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                    *
                    *    V.D.M.  PART  NO.       92L0206-001A
                    *
                    *                                          RELEASED      08-06-71
                    *
                    *
                    *              EBCDIC-HOLLERITH-ASCII CONV
                    *
                    *
001500                        ,ORG    ,01500                                          00010
                    ***                                                               00020
                    *       TEST ROUTINE FOR SA01                                     00030
                    ***                                                               00040
001500  031562            ,LDX    ,ADT1          ADDRESS OF HOLLERITH TABLE TO X     00050
001501  011561    TS01    ,LDA    ,TSC1          LOAD EBCDIC VALUE                   00060
001502  005111            ,IAR    ,              ADD ONE                             00070
001503  141000            ,SUB    ,=256          ARE WE DONE                         00080
001504  001010            ,JAZ    ,TS05          YES                                 00090
001505  001516 R
001506  121000            ,ADD    ,=256          NO - GET EBCDIC VALUE BACK          00100
001507  051561            ,STA    ,TSC1                                              00110
001510  002000            ,CALL   ,SA01          CONVERT                             00120
001511  002565 R
001512  055000            ,STA    ,0,X           STORE HOLLERITH VALUE               00130
001513  005144            ,IXR    ,              INCREMENT HOLLERITH TABLE ADDRESS   00140
001514  001000            ,JMP    ,TS01          DO NEXT VALUE                       00150
001515  001501 R
001516  000001    TS05    ,HLT    ,1                                                 00160

                    ***                                                               00180
                    *       TEST ROUTINE FOR SB01                                     00190
                    ***                                                               00200
001517  031562            ,LDX    ,ADT1          ADDRESS OF HOLLERITH TABLE TO X     00210
001520  022163            ,LDB    ,ADT2          ADDRESS OF EBCDIC TABLE TO B        00220
001521  015000    TS10    ,LDA    ,0,X           GET HOLLERITH VALUE                 00230
001522  002000            ,CALL   ,SB01          CONVERT                             00240
001523  003037 R
001524  056000            ,STA    ,0,B           STORE EBCDIC VALUE                  00250
001525  005144            ,IXR    ,              INCREMENT HOLLERITH TABLE ADDRESS   00260
001526  005122            ,IBR    ,              INCREMENT EBCDIC TABLE ADDRESS      00270
001527  011560            ,LDA    ,CNTR          ARE WE DONE                         00280
001530  141001            ,SUB    ,=255                                              00290
```

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001531  001010        ,JAZ    ,TS15          YES                                  00300
001532  001536 R
001533  041560        ,INR    ,CNTR          NO - INCREMENT COUNTER                00310
001534  001000        ,JMP    ,TS10                                               00320
001535  001521 R
001536  011002  TS15  ,LDA    ,=014          ERROR VALUE                          00330
001537  002000        ,CALL   ,SB01                                               00340
001540  003037 R
001541  056000        ,STA    ,0,B           STORE ERROR RETURN                   00350
001542  000003        ,HLT    ,3                                                  00360
                      ***                                                       00370
                      *       TEST ROUTINE FOR SC01                             00380
                      ***                                                       00390
001543  031562        ,LDX    ,ADT1          ADDRESS OF ASCII  TABLE TO X         00400
001544  022163        ,LDB    ,ADT2          ADDRESS OF EBCDIC TABLE TO B         00410
001545  016000  TS20  ,LDA    ,0,B           GET EBCDIC VALUE                     00420
001546  001004        ,JAN    ,TS30          ARE WE DONE - YES                    00430
001547  001557 R
001550  002000        ,CALL   ,SC01          NO - CONVERT                         00440
001551  003332 R
001552  055000        ,STA    ,0,X           STORE ASCII OR ERROR VALUE           00450
001553  005144        ,IXR    ,              INCREMENT ASCII TABLE ADDRESS        00460
001554  005122        ,IBR    ,              INCREMENT EBCDIC TABLE ADDRESS       00470
001555  001000        ,JMP    ,TS20          DO NEXT EBCDIC VALUE                 00480
001556  001545 R
001557  000004  TS30  ,HLT    ,4                                                  00490

001560  000000  CNTR  ,DATA   ,0             EBCDIC COUNTER                       00510
001561  177777  TSC1  ,DATA   ,0177777       EBCDIC VALUE                         00520
001562  001563 R ADT1 ,DATA   ,TBL1          HOLLERITH AND ASCII TABLE            00530
001563          TBL1  ,BSS    ,256                                                00540
002163  002164 R ADT2 ,DATA   ,TBL2          EBCDIC TABLE                         00550
002164          TBL2  ,BSS    ,257                                                00560
```

```
                    *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
                    *
                    *      EBCDIC TO HOLLERITH CONVERSION (SA01)
                    *
                    *              SA01 CONVERTS AN 8-BIT EBCDIC CHARACTER IN THE A-REGISTER
                    *              TO ITS EQUIVALENT 12-BIT HOLLERITH CODE IN THE A-REGISTER
                    *              THE B AND X REGISTERS WILL BE SAVED UPON ENTRANCE AND
                    *              RESTORED UPON EXIT.
                    *
                    *      CALLING SEQUENCE:
                    *
                    *          P-1 LDA VALUE           EBCDIC CHARACTER IN BITS 0 THROUGH 7
                    *          P   JMPM SA01           CALL CONVERT EBCDIC TO HOLLERITH
                    *          P+2 (ANY INSTRUCTION)   NORMAL RETURN HOLLERITH CODE IN A-REG.
                    *                                  ROW BIT RELATIONSHIP IS:
                    *
                    *                                  ROW 12 11  0 1 2 3 4 5 6 7 8 9
                    *                                  BIT 11 10  9 8 7 6 5 4 3 2 1 0
                    *
                    *                                  EVERY EBCDIC CHARACTER IS CONVERTABLE,
                    *                                  IE., THERE IS NO ERROR CONDITION
                    *                                  ASSOCIATED WITH SUBROUTINE.
                    *
                    *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
        000001      X      ,EQU    ,1
        000002      B      ,EQU    ,2
002565  000000      SA01   ,ENTR   ,
002566  062625             ,STB    ,SAS1           SAVE B-REGISTER
002567  052626             ,STA    ,SAS2           SAVE EBCDIC INPUT (UNALTERED)
002570  004301             ,ASRA   ,1              BUILD INDEX POINTER INTO SAT2 TO B-REGISTER
002571  151003             ,ANA    ,=0177          .
002572  121004             ,ADD    ,=SAT2          .
002573  005012             ,TAB    ,               .
002574  026000             ,LDB    ,0,B            2 PACKED HOLLERITH CHARACTERS TO B-REGISTER
002575  005101             ,INCR   ,01             ISOLATE LOW ORDER BIT OF EBCDIC INPUT
002576  152626             ,ANA    ,SAS2           .
002577  001010             ,JAZ    ,SA02           0.   IS EBCTIC CHARACTER AN EVEN OR ODD NO.
002600  002604 R
002601  005021             ,TBA    ,               ODD  HOLLERITH CHARACTER IN BITS 0-7 OF
002602  001000             ,JMP    ,SA03           .    PACKED WORD TO A - REGISTER
002603  002605 R
002604  004450      SA02   ,LLRL   ,8              EVEN HOLLERITH CHAR. IN BITS 8-15 TO A-REG.
