-45
MASACS   V OBUFLEN       11-18  61-18
 0000000 L OFFSET        13-43  14-20, 15-05, 15-13, 15-46, 16-17, 16-32
CINIT    V OFL_HG        11-41  14-10
 0006453 A OFLBOOTCON     7-47  17-19, 69-19
 0013476 L OFLBOOTSW     72-02  17-18, 21-49, 23-09, 27-18, 58-39, 69-18, 72-04, 72-06
 0010175 L OFLBOOTTBL    17-06  17-17
 0010207 L OFLBOOTTBLE   17-37  17-17
 0013373 L OFLBOOTTST    69-15  23-04, 23-20, 23-39, 26-07, 27-15, 29-44, 30-13, 58-36, 70-19
 0000175 A OFLBTOFS      17-05  12-15
 0013476 L OFLBTSW       72-04 W=14  S=0  N=0  CL=4           69-20
'+23'    T OLD                  W=20  S=0  N=27  CL=2
'+22'    T OLDH                 W=10  S=0  N=26  CL=2
 0013524 L ONDEST        73-09
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  VALUE  T  NAME         DEF/REF   ATTRIBUTES AND REFERENCES                                                    CIPL          W77D

   ¢.<(AON
      X$*);
¬S/        ;
,%_>?
   :#@'L" ab
cdefghi n≤(+
† jklmnopqr^
 ¤)±■-~stuvw
xyz+└┌[≥●012
3456789↑┘┐]≠
-(IBCLEFGHI
     }JKLMNO
PQR      \ S
LLLWLYZ
 0123456789
    .'       T OPTR
    0011603 L ORDER         43-17  43-25
         12 R ORDEREG       13-08
    0013276 L ORDOUT        66-40  19-32, 19-37, 19-40, 19-45, 20-01, 20-24, 20-28, 20-40, 37-30, 38-03, 38-41, 39-19, 40-08,
                                   40-20, 40-44, 41-02, 41-09, 42-04, 42-19, 42-44, 43-05, 43-08, 43-28, 45-02, 47-34
    0000417 A ORG_000075    15-20
    0000421 A ORG_000204    17-23
    0000425 A ORG_000207    17-34
    0000455 A ORG_000567    24-02
    0000501 A ORG_000660    26-10
    0000530 A ORG_001206    34-38
    0000607 A ORG_001640    44-11
    0000616 A ORG_001756    46-14
    0000640 A ORG_002454    55-04
    0000653 A ORG_002727    59-33
    0000665 A ORG_002767    60-43
    0000676 A ORG_003236    65-38
    0000457 A ORG_003422    24-13
    0000503 A ORG_003432    26-20
    0000532 A ORG_003450    35-02
    0000655 A ORG_003462    59-43
    0012516 L OUT           56-19  56-05, 56-14, 57-32
         16 R OVLOF                W=1  S=0  N=0  CL=1  LIBNUM=10       23-07
    0013012 L OVWRT         61-33  62-45, 63-37, 64-18, 64-44
'+13'       T OWNO                 W=20  S=0  N=15  CL=2
'+17'       T OWSTAT               W=2  S=0  N=21  CL=2            61-42, 61-44
    0000020 A PACKINT              LIBNUM=6         46-40
    0000001 A PAGECNT
    0000062 A PAGL           1-39
    0010611 L PARCORRLP     25-07  25-15
         11 R PASS           4-27  W=1  S=1  N=0  CL=1   25-25, 27-02, 27-03
    0013550 L PATADR        74-07  62-23, 62-24, 63-42, 63-43
    0012771 L PATCHUNL      61-15  72-45
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  VALUE  T  NAME        DEF/REF   ATTRIBUTES AND REFERENCES                                          CIPL        W77D

  0013547 L PATESSWD      74-05  62-29, 63-38
'+12'   ' T PATLENGTH            W=20  S=0  N=14  CL=2         61-28, 61-29, 61-42, 62-05
  0013546 L PATOTLEN      74-03  62-28, 63-31, 64-08, 65-18
  0013512 D PATTERN       72-39  29-38
  0013513 D PATTERN1      72-40  60-40
  0013514 D PATTERN2      72-41  60-41
  0011064 L PAX           32-01  31-31
  0012535 L PAXC          56-36  56-30
  0012226 L PAXOFF        51-28  50-43, 51-04, 51-06
        5 R PGMCNT        13-05
  0010410 L PHASE3        21-09  18-14
 CINIT    V PMISC         11-37
  0013247 L POSITIVE      66-08  66-05
 CTSD     V POSTMORT      11-32
  0000000 A PPE            5-04 W=1   S=6  N=0  CL=3
  0013153 L PROCMA        64-01  61-45
  0000004 A PROGBLKS       7-10 W=20  S=0  N=4  CL=3         12-16, 23-46
