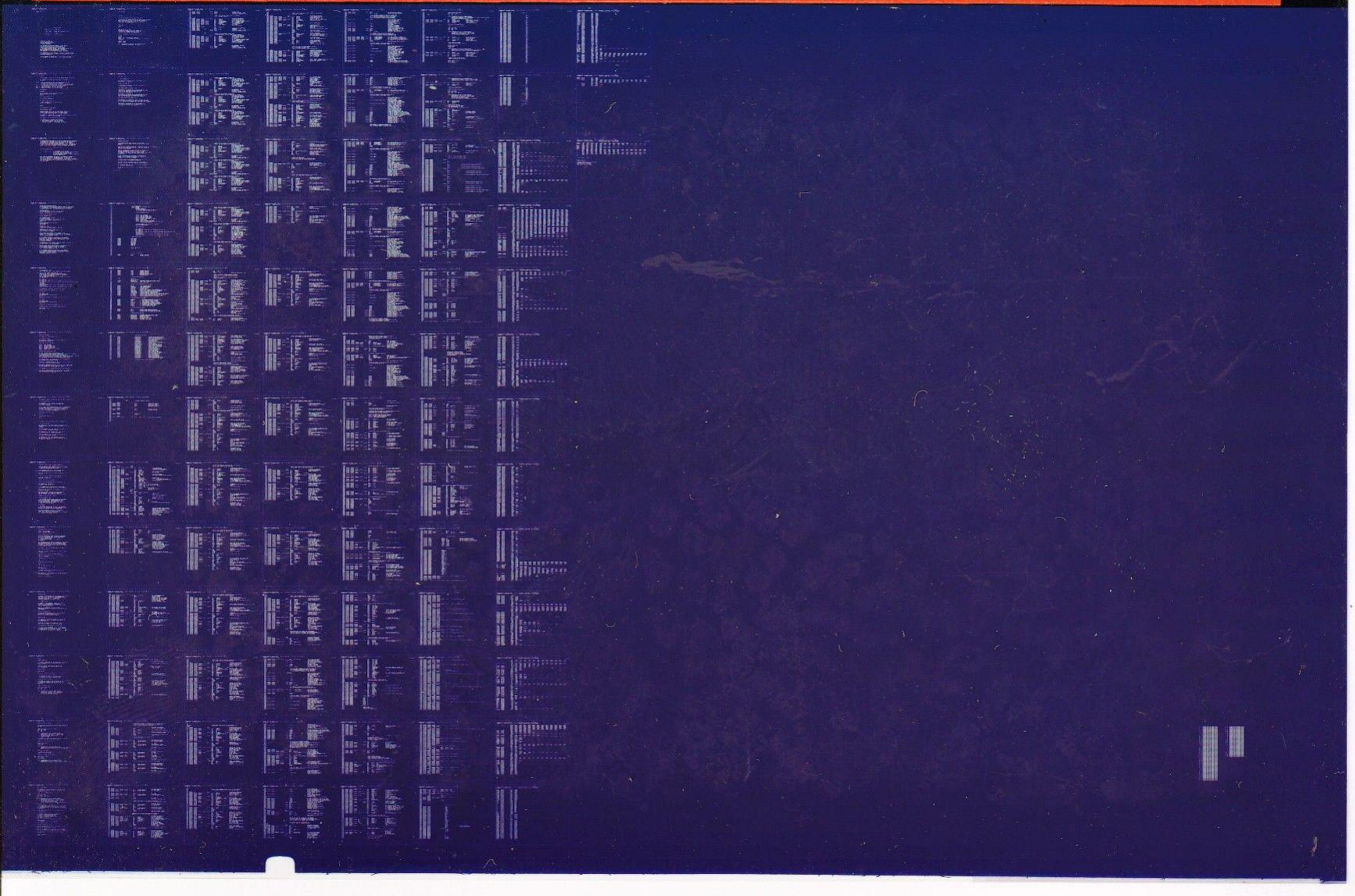
DM11-BA

DM11-BA MODEM CONTRL
CZKMGA0

AH-S892A-MC
FICHE 1 OF 1



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        .NLIST SEQ,BIN,LOC
        .REM %
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IDENTIFICATION

PRODUCT CODE: AC-S890A-MC

PRODUCT NAME: CZKMGA0 DM11-BA MODEM CONTRL

PROGRAM DATE: SEPTEMBER 1981

MAINTAINER: CSS/NPG DIAGNOSTICS

1.0 ABSTRACT

THIS PROGRAM IS A TEST OF THE DM11-BA MODEM CONTROL MULTIPLEXER

THE PROGRAM IS DIVIDED INTO FUNCTIONAL TEST GROUPS AS FOLLOWS:

GROUP 0: ALL LINE SCANNER AND LINE MULTIPLEXER FUNCTIONS ARE TESTED USING THE 54-14700 TEST CONNECTOR (OR H3256 TEST CONNECTORS WITH THE H317-M DISTRIBUTION PANEL)
GROUP 1: A SINGLE LINE IS TESTED USING THE H317-M PANEL WITH H3256 TEST CONNECTORS IN PLACE OF THE MODEM CABLES .
GROUP 2: CONNECT-DISCONNECT TEST FOR 103A MODEMS
GROUP 3: CONNECT-DISCONNECT TEST FOR 202C MODEMS

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-11 COMPUTER WITH AT LEAST 8K OF MEMORY
ASR-33 TELETYPE OR EQUIVALENT
DM11-BA

2.1.1 FOR 8 LINE SCANNER TEST

54-14700 TEST CONNECTOR

2.1.2 FOR SINGLE LINE CABLE TEST

2 CABLES CONNECTED TO DISTRIBUTION PANEL
H3256 TEST CONNECTOR

2.2 MEMORY

THE PROGRAM RUNS IN 8K MEMORY

2.3 M8640 HARDWARE JUMPERS

HARDWARE JUMPERS W10-17 ON THE M8640 MODULE ENABLE OR DISABLE TRANSITTION DETECTION OF THE MODEM SIGNALS .
THE FOLLOWING RESTRICTIONS APPLY TO THESE JUMPERS:

TEST GROUP 0 - ASSUMES THAT ALL TRANSITTION DETECTIONS WILL NOT BE DISABLED (AT LEAST 1 MUST BE ENABLED)

TEST GROUP 1 - IS NOT EFFECTED BY THESE JUMPERS .

TEST GROUPS 2 & 3 - ASSUMES THE FOLLOWING :
(1) RING TRANSITTIONS WILL NOT BE DISABLED .
(2) BOTH CLEAR TO SEND & CARRIER WILL NOT BE DISABLED TOGETHER . (ONE DISABLE IS ALLOWED).

3.0 THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC. 176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(IE) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

1.	<CR>	IF NO CHANGES ARE TO BE MADE
2.	6 DIGITS 0-7	TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE ;LAST DIGIT FOLLOWED BY <CR>.
3.	^U	TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED KEYING IN SWREG VALUE.

BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ^G (CNTL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

4.0 LOADING AND STARTING PROCEDURE
THE STANDARD PROCEDURE FOR LOADING BINARY TAPES IS TO BE USED.
IF THE DIAGNOSTIC IS ON MAGNETIC MEDIA, FOLLOW INSTRUCTIONS FOR
THE MONITOR BEING USED. THE PROGRAM AUTOSTARTS ON LOADING.

4.1 STARTING ADDRESS
THE STARTING ADDRESS FOR ALL TESTS IS 000200.
RESTART ADDRESS FOR ALL TESTS IS 000200

4.2 OPERATOR AND/OR PROGRAM ACTION

4.2.1 INITIAL PROGRAM START

4.2.1A WITH HARDWARE SWITCH REGISTER
LOAD ADDRESS 000200
IF DEFAULT ADDRESSES ARE NOT PRESENT SET SW00 = 0
(DEFAULT CSR = 764200 , VECTOR = 540)
PRESS START

4.2.1B WITHOUT HARDWARE SWITCH REGISTER
LOAD ADDRESS 200
PRESS START

4.2.1.2 PROGRAM WILL TYPE:
''CZKMGA0 DM11-BA MODEM CONTROL'' (ONCE ONLY)

4.2.1.3 PROGRAM WILL TYPE (WITH SW00 = 0)
VECTOR ADDRESS-'' AND WILL WAIT FOR AN INPUT
FROM THE TELETYPE KEYBOARD.

4.2.1.4 TYPE A THREE DIGIT NUMBER (OCTAL) WHICH IS THE
ADDRESS THAT THE DM11-BA WILL INTERRUPT TO, FOLLOWED BY
<RETURN>. IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL
TYPE ''?'' AND THEN REPEAT 4.2.1.3.

NOTE: IF THE ADDRESS ENTERED IS ACCEPTIBLE TO THE PROGRAM,
BUT IS NOT THE INTERRUPT VECTOR ADDRESS OF THE DM11-BA
UNDER TEST, A HALT WILL OCCUR AT THAT ADDRESS+2, WHEN
THE DM11-BA INTERRUPTS.
TO RECOVER, PERFORM 4.2.2.1.

4.2.1.5 THE PROGRAM WILL TYPE ''CONTROL REGISTER ADDRESS-'' AND WAIT FOR
AN INPUT FROM THE TELETYPE KEYBOARD.

4.2.1.6 TYPE A 6 DIGIT (OCTAL NUMBER) WHICH IS THE ADDRESS OF THE
DM11-BA CONTROL REGISTER FOLLOWED BY <RETURN>.
IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL
TYPE ''?'' AND THEN REPEAT 4.2.1.6.

NOTE: IF THE ADDRESS ENTERED IS ACCEPTIBLE TO THE PROGRAM
BUT IS A NON-EXISTANT REGISTER, A BUS ERROR TRAP WILL
OCCUR WHEN THE PROGRAM ADDRESSES THE REGISTER, AND THE
PROGRAM WILL HALT AT LOCATION 6.
TO RECOVER, PERFORM 4.2.2.1.

4.2.1.7 THE PROGRAM WILL TYPE
''TEST-'' AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

4.2.1.8 TYPE AN OCTAL NUMBER CORRESPONDING TO THE
NUMBER OF THE TEST TO BE RUN FOLLOWED BY <RETURN>.
IF AN INCORRECT TEST NUMBER IS TYPED THE PROGRAM WILL
TYPE ''?'' AND THEN REPEAT 4.2.1.7
THE AVAILABLE TESTS TOGETHER WITH THE NUMBER TO BE TYPED
ARE GIVEN BELOW.

TEST GROUP 0:
OFF LINE TESTS USING 54-14700 TEST CONNECTOR. FIRST TEST=0
TEST GROUP 1:
OFF LINE TESTS USING H3256 TEST CONNECTOR AND H317-M DISTRIBUTION PANEL.
 TEST=100
TEST GROUP 2:
CONNECT/DISCONNECT TEST FOR BELL 103A MODEMS-FIRST TEST=200
TEST GROUP 3:
CONNECT/DISCONNECT TEST FOR BELL 202C MODEMS-FIRST TEST=300

4.2.1.9 THE PROGRAM WILL ENTER THE SELECTED TEST GROUP.

4.2.2 PROGRAM RESTART WITH HARDWARE SWITCH REGISTER

4.2.2.1 WITH SW00=0

LOAD ADDRESS 200
SET SW00=1 BEFORE PRESSING START.
PRESS START

PROGRAM WILL PERFORM AS DESCRIBED IN 4.2.1.3 TO 4.2.1.9.

4.2.2.2 WITH SW00=1

LOAD ADDRESS 200
SET SW00=1 BEFORE PRESSING START
PRESS START

PROGRAM WILL PERFORM AS DESCRIBED IN 4.2.1.7 TO 4.2.1.9

4.2.3 PROGRAM RESTART WITHOUT HARDWARE SWITCH REGISTER

LOAD ADDRESS 200
PRESS START

5.0 OPERATING PROCEDURE

5.1 TEST GROUP 0 8 LINE SCANNER TEST

5.1.1 TEST INITIALIZATION

NONE REQUIRED, PROGRAM TYPES "8 LINE SCANNER TEST"
AND BEGINS TEST EXECUTION.

5.1.2 OPERATIONAL SWITCH SETTINGS

SW15=1, HALT ON ERROR
SW14=1, LOOP ON CURRENT TEST
SW13=1, SUPPRESS ERROR TYPEOUT
SW11=1, SUPPRESS ITERATIONS
SW10=1, ESCAPE TO NEXT TEST ON ERROR
SW09=1, FREEZE DATA

5.1.3 PROGRAM AND/OR OPERATOR ACTION

5.1.3.1 WITH ALL SWITCHES DOWN, THE PROGRAM WILL RUN
ALL TESTS IN THE SELECTED GROUP, SEQUENTIALLY. EACH TEST IS REPEATED
A FIXED NUMBER OF TIMES (SEE LISTING FOR DETAILS),
EXCEPT FOR TO WHICH IS EXECUTED ONCE ONLY AFTER START OF TEST. WHEN ALL
TESTS HAVE BEEN COMPLETED, THE PROGRAM WILL RING THE TELETYPE
BELL AND RESTART AT THE FIRST TEST OF THE SELECTED GROUP.

IF AN ERROR OCCURS, THE PROGRAM WILL TYPE AN APPROPRIATE
ERROR MESSAGE AND CONTINUE TESTING.

5.1.3.2 WITH SW15=1, PROGRAM ACTION WILL BE AS IN 5.1.3.1 EXCEPT THAT
A HALT WILL OCCUR AFTER ERROR TYPEOUT.

5.1.3.3 WITH SW13=1, PROGRAM ACTION WILL BE AS IN 5.1.3.1 EXCEPT THAT
NO ERROR TYPEOUT WILL OCCUR. THE PC OF THE TEST THAT FAILED
WILL BE DISPLAYED IN THE COMPUTER DATA LIGHTS.

5.1.3.4 THIS PROGRAM WILL NO LONGER TRACE TRAP WITH THIS RELEASE

5.1.3.5 WITH SW10=1, PROGRAM ACTION WILL BE AS IN 5.1.3.1 EXCEPT THAT
AFTER AN ERROR HAS OCCURED, THE PROGRAM WILL IMMEDIATELY
START THE NEXT TEST IN SEQUENCE.

5.2 TEST GROUP 1 SINGLE LINE DM11-BA CABLE AND H317-M PANEL TEST

5.2.1 TEST INITIALIZATION

THE PROGRAM WILL TYPE "SINGLE LINE CABLE TEST
LINE NUMBER-" AND WILL WAIT FOR AN INPUT FROM
THE TELETYPE KEYBOARD.

TYPE A 1 DIGIT OCTAL NUMBER BETWEEN 0 AND 7, CORRESPONDING
TO THE NUMBER OF THE LINE TO BE TESTED, FOLLOWED BY
<RETURN>. THE PROGRAM WILL THEN BEGIN TEST EXECUTION.
IF THE TELETYPE INPUT IS INCORRECT, THE PROGRAM
WILL TYPE "?" AND REPEAT THE MESSAGE.

5.2.2 OPERATIONAL SWITCH SETTINGS

SAME AS 5.1.2

5.2.3 PROGRAM AND/OR OPERATOR ACTION

SAME AS 5.1.3

5.3 TEST GROUP 2 BELL 103A MODEM CONNECT-DISCONNECT TEST

5.3.1 TEST INITIALIZATION

THE PROGRAM WILL TYPE "103A CONNECT-DISCONNECT TEST
ORIGINATE LINE-" AND WAIT FOR AN INPUT FROM THE TELETYPE
KEYBOARD.

TYPE THE NUMBER OF THE LINE THAT WILL ORIGINATE THE
CALL (0-7 OCTAL) FOLLOWED BY RETURN.

THE PROGRAM WILL TYPE "ANSWER LINE-" AND WILL WAIT
FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE THE NUMBER OF THE LINE THAT WILL ANSWER THE CALL
(0-7 OCTAL) FOLLOWED BY <RETURN>.

THE PROGRAM WILL TYPE "DIAL ANSWERING DATA SET"
AND WILL WAIT FOR THE ORIGINATE AND ANSWERING MODEMS
TO GENERATE INTERRUPTS.

5.3.2 OPERATOR ACTION TO MAKE TELEPHONE CONNECTION

AFTER THE MESSAGE 'DIAL ANSWERING DATA SET'' IS TYPED
THE OPERATOR HAS APPROXIMATELY 5 MINUTES TO ESTABLISH
A CONNECTION BETWEEN THE 2 DATA SETS.

5.3.2.1 PLACE ANSWERING DATA SET IN ''AUTO ANSWER'' MODE
5.3.2.2 PLACE ORIGINATING DATA SET IN ''TALK'' MODE

5.3.2.3 DIAL DIAL ANSWERING DATA SET FROM ORIGINATING
DATA SET

5.3.2.4 LISTEN FOR TONE IN HANDSET OF ORIGINATING DATA SET.

WHEN TONE IS HEARD, PRESS ''DATA'' BUTTON ON
ORIGINATING DATA SET.

''DATA'' LIGHT SHOULD ILLUMINATE

5.3.2.5 ''DATA'' LIGHT ON ANSWERING DATA SET SHOULD BE LIT.

5.3.2.6 THE PROGRAM WILL NOW WAIT FOR
INTERRUPTS FROM THE DM11-BA.

5.3.2.7 IF THE CONNECTION HAS BEEN PROPERLY ESTABLISHED,
THE PROGRAM TYPES ''STRIKE ANY TTY KEY TO DISCONNECT''.

WHEN A TTY KEY IS STRUCK, THE PROGRAM WILL BEGIN THE
DISCONNECT SEQUENCE.

5.3.2.8 WHEN THE DISCONNECT SEQUENCE HAS BEEN COMPLETED
THE PROGRAM WILL TYPE ''103A TEST COMPLETE'',
AND WILL REQUEST THE OPERATOR TO SELECT NEW LINES.

5.3.3 PROGRAM ACTION IN CASE OF ERROR

5.3.3.1 RING ON INCORRECT LINE

IF THE PROGRAM DETECTS A RING SIGNAL ON AN INCORRECT
LINE, OR IF ANY OTHER TRANSITION BESIDES RING IS
DETECTED BEFORE RING, THE PROGRAM WILL TYPE
A FATAL ERROR MESSAGE AND REQUEST THE OPERATOR
TO RESELECT LINES AND REDIAL.

5.3.3.2 OTHER ERRORS

IF ANY ERRORS OCCUR AFTER THE FIRST RING HAS BEEN
DETECTED, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR
MESSAGE AND CONTINUE TESTING TO COMPLETION.

THE ONLY EXCEPTION TO THIS IS IF AN INTERRUPT
OCCURS ON A LINE NOT SELECTED, IN WHICH
CASE A FATAL ERROR WILL BE REPORTED, AND THE PROGRAM
WILL PROCEED AS DESCRIBED IN 5.3.3.1

5.3.4 OPERATION SWITCH SETTINGS

SW15=1, HALT ON ERROR
SW13=1, SUPPRESS ERROR TYPEOUT

5.3.5 DATA SET MODE SWITCHING

AFTER THE PROGRAM HAS TYPED THE MESSAGE DESCRIBED IN 5.3.2.7, BUT BEFORE SW01 IS SET, THE OPERATOR MAY SWITCH EITHER DATA SET FROM THE MODE THAT IT IS IN TO ANOTHER MODE.
ALL TRANSITIONS DETECTED AT THIS TIME WILL BE REPORTED.

NOTE: THE ORIGINATE DATA SET MUST BE RETURNED TO ''TALK'' MODE AND THE ANSWERING DATA SET TO ''AUTO ANSWER'' BEFORE DISCONNECT IS STARTED TO PREVENT ERRORS FROM BEING DETECTED THAT ARE CAUSED BY THE FACT THAT THE MODEM IS IN THE INCORRECT STATE.

5.4 TEST GROUP 3 BELL 202C MODEM CONNECT-DISCONNECT TEST

5.4.1 TEST INITIALIZATION

SAME AS 5.3.1 EXCEPT PROGRAM WILL TYPE ''202C CONNECT DISCONNECT TEST''.

5.4.2 OPERATOR ACTION TO MAKE TELEPHONE CONNECTION

SAME AS 5.3.2 EXCEPT AT END OF TEST, PROGRAM WILL TYPE ''202C TEST COMPLETE''.

5.4.3 PROGRAM ACTION IN CASE OF ERRORS

SAME AS 5.3.3

5.4.4 OPERATIONAL SWITCH SETTINGS

SAME AS 5.3.4

5.4.5 DATA SET MODE SWITCHING

SAME AS 5.3.5

5.5 TEST RESELECTION

TO ESCAPE FROM THE TEST IN PROGRESS, AND SELECT A NEW TEST, TYPE <CONTOL C>.

THE PROGRAM WILL STOP EXECUTION OF THE TEST IN PROGRESS AND THEN TYPE ''TEST-'' AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

PROCEED AS DESCRIBED IN 4.2.1.8

5.6 ADDRESS CHANGE

TO CHANGE THE VECTOR AND REGISTER ADDRESS OF THE DM11-BA UNDER TEST, TYPE <CONTROL V>. THE PROGRAM WILL STOP EXECUTION OF THE TEST IN PROGRESS AND PROCEED AS DESCRIBED IN SECTION 4.2.1, EXCEPT THAT "DM11-BA DIAGNOSTIC" WILL NOT BE TYPED.

5.7 LINE NUMBER CHANGE

TO CHANGE THE LINE NUMBER(S) UNDER TEST, TYPE <CONTROL L>. THE PROGRAM WILL SUSPEND THE TEST IN PROGRESS AND RETURN TO THE INITIALIZATION STAGE OF THE SELECTED TEST.

WHEN THE LINE NUMBER(S) HAS BEEN CHANGED, THE PROGRAM WILL RESTART THE SELECTED TEST USING THE NEW LINE NUMBER(S).

5.8 ERROR IN ENTERING DATA

TO ALLOW RE-ENTERING DATA TYPE ^U <CNTL U> BEFORE DEPRESSING <CR> WHEN ENTERING DATA. THIS WILL RESULT IN THE QUESTION BEING RE-ASKED.

5.9 POWER FAILURE

IF A POWER FAIL TRAP OCCURS DURING TEST EXECUTION THE PROGRAM.WILL SAVE THE GENERAL REGISTERS OF THE PROCESSOR AND HALT.

WHEN POWER UP OCCURS, THE PROGRAM WILL TYPE "POWER FAILURE-CURRENT TEST WILL BE RESTARTED".

THE PROGRAM WILL THEN RESUME TEST EXECUTION.

NOTE: IF A TEST IS NOT IN PROGRESS, I.E., IF THE PROGRAM IS WAITING FOR AN INPUT FROM THE TELETYPE KEYBOARD, THE ERROR MESSAGE WILL BE "POWER FAILURE". THE PROGRAM WILL THEN REQUEST THE OPERATOR TO SELECT A TEST.