```

```
002605  052626     SA03  ,STA    ,SAS2     SAVE PACKED HOLLERITH CODE                    00410
002606  151005           ,ANA    ,=7       .    BUILD INDEX POINTER INTO SAT1 TO B-REG   00420
002607  121006           ,ADD    ,=SAT1    .    BITS 0-2 OF PACKED HOLLERITH CODE ARE    00430
002610  005012           ,TAB    ,         .    INDEX TO TABLE WITH 1-7 PUNCH CODE       00440
002611  012626           ,LDA    ,SAS2     PACKED HOLLERITH CODE TO A-REGISTER           00450
002612  151007           ,ANA    ,=070     SHIFT ROWS 12,11,0 PUNCH CODE TO OUTPUT POS   00460
002613  004246           ,LRLA   ,6        SHIFT ROW 12,11 PUNCH CODE TO OUT. POSITION   00470
002614  116000           ,ORA    ,0,B      MERGE ROWS 1-7 INTO OUTPUT POSITION           00480
002615  022625           ,LDB    ,SAS1     RESTORE B-REGISTER                            00490
002616  052625           ,STA    ,SAS1     SAVE OUTPUT FOR ROWS 1-7,12+11+0              00500
002617  012626           ,LDA    ,SAS2     PACKED HOLLERITH CODE TO A-REGISTER           00510
002620  004306           ,ASRA   ,6        ROW 8 AND 9 CODE TO OUTPUT POSITION           00520
002621  151010           ,ANA    ,=3       .                                             00530
002622  112625           ,ORA    ,SAS1     BUILD 029 HOLLERITH CODE FROM PARTS           00540
002623  001000           ,JMP*   ,SA01     RETURN TO CALLING PROGRAM                     00550
002624  102565 R
002625           SAS1    ,BSS    ,1        TEMPORARY STORAGE 1 - B REG. AND TEMP.        00560
002626           SAS2    ,BSS    ,1        TEMPORARY STORAGE 2 - INPUT VALUE AND TEMP.   00570
```

```
                        *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *     00590
                        *                                                                                00600
                        *       TABLE SAT1 - THE HIGH ORDER SEVEN BIT OF THE INPUT EBCDIC CODE           00610
                        *                    ARE USED AS AN INDEX INTO THIS 128 WORD TABLE. WHEN         00620
                        *                    THE LOW ORDER BIT OF THE EBCDIC CODE IS ZERO (0),           00630
                        *                    BITS 8-15 OF THE PACKED WORD CONTAIN THE PACKED             00640
                        *                    HOLLERITH CODE CORRESPONDING TO THE INPUT EBCDIC            00650
                        *                    CHARACTER. LIKEWISE, WHEN THE LOW ORDER BIT IS              00660
                        *                    ONE (1), BITS 0-7 CONTAIN THE CORRESPONDING PACKED          00670
                        *                    HOLLERITH CHARACTER.                                        00680
                        *                                                                                00690
                        *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *     00700
                                                                                                         00710
        002627 R  SAT1  ,EQU    ,*
002627  000000          ,DATA   ,0              NO PUNCHES                                               00720
002630  000400          ,DATA   ,0400           ROW 1 PUNCH = BIT 8                                      00730
002631  000200          ,DATA   ,0200           ROW 2 PUNCH = BIT 7                                      00740
002632  000100          ,DATA   ,0100           ROW 3 PUNCH = BIT 6                                      00750
002633  000040          ,DATA   ,0040           ROW 4 PUNCH = BIT 5                                      00760
002634  000020          ,DATA   ,0020           ROW 5 PUNCH = BIT 4                                      00770
002635  000010          ,DATA   ,0010           ROW 6 PUNCH = BIT 3                                      00780
002636  000004          ,DATA   ,0004           ROW 7 PUNCH = BIT 2                                      00790
```

```
                    * * * * * * * * * * * * * * * * * * * * * * *
                    *
                    *      TABLE SAT2 - THIS TABLE IS UTILIZED TO FETCH THE DESIRED 029
                    *                   HOLLERITH CHARACTER AFTER THE EBCDIC INPUT IS
                    *                   TRANSLATED INTO AN INDEX VALUE (0-127). THE TABLE
                    *                   IS PACKED TWO CHARACTERS PER WORD. THE 12 CARD ROWS
                    *                   FOR EACH CHARACTER ARE PACKED IN 8 BITS AS FOLLOWS:
                    *
                    *                   1. THE LOW ORDER 3 BITS CONTAIN A COUNT (1-7) WHICH
                    *                      IS USED AS AN INDEX INTO THE SAT1 TABLE TO FETCH
                    *                      THE APPROPRIATE ROW PUNCH, 1-7. 029-HOLLERITH
                    *                      NEVER HAS MORE THAN ONE ROW 1-7 PUNCHED FOR ANY
                    *                      CHARACTER.
                    *
                    *                   2. THE 4TH LOWEST BIT=1 IF ROW  0 IS TO BE PUNCHED
                    *
                    *                   3. THE 5TH LOWEST BIT=1 IF ROW 11 IS TO BE PUNCHED
                    *
                    *                   4. THE 6TH LOWEST BIT=1 IF ROW 12 IS TO BE PUNCHED
                    *
                    *                   5. THE 7TH LOWEST BIT=1 IF ROW  9 IS TO BE PUNCHED
                    *
                    *                   6. THE 8TH LOWEST BIT=1 IF ROW  8 IS TO BE PUNCHED
                    *
                    * * * * * * * * * * * * * * * * * * * * * * *
                    *                                     ****** ************ ** *************
                    *                                      UPPER UPPER 8 BITS  LB LOWER 8 BITS
                    *                                    8 BITS CARD ROWS TO  OI CARD ROWS TO
                    *                                     EBCDIC BE PUNCHED    WI BE PUNCHED
                    *                                       HEX                8S
                    *                                     ****** ************ ** *************
                    ROW   ,FORM   ,1,1,1,1,1,3,1,1,1,1,1,3
002637  164541      SAT2  ,ROW    ,1,1,1,0,1,1,0,1,1,0,0,1 00 12-0-1-8-9     01 12-1-9
002640  061143            ,ROW    ,0,1,1,0,0,2,0,1,1,0,0,3 02 12-2-9         03 12-3-9
002641  062145            ,ROW    ,0,1,1,0,0,4,0,1,1,0,0,5 04 12-4-9         05 12-5-9
002642  063147            ,ROW    ,0,1,1,0,0,6,0,1,1,0,0,7 06 12-6-9         07 12-7-9
002643  160341            ,ROW    ,1,1,1,0,0,0,1,1,1,0,0,1 08 12-8-9         09 12-1-8-9
002644  161343            ,ROW    ,1,1,1,0,0,2,1,1,1,0,0,3 0A 12-2-8-9       0B 12-3-8-9
002645  162345            ,ROW    ,1,1,1,0,0,4,1,1,1,0,0,5 0C 12-4-8-9       0D 12-5-8-9
