2/3

IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DHDRA-A-D
PRODUCT NAME:	DR8-EA 12 CHANNEL BUFFERED DIGITAL INTERFACE
DATE:	MARCH, 1972
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	MICHAEL DAVIS/P. COYNE
REPLACES:	MAINDEC-8E-DØQB

ADVANCE COPY

THIS DESCRIPTION IS PRELIMINARY AND SUBJECT TO CHANGE WITHOUT NOTICE.

1. ABSTRACT

THIS PROGRAM IS A DIAGNOSTIC AND EXERCISER FOR THE DR8-EA 12 CHANNEL BUFFERED DIGITAL INTERFACE. ALL FUNCTIONS ARE TESTED AND ERRORS ARE REPORTED BY HALTS AND/OR ERROR TYPEOUTS.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP8E STANDARD COMPUTER WITH 4K OF CORE
ASR-33 TELETYPE (OR EQUIVALENT)
DR8-EA WITH TEST CABLE

2.2 STORAGE

THE PROGRAM USES LOCATION ØØØØ-3377

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING BINARY TAPES SHOULD BE USED.

4. STARTING PROCEDURE

4.1 STARTING ADDRESS

2ØØ-INPUT DEVICE CONFIGURATION
2Ø1-START WITH STANDARD CONFIGURATION

4.2 SWITCH SETTINGS

FOR EITHER STARTING ADDRESS, NORMAL SETTING IS SRØ-SR11=Ø (DOWN).

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY
SET SWITCH REGISTER TO DESIRED STARTING ADDRESS
 LOAD ADDRESS
 CLEAR SWITCHES
 PRESS CLEAR AND CONTINUE

4,3,1 FOR STARTING ADDRESS 2ØØ

THE PROGRAM WILL TYPE "SET SR FOR DEVICE CODE AND CONT" AND THEN HALT,

SET SWITCHES TO ØØX WHERE X IS AN OCTAL NUMBER CORRESPONDING TO THE 3 LSB OF THE DEVICE SELECTOR CODE. PRESS CONTINUE,

PROGRAM WILL RESPOND BY TYPING "SET SR FOR INTERRUPT JUMPERS AND CONT" AND THEN HALT,
SET SWITCHES FOR ALL INPUT REGISTER BITS JUMPERED TO INTERRUPT.
PRESS CONTINUE,

PROGRAM WILL RESPOND BY TYPING "SET SR FOR FLIPFLOP JUMPERS AND CONT" AND THEN HALT,
SET SWITCHES FOR ALL INPUT REGISTER FLIPFLOPS,
PRESS CONTINUE,

PROGRAM WILL RESPOND BY TYPING "SET SR FOR RUN" AND THEN HALT,
SET SWITCHES AS IN 4.2 OR 5,1
PRESS CONTINUE,

PROGRAM WILL BEGIN TEST EXECUTION

4,3,2 FOR STARTING ADDRESS 2Ø1

SET SWITCHES AS IN 4.2 OR 5,1
PRESS CLEAR AND CONTINUE,

PROGRAM WILL BEGIN TEST EXECUTION

. OPERATING PROCEDURE

.1 OPERATIONAL SWITCH SETTINGS

SRØ=1, SUPPRESS ERROR HALT
SR1=1, SUPPRESS ERROR TYPEOUT
SR2=1, LOOP ON CURRENT TEST
SR3=1, LOOP WITH CURRENT DATA
SR4=1, SUPPRESS BELL OR TYPEOUT AT END OF PASS
SR5=1, SUPPRESS ITERATIONS
SR6=1, ESCAPE TO NEXT TEST ON ERROR

.2 PROGRAM AND/OR OPERATOR ACTION

.2.1.1 WITH SWITCHES SET AS IN 4.2, THE PROGRAM WILL RUN ALL TESTS SEQUENTIALLY. EACH IOT TEST WILL BE REPEATED 4Ø96 TIMES. EACH DATA TEST WILL BE REPEATED 5Ø TIMES. AFTER ALL TESTS HAVE BEEN COMPLETED, THE PROGRAM WILL TYPE "DR" AND START ALL TESTS AGAIN.
IF AN ERROR OCCURS, THE PROGRAM WILL HALT AND TYPE AN APPROPRIATE ERROR MESSAGE (SEE SECTION 6 FOR DETAILS).

.2.1.2 WITH SRØ=1 (UP), PROGRAM ACTION WILL BE AS IN 5.2.1.1, EXCEPT NO TYPEOUT WILL OCCUR.

.2.1.3 WITH SR2=1(UP) PROGRAM ACTION WILL BE AS IN 5.2.1.1, EXCEPT NO TYPEOUT WILL OCCUR. THE ADDRESS OF THE FAILING TEST WILL BE DISPLAYED IN THE COMPUTER AC.

.2.1.4 WITH SR4=1(UP), PROGRAM ACTION WILL BE AS IN 5.2.1.1 EXCEPT NO END OF PASS TYPEOUT WILL OCCUR.

.2.1.5 WITH SR5=1 (UP), EACH TEST WILL BE EXECUTED ONLY ONCE. INSTEAD OF TYPING "DR", THE PROGRAM WILL RING THE TTY BELL

.2.1.6 WITH SRØ=1 AND SR6=1, PROGRAM ACTION WILL BE AS IN 5.2.1.1 IF NO ERRORS OCCUR.
IF AN ERROR OCCURS, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR MESSAGE AND IMMEDIATLY TERMINATE ITERATIONS OF THE FAILING TEST. THE PROGRAM WILL THEN START THE NEXT TEST IN SEQUENCE.

6. ERRORS

6.1 NORMAL OPERATION

IF AN ERROR OCCURS WITH SWITCHES SET AS IN 4.2, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR MESSAGE (WITH DATA IF APPLICABLE) AND HALT.

THE FORMAT OF THE ERROR TYPEOUT IS

```
XXXX    MESSAGE
        HEADER FOR DATA (IF APPLICABLE)
        DATA            (IF APPLICABLE)
XXX=    ADDRESS OF JMS TO ERROR ROUTINE IN TEST THAT FAILED.
```

6.2 ERROR RECOVERY

SET SR6=1(UP) TO ESCAPE TO NEXT TEST, PRESS CONTINUE.

6.3 ERROR LOOP (IOTS)

SET SRØ=1 TO SUPPRESS HALT
SET SR1=1 TO SUPPRESS TYPEOUT
SET SR2=1 TO LOOP ON CURRENT FAILING TEST

6.4 ERROR LOOP (DATA)

SAME AS 6.3 EXCEPT USE SR3 INSTEAD OF SR2 TO LOOP WITH CURRENT DATA.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

TEST JUMPER CABLE MUST BE INSTALLED.
ANY FLOATING INPUTS TO INPUT REGISTER SHOULD BE GROUNDED, OR ERRORS MAY OCCUR.

7.2 OPERATING RESTRICTIONS

NONE

. MISCELLANEOUS

.1 EXECUTION TIME

EXECUTION TIME IS APPROXIMATELY 3 MINUTES FOR FULL ITERATION AND APPROXIMATELY 1Ø SECONDS WITH ITERATIONS SUPPRESSED.

. PROGRAM DESCRIPTION

THE DR8-EA IS A TEST OF ALL FUNCTIONS OF THE INTERFACE.

THE PROGRAM SEQUENCE IS AS FOLLOWS:

ALL BASIC IOT TESTS ARE EXECUTED 4Ø96 TIMES.
ALL OUTPUT REGISTER FUNCTIONS ARE TESTED WITH BINARY COUNT PATTERNS.
ALL INPUT REGISTER FUNCTIONS ARE TESTED USING BINARY COUNT PATTERNS.
INTERACTION BETWEEN INPUT AND OUTPUT REGISTERS IS TESTED FOR
WITH BINARY COUNT PATTERNS.
ALL SKIPS AND INTERRUPTS ARE TESTED USING BINARY COUNT PATTERNS.