  0013126 L PSTV          63-28  63-18
  0000003 A PTPKNOWN       6-13 W=1   S=5  N=3  CL=3   29-03, 35-28, 36-13, 38-28, 49-03, 53-46, 57-10, 59-01, 59-06
  0013530 L PTPOFF        73-19
  0013521 L PTPON         73-03
  0000001 A PTPOS          6-05 W=13  S=0  N=1  CL=3         21-20, 29-02, 36-48, 37-01, 37-02, 37-35, 37-37, 37-38, 38-31,
                                 38-32, 45-08, 47-15, 47-18, 47-21, 48-31, 49-02, 54-18, 54-19, 57-12, 57-13, 58-46, 58-48,
                                 59-01, 60-19, 65-35, 65-36, 65-41
 BLMMA    V PTRESET       11-01  70-23
       14 P RA0                 LIBNUM=3          14-14, 14-34, 14-40, 14-43, 14-44, 15-11, 15-29, 15-45, 18-19, 18-32, 18-37,
                                 18-47, 18-48, 19-15, 19-46, 21-12, 21-16, 21-38, 23-46, 23-47, 23-48, 24-38, 24-39, 25-38,
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                                 48-26, 48-29, 48-30, 48-33, 48-35, 48-36, 48-38, 48-40, 48-42, 49-02, 49-03, 49-04, 49-05,
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       16 P RA1                 LIBNUM=3          15-01, 15-03, 15-12, 19-05, 19-07, 19-17, 19-20, 21-13, 21-14, 21-17, 21-31,
                                 21-35, 21-36, 21-37, 23-49, 25-10, 25-13, 25-45, 25-47, 25-48, 28-43, 28-49, 29-02, 29-03,
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                                  54-21, 54-47, 54-48, 55-01, 55-08, 55-45, 58-06, 58-07, 58-09, 59-07, 59-12, 59-13, 59-16,
                                  59-17, 59-18, 59-23, 59-25, 59-30, 61-21, 61-24, 61-29, 61-34, 61-42, 62-05, 62-11, 62-14,
                                  62-15, 62-16, 63-02, 63-03, 63-08, 63-32, 64-17, 64-29, 64-42, 68-04
 0000000 A RDY             5-06 W=1  S=10  N=0  CL=3
 0010474 L READCKSUM      22-05  18-13
 0011546 L READON         42-40  32-25, 51-47
 0011107 L READONX        32-24  32-11
 0000001 A RECOV           6-06 W=1  S=13  N=1  CL=3         44-26, 44-28, 45-04, 46-28, 47-14, 48-38, 48-40, 67-15, 67-33
 0012011 L RECOVCHK       47-06  45-05
 0011734 L RECOVIP        45-42  44-27
 0012713 L RECOVUNL       59-21  62-34
MASACS   V REDKON         11-19  37-47, 39-26, 42-49, 44-23, 47-37, 53-03
 0000012 A REDRCV              LIBNUM=6        49-34
 0011451 L REDVER         40-40  32-09, 36-14, 37-34, 51-43, 53-48, 57-11
 0000006 A REDVERST            LIBNUM=6        40-23, 48-41
 0011506 L REEVAL         41-43  32-33, 36-15, 51-45, 53-49
 0011117 L REEVALX        32-32  32-10
 0010175 L REMAINBOOT     17-01  14-14
 0012741 L REPKMRF        60-24  32-31, 52-10, 57-05
 0011115 L REPKMRFX       32-30  32-19
 0011335 L REPOSI         37-32  37-04
 0012002 L REQINT         46-45  45-44, 47-23
 0012443 L REQUGO         54-38  54-34
 0010477 L RERT           22-08  22-10
CBLM     V RESETPT        11-24  26-21, 30-18
 0010104 L RESND          15-33  15-36
 0010314 L RESND2         19-30  19-34
 0010154 L RESTAT         16-25  16-28
 0010370 L RESTAT2        20-26  20-30
 0011661 L RESTRV         44-34  44-30, 46-03
 0000000 A REWND           4-12 W=1  S=15  N=0  CL=3
CINIT    V RLDXLATE       11-36
 0010707 L RLOD           28-01  27-10, 27-13
''           T RMK_ACTIV
'ACTIVATE SE
Q. ERROR CHE
CK'          T RMK_ACTSEQ
' FULL MEMOR
Y RELOAD CON
TROL'        T RMK_ALLMAS
' RELOAD OF
AT LEAST ONE
 4K REQUIRED'T RMK_BAD4K
''           T RMK_BOFL
''           T RMK_BOT
''           T RMK_BR
''           T RMK_BSBOT
''           T RMK_BUFC
```

```
' PATCH CROS
SES BLOCK BO
UNDRY'        T RMK_CARYBIT
' CONTINUOUS
 READ RECOVE
RY.'          T RMK_CONRCV