6.0 ERRORS

6.1 NORMAL OPERATION

IF AN ERROR OCCURS WITH ALL SWITCHES DOWN, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR MESSAGE AND THEN RESUME TESTING.

THERE ARE SEVERAL ERROR MESSAGE FORMATS, AND THE PARTICULAR MESSAGE TYPED DEPENDS UPON THE TEST IN PROGRESS.

6.1.1 ERROR MESSAGES

6.1.1.1 UNIQUE ERROR

ONLY PC OF FAILING TEST IS OUTPUT TO TELEPRINTER

AN EXAMPLE OF THIS TYPE OF ERROR IS:

1. AN INTERRUPT OCCURED AT THE WRONG PRIORITY
2. A REGISTER BIT WAS NOT CLEARED BY RESET

6.1.1.2 TRANSITION DETECTION ERROR

THIS ERROR WILL OCCUR IN ONE OF THE ON-LINE TESTS IF AN EXPECTED INTERRUPT DOES NOT OCCUR, OR IF AN UNEXPECTED INTERRUPT DOES OCCUR, ON THE LINES UNDER TEST.

FORMAT FOR ERROR TYPEOUT IS

```
XXXXXX TRANSITION ERROR
EXP    REC    LINE
AA     BB     CC

WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
      AA=EXPECTED INTERRUPT FLAGS (CORRESPONDS TO 4 MSB OF CONTROL REGISTER
      BB=RECEIVED INTERRUPT FLAGS (AS ABOVE)
      CC=LINE ON WHICH ERROR OCCURED
```

6.1.1.3 SINGLE LINE STATUS ERROR

THIS ERROR WILL OCCUR IN ANY TEST, OFF LINE OR ON-LINE
WHEN THE EXPECTED AND RECEIVED LINE STATUS ARE NOT
THE SAME.

FORMAT FOR SINGLE LINE STATUS ERROR IS
XXXX LINE ERROR
EXP REC LINE
AAA BBB CC

WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
AAA=EXPECTED LINE STATUS AT TIME OF ERROR
BBB=RECEIVED LINE STATUS AT TIME OF ERROR
CC=LINE ON WHICH ERROR OCCURED

6.1.1.4 FATAL TRANSITION ERROR

THIS ERROR WILL OCCUR IN AN ON-LINE TEST IF AN INTERRUPT
OCCURS ON A LINE NOT SELECTED FOR TESTING.

FORMAT FOR FATAL ERROR TYPEOUT IS

XXXXXX FATAL ERROR
CSTAT LSTAT
AAAAAA BBB

WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
AAAAAA=RECEVICED CONTROL STATUS ON LINE THAT INTERRUPTED
BBB=RECEIVED LINE STATUS ON LINE THAT INTERRUPTED

6.1.1.4 CONTROL STATUS ERROR

THIS ERROR WILL OCCUR IN A TEST THAT PRIMARILY
INVOLVES THE LINE SCANNER

FORMAT FOR CONTROL STATUS ERROR IS

XXXXXX STATUS ERROR
EXP REC
AAAAAA BBBBBB

WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
AAAAAA=EXPECTED CONTROL STATUS AT TIME OF ERROR
BBBBBB=RECEIVED(ACTUAL) CONTROL STATUS AT TIME OF ERROR

6.1.1.5 LINE STATUS ERROR

THIS ERROR WILL OCCUR IN THOSE OFF LINE TESTS THAT
SET ONE LINE TO A PARTICULAR STATE, AND THEN CHECK
ALL OTHER LINES

FORMAT FOR LINE STATUS ERROR IS

```
XXXX LINE ERROR
EXP   REC   LINE  SEL
AAA   DDD   CC    DD
```

WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
AAA=EXPECTED LINE STATUS AT TIME OF ERROR
BBB=RECEIVED LINE STATUS AT TIME OF ERROR
CC=LINE ON WHICH ERROR OCCURED
DD=THE LINE ON WHICH THE PROGRAM WAS OPERATING

6.1.2 REPEATED ERRORS

IF THE SAME ERROR OCCURS REPEATEDLY IN A GIVEN TEST
ONLY THE DATA RELATING TO THAT ERROR WILL BE TYPED
IF THE ERROR OCCURS IN THE SAME TEST ON THE SAME PASS

6.2 SCOPE LOOPS

NOTE: SCOPE LOOPING APPLIES ONLY TO TEST GROUPS 0 AND 1

6.2.1 AFTER ERROR HALT

TO LOOP ON A GIVEN TEST AFTER AN ERROR HALT,
SET SW15=0 TO RUN WITHOUT STOPPING
SET SW14=1 TO LOOP ON CURRENT TEST
SET SW13=1 TO SUPPRESS ERROR TYPEOUT
SET SW10=0 (IF IT IS 1)
SET SW09=1 TO LOOP ON SAME DATA (IF REQUIRED)

PRESS CONTINUE
THE PROGRAM WILL LOOP ON THE SAME TEST.

6.2.2 FROM PROGRAM START

6.2.2.1 PROCEED AS DESCRIBED IN 4.2.1.1 TO 4.2.1.4

6.2.2.2 WHEN THE PROGRAM TYPES "TEST-", SET SW14=1 TO LOOP
ON THE TEST THAT WILL BE SELECTED.

6.2.2.3 TYPE IN THE NUMBER OF THE TEST THAT IS TO BE LOOPED
ON (SEE LISTING FOR TEST NUMBER REFERENCE DESIGNATIONS)

6.2.2.4 THE PROGRAM WILL LOOP ON THE SELECTED TEST UNTIL
SW14=0.

6.2.3 AFTER <CONTROL-C>
SAME AS 6.2.2.2 TO 6.2.2.4

7.0 RESTRICTIONS

7.1 STARTING

FOR 8 LINE SCANNER TEST OR SINGLE LINE TEST

THE 54-14700 TEST CONNECTORS MUST BE INSTALLED ON THE M8640 MODULE OR WHEN CONNECTTED TO THE H317-M DISTRIBUTION PANEL H3256 TEST CONNECTORS SHOULD BE INSTALLED IN PLACE OF THE MODEM CABLES.

7.2 OPERATING

NONE.

7.3 WHEN ON ACT-11 OR ''XOR''
PROGRAM WILL DEFAULT TO 8 LINE SCANNER TEST
54-14700 TEST CONNECTOR MUST BE INSTALLED
(OR H317-M WITH H3256 TEST CONNECTORS).

7.4 DEFAULT PARAMETERS (INCLUDING ACT-11 & ''XOR'')

VECTORS

DMBVEC: 540 (AUTOMATICALLY GENERATED
DMBLVL: 542 BY PROGRAM WHEN UNDER ACT-11 OR ''XOR'')

ADDRESSES

DMBCSR: 164200
DMBLSR: 164202

NOTE: SW00(RESELECT ADDRESSES AND VECTORS BECOMES
INOPERATIVE UNDER ACT-11 OR ''XOR''.

8.0 EXECUTION TIME

8.1 16 LINE SCANNER TEST

THE TIME FOR 2 PASSES OF THE 16 LINE SCANNER TEST IS APPROXIMATELY 1.5 MINUTES.

8.2 SINGLE LINE CABLE TEST

THE TIME FOR 12 PASSES OF THE SINGLE LINE CABLE TEST IS APPROXIMATELY 1 MINUTE.

8.3 103A MODEM CONNECT-DISCONNECT TEST

APPROXIMATELY 30 SECONDS WILL ELAPSE BETWEEN THE TIME THAT THE ANSWERING DATA SET FIRST DETECTS A RING SIGNAL TO THE TIME THAT THE PROGRAM TYPES "SET SW01=1 TO DISCONNECT".

APPROXIMATELY 30 SECONDS WILL ELAPSE BETWEEN THE TIME THAT THE PROGRAM TYPES THE ABOVE MESSAGE UNTIL THE TIME THAT THE PROGRAM TYPES "103A TEST COMPLETE".

8.4 202C MODEM CONNECT-DISCONNECT TEST

APPROXIMATELY 1.5 MINUTES WILL ELAPSE BETWEEN THE TIME THAT THE ANSWERING DATA SET DETECTS THE FIRST RING SIGNAL TO THE TIME THAT THE PROGRAM TYPES "SET SW01=1 TO DISCONNECT".

APPROXIMATELY 30 SECONDS WILL ELAPSE BETWEEN THE TIME THAT THE PROGRAM TYPES THE ABOVE MESSAGE UNTIL THE PROGRAM TYPES "202C TEST COMPLETE".

9.0 PROGRAM DESCRIPTION

THIS PROGRAM CONSISTS OF A SERIES OF TEST GROUPS
LINKED BY A SET OF COMMON SERVICE ROUTINES AND A KEYBOARD
MONITOR.

WHEN INITIALLY LOADED AND STARTED ...SW00 MUST BE SET =0, THE PROGRAM WILL
BEGIN A DIALOG WITH THE OPERATOR TO INPUT THE PARAMETERS
REQUIRED BY THE PROGRAM.

WHEN ALL INFORMATION HAS BEEN INPUTTED, THE PROGRAM WILL
REQUEST THE OPERATOR TO SELECT A TEST BY TYPING
THE NUMBER OF THE TEST TO BE RUN. WHEN A CORRECT TEST NUMBER
IS RECEIVED, THE PROGRAM WILL BEGIN EXECUTION OF THE
SELECTED TEST.

AT ANY TIME DURING TEST EXECUTION, THE OPERATOR MAY
CHANGE A TEST PARAMETER BY ENTERING THE APPROPRIATE
COMMAND VIA THE TELETYPE KEYBOARD.

IF AN OFF LINE TEST HAS BEEN SELECTED, THAT TEST WILL
BE REPEATED UNTIL THE OPERATOR INTERVENES.

IF AN ON LINE TEST HAS BEEN SELECTED, THE OPERATOR IS
REQUIRED TO TAKE ACTION EACH TIME THE TEST IS COMPLETED.

AT THE END OF EVERY OFF LINE TEST PASS, THE PROGRAM
WILL RING THE TELETYPE BELL.

AT THE END OF AN ON LINE TEST, A TEST COMPLETE MESSAGE WILL BE
TYPED.