Ø. LISTING

```
0030  0000      TYPFLG, 0
0031  0000      LPCNT,  0

                        /
                        /INDIRECT POINTERS
                        /
0032  0261      XDBDI,  DBDIX
0033  0266      XDBEI,  DBEIX
0034  0273      XDBSK,  DBSKX
0035  0300      XDBCI,  DBCIX
0036  0305      XDBRI,  DBRIX
0037  0312      XDBCO,  DBCOX
0040  0317      XDBSO,  DBSOX
0041  0324      XDBRO,  DBROX
0042  3200      XPRINT, PRINT
0043  3251      XTYPE,  TYPE
0044  2600      XERROR, ERROR
0045  2667      XLOOP1, LOOP1
0046  2712      XLOOP2, LOOP2

                        /
                        /TEST INITIALIZATION
                        /
      0200      *200
0200  5202              JMP     START1
0201  5244              JMP     START2
0202  6007      START1, CAF                     /CLEAR ALL FLAGS
0203  4442              JMS I   XPRINT          /TYPE "SET SR FOR DEVICE
0204  3377              M1-1                    /CODE AND CONT"
0205  7402              HLT                     /HALT FOR SWITCHES
0206  7604              LAS                     /GET SWITCHES
0207  0377              AND     (7              /MASK DEVICE CODE
0210  7106              CLL RTL                 /POSITION BITS
0211  7004              RAL
0212  1376              TAD     (6500           /GENERATE BASIC IOT
0213  3247              DCA     IOTS            /SAVE BASIC IOT
0214  4442              JMS I   XPRINT          /TYPE "SET SR FOR JUMPERS
0215  3420              M2-1                    /AND CONT"
0216  7402              HLT                     /HALT FOR SWITCHES
0217  7604              LAS                     /GET SWITCHES
0220  3026              DCA     IJUMPER         /SAVE JUMPER MASK
0221  4442              JMS I   XPRINT
0222  3444              M2A-1
0223  7402              HLT
0224  7604              LAS
0225  3027              DCA     FJUMPER
0226  1375              TAD     (-10            /8 IOTS WILL BE
0227  3020              DCA     CNTR1           /SET UP
0230  1260              TAD     DIOT            /STORE INSTRUCTION FOR
0231  3233              DCA     PNTR1           /IOT SET UP
0232  1247              TAD     IOTS            /GET IOT
0233  0000      PNTR1,  0                       /STORE IT
0234  2233              ISZ     PNTR1           /PREPARE TO STORE
0235  2247              ISZ     IOTS            /NEXT IOT
0236  2020              ISZ     CNTR1
```

```
                        /MAINDEC-Ø8-DHDRA-A
                        /DR8-EA
                        /12 CHANNEL BUFFERED I/O DIAGNOSTIC
                        /COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS, Ø1754
                        /
                        /STARTING ADDRESS!                  2ØØ-INPUT DEVICE CONFIGURATION
                        /                                   2Ø1-USE STANDARD CONFIGURATION
                        /
                        /SWITCH REGISTER OPTIONS
                        /
                        /SRØØ  =1, SUPPRESS HALT ON ERROR
                        /SRØ1  =1, SUPPRESS ERROR TYPEOUT
                        /SRØ2  =1, LOOP ON CURRENT TEST
                        /SRØ3  =1, LOOP WITH CURRENT DATA
                        /SRØ4  =1, SUPPRESS BELL AT END OF PASS
                        /SRØ5  =1, SUPPRESS ITERATIONS
                        /SRØ6  =1, ESCAPE TO NEXT TEST ON ERROR
                        /
                        /INSTRUCTION DEFINITIONS
                        /
        7421            MQL=7421
        75Ø1            MQA=75Ø1
        7ØØ2            BSW=7ØØ2
        6ØØ7            CAF=6ØØ7
        6ØØ3            SRQ=6ØØ3
        4432            DBDI=JMS I XDBDI
        4433            DBEI=JMS I XDBEI
        4434            DBSK=JMS I XDBSK
        4435            DBCI=JMS I XDBCI
        4436            DBRI=JMS I XDBRI
        4437            DBCO=JMS I XDBCO
        444Ø            DBSO=JMS I XDBSO
        4441            DBRO=JMS I XDBRO
                        /
                        /LOCATION EQUIVALENCIES
                        /
        3Ø26            MSTDGT=ERADR+1
        3Ø27            LSTDGT=ERADR+2

                        /
                        /GENERAL VARIABLES
                        /
        ØØ1Ø    *1Ø
  ØØ1Ø  ØØØØ    POINT1, Ø
        ØØ2Ø    *2Ø
  ØØ2Ø  ØØØØ    CNTR1,  Ø
  ØØ21  ØØØØ    DATA1,  Ø
  ØØ22  ØØØØ    DATA2,  Ø
  ØØ23  ØØØØ    DATA3,  Ø
  ØØ24  ØØØØ    DATA4,  Ø
  ØØ25  ØØØØ    DATA5,  Ø
  ØØ26  7777    IJUMPE, 7777            /INTERRUPT JUMPER MASK

  ØØ27  7777    FJUMPE, 7777            /FLIPFLOP JUMPER MASK
```

```
 Ø237  5232             JMP     PNTR1-1
 Ø24Ø  4442             JMS I   XPRINT          /TYPE "SET SR FOR RUN
 Ø241  3475             M3-1                    /AND CONT
 Ø242  74Ø2             HLT                     /HALT FOR SWITCHES
 Ø243  73ØØ             CLA CLL
 Ø244  3Ø3Ø     START2, DCA     TYPFLG          /CLEAR ERROR FLAG               /CLEAR TYPE FLAG
 Ø245  5646             JMP I   .+1             /GO TO FIRST TEST
 Ø246  Ø4ØØ             INIT1


                        /
                        /INITIALIZATION CONSTANTS AND VARIABLES
                        /
 Ø247  ØØØØ     IOTS,   Ø                       /BASIC IOT
 Ø25Ø  Ø262     TIOT,   DBDIX+1
 Ø251  Ø267             DBEIX+1
 Ø252  Ø274             DBSKX+1
 Ø253  Ø3Ø1             DBCIX+1
 Ø254  Ø3Ø6             DBRIX+1
 Ø255  Ø313             DBCOX+1
 Ø256  Ø32Ø             DBSOX+1
 Ø257  Ø325             DBROX+1
 Ø26Ø  365Ø     DIOT,   DCA I   TIOT
                        /
                        /IOT SUBROUTINES
                        /
                        /DISABLE DATA BUFFER INTERRUPT (DBDI,65XØ)
                        /
 Ø261  ØØØØ     DBDIX,  Ø
 Ø262  65ØØ             65ØØ

 Ø263  741Ø             SKP                     /TRAP FOR UNDESIRED
 Ø264  74Ø2             HLT                     /SKIPS
 Ø265  5661             JMP I   DBDIX
                        /
                        /ENABLE DATA BUFFER INTERRUPTS (DBEI,65X1)
                        /
 Ø266  ØØØØ     DBEIX,  Ø
 Ø267  65Ø1             65Ø1

 Ø27Ø  741Ø             SKP                     /TRAP FOR UNDESIRED
 Ø271  74Ø2             HLT                     /SKIPS
 Ø272  5666             JMP I   DBEIX
                        /
                        /SKIP ON DATA BUFFER INPUT FLAG (DBSK,65X2)
 Ø273  ØØØØ     DBSKX,  Ø
 Ø274  65Ø2             65Ø2

 Ø275  741Ø             SKP
 Ø276  2273             ISZ     DBSKX
 Ø277  5673             JMP I   DBSKX
                        /
                        /ØS TO INPUT REGISTER CORRESPONDING
                        /TO 1S IN AC (DBCI,65X3)
                        /
```

```
0300  0000     DBCIX,  0
0301  6503             6503

0302  7410             SKP                     /TRAP FOR UNDESIRED
0303  7402             HLT                     /SKIPS
0304  5700             JMP I   DBCIX

                       /
                       /INPUT REGISTER TO AC (DBRI,65X4)
                       /
0305  0000     DBRIX,  0
0306  6504             6504

0307  7410             SKP                     /TRAP FOR UNDESIRED
0310  7402             HLT                     /SKIPS
0311  5705             JMP I   DBRIX

                       /
                       /ZEROS TO OUTPUT REGISTER CORRESPONDING TO
                       /ONES IN AC (DBCO,65X5)
0312  0000     DBCOX,  0
0313  6505             6505

0314  7410             SKP                     /TRAP FOR UNDESIRED
0315  7402             HLT                     /SKIPS
0316  5712             JMP I   DBCOX
                       /
                       /1S TO OUTPUT REGISTER CORRESPONDING
                       /TO 1S IN AC (DBSO,65X6)
                       /
0317  0000     DBSOX,  0
0320  6506             6506

0321  7410             SKP                     /TRAP FOR UNDESIRED
0322  7402             HLT                     /SKIPS
0323  5717             JMP I   DBSOX
                       /
                       /JAM TRANSFER OUTPUT REGISTER TO AC (DBRO 65X7)
                       /
0324  0000     DBROX,  0
0325  6507             6507

0326  7410             SKP                     /TRAP FOR UNDESIRED
0327  7402             HLT                     /SKIPS
0330  5724             JMP I   DBROX
0375  7770
0376  6500
0377  0007
      0400     PAGE


                       /
                       /IS OUTPUT REGISTER CLEARED BY INITIALIZE?
                       /
```

```
 Ø4ØØ  3Ø3Ø    INIT1,  DCA     TYPFLG          /CLEAR ERROR FLAG
 Ø4Ø1  3Ø31            DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
 Ø4Ø2  6ØØ7            CAF                     /INITIALIZE INTERFACE
 Ø4Ø3  4441            DBRO                    /READ OUTPUT REGISTER
 Ø4Ø4  3Ø21            DCA     DATA1           /SAVE REGISTER DATA
 Ø4Ø5  1Ø21            TAD     DATA1           /GET REGISTER DATA
 Ø4Ø6  765Ø            SNA CLA                 /WAS REGISTER CLEARED BY INITIALIZE
 Ø4Ø7  5214            JMP     .+5             /DATA CORRECT, CONTINUE
 Ø41Ø  4444            JMS I   XERROR          /NO, ERROR
 Ø411  3645            INIT1E-1                /"OUTPUT REGISTER NOT CLEARED"
 Ø412  3515            DH1-1                   /"REGISTER DATA"
 Ø413  7777            -1                      /NUMBER OF WORDS TO BE OUTPUT
 Ø414  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 Ø415  52Ø2            JMP     INIT1+2         /LOOP ON CURRENT TEST
                       /
                       /IS INPUT REGISTER CLEARED BY INITIALIZE?
                       /
 Ø416  3Ø3Ø    INIT2,  DCA     TYPFLG          /CLEAR ERROR FLAG
 Ø417  3Ø31            DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
 Ø42Ø  741Ø            SKP
 Ø421  6ØØ7            CAF                     /INITIALIZE INTERFACE
 Ø422  4436            DBRI                    /READ INPUT REGISTER
 Ø423  3Ø21            DCA     DATA1           /SAVE REGISTER DATA
 Ø424  1Ø21            TAD     DATA1           /GET REGISTER DATA
 Ø425  765Ø            SNA CLA                 /WAS REGISTER CLEARED
 Ø426  5233            JMP     .+5             /DATA CORRECT, CONTINUE
 Ø427  4444            JMS I   XERROR          /NO, ERROR
 Ø43Ø  3661            INIT2E-1                /"INPUT REGISTER NOT CLEARED"
 Ø431  3515            DH1-1                   /"REGISTER DATA"
 Ø432  7777            -1                      /NUMBER OF WORDS TO BE OUTPUT
 Ø433  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 Ø434  5221            JMP     INIT2+3         /LOOP ON CURRENT TEST
                       /
                       /IS SKIP FLAG SET AFTER INITIALIZE
                       /
 Ø435  3Ø3Ø    INIT3,  DCA     TYPFLG          /CLEAR ERROR FLAG
 Ø436  3Ø31            DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
 Ø437  741Ø            SKP
 Ø44Ø  6ØØ7            CAF                     /INITIALIZE INTERFACE
 Ø441  4433            DBEI                    /ENABLE INTERFACE INTERRUPTS
 Ø442  6ØØ3            SRQ                     /TEST FOR INTERRUPT ACTIVE
 Ø443  525Ø            JMP     .+5             /NO INTERRUPT, CONTINUE
 Ø444  4444            JMS I   XERROR          /INTERRUPT ACTIVE, ERROR
 Ø445  4Ø42            INT1E-1                 /"INTERRUPT ACTIVE"
 Ø446  3514            DHØ-1                   /NO DATA HEADER
 Ø447  ØØØØ            Ø                       /NO DATA
 Ø45Ø  4434            DBSK                    /IS INTERFACE FLAG SET
 Ø451  5256            JMP     .+5             /FLAG NOT SET, CONTINUE
 Ø452  4444            JMS I   XERROR          /FLAG SET, ERROR
 Ø453  3674            INIT3E-1                /"SKIP FLAG SET"
 Ø454  3514            DHØ-1                   /NO DATA HEADER
 Ø455  ØØØØ            Ø                       /NO DATA
 Ø456  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 Ø457  524Ø            JMP     INIT3+3         /LOOP ON CURRENT TEST
```

```
                              /
                              /DOES OUTPUT REGISTER JAM TRANSFER TO AC?
                              /
Ø46Ø  3Ø3Ø         TRAN1,     DCA     TYPFLG          /CLEAR ERROR FLAG
Ø461  3Ø31                    DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
Ø462  6ØØ7                    CAF                     /INITIALIZE INTERFACE
Ø463  734Ø                    CLA CLL CMA             /SET AC =7777
Ø464  4441                    DBRO                    /READ OUTPUT REGISTER
Ø465  3Ø21                    DCA     DATA1           /SAVE AC CONTENTS
Ø466  1Ø21                    TAD     DATA1           /GET AC CONTENTS
Ø467  765Ø                    SNA CLA                 /WAS AC CLEARED BY TRANSFER
Ø47Ø  5275                    JMP     .+5             /DATA CORRECT, CONTINUE
Ø471  4444                    JMS I   XERROR          /NO, ERROR
Ø472  37Ø3                    TRAN1E-1                /"DBRO DID NOT CLEAR AC"
Ø473  3525                    DH2-1                   /"AC CONTENTS"