002646  163347            ,ROW    ,1,1,1,0,0,6,1,1,1,0,0,7 0E 12-6-8-9       0F 12-7-8-9
002647  170521            ,ROW    ,1,1,1,1,0,1,0,1,0,1,0,1 10 12-11-1-8-9    11 11-1-9
002650  051123            ,ROW    ,0,1,0,1,0,2,0,1,0,1,0,3 12 11-2-9         13 11-3-9
```

```
002651  052125          ,ROW     ,0,1,0,1,0,4,0,1,0,1,0,5 14 11-4-9          15 11-5-9          01230
002652  053127          ,ROW     ,0,1,0,1,0,6,0,1,0,1,0,7 16 11-6-9          17 11-7-9          01240
002653  150321          ,ROW     ,1,1,0,1,0,0,1,1,0,1,0,1 18 11-8-9          19 11-1-8-9        01250
002654  151323          ,ROW     ,1,1,0,1,0,2,1,1,0,1,0,3 1A 11-2-8-9        1B 11-3-8-9        01260
002655  152325          ,ROW     ,1,1,0,1,0,4,1,1,0,1,0,5 1C 11-4-8-9        1D 11-5-8-9        01270
002656  153327          ,ROW     ,1,1,0,1,0,6,1,1,0,1,0,7 1E 11-6-8-9        1F 11-7-8-9        01280
002657  154511          ,ROW     ,1,1,0,1,1,1,0,1,0,0,1,1 20 11-0-1-8-9      21 0-1-9           01290
002660  045113          ,ROW     ,0,1,0,0,1,2,0,1,0,0,1,3 22 0-2-9           23 0-3-9           01300
002661  046115          ,ROW     ,0,1,0,0,1,4,0,1,0,0,1,5 24 0-4-9           25 0-5-9           01310
002662  047117          ,ROW     ,0,1,0,0,1,6,0,1,0,0,1,7 26 0-6-9           27 0-7-9           01320
002663  144311          ,ROW     ,1,1,0,0,1,0,1,1,0,0,1,1 28 0-8-9           29 0-1-8-9         01330
002664  145313          ,ROW     ,1,1,0,0,1,2,1,1,0,0,1,3 2A 0-2-8-9         2B 0-3-8-9         01340
002665  146315          ,ROW     ,1,1,0,0,1,4,1,1,0,0,1,5 2C 0-4-8-9         2D 0-5-8-9         01350
002666  147317          ,ROW     ,1,1,0,0,1,6,1,1,0,0,1,7 2E 0-6-8-9         2F 0-7-8-9         01360
002667  174501          ,ROW     ,1,1,1,1,1,1,0,1,0,0,0,1 30 12-11-0-1-8-9   31 1-9             01370
002670  041103          ,ROW     ,0,1,0,0,0,2,0,1,0,0,0,3 32 2-9             33 3-9             01380
002671  042105          ,ROW     ,0,1,0,0,0,4,0,1,0,0,0,5 34 4-9             35 5-9             01390
002672  043107          ,ROW     ,0,1,0,0,0,6,0,1,0,0,0,7 36 6-9             37 7-9             01400
002673  140301          ,ROW     ,1,1,0,0,0,0,1,1,0,0,0,1 38 8-9             39 1-8-9           01410
002674  141303          ,ROW     ,1,1,0,0,0,2,1,1,0,0,0,3 3A 2-8-9           3B 3-8-9           01420
002675  142305          ,ROW     ,1,1,0,0,0,4,1,1,0,0,0,5 3C 4-8-9           3D 5-8-9           01430
002676  143307          ,ROW     ,1,1,0,0,0,6,1,1,0,0,0,7 3E 6-8-9           3F 7-8-9           01440
002677  000151          ,ROW     ,0,0,0,0,0,0,0,1,1,0,1,1 40 NO PUNCHES      41 12-0-1-9        01450
002700  065153          ,ROW     ,0,1,1,0,1,2,0,1,1,0,1,3 42 12-0-2-9        43 12-0-3-9        01460
002701  066155          ,ROW     ,0,1,1,0,1,4,0,1,1,0,1,5 44 12-0-4-9        45 12-0-5-9        01470
002702  067157          ,ROW     ,0,1,1,0,1,6,0,1,1,0,1,7 46 12-0-6-9        47 12-0-7-9        01480
002703  164241          ,ROW     ,1,1,1,0,1,0,1,0,1,0,0,1 48 12-0-8-9        49 12-1-8          01490
002704  121243          ,ROW     ,1,0,1,0,0,2,1,0,1,0,0,3 4A 12-2-8          4B 12-3-8          01500
002705  122245          ,ROW     ,1,0,1,0,0,4,1,0,1,0,0,5 4C 12-4-8          4D 12-5-8          01510
002706  123247          ,ROW     ,1,0,1,0,0,6,1,0,1,0,0,7 4E 12-6-8          4F 12-7-8          01520
002707  020161          ,ROW     ,0,0,1,0,0,0,0,1,1,1,0,1 50 12              51 12-11-1-9       01530
002710  071163          ,ROW     ,0,1,1,1,0,2,0,1,1,1,0,3 52 12-11-2-9       53 12-11-3-9       01540
002711  072165          ,ROW     ,0,1,1,1,0,4,0,1,1,1,0,5 54 12-11-4-9       55 12-11-5-9       01550
002712  073167          ,ROW     ,0,1,1,1,0,6,0,1,1,1,0,7 56 12-11-6-9       57 12-11-7-9       01560
002713  170221          ,ROW     ,1,1,1,1,0,0,1,0,0,1,0,1 58 12-11-8-9       59 11-1-8          01570
002714  111223          ,ROW     ,1,0,0,1,0,2,1,0,0,1,0,3 5A 11-2-8          5B 11-3-8          01580
002715  112225          ,ROW     ,1,0,0,1,0,4,1,0,0,1,0,5 5C 11-4-8          5D 11-5-8          01590
002716  113227          ,ROW     ,1,0,0,1,0,6,1,0,0,1,0,7 5E 11-6-8          5F 11-7-8          01600
002717  010011          ,ROW     ,0,0,0,1,0,0,0,0,0,0,1,1 60 11              61 0-1             01610
002720  055133          ,ROW     ,0,1,0,1,1,2,0,1,0,1,1,3 62 11-0-2-9        63 11-0-3-9        01620
002721  056135          ,ROW     ,0,1,0,1,1,4,0,1,0,1,1,5 64 11-0-4-9        65 11-0-5-9        01630
002722  057137          ,ROW     ,0,1,0,1,1,6,0,1,0,1,1,7 66 11-0-6-9        67 11-0-7-9        01640
```

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002723  154211          ,ROW    ,1,1,0,1,1,0,1,0,0,0,1,1 68 11-0-8-9      69 0-1-8          01650
002724  030213          ,ROW    ,0,0,1,1,0,0,1,0,0,0,1,3 6A 12-11         6B 0-3-8          01660
002725  106215          ,ROW    ,1,0,0,0,1,4,1,0,0,0,1,5 6C 0-4-8         6D 0-5-8          01670
002726  107217          ,ROW    ,1,0,0,0,1,6,1,0,0,0,1,7 6E 0-6-8         6F 0-7-8          01680
002727  034171          ,ROW    ,0,0,1,1,1,0,0,1,1,1,1,1 70 12-11-0       71 12-11-0-1-9    01690
002730  075173          ,ROW    ,0,1,1,1,1,2,0,1,1,1,1,3 72 12-11-0-2-9   73 12-11-0-3-9    01700
002731  076175          ,ROW    ,0,1,1,1,1,4,0,1,1,1,1,5 74 12-11-0-4-9   75 12-11-0-5-9    01710
002732  077177          ,ROW    ,0,1,1,1,1,6,0,1,1,1,1,7 76 12-11-0-6-9   77 12-11-0-7-9    01720
002733  174201          ,ROW    ,1,1,1,1,1,0,1,0,0,0,0,1 78 12-11-0-8-9   79 1-8            01730
002734  101203          ,ROW    ,1,0,0,0,0,2,1,0,0,0,0,3 7A 2-8           7B 3-8            01740
002735  102205          ,ROW    ,1,0,0,0,0,4,1,0,0,0,0,5 7C 4-8           7D 5-8            01750
002736  103207          ,ROW    ,1,0,0,0,0,6,1,0,0,0,0,7 7E 6-8           7F 7-8            01760
002737  124451          ,ROW    ,1,0,1,0,1,1,0,0,1,0,1,1 80 12-0-1-8      81 12-0-1         01770
002740  025053          ,ROW    ,0,0,1,0,1,2,0,0,1,0,1,3 82 12-0-2        83 12-0-3         01780
002741  026055          ,ROW    ,0,0,1,0,1,4,0,0,1,0,1,5 84 12-0-4        85 12-0-5         01790
002742  027057          ,ROW    ,0,0,1,0,1,6,0,0,1,0,1,7 86 12-0-6        87 12-0-7         01800
002743  124150          ,ROW    ,1,0,1,0,1,0,0,1,1,0,1,0 88 12-0-8        89 12-0-9         01810
002744  125253          ,ROW    ,1,0,1,0,1,2,1,0,1,0,1,3 8A 12-0-2-8      8B 12-0-3-8       01820
002745  126255          ,ROW    ,1,0,1,0,1,4,1,0,1,0,1,5 8C 12-0-4-8      8D 12-0-5-8       01830
002746  127257          ,ROW    ,1,0,1,0,1,6,1,0,1,0,1,7 8E 12-0-6-8      8F 12-0-7-8       01840
002747  130461          ,ROW    ,1,0,1,1,0,1,0,0,1,1,0,1 90 12-11-1-8     91 12-11-1        01850
002750  031063          ,ROW    ,0,0,1,1,0,2,0,0,1,1,0,3 92 12-11-2       93 12-11-3        01860
002751  032065          ,ROW    ,0,0,1,1,0,4,0,0,1,1,0,5 94 12-11-4       95 12-11-5        01870