10.0 LISTING
%

```
                        .LIST SEQ,BIN,LOC
                        .TITLE  CZKMGA0 DM11-BA MODEM CONTRL
                        .ENABLE ABS,AMA
                                ;DM11-BA DIAGNOSTIC
                                ;THIS PROGRAM CONTAINS TEST OF THE DM11-BA IN
                                ;THE OFF LINE MODE OF OPERATION ONLY

                                ;SWITCH REGISTER OPTIONS


                                ;SW15=1, HALT ON ERROR
                                ;SW14=1, LOOP ON CURRENT TEST
                                ;SW13=1, SUPPRESS ERROR TYPEOUT
                                ;SW11=1, SUPPRESS ITERATIONS
                                ;SW10=1, ESCAPE TO NEXT TEST ON ERROR
                                ;SW09=1, FREEZE DATA
                                ;SW01=1, START DISCONNECT SEQUENCE
                                ;SW00=0, RESELECT VECTOR AND CONTROL REGISTER ADDRESS
                                        ;AFTER PROGRAM RESTART

                                ;STARTING ADDRESS FOR ALL TESTS IS 000200
                                ;RESTART ADDRESS=000200

                                ;TESTS AVAILABLE

                                ;TEST GROUP 0-
                                ;OFF LINE TESTS USING H861 TEST CONNECTOR-FIRST TEST=0
                                ;TEST GROUP 1-
                                ;OFF LINE TESTS USING DC11 TEST CONNECTOR AND MODEM CABLE-FIRST TEST=100
                                ;TEST GROUP 2-
                                ;CONNECT/DISCONNECT TEST FOR BELL 103A MODEMS-FIRST TEST=200
                                ;TEST GROUP 3-
                                ;CONNECT/DISCONNECT TEST FOR BELL 202C MODEMS-FIRST TEST=300

                        ;SYMBOL DEFINITIONS

100000                  SW15=100000
040000                  SW14=40000
020000                  SW13=20000
010000                  SW12=10000
004000                  SW11=4000
002000                  SW10=2000
001000                  SW09=1000
000400                  SW08=400
000100                  SW06=100

                        .NLIST  MC,MD,CND
                        .LIST   ME


                        ;REGISTER DEFINITIONS

000000                  R0=%0           ;GENERAL REGISTER
000001                  R1=%1           ;GENERAL REGISTER
```

```
                        R2=%2           ;GENERAL REGISTER
                        R3=%3           ;GENERAL REGISTER
                        R4=%4           ;GENERAL REGISTER
                        R5=%5           ;GENERAL REGISTER
                        SP=%6           ;PROCESSOR STACK POINTER
                        PC=%7           ;PROGRAM COUNTER

                        ;LOCATION EQUIVALENCIES

                        PS=177776
                        .EQUIV  PS,PSW
                        RADIX=DIVIS     ;CONVERSION FACTOR FOR DECIMAL OUTPUT
                        BINWRD=DIVIDL   ;WORD TO BE CONVERTED TO OCTAL ASCII
                        DIGIT=DIVIDH    ;ASCII OCTAL DIGIT

                        ;CONTROL STATUS REGISTER BIT FUNCTIONS

                        BUSY=20         ;LINE SCANNER RUNNING
                        SCNENA=40       ;LINE SCANNER ENABLE
                        INTENA=100      ;INTERRUPT ENABLE
                        DONE=200        ;SCANNER DONE
                        STEP=400        ;CAUSES LINE COUNTER TO BE INCREMENTED BY 1 COUNT
                        MAINT=1000      ;FORCES 1S TO INPUT OF SCRATCH PAD MEMORY
                        CLRMUX=2000     ;CLEAR MULTIPLEXER FUNCTION FLIPFLOPS
                        CLRSCN=4000     ;CLEARS SCANNER SCRATCHPAD MEMORY
                        SECRXF=10000    ;SECONDARY RECEIVE TRANSITION WAS DETECTED BY SCANNER
                        CSF=20000       ;CLEAR TO SEND TRANSITION WAS DETECTED BY SCANNER
                        COF=40000       ;CARRIER TRANSITION WAS DETECTED BY SCANNER
                        RINGF=100000    ;RING SIGNAL WAS DETECTED BY SCANNER

                        ;LINE REGISTER BIT FUNCTIONS

                        LINENA=1        ;=1, RECOGNIZE TRANSITIONS ON THIS LINE
                        TRMRDY=2        ;=1, SEND TERMINAL READY TO MODEM
                        RS=4            ;=1, SEND REQUEST TO SEND TO MODEM
                        SECTX=10        ;=1, SEND SECONDARY TRANSMIT TO MODEM
                        SECRX=20        ;=1, SECONDARY RECEIVE TURNED ON BY MODEM
                        CS=40           ;=1, CLEAR TO SEND TURNED ON BY MODEM
                        CO=100          ;=1, CARRIER TURNED ON BY MODEM
                        RING=200        ;=1, RING TURNED ON BY MODEM

                        ;SOFTWARE TRANSITION FLAGS

                        XCO=4           ;CARRIER TRANSITION WAS DETECTED
                        XCS=2           ;CLEAR TO SEND TRANSITION WAS DETECTED
                        XSCRX=1         ;SECONDARY RECEIVE TRANSITION WAS DETECTED

                        ;INSTRUCTION DEFINITIONS

                        PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
                        POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
                        PUSHR0=10046    ;SAVE R0 ON STACK
                        POPR0=12600     ;RESTORE R0 FROM STACK
                        PUSH2SP=24646   ;DECREMENT STACK TWICE
                        POP2SP=22626    ;INCREMENT STACK TWICE
```

```
                                        ;EMT DEFINITION TABLE
                                        
104000                                  ERRORC=EMT+X            ;CONTROL STATUS ERROR SERVICE
104001                                  ERRORL=EMT+X            ;LINE STATUS ERROR SERVICE
104002                                  SCOPE=EMT+X             ;SCOPE LOOP AND ITERATION SERVICE
104003                                  SCOPEF=EMT+X            ;DATA FREEZE SERVICE
104004                                  TYPE=EMT+X              ;TELETYPE OUTPUT
104005                                  SAV05P=EMT+X            ;SAVE R0-R5, PC+2 OF CALL
104006                                  OCTASC=EMT+X            ;CONVERT DATA TO ASCII AND TYPE
104007                                  RES05=EMT+X             ;RESTORE R0-R5
104010                                  CONVERT=EMT+X           ;ASCII CONVERSION ROUTINE
104011                                  EXTRACT=EMT+X           ;DIGIT EXTRACTION ROUTINE
104012                                  ERROR=EMT+X             ;TYPE PC OF FAILING TESTS ONLY
104013                                  INSTRG=EMT+X            ;INPUT OCTAL DATA STRING
104014                                  ERRORT=EMT+X            ;TRANSITION ERROR
104015                                  ERRORS=EMT+X            ;ON LINE STATUS ERROR
104016                                  ERRORN=EMT+X            ;FATAL TRANSITION
104017                                  GETLNS=EMT+X            ;INPUT LINE NUMBERS
104020                                  SETUP=EMT+X             ;SET UP FOR ON LINE TEST
104021                                  CKRING=EMT+X            ;CHECK FOR RING ON CORRERT LINE
104022                                  WAITRN=EMT+X            ;WAIT FOR TRANSITIONS
104023                                  CKTRAN=EMT+X            ;CHECK TRANSITIONS
104024                                  WAITS=EMT+X             ;DELAY FOR TRANSIENTS
104025                                  CNTLUU=EMT+X            ;CHANGE SWREG ROUTINE
104026                                  CKINTT=EMT+X            ;CHECK FOR INTERRUPTS-FLAG STYLE
104027                                  KBDIN=EMT+X             ;FAKE INTERRUPT ENTRY POINT

                                        ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
```

```
                                                H 2
 850
 851                                    ;STANDARD INTERRUPT VECTORS
 852
 853            000024          .=24
 854  000024    015346                 PFAIL                ;POWER FAIL HANDLER
 855  000026    000340                 340                  ;SERVICE AT LEVEL 7
 856  000030    013350                 EMTSRV               ;EMT DISPATCH SERVICE
 857  000032    000340                 340                  ;SERVICE AT LEVEL 7
 858
 859            000060          .=60
 860  000060    001732                 KBDINT               ;KEYBOARD MONITOR
 861  000062    000340                 340                  ;SERVICE AT LEVEL 7
 862
 863
 864            000174          .=174
 865  000174    000000                 DISPREG:0
 866  000176    000000                 SWREG:  0
 867
 868            000200          .=200
 869  000200    000137  001100         JMP     START        ;GO TO START OF PROGRAM
 870
 871
 872
 873
 874
```

```
                        001100                          .=1100
001100                                                  STACK:
001100  012737  015346  000024                  START:  MOV     #PFAIL,24               ;SET UP POWER FAIL
                                                                                        ;INTERRUPT SERVICE VECTOR
001106  005037  001730                                  CLR     TIPFLG                  ;CLEAR TEST IN PROGRESS FLAG
001112  005077  014642                                  CLR     @TKCSR
001116  012706  001100                                  MOV     #STACK,SP               ;SET UP STACK POINTER
001122  013746  000006                          SUSWR:  MOV     @#6,-(SP)               ;SAVE VECTORS
001126  013746  000004                                  MOV     @#4,-(SP)
001132  012737  001152  000004                          MOV     #1$,@#4                 ;SET UP FOR TIMEOUT
001140  022777  177777  014622                          CMP     #-1,@SWR                ;REFERENCE HARDWARE SWITCH REGISTER
001146  001402                                          BEQ     2$
001150  000407                                          BR      3$
001152  022626                                  1$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
001154  012737  000176  015770                  2$:     MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REG
001162  012737  000174  015772                          MOV     #DISPREG,DISPLAY                ;POINT TO SOFT DISPLAY REG
001170  012637  000004                          3$:     MOV     (SP)+,@#4               ;RESTORE VECTORS
001174  012637  000006                                  MOV     (SP)+,@#6
001200  005037  001242                                  CLR     XFLAG   ;XOR = NO
001204  013746  000004                                  MOV     4,-(SP) ;SAVE 4
001210  012737  001246  000004                          MOV     #XORSVC,4       ;SET UP SVC ROUTINE
001216  005737  177060                                  TST     177060  ;GOT AN XOR TESTER OUT THERE ?
001222  012637  000004                                  MOV     (SP)+,4 ;YES
001226  005137  001242                                  COM     XFLAG   ;XOR = YES
001232  004737  015470                                  JSR     PC,XOR          ;AUTO VECTOR
001236  000137  001254                                  JMP     START0          ;RESTORE TRAPCATCHER
001242  000000                                  XFLAG:  0                       ;XOR FLAG
001244  000000                                  FST:    0
001246  022626                                  XORSVC: POP2SP
001250  012637  000004                                  MOV     (SP)+,4 ;RESTORE 4
001254  005737  016060                          START0: TST     TIFLG                   ;TYPED TITLE?
001260  001005                                          BNE     .+14                    ;YES
001262  104004                                          TYPE                            ;TYPE 'DM11-BA DIAGNOSTIC'
001264  016645                                          MTITLE
001266  012737  000001  016060                          MOV     #1,TIFLG                ;SET TITLE TYPED FLAG
001274  005737  001242                                  TST     XFLAG                   ;X OR ?
001300  100417                                          BMI     VECSTR                  ;RESTORE TRAPCATCHER
001302  005737  000042                                  TST     42              ;ACT 11?
001306  001403                                          BEQ     START1          ;NO
001310  004737  015470                                  JSR     PC,XOR          ;YES  AUTO VECTOR
001314  000411                                          BR      VECSTR                  ;GET VECTOR AND REGISTER ADDRESS
001316  022737  000176  015770  START1: CMP     #SWREG,SWR
001324  001001                                          BNE     1$
001326  104025                                          CNTLUU
001330  032777  000001  014432  1$:     BIT     #1,@SWR
001336  001103                                          BNE     STARTN
001340  012706  001100                          VECSTR: MOV     #STACK,SP               ;SET UP PROCESSOR STACK POINTER
001344  012737  000300  013274                          MOV     #300,DATA1              ;ADDRESS OF FIRST FLOATING VECTOR
001352  012737  000302  013276                          MOV     #302,DATA2              ;ADDRESS OF STATUS WORD
001360  013777  013276  011706  VECSTA: MOV     DATA2,@DATA1            ;MOVE ADDRESS OF STATUS WORD TO VECTOR
001366  005077  011704                                  CLR     @DATA2                  ;CLEAR STATUS WORD
                                                                                        ;(FOR HALT ON ILLEGAL INTERRUPT)
001372  062737  000004  013274                          ADD     #4,DATA1                ;NEXT VECTOR
001400  062737  000004  013276                          ADD     #4,DATA2                ;NEXT STATUS WORD
001406  023727  013274  001000                          CMP     DATA1,#1000             ;IS TABLE CLEARED
```

```
                                                                J 2
  931  001414  001361                          BNE     VECSTA                  ;IF NOT, CONTINUE
  932  001416  005737  001242                   TST     XFLAG           ;XOR ?
  933  001422  100516                          BMI     TSTGO           ;YES
  934  001424  005737  000042                   TST     42              ;ACT 11 ?
  935  001430  001113                          BNE     TSTGO           ;YES
  936  001432  104013                          INSTRG                  ;GET VECTOR ADDRESS
  937  001434  017422                          MVECTOR                 ;MESSAGE 'VECTOR ADDRESS-''
  938  001436  000100                          100                     ;LOWER LIMIT FOR ADDRESS
  939  001440  000774                          774                     ;UPPER LIMIT FOR ADDRESS
  940  001442  015750                          DMBVEC                  ;STORAGE FOR ADDRESS
  941  001444  032737  000003  015750  1$:     BIT     #3,DMBVEC               ;TEST 2 LSB OF ADDRESS
  942  001452  001404                          BEQ     VECST1                  ;IF 0, CONTINUE
  943  001454  012716  001444                  MOV     #1$,(SP)
  944  001460  000137  015176                  JMP     INSTER                  ;INCORRECT ADDRESS, TRY AGAIN
  945  001464  013737  015750  015752  VECST1: MOV     DMBVEC,DMBLVL           ;GENERATE ADDRESS OF
  946  001472  062737  000002  015752          ADD     #2,DMBLVL               ;INTERRUPT STATUS WORD
  947  001500  104013                          INSTRG                  ;GET ADDRESS OF CONTROL REGISTER
  948  001502  017444                          MREGAD                  ;MESSAGE 'REGISTER ADDRESS-''
  949  001504  160000                          160000                  ;LOWER LIMIT FOR ADDRESS
  950  001506  176000                          176000                  ;UPPER LIMIT FOR ADDRESS
  951  001510  015754                          DMBCSR                  ;STORAGE FOR ADDRESS
  952  001512  032737  000007  015754  1$:     BIT     #7,DMBCSR               ;IF 3 LSB ARE NOT 0
  953  001520  001404                          BEQ     REGST1
  954  001522  012716  001512                  MOV     #1$,(SP)
  955  001526  000137  015176                  JMP     INSTER                  ;INCORRECT ADDRESS, TRY AGAIN
  956  001532  013737  015754  015756  REGST1: MOV     DMBCSR,DMBLSR           ;SET UP ADDRESS OF LINE STATUS REGISTER
  957  001540  062737  000002  015756          ADD     #2,DMBLSR
```

```
                    
001546  012706  001100          STARTN: MOV     #STACK,SP               ;SET UP PROCESSOR STACK
001552  104013                          INSTRG                          ;GET TEST NUMBER
001554  017500                          MTEST                           ;MESSAGE 'TEST-'
001556  000000                          0                               ;LOWER LIMIT FOR TEST NUMBER
001560  000777                          777                             ;UPPER LIMIT FOR TEST NUMBER
001562  016002                          TSTNO                           ;STORAGE FOR TEST NUMBER
001564  013705  016002          X1A:    MOV     TSTNO,R5                ;GET TEST NUMBER
001570  042705  177077                  BIC     #177077,R5              ;EXTRACT TEST GROUP NUMBER
001574  006205                          ASR     R5
001576  006205                          ASR     R5
001600  006205                          ASR     R5
001602  006205                          ASR     R5
001604  006205                          ASR     R5
001606  016537  020236  016036        MOV     GR0(R5),TSTMAX          ;GET HIGHEST TEST IN GROUP
001614  016537  020216  016034        MOV     TSTLST(R5),TSTPNT       ;GET POINTER TO TEST TABLE
001622  005737  016034                TST     TSTPNT                  ;IF 0, INVALID TEST GROUP
001626  001004                        BNE     STRT0A
001630  012716  001564          X1B:    MOV     #X1A,(SP)
001634  000137  015176                  JMP     INSTER                  ;TRY AGAIN
001640  042737  177700  016002  STRT0A: BIC     #177700,TSTNO           ;GET NUMBER OF FIRST TEST
                                                                        ;TO BE EXECUTED IN SELECTED GROUP
001646  023737  016002  016036        CMP     TSTNO,TSTMAX            ;IS NUMBER TOO LARGE
001654  003401                        BLE     TSTGO
001656  000764                        BR      X1B
001660  012746  000340          TSTGO:  MOV     #340,-(SP)              ;SET UP PRIORITY LEVEL
001664  005746                        PUSH1SP
001666  000005                        RESET
001670  012737  002146  002150        MOV     #DMYRTI,KRET            ;SET UP DUMMY KEYBOARD RETURN
001676  005037  016040                CLR     LINFLG                  ;CLEAR LINE SELECTED FLAG
001702  005037  015776                CLR     TRACON                  ;CLEAR TRACE TRAP FLAG
001706  005037  016000                CLR     PASCNT                  ;CLEAR PASS COUNT
001712  104004                        TYPE
001714  017514                        MCRLF
001716  012737  000001  001730  1$:   MOV     #1,TIPFLG               ;SET TEST IN PROGRESS FLAG
001724  000137  013564                JMP     TSTENT                  ;START TESTING
001730  000000          TIPFLG: 0
```

```
                                                ;TELETYPE KEYBOARD INTERRUPT SERVICE ROUTINE

001732  005037  001730          KBDINT: CLR     TIPFLG                  ;CLEAR TEST IN PROGRESS FLAG
001736  005037  014504                  CLR     TMP1
001742  005037  002152                  CLR     SINTFL                  ;CLEAR SOFTWARE INTERRUPT FLAG
001746  117737  014010  014504          MOVB    @TKDBR,TMP1
001754  142737  000200  014504          BICB    #200,TMP1
001762  122737  000003  014504          CMPB    #3,TMP1         ;IF <CONTROL C> WAS TYPED
001770  001011                          BNE     KBDIN1                  ;TYPE "^C" AND
001772  104004                          TYPE                            ;SELECT NEW TEST
001774  017744                          MCONTC
001776  022626                          POP2SP
002000  005077  013750                  CLR     @DMBCSR
002004  005077  013750                  CLR     @TKCSR
002010  000137  001546                  JMP     STARTN
002014  122737  000026  014504  KBDIN1: CMPB    #26,TMP1                ;IF <CONTROL V> WAS TYPED
002022  001011                          BNE     KBDIN2                  ;TYPE "^V" AND GET NEW
002024  104004                          TYPE                            ;VECTOR AND REGISTER ADDRESS
002026  017747                          MCONTV
002030  022626                          POP2SP
002032  005077  013716                  CLR     @DMBCSR
002036  005077  013716                  CLR     @TKCSR
002042  000137  001340                  JMP     VECSTR
002046  122737  000014  014504  KBDIN2: CMPB    #14,TMP1                ;IF <CONTROL L> WAS TYPED
002054  001015                          BNE     KBDIN3                  ;TYPE "^L" AND GET NEW
002056  104004                          TYPE                            ;LINE NUMBERS, UNLESS
002060  017752                          MCONTL                          ;TEST GROUP 0 WAS IN PROGRESS
002062  022737  002146  002150          CMP     #DMYRTI,KRET            ;IF <CONTROL L> WAS TYPED IN TEST
002070  001426                          BEQ     DMYRTI                  ;GROUP 0, IGNORE
002072  022626                          POP2SP
002074  005077  013654                  CLR     @DMBCSR
002100  005077  013654                  CLR     @TKCSR
002104  000177  000040                  JMP     @KRET
002110  022737  000176  015770  KBDIN3: CMP     #SWREG,SWR
002116  001005                          BNE     1$
002120  122737  000007  014504          CMPB    #7,TMP1
002126  001001                          BNE     1$
002130  104025                          CNTLUU
002132  012737  000001  002152  1$:     MOV     #1,SINTFL               ;SET SOFTWARE INTERRUPT FLAG
002140  012737  000001  001730          MOV     #1,TIPFLG               ;SET TEST IN PROGRESS FLAG
002146  000002                  DMYRTI: RTI
                                .EVEN
002150  000000                  KRET:   0
002152  000000                  SINTFL: 0
```

```
                                        ;INITIALIZATION CHECK - PERFORMED ONLY AT PROGRAM START
                                        ;VERIFY THAT CONTROL STATUS REGISTER AND LINE STATUS
                                        ;REGISTER WERE CLEARED BY INITIALIZE

002154                          T0:                                     ;REFERENCE DESIGNATION
002154  104004                         TYPE                            ;TYPE "8 LINE SCANNER TEST"
002156  016613                         M16
002160  005777  013570          INIT1: TST     @DMBCSR                  ;TEST CONTROL STATUS REGISTER
002164  001401                         BEQ     .+4
002166  104012                         ERROR                           ;CONTROL STATUS NOT CLEARED, ERROR
002170  005777  013562                 TST     @DMBLSR                 ;TEST LINE STATUS REGISTER
002174  001401                         BEQ     .+4
002176  104012                         ERROR                           ;LINE STATUS NOT CLEARED, ERROR
002200  104002                         SCOPE                           ;CHECK FOR LOOP

                                        ;VERIFY THAT "INTERRUPT ENABLE" CAN BE
                                        ;SET AND CLEARED.

002202                          T1:                                     ;REFERENCE DESIGNATION
002202  012777  000100  013544  CSTR1: MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
002210  032777  000100  013536         BIT     #INTENA,@DMBCSR         ;WAS INTERRUPT ENABLE SET
002216  001001                         BNE     .+4
002220  104012                         ERROR                           ;NO, ERROR
002222  042777  000100  013524         BIC     #INTENA,@DMBCSR         ;CLEAR INTERRUPT ENABLE
002230  032777  000100  013516         BIT     #INTENA,@DMBCSR         ;WAS INTERRUPT ENABLE CLEARED
002236  001401                         BEQ     .+4
002240  104012                         ERROR                           ;NO, ERROR
002242  104002                         SCOPE                           ;CHECK FOR ITERATIONS, LOOP

                                        ;VERIFY THAT "DONE" CAN BE SET AND CLEARED

002244                          T2:                                     ;REFERENCE DESIGNATION
002244  012777  000200  013502  CSTR2: MOV     #DONE,@DMBCSR           ;SET DONE
002252  032777  000200  013474         BIT     #DONE,@DMBCSR           ;WAS DONE SET
002260  001001                         BNE     .+4
002262  104012                         ERROR                           ;NO, ERROR
002264  042777  000200  013462         BIC     #DONE,@DMBCSR           ;CLEAR DONE
002272  032777  000200  013454         BIT     #DONE,@DMBCSR           ;WAS DONE CLEARED
002300  001401                         BEQ     .+4
002302  104012                         ERROR                           ;NO, ERROR
002304  104002                         SCOPE                           ;CHECK FOR ITERATIONS, LOOP

                                        ;VERIFY "MAINTENANCE MODE" CAN BE SET AND CLEARED

002306                          T3:                                     ;REFERENCE DESIGNATION
002306  012777  001000  013440  CSTR3: MOV     #MAINT,@DMBCSR          ;SET MAINTENANCE MODE
002314  032777  001000  013432         BIT     #MAINT,@DMBCSR          ;WAS MAINTENANCE MODE SET
002322  001001                         BNE     .+4
002324  104012                         ERROR                           ;NO, ERROR
002326  042777  001000  013420         BIC     #MAINT,@DMBCSR          ;CLEAR MAINTENANCE MODE
002334  032777  001000  013412         BIT     #MAINT,@DMBCSR          ;WAS MAINTENANCE MODE CLEARED
002342  001401                         BEQ     .+4
002344  104012                         ERROR                           ;NO, ERROR
002346  104002                         SCOPE                           ;CHECK FOR ITERATIONS, LOOP

                                        ;VERIFY THAT "SCAN ENABLE" CAN BE SET AND CLEARED.
```

```
1096
1097  002350                                  T4:                                     ;REFERENCE DESIGNATION
1098  002350  012777  000040  013376  CSTR4:  MOV     #SCNENA,@DMBCSR                 ;SET SCAN ENABLE
1099  002356  032777  000040  013370          BIT     #SCNENA,@DMBCSR                 ;WAS SCAN ENABLE SET
1100  002364  001001                          BNE     .+4
1101
1102  002366  104012                          ERROR                                   ;NO, ERROR
1103  002370  042777  000040  013356          BIC     #SCNENA,@DMBCSR                 ;CLEAR SCAN ENABLE
1104  002376  032777  000040  013350          BIT     #SCNENA,@DMBCSR                 ;WAS SCAN ENABLE CLEARED
1105  002404  001401                          BEQ     .+4
1106
1107  002406  104012                          ERROR                                   ;NO, ERROR
1108  002410  104002                          SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
1109
1110                                          ;VERIFY THAT "BUSY" IS SET WHEN "SCAN ENABLE" IS SET
1111                                          ;VERIFY THAT "BUSY" IS CLEARED WHEN "SCAN ENABLE" IS CLEARED
1112
1113  002412                                  T5:                                     ;REFERENCE DESIGNATION
1114  002412  012777  000040  013334  CSTR5:  MOV     #SCNENA,@DMBCSR                 ;SET SCAN ENABLE
1115  002420  032777  000020  013326          BIT     #BUSY,@DMBCSR                   ;IS BUSY BIT SET
1116  002426  001001                          BNE     .+4
1117  002430  104012                          ERROR                                   ;BUSY NOT SET, ERROR
1118  002432  042777  000040  013314          BIC     #SCNENA,@DMBCSR                 ;CLEAR SCAN ENABLE
1119  002440  032777  000020  013306          BIT     #BUSY,@DMBCSR                   ;IS BUSY BIT CLEARED
1120  002446  001401                          BEQ     .+4
1121  002450  104012                          ERROR                                   ;BUSY NOT CLEARED, ERROR
1122  002452  104002                          SCOPE                                   ;CHECK FOR LOOP, ITERATIONS
1123
1124                                          ;VERIFY THAT SETTING "DONE" DOES NOT CCAUSE AN
1125                                          ;INTERRUPT IF "INTERRUPT ENABLE" IS CLEARED.
1126
1127  002454                                  T6:                                     ;REFERENCE DESIGNATION
1128  002454  052737  000340  177776  INT1:   BIS     #340,PS                         ;LOCK OUT INTERRUPTS
1129  002462  005077  013266                  CLR     @DMBCSR                         ;CLEAR CONTROL REGISTER
1130  002466  012777  002522  013254          MOV     #INT1A,@DMBVEC                  ;SET UP INTERRUPT SERVICE ADDRESS
1131  002474  013777  177776  013250          MOV     PS,@DMBLVL                      ;SET UP INTERRUPT PRIORITY
1132  002502  052777  000200  013244          BIS     #DONE,@DMBCSR                   ;SET DONE
1133  002510  042737  000340  177776          BIC     #340,PS                         ;ALLOW INTERRUPTS
1134  002516  000240                          NOP                                     ;DELAY FOR INTERRUPT
1135  002520  000402                          BR      INT1B                           ;NO INTERRUPT, CONTINUE
1136  002522  022626                  INT1A:  POP2SP                                  ;RESTORE STACK, INTERRUPT
1137  002524  104012                          ERROR                                   ;OCCURED, ERROR
1138  002526  104002                  INT1B:  SCOPE                                   ;CHECK FOR LOOP, ITERATIONS
1139
1140                                          ;VERIFY THAT NO INTERRUPT OCCURS WITH "INTERRUPT ENABLE"
1141                                          ;SET AND "DONE" CLEARED.
1142
1143  002530                                  T7:                                     ;REFERENCE DESIGNATION
1144  002530  052737  000340  177776  INT2:   BIS     #340,PS                         ;LOCK OUT INTERRUPTS
1145  002536  005077  013212                  CLR     @DMBCSR                         ;CLEAR CONTROL REGISTER
1146  002542  012777  002576  013200          MOV     #INT2A,@DMBVEC                  ;SET UP INTERRUPT SERVICE ADDRESS
1147  002550  013777  177776  013174          MOV     PS,@DMBLVL                      ;SET UP INTERRUPT SERVICE LEVEL
1148  002556  052777  000100  013170          BIS     #INTENA,@DMBCSR                 ;SET INTERRUPT ENABLE
1149  002564  042737  000340  177776          BIC     #340,PS                         ;ALLOW INTERRUPTS
1150  002572  000240                          NOP                                     ;DELAY FOR INTERRUPTS
1151  002574  000402                          BR      INT2B                           ;NO INTERRUPT, CONTINUE
```

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1152  002576  022626                    INT2A:  POP2SP                          ;RESTORE STACK
1153  002600  104012                            ERROR                           ;INTERRUPT OCCURED, ERROR
1154  002602  104002                    INT2B:  SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1155
1156                                              ;VERIFY THAT SETTING "DONE" CAUSES AN INTERRUPT
1157                                              ;WITH "INTERRUPT ENABLE" SET
1158
1159  002604                            T10:                                    ;REFERENCE DESIGNATION
1160  002604  052737  000340  177776    INT3:   BIS     #340,PS                 ;LOCK OUT INTERRUPTS
1161  002612  005077  013136                    CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1162  002616  012777  002670  013124            MOV     #INT3A,@DMBVEC          ;SET UP INTERRUPT SERVICE ADDRESS
1163  002624  012777  000100  013122            MOV     #INTENA,@DMBCSR         ;SET "INTERRUPT ENABLE"
1164  002632  013777  177776  013112            MOV     PS,@DMBLVL              ;SET "INTERRUPT LEVEL"
1165  002640  042737  000340  177776            BIC     #340,PS                 ;ALLOW INTERRUPTS
1166  002646  052777  000200  013100            BIS     #DONE,@DMBCSR           ;SET "DONE"
1167  002654  000240                            NOP                             ;DELAY FOR INTERRUPT
1168  002656  000240                            NOP
1169  002660  005077  013070                    CLR     @DMBCSR
1170  002664  104012                            ERROR                           ;INTERRUPT OCCURED, ERROR
1171  002666  000401                            BR      INT3B                   ;CONTINUE
1172  002670  022626                    INT3A:  POP2SP                          ;INTERRUPT OCCURED, RESTOR STACK
1173  002672  104002                    INT3B:  SCOPE                           ;CHECK FOR ITERATION, LOOP
1174
1175
1176                                              ;VERIFY THAT NO INTERRUPT OCCURS WITH
1177                                              ;"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 7.
1178  002674                            T11:                                    ;REFERENCE DESIGNATION
1179  002674  005077  013054            INT4:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1180  002700  042737  000340  177776            BIC     #340,PS                 ;SET PROCESSOR PRIORITY
1181  002706  052737  000340  177776            BIS     #340,PS                 ;TO LEVEL 7.
1182  002714  012777  002756  013026            MOV     #INT4A,@DMBVEC          ;SET UP INTERRUPT SERVICE ADDRESS
1183  002722  013777  177776  013022            MOV     PS,@DMBLVL              ;SET UP INTERRUPT SERVICE LEVEL
1184  002730  012777  000100  013016            MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
1185  002736  052777  000200  013010            BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
1186  002744  000240                            NOP                             ;DELAY FOR INTERRUPT
1187  002746  000240                            NOP
1188  002750  005077  013000                    CLR     @DMBCSR
1189  002754  000402                            BR      INT4B                   ;NO INTERRUPT, CONTINUE
1190  002756  022626                    INT4A:  POP2SP                          ;RESTORE STACK
1191  002760  104012                            ERROR                           ;INTERRUPT OCCURED, ERROR
1192  002762  104002                    INT4B:  SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
1193
1194                                                    ;VERIFY THAT NO INTERRUPT OCCURS WITH
1195                                                    ;"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 6.
1196  002764                                    T12:                                    ;REFERENCE DESIGNATION
1197  002764  005077  012764                  INT5:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1198  002770  042737  000340  177776                  BIC     #340,PS                 ;SET PROCESSOR PRIORITY
1199  002776  052737  000300  177776                  BIS     #300,PS                 ;TO LEVEL 6.
1200  003004  012777  003046  012736                  MOV     #INT5A,@DMBVEC          ;SET UP INTERRUPT SERVICE ADDRESS
1201  003012  013777  177776  012732                  MOV     PS,@DMBLVL              ;SET UP INTERRUPT SERVICE LEVEL
1202  003020  012777  000100  012726                  MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
1203  003026  052777  000200  012720                  BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
1204  003034  000240                                  NOP                             ;DELAY FOR INTERRUPT
1205  003036  000240                                  NOP
1206  003040  005077  012710                          CLR     @DMBCSR
1207  003044  000402                                  BR      INT5B                   ;NO INTERRUPT, CONTINUE
1208  003046  022626                          INT5A:  POP2SP                          ;RESTORE STACK
1209  003050  104012                                  ERROR                           ;INTERRUPT OCCURED, ERROR
1210  003052  104002                          INT5B:  SCOPE                           ;CHECK FOR ITERATION, LOOP
1211
1212                                                    ;VERIFY THAT NO INTERRUPT OCCURS WITH
1213                                                    ;"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 5.
1214  003054                                    T13:                                    ;REFERENCE DESIGNATION
1215  003054  005077  012674                  INT6:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1216  003060  042737  000340  177776                  BIC     #340,PS                 ;SET PROCESSOR PRIORITY
1217  003066  052737  000240  177776                  BIS     #240,PS                 ;TO LEVEL 5.
1218  003074  012777  003136  012646                  MOV     #INT6A,@DMBVEC          ;SET UP INTERRUPT SERVICE ADDRESS
1219  003102  013777  177776  012642                  MOV     PS,@DMBLVL              ;SET UP INTERRUPT SERVICE LEVEL
1220  003110  012777  000100  012636                  MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
1221  003116  052777  000200  012630                  BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
1222  003124  000240                                  NOP                             ;DELAY FOR INTERRUPT
1223  003126  000240                                  NOP
1224  003130  005077  012620                          CLR     @DMBCSR
1225  003134  000402                                  BR      INT6B                   ;NO INTERRUPT, CONTINUE
1226  003136  022626                          INT6A:  POP2SP                          ;RESTORE STACK
1227  003140  104012                                  ERROR                           ;INTERRUPT OCCURED, ERROR
1228  003142  104002                          INT6B:  SCOPE                           ;CHECK FOR ITERATION, LOOP
1229
1230                                                    ;VERIFY THAT NO INTERRUPT OCCURS WITH
1231                                                    ;"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 4.
1232  003144                                    T14:                                    ;REFERENCE DESIGNATION
1233  003144  005077  012604                  INT7:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1234  003150  042737  000340  177776                  BIC     #340,PS                 ;SET PROCESSOR PRIORITY
1235  003156  052737  000200  177776                  BIS     #200,PS                 ;TO LEVEL 4.
1236  003164  012777  003226  012556                  MOV     #INT7A,@DMBVEC          ;SET UP INTERRUPT SERVICE ADDRESS
1237  003172  013777  177776  012552                  MOV     PS,@DMBLVL              ;SET UP INTERRUPT SERVICE LEVEL
1238  003200  012777  000100  012546                  MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
1239  003206  052777  000200  012540                  BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
1240  003214  000240                                  NOP                             ;DELAY FOR INTERRUPT
1241  003216  000240                                  NOP
1242  003220  005077  012530                          CLR     @DMBCSR
1243  003224  000402                                  BR      INT7B                   ;NO INTFRRUPT, CONTINUE
1244  003226  022626                          INT7A:  POP2SP                          ;RESTORE STACK
1245  003230  104012                                  ERROR                           ;INTERRUPT OCCURED, ERROR
1246  003232  104002                          INT7B:  SCOPE                           ;CHECK FOR ITERATION, LOOP
```

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                                                ;VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                                ;ENABLE" SET AND "DONE" SET AT PRIORITY 0.
003234                                  T15:                                    ;REFERENCE DESIGNATION
003234  005077  012514                  INT10:  CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
003240  042737  000340  177776                  BIC     #340,PS                 ;ALLOW INTERRUPTS
003246  012777  003316  012474                  MOV     #INT10A,@DMBVEC         ;SET UP INTERRUPT SERVICE ADDRESS
003254  005077  012472                          CLR     @DMBLVL                 ;SET UP INTERRUPT SERVICE PRIORITY
003260  052737  000000  177776                  BIS     #0,PS                   ;SET PROCESSOR PRIORITY TO LEVEL 0.
003266  012777  000100  012460                  MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
003274  052777  000200  012452                  BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
003302  000240                                  NOP                             ;WAIT FOR INTERRUPT
003304  000240                                  NOP
003306  005077  012442                          CLR     @DMBCSR
003312  104012                                  ERROR                           ;NO INTERRUPT, ERROR
003314  000401                                  BR      INT10B                  ;CONTINUE
003316  022626                  INT10A: POP2SP                                  ;INTERRUPT OCCURED, RESTORE STACK
003320  104002                  INT10B: SCOPE                                   ;CHECK FOR INTERATIONS, LOOP.

                                                ;VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                                ;ENABLE" SET AND "DONE" SET AT PRIORITY 1.
003322                                  T16:                                    ;REFERENCE DESIGNATION
003322  005077  012426                  INT11:  CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
003326  042737  000340  177776                  BIC     #340,PS                 ;ALLOW INTERRUPTS
003334  012777  003404  012406                  MOV     #INT11A,@DMBVEC         ;SET UP INTERRUPT SERVICE ADDRESS
003342  005077  012404                          CLR     @DMBLVL                 ;SET UP INTERRUPT SERVICE PRIORITY
003346  052737  000040  177776                  BIS     #40,PS                  ;SET PROCESSOR PRIORITY TO LEVEL 1.
003354  012777  000100  012372                  MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
003362  052777  000200  012364                  BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
003370  000240                                  NOP                             ;WAIT FOR INTERRUPT
003372  000240                                  NOP
003374  005077  012354                          CLR     @DMBCSR
003400  104012                                  ERROR                           ;NO INTERRUPT, ERROR
003402  000401                                  BR      INT11B                  ;CONTINUE
003404  022626                  INT11A: POP2SP                                  ;INTERRUPT OCCURED, RESTORE STACK
003406  104002                  INT11B: SCOPE                                   ;CHECK FOR INTERATIONS, LOOP.

                                                ;VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                                ;ENABLE" SET AND "DONE" SET AT PRIORITY 2.
003410                                  T17:                                    ;REFERENCE DESIGNATION
003410  005077  012340                  INT12:  CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
003414  042737  000340  177776                  BIC     #340,PS                 ;ALLOW INTERRUPTS
003422  012777  003472  012320                  MOV     #INT12A,@DMBVEC         ;SET UP INTERRUPT SERVICE ADDRESS
003430  005077  012316                          CLR     @DMBLVL                 ;SET UP INTERRUPT SERVICE PRIORITY
003434  052737  000100  177776                  BIS     #100,PS                 ;SET PROCESSOR PRIORITY TO LEVEL 2.
003442  012777  000100  012304                  MOV     #INTENA,@DMBCSR         ;SET INTERRUPT ENABLE
003450  052777  000200  012276                  BIS     #DONE,@DMBCSR           ;GENERATE INTERRUPT
003456  000240                                  NOP                             ;WAIT FOR INTERRUPT
003460  000240                                  NOP
003462  005077  012266                          CLR     @DMBCSR
003466  104012                                  ERROR                           ;NO INTERRUPT, ERROR
003470  000401                                  BR      INT12B                  ;CONTINUE
003472  022626                  INT12A: POP2SP                                  ;INTERRUPT OCCURED, RESTORE STACK
003474  104002                  INT12B: SCOPE                                   ;CHECK FOR INTERATIONS, LOOP.
```