''            T RMK_DDT
' TAPE DESTI
NATION'       T RMK_DESTON
''            T RMK_DEVICODE
' FORCE ALL
MEMORY TO RE
LOAD'         T RMK_DOALL
' TAPE ENABL
E ADDRESS'    T RMK_EA
' SAVED EA F
OR RECOVERY'  T RMK_EASV
'END OF PATC
H FILE SEEN.'T RMK_EOPF
''            T RMK_EOT
'ERROR RECOV
ERY NOT ALLO
WED'          T RMK_ERNO
''            T RMK_FILL
' BIT SET TO
 FORCE COPY
OF BLOCK'     T RMK_FORCOPY
' HIGH BITS
OF PATCH ADD
RESS.'        T RMK_HADR
' LENGTH FOR
 HASHSUM CAL
C.'           T RMK_HASHLEN
' LENGTH OF
HEADER.'      T RMK_HDRSIZE
' INT. REQUE
ST HONORED.'  T RMK_INTHNR
''            T RMK_INTOFF
' INTERRUPT
REQUESTED.'   T RMK_INTREQ
' PATCH ADDR
ESS'          T RMK_LADR
''            T RMK_LODST
''            T RMK_MOP
''            T RMK_MTCE
' LOW 16 BIT
S OF NEW DAT
A.'           T RMK_NEWD
' HIGH 8 BIT
```

```
S OF NEW DAT
A.'           T RMK_NEWDH
' DO NOT TES
T FOR RELOAD'T RMK_NOTEST
' NORMAL/OFF
LINE BOOTSTR
AP SWITCH'    T RMK_OFLBTSW
' LOW 16 BIT
S OF OLD DAT
A.'           T RMK_OLD
' HIGH 8 BIT
S OF OLD DAT
A.'           T RMK_OLDH
' OVERWRITE
NUMBER.'      T RMK_OWNO
' OVERWRITE
STATUS'       T RMK_OWSTAT
' GENERIC/TR
NSLN PASS'    T RMK_PASS
' TOTAL LENG
TH OF PATCH
FILE.'        T RMK_PATLENGT
                H
''            T RMK_PPE
' NUMBER OF
GENERIC RELA
TED CHECKSUM
S.'           T RMK_PROGBLKS
' TAPE POSIT
ION KNOWN FL
AG'           T RMK_PTPKNOWN
' TAPE POSIT
ION'          T RMK_PTPOS
''            T RMK_RDY
' ERROR RECO
VERY IP'      T RMK_RECOV
''            T RMK_REWND
' SCHEDULER
CONTROL BIT'  T RMK_SCHCON1
' SCHEDULER
CONTROL BIT'  T RMK_SCHCON2
' SEGMENT NU
MBER'         T RMK_SEGNO
' SPEC. UNLO
AD REQUIRED.'T RMK_SPECSTOR
' SCHEDULER
STATE'        T RMK_STATE
'NO STORAGE
OF BLOCK BIT'T RMK_STORNOT
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    VALUE  T  NAME        DEF/REF   ATTRIBUTES AND REFERENCES                                                CIPL          W77D

''            T RMK_STUFF
' ACTIVE OR
DONE FLAG'    T RMK_STUS
''            T RMK_TIM
' TIMING FLA
G'            T RMK_TIMING
' TIMING CON
STANTS'       T RMK_TIMKON
''            T RMK_TOR
' READ TRACK
'             T RMK_TR
' TEMPORARY
STORE FLAG,
4K BLOCK IS
NOT WRITE PR
OTECTED'      T RMK_TSFLG
' BSCHED TU
OOS'          T RMK_TUOOS
''            T RMK_TUR
''            T RMK_UNST
' VERIFY TRA
CK NUMBER.'   T RMK_VERT
''            T RMK_WENBL
'CHECKSUM IN
FO. CHANGING
. (XLATE BEI
NG WRITTEN)'  T RMK_WOPEN
' LENGTH OF
SPECIFIC PAT
CH'           T RMK_WRDLENGT
                H
     0011536 L RON           42-25  42-21
     0011767 L RPCK          46-31  32-43, 46-49, 54-08, 54-30, 58-05
     0013363 L RTNBSCH       67-45  67-42
           0 R RO                  LIBNUM=3        13-01, 14-10, 14-14, 14-33, 14-36, 14-37, 15-11, 15-12, 15-29, 18-09, 18-10,
                                    18-19, 18-31, 18-34, 18-35, 21-12, 21-13, 21-14, 21-16, 21-17, 21-19, 21-20, 21-21, 21-26,
                                    21-29, 21-33, 21-36, 21-48, 21-49, 22-47, 23-09, 23-10, 23-49, 24-13, 24-14, 24-15, 24-33,
                                    25-13, 25-19, 25-20, 25-23, 25-29, 25-48, 26-01, 27-17, 27-18, 28-42, 28-45, 28-46, 29-02,
                                    29-04, 29-08, 29-13, 29-14, 29-24, 29-25, 29-26, 29-28, 29-31, 31-15, 31-16, 31-32, 32-41,
                                    32-42, 32-46, 33-02, 33-03, 33-12, 33-13, 34-29, 34-30, 34-34, 34-35, 35-02, 35-03, 35-05,
                                    35-13, 35-34, 35-35, 35-39, 35-40, 35-46, 35-48, 36-02, 36-09, 36-10, 36-48, 37-01, 37-03,