002752  033067          ,ROW    ,0,0,1,1,0,6,0,0,1,1,0,7 96 12-11-6       97 12-11-7        01880
002753  130160          ,ROW    ,1,0,1,1,0,0,0,1,1,1,0,0 98 12-11-8       99 12-11-9        01890
002754  131263          ,ROW    ,1,0,1,1,0,2,1,0,1,1,0,3 9A 12-11-2-8     9B 12-11-3-8      01900
002755  132265          ,ROW    ,1,0,1,1,0,4,1,0,1,1,0,5 9C 12-11-4-8     9D 12-11-5-8      01910
002756  133267          ,ROW    ,1,0,1,1,0,6,1,0,1,1,0,7 9E 12-11-6-8     9F 12-11-7-8      01920
002757  114431          ,ROW    ,1,0,0,1,1,1,0,0,0,1,1,1 A0 11-0-1-8      A1 11-0-1         01930
002760  015033          ,ROW    ,0,0,0,1,1,2,0,0,0,1,1,3 A2 11-0-2        A3 11-0-3         01940
002761  016035          ,ROW    ,0,0,0,1,1,4,0,0,0,1,1,5 A4 11-0-4        A5 11-0-5         01950
002762  017037          ,ROW    ,0,0,0,1,1,6,0,0,0,1,1,7 A6 11-0-6        A7 11-0-7         01960
002763  114130          ,ROW    ,1,0,0,1,1,0,0,1,0,1,1,0 A8 11-0-8        A9 11-0-9         01970
002764  115233          ,ROW    ,1,0,0,1,1,2,1,0,0,1,1,3 AA 11-0-2-8      AB 11-0-3-8       01980
002765  116235          ,ROW    ,1,0,0,1,1,4,1,0,0,1,1,5 AC 11-0-4-8      AD 11-0-5-8       01990
002766  117237          ,ROW    ,1,0,0,1,1,6,1,0,0,1,1,7 AE 11-0-6-8      AF 11-0-7-8       02000
002767  134471          ,ROW    ,1,0,1,1,1,1,0,0,1,1,1,1 B0 12-11-0-1-8   B1 12-11-0-1      02010
002770  035073          ,ROW    ,0,0,1,1,1,2,0,0,1,1,1,3 B2 12-11-0-2     B3 12-11-0-3      02020
002771  036075          ,ROW    ,0,0,1,1,1,4,0,0,1,1,1,5 B4 12-11-0-4     B5 12-11-0-5      02030
002772  037077          ,ROW    ,0,0,1,1,1,6,0,0,1,1,1,7 B6 12-11-0-6     B7 12-11-0-7      02040
002773  134170          ,ROW    ,1,0,1,1,1,0,0,1,1,1,1,0 B8 12-11-0-8     B9 12-11-0-9      02050
002774  135273          ,ROW    ,1,0,1,1,1,2,1,0,1,1,1,3 BA 12-11-0-2-8   BB 12-11-0-3-8    02060
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002775  136275          ,ROW     ,1,0,1,1,1,4,1,0,1,1,1,5 BC 12-11-0-4-8    BD 12-11-0-5-8      02070
002776  137277          ,ROW     ,1,0,1,1,1,6,1,0,1,1,1,7 BE 12-11-0-6-8    BF 12-11-0-7-8      02080
002777  024041          ,ROW     ,0,0,1,0,1,0,0,0,1,0,0,1 C0 12-0            C1 12-1             02090
003000  021043          ,ROW     ,0,0,1,0,0,2,0,0,1,0,0,3 C2 12-2            C3 12-3             02100
003001  022045          ,ROW     ,0,0,1,0,0,4,0,0,1,0,0,5 C4 12-4            C5 12-5             02110
003002  023047          ,ROW     ,0,0,1,0,0,6,0,0,1,0,0,7 C6 12-6            C7 12-7             02120
003003  120140          ,ROW     ,1,0,1,0,0,0,0,1,1,0,0,0 C8 12-8            C9 12-9             02130
003004  165353          ,ROW     ,1,1,1,0,1,2,1,1,1,0,1,3 CA 12-0-2-8-9      CB 12-0-3-8-9       02140
003005  166355          ,ROW     ,1,1,1,0,1,4,1,1,1,0,1,5 CC 12-0-4-8-9      CD 12-0-5-8-9       02150
003006  167357          ,ROW     ,1,1,1,0,1,6,1,1,1,0,1,7 CE 12-0-6-8-9      CF 12-0-7-8-9       02160
003007  014021          ,ROW     ,0,0,0,1,1,0,0,0,0,1,0,1 D0 11-0            D1 11-1             02170
003010  011023          ,ROW     ,0,0,0,1,0,2,0,0,0,1,0,3 D2 11-2            D3 11-3             02180
003011  012025          ,ROW     ,0,0,0,1,0,4,0,0,0,1,0,5 D4 11-4            D5 11-5             02190
003012  013027          ,ROW     ,0,0,0,1,0,6,0,0,0,1,0,7 D6 11-6            D7 11-7             02200
003013  110120          ,ROW     ,1,0,0,1,0,0,0,1,0,1,0,0 D8 11-8            D9 11-9             02210
003014  171363          ,ROW     ,1,1,1,1,0,2,1,1,1,1,0,3 DA 12-11-2-8-9     DB 12-11-3-8-9      02220
003015  172365          ,ROW     ,1,1,1,1,0,4,1,1,1,1,0,5 DC 12-11-4-8-9     DD 12-11-5-8-9      02230
003016  173367          ,ROW     ,1,1,1,1,0,6,1,1,1,1,0,7 DE 12-11-6-8-9     DF 12-11-7-8-9      02240
003017  105131          ,ROW     ,1,0,0,0,1,2,0,1,0,1,1,1 E0 0-2-8           E1 11-0-1-9         02250
003020  005013          ,ROW     ,0,0,0,0,1,2,0,0,0,0,1,3 E2 0-2             E3 0-3              02260
003021  006015          ,ROW     ,0,0,0,0,1,4,0,0,0,0,1,5 E4 0-4             E5 0-5              02270
003022  007017          ,ROW     ,0,0,0,0,1,6,0,0,0,0,1,7 E6 0-6             E7 0-7              02280
003023  104110          ,ROW     ,1,0,0,0,1,0,0,1,0,0,1,0 E8 0-8             E9 0-9              02290
003024  155333          ,ROW     ,1,1,0,1,1,2,1,1,0,1,1,3 EA 11-0-2-8-9      EB 11-0-3-8-9       02300
003025  156335          ,ROW     ,1,1,0,1,1,4,1,1,0,1,1,5 EC 11-0-4-8-9      ED 11-0-5-8-9       02310
003026  157337          ,ROW     ,1,1,0,1,1,6,1,1,0,1,1,7 EE 11-0-6-8-9      EF 11-0-7-8-9       02320
003027  004001          ,ROW     ,0,0,0,0,1,0,0,0,0,0,0,1 F0 0               F1 1                02330
003030  001003          ,ROW     ,0,0,0,0,0,2,0,0,0,0,0,3 F2 2               F3 3                02340
003031  002005          ,ROW     ,0,0,0,0,0,4,0,0,0,0,0,5 F4 4               F5 5                02350
003032  003007          ,ROW     ,0,0,0,0,0,6,0,0,0,0,0,7 F6 6               F7 7                02360
003033  100100          ,ROW     ,1,0,0,0,0,0,0,1,0,0,0,0 F8 8               F9 9                02370
003034  175373          ,ROW     ,1,1,1,1,1,2,1,1,1,1,1,3 FA 12-11-0-2-8-9   FB 12-11-0-3-8-9    02380
003035  176375          ,ROW     ,1,1,1,1,1,4,1,1,1,1,1,5 FC 12-11-0-4-8-9   FD 12-11-0-5-8-9    02390
003036  177377          ,ROW     ,1,1,1,1,1,6,1,1,1,1,1,7 FE 12-11-0-6-8-9   FF 12-11-0-7-8-9    02400
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                         * * * * * * * * * * * * * * * * * * * * * * * * *
                         *
                         *      HOLLERITH TO EBCDIC CONVERSION (SB01)
                         *
                         *              SB01 CONVERTS A 12-BIT 029-HOLLERITH CHARACTER IN THE
                         *              A-REGISTER TO ITS EQUIVALENT 8-BIT EBCDIC CODE IN THE
                         *              A-REGISTER. THE B AND X REGISTERS WILL BE SAVED UPON
                         *              ENTRANCE AND RESTORED UPON EXIT.
                         *
                         *      CALLING SEQUENCE:
                         *
                         *          P-1  LDA  VALUE          029 HOLLERITH CODE IN A-REGISTER
                         *          P    JMPM SB01           CALL CONVERT HOLLERITH TO EBCDIC
                         *          P+2  (ANY INSTRUCTION)   NORMAL RETURN EBCDIC CODE IN A-REG.
                         *
                         *                                   THE A-REGISTER IS SET TO MINUS ONE
                         *                                   (-1) WHEN THE INPUT HOLLERITH CODE IS
                         *                                   INVALID (IE., MORE THAN ONE ROW
                         *                                   PUNCHED IN ROWS 1 THROUGH 7).