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1302
1303                                            ;VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
1304                                            ;ENABLE'' SET AND ''DONE'' SET AT PRIORITY 3.
1305  003476                            T20.                                  ;REFERENCE DESIGNATION
1306  003476  005077  012252            INT13:  CLR     @DMBCSR               ;CLEAR CONTROL REGISTER
1307  003502  042737  000340  177776            BIC     #340,PS               ;ALLOW INTERRUPTS
1308  003510  012777  003560  012232            MOV     #INT13A,@DMBVEC       ;SET UP INTERRUPT SERVICE ADDRESS
1309  003516  005077  012230                    CLR     @DMBLVL               ;SET UP INTERRUPT SERVICE PRIORITY
1310  003522  052737  000140  177776            BIS     #140,PS               ;SET PROCESSOR PRIORITY TO LEVEL 3.
1311  003530  012777  000100  012216            MOV     #INTENA,@DMBCSR       ;SET INTERRUPT ENABLE
1312  003536  052777  000200  012210            BIS     #DONE,@DMBCSR         ;GENERATE INTERRUPT
1313  003544  000240                            NOP                           ;WAIT FOR INTERRUPT
1314  003546  000240                            NOP
1315  003550  005077  012200                    CLR     @DMBCSR
1316  003554  104012                            ERROR                         ;NO INTERRUPT, ERROR
1317  003556  000401                            BR      INT13B                ;CONTINUE
1318  003560  022626                    INT13A: POP2SP                        ;INTERRUPT OCCURED, RESTORE STACK
1319  003562  104002                    INT13B: SCOPE                         ;CHECK FOR INTERATIONS, LOOP.
1320
1321                                            ;VERIFY THAT ALL LINE NUMBERS CAN BE WRITTEN INTO AND
1322                                            ;READ BACK FROM LINE COUNTER
1323
1324  003564                            T21:                                  ;REFERENCE DESIGNATION
1325  003564  005077  012164            LINT1:  CLR     @DMBCSR               ;CLEAR CONTROL STATUS REGISTER
1326  003570  042737  000340  177776            BIC     #340,PS               ;ENABLE INTERRUPTS
1327  003576  005005                            CLR     R5                    ;CLEAR EXPECTED LINE NUMBER
1328  003600  012700  000010                    MOV     #8.,R0                ;SET UP TO TEST 8 LINE NUMBERS
1329  003604  010577  012144            LINT1A: MOV     R5,@DMBCSR            ;SET LINE NUMBER
1330  003610  017704  012140                    MOV     @DMBCSR,R4            ;READ BACK LINE NUMBER
1331  003614  020504                            CMP     R5,R4                 ;ARE EXPECTED AND RECEIVED
1332  003616  001401                            BEQ     LINT1B                ;LINE NUBMERS THE SAME
1333  003620  104000                            ERRORC                        ;LINE NUMBERS DIFFERENT, ERROR
1334  003622  104003            LINT1B: SCOPEF                                ;CHECK FOR DATA FREEZE
1335  003624  003604                            LINT1A                        ;RETURN FOR DATA FREEZE
1336  003626  005205                            INC     R5                    ;UPDATE LINE COUNT
1337  003630  005300                            DEC     R0                    ;UPDATE LINE NUMBER
1338  003632  001364                            BNE     LINT1A                ;CONTINUE
1339  003634  104002                            SCOPE                         ;CHECK FOR ITERATION, LOOP
1340
1341                                            ;USING ''STEP'' MODE, VERIFY THAT THE
1342                                            ;LINE COUNTER CAN BE STEPPED THRU ALL STATES.
1343
1344  003636                            T22:                                  ;REFERENCE DESIGNATION
1345  003636  042737  000340  177776    LINT2:  BIC     #340,PS               ;ENABLE INTERRUPTS
1346  003644  005077  012104                    CLR     @DMBCSR               ;CLEAR CONTROL STATUS REGISTER
1347  003650  005005                            CLR     R5                    ;CLEAR EXPECTED LINE COUNT
1348  003652  012700  000010                    MOV     #8.,R0                ;SET UP TO TEST 8 VALUES
1349  003656  012777  000007  012070            MOV     #7,@DMBCSR            ;FIRST VALUE =0
1350  003664  052777  000400  012062    LINT2A: BIS     #STEP,@DMBCSR         ;STEP LINE COUNTER
1351  003672  017704  012056                    MOV     @DMBCSR,R4            ;READ LINE COUNTER
1352  003676  020504                            CMP     R5,R4                 ;COMPARE EXPECTED AND
1353  003700  001401                            BEQ     LINT2B                ;RECEIVED LINE NUMBERS
1354  003702  104000                            ERRORC                        ;LINE COUNTER ERROR
1355  003704  104003            LINT2B: SCOPEF                                ;CHECK FOR DATA FREEZE
1356  003706  003636                            LINT2
1357  003710  005205                            INC     R5                    ;UPDATE EXPECTED LINE NUMBER
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1358  003712  005300                          DEC     R0
1359  003714  001363                          BNE     LINT2A
1360  003716  104002                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1361
1362                                          ;WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS.
1363                                          ;VERIFY THAT ALL LOCATIONS HAVE BEEN WRITTEN
1364                                          ;TO 1'S.
1365                                          ;VERIFY THAT "CLEAR SCAN" CLEARS ALL SCANNER
1366                                          ;MEMORY LOCATIONS.
1367
1368  003720                          T23:                                    ;REFERENCE DESIGNATION
1369  003720  012777  002000  012026  MEMT1:  MOV     #CLRMUX,@DMBCSR         ;CLEAR CONTROL STATUS REGISTER
1370  003726  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1371  003734  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 LOCATIONS
1372  003740  052777  001017  012006          BIS     #MAINT+17,@DMBCSR       ;SET MAINTEANCE MODE
1373  003746  052777  000400  012000  MEMT1A: BIS     #STEP,@DMBCSR           ;SET LINE COUNTER THRU ALL
1374  003754  005300                          DEC     R0                      ;STATES, WRITING 1'S INTO
1375  003756  001373                          BNE     MEMT1A                  ;ALL MEMORY WORDS
1376  003760  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 WORDS
1377  003764  012705  070000                  MOV     #70000,R5               ;SET UP EXPECTED STATUS REGISTER
1378  003770  012777  000007  011756          MOV     #7,@DMBCSR              ;START WITH LINE 0
1379  003776  052777  000400  011750  MEMT1B: BIS     #STEP,@DMBCSR           ;ACCESS SCANNER MEMORY
1380  004004  017704  011744                  MOV     @DMBCSR,R4              ;READ DATA
1381  004010  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
1382  004012  001403                          BEQ     MEMT1C                  ;DATA
1383  004014  104000                          ERRORC                          ;CONTROL STATUS OR MEMORY ERROR
1384  004016  104003                          SCOPEF                          ;CHECK FOR DATA FREEZE
1385  004020  003720                          MEMT1
1386  004022  005205                  MEMT1C: INC     R5                      ;UPDATE EEXPECTED STATUS
1387  004024  005300                          DEC     R0                      ;UPDATE LINE COUNT
1388  004026  001363                          BNE     MEMT1B                  ;CONTINUE
1389  004030  012777  004000  011716  MEMT1D: MOV     #CLRSCN,@DMBCSR         ;SET "CLEAR SCAN"
1390  004036  032777  000020  011710          BIT     #BUSY,@DMBCSR           ;WAIT FOR "CLEAR CYCLES"
1391  004044  001374                          BNE     .-6
1392  004046  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 MEMORY
1393  004052  005005                          CLR     R5                      ;LOCATIONS
1394  004054  012777  000007  011672          MOV     #7,@DMBCSR              ;FIRST TO BE TESTED=0
1395  004062  052777  000400  011664  MEMT1E: BIS     #STEP,@DMBCSR           ;ACCESS SEANNER MEMORY
1396  004070  017704  011660                  MOV     @DMBCSR,R4              ;READ DATA
1397  004074  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
1398  004076  001403                          BEQ     MEMT1F                  ;DATA
1399  004100  104000                          ERRORC                          ;CONTROL  STATUS OF MEMORY ERROR
1400  004102  104003                          SCOPEFF                         ;CHECK FOR DATA FREEZE
1401  004104  004030                          MEMT1D
1402  004106  005205                  MEMT1F: INC     R5                      ;UPDATE EXPECTED DATA
1403  004110  005300                          DEC     R0                      ;UPDATE LINE COUNT
1404  004112  001363                          BNE     MEMT1E                  ;CONTTINUE
1405  004114  104002                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1406
1407                                          ;WRITE 1'S INTO SELECTED SCANNER MEMORY LOCATION.
1408                                          ;VERIFY THAT ONLY SELECTED LOCATION WAS WRITTEN INTO.
1409
1410  004116                          T24:                                    ;REFERENCE DESIGNATION
1411  004116  005077  011632          MEMT2:  CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
1412  004122  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1413  004130  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 ADDRESSES
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1414  004134  012702  000007                  MOV     #7,R2                   ;FIRST ADDRESS TO BE TESTED=0
1415  004140  012777  004000  011606  MEMT2A: MOV     #CLRSCN,@DMBCSR         ;CLEAR ACANNER MEMORY
1416  004146  032777  000020  011600          BIT     #BUSY,@DMBCSR           ;WAIT FOR CLEAR CYCLE
1417  004154  001374                          BNE     .-6
1418  004156  012777  001000  011570          MOV     #MAINT,@DMBCSR          ;SET 'MAINTENANCE MODE''
1419  004164  050277  011564                  BIS     R2,@DMBCSR              ;SET LINE COUNTER TO TEST ADDRESS-1
1420  004170  052777  000400  011556          BIS     #STEP,@DMBCSR           ;WRITE 1'S INTO TEST ADDRESS
1421  004176  042777  001000  011550          BIC     #MAINT,@DMBCSR          ;CLEAR 'MAINTENANCE MODE''
1422  004204  012703  000010                  MOV     #8.,R3                  ;SET UP TO TEST ALL 8
1423  004210  012777  000007  011536          MOV     #7,@DMBCSR              ;SCANNER MEMORY LOCATIONS
1424  004216  005202                          INC     R2
1425  004220  005001                          CLR     R1
1426  004222  052777  000400  011524  MEMT2B: BIS     #STEP,@DMBCSR           ;ACCESS SCANNER MEMORY
1427  004230  117704  011520                  MOVB    @DMBCSR,R4              ;READ CONPENTS OF MEMORY
1428  004234  010105                          MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
1429  004236  120402                          CMPB    R4,R2                   ;OF SCANNER MEMORY
1430  004240  001002                          BNE     MEMT2C
1431  004242  052705  070000                  BIS     #70000,R5
1432  004246  020405                  MEMT2C: CMP     R4,R5                   ;COMPARE EXPECTED AND RECEIVED
1433  004250  001403                          BEQ     MEMT2D                  ;VALUES
1434  004252  104000                          ERRORC                          ;SCANNER MEMORY ERROR
1435  004254  104003                          SCOPEF                          ;CHECK FOR DATA FREEZE
1436  004256  004140                          MEMT2A
1437  004260  005201                  MEMT2D: INC     R1
1438  004262  005303                          DEC     R3                      ;TEST NEXT SCANNEB LOCATION
1439  004264  001356                          BNE     MEMT2B
1440  004266  005300                          DEC     R0                      ;UPDATE LINE COUNT
1441  004270  001323                          BNE     MEMT2A
1442  004272  104002                          SCOPE                           ;CHECK FOR ITERATION, LOOP
1443
1444                                          ;WITH ALL ACANNER MEMORY LOCATIONS SET TO 1'S,
1445                                          ;WRITE 0'S INTO SELECTED LOCATION
1446                                          ;VERIFY THAT ONLY SELECTED LOCATION WAS CLEARED.
1447
1448  004274                          T25:                                    ;REFERENCE DESIGNATION
1449  004274  005077  011454          MEMT3:  CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
1450  004300  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1451  004306  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 ADDRESSES
1452  004312  012702  000007                  MOV     #7,R2                   ;FIRST ADDRESS TO BE TESTED=0
1453  004316  012703  000010          MEMT3A: MOV     #8.,R3                  ;WRITE 1'S INTO ALL SCANNER
1454  004322  012777  001007  011424          MOV     #MAINT+7,@DMBCSR        ;MEMORY LOCATIONS
1455  004330  052777  000400  011416  MEMT3B: BIS     #STEP,@DMBCSR
1456  004336  005303                          DEC     R3
1457  004340  001373                          BNE     MEMT3B
1458  004342  010277  011406                  MOV     R2,@DMBCSR              ;SET LINE COUNTER TO TEST ADDRESS-1
1459  004346  052777  000400  011400          BIS     #STEP,@DMBCSR           ;WRITE 0'S INTO TEST ADDRESS
1460  004354  012703  000010                  MOV     #8.,R3                  ;SET UP TO TEST ALL 8
1461  004360  012777  000007  011366          MOV     #7,@DMBCSR              ;SCANNER MEMORY LOCATIONS
1462  004366  005202                          INC     R2
1463  004370  005001                          CLR     R1
1464  004372  052777  000400  011354  MEMT3C: BIS     #STEP,@DMBCSR           ;ACESS SCANNER MEMORY
1465  004400  117704  011350                  MOVB    @DMBCSR,R4              ;READ CONTENTS OF MEMORY
1466  004404  010105                          MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
1467  004406  120402                          CMPB    R4,R2                   ;OF SCANNER MEIORY
1468  004410  001002                          BNE     MEMT3D
1469  004412  052705  070000                  BIS     #70000,R5
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1470  004416  020405                    MEMT3D: CMP     R4,R5                   ;COMPARE EXPECTED AND
1471  004420  001403                            BEQ     MEMT3E                  ;RECEIVED VALUES
1472  004422  104000                            ERRORC                          ;SCANNER MEMORY ERROR
1473  004424  104003                            SCOPEF                          ;CHECK FOR DATA FREEZE
1474  004426  004316                            MEMT3A
1475  004430  005201                    MEMT3E: INC     R1
1476  004432  005303                            DEC     R3                      ;TEST NEXT SCANNER LOCATION
1477  004434  001356                            BNE     MEMT3C
1478  004436  005300                            DEC     R0                      ;UPDATE ADDRESS COUNT
1479  004440  001326                            BNE     MEMT3A
1480  004442  104002                            SCOPE                           ;CHECK FOR ITERATION, LOOP
1481                                            ;VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
1482                                            ;BE SET AND CLEARED FOR SELECTED LINE
1483
1484  004444                            T26:                                    ;REFERENCE DESIGNATION
1485  004444  005077  011304           MUX1:   CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
1486  004450  042737  000340  177776           BIC     #340,PS                 ;ENABLE INTERRUPTS
1487  004456  012700  000010                   MOV     #8.,R0                  ;SET UP TO TEST 8 FUNCTION FLIP-FLOP
1488  004462  005001                            CLR     R1                      ;START AT LINE 0
1489  004464  012777  002000  011262  MUX1A:   MOV     #CLRMUX,@DMBCSR
1490  004472  012702  000010                   MOV     #8.,R2
1491  004476  010177  011252                   MOV     R1,@DMBCSR              ;SELECT LINE TO BE TESTED
1492  004502  012777  000001  011246           MOV     #LINENA,@DMBLSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
1493  004510  005077  011240                   CLR     @DMBCSR
1494  004514  005005                   MUX1B:  CLR     R5
1495  004516  017704  011234                   MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
1496  004522  117703  011226                   MOVB    @DMBCSR,R3              ;READ CONTROL STATUS REGISTER
1497  004526  042703  177760                   BIC     #177760,R3              ;CLEAR UNWANTED BITS
1498  004532  020103                            CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
1499  004534  001002                            BNE     MUX1C                   ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
1500  004536  012705  000001                   MOV     #LINENA,R5
1501                                                                            ;TO BE SET
1502  004542  020504                    MUX1C:  CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
1503  004544  001403                            BEQ     MUX1D                   ;RESULTS
1504  004546  104001                            ERRORL                          ;LINE STATUS ERROR
1505  004550  104003                            SCOPEF
1506  004552  004554                            MUX1D
1507  004554  052777  000400  011172   MUX1D:  BIS     #STEP,@DMBCSR           ;EXAMINE NEXT LINE
1508  004562  005302                            DEC     R2
1509  004564  001353                            BNE     MUX1B
1510  004566  005005                            CLR     R5
1511  004570  010177  011160           MUX1E:  MOV     R1,@DMBCSR
1512  004574  010103                            MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
1513  004576  005077  011154                   CLR     @DMBLSR                 ;CLEAR LINE ENABLE FLIP FLOP
1514  004602  105227  000000                   INCB    #0                      ;DELAY FOR CABLE
1515  004606  001375                            BNE     .-4                     ;DITTO
1516  004610  017704  011142                   MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
1517  004614  005704                            TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
1518  004616  001401                            BEQ     MUX1F                   ;CLEARED
1519  004620  104001                            ERRORL                          ;NO, LINE STATUS ERROR
1520  004622  104003                    MUX1F:  SCOPEF                          ;CHECK FOR LOOP ON SAME DATA
1521  004624  004464                            MUX1A
1522  004626  005201                            INC     R1                      ;SELECT NEXT LINE
1523  004630  005300                            DEC     R0                      ;DECREMENT LINE COUNT
1524  004632  001314                            BNE     MUX1A                   ;CONTINU IF NOT DONE
1525  004634  104002                            SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
1526                                        ;VERIFY THAT TERMINAL READY FUNCTION FL   ,LOP CAN
1527                                        ;BE SET AND CLEARED FOR SELECTED LINE
1528
1529  004636                          T27:                                  ;REFFRENCE DESIGNATION
1530  004636  005077  011112         MUX2:   CLR     @DMBCSR               ;CLEAR CONTROL STATUS REGISTER
1531  004642  042737  000340  177776         BIC     #340,PS               ;ENABLE INTERRUPTS
1532  004650  012700  000010                 MOV     #8.,R0                ;SET UP TO TEST 8 FUNCTION FLIP-FLOP
1533  004654  005001                         CLR     R1                    ;START AT LINE 0
1534  004656  012777  002000  011070 MUX2A:  MOV     #CLRMUX,@DMBCSR
1535  004664  012702  000010                 MOV     #8.,R2
1536  004670  010177  011060                 MOV     R1,@DMBCSR            ;SELECT LINE TO BE TESTED
1537  004674  012777  000002  011054         MOV     #TRMRDY,@DMBLSR       ;SET TERMINAL READY FUNCTION FLIP-FLOP
1538  004702  005077  011046                 CLR     @DMBCSR
1539  004706  005005                 MUX2B:  CLR     R5
1540  004710  017704  011042                 MOV     @DMBLSR,R4            ;READ LINE STATUS REGISTER
1541  004714  117703  011034                 MOVB    @DMBCSR,R3            ;READ CONTROL STATUS REGISTER
1542  004720  042703  177760                 BIC     #177760,R3            ;CLEAR UNWANTED BITS
1543  004724  020103                         CMP     R1,R3                 ;IF LINE NUMBER=SELECTED LINE NUMBER,
1544  004726  001002                         BNE     MUX2C                 ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
1545  004730  012705  000002                 MOV     #TRMRDY,R5
1546                                                                        ;TO BE SET
1547  004734  020504                 MUX2C:  CMP     R5,R4                 ;COMPARE EXPECTED AND RECEIVED
1548  004736  001403                         BEQ     MUX2D                 ;RESULTS
1549  004740  104001                         ERRORL                        ;LINE STATUS ERROR
1550  004742  104003                         SCOPEF
1551  004744  004746                         MUX2D
1552  004746  052777  000400  011000 MUX2D:  BIS     #STEP,@DMBCSR         ;EXAMINE NEXT LINE
1553  004754  005302                         DEC     R2
1554  004756  001353                         BNE     MUX2B
1555  004760  005005                         CLR     R5
1556  004762  010177  010766         MUX2E:  MOV     R1,@DMBCSR
1557  004766  010103                         MOV     R1,R3                 ;SET LINE COUNTER TO SELECTED LINE
1558  004770  005077  010762                 CLR     @DMBLSR               ;CLEAR TERMINAL READY FLIP FLOP
1559  004774  105227  000000                 INCB    #0                    ;DELAY FOR CABLE
1560  005000  001375                         BNE     .-4                   ;DITTO
1561  005002  017704  010750                 MOV     @DMBLSR,R4            ;READ LINE STATUS REGISTER
1562  005006  005704                         TST     R4                    ;WAS TERMINAL READY FUNCTION FLIP FLOP
1563  005010  001401                         BEQ     MUX2F                 ;CLEARED
1564  005012  104001                         ERRORL                        ;NO, LINE STATUS ERROR
1565  005014  104003                 MUX2F:  SCOPEF                        ;CHECK FOR LOOP ON SAME DATA
1566  005016  004656                         MUX2A
1567  005020  005201                         INC     R1                    ;SELECT NEXT LINE
1568  005022  005300                         DEC     R0                    ;DECREMENT LINE COUNT
1569  005024  001314                         BNE     MUX2A                 ;CONTINU IF NOT DONE
1570  005026  104002                         SCOPE                         ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
                                        ;BE SET AND CLEARED FOR SELECTED LINE