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                                    38-42, 38-43, 39-20, 39-22, 39-27, 40-05, 40-06, 40-09, 40-10, 40-23, 41-06, 41-07, 41-12,
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                                  70-17, 70-20, 70-26, 70-27
0000123 A ROXF                    LIBNUM=10       14-13
      1 R R1                      LIBNUM=3        14-09, 14-26, 14-29, 15-17, 16-06, 16-08, 16-10, 18-09, 19-24, 20-08, 20-10,
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                                  21-40, 21-42, 21-46, 23-07, 23-08, 25-24, 25-28, 25-29, 28-43, 28-44, 29-27, 29-28, 29-29,
                                  29-30, 29-31, 29-32, 34-31, 35-04, 36-01, 36-08, 36-10, 36-11, 36-49, 37-02, 37-03, 37-11,
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                                  61-18, 61-28, 61-47, 61-48, 62-01, 62-02, 62-06, 62-08, 62-20, 62-21, 63-17, 63-20, 63-21,
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                                  66-18, 66-22, 66-28, 70-17, 70-20, 70-23, 70-24, 70-25, 70-26
     12 R R10                     LIBNUM=3        13-08, 14-21, 15-32, 15-37, 15-39, 15-42, 15-47, 16-11, 16-18, 16-21, 16-24,
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     13 R R11                     LIBNUM=3        13-09, 15-35, 15-45, 16-27, 19-33, 19-46, 20-29, 23-34, 23-48, 25-39, 25-42,
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     14 R R12                     LIBNUM=3        31-21, 45-15, 45-18, 45-30, 50-29, 55-49, 59-12, 59-14, 67-27
     15 R R13                     LIBNUM=3        31-22, 45-17, 45-31, 50-30, 56-01, 59-13, 67-28
     16 R R14                     LIBNUM=3        14-43, 14-45, 18-47, 18-49, 31-18, 43-31, 45-28, 50-26, 55-46, 61-19, 68-02
     17 R R15                     LIBNUM=3        14-44, 18-48, 26-22, 31-19, 43-32, 45-27, 50-27, 55-47, 61-20, 68-03
      2 R R2                      LIBNUM=3        13-02, 14-28, 14-33, 14-34, 14-35, 14-37, 14-40, 15-18, 16-19, 16-34, 18-31,
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                                  66-27, 66-31
      3 R R3                      LIBNUM=3        13-03, 14-15, 14-20, 15-28, 16-14, 16-17, 16-29, 16-32, 18-20, 18-25, 18-42,
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      4 R R4                      LIBNUM=3        13-04, 15-41, 15-46, 19-41, 19-47, 25-04, 25-10, 25-13, 25-15, 29-48, 30-01,
                                  30-03, 30-05, 30-06, 43-14, 43-25, 47-46, 47-48, 48-01, 48-02, 62-14, 62-29, 62-40, 63-38,
                                  63-39, 64-23, 65-08
      5 R R5                      LIBNUM=3        13-05, 14-41, 14-47, 15-06, 15-13, 18-45, 19-02, 19-10, 19-21, 23-46, 26-44,
                                  27-01, 29-49, 30-02, 30-04, 30-05, 47-15, 47-21, 47-47, 47-48, 48-04, 63-02, 63-07, 63-32,
                                  63-33, 63-34, 63-35, 64-29, 64-30, 64-31, 64-32, 64-33, 64-35, 64-41, 64-42, 65-02, 65-04,
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        6 R R6                   LIBNUM=3        13-06, 14-45, 14-46, 15-05, 18-49, 19-01, 19-09, 24-38, 24-40, 24-44, 25-01,
                                   25-19, 25-31, 25-40, 47-16, 47-17, 47-18, 63-03, 64-34, 65-06, 65-14
  0000143 A R6%F                 LIBNUM=10       63-06
        7 R R7                   LIBNUM=3        13-07, 24-39, 25-28, 26-03, 26-05
       10 R R8                   LIBNUM=3        23-24, 23-26, 23-29, 23-31, 35-23, 35-26, 54-39, 54-40, 56-10, 56-16, 56-25,