Ø474  7777                    -1                      /NUMBER OF WORDS TO BE OUTPUT
Ø475  4445                    JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
Ø476  5262                    JMP     TRAN1+2         /LOOP ON CURRENT TEST
                              /
                              /DOES INPUT REGISTER JAM TRANSFER TO AC
                              /
Ø477  3Ø3Ø         TRAN2,     DCA     TYPFLG          /CLEAR ERROR FLAG
Ø5ØØ  3Ø31                    DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
Ø5Ø1  6ØØ7                    CAF                     /INITIALIZE INTERFACE
Ø5Ø2  734Ø                    CLA CLL CMA             /SET AC =7777
Ø5Ø3  4436                    DBRI                    /READ INPUT REGISTER
Ø5Ø4  3Ø21                    DCA     DATA1           /SAVE AC CONTENTS
Ø5Ø5  1Ø21                    TAD     DATA1           /GET AC CONTENTS
Ø5Ø6  765Ø                    SNA CLA                 /WAS AC CLEARED BY TRANSFER
Ø5Ø7  5314                    JMP     .+5             /DATA CORRECT, CONTINUE
Ø51Ø  4444                    JMS I   XERROR          /NO, ERROR
Ø511  3716                    TRAN2E-1                /"DBRI DID NOT CLEAR AC"
Ø512  3525                    DH2-1                   /"AC CONTENTS"
Ø513  7777                    -1                      /NUMBER OF WORDS TO BE OUTPUT
Ø514  4445                    JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
Ø515  53Ø1                    JMP     TRAN2+2         /LOOP ON CURRENT TEST
                              /
                              /DOES TRANSFER TO OUTPUT REGISTER CHANGE AC (WITH AC=7777,DBSO)
                              /
Ø516  3Ø3Ø         TRAN3,     DCA     TYPFLG          /CLEAR ERROR FLAG
Ø517  3Ø31                    DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
Ø52Ø  6ØØ7                    CAF                     /INITIALIZE INTERFACE
Ø521  734Ø                    CLA CLL CMA             /SET AC =7777
Ø522  444Ø                    DBSO                    /BIT SET OUTPUT REGISTER
Ø523  3Ø21                    DCA     DATA1           /SAVE AC CONTENTS
Ø524  1Ø21                    TAD     DATA1           /GET AC CONTENTS
Ø525  7Ø4Ø                    CMA                     /COMPLIMENT DATA TO TEST FOR 7777
Ø526  765Ø                    SNA CLA                 /DID AC CHANGE
Ø527  5334                    JMP     .+5             /DATA CORRECT, CONTINUE
Ø53Ø  4444                    JMS I   XERROR          /NO, ERROR
Ø531  3731                    TRAN3E-1                /"DBSO CHANGED AC"
Ø532  3525                    DH2-1                   /"AC CONTENTS"
Ø533  7777                    -1                      /NUMBER OF WORDS TO BE OUTPUT
Ø534  4445                    JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
Ø535  532Ø                    JMP     TRAN3+2         /LOOP ON CURRENT TEST
```

```
                            /
                            /DOES TRANSFER TO OUTPUT REGISTER CHANGE AC (WITH AC=7777, DBCO)
                            /
Ø536  3Ø3Ø     TRAN4,       DCA      TYPFLG          /CLEAR ERROR FLAG
Ø537  3Ø31                  DCA      LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
Ø54Ø  6ØØ7                  CAF                      /INITIALIZE INTERFACE
Ø541  734Ø                  CLA CLL CMA              /SET AC =7777
Ø542  4437                  DBCO                     /BIT CLEAR OUTPUT REGISTER
Ø543  3Ø21                  DCA      DATA1           /SAVE AC CONTENTS
Ø544  1Ø21                  TAD      DATA1           /GET AC CONTENTS
Ø545  7Ø4Ø                  CMA                      /COMPLIMENT DATA TO TEST FOR 7777
Ø546  765Ø                  SNA CLA                  /DID AC CHANGE
Ø547  5354                  JMP      .+5             /DATA CORRECT, CONTINUE
Ø55Ø  4444                  JMS I    XERROR          /NO, ERROR
Ø551  3741                  TRAN4E-1                 /"DBCO CHANGED AC"
Ø552  3525                  DH2-1                    /"AC CONTENTS"
Ø553  7777                  -1                       /NUMBER OF WORDS TO BE OUTPUT
Ø554  4445                  JMS I    XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
Ø555  534Ø                  JMP      TRAN4+2         /LOOP ON CURRENT TEST
                            /
                            /DOES TRANSFER TO INPUT REGISTER CHANGE AC (WITH AC=7777, DBCI)
                            /
Ø556  3Ø3Ø     TRAN5,       DCA      TYPFLG          /CLEAR ERROR FLAG
Ø557  3Ø31                  DCA      LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
Ø56Ø  6ØØ7                  CAF                      /INITIALIZE INTERFACE
Ø561  734Ø                  CLA CLL CMA              /SET AC =7777
Ø562  4435                  DBCI                     /BIT CLEAR INPUT REGISTER
Ø563  3Ø21                  DCA      DATA1           /SAVE AC CONTENTS
Ø564  1Ø21                  TAD      DATA1           /GET AC CONTENTS
Ø565  7Ø4Ø                  CMA                      /COMPLIMENT DATA TO TEST FOR 7777
Ø566  765Ø                  SNA CLA                  /DID AC CHANGE
Ø567  5374                  JMP      .+5             /DATA CORRECT, CONTINUE
Ø57Ø  4444                  JMS I    XERROR          /NO, ERROR
Ø571  3751                  TRAN5E-1                 /"DBCI CHANGED AC"
Ø572  3525                  DH2-1                    /"AC CONTENTS"
Ø573  7777                  -1                       /NUMBER OF WORDS TO BE OUTPUT
Ø574  4445                  JMS I    XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
Ø575  536Ø                  JMP      TRAN5+2         /LOOP ON CURRENT TEST
Ø576  5777'                 JMP      TRAN6           /GO TO NEXT TEST
Ø577  Ø6ØØ
      Ø6ØØ     PAGE


                            /
                            /DOES TRANSFER TO OUTPUT REGISTER CHANGE AC (WITH AC=Ø,DBSO)
                            /
Ø6ØØ  3Ø3Ø     TRAN6,       DCA      TYPFLG          /CLEAR ERROR FLAG
Ø6Ø1  3Ø31                  DCA      LPCNT           /SET ITERATION COUNT TO 4Ø96 (DECIMAL)
Ø6Ø2  6ØØ7                  CAF                      /INITIALIZE INTERFACE
Ø6Ø3  444Ø                  DBSO                     /BIT SET OUTPUT REGISTER
Ø6Ø4  3Ø21                  DCA      DATA1           /SAVE AC CONTENTS
Ø6Ø5  1Ø21                  TAD      DATA1           /GET AC CONTENTS
Ø6Ø6  765Ø                  SNA CLA                  /WAS AC CHANGED
Ø6Ø7  5214                  JMP      .+5             /DATA CORRECT, CONTINUE
```

```
 Ø61Ø  4444            JMS I   XERROR          /AC CHANGED, ERROR
 Ø611  3731            TRAN3E-1                /"DBSO CHANGED AC"
 Ø612  3525            DH2-1                   /"AC CONTENTS"
 Ø613  7777            -1                      /NUMBER OF WORDS TO BE OUTPUT
 Ø614  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 Ø615  52Ø2            JMP     TRAN6+2         /LOOP ON CURRENT TEST
                       /
                       /DOES TRANSFER TO OUTPUT REGISTER CHANGE AC (WITH AC=Ø,DBCO)
                       /
 Ø616  3Ø3Ø    TRAN7,  DCA     TYPFLG          /CLEAR ERROR FLAG
 Ø617  3Ø31            DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96 (DECIMAL)
 Ø62Ø  6ØØ7            CAF                     /INITIALIZE INTERFACE
 Ø621  4437            DBCO                    /BIT CLEAR OUTPUT REGISTER
 Ø622  3Ø21            DCA     DATA1           /SAVE AC CONTENTS
 Ø623  1Ø21            TAD     DATA1           /GET AC CONTENTS
 Ø624  765Ø            SNA CLA                 /IS AC STILL Ø
 Ø625  5232            JMP     .+5             /DATA CORRECT, CONTINYE
 Ø626  4444            JMS I   XERROR          /NO, ERROR
 Ø627  3741            TRAN4E-1                /"DBCO CHANGED AC"
 Ø63Ø  3525            DH2-1                   /"AC CONTENTS"
 Ø631  7777            -1                      /NUMBER OF WORDS TO BE OUTPUT
 Ø632  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 Ø633  522Ø            JMP     TRAN7+2         /LOOP ON CURRENT TEST
                       /
                       /DOES TRANSFER TO INPUT REGISTER CHANGE AC (WITH AC=Ø, DBCI)
                       /
 Ø634  3Ø3Ø    TRAN8,  DCA     TYPFLG          /CLEAR ERROR FLAG
 Ø635  3Ø31            DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96 (DECIMAL)
 Ø636  6ØØ7            CAF                     /INITIALIZE INTERFACE
 Ø637  4435            DBCI                    /BIT CLEAR INPUT REGISTER
 Ø64Ø  3Ø21            DCA     DATA1           /SAVE AC CONTENTS
 Ø641  1Ø21            TAD     DATA1           /GET AC CONTENTS
 Ø642  765Ø            SNA CLA                 /IS AC STILL Ø
 Ø643  525Ø            JMP     .+5             /DATA CORRECT, CONTINUE
 Ø644  4444            JMS I   XERROR          /AC CHANGED, ERROR
 Ø645  3751            TRAN5E-1                /"DBCI CHANGED AC"
 Ø646  3525            DH2-1                   /"AC CONTENTS"
 Ø647  7777            -1                      /NUMBER OF WORDS TO BE OUTPUTED
 Ø65Ø  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 Ø651  5236            JMP     TRAN8+2         /LOOP ON CURRENT TEST
 Ø652  5777'           JMP     OUT1            /GO TO NEXT TEST
 Ø777  1ØØØ
       1ØØØ    PAGE

                       /
                       /CAN ALL BITS IN OUTPUT REGISTER BE SET (DBSO)
                       /DOES INITIALIZE CLEAR OUTPUT REGISTER
                       /
 1ØØØ  3Ø3Ø    OUT1,   DCA     TYPFLG          /CLEAR ERROR FLAG
 1ØØ1  3Ø31            DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
 1ØØ2  6ØØ7            CAF                     /INITIALIZE INTERFACE
 1ØØ3  734Ø            CLA CLL CMA             /SET AC =7777
 1ØØ4  444Ø            DBSO                    /BIT SET OUTPUT REGISTER
 1ØØ5  4441            DBRO                    /READ OUTPUT REGISTER
 1ØØ6  3Ø21            DCA     DATA1           /SAVE REGISTER DATA
```

```
  1ØØ7  1Ø21              TAD     DATA1           /GET REGISTER DATA
  1Ø1Ø  7Ø4Ø              CMA                     /COMPLIMENT DATA TO TEST FOR 7777
  1Ø11  765Ø              SNA CLA                 /IS REGISTER=7777
  1Ø12  5217              JMP     .+5             /DATA CORRECT, CONTINUE
  1Ø13  4444              JMS I   XERROR          /NO, ERROR
  1Ø14  3761              OUT1E-1                 /"DBSO ERROR"
  1Ø15  3515              DH1-1                   /"REGISTER DATA"
  1Ø16  7777              -1                      /NUMBER OF WORDS TO BE OUTPUT
  1Ø17  6ØØ7              CAF                     /INITIALIZE INTERFACE
  1Ø2Ø  4441              DBRO                    /READ OUTPUT REGISTER
  1Ø21  3Ø21              DCA     DATA1           /SAVE REGISTER DATA
  1Ø22  1Ø21              TAD     DATA1           /GET REGISTER DATA
  1Ø23  765Ø              SNA CLA                 /WAS REGISTER CLEARED
  1Ø24  5231              JMP     .+5             /DATA CORRECT, CONTINUE
  1Ø25  4444              JMS I   XERROR          /NO, ERROR
  1Ø26  3645              INIT1E-1                /"OUTPUT REG NOT CLEARED"
  1Ø27  3515              DH1-1                   /"REGISTER DATA"
  1Ø3Ø  7777              -1                      /NUMBER OF WORDS TO BE OUTPUT
  1Ø31  4445              JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
  1Ø32  52Ø2              JMP     OUT1+2          /LOOP ON CURRENT TEST
                          /
                          /CAN ALL BITS OF OUTPUT REGISTER BE CLEARED (DBCO)
                          /
  1Ø33  3Ø3Ø      OUT2,   DCA     TYPFLG          /CLEAR ERROR FLAG
  1Ø34  3Ø31              DCA     LPCNT           /SET ITERATION COUNT TO 4Ø96(DECIMAL)
  1Ø35  734Ø              CLA CLL CMA             /SET AC =7777
  1Ø36  444Ø              DBSO                    /BIT SET OUTPUT REGISTER
  1Ø37  4437              DBCO                    /BIT CLEAR OUTPUT REGISTER
  1Ø4Ø  73ØØ              CLA CLL
  1Ø41  4441              DBRO                    /READ OUTPUT REGISTER
  1Ø42  3Ø21              DCA     DATA1           /SAVE REGISTER DATA
  1Ø43  1Ø21              TAD     DATA1           /GET REGISTER DATA
  1Ø44  765Ø              SNA CLA                 /WAS OUTPUT REGISTER CLEARED
  1Ø45  5252              JMP     .+5             /DATA CORRECT, CONTINUE
  1Ø46  4444              JMS I   XERROR          /NO, ERROR
  1Ø47  3645              INIT1E-1                /"OUTPUT REGISTER NOT CLEARED"
  1Ø5Ø  3515              DH1-1                   /"REGISTER DATA"
  1Ø51  7777              -1                      /NUMBER OF WORDS TO BE OUTPUT
  1Ø52  4445              JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
  1Ø53  5235              JMP     OUT2+2          /LOOP ON CURRENT TEST

                          /
                          /CAN EACH BIT OF OUTPUT REGISTER BE SET
                          /INDEPENDENTLY (DBSO)
                          /
  1Ø54  3Ø3Ø      OUT3,   DCA     TYPFLG          /CLEAR ERROR FLAG