005030                          T30:                                    ;REFERENCE DESIGNATION
005030  005077  010720          MUX3:   CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
005034  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
005042  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 FUNCTION FLIP-FLOP
005046  005001                          CLR     R1                      ;START AT LINE 0
005050  012777  002000  010676  MUX3A:  MOV     #CLRMUX,@DMBCSR
005056  012702  000010                  MOV     #8.,R2
005062  010177  010666                  MOV     R1,@DMBCSR              ;SELECT LINE TO BE TESTED
005066  012777  000004  010662          MOV     #RS,@DMBLSR             ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
005074  005077  010654                  CLR     @DMBCSR
005100  005005                  MUX3B:  CLR     R5
005102  017704  010650                  MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
005106  117703  010642                  MOVB    @DMBCSR,R3              ;READ CONTROL STATUS REGISTER
005112  042703  177760                  BIC     #177760,R3              ;CLEAR UNWANTED BITS
005116  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
005120  001002                          BNE     MUX3C                   ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
005122  012705  000004                  MOV     #RS,R5
                                                                        ;TO BE SET
005126  020504                  MUX3C:  CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
005130  001403                          BEQ     MUX3D                   ;RESULTS
005132  104001                          ERRORL                          ;LINE STATUS ERROR
005134  104003                          SCOPEF
005136  005140                          MUX3D
005140  052777  000400  010606  MUX3D:  BIS     #STEP,@DMBCSR           ;EXAMINE NEXT LINE
005146  005302                          DEC     R2
005150  001353                          BNE     MUX3B
005152  005005                          CLR     R5
005154  010177  010574          MUX3E:  MOV     R1,@DMBCSR
005160  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
005162  005077  010570                  CLR     @DMBLSR                 ;CLEAR REQUEST TO SEND FLIP FLOP
005166  105227  000000                  INCB    #0                      ;DELAY FOR CABLE
005172  001375                          BNE     .-4                     ;DITTO
005174  017704  010556                  MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
005200  005704                          TST     R4                      ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
005202  001401                          BEQ     MUX3F                   ;CLEARED
005204  104001                          ERRORL                          ;NO, LINE STATUS ERROR
005206  104003                  MUX3F:  SCOPEF                          ;CHECK FOR LOOP ON SAME DATA
005210  005050                          MUX3A
005212  005201                          INC     R1                      ;SELECT NEXT LINE
005214  005300                          DEC     R0                      ;DECREMENT LINE COUNT
005216  001314                          BNE     MUX3A                   ;CONTINU IF NOT DONE
005220  104002                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
1616                                            ;VERIFY THAT SECONDARY TRANSMIT FUNCTION FLIP-FLOP CAN
1617                                            ;BE SET AND CLEARED FOR SELECTED LINE
1618
1619  005222                            T31:                                ;REFERENCE DESIGNATION
1620  005222  005077  010526            MUX4:   CLR     @DMBCSR             ;CLEAR CONTROL STATUS REGISTER
1621  005226  042737  000340  177776            BIC     #340,PS             ;ENABLE INTERRUPTS
1622  005234  012700  000010                    MOV     #8.,R0              ;SET UP TO TEST 8 FUNCTION FLIP-FLOP
1623  005240  005001                            CLR     R1                  ;START AT LINE 0
1624  005242  012777  002000  010504  MUX4A:   MOV     #CLRMUX,@DMBCSR
1625  005250  012702  000010                    MOV     #8.,R2
1626  005254  010177  010474                    MOV     R1,@DMBCSR          ;SELECT LINE TO BE TESTED
1627  005260  012777  000010  010470            MOV     #SECTX,@DMBLSR      ;SET SECONDARY TRANSMIT FUNCTION FLIP-FLOP
1628  005266  005077  010462                    CLR     @DMBCSR
1629  005272  005005                    MUX4B:  CLR     R5
1630  005274  017704  010456                    MOV     @DMBLSR,R4          ;READ LINE STATUS REGISTER
1631  005300  117703  010450                    MOVB    @DMBCSR,R3          ;READ CONTROL STATUS REGISTER
1632  005304  042703  177760                    BIC     #177760,R3          ;CLEAR UNWANTED BITS
1633  005310  020103                            CMP     R1,R3               ;IF LINE NUMBER-SELECTED LINE NUMBER,
1634  005312  001002                            BNE     MUX4C               ;EXCEPT SECONDARY TRANSMIT FUNCTION FLIP FLOP
1635  005314  012705  000010                    MOV     #SECTX,R5
1636                                                                        ;TO BE SET
1637  005320  020504                    MUX4C:  CMP     R5,R4               ;COMPARE EXPECTED AND RECEIVED
1638  005322  001403                            BEQ     MUX4D               ;RESULTS
1639  005324  104001                            ERRORL                      ;LINE STATUS ERROR
1640  005326  104003                            SCOPEF
1641  005330  005332                            MUX4D
1642  005332  052777  000400  010414  MUX4D:   BIS     #STEP,@DMBCSR       ;EXAMINE NEXT LINE
1643  005340  005302                            DEC     R2
1644  005342  001353                            BNE     MUX4B
1645  005344  005005                            CLR     R5
1646  005346  010177  010402            MUX4E:  MOV     R1,@DMBCSR
1647  005352  010103                            MOV     R1,R3               ;SET LINE COUNTER TO SELECTED LINE
1648  005354  005077  010376                    CLR     @DMBLSR             ;CLEAR SECONDARY TRANSMIT FLIP FLOP
1649  005360  105227  000000                    INCB    #0                  ;DELAY FOR CABLE
1650  005364  001375                            BNE     .-4                 ;DITTO
1651  005366  017704  010364                    MOV     @DMBLSR,R4          ;READ LINE STATUS REGISTER
1652  005372  005704                            TST     R4                  ;WAS SECONDARY TRANSMIT FUNCTION FLIP FLOP
1653  005374  001401                            BEQ     MUX4F               ;CLEARED
1654  005376  104001                            ERRORL                      ;NO, LINE STATUS ERROR
1655  005400  104003                    MUX4F:  SCOPEF                      ;CHECK FOR LOOP ON SAME DATA
1656  005402  005242                            MUX4A
1657  005404  005201                            INC     R1                  ;SELECT NEXT LINE
1658  005406  005300                            DEC     R0                  ;DECREMENT LINE COUNT
1659  005410  001314                            BNE     MUX4A               ;CONTINU IF NOT DONE
1660  005412  104002                            SCOPE                       ;CHECK FOR ITERATIONS, LOOP
```