                         *
                         * * * * * * * * * * * * * * * * * * * * * * * * *
003037  000000           SB01  ,ENTR  ,
003040  063116                 ,STB   ,SBS1          SAVE B REGISTER
003041  073121                 ,STX   ,SBS4          SAVE X REGISTER
003042  005002                 ,TZB   ,              SET FIELD 1 POINTER FOR NO PUNCHES
003043  004257                 ,LRLA  ,15            ROW 9 TO SIGN POSITION
003044  001002                 ,JAP   ,SB02          Q.   ROW 9 PUNCHED
003045  003047 R
003046  111011                 ,ORA   ,=04000        YES  IDENTIFY ROW 9 INPUT (BIT11=1)
003047  053117           SB02  ,STA   ,SBS2          .    SAVE INPUT (BIT11=0 IF NO ROW 9 PUNCH)
003050  151012                 ,ANA   ,=0376         Q.   ANY ROWS 1-7 PUNCHED
003051  001010                 ,JAZ   ,SB04          NO
003052  003071 R
003053  053120                 ,STA   ,SBS3          YES  SAVE ROWS 1-7
003054  031013                 ,LDX   ,=SBT1         .    ADDRESS OF SBT1 TABLE TO X-REGISTER
003055  005122           SB03  ,IBR   ,              SET FIELD 1 POINTER FOR NEXT ROW
003056  005144                 ,IXR   ,              INCREMENT SBT1 ADDRESS
003057  013120                 ,LDA   ,SBS3          ROWS 1-7 INPUT
003060  155000                 ,ANA   ,0,X           Q. IS ROW INDEXED BY B-REGISTER PUNCHED
003061  001010                 ,JAZ   ,SB03          NO
003062  003055 R
003063  133120                 ,ERA   ,SBS3          Q.   INVALID INPUT VALUE (MULTIPLE PUNCH
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003064  001010        ,JAZ    ,SB04       NO   . ROWS 1-7)                          02810
003065  003071 R
003066  005301        ,DECR   ,1          YES  SET ERROR CONDITION, NEGATIVE NO, TO A  02820
003067  001000        ,JMP    ,SB06       GO TO RESTORE B,X REGISTERS                 02830
003070  003112 R
003071  063120  SB04  ,STB    ,SBS3       SAVE FIELD 1 POINTER                        02840
003072  013117        ,LDA    ,SBS2       INPUT (MODIFIED)                            02850
003073  151014        ,ANA    ,=07400     ISOLATE CARD ROWS 9,12,11,0                 02860
003074  004345        ,LSRA   ,5          POSITION TO FIELD 2                         02870
003075  123120        ,ADD    ,SBS3       ADD FIELDS 1 AND 2 TO FORM TABLE ADDRESS    02880
003076  121015        ,ADD    ,=SBT2      ADDRESS OF SBT2 TABLE TO X-REGISTER         02890
003077  005012        ,TAB    ,           TABLE ADDRESS TO INDEX REGISTER-B           02900
003100  026000        ,LDB    ,0,B        2 PACKED EBCDIC CHARACTERS TO B-REGISTER    02910
003101  005101        ,INCR   ,01         Q. IS ROW 8 PUNCHED                         02920
003102  153117        ,ANA    ,SBS2       .                                           02930
003103  001010        ,JAZ    ,SB05       NO                                          02940
003104  003111 R
003105  005021        ,TBA    ,           YES  EBCDIC CHARACTER IN BITS 0-7 OF PACKED  02950
003106  151001        ,ANA    ,=0377           . WORD TO A-REGISTER                    02960
003107  001000        ,JMP    ,SB06       SKIP TO SB06                                02970
003110  003112 R
003111  004450  SB05  ,LLRL   ,8          EBCDIC CHARACTER IN BITS 8-15 OF PACKED     02980
003112  023116  SB06  ,LDB    ,SBS1       RESTORE B REGISTER                          02990
003113  033121        ,LDX    ,SBS4       RESTORE X REGISTER                          03000
003114  001000        ,JMP*   ,SB01       . WORD TO A-REGISTER AND RETURN             03010
003115  103037 R
003116          SBS1  ,BSS    ,1          TEMPORARY STORAGE 1 - B REGISTER            03020
003117          SBS2  ,BSS    ,1          TEMPORARY STORAGE 2 - MODIFIED COLUMN INPUT 03030
003120          SBS3  ,BSS    ,1          TEMPORARY STORAGE 3 - ROWS 1-7, FIELD 1 PTR 03040
003121          SBS4  ,BSS    ,1          TEMPORARY STORAGE 4 - X REGISTER SAVE       03050
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                        *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  03070
                        *                                                                                    03080
                        *      TABLE SBT1 - THE PROGRAM LOOPS AROUND SB03 TO SET AN INDEXABLE                03090
                        *                   COUNT IN THE B-REGISTER BASED ON THE PUNCHED ROW                  03100
                        *                   1-7 OF THE INPUT DATA. MASKED INPUT OF ROWS 1-7                   03110
                        *                   IS COMPARED TO EACH ELEMENT OF SBT1 UNTIL A MATCH IS              03120
                        *                   FOUND. THE B-REGISTER WHICH IS INITIALIZED TO ZERO,               03130
                        *                   IS INCREMENTED BY 1 FOR EACH COMPARISON UNTIL A                   03140
                        *                   MATCH IS FOUND, THE SB03 LOOP IS BY-PASSED IF THERE               03150
                        *                   IS NO 1-7 ROW PUNCH.                                             03160
                        *                                                                                    03170
                        *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  03180
003122                  SBT1   ,BES    ,1                                                                    03190
003123  000200                 ,DATA   ,0200          ROW=COUNT=1                                           03200
003124  000100                 ,DATA   ,0100          ROW=COUNT=2                                           03210
003125  000040                 ,DATA   ,0040          ROW=COUNT=3                                           03220
003126  000020                 ,DATA   ,0020          ROW=COUNT=4                                           03230
003127  000010                 ,DATA   ,0010          ROW=COUNT=5                                           03240
003130  000004                 ,DATA   ,0004          ROW=COUNT=6                                           03250
003131  000002                 ,DATA   ,0002          ROW=COUNT=7                                           03260
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                *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  03280
                *                                                                                    03290
                *      TABLE SBT2 -THIS TABLE IS UTILIZED TO FETCH THE DESIRED EBCDIC                03300
                *                  CHARACTER AFTER THE 029-HOLLERITH INPUT IS TRANSLATED             03310
                *                  INTO AN INDEX VALUE (1-128). THE TABLE IS PACKED TWO              03320
                *                  CHARACTERS PER WORD. THE BITS 8-15 CONTAINS THE                   03330
                *                  EBCDIC CHARACTER FOR THE 029 INPUTS WITHOUT AN                    03340
                *                  8-PUNCH. BITS 0-7 CONTAINS THE EBCDIC CHARACTER FOR               03350
                *                  THE 029 INPUTS WITH AN 8-PUNCH. FOR ANY INDIVIDUAL                03360
                *                  WORD IN THE TABLE THE CARD INPUT ASSOCIATED WITH IT               03370
                *                  DIFFERS ONLY BY THE ABSENCE OR PRESENCE OF AN 8-PUNCH             03380
                *                                                                                    03390
                *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  03400
                *                                                                                    03410
                *                                    COLUMNS          COLUMN        HEX             03420
                *                                   9  12  11   0     PUNCHES       CODES           03430
003132  040370  SBT2   ,DATA    ,0040370            0   0   0   0     1,1-8         F1,79           03440
003133  170571          ,DATA    ,0170571            0   0   0   0     1,1-8         F1,79           03450
003134  171172          ,DATA    ,0171172            0   0   0   0     2,2-8         F2,7A           03460
003135  171573          ,DATA    ,0171573            0   0   0   0     3,3-8         F3,7B           03470
003136  172174          ,DATA    ,0172174            0   0   0   0     4,4-8         F4,7C           03480
003137  172575          ,DATA    ,0172575            0   0   0   0     5,5-8         F5,7D           03490
003140  173176          ,DATA    ,0173176            0   0   0   0     6,6-8         F6,7E           03500
003141  173577          ,DATA    ,0173577            0   0   0   0     7,7-8         F7,7F           03510
003142  170350          ,DATA    ,0170350            0   0   0   1     BLANK,8       F0,E8           03520
003143  060551          ,DATA    ,0060551            0   0   0   1     1,1-8         61,69           03530