  1Ø55  1177              TAD     [-62            /SET ITERATION COUNT
  1Ø56  3Ø31              DCA     LPCNT           /TO 5Ø(DECIMAL)
  1Ø57  3Ø21              DCA     DATA1           /CLEAR TEST DATA
  1Ø6Ø  6ØØ7      OUT3A,  CAF                     /INITIALIZE INTERFACE
  1Ø61  1Ø21              TAD     DATA1           /GET TEST DATA
  1Ø62  444Ø              DBSO                    /BIT SET OUTPUT REGISTER
  1Ø63  73ØØ              CLA CLL
  1Ø64  4441              DBRO                    /READ OUTPUT REGISTER
  1Ø65  3Ø22              DCA     DATA2           /SAVE REGISTER DATA
```

```
 1Ø66  1Ø21           TAD     DATA1           /GET TEST DATA
 1Ø67  7Ø41           CIA
 1Ø7Ø  1Ø22           TAD     DATA2           /COMPARE TO REGISTER CONTENTS
 1Ø71  765Ø           SNA CLA                 /DO THEY COMPARE
 1Ø72  5277           JMP     .+5             /DATA CORRECT, CONTINUE
 1Ø73  4444           JMS I   XERROR          /NO, ERROR
 1Ø74  3761           OUT1E-1                 /"DBSO ERROR"
 1Ø75  356Ø           DH4-1                   /"EXPECTED RECEIVED"
 1Ø76  7776           -2                      /NUMBER OF WORDS TO BE OUTPUT
 1Ø77  4446           JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA,ESCAPE ON DATA ERROR
 11ØØ  526Ø           JMP     OUT3A           /LOOP WITH SAME DATA
 11Ø1  2Ø21           ISZ     DATA1           /INCREMENT DATA PATTERN
 11Ø2  526Ø           JMP     OUT3A           /CONTINUE TEST
 11Ø3  4445           JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 11Ø4  5257           JMP     OUT3+3          /LOOP ON CURRENT TEST
                      /
                      /CAN EACH BIT OF OUTPUT REGISTER BE CLEARED
                      /INDEPENDENTLY (DBCO)
                      /
 11Ø5  3Ø3Ø     OUT4, DCA     TYPFLG          /CLEAR ERROR FLAG
 11Ø6  1177           TAD     [-62            /SET ITERATION COUNT
 11Ø7  3Ø31           DCA     LPCNT           /TO 5Ø(DECIMAL)
 111Ø  3Ø21           DCA     DATA1           /CLEAR TEST DATA
 1111  6ØØ7     OUT4A, CAF                    /INITIALIZE INTERFACE
 1112  1Ø21           TAD     DATA1           /GET MASK
 1113  7Ø4Ø           CMA                     /COMPLIMENT TO GET EXPECTED RESULT
 1114  3Ø22           DCA     DATA2           /SAVE EXPECTED RESULT
 1115  7Ø4Ø           CMA                     /SET OUTPUT REGISTER TO 7777
 1116  444Ø           DBSO                    /BIT SET OUTPUT REGISTER
 1117  73ØØ           CLA CLL
 112Ø  1Ø21           TAD     DATA1           /GET PATTERN TO CLEAR OUTPUT REGISTER
 1121  4437           DBCO                    /BIT CLEAR OUTPUT REGISTER
 1122  4441           DBRO                    /READ OUTPUT REGISTER
 1123  3Ø23           DCA     DATA3           /SAVE REGISTER DATA
 1124  1Ø22           TAD     DATA2           /GET EXPECTED RESULT
 1125  7Ø41           CIA
 1126  1Ø23           TAD     DATA3           /COMPARE TO RECEIVED DATA
 1127  765Ø           SNA CLA                 /WERE CORRECT BITS IN OUTPUT REGISTER CLEARED
 113Ø  5335           JMP     .+5             /DATA CORRECT, CONTINUE
 1131  4444           JMS I   XERROR          /NO, ERROR
 1132  3767           OUT4E-1                 /"DBCO ERROR"
 1133  3534           DH3-1                   /MASK EXPECTED RECEIVED
 1134  7775           -3                      /NUMBER OF WORDS TO BE OUTPUT
 1135  4446           JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA,ESCAPE ON DATA ERROR
 1136  5311           JMP     OUT4A           /LOOP WITH SAME DATA
 1137  2Ø21           ISZ     DATA1           /INCREMENT DATA PATTERN
 114Ø  5311           JMP     OUT4A           /CONTINUE TEST
 1141  4445           JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 1142  531Ø           JMP     OUT4+3          /LOOP ON CURRENT TEST
 1143  5777'          JMP     OUT5
 1177  12ØØ
       12ØØ     PAGE
                      /
                      /WITH OUTPUT REGISTER CLEARED, DOES CLEARING
                      /OUTPUT REGISTER CHANGE ANY BIT IN OUTPUT
```

```
                                /
 12ØØ  3Ø3Ø     OUT5,   DCA     TYPFLG          /CLEAR ERROR FLAG
 12Ø1  1177             TAD     [-62            /SET ITERATION COUNT
 12Ø2  3Ø31             DCA     LPCNT           /TO 5Ø (DECIMAL)
 12Ø3  3Ø21             DCA     DATA1           /CLEAR TEST DATA
 12Ø4  3Ø22             DCA     DATA2           /CLEAR EXPECTED RESULT
 12Ø5  6ØØ7     OUT5A,  CAF                     /INITIALIZE INTERFACE
 12Ø6  1Ø21             TAD     DATA1           /GET TEST DATA
 12Ø7  4437             DBCO                    /BIT CLEAR OUTPUT REGISTER
 121Ø  73ØØ             CLA CLL
 1211  4441             DBRO                    /READ OUTPUT REGISTER
 1212  3Ø23             DCA     DATA3           /SAVE REGISTER DATA
 1213  1Ø23             TAD     DATA3           /GET REGISTER DATA
 1214  765Ø             SNA CLA                 /IS OUTPUT REGISTER Ø
 1215  5222             JMP     .+5             /DATA CORRECT, CONTINUE
 1216  4444             JMS I   XERROR          /NO, ERROR
 1217  3767             OUT4E-1                 /"DBCO ERROR"
 122Ø  3534             DH3-1                   /"MASK EXPECTED RECEIVED"
 1221  7775             -3                      /NUMBER OF DATA WORDS
 1222  4446             JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA
 1223  52Ø5             JMP     OUT5A           /LOOP WITH SAME DATA
 1224  2Ø21             ISZ     DATA1           /INCREMENT DATA PATTERN
 1225  52Ø5             JMP     OUT5A           /CONTINUE
 1226  4445             JMS I   XLOOP1          /CHECH FOR LOOP ON CURRENT TEST
 1227  52Ø3             JMP     OUT5+3          /LOOP ON CURRENT TEST

                                /
                                /DOES SETTING OUTPUT REGISTER TWICE WITH SAME
                                /DATA CHANGE OUTPUT REGISTER
                                /
 123Ø  3Ø3Ø     OUT6,   DCA     TYPFLG          /CLEAR ERROR FLAG
 1231  1177             TAD     [-62            /SET ITERATION COUNT
 1232  3Ø31             DCA     LPCNT           /TO 5Ø (DECIMAL)
 1233  3Ø21             DCA     DATA1           /CLEAR TEST DATA
 1234  6ØØ7     OUT6A,  CAF                     /INITIALIZE INTERFACE
 1235  1Ø21             TAD     DATA1           /GET TEST DATA
 1236  444Ø             DBSO                    /BIT SET OUTPUT REGISTER
 1237  444Ø             DBSO                    /BIT SET OUTPUT REGISTER
 124Ø  73ØØ             CLA CLL
 1241  4441             DBRO                    /READ OUTPUT REGISTER
 1242  3Ø22             DCA     DATA2           /SAVE REGISTER DATA
 1243  1Ø21             TAD     DATA1           /GET TEST DATA
 1244  7Ø41             CIA
 1245  1Ø22             TAD     DATA2           /COMPARE TO REGISTER DATA
 1246  765Ø             SNA CLA                 /AARE THEY THE SAME
 1247  5254             JMP     .+5             /DATA CORRECT, CONTINE
 125Ø  4444             JMS I   XERROR          /NO, ERROR
 1251  3767             OUT4E-1                 /"DBSO ERROR"
 1252  356Ø             DH4-1                   /"EXPECTED RECEIVED"
 1253  7776             -2                      /NUMBER OF DATA WORDS
 1254  4446             JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA
 1255  5234             JMP     OUT6A           /LOOP WITH SAME DATA
 1256  2Ø21             ISZ     DATA1           /INCREMENT DATA PATTERN
 1257  5234             JMP     OUT6A           /CONTINUE
 126Ø  4445             JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
```

```
1261  5233              JMP     OUT6+3          /LOOP ON CURRENT TEST

                        /
                        /DOES READING OUTPUT REGISTER TWICE CHANGE
                        /OUTPUT REGISTER
                        /
1262  3Ø3Ø      OUT7,   DCA     TYPFLG          /CLEAR ERROR FLAG
1263  1177              TAD     [-62            /SET ITERATION COUNT
1264  3Ø31              DCA     LPCNT           /TO 5Ø (DECIMAL)
1265  3Ø21              DCA     DATA1           /CLEAR TEET DATA
1266  6ØØ7      OUT7A,  CAF                     /INITIALIZE INTERFACE
1267  1Ø21              TAD     DATA1           /GET TEST DATA
127Ø  444Ø              DBSO                    /BIT SET OUTPUT REGISTER
1271  73ØØ              CLA CLL
1272  4441              DBRO                    /READ OUTPUT REGISTER
1273  73ØØ              CLA CLL
1274  4441              DBRO                    /READ OUTPUT REGISTER
1275  3Ø22              DCA     DATA2           /SAVE REGISTER DATA
1276  1Ø21              TAD     DATA1           /GET TEST DATA
1277  7Ø41              CIA
13ØØ  1Ø22              TAD     DATA2           /COMPARE TO REGISTER DATA
13Ø1  765Ø              SNA CLA                 /ARE THEY THE SAME
13Ø2  53Ø7              JMP     .+5             /DATA CORRECT, CONTINUE
13Ø3  4444              JMS I   XERROR          /NO, ERROR
13Ø4  3775              OUT7E-1                 /"DBRO ERROR"
13Ø5  356Ø              DH4-1                   /"EXPECTED RECEIVED"
13Ø6  7776              -2                      /NUMBER OF DATA WORDS
13Ø7  4446              JMS I   XLOOP2          /TEST FOR LOOP WITH SAME DATA
131Ø  5266              JMP     OUT7A           /LOOP WITH SAME DATA
1311  2Ø21              ISZ     DATA1           /INCREMENT DATA PATTERN
1312  5266              JMP     OUT7A           /CONTINUE
1313  4445              JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
1314  5265              JMP     OUT7+3          /LOOP ON CURRENT TEST

                        /
                        /DOES CLEARING OUTPUT REGISTER TWICE
                        /CHANGE ANY BIT IN OUTPUT REGISTER
                        /
1315  3Ø3Ø      OUT8,   DCA     TYPFLG          /CLEAR ERROR FLAG
1316  1177              TAD     [-62            /SET ITERATION COUNT
1317  3Ø31              DCA     LPCNT           /TO 5Ø (DECIMAL)
132Ø  3Ø21              DCA     DATA1           /CLEAR TEST DATA
1321  3Ø22              DCA     DATA2           /CLEAR EXPECTED RESULT
1322  6ØØ7      OUT8A,  CAF                     /INITIALIZE INTERFACE
1323  1Ø21              TAD     DATA1           /GET TEST DATA
1324  444Ø              DBSO                    /BIT SET OUTPUT RETISTER
1325  4437              DBCO                    /BIT CLEAR OUTPUT REGISTER
1326  4437              DBCO                    /BIT CLEAR OUTPUT REGISTER
1327  73ØØ              CLA CLL
133Ø  4441              DBRO                    /READ OUTPUT REGISTER
1331  3Ø23              DCA     DATA3           /SAVE REGISTER DATA
1332  1Ø23              TAD     DATA3           /GET REGISTER DATA
1333  765Ø              SNA CLA                 /IS REGISTER Ø
1334  5341              JMP     .+5             /DATA CORRECT, CONTINUE
1335  4444              JMS I   XERROR          /NO, ERROR
```

```
 1336  3767            OUT4E-1                /"DBCO ERROR"
 1337  3534            DH3-1                  /"MASK EXPECTED RECEIVED"
 134Ø  7775            -3                     /NUMBER OF DATA WORDS
 1341  4446            JMS I   XLOOP2         /TEST FOR LOOP WITH SAME DATA
 1342  5322            JMP     OUT8A          /LOOP WITH SAME DATA
 1343  2Ø21            ISZ     DATA1          /INCREMENT DATA PATTERN
 1344  5322            JMP     OUT8A          /CONTINUE
 1345  4445            JMS I   XLOOP1         /CHECK FOR LOOP ON CURRENT TEST
 1346  532Ø            JMP     OUT8+3         /LOOP ON CURRENT TEST
 1347  5777'           JMP     IN1
 1377  14ØØ
       14ØØ    PAGE

                       /
                       /CAN ALL BITS IN INPUT REGISTER BE SET
                       /DOES INITIALIZE CLEAR INPUT REGISTER
                       /
 14ØØ  3Ø3Ø    IN1,    DCA     TYPFLG         /CLEAR ERROR FLAG
 14Ø1  3Ø31            DCA     LPCNT          /SET ITERATION COUNT TO 4Ø96(DECIMAL)
 14Ø2  6ØØ7            CAF                    /INITIALIZE INTERFACE
 14Ø3  734Ø    IN1A,   CLA CLL CMA            /SET AC =7777
 14Ø4  444Ø            DBSO                   /BIT SET OUTPUT REGISTER
 14Ø5  73ØØ            CLA CLL
 14Ø6  4436            DBRI                   /READ INPUT REGISTER
 14Ø7  3Ø21            DCA     DATA1          /SAVE REGISTER DATA
 141Ø  1Ø21            TAD     DATA1          /GET REGISTER DATA
 1411  7Ø4Ø            CMA              /COMPLIMENT TO TEST FOR 7777
 1412  765Ø            SNA CLA                /WAS INPUT REGISTER SET TO 7777
 1413  522Ø            JMP     .+5            /DATA CORRECT, CONTINUE
 1414  4444            JMS I   XERROR         /NO, ERROR
 1415  4Ø11            IN3E-1                 /"INPUT REGISTER NOT CORRECT"
 1416  3515            DH1-1                  /"REGISTER DATA"
 1417  7777            -1                     /NUMBER OF WORDS TO BE OUTPUT
 142Ø  6ØØ7    IN1B,   CAF                    /INITIALIZE INTERFACE
 1421  4436            DBRI                   /READ INPUT REGISTER
 1422  3Ø21            DCA     DATA1          /SAVE REGISTER DATA