                                   57-33, 57-34, 57-36, 58-09, 58-10, 58-12, 58-15
       11 R R9                   LIBNUM=3         4-26,  4-27,  4-28,  4-29, 21-40, 21-45, 22-46, 23-01, 23-11, 23-14, 23-17,
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  0013064 L SAVEINFO       62-27  64-24, 65-09
  0013362 L SBLK           67-43  67-39
  0011441 L SCANSTP        40-15  32-08, 51-41
  0000003 A SCHCON1         6-23 W=1  S=16  N=3  CL=3          37-17, 46-11, 46-17, 50-37, 51-03, 51-13, 61-22, 61-27
  0000003 A SCHCON2         6-24 W=1  S=17  N=3  CL=3          46-11, 46-17, 62-31, 63-35, 63-36
  0013305 L SCHLOOK        67-02  42-24, 66-48
  0000005 A SCNSTP               LIBNUM=6        40-09
        0 R SCRTCH         13-01
  0100007 A SD                   LIBNUM=6        15-42, 19-42, 43-16
  0000344 A SDR1%T               LIBNUM=10       63-06
'+19'     T SEGNO                W=14  S=4  N=23  CL=2         62-12
  0000757 A SERNO_049252   75-26
  0000763 A SERNO_050340   76-02
  0000753 A SERNO_061983   75-13
  0000747 A SERNO_062873   75-02
  0011420 L SETIME         39-23  49-08
  0012127 L SETIMEL        49-07  48-43
  0011417 L SETIMEST       39-21  40-11, 40-24
  0010077 L SETNEWUP       15-27  16-39
  0011225 L SETRK          35-29  35-18, 35-20
  0012326 L SETTRK         53-09  52-47
  0011011 L SKIPBELLRING   29-47  29-45
  0010531 L SKIPCRITALM    23-23  23-21
  0011035 L SKIPLOADDB     30-19  30-14
  0010520 L SKIPOFLSETUP   23-13  23-05
  0010662 L SKIPRESETPT    26-42  26-08
  0010556 L SKIPTTYCINIT   23-42  23-40
  0013552 L SKIPWRD        74-10  62-02, 63-15, 63-23, 63-34, 65-07, 65-15
  0011274 L SLOWPOS        36-45  32-05, 51-35
  0000003 A SPECSTOR        6-20 W=1  S=13  N=3  CL=3          45-12, 57-09, 59-10
  0013366 L SPECUNL        68-01  45-13, 59-11
CBLM      V SSPAB1         11-25  23-27
CBLM      V SSPIOADR       11-26  23-17
  0013545 L SSPSV          74-01  12-11, 23-34, 27-11
  0010007 A SST                  LIBNUM=6        16-24, 20-25, 42-17
  0010004 L START          14-07
  0024000 L STARTCLRBLK    74-31
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  VALUE  T  NAME        DEF/REF   ATTRIBUTES AND REFERENCES                                                       CIPL            W77D

 0000000 A STATE          6-03 W=5  S=0  N=0  CL=3   12-12, 35-41, 37-20, 37-42, 38-43, 39-22, 40-10, 41-13, 41-46, 42-27,
                               44-37, 46-12, 48-23, 48-42, 49-35, 51-15, 51-18, 59-28, 60-38, 67-07
 0013532 L STATOFF       73-23  35-34, 35-40, 56-15, 57-20, 57-22
 0013523 L STATON        73-07  56-12, 67-40
      13 R STATUSR       13-09
 0013157 L STEXT         64-07  64-16
 0012035 L STOPSW        47-31  47-26
 0011024 L STORECNT      30-09  29-40
 0000003 A STORNOT        6-19 W=1  S=12  N=3  CL=3          41-10, 44-29, 45-09, 45-33, 45-37, 47-08
 0013076 L STORPAT       62-39  62-22, 63-44
 0011662 L STOSUB        44-36  32-47, 44-33, 46-30, 46-41, 47-02, 47-41
 0010142 L STPT          16-16  16-17
 0010355 L STPT2         20-16  20-17
 0012617 L STREA         57-37  57-42
 0011476 L STREAD        41-11  37-31, 48-20
 0011322 L STREAD1       37-23  12-17, 32-13, 37-08, 52-02
 0013335 L STR9          67-22  67-20
 0000000 A STUFF          5-10 W=1  S=14  N=0  CL=3
 0000003 A STUS           6-15 W=1  S=6  N=3  CL=3   33-02, 33-03, 34-26, 35-33, 52-16, 52-17, 52-42, 53-25, 54-48, 56-13,
                               56-18, 56-23, 57-23, 57-30, 57-31, 58-07, 67-41
 0013243 L SUBIT         66-03  66-01
 0000000 A SV_REG