```
1661
1662                                        ;VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF 'LINE ENABLE'
1663                                        ;AND TERMINAL ARE SET FOR SELECTED LINE.
1664
1665  005414                        T32:                                    ;REFERENCE DESIGNATION
1666  005414  005077  010334        MUX5:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1667  005420  042737  000340 177776        BIC     #340,PS                 ;ENABLE INTERRUPTS
1668  005426  012700  000010              MOV     #8.,R0                  ;SET UP TO TEST 8 LINES
1669  005432  005001                      CLR     R1                      ;START AT LINE 0
1670  005434  012702  000010        MUX5A:  MOV     #8.,R2          ;8 LINES
1671  005440  010177  010310              MOV     R1,@DMBCSR              ;SELECT A LINE
1672  005444  012777  000003 010304      MOV     #LINENA+TRMRDY,@DMBLSR  ;SET LINE ENABLE +TRMRDY
1673  005452  005077  010276              CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1674  005456  005005                MUX5B:  CLR     R5                      ;CLEAR EXPECTED RESULT
1675  005460  017704  010272              MOV     @DMBLSR,R4              ;READ LINE STATUS
1676  005464  117703  010264              MOVB    @DMBCSR,R3              ;READ LINE NUMBER
1677  005470  042703  177760              BIC     #177760,R3              ;CLEAR UNWANTED BITS
1678  005474  020103                      CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
1679  005476  001002                      BNE     MUX5C                   ;EXPECT LINE ENABLE AND
1680  005500  012705  000143              MOV     #LINENA+TRMRDY+CO+CS,R5
1681                                                                      ;CLEAR TO SEND AND CARRIER ARE SET
1682  005504  020405        MUX5C:  CMP     R4,R5                   ;COMPARE EXPECTED AND
1683  005506  001403                      BEQ     MUX5D                   ;RECEIVED RESULTS
1684  005510  104001                      ERRORL                          ;LINE STATUS ERROR
1685  005512  104003                      SCOPEF
1686  005514  005516                      MUX5D
1687  005516  052777  000400 010230 MUX5D:  BIS     #STEP,@DMBCSR           ;UPDATE LINE COUNTER
1683  005524  005302                      DEC     R2                      ;CONTINUE IF ALL CHECKS
1689  005526  001353                      BNE     MUX5B                   ;ARE NOT DONE FOR THIS LINE
1690  005530  012705  000001              MOV     #LINENA,R5              ;EXPECT LINE ENABLE
1691  005534  010103        MUX5E:  MOV     R1,R3                   ;ON SELECTED LINE
1692  005536  010177  010212              MOV     R1,@DMBCSR              ;SELECT LINE
1693  005542  042777  000002 010206      BIC     #TRMRDY,@DMBLSR         ;CLEAR TERMINAL
1694  005550  105227  000000              INCB    #0                      ;DELAY FOR CABLE
1695  005554  001375                      BNE     .-4                     ;DITTO
1696  005556  017704  010174              MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
1697  005562  020504                      CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
1698  005564  001401                      BEQ     MUX5F                   ;SET ON THIS LINE
1699  005566  104001                      ERRORL                          ;LINE STATUS ERROR
1700  005570  104003        MUX5F:  SCOPEF                          ;CHECK FOR LOOP ON SAME DATA
1701  005572  005434                      MUX5A
1702  005574  005201                      INC     R1                      ;UPDATE LINE NUMBER
1703  005576  005077  010154              CLR     @DMBLSR                 ;CLEAR LINE STATUS REGISTER
1704  005602  005300                      DEC     R0                      ;CONTINUE IF ALL LINES NOT
1705  005604  001313                      BNE     MUX5A                   ;TESTED
1706  005606  104002                      SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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1707
1708                                        ;VERIFY THAT RING IS SET IF "LINE ENABLE"
1709                                        ;AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
1710
1711  005610                          T33:                                    ;REFERENCE DESIGNATION
1712  005610  005077  010140        MUX6:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1713  005614  042737  000340  177776        BIC     #340,PS                 ;ENABLE INTERRUPTS
1714  005622  012700  000010                MOV     #8.,R0                  ;SET UP TO TEST 8 LINES
1715  005626  005001                        CLR     R1                      ;START AT LINE 0
1716  005630  012702  000010        MUX6A:  MOV     #8.,R2          ;8 LINES
1717  005634  010177  010114                MOV     R1,@DMBCSR              ;SELECT A LINE
1718  005640  012777  000005  010110        MOV     #LINENA+RS,@DMBLSR      ;SET LINE ENABLE +RS
1719  005646  005077  010102                CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1720  005652  005005                MUX6B:  CLR     R5                      ;CLEAR EXPECTED RESULT
1721  005654  017704  010076                MOV     @DMBLSR,R4              ;READ LINE STATUS
1722  005660  117703  010070                MOVB    @DMBCSR,R3              ;READ LINE NUMBER
1723  005664  042703  177760                BIC     #177760,R3              ;CLEAR UNWANTED BITS
1724  005670  020103                        CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
1725  005672  001002                        BNE     MUX6C                   ;EXPECT LINE ENABLE AND
1726  005674  012705  000205                MOV     #LINENA+RS+RING,R5
1727                                                                        ;RING IS SET
1728  005700  020405                MUX6C:  CMP     R4,R5                   ;COMPARE EXPECTED AND
1729  005702  001403                        BEQ     MUX6D                   ;RECEIVED RESULTS
1730  005704  104001                        ERRORL                          ;LINE STATUS ERROR
1731  005706  104003                        SCOPEF
1732  005710  005712                        MUX6D
1733  005712  052777  000400  010034 MUX6D:  BIS     #STEP,@DMBCSR           ;UPDATE LINE COUNTER
1734  005720  005302                        DEC     R2                      ;CONTINUE IF ALL CHECKS
1735  005722  001353                        BNE     MUX6B                   ;ARE NOT DONE FOR THIS LINE
1736  005724  012705  000001                MOV     #LINENA,R5              ;EXPECT LINE ENABLE
1737  005730  010103                MUX6E:  MOV     R1,R3                   ;ON SELECTED LINE
1738  005732  010177  010016                MOV     R1,@DMBCSR              ;SELECT LINE
1739  005736  042777  000004  010012        BIC     #RS,@DMBLSR             ;CLEAR REQUEST TO SEND
1740  005744  105227  000000                INCB    #0                      ;DELAY FOR CABLE
1741  005750  001375                        BNE     .-4                     ;DITTO
1742  005752  017704  010000                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
1743  005756  020504                        CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
1744  005760  001401                        BEQ     MUX6F                   ;SET ON THIS LINE
1745  005762  104001                        ERRORL                          ;LINE STATUS ERROR
1746  005764  104003                MUX6F:  SCOPEF                          ;CHECK FOR LOOP ON SAME DATA
1747  005766  005630                        MUX6A
1748  005770  005201                        INC     R1                      ;UPDATE LINE NUMBER
1749  005772  005077  007760                CLR     @DMBLSR                 ;CLEAR LINE STATUS REGISTER
1750  005776  005300                        DEC     R0                      ;CONTINUE IF ALL LINES NOT
1751  006000  001313                        BNE     MUX6A                   ;TESTED
1752  006002  104002                        SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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1753
1754                                        ;VERIFY THAT SECONDARY RECEIVE IS SET IF "LINE ENABLE"
1755                                        ;AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
1756
1757  006004                        T34:                                    ;REFERENCE DESIGNATION
1758  006004  005077  007744        MUX7:   CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1759  006010  042737  000340  177776        BIC     #340,PS                 ;ENABLE INTERRUPTS
1760  006016  012700  000010              MOV     #8.,R0                  ;SET UP TO TEST 8 LINES
1761  006022  005001                       CLR     R1                      ;START AT LINE 0
1762  006024  012702  000010        MUX7A:  MOV     #8.,R2          ;8 LINES
1763  006030  010177  007720              MOV     R1,@DMBCSR              ;SELECT A LINE
1764  006034  012777  000011  007714       MOV     #LINENA+SECTX,@DMBLSR   ;SET LINE ENABLE +SECTX
1765  006042  005077  007706              CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
1766  006046  005005                MUX7B:  CLR     R5                      ;CLEAR EXPECTED RESULT
1767  006050  017704  007702              MOV     @DMBLSR,R4              ;READ LINE STATUS
1768  006054  117703  007674              MOVB    @DMBCSR,R3              ;READ LINE NUMBER
1769  006060  042703  177760              BIC     #177760,R3              ;CLEAR UNWANTED BITS
1770  006064  020103                       CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
1771  006066  001002                       BNE     MUX7C                   ;EXPECT LINE ENABLE AND
1772  006070  012705  000031              MOV     #LINENA+SECTX+SECRX,R5
1773                                                                        ;SECONDARY RECEIVE IS SET
1774  006074  020405                MUX7C:  CMP     R4,R5                   ;COMPARE EXPECTED AND
1775  006076  001403                       BEQ     MUX7D                   ;RECEIVED RESULTS
1776  006100  104001                       ERRORL                          ;LINE STATUS ERROR
1777  006102  104003                       SCOPEF
1778  006104  006106                       MUX7D
1779  006106  052777  000400  007640  MUX7D:  BIS     #STEP,@DMBCSR           ;UPDATE LINE COUNTER
1780  006114  005302                       DEC     R2                      ;CONTINUE IF ALL CHECKS
1781  006116  001353                       BNE     MUX7B                   ;ARE NOT DONE FOR THIS LINE
1782  006120  012705  000001              MOV     #LINENA,R5              ;EXPECT LINE ENABLE
1783  006124  010103                MUX7E:  MOV     R1,R3                   ;ON SELECTED LINE
1784  006126  010177  007622              MOV     R1,@DMBCSR              ;SELECT LINE
1785  006132  042777  000010  007616       BIC     #SECTX,@DMBLSR          ;CLEAR SECONDARY TRANSMIT
1786  006140  105227  000000              INCB    #0                      ;DELAY FOR CABLE
1787  006144  001375                       BNE     .-4                     ;DITTO
1788  006146  017704  007604              MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
1789  006152  020504                       CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
1790  006154  001401                       BEQ     MUX7F                   ;SET ON THIS LINE
1791  006156  104001                       ERRORL                          ;LINE STATUS ERROR
1792  006160  104003                MUX7F:  SCOPEF                          ;CHECK FOR LOOP ON SAME DATA
1793  006162  006024                       MUX7A
1794  006164  005201                       INC     R1                      ;UPDATE LINE NUMBER
1795  006166  005077  007564              CLR     @DMBLSR                 ;CLEAR LINE STATUS REGISTER
1796  006172  005300                       DEC     R0                      ;CONTINUE IF ALL LINES NOT
1797  006174  001313                       BNE     MUX7A                   ;TESTED
1798  006176  104002                       SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
1799
1800                                        ;VERIFY THAT "CLEAR MULTIPLXER" CLEARS ALL MULTIPLEXER
1801                                        ;FUNCTION FLIP-FLOPS
1802
1803  006200                          T35:                                ;REFERENCE DESIGNATION
1804  006200  005077  007550         MUX8:  CLR     @DMBCSR              ;CLEAR CONTROL REGISTER
1805  006204  042737  000340  177776        BIC     #340,PS              ;ENABLE INTERRUPTS
1806  006212  012700  000010               MOV     #8.,R0               ;SET UP TO TEST 8  LINES
1807  006216  012777  000017  007532 MUX8A: MOV     #17,@DMBLSR          ;WRITE 1S INTO  ALL MULTIPLEXER
1808  006224  052777  000400  007522        BIS     #STEP,@DMBCSR        ;FUNCTION FLIPFLOPS
1809  006232  005300                       DEC     R0
1810  006234  001370                       BNE     MUX8A
1811  006236  005003                       CLR     R3                   ;SET UP FOR 8 LINES
1812  006240  012700  000010               MOV     #8.,R0
1813  006244  012777  002000  007502 MUX8B: MOV     #CLRMUX,@DMBCSR      ;CLEAR MULTIPLEXER
1814  006252  010377  007476        MUX8C: MOV     R3,@DMBCSR           ;SELECT LINE
1815  006256  017704  007474               MOV     @DMBLSR,R4           ;READ LINE STATUS REGISTER
1816  006262  005005                       CLR     R5                   ;EXPECT 0S
1817  006264  005704                       TST     R4                   ;WAS LINE STATUS REGISTER CLEARED
1818  006266  001403                       BEQ     MUX8D
1819  006270  104001                       ERRORL                       ;LINE STATUS ERROR
1820  006272  104003                       SCOPEF                       ;CHECK FOR LOOP ON SAME DATA
1821  006274  006244                       MUX8B
1822  006276  005205                MUX8D: INC     R5                   ;EXPECT LINE ENABLE
1823  006300  052777  000001  007450        BIS     #LINENA,@DMBLSR      ;SET LINE ENABLE ON SELECTED LINE
1824  006306  017704  007444               MOV     @DMBLSR,R4           ;READ LINE STATUS REGISTER
1825  006312  020504                       CMP     R5,R4                ;IS ANYTHING BUT LINE ENABLE SET
1826  006314  001403                       BEQ     MUX8E
1827  006316  104001                       ERRORL                       ;LINE STATUS ERROR
1828  006320  104003                       SCOPEF                       ;CHECK FOR LOOP ON SAME DATA
1829  006322  006244                       MUX8B
1830  006324  005203                MUX8E: INC     R3                   ;UPDATE LINE NUMBER
1831  006326  005077  007424               CLR     @DMBLSR              ;CLEAR CURRENT LINE
1832  006332  005300                       DEC     R0                   ;CONTINUE IF ALL LINES NOT
1833  006334  001346                       BNE     MUX8C                ;TESTED
1834  006336  104002                       SCOPE                        ;CHECK FOR ITERATIONS, LOOP
1835
1836
1837                                        ;WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS
1838                                        ;SET 'LINE ENABLE FOR ALL LINES
1839                                        ;VERIFY THAT AN INTERRUPP OCCURS FOR EACH LINE
1840
1841  006340                          T36:                                ;REFERENCE DESIGNATION
1842  006340  012777  002000  007406 SCNT1: MOV     #CLRMUX,@DMBCSR      ;CLEAR ALL MULTIPLEXER FLIPFLOPS
1843  006346  005077  007402               CLR     @DMBCSR              ;CLEAR CONTROL REGISTER
1844  006352  042737  000340  177776        BIC     #340,PS              ;ENABLE INTERRUPTS
1845  006360  012700  000010               MOV     #8.,R0               ;SET UP TO WRITE 1'S INTO
1846  006364  012777  001007  007362        MOV     #MAINT+7,@DMBCSR     ;ALL SCANNER MEMORY LOCATION
1847  006372  052777  000400  007354 SCNT1A: BIS     #STEP,@DMBCSR        ;WRITE A LOCATION
1848  006400  012777  000001  007350        MOV     #LINENA,@DMBLSR      ;LET 'LINE ENABLE"
1849  006406  005300                       DEC     R0
1850  006410  001370                       BNE     SCNT1A
1851  006412  012705  070340               MOV     #70340,R5            ;EXPECT 'DONE'+'SCNENA'+'COF'+'CSF'+'SECRXF'
1852  006416  012777  006516  007324        MOV     #SCNT1C,@DMBVEC      ;SET UP LOCAL INTERRUPT SERVICE
1853  006424  013777  177776  007320        MOV     PS,@DMBLVL           ;SERVICE AT LEVEL 7
1854  006432  012700  000010               MOV     #8.,R0
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1855  006436  012777  000107  007310          MOV     #INTENA+7,@DMBCSR       ;SET INTERRUPT ENABLE
1856  006444  052737  000340  177776  SCNT1B: BIS     #340,PS                 ;LOCK OUT INTERRUPTS
1857  006452  052777  000040  007274          BIS     #SCNENA,@DMBCSR         ;START SCANNER
1858  006460  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1859  006466  105777  007262                  TSTB    @DMBCSR                 ;WAIT FOR DONE
1860  006472  100375                          BPL     .-4                     ;PROGRAM WILL HANG HERE
1861                                                                          ;IF DONE NEVER SETS
1862  006474  052737  000340  177776          BIS     #340,PS                 ;INTERRUPT DID NOT OCCUR
1863  006502  017704  007246                  MOV     @DMBCSR,R4              ;ERROR
1864  006506  104000                          ERRORC                          ;CONTROL STATUS ERROR
1865  006510  104003                          SCOPEF                          ;CHECK FOR LOOP ON SAME DATA
1866  006512  006340                          SCNT1
1867  006514  000410                          BR      SCNT1D
1868  006516  022626                  SCNT1C: POP2SP                          ;INTERRUPT OCCURED, REPOSITION STACK
1869  006520  017704  007230                  MOV     @DMBCSR,R4              ;READ CONTROL STATUS
1870  006524  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED
1871  006526  001403                          BEQ     SCNT1D                  ;REGISTERS THE SAME
1872  006530  104000                          ERRORC                          ;NO, LINE STATUS ERROR
1873  006532  104003                          SCOPEF                          ;CHECK FOR LOOP WITH CURRENT DATA
1874  006534  006340                          SCNT1
1875  006536  042777  000240  007210  SCNT1D: BIC     #SCNENA+DONE,@DMBCSR    ;CLEAR SCAN ENABLE AND DONE
1876  006544  005205                          INC     R5                      ;UPDATE EXPECTED RESULT
1877  006546  005300                          DEC     R0                      ;CONTINUE IF NOT DONE
1878  006550  001335                          BNE     SCNT1B
1879  006552  104002                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1880
1881                                          ;WRITE 1'S INTO ALL MULTIPLEXER FUNCTION FLIP-FLOPS
1882                                          ;CLEAR SCANNER MEMORY
1883                                          ;VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
1884
1885  006554                          T37:                                    ;REFERENCE DESIGNATION
1886  006554  012700  000010          SCNT2:  MOV     #8.,R0                  ;WRITE 1S INTO ALL
1887  006560  012777  002000  007166          MOV     #CLRMUX,@DMBCSR         ;CLEAR MULTIPLEXER
1888  006566  005077  007162                  CLR     @DMBCSR                 ;MULTIPLEXER FUNCTION
1889  006572  042737  000340  177776          BIC     #340,PS                 ;ENABLE TELETYPE INTERRUPTS
1890  006600  012777  000017  007150  SCNT2A: MOV     #17,@DMBLSR             ;FLIPFLOPS
1891  006606  052777  000400  007140          BIS     #STEP,@DMBCSR
1892  006614  005300                          DEC     R0
1893  006616  001370                          BNE     SCNT2A
1894  006620  012777  004000  007126          MOV     #CLRSCN,@DMBCSR         ;CLEAR SCANNER MEMORY
1895  006626  032777  000020  007120          BIT     #BUSY,@DMBCSR           ;WAIT FOR CLEAR CYCLE TO COMPLETE
1896  006634  001374                          BNE     .-6
1897  006636  012700  000010                  MOV     #8.,R0                  ;SET UP TO TEST 8 LINES
1898  006642  012705  170340                  MOV     #170340,R5              ;FIRST EXPECTED RESULT
1899  006646  012777  006742  007074          MOV     #SCNT2C,@DMBVEC         ;SET UP LOCAL INTERRUPT RETURN
1900  006654  013777  177776  007070          MOV     PS,@DMBLVL
1901  006662  012777  000107  007064          MOV     #INTENA+7,@DMBCSR       ;SET INTERRUPT ENABLE
1902  006670  052737  000340  177776  SCNT2B: BIS     #340,PS                 ;LOCK OUT INTERRUPTS
1903  006676  052777  000040  007050          BIS     #SCNENA,@DMBCSR         ;START SCANNER
1904  006704  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1905  006712  105777  007036                  TSTB    @DMBCSR                 ;WAIT FOR DONE
1906  006716  100375                          BPL     .-4                     ;PROGRAM WILL HANG HERE
1907                                                                          ;IF DONE NEVER SETS
1908  006720  052737  000340  177776          BIS     #340,PS                 ;LOCK OUT INTERRUPTS
1909  006726  017704  007022                  MOV     @DMBCSR,R4              ;READ CONTROL STATUS
1910  006732  104000                          ERRORC                          ;INTERRUPT DID NOT OCCUR
```

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1911  006734  104003                          SCOPEF                          ;CHECK FOR LOOP ON CURRENT DATA
1912  006736  006554                          SCNT2
1913  006740  000410                          BR      SCNT2D                  ;CONTINUE
1914  006742  022626                SCNT2C:   POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
1915  006744  017704  007004                  MOV     @DMBCSR,R4              ;READ CONTROL STATUS REGISTER
1916  006750  020504                          CMP     R5,R4                   ;COMPARE TO EXPECTED RESULT
1917  006752  001403                          BEQ     SCNT2D
1918  006754  104000                          ERRORC                          ;CONTROL STATUS ERROR
1919  006756  104003                          SCOPEF                          ;CHECK FOR LOOP ON CURRENT DATA
1920  006760  006554                          SCNT2
1921  006762  042777  000240  006764  SCNT2D: BIC     #SCNENA+DONE,@DMBCSR    ;CLEAR SCAN ENABLE AND DONE
1922  006770  005205                          INC     R5                      ;UPDATE EXPECTED RESULT
1923  006772  005300                          DEC     R0                      ;CONTINUE IF ALL
1924  006774  001335                          BNE     SCNT2B                  ;LINES NOT TESTED
1925  006776  104002                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1926
1927
1928                                          ;SINGLE LINE CABLE TEST
1929                                          ;FOR USE WITH THE H317-M DISTRIBUTION PANEL
1930                                          ;H3256 TEST CONNECTORS REPLACE MODEM CABLES
1931
1932
1933
1934  007000                        T100:                                     ;REFERENCE DESIGNATION
1935  007000  012737  007020  002150  STRLIN: MOV     #STRLNA,KRET            ;SET UP FOR NEW LINE SELECTION
1936  007006  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1937  007014  104004                          TYPE                            ;TYPE ''SINGLE LINE CABLE TEST''
1938  007016  017517                          MLINE
1939  007020  104013                STRLNA:   INSTRG                          ;GET LINE NUMBER
1940  007022  017552                          MLINEI
1941  007024  000000                          0
1942  007026  000007                          7
1943  007030  016042                          LINE
1944  007032  104004                          TYPE
1945  007034  017514                          MCRLF
1946
1947                                          ;VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
1948                                          ;BE SET AND CLEARED FOR SELECTED LINE
1949
1950  007036                        T101:                                     ;REFERENCE DESIGNATION
1951  007036  005077  006712          MUX11:  CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
1952  007042  042737  000340  177776          BIC     #340,PS                 ;ENABLE INTERRUPTS
1953  007050  013701  016042                  MOV     LINE,R1
1954  007054  012777  002000  006672  MUX11A: MOV     #CLRMUX,@DMBCSR
1955  007062  012702  000010                  MOV     #8.,R2
1956  007066  010177  006662                  MOV     R1,@DMBCSR              ;SELECT LINE TO BE TESTED
1957  007072  012777  000001  006656          MOV     #LINENA,@DMBLSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
1958  007100  005077  006650                  CLR     @DMBCSR
1959  007104  005005                MUX11B:   CLR     R5
1960  007106  017704  006644                  MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
1961  007112  117703  006636                  MOVB    @DMBCSR,R3              ;READ CONTROL STATUS REGISTER
1962  007116  042703  177760                  BIC     #177760,R3              ;CLEAR UNWANTED BITS
1963  007122  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
1964  007124  001002                          BNE     MUX11C                  ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
1965  007126  012705  000001                  MOV     #LINENA,R5
1966                                                                          ;TO BE SET
```

```
 1967  007132  020504                  MUX11C: CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
 1968  007134  001403                          BEQ     MUX11D                  ;RESULTS
 1969  007136  104001                          ERRORL                          ;LINE STATUS ERROR
 1970  007140  104003                          SCOPEF
 1971  007142  007144                          MUX11D
 1972  007144  052777  000400  006602  MUX11D: BIS     #STEP,@DMBCSR           ;EXAMINE NEXT LINE
 1973  007152  005302                          DEC     R2
 1974  007154  001353                          BNE     MUX11B
 1975  007156  005005                          CLR     R5
 1976  007160  010177  006570          MUX11E: MOV     R1,@DMBCSR
 1977  007164  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
 1978  007166  005077  006564                  CLR     @DMBLSR                 ;CLEAR LINE ENABLE FLIP FLOP
 1979  007172  105227  000000                  INCB    #0                      ;DELAY FOR CABLE
 1980  007176  001375                          BNE     .-4                     ;DITTO
 1981  007200  017704  006552                  MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
 1982  007204  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
 1983  007206  001401                          BEQ     MUX11F                  ;CLEARED
 1984  007210  104001                          ERRORL                          ;NO, LINE STATUS ERROR
 1985  007212  104002                  MUX11F: SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
                                        ;BE SET AND CLEARED FOR SELECTED LINE

007214                          T102:                                   ;REFERENCE DESIGNATION
007214  005077  006534          MUX12:  CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
007220  042737  000340  177776        BIC     #340,PS                 ;ENABLE INTERRUPTS
007226  013701  016042                MOV     LINE,R1
007232  012777  002000  006514  MUX12A: MOV     #CLRMUX,@DMBCSR
007240  012702  000010                MOV     #8.,R2
007244  010177  006504                MOV     R1,@DMBCSR              ;SELECT LINE TO BE TESTED
007250  012777  000002  006500        MOV     #TRMRDY,@DMBLSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
007256  005077  006472                CLR     @DMBCSR
007262  005005                  MUX12B: CLR     R5
007264  017704  006466                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
007270  117703  006460                MOVB    @DMBCSR,R3              ;READ CONTROL STATUS REGISTER
007274  042703  177760                BIC     #177760,R3              ;CLEAR UNWANTED BITS
007300  020103                        CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
007302  001002                        BNE     MUX12C                  ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
007304  012705  000002                MOV     #TRMRDY,R5
                                                                        ;TO BE SET
007310  020504                  MUX12C: CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
007312  001403                        BEQ     MUX12D                  ;RESULTS
007314  104001                        ERRORL                          ;LINE STATUS ERROR
007316  104003                        SCOPEF
007320  007322                        MUX12D
007322  052777  000400  006424  MUX12D: BIS     #STEP,@DMBCSR           ;EXAMINE NEXT LINE
007330  005302                        DEC     R2
007332  001353                        BNE     MUX12B
007334  005005                        CLR     R5
007336  010177  006412          MUX12E: MOV     R1,@DMBCSR
007342  010103                        MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
007344  005077  006406                CLR     @DMBLSR                 ;CLEAR TERMINAL READY FLIP FLOP
007350  105227  000000                INCB    #0                      ;DELAY FOR CABLE
007354  001375                        BNE     .-4                     ;DITTO
007356  017704  006374                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
007362  005704                        TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
007364  001401                        BEQ     MUX12F                  ;CLEARED
007366  104001                        ERRORL                          ;NO, LINE STATUS ERROR
007370  104002                  MUX12F: SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
                                        ;BE SET AND CLEARED FOR SELECTED LINE

007372                          T103:                                   ;REFERENCE DESIGNATION
007372  005077  006356          MUX13:  CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
007376  042737  000340  177776        BIC     #340,PS                 ;ENABLE INTERRUPTS
007404  013701  016042                MOV     LINE,R1
007410  012777  002000  006336  MUX13A: MOV     #CLRMUX,@DMBCSR
007416  012702  000010                MOV     #8.,R2
007422  010177  006326                MOV     R1,@DMBCSR              ;SELECT LINE TO BE TESTED
007426  012777  000004  006322        MOV     #RS,@DMBLSR             ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
007434  005077  006314                CLR     @DMBCSR
007440  005005                  MUX13B: CLR     R5
007442  017704  006310                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
007446  117703  006302                MOVB    @DMBCSR,R3              ;READ CONTROL STATUS REGISTER
007452  042703  177760                BIC     #177760,R3              ;CLEAR UNWANTED BITS
007456  020103                        CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
007460  001002                        BNE     MUX13C                  ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
007462  012705  000004                MOV     #RS,R5
                                                                        ;TO BE SET