 1423  1Ø21            TAD     DATA1
 1424  765Ø            SNA CLA
 1425  5232            JMP     .+5            /DATA CORRECT, CONTINUE
 1426  4444            JMS I   XERROR         /NO, ERROR
 1427  3661            INIT2E-1               /"INPUT REGISTER NOT CLEARED"
 143Ø  3515            DH1-1                  /"REGISTER DATA"
 1431  7777            -1                     /NUMBER OF WORDS TO BE OUTPUT
 1432  4445            JMS I   XLOOP1         /CHECK FOR LOOP ON CURRENT TEST
 1433  52Ø3            JMP     IN1A           /LOOP ON CURRENT TEST

                       /
                       /CAN ALL BITS IN INPUT REGISTER BE CLEARED (DBCI)
                       /
 1434  3Ø3Ø    IN2,    DCA     TYPFLG         /CLEAR ERROR FLAG
 1435  3Ø31            DCA     LPCNT          /SET ITERATION COUNT TO 4Ø96(DECIMAL)
 1436  6ØØ7            CAF                    /INITIALIZE INTERFACE
 1437  734Ø            CLA CLL CMA            /SET AC =7777
 144Ø  ØØ27            AND     FJUMPER        /MASK TO TEST ONLY FLIPFLOP BITS
 1441  3Ø21            DCA     DATA1          /SAVE MASK
```

```
1442  3022            DCA     DATA2           /SAVE EXPECTED RESULT
1443  1021            TAD     DATA1           /GET MASK
1444  4440            DBSO                    /BIT SET OUTPUT REGISTER
1445  4435            DBCI                    /BIT CLEAR INPUT REGISTER
1446  7300            CLA CLL
1447  4436            DBRI                    /READ INPUT REGISTER
1450  3023            DCA     DATA3           /SAVE REGISTER DATA
1451  1023            TAD     DATA3           /COMPARE TO REGISTER DATA
1452  7650            SNA CLA                 /WERE CORRECT BITS CLEARED
1453  5260            JMP     .+5             /DATA CORRECT, CONTINUE
1454  4444            JMS I   XERROR          /NO, ERROR
1455  4003            IN2E-1                  /"DBCI ERROR"
1456  3534            DH3-1                   /"MASK EXPECTED RECEIVED"
1457  7775            -3                      /NUMBER OF WORDS TO BE OUTPUT
1460  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
1461  5236            JMP     IN2+2           /LOOP ON CURRENT TEST

                      /
                      /CAN EACH BIT OF INPUT REGISTER BE SET INDEPENDENTLY
                      /
1462  3030    IN3,    DCA     TYPFLG          /CLEAR ERROR FLAG
1463  1177            TAD     [-62            /SET ITERATION COUNT
1464  3031            DCA     LPCNT           /TO 50(DECIMAL)
1465  3021            DCA     DATA1           /CLEAR TEST DATA
1466  6007    IN3A,   CAF                     /INITIALIZE INTERFACE
1467  1021            TAD     DATA1           /GET TEST DATA
1470  4440            DBSO                    /BIT SET OUTPUT REGISTER
1471  7300            CLA CLL
1472  4436            DBRI                    /READ INPUT REGISTER
1473  3022            DCA     DATA2           /SAVE REGISTER DATA
1474  1021            TAD     DATA1           /GET TEST DATA
1475  7041            CIA
1476  1022            TAD     DATA2           /COMPARE TO RECEIVED DATA
1477  7650            SNA CLA                 /ARE THEY THE SAME
1500  5305            JMP     .+5             /DATA CORRECT, CONTINUE
1501  4444            JMS I   XERROR          /NO, ERROR
1502  4011            IN3E-1                  /"INPUT REGISTER DATA ERROR"
1503  3560            DH4-1                   /"EXPECTED RECEIVED"
1504  7776            -2                      /NUMBER OF WORDS TO BE OUTPUT
1505  4446            JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA,ESCAPE ON DATA ERROR
1506  5266            JMP     IN3A            /LOOP WITH SAME DATA
1507  2021            ISZ     DATA1           /INCREMENT DATA PATTERN
1510  5266            JMP     IN3A            /CONTINUE TEST
1511  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
1512  5265            JMP     IN3+3           /LOOP ON CURRENT TEST
1513  5777'           JMP     IN5
1577  1600
      1600    PAGE

                      /
                      /VERIFY THAT ALL LATCHING INPUT LINES HOLD DATA
                      /

1600  3030    IN5,    DCA     TYPFLG          /CLEAR ERROR FLAG
1601  1177            TAD     [-62            /SET ITERATION COUNT
```

```
1602  3031            DCA     LPCNT           /TO 50(DECIMAL)
1603  3023            DCA     DATA3           /CLEAR TEST DATA
1604  6007    IN5A,   CAF                     /INITIALIZE INTERFACE
1605  1023            TAD     DATA3           /GET TEST DATA
1606  0027            AND     FJUMPER         /MASK OFF NON LATCHING BITS
1607  3021            DCA     DATA1           /SAVE AS EXPECTED RESULT
1610  1021            TAD     DATA1           /GET TEST DATA
1611  7450            SNA                     /ARE ANY BITS TO BE TESTED
1612  5233            JMP     IN5C            /NO, GET NEXT DATA WORD
1613  4440            DBSO                    /BIT SET OUTPUT REGISTER
1614  4437            DBCO                    /BIT CLEAR OUTPUT REGISTER
1615  7300            CLA CLL
1616  4436            DBRI                    /READ INPUT REGISTER
1617  3022            DCA     DATA2           /SAVE REGISTER DATA
1620  1021            TAD     DATA1           /GET EXPECTED RESULT
1621  7041            CIA
1622  1022            TAD     DATA2           /COMPARE TO RECEIVED DATA
1623  7650            SNA CLA                 /ARE THEY THE SAME
1624  5231            JMP     .+5             /DATA CORRECT, CONTINUE
1625  4444            JMS I   XERROR          /NO, ERROR
1626  4026            IN4E-1                  /"LATCH ERROR"
1627  3560            DH4-1                   /"EXPECTED RECEIVED"
1630  7776            -2                      /NUMBER OF WORDS TO BE OUTPUT
1631  4446            JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA,ESCAPE ON DATA ERROR
1632  5204            JMP     IN5A            /LOOP WITH SAME DATA
1633  2023    IN5C,   ISZ     DATA3           /INCREMENT DATA PATTERN
1634  5204            JMP     IN5A            /CONTINUE TEST
1635  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
1636  5203            JMP     IN5+3           /LOOP ON CURRENT TEST
                      /

                      /VERIFY ALL NON LATCHING DATA BITS DO NOT HOLD DATA
                      /
1637  3030    IN6,    DCA     TYPFLG          /CLEAR ERROR FLAG
1640  1177            TAD     [-62            /SET ITERATION COUNT
1641  3031            DCA     LPCNT           /TO 50(DECIMAL)
1642  3024            DCA     DATA4           /CLEAR TEST DATA
1643  3022            DCA     DATA2           /CLEAR EXPECTED RESULT
1644  6007    IN6A,   CAF                     /INITIALIZE INTERFACE
1645  1027            TAD     FJUMPER         /GET MASK FOR NON LATCHING BITS
1646  7040            CMA                     /CHANGE TO MASK OFF LATCHING BITS
1647  0024            AND     DATA4
1650  3021            DCA     DATA1           /SAVE FOR TRANSMISSION
1651  1021            TAD     DATA1           /GET TEST DATA
1652  7450            SNA                     /ARE ANY BITS TO BE TESTED
1653  5272            JMP     IN6C            /NO GET NEXT DATA WORD
1654  4440            DBSO                    /BIT SET OUTPUT REGISTER
1655  4437            DBCO                    /BIT CLEAR OUTPUT REGISTER
1656  7300            CLA CLL
1657  4436            DBRI                    /READ INPUT REGISTER
1660  3023            DCA     DATA3           /SAVE REGISTER DATA
1661  1023            TAD     DATA3           /GET RECEIVED DATA
1662  7650            SNA CLA         /DID ANY BITS HOLD DATA
1663  5270            JMP     .+5             /DATA CORRECT, CONTINUE
1664  4444            JMS I   XERROR          /YES, ERROR
```

```
1665  4Ø26             IN4E-1                  /"LATCH ERROR"
1666  3534             DH3-1                   /"MASK EXPECTED RECEIVED"
1667  7775             -3                      /NUMBER OF WORDS TO BE OUTPUT
167Ø  4446             JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA,ESCAPE ON DATA ERROR
1671  5244             JMP     IN6A            /LOOP WITH SAME DATA
1672  2Ø24     IN6C,   ISZ     DATA4           /INCREMENT DATA PATTERN
1673  5244             JMP     IN6A            /CONTINUE TEST
1674  4445             JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
1675  5242             JMP     IN6+3           /LOOP ON CURRENT TEST


                       /
                       /VERIFY THAT ALL LATCHING LINES CAN BE CLEARED INDEPENDENTLY
                       /
1676  3Ø3Ø     IN7,    DCA     TYPFLG          /CLEAR ERROR FLAG
1677  1177             TAD     [-62            /SET ITERATION COUNT
17ØØ  3Ø31             DCA     LPCNT           /TO 5Ø(DECIMAL)
17Ø1  3Ø24             DCA     DATA4           /CLEAR TEST
17Ø2  6ØØ7     IN7A,   CAF                     /INITIALIZE INTERFACE
17Ø3  1Ø27             TAD     FJUMPER         /GET MASK FOR LATCHING BITS
17Ø4  ØØ24             AND     DATA4           /MASK OFF NON LATCHING BITS
17Ø5  3Ø21             DCA     DATA1           /SAVE FOR TRANSMISSION
17Ø6  3Ø22             DCA     DATA2           /EXPECTED RESULT
17Ø7  1Ø21             TAD     DATA1           /SET OUTPUT REGISTER=7777
171Ø  444Ø             DBSO                    /BIT SET OUTPUT REGISTER
1711  4437             DBCO                    /BIT CLEAR OUTPUT REGISTER
1712  73ØØ             CLA CLL
1713  1Ø21             TAD     DATA1           /GET TEST DATA
1714  4435             DBCI                    /BIT CLEAR INPUT REGISTER
1715  73ØØ             CLA CLL
1716  4436             DBRI                    /READ INPUT REGISTER
1717  3Ø23             DCA     DATA3           /SAVE REGISTER DATA
172Ø  1Ø23             TAD     DATA3           /COMPARE TO RECEIVED DATA
1721  765Ø             SNA CLA                 /ARE THEY THE SAME
1722  5327             JMP     .+5             /DATA CORRECT, CONTINUE
1723  4444             JMS I   XERROR          /NO, ERROR
1724  4Ø26             IN4E-1                  /"LATCH ERROR"
1725  3534             DH3-1                   /"MASK EXPECTED RECEIVED"
1726  7775             -3                      /NUMBER OF WORDS TO BE OUTPUT
1727  4446             JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA,ESCAPE ON DATA ERROR
173Ø  53Ø2             JMP     IN7A            /LOOP WITH SAME DATA
1731  2Ø24     IN7C,   ISZ     DATA4           /INCREMENT DATA PATTERN
1732  53Ø2             JMP     IN7A            /CONTINUE TEST
1733  4445             JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
1734  53Ø1             JMP     IN7+3           /LOOP ON CURRENT TEST
1735  5777'            JMP     IN8             /GO TO NEXT TEST
1777  2ØØØ
      2ØØØ     PAGE

                       /
                       /WITH THE INPUT REGISTER CLEARED, DOES CLEARING
                       /THE INPUT REGISTER SET ANY BIT IN INPUT
                       /
2ØØØ  3Ø3Ø     IN8,    DCA     TYPFLG          /CLEAR ERROR FLAG
2ØØ1  1177             TAD     [-62            /SET ITERATION COUNT
```

```
 2ØØ2  3Ø31                 DCA     LPCNT           /TO 5Ø (DECIMAL)
 2ØØ3  3Ø21                 DCA     DATA1           /CLEAR TEST DATA
 2ØØ4  3Ø22                 DCA     DATA2           /CLEAR EXPECTED RESULT
 2ØØ5  6ØØ7         IN8A,   CAF                     /INITIALIZE INTERFACE
 2ØØ6  1Ø21                 TAD     DATA1           /GET    TEST DATA
 2ØØ7  4435                 DBCI                    /BIT CLEAR INPUT REGISTER
 2Ø1Ø  73ØØ                 CLA CLL
 2Ø11  4436                 DBRI                    /READ INPUT REGISTER
 2Ø12  3Ø23                 DCA     DATA3           /SAVE REGISTER DATA
 2Ø13  1Ø23                 TAD     DATA3           /GET REGISTER DATA
 2Ø14  765Ø                 SNA CLA                 /IS INPUT REGISTER Ø
 2Ø15  5222                 JMP     .+5             /DATA CORRECT, CONTINUE
 2Ø16  4444                 JMS I   XERROR          /NO, ERROR
 2Ø17  4ØØ3                 IN2E-1                  /"DBCI ERROR"
 2Ø2Ø  3534                 DH3-1                   /"MASK EXPECTED RECEIVED"
 2Ø21  7775                 -3                      /NUMBER OF DATA WORDS
 2Ø22  4446                 JMS I   XLOOP2          /TEST FOR LOOP WITH SAME DATA
 2Ø23  52Ø5                 JMP     IN8A            /LOOP WITH SAME DATA
 2Ø24  2Ø21                 ISZ     DATA1           /INCREMENT DATA PATTERN
 2Ø25  52Ø5                 JMP     IN8A            /CONTINUE
 2Ø26  4445                 JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 2Ø27  52Ø3                 JMP     IN8+3           /LOOP ON CURRENT TEST

                            /
                            /DOES READING THE INPUT REGISTER TWICE
                            /CHANGE THE INPUT REGISTER
                            /
 2Ø3Ø  3Ø3Ø         IN9,    DCA     TYPFLG          /CLEAR ERROR FLAG
 2Ø31  1177                 TAD     [-62            /SET ITERATION COUNT