 0010161 L SVNTY         16-31  16-32
 0010376 L SVNTY2        20-32  20-33
CTSD     V SYSTIM        11-31  18-02, 23-45
 0000211 A SYSTMOFS      18-01  12-18
 0006415 A TBS                 LIBNUM=6         16-18, 20-18, 38-01, 40-04
 0013557 L TEMPAD        74-18  50-24, 50-25
 0024000 L TEMPI01       74-29  74-19
 0002415 A TFF                 LIBNUM=6         38-36, 60-26
 0004415 A TFR                 LIBNUM=6         38-38
 0000000 A TIM            4-09 W=1  S=12  N=0  CL=3          40-21, 42-05
CSYSUB   V TIMCHK        11-44  70-30, 70-31
 0013403 L TIMCHKALT     70-15  31-34, 42-10, 50-46, 56-33
 0013417 L TIMCHKGO      70-28  70-21
 0013534 D TIMEOFF       73-27
 0013525 D TIMEON        73-11
 0000003 A TIMING         6-17 W=1  S=10  N=3  CL=3          12-20, 31-29, 31-36, 37-49, 38-44, 39-28, 44-25, 46-39, 47-39,
                               50-42, 50-48, 52-49, 56-29, 56-35, 60-36
 0000005 A TIMKON         6-30 W=20  S=0  N=5  CL=3          12-19, 31-32, 37-48, 39-27, 41-17, 42-08, 42-32, 43-01, 44-24,
                               46-38, 47-38, 50-44, 53-04, 56-31, 60-35, 66-34
CSYSUB   V TIMOUT        11-45  37-46, 39-25, 41-15, 42-29, 42-30, 42-48, 44-22, 46-35, 46-36, 47-36, 53-02, 60-32, 60-33,

CSYSUB   V TIMOUTX       11-46  66-33
 0000013 A TMCHECK             LIBNUM=6         41-12
 0000000 A TOR            4-08 W=1  S=11  N=0  CL=3
 0011520 L TOUTCHK       42-07  42-46
 0000001 A TR             6-07 W=2  S=14  N=1  CL=3          12-13, 16-21, 16-36, 20-21, 20-37, 21-24, 35-30, 37-26, 37-28,
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  VALUE  T  NAME       DEF/REF    ATTRIBUTES AND REFERENCES                                              CIPL          W77D

 0000747 A TR_011428     75-02
 0000753 A TR_012432     75-13
 0000757 A TR_013299     75-26
 0000763 A TR_013712     76-02
 0000417 A TR_11428      15-20
 0000607 A TR_12432      24-02  24-13, 26-10, 26-20, 44-11
 0000425 A TR_13299      17-23  17-34
 0000676 A TR_13712      34-38  35-02, 46-14, 55-04, 59-33, 59-43, 60-43, 65-38
 0003415 A TRB                 LIBNUM=6      41-05
 0000000 A TRCK                W=2  S=13  N=0  CL=3  LIBNUM=6      16-19, 16-34, 20-19, 20-35
       6 R TRIGREG       13-06
 0013236 L TRORG         15-20  17-23, 17-34, 24-02, 26-10, 34-38, 44-11, 46-14, 55-04, 59-33, 60-43, 65-38
 0007415 A TRT                 LIBNUM=6      16-33, 20-34, 22-06, 37-27
 0000005 A TSFLG          7-15 W=1  S=17  N=5  CL=3          12-14, 25-01, 25-19, 35-48, 53-34
 0002015 A TSTAT               LIBNUM=6      14-21, 18-26, 29-11, 40-18, 40-42, 42-02, 44-02
 0000015 A TSTOP               LIBNUM=6      39-17, 44-48
 0000207 A TTY_BEL        7-46  26-26
 0010751 L TUOFOOS       29-20  29-10, 29-16
 0000003 A TUOOS          6-16 W=1  S=7  N=3  CL=3   28-44, 28-48, 28-49, 29-21, 35-19, 35-35, 35-39, 37-15, 50-35, 51-19,
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 0000000 A TUR            4-06 W=1  S=7  N=0  CL=3   29-17
 0016320 A TU0ADR              LIBNUM=6      21-39, 60-27
 0016340 A TU1ADR              LIBNUM=6      21-42, 60-29
 0012212 L UNITOK        51-17  51-10
 0013516 L UNLSPEC       72-44  12-21, 68-02, 68-03
MASACS    V UNPKWRDS     11-20  45-24, 59-20
 0000000 A UNST           5-09 W=1  S=13  N=0  CL=3
 0011216 L USEB          35-22
 0012644 L USEBUSE       58-13  58-11
 0000015 A VERCONT             LIBNUM=6      32-46
 0011750 L VERECFAL      46-07  46-02, 48-03, 48-39
 0000014 A VERFALST            LIBNUM=6      46-27
 0011426 L VERIT         40-01  32-07, 51-24, 51-39, 59-46
 0012051 L VERRECHK      47-45  47-20