007466  020504                  MUX13C: CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
007470  001403                        BEQ     MUX13D                  ;RESULTS
007472  104001                        ERRORL                          ;LINE STATUS ERROR
007474  104003                        SCOPEF
007476  007500                        MUX13D
007500  052777  000400  006246  MUX13D: BIS     #STEP,@DMBCSR           ;EXAMINE NEXT LINE
007506  005302                        DEC     R2
007510  001353                        BNE     MUX13B
007512  005005                        CLR     R5
007514  010177  006234          MUX13E: MOV     R1,@DMBCSR
007520  010103                        MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
007522  005077  006230                CLR     @DMBLSR                 ;CLEAR REQUEST TO SEND FLIP FLOP
007526  105227  000000                INCB    #0                      ;DELAY FOR CABLE
007532  001375                        BNE     .-4                     ;DITTO
007534  017704  006216                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
007540  005704                        TST     R4                      ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
007542  001401                        BEQ     MUX13F                  ;CLEARED
007544  104001                        ERRORL                          ;NO, LINE STATUS ERROR
007546  104002          MUX13F: SCOPE                                 ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;VERIFY THAT SECONDARY TRANSMIT FUNCTION FLIP-FLOP CAN
                                        ;BE SET AND CLEARED FOR SELECTED LINE

007550                          T104:                                   ;REFERENCE DESIGNATION
007550  005077  006200          MUX14:  CLR     @DMBCSR                 ;CLEAR CONTROL STATUS REGISTER
007554  042737  000340  177776        BIC     #340,PS                 ;ENABLE INTERRUPTS
007562  013701  016042                MOV     LINE,R1
007566  012777  002000  006160  MUX14A: MOV     #CLRMUX,@DMBCSR
007574  012702  000010                MOV     #8.,R2
007600  010177  006150                MOV     R1,@DMBCSR              ;SELECT LINE TO BE TESTED
007604  012777  000010  006144        MOV     #SECTX,@DMBLSR          ;SET SECONDARY TRANSMIT FUNCTION FLIP-FLOP
007612  005077  006136                CLR     @DMBCSR
007616  005005                  MUX14B: CLR     R5
007620  017704  006132                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
007624  117703  006124                MOVB    @DMBCSR,R3              ;READ CONTROL STATUS REGISTER
007630  042703  177760                BIC     #177760,R3              ;CLEAR UNWANTED BITS
007634  020103                        CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
007636  001002                        BNE     MUX14C                  ;EXCEPT SECONDARY TRANSMIT FUNCTION FLIP FLOP
007640  012705  000010                MOV     #SECTX,R5
                                                                        ;TO BE SET
007644  020504                  MUX14C: CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
007646  001403                        BEQ     MUX14D                  ;RESULTS
007650  104001                        ERRORL                          ;LINE STATUS ERROR
007652  104003                        SCOPEF
007654  007656                        MUX14D
007656  052777  000400  006070  MUX14D: BIS     #STEP,@DMBCSR           ;EXAMINE NEXT LINE
007664  005302                        DEC     R2
007666  001353                        BNE     MUX14B
007670  005005                        CLR     R5
007672  010177  006056          MUX14E: MOV     R1,@DMBCSR
007676  010103                        MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
007700  005077  006052                CLR     @DMBLSR                 ;CLEAR SECONDARY TRANSMIT FLIP FLOP
007704  105227  000000                INCB    #0                      ;DELAY FOR CABLE
007710  001375                        BNE     .-4                     ;DITTO
007712  017704  006040                MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
007716  005704                        TST     R4                      ;WAS SECONDARY TRANSMIT FUNCTION FLIP FLOP
007720  001401                        BEQ     MUX14F                  ;CLEARED
007722  104001                        ERRORL                          ;NO, LINE STATUS ERROR
007724  104002                  MUX14F: SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2103
2104                                        ;VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF 'LINE ENABLE'
2105                                        ;AND TERMINAL ARE SET FOR SELECTED LINE.
2106
2107  007726                          T105:                                       ;REFERENCE DESIGNATION
2108  007726  005077  006022        MUX15:  CLR     @DMBCSR                     ;CLEAR CONTROL REGISTER
2109  007732  042737  000340 177776        BIC     #340,PS                     ;ENABLE INTERRUPTS
2110  007740  013701  016042              MOV     LINE,R1
2111  007744  012702  000010        MUX15A: MOV     #8.,R2          ;8 LINES
2112  007750  010177  006000              MOV     R1,@DMBCSR                  ;SELECT A LINE
2113  007754  012777  000003 005774      MOV     #LINENA+TRMRDY,@DMBLSR      ;SET LINE ENABLE +TRMRDY
2114  007762  005077  005766              CLR     @DMBCSR                     ;CLEAR CONTROL REGISTER
2115  007766  005005                MUX15B: CLR     R5                          ;CLEAR EXPECTED RESULT
2116  007770  017704  005762              MOV     @DMBLSR,R4                  ;READ LINE STATUS
2117  007774  117703  005754              MOVB    @DMBCSR,R3                  ;READ LINE NUMBER
2118  010000  042703  177760              BIC     #177760,R3                  ;CLEAR UNWANTED BITS
2119  010004  020103                      CMP     R1,R3                       ;IF RECEIVED LINE=SELECTED LINE
2120  010006  001002                      BNE     MUX15C                      ;EXPECT LINE ENABLE AND
2121  010010  012705  000143              MOV     #LINENA+TRMRDY+CO+CS,R5
2122                                                                          ;CLEAR TO SEND AND CARRIER ARE SET
2123  010014  020405                MUX15C: CMP     R4,R5                       ;COMPARE EXPECTED AND
2124  010016  001403                      BEQ     MUX15D                      ;RECEIVED RESULTS
2125  010020  104001                      ERRORL                              ;LINE STATUS ERROR
2126  010022  104003                      SCOPEF
2127  010024  010026                      MUX15D
2128  010026  052777  000400 005720 MUX15D: BIS     #STEP,@DMBCSR               ;UPDATE LINE COUNTER
2129  010034  005302                      DEC     R2                          ;CONTINUE IF ALL CHECKS
2130  010036  001353                      BNE     MUX15B                      ;ARE NOT DONE FOR THIS LINE
2131  010040  012705  000001              MOV     #LINENA,R5                  ;EXPECT LINE ENABLE
2132  010044  010103                MUX15E: MOV     R1,R3                       ;ON SELECTED LINE
2133  010046  010177  005702              MOV     R1,@DMBCSR                  ;SELECT LINE
2134  010052  042777  000002 005676      BIC     #TRMRDY,@DMBLSR             ;CLEAR TERMINAL
2135  010060  105227  000000              INCB    #0                          ;DELAY FOR CABLE
2136  010064  001375                      BNE     .-4                         ;DITTO
2137  010066  017704  005664              MOV     @DMBLSR,R4                  ;READ LINE STATUS REGISTER
2138  010072  020504                      CMP     R5,R4                       ;ONLY LINE ENABLE SHOULD BE
2139  010074  001401                      BEQ     MUX15F                      ;SET ON THIS LINE
2140  010076  104001                      ERRORL                              ;LINE STATUS ERROR
2141  010100  104002                MUX15F: SCOPE                               ;CHECK FOR ITERATIONS, LOOP
```

```
                                                ;VERIFY THAT RING IS SET IF "LINE ENABLE"
                                                ;AND REQUEST TO SEND ARE SET FOR SELECTED LINE.

010102                                  T106:                                   ;REFERENCE DESIGNATION
010102  005077  005646                  MUX16:  CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
010106  042737  000340  177776                  BIC     #340,PS                 ;ENABLE INTERRUPTS
010114  013701  016042                          MOV     LINE,R1
010120  012702  000010                  MUX16A: MOV     #8.,R2          ;8 LINES
010124  010177  005624                          MOV     R1,@DMBCSR              ;SELECT A LINE
010130  012777  000005  005620                  MOV     #LINENA+RS,@DMBLSR      ;SET LINE ENABLE +RS
010136  005077  005612                          CLR     @DMBCSR                 ;CLEAR CONTROL REGISTER
010142  005005                          MUX16B: CLR     R5                      ;CLEAR EXPECTED RESULT
010144  017704  005606                          MOV     @DMBLSR,R4              ;READ LINE STATUS
010150  117703  005600                          MOVB    @DMBCSR,R3              ;READ LINE NUMBER
010154  042703  177760                          BIC     #177760,R3              ;CLEAR UNWANTED BITS
010160  020103                                  CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
010162  001002                                  BNE     MUX16C                  ;EXPECT LINE ENABLE AND
010164  012705  000205                          MOV     #LINENA+RS+RING,R5
                                                                                ;RING IS SET
010170  020405                          MUX16C: CMP     R4,R5                   ;COMPARE EXPECTED AND
010172  001403                                  BEQ     MUX16D                  ;RECEIVED RESULTS
010174  104001                                  ERRORL                          ;LINE STATUS ERROR
010176  104003                                  SCOPEF
010200  010202                                  MUX16D
010202  052777  000400  005544  MUX16D: BIS     #STEP,@DMBCSR           ;UPDATE LINE COUNTER
010210  005302                                  DEC     R2                      ;CONTINUE IF ALL CHECKS
010212  001353                                  BNE     MUX16B                  ;ARE NOT DONE FOR THIS LINE
010214  012705  000001                          MOV     #LINENA,R5              ;EXPECT LINE ENABLE
010220  010103                          MUX16E: MOV     R1,R3                   ;ON SELECTED LINE
010222  010177  005526                          MOV     R1,@DMBCSR              ;SELECT LINE
010226  042777  000004  005522                  BIC     #RS,@DMBLSR             ;CLEAR REQUEST TO SEND
010234  105227  000000                          INCB    #0                      ;DELAY FOR CABLE
010240  001375                                  BNE     .-4                     ;DITTO
010242  017704  005510                          MOV     @DMBLSR,R4              ;READ LINE STATUS REGISTER
010246  020504                                  CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
010250  001401                                  BEQ     MUX16F                  ;SET ON THIS LINE
010252  104001                                  ERRORL                          ;LINE STATUS ERROR
010254  104002                          MUX16F: SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2181
2182                                        ;VERIFY THAT SECONDARY RECEIVE IS SET IF 'LINE ENABLE'
2183                                        ;AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
2184
2185  010256                          T107:                                       ;REFERENCE DESIGNATION
2186  010256  005077  005472        MUX17:  CLR     @DMBCSR                     ;CLEAR CONTROL REGISTER
2187  010262  042737  000340 177776        BIC     #340,PS                     ;ENABLE INTERRUPTS
2188  010270  013701  016042              MOV     LINE,R1
2189  010274  012702  000010        MUX17A: MOV     #8.,R2          ;8 LINES
2190  010300  010177  005450              MOV     R1,@DMBCSR                  ;SELECT A LINE
2191  010304  012777  000011 005444       MOV     #LINENA+SECTX,@DMBLSR       ;SET LINE ENABLE +SECTX
2192  010312  005077  005436              CLR     @DMBCSR                     ;CLEAR CONTROL REGISTER
2193  010316  005005                MUX17B: CLR     R5                          ;CLEAR EXPECTED RESULT
2194  010320  017704  005432              MOV     @DMBLSR,R4                  ;READ LINE STATUS
2195  010324  117703  005424              MOVB    @DMBCSR,R3                  ;READ LINE NUMBER
2196  010330  042703  177760              BIC     #177760,R3                  ;CLEAR UNWANTED BITS
2197  010334  020103                      CMP     R1,R3                       ;IF RECEIVED LINE=SELECTED LINE
2198  010336  001002                      BNE     MUX17C                      ;EXPECT LINE ENABLE AND
2199  010340  012705  000031              MOV     #LINENA+SECTX+SECRX,R5
2200                                                                          ;SECONDARY RECEIVE IS SET
2201  010344  020405                MUX17C: CMP     R4,R5                       ;COMPARE EXPECTED AND
2202  010346  001403                      BEQ     MUX17D                      ;RECEIVED RESULTS
2203  010350  104001                      ERRORL                              ;LINE STATUS ERROR
2204  010352  104003                      SCOPEF
2205  010354  010356                      MUX17D
2206  010356  052777  000400 005370 MUX17D: BIS     #STEP,@DMBCSR               ;UPDATE LINE COUNTER
2207  010364  005302                      DEC     R2                          ;CONTINUE IF ALL CHECKS
2208  010366  001353                      BNE     MUX17B                      ;ARE NOT DONE FOR THIS LINE
2209  010370  012705  000001              MOV     #LINENA,R5                  ;EXPECT LINE ENABLE
2210  010374  010103                MUX17E: MOV     R1,R3                       ;ON SELECTED LINE
2211  010376  010177  005352              MOV     R1,@DMBCSR                  ;SELECT LINE
2212  010402  042777  000010 005346       BIC     #SECTX,@DMBLSR              ;CLEAR SECONDARY TRANSMIT
2213  010410  105227  000000              INCB    #0                          ;DELAY FOR CABLE
2214  010414  001375                      BNE     .-4                         ;DITTO
2215  010416  017704  005334              MOV     @DMBLSR,R4                  ;READ LINE STATUS REGISTER
2216  010422  020504                      CMP     R5,R4                       ;ONLY LINE ENABLE SHOULD BE
2217  010424  001401                      BEQ     MUX17F                      ;SET ON THIS LINE
2218  010426  104001                      ERRORL                              ;LINE STATUS ERROR
2219  010430  104002                MUX17F: SCOPE                               ;CHECK FOR ITERATIONS, LOOP
2220
2221                                        ;DM11-BA ON LINE TEST USING 103A TYPE MODEMS
2222                                        ;ANSWER STATION TO BE OPERATED IN AUTO-ANSWER MODE
2223                                        ;THIS TEST VERIFIES THE CONNECT AND DISCONNECT SEQUENCES
2224                                        ;USING THE DM11-BA TO CONTROL 103A TYPE MODEMS
2225
2226
2227
2228  010432                          T200:                                       ;REFERENCE DESIGNATION
2229  010432  000005                ST103A: RESET                               ;INITIALIZE INTERFACE
2230  010434  012737  000340 177776       MOV     #340,PS                     ;DISABLE ALL INTERRUPTS
2231  010442  104004                      TYPE                                ;TYPE "103A MODEM CONNECT-
2232  010444  016300                      MT103T                              ;DISCONNECT TEST"
2233  010446  022737  000176 015770       CMP     #SWREG,SWR
2234  010454  001001                      BNE     1$
2235  010456  104025                      CNTLUU
2236  010460  012737  010476 012266  1$:  MOV     #T103A,FATRET               ;SET UP FOR FATAL ERROR
```

```
2237  010466  012737  010474  002150          MOV     #ST103B,KRET            ;SET UP FOR LINE CHANGE
2238  010474  104017                  ST103B: GETLNS                          ;INPUT ORIGINATE AND
2239                                                                          ;AND ANSWER LINE NUMBERS
2240  010476  104020                  T103A:  SETUP                           ;SET UP TO RECEIVE INTERRUPTS
2241                                                                          ;WAIT FOR RING
2242  010500  010510                          T103B                          ;GO HERE IF RING OK
2243  010502  010504                          T103A1                         ;GO HERE IF NO RING
2244  010504  104012                  T103A1: ERROR                          ;NO RING WITHIN 5 MINUTES
2245  010506  000772                          BR      ST103B                 ;SELECT NEW LINES AND REDIAL
2246
2247                                          ;CHECK FOR RING INTERRUPT ON SELECTED ANSWER LINE
2248                                          ;IF AN INCORRECT TRANSITION OCCURS, THE PROGRAM
2249                                          ;WILL TYPE AN ERROR MESSAGE, AND THE OPERATOR
2250                                          ;WILL BE REQUESTED TO RESELECT LINES AND REDIAL
2251
2252  010510  104021                  T103B:  CKRING                          ;CHECK FOR RING INTERRUPT
2253                                                                          ;ONLY ON ANSWER LINE
2254                                                                          ;AND NO TRANSITIONS ON
2255                                                                          ;ORIGINATE LINE
2256  010512  010530                          T103C                          ;GO HERE IF TRANSITIONS
2257                                                                          ;ARE CORRECT
2258  010514  010520                          T103B1                         ;GO HERE IF INCORRECT
2259                                                                          ;TRANSITION ON ANSWER LINE
2260  010516  010524                          T103B2                         ;GO HERE IF INCORRECT TRANSITION
2261                                                                          ;ON ORIGINATE LINE
2262  010520  104014                  T103B1: ERRORT                         ;TRANSITION ERROR ON ANSWER LINE
2263  010522  000207                          RTS     PC                     ;CONTINUE CHECKING
2264  010524  104014                  T103B2: ERRORT                         ;TRANSITION ERROR ON ORIGINATE LINE
2265  010526  000762                          BR      ST103B                 ;RESELECT LINES AND REDIAL
2266
2267                                          ;SET TERMINAL READY ON SELECTED ANSWER LINE
2268                                          ;WAIT FOR TRANSITIONS TO OCCUR ON SELECTED LINES
2269
2270  010530  013777  016046  005216  T103C:  MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO
2271                                                                          ;ANSWER LINE NUMBER
2272  010536  052777  000002  005212          BIS     #TRMRDY,@DMBLSR         ;SET TERMINAL READY ON
2273                                                                          ;SELECTED ANSWER LINE
2274  010544  104026                          CKINTT
2275  010546  104022                          WAITRN                         ;WAIT FOR TRANSITIONS TO OCCUR
2276
2277                                          ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
2278                                          ;SELECTED ORIGINATE AND ANSWER LINES
2279
2280  010550  104023                          CKTRAN                         ;CHECK TRANSITIONS AND
2281                                                                          ;STATUS ON SELECTED
2282                                                                          ;ANSWER AND ORIGINATE LINES
2283  010552  000143                          CO+CS+LINENA+TRMRDY             ;EXPECT CARRIER, CLEAR TO SEND,
2284                                                                          ;LINE ENABLE AND TERMINAL
2285                                                                          ;READY STATUS BITS SET ON
2286                                                                          ;ANSWER LINE
2287  010554  000143                          CO+CS+LINENA+TRMRDY             ;EXPECT CARRIER, CLEAR TO SEND,
2288                                                                          ;LINE ENABLE   , AND TERMINAL
2289                                                                          ;READY STATUS BITS ON
2290                                                                          ;ORIGINATE LINE
2291  010556  100006                          RINGF+XCO+XCS                  ;EXPECT CARRIER, CLEAR TO SEND
2292                                                                          ;AND POSSIBLE RING TRANSITIONS
```

```
                                                        ;ON ANSWER LINE
010560  000006                    XCO+XCS               ;EXPECT CARRIER AND CLEAR
                                                        ;TO SEND TRANSITIONS ON
                                                        ;ORIGINATE LINE
010562  010574                    T103D1                ;GO HERE ON ANSWER LINE STATUS ERROR

010564  010600                    T103D2                ;GO HERE ON ORIGINATE LINE STATUS ERROR
010566  010604                    T103D3                ;GO HERE ON ANSWER LINE TRANSITION ERROR
010570  010610                    T103D4                ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
010572  010614                    T103E                 ;GO TO NEXT TEST IF NO ERRORS
010574  104015          T103D1:   ERRORS                ;ANSWER LINE STATUS ERROR
010576  000207                    RTS     PC            ;CONTINUE CHECKING
010600  104015          T103D2:   ERRORS                ;ORIGINATE LINE STATUS ERROR
010602  000207                    RTS     PC            ;CONTINUE CHECKING
010604  104014          T103D3:   ERRORT                ;ANSWER LINE TRANSITION ERROR
010606  000207                    RTS     PC            ;CONTINUE CHECKING
010610  104014          T103D4:   ERRORT                ;ORIGINATE LINE TRANSITION ERROR
010612  000207                    RTS     PC            ;CONTINUE CHECKING

                                  ;SET UP TO TEST DISCONNECT SEQUENCE
                                  ;THE PROGRAM WILL REQUEST THE OPERATOR TO SET SW01=1
                                  ;TO INITIATE THE DISCONNECT SEQUENCE
                                  ;THE OPERATOR MAY MANUALLY SWITCH THE DATA SETS FROM
                                  ;DATA TO TALK MODE AS MANY TIMES AS DESIRED
                                  ;BEFORE THE SWITCH SEETIN IS MADE
                                  ;ANY TRANSITIONS DETECTED DURING THIS TIME WILL BE
                                  ;REPORTED BY TYPEOUT

010614  104004          T103E:    TYPE                  ;TYPE "SET SW01=1 TO
010616  016543                    MDISC                 ;TEST DISCONNECT"
010620  012737  000340  177776    MOV     #340,PS       ;LOCK OUT INTERRUPTS
010626  012777  012310  005114    MOV     #TRNTYP,@DMBVEC ;SET UP TO DETECT TRANSITIONS
                                                        ;BEFORE DISCONNECT SEQUENCE STARTS
010634  012737  010654  016062    MOV     #T103ES,RNGRET ;SET UP DUMMY RETURN FOR
                                                        ;RING INTERRUPT
010642  012777  000140  005104    MOV     #SCNENA+INTENA,@DMBCSR ;SET SCAN ENABLE AND INTERRUPT ENABLE
010650  005037  177776            CLR     PS            ;ALLOW INTERRUPTS
010654  005077  005102  T103ES:   CLR     @TKDBR
010660  105777  005074  1$:       TSTB    @TKCSR
010664  100375                    BPL     1$
010666  005777  005070            TST     @TKDBR
010672  012737  000340  177776    MOV     #340,PS       ;START DISCONNECT SEQUENCE
010700  005077  005050            CLR     @DMBCSR       ;CLEAR CONROL REGISTER
010704  013777  016044  005042    MOV     LINORG,@DMBCSR ;SET LINE COUNTER TO SELECTED ORIGINATE LINE
010712  042777  000002  005036    BIC     #TRMRDY,@DMBLSR ;SET TERMINAL READY ON SELECTED LINE
010720  104026                    CKINTT
010722  104022                    WAITRN                ;WAIT FOR TRANSITIONS TO OCCUR

                                  ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON SELECTED
                                  ;ORIGINATE AND ANSWER LINES

010724  104023                    CKTRAN                ;CHECK TRANSITIONS AND
                                                        ;STATUS ON SELECTED
                                                        ;ANSWER AND ORIGINATE LINES
010726  000003                    LINENA+TRMRDY         ;EXPECT LINE ENABLE AND
                                                        ;TERMINAL READY STATUS BITS
```

```
2349
2350  010730  000001                          LINENA                          ;SET ON ANSWER LINE
                                                                              ;EXPECT LINE ENABLE STATUS BIT
2351                                                                          ;SET ON ORIGINATE LINE
2352  010732  000006                          XCO+XCS                         ;EXPECT CARRIER AND CLEAR
2353                                                                          ;TO SEND TRANSITIONS ON
2354                                                                          ;ANSWER LINE
2355  010734  000006                          XCO+XCS                         ;EXPECT CARRIER AND CLEAR
2356                                                                          ;TO SEND TRANSITIONS ON
2357                                                                          ;ORIGINATE LINE
2358  010736  010750                          T103E1                          ;GO HERE ON ANSWER LINE STATUS ERROR
2359
2360  010740  010754                          T103E2                          ;GO HERE ON ORIGINATE LINE STATUS ERROR
2361  010742  010760                          T103E3                          ;GO HERE ON ANSWER LINE TRANSITION ERROR
2362  010744  010764                          T103E4                          ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
2363  010746  010770                          T103EN                          ;GO TO NEXT TEST IF NO ERRORS
2364  010750  104015              T103E1:     ERRORS                          ;ANSWER LINE STATUS ERROR
2365  010752  000207                          RTS     PC                      ;CONTINUE CHECKING
2366  010754  104015              T103E2:     ERRORS                          ;ORIGINATE LINE STATUS ERROR
2367  010756  000207                          RTS     PC                      ;CONTINUE CHECKING
2368  010760  104014              T103E3:     ERRORT                          ;ANSWER LINE TRANSITION ERROR
2369  010762  000207                          RTS     PC                      ;CONTINUE CHECKING
2370  010764  104014              T103E4:     ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
2371  010766  000207                          RTS     PC                      ;CONTINUE CHECKING
2372
2373  010770                      T201:                                       ;REFERENCE DESIGNATION
2374  010770  104004              T103EN:     TYPE                            ;TYPE '' 103A TEST COMPLETE''
2375  010772  016465                          MT103A
2376  010774  005037  016002                  CLR     TSTNO                   ;CLEAR TEST NUMBER FOR LOOPING
2377  011000  104026                          CKINTT
2378  011002  000137  010474                  JMP     ST103B                  ;SELECT NEW LINE NUMBERS AND
2379                                                                          ;RESTART TEST
2380
2381                                          ;DM11-BA ON LINE TEST USING 202C TYPE MODEMS
2382                                          ;ANSWER STATION TO BE OPERATED IN AUTO-ANSWER MODE
2383                                          ;THIS TEST VERIFIES THE CONNECT AND DISCONNECT SEQUENCES
2384                                          ;USING THE DM11-BA TO CONTROL 202C TYPE MODEMS
2385
2386                                          ;ALSO TESTED ARE LINE TURN-AROUND AND
2387                                          ;SECONDARY TRANSMIT-SECONDARY RECEIVE
2388
2389  011006                      T300:                                       ;REFERENCE DESIGNATION
2390  011006  000005              ST202A:     RESET                           ;INITIALIZE INTERFACE
2391  011010  012737  000340  177776          MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2392  011016  104004                          TYPE                            ;TYPE "202C MODEM CONNECT-
2393  011020  016351                          MT202T                          ;DISCONNECT TEST''
2394  011022  022737  000176  015770          CMP     #SWREG,SWR
2395  011030  001001                          BNE     1$
2396  011032  104025                          CNTLUU
2397  011034  012737  011052  012266  1$:     MOV     #T202A,FATRET           ;SET UP FOR FATAL ERROR
2398  011042  012737  011050  002150          MOV     #ST202B,KRET            ;SET UP FOR LINE CHANGE
2399  011050  104017              ST202B:     GETLNS                          ;INPUT ORIGINATE AND
2400                                                                          ;ANSWER LINE NUMBERS
2401  011052  104020              T202A:      SETUP                           ;SET UP TO RECEIVE INTERRUPTS
2402                                                                          ;WAIT FOR RING
2403  011054  011064                          T202B                           ;GO HERE IF RING OK
2404  011056  011060                          T202A1                          ;GO HERE IF NO RING
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 2405  011060  104012                  T202A1: ERROR                           ;NO RING WITHIN 5 MINUTES
 2406  011062  000772                          BR      ST202B                  ;SELECT NEW LINES AND REDIAL
 2407
 2408                                          ;CHECK FOR RING INTERRUPT ON SELECTED ANSWER LINE
 2409                                          ;IF AN INCORRECT TRANSITION OCCURS, THE PROGRAM
 2410                                          ;WILL TYPE AN ERROR MESSAGE, AND THE OPERATOR
 2411                                          ;WILL BE REQUESTED TO RESELECT LINES AND REDIAL
 2412
 2413  011064  104021                  T202B:  CKRING                          ;CHECK FOR RING INTERRUPT
 2414                                                                          ;ONLY ON ANSWER LINE
 2415                                                                          ;AND NO TRANSITIONS ON
 2416                                                                          ;ORIGINATE LINE
 2417  011066  011104                          T202C                           ;GO HERE IF TRANSITIONS
 2418                                                                          ;ARE CORRECT
 2419  011070  011074                          T202B1                          ;GO HERE IF INCORRECT
 2420                                                                          ;TRANSITION ON ANSWER LINE
 2421  011072  011100                          T202B2                          ;GO HERE IF INCORRECT
 2422                                                                          ;TRANSITION ON ORIGINATE LINE