 2Ø32  3Ø31                 DCA     LPCNT           /TO 5Ø (DECIMAL)
 2Ø33  3Ø21                 DCA     DATA1           /CLEAR TEST DATA
 2Ø34  6ØØ7         IN9A,   CAF                     /INITIALIZE INTERFACE
 2Ø35  1Ø21                 TAD     DATA1           /GET TEST DATA
 2Ø36  444Ø                 DBSO                    /BIT SET OUTPUT REGISTER
 2Ø37  73ØØ                 CLA CLL
 2Ø4Ø  4436                 DBRI                    /READ INPUT REGISTER
 2Ø41  73ØØ                 CLA CLL
 2Ø42  4436                 DBRI                    /READ INPUT REGISTER
 2Ø43  3Ø22                 DCA     DATA2           /SAVE REGISTER DATA
 2Ø44  1Ø21                 TAD     DATA1           /GET TEST DATA
 2Ø45  7Ø41                 CIA
 2Ø46  1Ø22                 TAD     DATA2           /COMPARE TO REGISTER DATA
 2Ø47  765Ø                 SNA CLA                 /ARE THEY THE SAME
 2Ø5Ø  5255                 JMP     .+5             /DATA CORRECT, CONTINUE
 2Ø51  4444                 JMS I   XERROR          /NO, ERROR
 2Ø52  4Ø34                 IN9E-1                  /"DBRI ERROR"
 2Ø53  356Ø                 DH4-1                   /"EXPECTED RECEIVED"
 2Ø54  7776                 -2                      /NUMBER OF DAT WORDS
 2Ø55  4446                 JMS I   XLOOP2          /TEST FOR LOOP WITH SAME DATA
 2Ø56  5234                 JMP     IN9A            /LOOP WITH SAME DATA
 2Ø57  2Ø21                 ISZ     DATA1           /INCREMENT DATA PATTERN
 2Ø6Ø  5234                 JMP     IN9A            /CONTINUE
 2Ø61  4445                 JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
 2Ø62  5233                 JMP     IN9+3           /LOOP ON CURRENT TEST
```

```
                                /
                                /DOES CLEARING INPUT REGISTER TWICE SET ANY BIT
                                /IN INPUT REGISTER
                                /
2Ø63    3Ø3Ø    IN1Ø,   DCA     TYPFLG          /CLEAR ERROR FLAG
2Ø64    1177            TAD     [-62            /SET ITERATION COUNT
2Ø65    3Ø31            DCA     LPCNT           /TO 5Ø (DECIMAL)
2Ø66    3Ø22            DCA     DATA2           /CLEAR EXPECTED RESULT
2Ø67    3Ø21            DCA     DATA1           /CLEAR TEST DATA
2Ø7Ø    6ØØ7    IN1ØA,  CAF                     /INITIALIZE INTERFACE
2Ø71    1Ø21            TAD     DATA1           /GET TEST DATA
2Ø72    444Ø            DBSO                    /BIT SET OUTPUT REGISTER
2Ø73    4437            DBCO                    /BIT CLEAR OUTPUT REGISTER
2Ø74    4435            DBCI                    /BIT CLEAR INPUT REGISTER
2Ø75    4435            DBCI                    /BIT CLEAR INPUT REGISTER
2Ø76    73ØØ            CLA CLL
2Ø77    4436            DBRI                    /READ INPUT REGISTER
21ØØ    3Ø23            DCA     DATA3           /SAVE REGISTER DATA
21Ø1    1Ø23            TAD     DATA3           /GET REGISTER DATA
21Ø2    765Ø            SNA CLA                 /IS INPUT REGISTER Ø
21Ø3    531Ø            JMP     .+5             /DATA CORRECT, CONTINUE
21Ø4    4444            JMS I   XERROR          /NO, ERROR
21Ø5    4ØØ3            IN2E-1                  /"DBCI ERROR"
21Ø6    3534            DH3-1                   /"MASK EXPECTED RECEIVED"
21Ø7    7775            -3                      /NUMBER OF DATA WORDS
211Ø    4446            JMS I   XLOOP2          /TEST FOR LOOP WITH SAME DATA
2111    527Ø            JMP     IN1ØA           /LOOP WITH SAME DATA
2112    2Ø21            ISZ     DATA1           /INCREMENT DATA PATTERN
2113    527Ø            JMP     IN1ØA           /CONTINUE
2114    4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
2115    5266            JMP     IN1Ø+3          /LOOP ON CURRENT TEST
2116    5777'           JMP     INOU1           /GO TO NEXT TEST
2177    22ØØ
        22ØØ    PAGE

                                /
                                /WITH BOTH INPUT AND OUTPUT REGISTERS CLEARED
                                /DOES CLEARING OUTPUT SET
                                /ANY BIT IN INPUT
                                /
22ØØ    3Ø3Ø    INOU1,  DCA     TYPFLG          /CLEAR ERROR FLAG
22Ø1    1177            TAD     [-62            /SET ITERATION COUNT
22Ø2    3Ø31            DCA     LPCNT           /TO 5Ø (DECIMAL)
22Ø3    3Ø21            DCA     DATA1           /CLEAR TEST DATA
22Ø4    3Ø22            DCA     DATA2           /CLEAR EXPECTED RESULT
22Ø5    6ØØ7    INOU1A, CAF                     /INITIALIZE INTERFACE
22Ø6    1Ø21            TAD     DATA1           /GET TEST DATA
22Ø7    4437            DBCO                    /BIT CLEAR OUTPUT REGISTER
221Ø    73ØØ            CLA CLL
2211    4436            DBRI                    /READ INPUT REGISTER
2212    3Ø23            DCA     DATA3           /SAVE REGISTER DATA
2213    1Ø23            TAD     DATA3           /GET REGISTER DATA
2214    765Ø            SNA CLA                 /IS OUTPUT REGISTER Ø
2215    5222            JMP     .+5             /DATA CORRECT, CONTINUE
2216    4444            JMS I   XERROR          /NO, ERROR
```

```
2217  3767              OUT4E-1                 /"DBCO ERROR"
2220  3534              DH3-1                   /"MASK EXPECTED RECEIVED"
2221  7775              -3                      /NUMBER OF DATA WORDS
2222  4446              JMS I   XLOOP2          /TEST FOR LOOP WITH SAME DATA
2223  5205              JMP     INOU1A          /LOOP WITH SAME DATA
2224  2021              ISZ     DATA1           /INCREMENT DATA PATTERN
2225  5205              JMP     INOU1A          /CONTINUE
2226  4445              JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
2227  5203              JMP     INOU1+3         /LOOP ON CURRENT TEST

                        /
                        /WITH BOTH INPUT AND OUTPUT REGISTERS CLEARED
                        /DOES CLEARING INPUT SET ANY BIT IN OUTPUT
                        /
2230  3030      INOU2,  DCA     TYPFLG          /CLEAR ERROR FLAG
2231  1177              TAD     [-62            /SET ITERATION COUNT
2232  3031              DCA     LPCNT           /TO 50 (DECIMAL)
2233  3021              DCA     DATA1           /CLEAR TEST DATA
2234  3022              DCA     DATA2           /CLEAR EXPECTED RESULT
2235  6007      INOU2A, CAF                     /INITIALIZE INTERFACE
2236  1021              TAD     DATA1           /GET TEST DATA
2237  4435              DBCI                    /BIT CLEAR INPUT REGISTER
2240  7300              CLA CLL
2241  4441              DBRO                    /READ OUTPUT REGISTER
2242  3023              DCA     DATA3           /SAVE REGISTER DATA
2243  1023              TAD     DATA3           /GET REGISTER DATA
2244  7650              SNA CLA                 /IS OUTPUT REGISTER 0
2245  5252              JMP     .+5             /DATA CORRECT, CONTINUE
2246  4444              JMS I   XERROR          /NO, ERROR
2247  4003              IN2E-1                  /"DBCI ERROR"
2250  3534              DH3-1                   /"MASK EXPECTED RECEIVED"
2251  7775              -3                      /NUMBER OF DATAA WORDS
2252  4446              JMS I   XLOOP2          /TEST FOR LOOP WITH CURRENT DATA
2253  5235              JMP     INOU2A          /LOOP WITH SAME DATA
2254  2021              ISZ     DATA1           /INCREMENT DATA PATTERN
2255  5235              JMP     INOU2A          /CONTINUE
2256  4445              JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
2257  5233              JMP     INOU2+3         /LOOP ON CURRENT TEST
                        /
                        /WITH THE OUTPUT REGISTER SET TO ALL 1S, AND
                        /THE INPUT REGISTER CLEARED, DOES SELECTIVELY
                        /CLEARING THE OUTPUT REGISTER SET ANY BIT IN
                        /THE INPUT REGISTER
                        /
2260  3030      INOU3,  DCA     TYPFLG          /CLEAR ERROR FLAG
2261  1177              TAD     [-62            /SET ITERATION COUNT
2262  3031              DCA     LPCNT           /TO 50 (DECIMAL)
2263  3021              DCA     DATA1           /CLEAR TEST DATA
2264  3022              DCA     DATA2           /CLEAR EXPECTED RESULT
2265  6007      INOU3A, CAF                     /INITIALIZE INTERFACE
2266  7040              CMA                     /SET AC=7777
2267  4440              DBSO                    /BIT SET OUTPUT REGISTER
2270  4435              DBCI                    /BIT CLEAR INPUT REGISTER
2271  7300              CLA CLL
2272  1027              TAD     FJUMPER         /GET FLIPFLOP JUMPER MASK
```

```
2273  7040          CMA
2274  3022          DCA     DATA2
2275  1021          TAD     DATA1           /GET TEST DATA2
2276  7040          CMA                     /COMPLEMENT
2277  0022          AND     DATA2           /AND WITN COMPLEMENT OF JUMPER MASK
2300  3022          DCA     DATA2           /TO GET EXPECTED RESULT
2301  1021          TAD     DATA1           /GET TEST DATA
2302  4437          DBCO                    /BIT CLEAR OUTPUT REGISTER
2303  7300          CLA CLL
2304  4436          DBRI                    /READ INPUT REGISTER
2305  3023          DCA     DATA3           /SAVE REGISTER DATA
2306  1023          TAD     DATA3           /GET REGISTER DATA
2307  7041          CIA
2310  1022          TAD     DATA2           /COMPARE TO EXPECTED RESULT
2311  7650          SNA CLA                 /ARE THEY THE SAME
2312  5317          JMP     .+5             /DATA CORRECT, CONTINUE
2313  4444          JMS I   XERROR          /NO, ERROR
2314  3767          OUT4E-1                 /"DBCO ERROR"
2315  3534          DH3-1                   /"MASK EXPECTED RECEIVED
2316  7775          -3                      /NUMBER OF DATA WORDS
2317  4446          JMS I   XLOOP2          /TEST FOR LOOP WITH SAME DATA
2320  5265          JMP     INOU3A          /LOOP WITH SAME DATA
2321  2021          ISZ     DATA1           /INCREMENT DATA PATTERN
2322  5265          JMP     INOU3A          /CONTINUE
2323  4445          JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
2324  5263          JMP     INOU3+3         /LOOP ON CURRENT TEST
                    /
                    /WITH THE INPUT REGISTER SET TO ALL 1S, DOES SELECTIVELY
                    /CLEARING THE OUTPUT REGISTER CLEAR ANY BITS IN THE INPUT
                    /REGISTER (EXCEPT THOSE NOT FLIPFLOPS)
                    /
2325  3030  INOU4,  DCA     TYPFLG          /CLEAR ERROR FLAG
2326  1177          TAD     [-62            /SET ITERATION COUNT
2327  3031          DCA     LPCNT           /TO 50 (DECIMAL)
2330  3021          DCA     DATA1           /CLEAR TEST DATA
2331  6007  INOU4A, CAF                     /INITIALIZE INTERFACE
2332  7040          CMA                     /SET AC TO 7777
2333  4440          DBSO                    /BIT SET OUTPUT REGISTER
2334  7300          CLA CLL
2335  1027          TAD     FJUMPER         /GET FLIPFLOP JUMPER MASK
2336  7040          CMA
2337  0021          AND     DATA1           /COMBINE WITH MASK
2340  7040          CMA
2341  3022          DCA     DATA2           /TO GET EXPECTED RESULT
2342  1021          TAD     DATA1           /GET TEST DATA
2343  4437          DBCO                    /BIT CLEAR OUTPUT REGISTER
2344  7300          CLA CLL
2345  4436          DBRI                    /READ INPUT REGISTER
2346  3023          DCA     DATA3           /SAVE REGISTER DATA
2347  1022          TAD     DATA2           /GET EXPECTED RESULT
2350  7041          CIA
2351  1023          TAD     DATA3           /COMPARE TO RECEIVED DATA
2352  7650          SNA CLA                 /ARE THEY THE SAME
2353  5360          JMP     .+5             /DATA CORRECT, CONTINUE
2354  4444          JMS I   XERROR          /NO, ERROR
```

```
2355  3767            OUT4E-1                 /"DBCO ERROR"
2356  3534            DH3-1                   /"MASK EXPECTED RECEIVED"
2357  7775            -3                      /NUMBER OF DATA WORDS
2360  4446            JMS I   XLOOP2          /TEST FOR LOOP WITH CURRENT DATA
2361  5331            JMP     INOU4A          /LOOP WITH SAME DATA
2362  2021            ISZ     DATA1           /INCREMENT DATA PATTERN
2363  5331            JMP     INOU4A          /CONTINUE
2364  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
2365  5330            JMP     INOU4+3         /LOOP ON CURRENT TEST
2366  5777'           JMP     INT1            /GO TO NEXT TEST
2377  2400
      2400    PAGE


                      /
                      /VERIFY THAT EACH BIT SET UP TO  SKIP DOES
                      /
2400  3030    INT1,   DCA     TYPFLG          /CLEAR ERROR FLAG
2401  1177            TAD     [-62            /SET ITERATION COUNT
2402  3031            DCA     LPCNT           /TO 50(DECIMAL)
2403  3022            DCA     DATA2
2404  6007    INT1A,  CAF                     /INITIALIZE INTERFACE
2405  1022            TAD     DATA2
2406  0026            AND     IJUMPER