 0012015 L VERRTN        47-12  47-09
 0000004 A VERSTATE            LIBNUM=6      37-41, 39-20
 0012351 L VERSUM        53-30  53-24
 0000003 A VERT           6-22 W=2  S=14  N=3  CL=3          21-25, 40-05, 40-06, 41-06, 41-07, 45-45, 45-48, 45-49, 46-01,
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 0012737 L WASASCH       60-18  60-16
 0000000 A WENBL          4-05 W=1  S=6  N=0  CL=3
 0000000 A WOPEN          7-05 W=1  S=17  N=0  CL=3          28-45, 28-46, 37-09
       3 R WORDCNT       13-03 W=3  S=0  N=0  CL=2  LIBNUM=6
 0010615 L WORDOK        25-14  25-05, 25-12
 0010636 L WORKTABLE     25-37  24-42
 0000100 A WRDBUF              LIBNUM=6      15-41, 19-41, 43-14
'+18'      T WRDLENGTH         W=20  S=0  N=22  CL=2          62-05
 0010121 L WRDMORE       15-43  15-46
 0010334 L WRDMORE2      19-43  19-47
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0012260	L	XAVERREC	52-05	57-01
0012252	L	XBCKRECV1	51-48	56-47
0011752	L	XCHKCLN	46-10	46-47
0012256	L	XCHKTIM	52-03	56-49
0012232	L	XFASTPOS	51-32	52-21, 56-39
0012236	L	XFSTOPTST	51-36	56-41
0011315	L	XLATEOK	37-16	37-10, 37-13
0013505	L	XLAT4KNO	72-26	29-30
0012250	L	XREADON	51-46	56-46
0012244	L	XREDVER	51-42	56-44
0012246	L	XREEVAL	51-44	56-45
0012242	L	XSCANSTP	51-40	56-43
0012234	L	XSLOWPOS	51-34	56-40
0012254	L	XSTREAD1	52-01	56-48
0012240	L	XVERIT	51-38	54-22, 56-42
0013010	L	YESDONE	61-30	61-23
0010034	L	YESIN	14-32	14-27
0134350	A	ZPTX		LIBNUM=10 14-19, 18-24
0010073	L	ZROER	15-16	14-30, 14-48, 15-07
0010307	L	ZROER2	19-23	19-03, 19-11
0010014	L	ZRPT	14-16	15-30, 15-49
0012070	L	ZRSTATE	48-22	45-38, 48-19
0013163	L	ZRT	64-14	64-04
1	J	3ACC	1-09	

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       5 0 AI                    LIBNUM=1        36-01, 45-48, 48-34, 53-36, 66-22
      16 0 AN                    LIBNUM=1        14-36, 18-34, 25-47, 35-45, 43-12, 45-07, 47-17, 48-25, 53-32, 59-08, 63-21,
                                  64-06, 64-33, 66-07, 66-27, 70-27
       7 0 AR                    LIBNUM=1        21-29, 25-45, 29-28, 36-10, 64-32, 66-31, 70-26
       3 0 A1S                   LIBNUM=1        32-44, 35-21, 67-06
     106 0 B                     LIBNUM=1        14-30, 15-08, 15-30, 15-49, 16-39, 18-11, 18-12, 18-13, 18-14, 19-12, 19-27,
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      82 0 BC                    LIBNUM=1        14-27, 15-02, 15-07, 16-09, 16-20, 16-35, 19-06, 19-11, 20-09, 20-20, 20-36,
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       6 0 BCL                   LIBNUM=1        15-23, 45-13, 56-34, 59-11, 59-31, 59-45
      50 0 BL                    LIBNUM=1        22-01, 24-07, 24-19, 26-14, 26-31, 32-25, 32-27, 32-29, 32-31, 32-33, 32-35,
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      90 0 BNC                   LIBNUM=1        14-01, 14-25, 14-38, 14-48, 15-36, 16-07, 16-28, 18-30, 18-36, 18-39, 19-03,
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      12 0 BNCL                  LIBNUM=1        27-16, 32-43, 53-48, 54-08, 54-12, 54-30, 56-20, 57-11, 57-24, 58-05, 58-08,
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       5 0 BPAX                  LIBNUM=1        18-10, 32-02, 33-13, 51-30, 56-37
       1 0 BR                    LIBNUM=1        68-04
      60 0 BSA                   LIBNUM=1        19-32, 19-37, 19-40, 19-45, 20-01, 20-24, 20-28, 20-40, 23-04, 23-20, 23-39,
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       8 0 BSAI                  LIBNUM=1        15-34, 15-38, 15-40, 15-44, 15-48, 16-23, 16-26, 16-38