003144  161340          ,DATA    ,0161340            0   0   0   1     2,2-8         E2,E0           03540
003145  161553          ,DATA    ,0161553            0   0   0   1     3,3-8         E3,6B           03550
003146  162154          ,DATA    ,0162154            0   0   0   1     4,4-8         E4,6C           03560
003147  162555          ,DATA    ,0162555            0   0   0   1     5,5-8         E5,6D           03570
003150  163156          ,DATA    ,0163156            0   0   0   1     6,6-8         E6,6E           03580
003151  163557          ,DATA    ,0163557            0   0   0   1     7,7-8         E7,6F           03590
003152  060330          ,DATA    ,0060330            0   0   1   0     BLANK,8       60,D8           03600
003153  150531          ,DATA    ,0150531            0   0   1   0     1,1-8         D1,59           03610
003154  151132          ,DATA    ,0151132            0   0   1   0     2,2-8         D2,5A           03620
003155  151533          ,DATA    ,0151533            0   0   1   0     3,3-8         D3,5B           03630
003156  152134          ,DATA    ,0152134            0   0   1   0     4,4-8         D4,5C           03640
003157  152535          ,DATA    ,0152535            0   0   1   0     5,5-8         D5,5D           03650
003160  153136          ,DATA    ,0153136            0   0   1   0     6,6-8         D6,5E           03660
003161  153537          ,DATA    ,0153537            0   0   1   0     7,7-8         D7,5F           03670
003162  150250          ,DATA    ,0150250            0   0   1   1     BLANK,8       D0,A8           03680
003163  120640          ,DATA    ,0120640            0   0   1   1     1,1-8         A1,A0           03690
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003164  121252          ,DATA   ,0121252        0  0  1  1     2,2-8          A2,AA          03700
003165  121653          ,DATA   ,0121653        0  0  1  1     3,3-8          A3,AB          03710
003166  122254          ,DATA   ,0122254        0  0  1  1     4,4-8          A4,AC          03720
003167  122655          ,DATA   ,0122655        0  0  1  1     5,5-8          A5,AD          03730
003170  123256          ,DATA   ,0123256        0  0  1  1     6,6-8          A6,AE          03740
003171  123657          ,DATA   ,0123657        0  0  1  1     7,7-8          A7,AF          03750
003172  050310          ,DATA   ,0050310        0  1  0  0     BLANK,8        50,C8          03760
003173  140511          ,DATA   ,0140511        0  1  0  0     1,1-8          C1,49          03770
003174  141112          ,DATA   ,0141112        0  1  0  0     2,2-8          C2,4A          03780
003175  141513          ,DATA   ,0141513        0  1  0  0     3,3-8          C3,4B          03790
003176  142114          ,DATA   ,0142114        0  1  0  0     4,4-8          C4,4C          03800
003177  142515          ,DATA   ,0142515        0  1  0  0     5,5-8          C5,4D          03810
003200  143116          ,DATA   ,0143116        0  1  0  0     6,6-8          C6,4E          03820
003201  143517          ,DATA   ,0143517        0  1  0  0     7,7-8          C7,4F          03830
003202  140210          ,DATA   ,0140210        0  1  0  1     BLANK,8        C0,88          03840
003203  100600          ,DATA   ,0100600        0  1  0  1     1,1-8          81,80          03850
003204  101212          ,DATA   ,0101212        0  1  0  1     2,2-8          82,8A          03860
003205  101613          ,DATA   ,0101613        0  1  0  1     3,3-8          83,8B          03870
003206  102214          ,DATA   ,0102214        0  1  0  1     4,4-8          84,8C          03880
003207  102615          ,DATA   ,0102615        0  1  0  1     5,5-8          85,8D          03890
003210  103216          ,DATA   ,0103216        0  1  0  1     6,6-8          86,8E          03900
003211  103617          ,DATA   ,0103617        0  1  0  1     7,7-8          87,8F          03910
003212  065230          ,DATA   ,0065230        0  1  1  0     BLANK          6A,98          03920
003213  110620          ,DATA   ,0110620        0  1  1  0     1,1-8          91,90          03930
003214  111232          ,DATA   ,0111232        0  1  1  0     2,2-8          92,9A          03940
003215  111633          ,DATA   ,0111633        0  1  1  0     3,3-8          93,9B          03950
003216  112234          ,DATA   ,0112234        0  1  1  0     4,4-8          94,9C          03960
003217  112635          ,DATA   ,0112635        0  1  1  0     5,5-8          95,9D          03970
003220  113236          ,DATA   ,0113236        0  1  1  0     6,6-8          96,9E          03980
003221  113637          ,DATA   ,0113637        0  1  1  0     7,7-8          97,9F          03990
003222  070270          ,DATA   ,0070270        0  1  1  1     BLANK,8        70,B8          04000
003223  130660          ,DATA   ,0130660        0  1  1  1     1,1-8          B1,B0          04010
003224  131272          ,DATA   ,0131272        0  1  1  1     2,2-8          B2,BA          04020
003225  131673          ,DATA   ,0131673        0  1  1  1     3,3-8          B3,BB          04030
003226  132274          ,DATA   ,0132274        0  1  1  1     4,4-8          B4,BC          04040
003227  132675          ,DATA   ,0132675        0  1  1  1     5,5-8          B5,BD          04050
003230  133276          ,DATA   ,0133276        0  1  1  1     6,6-8          B6,BE          04060
003231  133677          ,DATA   ,0133677        0  1  1  1     7,7-8          B7,BF          04070
003232  174470          ,DATA   ,0174470        1  0  0  0     BLANK,8        F9,38          04080
003233  030471          ,DATA   ,0030471        1  0  0  0     1,1-8          31,39          04090
003234  031072          ,DATA   ,0031072        1  0  0  0     2,2-8          32,3A          04100
003235  031473          ,DATA   ,0031473        1  0  0  0     3,3-8          33,3B          04110
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003236  032074          ,DATA    ,0032074    1  0  0  0     4,4-8        34,3C          04120
003237  032475          ,DATA    ,0032475    1  0  0  0     5,5-8        35,3D          04130
003240  033076          ,DATA    ,0033076    1  0  0  0     6,6-8        36,3E          04140
003241  033477          ,DATA    ,0033477    1  0  0  0     7,7-8        37,3F          04150
003242  164450          ,DATA    ,0164450    1  0  0  1     BLANK,8      E9,28          04160
003243  020451          ,DATA    ,0020451    1  0  0  1     1,1-8        21,29          04170
003244  021052          ,DATA    ,0021052    1  0  0  1     2,2-8        22,2A          04180
003245  021453          ,DATA    ,0021453    1  0  0  1     3,3-8        23,2B          04190
003246  022054          ,DATA    ,0022054    1  0  0  1     4,4-8        24,2C          04200
003247  022455          ,DATA    ,0022455    1  0  0  1     5,5-8        25,2D          04210
003250  023056          ,DATA    ,0023056    1  0  0  1     6,6-8        26,2E          04220
003251  023457          ,DATA    ,0023457    1  0  0  1     7,7-8        27,2F          04230
003252  154430          ,DATA    ,0154430    1  0  1  0     BLANK,8      D9,18          04240
003253  010431          ,DATA    ,0010431    1  0  1  0     1,1-8        11,19          04250
003254  011032          ,DATA    ,0011032    1  0  1  0     2,2-8        12,1A          04260
003255  011433          ,DATA    ,0011433    1  0  1  0     3,3-8        13,1B          04270
003256  012034          ,DATA    ,0012034    1  0  1  0     4,4-8        14,1C          04280
003257  012435          ,DATA    ,0012435    1  0  1  0     5,5-8        15,1D          04290
003260  013036          ,DATA    ,0013036    1  0  1  0     6,6-8        16,1E          04300
003261  013437          ,DATA    ,0013437    1  0  1  0     7,7-8        17,1F          04310
003262  124550          ,DATA    ,0124550    1  0  1  1     BLANK,8      A9,68          04320
003263  160440          ,DATA    ,0160440    1  0  1  1     1,1-8        E1,20          04330
003264  061352          ,DATA    ,0061352    1  0  1  1     2,2-8        62,EA          04340
003265  061753          ,DATA    ,0061753    1  0  1  1     3,3-8        63,EB          04350
003266  062354          ,DATA    ,0062354    1  0  1  1     4,4-8        64,EC          04360
003267  062755          ,DATA    ,0062755    1  0  1  1     5,5-8        65,ED          04370
003270  063356          ,DATA    ,0063356    1  0  1  1     6,6-8        66,EE          04380
003271  063757          ,DATA    ,0063757    1  0  1  1     7,7-8        67,EF          04390
003272  144410          ,DATA    ,0144410    1  1  0  0     BLANK,8      C9,08          04400
003273  000411          ,DATA    ,0000411    1  1  0  0     1,1-8        01,09          04410
003274  001012          ,DATA    ,0001012    1  1  0  0     2,2-8        02,0A          04420
003275  001413          ,DATA    ,0001413    1  1  0  0     3,3-8        03,0B          04430