2407  7450            SNA
2410  5241            JMP     INT1D
2411  3021            DCA     DATA1           /SAVE TEST DATA
2412  1021            TAD     DATA1
2413  4440            DBSO                    /BIT SET OUTPUT REGISTER
2414  7300            CLA CLL
2415  6003            SRQ                     /IS INTERRUPT ACTIVE
2416  5223            JMP     .+5             /NO, CONTINUE
2417  4444            JMS I   XERROR          /YES, ERROR
2420  4042            INT1E-1                 /INTERRUPT ACTIVE
2421  3515            DH1-1
2422  7777            -1                      /NUMBER OF DATA WORDS TO BE OUTPUT
2423  4433            DBEI                    /ENABLE INTERFACE
2424  6003            SRQ                     /IS INTERRUPT ACTIVE
2425  5231            JMP     INT1AE          /NO, ERROR
2426  4434            DBSK                    /IS FLAG SET
2427  5246            JMP     INT1BE          /NO, ERROR
2430  5237            JMP     INT1OK          /INTERRUPT ACTIVE, FLAG SET
2431  4434    INT1AE, DBSK                    /IS INTERFACE FLAG SET
2432  5253            JMP     INT1CE
2433  4444            JMS I   XERROR          /NO, ERROR
2434  4042            INT1E-1
2435  3515            DH1-1
2436  7777            -1                      /NUMBER OF WORDS TO BE OUTPUT
2437  4446    INT1OK, JMS I   XLOOP2          /TEST FOR LOOP ON SAME DATA, ESCAPE ON DATA ERROR
2440  5204            JMP     INT1A           /LOOP WITH SAME DATA
2441  2022    INT1D,  ISZ     DATA2           /INCREMENT DATA PATTERN
2442  5204            JMP     INT1A           /CONTINUE
2443  4445            JMS I   XLOOP1          /CHECK FOR LOOP ON CURRENT TEST
2444  5203            JMP     INT1+3          /LOOP ON CURRENT TEST
2445  5260            JMP     INT3            /GO TO NEXT TEST
```

```
2446  4444     INT1BE, JMS I   XERROR          /NO, ERROR
2447  4065             INT3E-1
2450  3515             DH1-1
2451  7777             -1                      /NUMBER OF WORDS TO BE OUTPUT
2452  5237             JMP     INT1OK
2453  4444     INT1CE, JMS I   XERROR          /NO, ERROR
2454  4077             INT4E-1
2455  3515             DH1-1
2456  7777             -1                      /NUMBER OF WORDS TO BE OUTPUT
2457  5237             JMP     INT1OK

                       /
                       /VERIFY THAT EACH BIT NOT JUMPERD TO SKIP DOES NOT
                       /
2460  3030     INT3,   DCA     TYPFLG          /CLEAR ERROR FLAG
2461  1177             TAD     [-62            /SET ITERATION COUNT
2462  3031             DCA     LPCNT           /TO 50 (DECIMAL)
2463  3022             DCA     DATA2           /CLEAR TEST DATA
2464  6007     INT3A,  CAF                     /INITIALIZE INTERFACE
2465  1026             TAD     IJUMPER         /GET JUMPER MASK
2466  7040             CMA                     /COMPLIMENT FOR NO SKIP BITS
2467  0022             AND     DATA2           /GET BITS TO BE TESTED
2470  7450             SNA                     /ARE ANY BITS TO BE TESTED
2471  5306             JMP     INT3C           /NO, GET NEXT DATA PATTERN
2472  3021             DCA     DATA1           /SAVE FOR OUTPUT
2473  1021             TAD     DATA1           /GET TEST DATA
2474  4440             DBSO                    /BIT SET OUTPUT REGISTER
2475  7300             CLA CLL
2476  4434             DBSK                    /IS FLAG SET
2477  5304             JMP     .+5             /NO, CONTINUE
2500  4444             JMS I   XERROR          /YES, ERROR
2501  3674             INIT3E-1                /"SKIP FLAG SET"
2502  3515             DH1-1           /"REGISTER DATA"
2503  7777             -1
2504  4446             JMS I   XLOOP2
2505  5264             JMP     INT3A
2506  2022     INT3C,  ISZ     DATA2
2507  5264             JMP     INT3A
2510  4445             JMS I   XLOOP1
2511  5263             JMP     INT3+3
2512  5777'            JMP     EPASS

                       /
                       /ERROR HANDLER
                       /
2577  3257
      2600     PAGE
2600  0000     ERROR,  0
2601  7300             CLA CLL
2602  1600             TAD I   ERROR           /GET POINTER TO ERROR MESSAGE
2603  3234             DCA     MESG            /SAVE POINTER
2604  2200             ISZ     ERROR
2605  1600             TAD I   ERROR           /GET POINTER TO DATA HEADER
2606  3236             DCA     DHDER           /SAVE HEADER
2607  2200             ISZ     ERROR                   /NUMBER OF WORDS TO BE OUTPUT
```

```
 261Ø  16ØØ             TAD I   ERROR               /GET NUMBER OF DATA WORDS TO BE TYPED
 2611  3264             DCA     DATCNT              /SAVE
 2612  12ØØ             TAD     ERROR               /GET ADDRESS OF TEST THAT FAILED
 2613  1377             TAD     (-3
 2614  3776'            DCA     LSTDGT
 2615  1776'            TAD     LSTDGT
 2616  3266             DCA     ERRAD
 2617  76Ø4             LAS
 262Ø  Ø334             AND     SRØ1
 2621  764Ø             SZA CLA
 2622  5254             JMP     EHALT
 2623  1Ø3Ø             TAD     TYPFLG
 2624  764Ø             SZA CLA
 2625  5241             JMP     DATOUT
 2626  7Ø4Ø             CMA
 2627  3Ø3Ø             DCA     TYPFLG              /CLEAR ERROR FLAG
 263Ø  4775'            JMS     OCTASC
 2631  4442             JMS I   XPRINT
 2632  3Ø24             ERADR-1
 2633  4442             JMS I   XPRINT
 2634  ØØØØ      MESG,  Ø
 2635  4442             JMS I   XPRINT
 2636  ØØØØ      DHDER, Ø
 2637  4442             JMS I   XPRINT                        /NUMBER OF WORDS TO BE OUTPUT
 264Ø  3512             CRLF-1
 2641  1264      DATOUT,TAD     DATCNT
 2642  765Ø             SNA CLA
 2643  5254             JMP     EHALT
 2644  1265             TAD     DATAP
 2645  3Ø1Ø             DCA     POINT1
 2646  141Ø      BITS,  TAD I   POINT1
 2647  4774'            JMS     BITOUT
 265Ø  2264             ISZ     DATCNT
 2651  5246             JMP     BITS
 2652  4442             JMS I   XPRINT
 2653  3512             CRLF-1
 2654  76Ø4      EHALT, LAS
 2655  Ø333             AND     SRØØ
 2656  764Ø             SZA CLA
 2657  5262             JMP     .+3
 266Ø  1266             TAD     ERRAD
 2661  74Ø2             HLT
 2662  22ØØ             ISZ     ERROR
 2663  56ØØ             JMP I   ERROR
 2664  ØØØØ      DATCNT,Ø
 2665  ØØ2Ø      DATAP, DATA1-1
 2666  ØØØØ      ERRAD, Ø
                        /
                        /TEST FOR LOOP ON CURRENT TEST
                        /
 2667  ØØØØ      LOOP1, Ø
 267Ø  1Ø3Ø             TAD     TYPFLG
 2671  765Ø             SNA CLA
 2672  5277             JMP     LP1EXA
 2673  76Ø4             LAS
```

```
2674  0341            AND     SR06
2675  7640            SZA CLA
2676  5310            JMP     LP1EXX-1
2677  7604   LP1EXA,  LAS
2700  0340            AND     SR05
2701  7640            SZA CLA
2702  5305            JMP     LP1EXT
2703  2031            ISZ     LPCNT
2704  5311            JMP     LP1EXX
2705  7604   LP1EXT,  LAS
2706  0335            AND     SR02
2707  7650            SNA CLA
2710  2267            ISZ     LOOP1
2711  5667   LP1EXX,  JMP I   LOOP1
                      /
                      /TEST FOR LOOP ON CURRENT DATA
                      /
2712  0000   LOOP2,   0
2713  1030            TAD     TYPFLG
2714  7650            SNA CLA
2715  5326            JMP     LP2EXT
2716  7604            LAS
2717  0341            AND     SR06
2720  7650            SNA CLA
2721  5326            JMP     .+5             /DATA CORRECT, CONTINUE
2722  1312            TAD     LOOP2
2723  1373            TAD     (5
2724  3312            DCA     LOOP2
2725  5712            JMP I   LOOP2
2726  7604   LP2EXT,  LAS
2727  0336            AND     SR03
2730  7650            SNA CLA
2731  2312            ISZ     LOOP2
2732  5712            JMP I   LOOP2
2733  4000   SR00,    4000
2734  2000   SR01,    2000
2735  1000   SR02,    1000
2736  0400   SR03,    400
2737  0200   SR04,    200
2740  0100   SR05,    100
2741  0040   SR06,    40


                      /
                      /OCTAL TO PACKED ASCII CONVERSION
2773  0005
2774  3031
2775  3000
2776  3027
2777  7775
      3000   PAGE     /
3000  0000   OCTASC,  0
3001  7300            CLA CLL
3002  1227            TAD     LSTDGT          /GET WORD TO BE CONVERTED
3003  7002            BSW                     /SWAP HALVES, SEPARATE DIGITS,
 3ØØ4  4212            JMS     SPLIT           /CONVERT MOST SIGNIFICANT
 3ØØ5  3226            DCA     MSTDGT          /DIGITS TO ASCII
 3ØØ6  1227            TAD     LSTDGT          /CONVERT LEAST SIGNIFICANT
 3ØØ7  4212            JMS     SPLIT           /DIGITS TO ASCII
 3Ø1Ø  3227            DCA     LSTDGT
 3Ø11  56ØØ            JMP I   OCTASC          /RETURN
 3Ø12  ØØØØ    SPLIT,  Ø
 3Ø13  Ø377            AND     (77
 3Ø14  7421            MQL
 3Ø15  75Ø1            MQA
 3Ø16  71Ø6            CLL RTL
 3Ø17  7ØØ4            RAL
 3Ø2Ø  Ø376            AND     (7Ø7
 3Ø21  75Ø1            MQA
 3Ø22  Ø376            AND     (7Ø7
 3Ø23  1375            TAD     (6Ø6Ø
 3Ø24  5612            JMP I   SPLIT
 3Ø25  3736    ERADR,  TEXT    /←↑      /
 3Ø26  4Ø4Ø
 3Ø27  4Ø4Ø
 3Ø3Ø  4ØØØ

                       /
                       /OUTPUT 12 BIT BINARY WORD
                       /
 3Ø31  ØØØØ    BITOUT, Ø
 3Ø32  7421            MQL                     /SAVE DATA IN MQ
 3Ø33  1374            TAD     (-14            /SET UP TO OURPUT
 3Ø34  3Ø2Ø            DCA     CNTR1           /12 BITS
 3Ø35  75Ø1    BITØ1,  MQA                     /GET DATA
 3Ø36  71Ø4            CLL RAL                 /GET MSB INTO LINK
 3Ø37  7421            MQL                     /SAVE REST OF WORD
 3Ø4Ø  1373            TAD     ("1             /GET ASCII 1 INTO AC
 3Ø41  742Ø            SNL
 3Ø42  Ø372            AND     ("Ø             /IS BIT=1
 3Ø43  4443            JMS I   XTYPE           /NO, CHANGE TO ASCII Ø
 3Ø44  2Ø2Ø            ISZ     CNTR1           /OUTPUT BIT
 3Ø45  5235            JMP     BITØ1           /CONTINUE
 3Ø46  1371            TAD     (24Ø            /TYPE 2 SPACES
 3Ø47  4443            JMS I   XTYPE           /AFTER LAST BIT HAS BEEN
 3Ø5Ø  1371            TAD     (24Ø            /OUTPUTTED
 3Ø51  4443            JMS I   XTYPE
 3Ø52  5631            JMP I   BITOUT          /RETURN


                       /
                       /CHARACTER STRING OUTPUT ROUTINE
 3171  Ø24Ø
 3172  Ø26Ø
 3173  Ø261
 3174  7764
 3175  6Ø6Ø
 3176  Ø7Ø7
 3177  ØØ77
       32ØØ    PAGE    /
 32ØØ  ØØØØ    PRINT,  Ø
```

```
3201  7300            CLA CLL
3202  1600            TAD I   PRINT           /GET POINTER TO MESSAGE
3203  3010            DCA     POINT1          /SET UP AUTO-INDEX REGISTER
3204  2200            ISZ     PRINT           /SET UP RETURN
3205  1410            TAD I   POINT1          /GET PACKED WORD
3206  7421            MQL                     /SAVE IN MQ
3207  7501            MQA                     /GET WORD
3210  7002            BSW                     /SWAP HALVES
3211  4215            JMS     TYPSET          /DECODE AND OUTPUT
3212  7501            MQA                     /GET WORD
3213  4215            JMS     TYPSET          /DECODE AND OUTPUT
3214  5205            JMP     PRINT+5         /CONTINUE
                      /
                      /UNPACK, DECODE, OUTPUT
                      /
3215  0000    TYPSET, 0
3216  0243            AND     K0077           /MASK UNWANTED BITS
3217  7450            SNA                     /IS AC=0
3220  5600            JMP I   PRINT           /YES, END OF MESSAGE, EXIT
3221  1244            TAD     M40             /SUBTRACT 40
3222  7510            SPA                     /IS PACKED CHARACTER >40
3223  5226            JMP     .+3             /NO
3224  1250            TAD     K240            /YES, CONVERT TO ASCII
3225  5241            JMP     MTP             /OUTPUT
3226  7001            IAC                     /ADD 1 TO AC
3227  7440            SZA                     /IS CHARACTER=37
3230  5233            JMP     .+3             /NO,
3231  1245            TAD     K215            /GET CODE FOR CARRIAGE RETURN
3232  5241            JMP     MTP             /OUTPUT
3233  7001            IAC                     /ADD 1 TO AC
3234  7440            SZA                     /IS CHARACTER=37
3235  5240            JMP     .+3             /NO
3236  1246            TAD     K212            /GET CODE FOR LINE FEED
3237  5241            JMP     MTP             /OUTPUT
3240  1247            TAD     K336            /PACKED CHARACTER <40, CONVERT TO ASCII
3241  4443    MTP,    JMS I   XTYPE           /OUTPUT
3242  5615            JMP I   TYPSET
3243  0077    K0077,  77
3244  7740    M40,    -40
3245  0215    K215,   215
3246  0212    K212,   212
3247  0336    K336,   336
3250  0240    K240,   240
                      /
                      /OUTPUT ONE CHARACTER TO TTY
                      /
3251  0000    TYPE,   0
3252  6046            TLS