       3 0 BTSA                  LIBNUM=1        14-03, 67-30, 70-33
       1 0 BTSAG                 LIBNUM=1        69-22
       2 0 BTSAGN                LIBNUM=1        66-14, 66-36
       1 0 BTSAN                 LIBNUM=1        67-01
      29 0 BX                    LIBNUM=1        14-20, 15-05, 15-13, 15-46, 16-17, 16-32, 18-25, 18-43, 19-09, 19-21, 19-47,
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   COUNT T  NAME        DEF/REF    REFERENCES                                                               CIPL        W77D

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       3 0 CI                       LIBNUM=1          43-29, 61-37, 67-09
       5 0 CIRM                     LIBNUM=1          16-27, 20-29, 26-22, 42-20, 61-44
       3 0 COM                      LIBNUM=1          63-20, 64-05, 66-06
       8 0 CR                       LIBNUM=1          21-40, 34-35, 37-03, 56-16, 57-34, 58-10, 65-02, 67-18
       7 0 CRM                      LIBNUM=1          37-38, 46-01, 47-21, 47-48, 48-02, 48-31, 48-37
       8 0 EXR                      LIBNUM=1          25-38, 25-39, 25-41, 25-42, 45-21, 45-22, 59-17, 59-18
       1 0 FLZ                      LIBNUM=1          18-09
       1 0 GA                       LIBNUM=1          26-28
      21 0 GN                       LIBNUM=1          23-44, 43-31, 43-32, 45-27, 45-28, 45-30, 45-31, 54-20, 54-21, 59-02, 59-03,
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       5 0 HA                       LIBNUM=1          14-23, 18-28, 26-24, 65-32, 69-17
       2 0 HALT                     LIBNUM=1          27-19, 58-40
      15 0 HN                       LIBNUM=1          23-14, 31-18, 31-19, 31-21, 31-22, 50-26, 50-27, 50-29, 50-30, 55-46, 55-47,
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       3 0 ICF                      LIBNUM=1          23-11, 24-34, 24-44
       3 0 IRM                      LIBNUM=1          37-28, 40-06, 41-07
      60 0 L                        LIBNUM=1          14-40, 14-43, 18-37, 18-47, 21-14, 21-37, 29-39, 29-48, 29-49, 31-28, 31-32,
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      22 0 LA                       LIBNUM=1          14-44, 15-11, 18-48, 19-15, 21-17, 21-35, 24-38, 24-39, 27-01, 34-30, 45-20,
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      27 0 LAL                      LIBNUM=1          14-34, 18-19, 18-32, 21-12, 21-13, 21-31, 23-46, 23-49, 28-43, 28-44, 29-38,
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       5 0 LAX                      LIBNUM=1          21-36, 43-15, 63-32, 64-17, 64-42
      89 0 LI                       LIBNUM=1          14-10, 14-21, 14-41, 15-37, 15-39, 15-41, 15-42, 15-47, 16-11, 16-18, 16-24,
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      68 0 LL                       LIBNUM=1          14-28, 21-19, 21-26, 21-28, 23-09, 25-24, 27-11, 28-42, 29-05, 29-26, 29-27,
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12	0	NI	LIBNUM=1	14-35, 18-33, 27-12, 37-01, 37-02, 38-32, 38-34, 58-48, 62-12, 65-35, 65-41, 69-20
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2	0	OR	LIBNUM=1	25-29, 30-05
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      1 0 XI                          LIBNUM=1        69-19
      1 0 XR                          LIBNUM=1        25-28
      5 0 ZBN                         LIBNUM=1        15-17, 19-24, 28-46, 35-39, 57-21
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COUNT	FLAG	PAGE-LINE OF FLAG
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8 FLAG(S) FOUND IN THIS ASSEMBLY