003276  002014          ,DATA    ,0002014    1  1  0  0     4,4-8        04,0C          04440
003277  002415          ,DATA    ,0002415    1  1  0  0     5,5-8        05,0D          04450
003300  003016          ,DATA    ,0003016    1  1  0  0     6,6-8        06,0E          04460
003301  003417          ,DATA    ,0003417    1  1  0  0     7,7-8        07,0F          04470
003302  104510          ,DATA    ,0104510    1  1  0  1     BLANK,8      89,48          04480
003303  040400          ,DATA    ,0040400    1  1  0  1     1,1-8        41,09          04490
003304  041312          ,DATA    ,0041312    1  1  0  1     2,2-8        42,CA          04500
003305  041713          ,DATA    ,0041713    1  1  0  1     3,3-8        43,CB          04510
003306  042314          ,DATA    ,0042314    1  1  0  1     4,4-8        44,CC          04520
003307  042715          ,DATA    ,0042715    1  1  0  1     5,5-8        45,CD          04530
```

```
003310  043316          ,DATA    ,0043316    1  1  0  1    6,6-8       46,CE          04540
003311  043717          ,DATA    ,0043717    1  1  0  1    7,7-8       47,CF          04550
003312  114530          ,DATA    ,0114530    1  1  1  0    BLANK,8     91,58          04560
003313  050420          ,DATA    ,0050420    1  1  1  0    1,1-8       51,10          04570
003314  051332          ,DATA    ,0051332    1  1  1  0    2,2-8       52,DA          04580
003315  051733          ,DATA    ,0051733    1  1  1  0    3,3-8       53,DB          04590
003316  052334          ,DATA    ,0052334    1  1  1  0    4,4-8       54,DC          04600
003317  052735          ,DATA    ,0052735    1  1  1  0    5,5-8       55,DD          04610
003320  053336          ,DATA    ,0053336    1  1  1  0    6,6-8       56,DE          04620
003321  053737          ,DATA    ,0053737    1  1  1  0    7,7-8       57,DF          04630
003322  134570          ,DATA    ,0134570    1  1  1  1    BLANK,8     B9,78          04640
003323  070460          ,DATA    ,0070460    1  1  1  1    1,1-8       71,30          04650
003324  071372          ,DATA    ,0071372    1  1  1  1    2,2-8       72,FA          04660
003325  071773          ,DATA    ,0071773    1  1  1  1    3,3-8       73,FB          04670
003326  072374          ,DATA    ,0072374    1  1  1  1    4,4-8       74,FC          04680
003327  072775          ,DATA    ,0072775    1  1  1  1    5,5-8       75,FD          04690
003330  073376          ,DATA    ,0073376    1  1  1  1    6,6-8       76,FE          04700
003331  073777          ,DATA    ,0073777    1  1  1  1    7,7-8       77,FF          04710
```

```
*  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
*
*     EBCDIC TO ASCII CONVERSION  (SC01)
*
*
*             SC01 CONVERTS AN 8-BIT EBCDIC CHARACTER IN THE A-REGISTER
*             TO ITS EQUIVALENT 8-BIT ASCII CODE (IF ANY) IN THE
*             A-REGISTER.
*             THE B-REGISTER IS SAVED UPON ENTRANCE AND RESTORED UPON
*             EXIT. THE X-REGISTER IS NOT USED.
*
*     CALLING SEQUENCE:
*
*         P-1 LDA  VALUE          EBCDIC CHAR IN BITS 0-7
*         P   JMPM SC01           CALL CONVERT EBCDIC TO ASCII
*         P+2 (ANY INSTRUCTION)   NORMAL RETURN ASCII CODE IN
*                                 A-REG BITS 0-7
*
*             NOT ALL EBCDIC CHARACTERS ARE CONVERTABLE, THERE ARE
*             256 LEGAL EBCDIC CHARS BUT ONLY 63 ASCII CHARS. THE
*             CONVERTABLE EBCDIC INPUTS ARE:
*
*                                 40         C1-C9
*                                 4A-4F
*                                 50         D1-D9
*                                 5A-5F
*                                 60-61      E2-E9
*                                 6B-6F
*                                 7A-7F      F0-F9
*
*             A NON-CONVERTABLE INPUT VALUE RESULTS IN A RETURN
*             TO THE CALLING PROGRAM WITH THE ACCUMULATOR NEGATIVE.
*
*     NOTE:   SOME LINE PRINTERS ALLOW ONLY 7-BIT ASCII WITH THE MOST
*             SIGNIFICANT BIT BEING USED FOR PRINT CONTROL, IF OTHER
*             THAN 8-BIT ASCII CODE IS DESIRED, THIS SUBROUTINE SHOULD
*             BE MODIFIED AS FOLLOWS:
*             EITHER -  1) MODIFY TABLE SCT2 TO INCLUDE DESIRED CODES
*                                       OR
*                       2) INSERT AN APPROPRIATE MASK INSTRUCTION AT
*                          LOCATION  SC30+1.
*
```

```
                        * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   05150
003332  000000      SC01  ,ENTR   ,              ENTRANCE                            05160
003333  063412            ,STB    ,SCS1          SAVE B-REGISTER                     05170
003334  053413            ,STA    ,SCS2          SAVE EBCDIC INPUT                   05180
003335  004251            ,LRLA   ,9             Q. IS INPUT BETWEEN 40-7F OR C0-FF  05190
003336  001004            ,JAN    ,SC10          YES - BIT 6 IS SET                  05200
003337  003343 R
003340  005301      SC05  ,DECR   ,1             NO - RETURN WITH ACCUM NEGATIVE     05210
003341  001000            ,JMP    ,SC30          .                                   05220
003342  003406 R
003343  013413      SC10  ,LDA    ,SCS2          RESTORE EBCDIC CHAR TO BITS 0-7     05230
003344  151016            ,ANA    ,=017          BUILD SHIFT COMMAND TO TEST VALIDITY OF 05240
003345  113411            ,ORA    ,SCC1          . VALUE TO BE CONVERTED             05250
003346  053364            ,STA    ,SC20          .                                   05260
003347  013413            ,LDA    ,SCS2          EBCDIC INPUT                        05270
003350  004304            ,ASRA   ,4             CALC DISPLACEMENT INTO SCT1 TABLE   05280
003351  151010            ,ANA    ,=3            USE BITS 4 AND 5                    05290
003352  121017            ,ADD    ,=SCT1         .                                   05300
003353  005012            ,TAB    ,              PUT SCT1 ADDRESS (OFFSET 0) INTO B REG 05310
003354  013413            ,LDA    ,SCS2          EXAMINE INPUT BIT 8                 05320
003355  004250            ,LRLA   ,8             Q. WHICH RANGE  4 OR C              05330
003356  001004            ,JAN    ,SC15          C0-FF                               05340
003357  003363 R
003360  016000            ,LDA    ,0,B           40-7F                               05350
003361  001000            ,JMP    ,SC20          SKIP TO SC20                        05360
003362  003364 R
003363  016004      SC15  ,LDA    ,4,B           C0-FF                               05370
003364  004240      SC20  ,LRLA   ,0             Q. IS EBCDIC INPUT CHAR CONVERTIBLE 05380
003365  001004            ,JAN    ,SC30          NO                                  05390
003366  003406 R
003367  013413            ,LDA    ,SCS2          YES - EBCDIC INPUT VALUE            05400
003370  004301            ,ASRA   ,1             BUILD ADDRESS INTO SCT2 TO B-REG    05410
003371  151020            ,ANA    ,=037          USE BITS 1-5                        05420
003372  121021            ,ADD    ,=SCT2         .                                   05430
003373  005012            ,TAB    ,              .                                   05440
003374  026000            ,LDB    ,0,B           2 PACKED ASCII CHARS FROM SCT2 TO B-REG 05450
003375  005101            ,INCR   ,01            Q. IS EBCDIC CHAR EVEN OR ODD       05460
003376  153413            ,ANA    ,SCS2                                              05470
003377  001010            ,JAZ    ,SC25          EVEN                                05480
003400  003405 R
003401  005021            ,TBA    ,              ODD - WANT RIGHT SIDE               05490
003402  151001            ,ANA    ,=0377         .                                   05500
```

```
003403  001000           ,JMP     ,SC30      SKIP TO SC30                          05510
003404  003406 R
003405  004450     SC25  ,LLRL    ,8         EVEN - WANT LEFT SIDE                 05520
003406  023412     SC30  ,LDB     ,SCS1      RESTORE B-REGISTER                    05530
003407  001000           ,JMP*    ,SC01      RETURN TO CALLING PROGRAM             05540
003410  103332 R

003411  004240     SCC1  ,LRLA    ,0         SHIFT LEFT 0 POSITIONS                05560
003412             SCS1  ,BSS     ,1         TEMP STORAGE 1 - B REGISTER           05570
003413             SCS2  ,BSS     ,1         TEMP STORAGE 2 - EBCDIC INPUT VALUE   05580
```

```
                    * * * * * * * * * * * * * * * * * * * * * * * * *
                    *
                    *     TABLE SCT1 - EBCDIC INPUT BITS 4 AND 5  ARE USED AS AN INDEX INTO
                    *                  THIS TABLE WITH AN OFFSET OFF ZERO OR FOUR. AN OFFSE
                    *                  OF ZERO IS USED IF THE EBCDIC INPUT IS BETWEEN 40 AN
                    *                  7F. AN OFFSET OF FOUR IS USED IF THE EBCDIC INPUT IS
                    *                  BETWEEN CO AND FF.