3253  6041            TSF
3254  5253            JMP     .-1
3255  7200            CLA
3256  5651            JMP I   TYPE
                      /
                      /
                      /
```

```
 3257  76Ø4   EPASS,  LAS
 326Ø  Ø777'          AND       SRØ4
 3261  764Ø           SZA CLA
 3262  5776'          JMP       INIT1
 3263  76Ø4           LAS
 3264  Ø775'          AND       SRØ5
 3265  764Ø           SZA CLA
 3266  5272           JMP       EPAS1
 3267  4442           JMS I     XPRINT
 327Ø  3274           MEP-1
 3271  5776'          JMP       INIT1
 3272  1374   EPAS1,  TAD       (2Ø7
 3273  4251           JMS       TYPE
 3274  5776'          JMP       INIT1
 3275  3736   MEP,    TEXT      /←↑DR/
 3276  Ø422
 3277  ØØØØ


                      /
                      /TELETYPE MESSAGES
                      /
 3374  Ø2Ø7
 3375  274Ø
 3376  Ø4ØØ
 3377  2737
       34ØØ   PAGE
 34ØØ  3736   M1,     TEXT      /←↑SET SR FOR DEVICE CODE AND CONT7
 34Ø1  23Ø5
 34Ø2  244Ø
 34Ø3  2322
 34Ø4  4ØØ6
 34Ø5  1722
 34Ø6  4ØØ4
 34Ø7  Ø526
 341Ø  11Ø3
 3411  Ø54Ø
 3412  Ø317
 3413  Ø4Ø5
 3414  4ØØ1
 3415  16Ø4
 3416  4ØØ3
 3417  1716
 342Ø  24ØØ
 3421  3736   M2,     TEXT      /←↑SET SR FOR INTERRUPT JUMPERS AND CONT/
 3422  23Ø5
 3423  244Ø
 3424  2322
 3425  4ØØ6
 3426  1722
 3427  4Ø11
 343Ø  1624
 3431  Ø522
 3432  2225
 3433  2Ø24
```

```
3434  4012
3435  2515
3436  2005
3437  2223
3440  4001
3441  1604
3442  4003
3443  1716
3444  2400
3445  3736    M2A,    TEXT    /←↑SET SWITCHES FOR FLIPFLOP JUMPERS AND CONTINUE/
3446  2305
3447  2440
3450  2327
3451  1124
3452  0310
3453  0523
3454  4006
3455  1722
3456  4006
3457  1411
3460  2006
3461  1417
3462  2040
3463  1225
3464  1520
3465  0522
3466  2340
3467  0116
3470  0440
3471  0317
3472  1624
3473  1116
3474  2505
3475  0000
3476  3736    M3,     TEXT    /←↑SET SR FOR RUN AND CONT/
3477  2305
3500  2440
3501  2322
3502  4006
3503  1722
3504  4022
3505  2516
3506  4001
3507  1604
3510  4003
3511  1716
3512  2400
3513  3736    CRLF,   TEXT    /←↑/
3514  0000
                      /
                      /DATA HEADERS
                      /
3515  0000    DH0,    0
3516  3736    DH1,    TEXT    /←↑REGISTER DATA/
3517  2205
```

```
3520  Ø711
3521  2324
3522  Ø522
3523  4ØØ4
3524  Ø124
3525  Ø1ØØ
3526  3736     DH2,    TEXT    /←↑AC CONTENTS/
3527  Ø1Ø3
353Ø  4ØØ3
3531  1716
3532  24Ø5
3533  1624
3534  23ØØ
3535  3736     DH3,    TEXT    /←↑MASK            EXPECTED        RECEIVED/
3536  15Ø1
3537  2313
354Ø  4Ø4Ø
3541  4Ø4Ø
3542  4Ø4Ø
3543  4Ø4Ø
3544  4Ø4Ø
3545  Ø53Ø
3546  2ØØ5
3547  Ø324
355Ø  Ø5Ø4
3551  4Ø4Ø
3552  4Ø4Ø
3553  4Ø4Ø
3554  22Ø5
3555  Ø3Ø5
3556  1126
3557  Ø5Ø4
356Ø  ØØØØ
3561  3736     DH4,    TEXT    /←↑EXPECTED        RECEIVED/
3562  Ø53Ø
3563  2ØØ5
3564  Ø324
3565  Ø5Ø4
3566  4Ø4Ø
3567  4Ø4Ø
357Ø  4Ø4Ø
3571  22Ø5
3572  Ø3Ø5
3573  1126
3574  Ø5Ø4
3575  ØØØØ
3576  3736     DH5,    TEXT    /←↑REGISTER         DATA OUT        DATA IN/
3577  22Ø5
36ØØ  Ø711
36Ø1  2324
36Ø2  Ø522
36Ø3  4Ø4Ø
36Ø4  4Ø4Ø
36Ø5  4Ø4Ø
36Ø6  4ØØ4
```

```
3607  Ø124
361Ø  Ø14Ø
3611  1725
3612  244Ø
3613  4Ø4Ø
3614  4Ø4Ø
3615  4Ø4Ø
3616  Ø4Ø1
3617  24Ø1
362Ø  4Ø11
3621  16ØØ
3622  3736     DH6,    TEXT    /**AC CONTENTS    DATA OUT       DATA IN/
3623  Ø1Ø3
3624  4ØØ3
3625  1716
3626  24Ø5
3627  1624
363Ø  234Ø
3631  4Ø4Ø
3632  4ØØ4
3633  Ø124
3634  Ø14Ø
3635  1725
3636  244Ø
3637  4Ø4Ø
364Ø  4Ø4Ø
3641  4Ø4Ø
3642  Ø4Ø1
3643  24Ø1
3644  4Ø11
3645  16ØØ
                       /
                       /ERROR MESSAGE
                       /
3646  1725     INIT1E, TEXT    /OUTPUT REG NOT CLEARED/
3647  242Ø
365Ø  2524
3651  4Ø22
3652  Ø5Ø7
3653  4Ø16
3654  1724
3655  4ØØ3
3656  14Ø5
3657  Ø122
366Ø  Ø5Ø4
3661  ØØØØ
3662  1116     INIT2E, TEXT    /INPUT REG NOT CLEARED/
3663  2Ø25
3664  244Ø
3665  22Ø5
3666  Ø74Ø
3667  1617
367Ø  244Ø
3671  Ø314
3672  Ø5Ø1
```

```
 3673  22Ø5
 3674  Ø4ØØ
 3675  2313     INIT3E, TEXT    /SKIP FLAG SET/
 3676  112Ø
 3677  4ØØ6
 37ØØ  14Ø1
 37Ø1  Ø74Ø
 37Ø2  23Ø5
 37Ø3  24ØØ
 37Ø4  Ø4Ø2     TRAN1E, TEXT    /DBRO DID NOT CLEAR AC/
 37Ø5  2217
 37Ø6  4ØØ4
 37Ø7  11Ø4
 371Ø  4Ø16
 3711  1724
 3712  4ØØ3
 3713  14Ø5
 3714  Ø122
 3715  4ØØ1
 3716  Ø3ØØ
 3717  Ø4Ø2     TRAN2E, TEXT    /DBRI DID NOT CLEAR AC/
 372Ø  2211
 3721  4ØØ4
 3722  11Ø4
 3723  4Ø16
 3724  1724
 3725  4ØØ3
 3726  14Ø5
 3727  Ø122
 373Ø  4ØØ1
 3731  Ø3ØØ
 3732  Ø4Ø2     TRAN3E, TEXT    /DBSO CHANGED AC/
 3733  2317
 3734  4ØØ3
 3735  1ØØ1
 3736  16Ø7
 3737  Ø5Ø4
 374Ø  4ØØ1
 3741  Ø3ØØ
 3742  Ø4Ø2     TRAN4E, TEXT    /DBCO CHANGED AC/
 3743  Ø317
 3744  4ØØ3
 3745  1ØØ1
 3746  16Ø7
 3747  Ø5Ø4
 375Ø  4ØØ1
 3751  Ø3ØØ
 3752  Ø4Ø2     TRAN5E, TEXT    /DBCI CHANGED AC/
 3753  Ø311
 3754  4ØØ3
 3755  1ØØ1
 3756  16Ø7
 3757  Ø5Ø4
 376Ø  4ØØ1
 3761  Ø3ØØ
 3762  0402     OUT1E,  TEXT     /DBSO ERROR/
 3763  2317
 3764  4005
 3765  2222
 3766  1722
 3767  0000
 3770  0402     OUT4E,  TEXT     /DBCO ERROR/
 3771  0317
 3772  4005
 3773  2222
 3774  1722
 3775  0000
 3776  0402     OUT7E,  TEXT     /DBRO ERROR/
 3777  2217
 4000  4005
 4001  2222
 4002  1722
 4003  0000
 4004  0402     IN2E,   TEXT     /DBCI ERROR/
 4005  0311
 4006  4005
 4007  2222
 4010  1722
 4011  0000
 4012  1116     IN3E,   TEXT     /INPUT REGISTER DATA ERROR/
 4013  2025
 4014  2440
 4015  2205
 4016  0711
 4017  2324
 4020  0522
 4021  4004
 4022  0124
 4023  0140
 4024  0522
 4025  2217
 4026  2200
 4027  1401     IN4E,   TEXT     /LATCH ERROR/
 4030  2403
 4031  1040
 4032  0522
 4033  2217
 4034  2200
 4035  0402     IN9E,   TEXT     /DBRI ERROR/
 4036  2211
 4037  4005
 4040  2222
 4041  1722
 4042  0000
 4043  1116     INT1E,  TEXT     /INTERRUPT ACTIVE/
 4044  2405
 4045  2222
 4046  2520
 4047  2440
 4050  0103
 4051  2411
 4052  2605
 4053  0000
 4054  1617       INT2E,  TEXT    /NO INTERRUPT, SKIP/
 4055  4011
 4056  1624
 4057  0522
 4060  2225
 4061  2024
 4062  5440
 4063  2313
 4064  1120
 4065  0000
 4066  1116       INT3E,  TEXT    /INTERRUPT, NO SKIP/
 4067  2405
 4070  2222
 4071  2520
 4072  2454
 4073  4016
 4074  1740
 4075  2313
 4076  1120
 4077  0000
 4100  1617       INT4E,  TEXT    /NO INTERRUPT, NO SKIP/
 4101  4011
 4102  1624
 4103  0522
 4104  2225
 4105  2024
 4106  5440
 4107  1617
 4110  4023
 4111  1311
 4112  2000
 4113  1617       INT5E,  TEXT    /NO SKIP/
 4114  4023
 4115  1311
 4116  2000
 4117  2313       INT6E,  TEXT    /SKIP/
 4120  1120
 4121  0000

                  $
 0177  7716
```

```
ØØØØ  ØØØØØØØØ  1ØØØØØØØ  11111111  11111111  1111111Ø  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
Ø1ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1

Ø2ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø3ØØ  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØ111

Ø4ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø5ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

Ø6ØØ  11111111  11111111  11111111  11111111  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØØØØ
Ø7ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1


1ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
11ØØ  11111111  11111111  11111111  11111111  1111ØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1

12ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
13ØØ  11111111  11111111  11111111  11111111  11111111  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1

14ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
15ØØ  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1

16ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
17ØØ  11111111  11111111  11111111  111111ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1


2ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
21ØØ  11111111  1111111Ø  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1

22ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
23ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1111111Ø  ØØØØØØØ1

24ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
25ØØ  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØ1

26ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
27ØØ  11111111  11111111  11111111  11111111  11ØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØ11111


3ØØØ  11111111  11111111  11111111  11111111  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØØØØ
31ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  Ø1111111

32ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
33ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØ1111

34ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
35ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

36ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
37ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
```

```
4ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
41ØØ  11111111  11111111  11ØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ

42ØØ
43ØØ

44ØØ
45ØØ

46ØØ
47ØØ


5ØØØ
51ØØ

52ØØ
53ØØ

54ØØ
55ØØ

56ØØ
57ØØ


6ØØØ
61ØØ

62ØØ
63ØØ

64ØØ
65ØØ

66ØØ
67ØØ


7ØØØ
71ØØ

72ØØ
73ØØ

74ØØ
75ØØ

76ØØ
77ØØ
```

```
/M   DEC-Ø8-DHORA-A     PAL1Ø    V141     29-MAR-72         107   PAGE 1-35

BITØ1   3Ø35          IN1B    142Ø          KØØ77   3243          SRØ6    2741
BITOUT  3Ø31          IN2     1434          K212    3246          SRQ     6ØØ3
BITS    2646          IN2E    4ØØ4          K215    3245          START1  Ø2Ø2
BSW     7ØØ2          IN3     1462          K24Ø    325Ø          START2  Ø244
CAF     6ØØ7          IN3A    1466          K336    3247          TIOT    Ø25Ø
CNTR1   ØØ2Ø          IN3E    4Ø12          LOOP1   2667          TRAN1   Ø46Ø
CRLF    3513          IN4E    4Ø27          LOOP2   2712          TRAN1E  37Ø4
DATA1   ØØ21          IN5     16ØØ          LP1EXA  2677          TRAN2   Ø477
DATA2   ØØ22          IN5A    16Ø4          LP1EXT  27Ø5          TRAN2E  3717
DATA3   ØØ23          IN5C    1633          LP1EXX  2711          TRAN3   Ø516
DATA4   ØØ24          IN6     1637          LP2EXT  2726          TRAN3E  3732
DATA5   ØØ25          IN6A    1644          LPCNT   ØØ31          TRAN4   Ø536
DATAP   2665          IN6C    1672          LSTDGT  3Ø27          TRAN4E  3742
DATCNT  2664          IN7     1676          M1      34ØØ          TRAN5   Ø556
DATOUT  2641          IN7A    17Ø2          M2      3421          TRAN5E  3752
DBCI    4435          IN7C    1731          M2A     3445          TRAN6   Ø6ØØ
DBCIX   Ø3ØØ          IN8     2ØØØ          M3      3476          TRAN7   Ø616
DBCO    4437          IN8A    2ØØ5          M4Ø     3244          TRAN8   Ø634
DBCOX   Ø312          IN9     2Ø3Ø          MEP     3275          TYPE    3251
DBDI    4432          IN9A    2Ø34          MESG    2634          TYPFLG  ØØ3Ø
DBDIX   Ø261          IN9E    4Ø35          MQA     75Ø1          TYPSET  3215
DBEI    4433          INIT1   Ø4ØØ          MQL     7421          XDBCI   ØØ35
DBEIX   Ø266          INIT1E  3646          MSTDGT  3Ø26          XDBCO   ØØ37
DBRI    4436          INIT2   Ø416          MTP     3241          XDBDI   ØØ32
DBRIX   Ø3Ø5          INIT2E  3662          OCTASC  3ØØØ          XDBEI   ØØ33
DBRO    4441          INIT3   Ø435          OUT1    1ØØØ          XDBRI   ØØ36
DBROX   Ø324          INIT3E  3675          OUT1E   3762          XDBRO   ØØ41
DBSK    4434          INOU1   22ØØ          OUT2    1Ø33          XDBSK   ØØ34
DBSKX   Ø273          INOU1A  22Ø5          OUT3    1Ø54          XDBSO   ØØ4Ø
DBSO    444Ø          INOU2   223Ø          OUT3A   1Ø6Ø          XERROR  ØØ44
DBSOX   Ø317          INOU2A  2235          OUT4    11Ø5          XLOOP1  ØØ45
DHØ     3515          INOU3   226Ø          OUT4A   1111          XLOOP2  ØØ46
DH1     3516          INOU3A  2265          OUT4E   377Ø          XPRINT  ØØ42
DH2     3526          INOU4   2325          OUT5    12ØØ          XTYPE   ØØ43
DH3     3535          INOU4A  2331          OUT5A   12Ø5
DH4     3561          INT1    24ØØ          OUT6    123Ø
DH5     3576          INT1A   24Ø4          OUT6A   1234
DH6     3622          INT1AE  2431          OUT7    1262
DHDER   2636          INT1BE  2446          OUT7A   1266
DIOT    Ø26Ø          INT1CE  2453          OUT7E   3776
EHALT   2654          INT1D   2441          OUT8    1315
EPAS1   3272          INT1E   4Ø43          OUT8A   1322
EPASS   3257          INT1OK  2437          PNTR1   Ø233
ERADR   3Ø25          INT2E   4Ø54          POINT1  ØØ1Ø
ERRAD   2666          INT3    246Ø          PRINT   32ØØ
ERROR   26ØØ          INT3A   2464          SPLIT   3Ø12
FJUMPE  ØØ27          INT3C   25Ø6          SRØØ    2733
IJUMPE  ØØ26          INT3E   4Ø66          SRØ1    2734
IN1     14ØØ          INT4E   41ØØ          SRØ2    2735
IN1Ø    2Ø63          INT5E   4113          SRØ3    2736
IN1ØA   2Ø7Ø          INT6E   4117          SRØ4    2737
IN1A    14Ø3          IOTS    Ø247          SRØ5    274Ø
```

```
ERRORS DETECTED: Ø

LINKS GENERATED: 18

RUN-TIME:  15 SECONDS

3K CORE USED
```