                    *                  EACH WORD OF SCT1 CONTAINS 16 BITS WHICH REPRESENT T
                    *                  CONVERTABLE/NON-CONVERTABLE STATUS OF EACH EBCDIC IN
                    *                  IN THE 40-7F,CO-FF RANGES (0=CONVERTABLE, 1= NON-
                    *                  CONVERTABLE). FOR EXAMPLE:
                    *
                    *                           WORD 1 (40-4F)- BIT 15=0 IMPLIES EBCDIC INP
                    *                                                    40 CONVERTABLE
                    *                           WORD 2 (50-5F)- BIT  1=0 IMPLIES EBCDIC INP
                    *                                                    5E CONVERTABLE
                    *                           WORD 5 (CO-CF)- BIT  5=1 IMPLIES EBCDIC INP
                    *                                                    CA NON-CONVERTABLE
                    *                           WORD 7 (EO-EF)- BIT 14=1 IMPLIES EBCDIC INP
                    *                                                    E1 NON-CONVERTABLE
                    *
                    * * * * * * * * * * * * * * * * * * * * * * * * *
        003414 R    SCT1   ,EQU     ,*
003414  077700             ,DATA    ,077700        40-4F
003415  077700             ,DATA    ,077700        50-5F
003416  037740             ,DATA    ,037740        60-6F
003417  177700             ,DATA    ,0177700       70-7F
003420  100077             ,DATA    ,0100077       CO-CF
003421  100077             ,DATA    ,0100077       DO-DF
003422  140077             ,DATA    ,0140077       EO-EF
003423  000077             ,DATA    ,077           FO-FF
```

```
                        * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   05920
                        *                                                           05930
                        *     TABLE SCT2 - THIS TABLE CONTAINS THE ASCII REPRESENTATIONS OF THE   05940
                        *                  CONVERTABLE EBCDIC INPUT VALUES ARRANGED AS INDICATE   05950
                        *                  BELOW IN THE COMMENT  FIELDS.                          05960
                        *                                                                         05970
                        * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   05980
003424  120301  SCT2    ,DATA   ,' A'                          HEX = 40 C1                      05990
003425  141303          ,DATA   ,'BC'                                C2 C3                      06000
003426  142305          ,DATA   ,'DE'                                C4 C5                      06010
003427  143307          ,DATA   ,'FG'                                C6 C7                      06020
003430  144311          ,DATA   ,'HI'                                C8 C9                      06030
003431  155656          ,DATA   ,0155656        [ .                  4A 4B                      06040
003432  136250          ,DATA   ,0136250        < (                  4C 4D                      06050
003433  125736          ,DATA   ,0125736        + ↑                  4E 4F                      06060
003434  123312          ,DATA   ,0123312        & J                  50 D1                      06070
003435  145714          ,DATA   ,'KL'                                D2 D3                      06080
003436  146716          ,DATA   ,'MN'                                D4 D5                      06090
003437  147720          ,DATA   ,'OP'                                D6 D7                      06100
003440  150722          ,DATA   ,'QR'                                D8 D9                      06110
003441  120644          ,DATA   ,0120644        ! $                  5A 5B                      06120
003442  125251          ,DATA   ,0125251        * )                  5C 5D                      06130
003443  135737          ,DATA   ,0135737        ; ←                  5E 5F                      06140
003444  126657          ,DATA   ,0126657        - /                  60 61                      06150
003445  151724          ,DATA   ,'ST'                                E2 E3                      06160
003446  152726          ,DATA   ,'UV'                                E4 E5                      06170
003447  153730          ,DATA   ,'WX'                                E6 E7                      06180
003450  154732          ,DATA   ,'YZ'                                E8 E9                      06190
003451  000254          ,DATA   ,0254             ,                     6B                    06200
003452  122735          ,DATA   ,0122735        ( )                  6C 6D                      06210
003453  137277          ,DATA   ,0137277        > ?                  6E 6F                      06220
003454  130261          ,DATA   ,'01'                                F0 F1                      06230
003455  131263          ,DATA   ,'23'                                F2 F3                      06240
003456  132265          ,DATA   ,'45'                                F4 F5                      06250
003457  133267          ,DATA   ,'67'                                F6 F7                      06260
003460  134271          ,DATA   ,'89'                                F8 F9                      06270
003461  135243          ,DATA   ,0135243        : #                  7A 7B                      06280
003462  140247          ,DATA   ,0140247        @ '                  7C 7D                      06290
003463  136642          ,DATA   ,0136642        = "                  7E 7F                      06300
        000000          ,END    ,                                                           06310

LITERALS
  001000  000400
```

001001	000377
001002	000014
001003	000177
001004	002637
001005	000007
001006	002627
001007	000070
001010	000003
001011	004000
001012	000376
001013	003122
001014	007400
001015	003132
001016	000017
001017	003414
001020	000037
001021	003424

POINTERS

SYMBOLS

1	003424	R	SCT2
1	003414	R	SCT1
1	003413	R	SCS2
1	003412	R	SCS1
1	003411	R	SCC1
1	003406	R	SC30
1	003405	R	SC25
1	003364	R	SC20
1	003363	R	SC15
1	003343	R	SC10
0	003340	R	SC05
1	003332	R	SC01
1	003132	R	SBT2
1	003122	R	SBT1
1	003121	R	SBS4
1	003120	R	SBS3
1	003117	R	SBS2
1	003116	R	SBS1
1	003112	R	SB06

```
1   003111 R   SB05
1   003071 R   SB04
1   003055 R   SB03
1   003047 R   SB02
1   003037 R   SB01
1   002637 R   SAT2
1   002627 R   SAT1
1   002626 R   SAS2
1   002625 R   SAS1
1   002605 R   SA03
1   002604 R   SA02
1   002565 R   SA01
1   000002     ?B
1   000001     ?X
1   002164 R   TBL2
1   002163 R   ADT2
1   001563 R   TBL1
1   001562 R   ADT1
1   001561 R   TSC1
1   001560 R   CNTR
1   001557 R   TS30
1   001545 R   TS20
1   001536 R   TS15
1   001521 R   TS10
1   001516 R   TS05
1   001501 R   TS01
```