 2423  011074  104014                  T202B1: ERRORT                          ;ANSWER LINE TRANSITION ERROR
 2424  011076  000207                          RTS     PC                      ;CONTINUE CHECKING
 2425  011100  104014                  T202B2: ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
 2426  011102  000762                          BR      ST202B                  ;RESELECT LINES AND REDIAL
 2427
 2428                                          ;SET TERMINAL READY ON SELECTED ANSWER LINE
 2429                                          ;SET REQUEST TO SEND ON SELECTED ORIGINATE LINE
 2430                                          ;WAIT FOR TRANSITIONS TO OCCUR ON SELECTED LINES
 2431
 2432  011104  013777  016046  004642  T202C:  MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
 2433  011112  052777  000002  004636          BIS     #TRMRDY,@DMBLSR         ;SET TERMINAL READY ON ANSWER LINE
 2434  011120  013777  016044  004626  T202D:  MOV     LINORG,@DMBCSR          ;SET LINE COUNTER TO ORIGINATE LINE
 2435  011126  052777  000004  004622          BIS     #RS,@DMBLSR             ;SET REQUEST TO SEND ON ORIGINATE LINE
 2436  011134  104026                          CKINTT
 2437  011136  104022                          WAITRN                          ;WAIT FOR TRANSITIONS TO OCCUR
 2438
 2439                                          ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
 2440                                          ;SELECTED ORIGINATE AND ANSWER LINES
 2441
 2442  011140  104023                          CKTRAN                          ;CHECK TRANSITIONS AND STATUS
 2443                                                                          ;ON SELECTED ANSWER AND
 2444                                                                          ;ORIGINATE LINES
 2445  011142  000103                          CO+LINENA+TRMRDY                ;EXPECT CARRIER, LINE ENABLE
 2446                                                                          ;AND TERMINAL READY STATUS
 2447                                                                          ;BITS SET ON ANSWER LINE
 2448  011144  000147                          RS+CO+CS+LINENA+TRMRDY          ;EXPECT REQUEST TO SEND, CLEAR
 2449                                                                          ;TO SEND, CARRIER, LINE ENABLE
 2450                                                                          ;AND TERMINAL READY STATUS BITS
 2451                                                                          ;SET ON ORIGINATE LINE
 2452  011146  100004                          RINGF+XCO                       ;EXPECT CARRIER AND POSSIBLE
 2453                                                                          ;RING TRANSITIONS ON
 2454                                                                          ;ANSWER LINE
 2455  011150  000006                          XCO+XCS                         ;EXPECT CARRIER AND CLEAR
 2456                                                                          ;TO SEND TRANSITIONS ON
 2457                                                                          ;ORIGINATE LINE
 2458  011152  011164                          T202D1                          ;GO HERE ON ANSWER LINE STATUS ERROR
 2459  011154  011170                          T202D2                          ;GO HERE ON ORIGINATE LINE STATUS ERROR
 2460  011156  011174                          T202D3                          ;GO HERE ON ANSWER LINE STATUS ERROR
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2461  011160  011200                        T202D4                          ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
2462  011162  011204                        T202E                           ;GO TO NEXT TEST IF NO ERRORS
2463  011164  104015              T202D1:   ERRORS                          ;ANSWER LINE SATAUS ERROR
2464  011166  000207                        RTS     PC                      ;CONTINUE CHECKING
2465  011170  104015              T202D2:   ERRORS                          ;ORIGINATE LINE STATUS ERROR
2466  011172  000207                        RTS     PC                      ;CONTINUE CHECKING
2467  011174  104014              T202D3:   ERRORT                          ;ANSWER LINE TRANSITION ERROR
2468  011176  000207                        RTS     PC                      ;CONTINUE CHECKING
2469  011200  104014              T202D4:   ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
2470  011202  000207                        RTS     PC                      ;CONTINUE CHECKING
2471
2472                                        ;SET SECONDARY TRANSMIT ON ANSWER LINE
2473                                        ;WAIT FOR TRANSITIONS TO OCCUR ON SELECTED LINES
2474
2475  011204  013777  016046  004542  T202E:   MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
2476  011212  052777  000010  004536            BIS     #SECTX,@DMBLSR          ;SET SECONDARY RECEIVE ON ANSWER LINE
2477  011220  104026                            CKINTT
2478  011222  104022                            WAITRN                          ;WAIT FOR TRANSITIONS TO OCCUR
2479
2480                                        ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
2481                                        ;SELECTED ORIGINATE AND ANSWER LINES
2482
2483  011224  104023                        CKTRAN                          ;CHECK TRANSITIONS AND STATUS
2484                                                                        ;ON SELECTED ANSWER AND
2485                                                                        ;ORIGINATE LINES
2486  011226  000133                        SECTX+CO+LINENA+TRMRDY+SECRX     ;EXPECT SECONDARY TRANSMIT
2487                                                                        ;SECONDARY RECEIVE, CARRIER
2488                                                                        ;LINE ENABLE AND TERMINAL READY
2489                                                                        ;STATUS BITS SET ON ANSWER LINE
2490  011230  000167                        SECRX+RS+CO+CS+LINENA+TRMRDY     ;EXPECT SECONDARY RECEIVE,
2491                                                                        ;REQUEST TO SEND, CLEAR TO SEND
2492                                                                        ;CARRIER, LINE ENABLE AND
2493                                                                        ;TERMINAL READY STATUS BITS
2494                                                                        ;SET ON ORIGINATE LINE
2495  011232  000001                        XSCRX                           ;EXPECT SECONDARY RECEIVE
2496                                                                        ;TRANSITION ON ANSWER LINE
2497  011234  000001                        XSCRX                           ;EXPECT SECONDARY RECEIVE
2498                                                                        ;TRANSITION ON ORIGINATE LINE
2499  011236  011250                        T202E1                          ;GO HERE ON ANSWER LINE STATUS ERROR
2500  011240  011254                        T202E2                          ;GO HERE ON ORIGINATE LINE STATUS ERROR
2501  011242  011260                        T202E3                          ;GO HERE ON ANSWER LINE TRANSITION ERROR
2502  011244  011264                        T202E4                          ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
2503  011246  011270                        T202F                           ;GO TO NEXT TEST IF NO ERRORS
2504  011250  104015              T202E1:   ERRORS                          ;ANSWER LINE STATUS ERROR
2505  011252  000207                        RTS     PC                      ;CONTINUE CHECKING
2506  011254  104015              T202E2:   ERRORS                          ;ORIGINATE LINE STATUS ERROR
2507  011256  000207                        RTS     PC                      ;CONTINUE CHECKING
2508  011260  104014              T202E3:   ERRORT                          ;ANSWER LINE TRANSITION ERROR
2509  011262  000207                        RTS     PC                      ;CONTINUE CHECKING
2510  011264  104014              T202E4:   ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
2511  011266  000207                        RTS     PC                      ;CONTINUE CHECKING
2512
2513                                        ;DROP REQUEST TO SEND ON ORIGINATE LINE
2514                                        ;DROP SECONDARY TRANSMIT ON ANSWER LINE
2515                                        ;WAIT FOR TRANSITIONS TO OCCUR ON SELECTED LINES
2516
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2517  011270  013777  016044  004456  T202F:  MOV     LINORG,@DMBCSR          ;SET LINE COUNTER TO ORIGINATE LINE
2518  011276  042777  000004  004452          BIC     #RS,@DMBLSR             ;DROP REQUEST TO SEND
2519  011304  013777  016046  004442          MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
2520  011312  042777  000010  004436          BIC     #SECTX,@DMBLSR          ;DROP SECONDARY RECEIVE
2521  011320  104026                          CKINTT
2522  011322  104022                          WAITRN                          ;WAIT FOR TRANSITIONS TO OCCUR
2523
2524                                          ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
2525                                          ;SELECTED ORIGINATE AND ANSWER LINES
2526
2527  011324  104023                          CKTRAN                          ;CHECK TRANSITIONS AND STATUS
2528                                                                          ;ON SELECTED ANSWER AND
2529                                                                          ;ORIGINATE LINES
2530  011326  000003                          LINENA+TRMRDY                   ;EXPECT LINE ENABLE AND
2531                                                                          ;TERMINAL READY STATUS BITS
2532                                                                          ;SET ON ANSWER LINE
2533  011330  000003                          LINENA+TRMRDY                   ;EXPECT LINE ENABLE AND
2534                                                                          ;TERMINAL READY STATUS BITS
2535                                                                          ;SET ON ORIGINATE LINE
2536  011332  000005                          XCO+XSCRX                       ;EXPECT CARRIER AND SECONDARY
2537                                                                          ;RECEIVE TRANSITIONS ON
2538                                                                          ;ANSWER LINE
2539  011334  000007                          XCO+XCS+XSCRX                   ;EXPECT CARRIER, CLEAR TO SEND
2540                                                                          ;AND SECONDARY RECEIVE
2541                                                                          ;TRANSITIONS ON ORIGINATE LINE
2542  011336  011350                          T202F2                          ;GO HERE ON ANSWER LINE STAATUS ERROR
2543  011340  011354                          T202F3                          ;GO HERE ON ORIGINATE LINE STATUS ERRORO
2544  011342  011360                          T202F4                          ;GO HERE ON ANSWER LINE TRANSITION ERROR
2545  011344  011364                          T202F5                          ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
2546  011346  011370                          T202G                           ;GO TO NEXT TEST IF NO ERRORS
2547  011350  104015          T202F2:         ERRORS                          ;ANSWER LINE STATUS ERROR
2548  011352  000207                          RTS     PC                      ;CONTINUE CHECKING
2549  011354  104015          T202F3:         ERRORS                          ;ORIGINATE LINE STATUS ERROR
2550  011356  000207                          RTS     PC                      ;CONTINUE CHECKING
2551  011360  104014          T202F4:         ERRORT                          ;ANSWER LINE TRANSITION ERROR
2552  011362  000207                          RTS     PC                      ;CONTINTUE CHECKING
2553  011364  104014          T202F5:         ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
2554  011366  000207                          RTS     PC                      ;CONTINUE CHECKING
2555
2556
2557                                          ;SET REQUEST TO SEND ON ANSWER LINE
2558                                          ;WAIT FOR TRANSITIONS ON SELECTED LINES
2559
2560  011370  013777  016046  004356  T202G:  MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
2561  011376  052777  000004  004352          BIS     #RS,@DMBLSR             ;SET REQUEST TO SEND
2562  011404  104026                          CKINTT
2563  011406  104022                          WAITRN                          ;WAIT FOR TRANSITIONS TO OCCUR
2564
2565                                          ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
2566                                          ;SELECTED ORIGINATE AND ANSWER LINES
2567
2568  011410  104023                          CKTRAN                          ;CHECK TRANSITIONS AND STATUS
2569                                                                          ;ON SELECTED ANSWER AND
2570                                                                          ;ORIGINATE LINES
2571  011412  000147                          RS+CO+CS+LINENA+TRMRDY          ;EXPECT LINE ENABLE, TERMINAL
2572                                                                          ;READY, REQUEST TO SEND, CLEAR
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                                                                ;TO SEND, AND CARRIER
                                                                ;STATUS BITS SET ON  ANSWER LINE
011414  000103                  CO+LINENA+TRMRDY               ;EXPECT LINE ENABLE, TERMINAL
                                                                ;READY AND CARRIER STATUS
                                                                ;BITS SET ON ORIGINATE LINE
011416  000006                  XCO+XCS                        ;EXPECT CARRIER AND CLEAR
                                                                ;TO SEND TRANSITIONS ON
                                                                ;ANSWER LINE
011420  000004                  XCO                            ;EXPECT CARRIER TRANSITION
                                                                ;ON ORIGINATE LINE
011422  011434                  T202G1                         ;GO HERE ON  ANSWER LINE STATUS ERROR
011424  011440                  T202G2                         ;GO HERE ON ORIGINATE LINE STATUS ERROR
011426  011444                  T202G3                         ;GO HERE ON ANSWER LINE TRANSITION ERROR
011430  011450                  T202G4                         ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
011432  011454                  T202H                          ;GO TO NEXT TEST IF NO ERRORS
011434  104015          T202G1: ERRORS                         ;ANSWER LINE STATUS ERROR
011436  000207                  RTS     PC                     ;CONTINUE TESTING
011440  104015          T202G2: ERRORS                         ;ORIGINATE LINE STATUS ERROR
011442  000207                  RTS     PC                     ;CONTINUE TESTING
011444  104014          T202G3: ERRORT                         ;ANSWER LINE TRANSITION ERROR
011446  000207                  RTS     PC                     ;CONTINUE TESTING
011450  104014          T202G4: ERRORT                         ;ORIGINATE LINE TRANSITION ERROR
011452  000207                  RTS     PC                     ;CONTINUE TESTING

                        ;SET SECONDARY TRANSMIT ON ORIGINATE LINE
                        ;WAIT FOR TRANSITIONS TO OCCUR ON SELECTED LINES

011454  013777  016044  004272  T202H:  MOV     LINORG,@DMBCSR ;SET LINE COUNTER TO ORIGINATE LINE
011462  052777  000010  004266          BIS     #SECTX,@DMBLSR ;SET SECONDARY TRANSMIT
011470  104026                          CKINTT
011472  104022                          WAITRN                 ;WAIT FOR TRANSITIONS TO OCCUR

                        ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
                        ;SELECTED ORIGINATE AND ANSWER LINES

011474  104023                  CKTRAN                         ;CHECK TRANSITIONS AND STATUS
                                                                ;ON SELECTED ANSWER AND
                                                                ;ORIGINATE LINES
011476  000167                  RS+CS+CO+LINENA+TRMRDY+SECRX   ;EXPECT LINE ENABLE, TERMINAL
                                                                ;READY, REQUEST TO SEND, CLEAR
                                                                ;TO SEND, CARRIER AND SECONDARY
                                                                ;RECEIVE STATUS BITS SET
                                                                ;ON ANSWER LINE
011500  000133                  SECTX+CO+LINENA+TRMRDY+SECRX   ;EXPECT LINE ENABLE, TERMINAL
                                                                ;READY, CARRIER, SECONDARY
                                                                ;TRANSMIT AND SECONDARY
                                                                ;RECEIVE STATUS BITS SET
                                                                ;ON ORIGINATE LINE
011502  000001                  XSCRX                          ;EXPECT SECONDARY RECEIVE
                                                                ;TRANSITION ON ANSWER LINE
011504  000001                  XSCRX                          ;EXPECT SECONDARY RECEIVE
                                                                ;TRANSITION ON ORIGINATE LINE
011506  011520                  T202H2                         ;GO HERE ON ANSWER LINE STATUS ERROR
011510  011524                  T202H3                         ;GO HERE ON ORIGINATE LINE STATUS ERROR
011512  011530                  T202H4                         ;GO HERE ON ANSWER LINE TRANSITION ERROR
011514  011534                  T202H5                         ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
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2629  011516  011540                          T202I                           ;GO TO NEXT TEST IF NO ERRORS
2630  011520  104015                T202H2:   ERRORS                          ;ANSWER LIN STATUS ERROR
2631  011522  000207                          RTS     PC                      ;CONTINUE CHECKING
2632  011524  104015                T202H3:   ERRORS                          ;ORIGINATE LINE STATUS ERROR
2633  011526  000207                          RTS     PC                      ;CONTINUE CHECKING
2634  011530  104014                T202H4:   ERRORT                          ;ANSWER LINE TRANSITION ERROR
2635  011532  000207                          RTS     PC                      ;CONTINUE CHECKING
2636  011534  104014                T202H5:   ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
2637  011536  000207                          RTS     PC                      ;CONTINUE CHECKING
2638
2639                                          ;DROP REQUEST TO SEND ON ANSWER LINE
2640                                          ;WAIT FOR TRANSITIONS TO OCCUR ON SELECTED LINES
2641
2642  011540  013777  016046  004206  T202I:  MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
2643  011546  042777  000004  004202          BIC     #RS,@DMBLSR             ;CLEAR REQUEST TO SEND
2644  011554  013777  016044  004172          MOV     LINORG,@DMBCSR          ;SET LINE COUNTER TO ORIGINATE LINE
2645  011562  042777  000010  004166          BIC     #SECTX,@DMBLSR          ;CLEAR SECONDARY TRANSMIT
2646  011570  104026                          CKINTT
2647  011572  104022                          WAITRN                          ;WAIT FRO TRANSITIONS TO OCCUR
2648
2649                                          ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
2650                                          ;SELECTED ORIGINATE AND ANSWER LINES
2651
2652  011574  104023                          CKTRAN                          ;CHECK TRANSITION S AND STATUS
2653                                                                          ;ON SELECTED ANSWE AND
2654                                                                          ;ORIGINATE LINES
2655  011576  000003                          LINENA+TRMRDY                   ;EXPECT LINE ENABLE AND
2656                                                                          ;TERMINAL READY STATUS BITS SET
2657                                                                          ;ON ANSWER LINE
2658  011600  000003                          LINENA+TRMRDY                   ;EXPECT LINE ENABLE AND
2659                                                                          ;TERMINAL READY STATUS BITS
2660                                                                          ;SET ON ORIGINATE LINE
2661  011602  000007                          XCO+XCS+XSCRX                   ;EXPECT CARRIER, CLEAR TO SEND
2662                                                                          ;AND SECONDARY RECEIVE TRANSITIONS
2663                                                                          ;ON ANSWER LINE
2664  011604  000005                          XCO+XSCRX                       ;EXPECT CARRIER AND SECONDARY
2665                                                                          ;RECEIVE TRANSITIONS ON
2666                                                                          ;ORIGINATE LINE
2667  011606  011620                          T20212                          ;GO HERE ON ANSWER LINE STATUS ERROR
2668  011610  011624                          T20213                          ;GO HERE ON ORIGINATE LINE STATUS ERROR
2669  011612  011630                          T20214                          ;GO HERE ON ANSWER LINE TRANSITIN ERROR
2670  011614  011634                          T20215                          ;GO HERE ON ORIGINATE LINE TRANSITION ERROR
2671  011616  011640                          T202J                           ;GO TO NEXT TEST IF NO ERRORS
2672  011620  104015                T20212:   ERRORS                          ;ANSWER LINE STATUS ERROR
2673  011622  000207                          RTS     PC                      ;CONTINUE CHECKING
2674  011624  104015                T20213:   ERRORS                          ;ORIGINATE LINE STATUS ERROR
2675  011626  000207                          RTS     PC                      ;CONTINUE CHECKING
2676  011630  104014                T20214:   ERRORT                          ;ANSWE LINE TRANSITION ERROR
2677  011632  000207                          RTS     PC                      ;CONTINUE CHECKING
2678  011634  104014                T20215:   ERRORT                          ;ORIGINATE LINE TRANSITION ERROR
2679  011636  000207                          RTS     PC                      ;CONTINUE CHECKING
2680
2681                                          ;SET UP TO TEST DISCONNECT SEQUENCE
2682                                          ;THE PROGRAM WILL REQUEST THE OPERATOR TO SET SW01=1
2683                                          ;TO INITIATE THE DISCONNECT SEQUENCE
2684                                          ;THE OPERATOR MAY MANUALLY SWITCH THE DATA SETS FROM
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                                        ;DATA TO TALK MODE AS MANY TIMES AS DESIRED
                                        ;BEFORE THE SWITCH SEETIN IS MADE
                                        ;ANY TRANSITIONS DETECTED DURING THIS TIME WILL BE
                                        ;REPORTED BY TYPEOUT

011640  104004              T202J:    TYPE                                ;TYPE "SET SW01=1 TO
011642  016543                        MDISC                               ;TEST DISCONNECT"
011644  012737  000340  177776        MOV     #340,PS                     ;LOCK OUT INTERRUPTS
011652  012777  012310  004070        MOV     #TRNTYP,@DMBVEC             ;SET UP TO DETECT TRANSITIONS
011660  012737  011700  016062        MOV     #T202JS,RNGRET              ;SET UP DUMMY RETURN FOR RING
                                                                          ;FROM RING INTERRUPT
011666  012777  000140  004060        MOV     #SCNENA+INTENA,@DMBCSR      ;ENABLE LINE SCANNER
                                                                          ;START SCANNER
011674  005037  177776                CLR     PS                          ;ENABLE INTERRUPTS
011700  005077  004056        T202JS: CLR     @TKDBR
011704  105777  004050        1$:     TSTB    @TKCSR
011710  100375                        BPL     1$
011712  005777  004044                TST     @TKDBR

                                        ;DISCONNECT SEQUENCE REQUESTED

011716  012737  000340  177776        MOV     #340,PS                     ;LOCK OUT INTERRUPTS
011724  005077  004024                CLR     @DMBCSR                     ;STOP SCANNER
011730  013777  016044  004016        MOV     LINORG,@DMBCSR              ;SET LINE COUNTER TO SELECTED ORIGINATE LINE
011736  042777  000002  004012        BIC     #TRMRDY,@DMBLSR             ;SET TERMINAL READY ON SELECTED LINE
011744  104024                        WAITS                               ;DELAY
011746  104026                        CKINTT
011750  104022                        WAITRN                              ;WAIT FOR TRANSITIONS TO OCCUR

                                        ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON SELECTED
                                        ;ORIGINATE AND ANSWER LINES

011752  104023                        CKTRAN                              ;CHECK TRANSITIONS AND STATUS
                                                                          ;ON SELECTED ASNWER AND
                                                                          ;ORIGINATE LINES
011754  000003                        LINENA+TRMRDY                       ;EXPECT LINE ENABLE AND
                                                                          ;TERMINAL READY STATUS BITS
                                                                          ;SET ON ANSWER LINE
011756  000001                        LINENA                              ;EXPECT LINE ENABLE STATUS
                                                                          ;BIT SET ON ORIGINATE LINE
011760  000000                        0                                   ;EXPECT NO TRANSITIONS ON
                                                                          ;ANSWER LINE
011762  000000                        0                                   ;EXPECT NO TRANSITIONS ON
                                                                          ;ORIGINATE LINE
011764  011776                        T202J1                              ;GO HERE IF ANSWER LINE STATUS ERROR
011766  012002                        T202J2                              ;GO HERE IF ORIGINATE LINE STATUS ERROR
011770  012006                        T202J3                              ;GO HERE IF ANSWER LINE TRANSITION ERROR
011772  012012                        T202J4                              ;GO HERE IF ORIGINATE LINE TRANSITIONS ERROR
011774  012016                        T202JN                              ;GO TO END OF TEST IF NO ERRORS
011776  104015          T202J1:   ERRORS                                  ;ANSWER LINE STATUS ERRORO
012000  000207                    RTS     PC                              ;CONTINUE CHECKING
012002  104015          T202J2:   ERRORS                                  ;ORIGINATE LINE STATUS ERRROR
012004  000207                    RTS     PC                              ;CONTINUE CHECKING
012006  104014          T202J3:   ERRORT                                  ;ANSWER LINE TRANSITION ERROR
012010  000207                    RTS     PC                              ;CONTINUE CHECKING
012012  104014          T202J4:   ERRORT                                  ;ORIGINATE LINE TRANSITION ERROR
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2741  012014  000207                          RTS     PC                      ;CONTINUE CHECKING
2742
2743  012016  104004              T202JN:     TYPE                            ;TYPE ''202C TEST COMPLETE''
2744  012020  016514                          MT202A
2745  012022  104026                          CKINTT
2746  012024  000137  011050                  JMP     ST202B                  ;GET NEW LINE NUMBERS
2747                                                                          ;RESTART TEST
2748
2749                                          ;DETECT AND RECORD TRANSITIONS ON SELECTED
2750                                          ;ORIGINATE AND ANSWER LINES
2751
2752                                          ;TRANSITION DATA IS STORED IN LOCATIONS ANSFLG AND ORGFLG
2753                                          ;FOR ANSWER AND ORIGINATE LINES RESPECTIVELY
2754                                          ;FORMAT OF DATA IS (FOR BOTH LINES)
2755
2756                                          ;BIT0=1,SECONDARY RECEIVE CAUSED INTERRUPT
2757                                          ;BIT1=1, CLEAR TO SEND CAUSED INTERRUPT
2758                                          ;BIT2=1, CARRIER CAUSED INTERRUPT
2759                                          ;BIT3=1, RING CAUSED INTERRUPT
2760
2761  012030  017704  003720          TRANS:  MOV     @DMBCSR,R4              ;GET LINE NUMBER AND
2762                                                                          ;INTERRUPT FLAGS
2763  012034  010405                          MOV     R4,R5
2764  012036  042705  177760                  BIC     #177760,R5              ;EXTRACT LINE NUMBER
2765  012042  023705  016044                  CMP     LINORG,R5               ;DID ORIGINATE LINE INTERRUPT
2766  012046  001411                          BEQ     ORGTR                   ;IF YES, SERVICE
2767  012050  023705  016046                  CMP     LINANS,R5               ;DID ANSWER LINE INTERRUPT
2768  012054  001443                          BEQ     ANSTR                   ;IF YES, SERVICE
2769  012056  010577  003672                  MOV     R5,@DMBCSR
2770  012062  017703  003670                  MOV     @DMBLSR,R3
2771  012066  104016                          ERRORN                          ;INTERRUPT ON INCORRECT LINE
2772  012070  000471                          BR      FATEX
2773
2774                                          ;RECORD TRANSITIONS FOR ORIGINATE LINE
2775
2776  012072  032704  100000          ORGTR:  BIT     #RINGF,R4               ;IF RING CAUSED INTERRUPT,
2777  012076  001403                          BEQ     ORGTR1                  ;SET RING TRANSITION BIT
2778  012100  052737  000010  016052          BIS     #10,ORGFLG
2779  012106  032704  040000          ORGTR1: BIT     #COF,R4                 ;IF CARRIER CAUSED INTERRUPT
2780  012112  001403                          BEQ     ORGTR2                  ;SET CARRIER TRANSITION BIT
2781  012114  052737  000004  016052          BIS     #4,ORGFLG
2782  012122  032704  020000          ORGTR2: BIT     #CSF,R4                 ;IF CLEAR TO SEND
2783                                                                          ;CAUSED INTERRUPT
2784  012126  001403                          BEQ     ORGTR3                  ;SET CLEAR TO SEND
2785                                                                          ;TRANSITION BIT
2786  012130  052737  000002  016052          BIS     #2,ORGFLG
2787  012136  032704  010000          ORGTR3: BIT     #SECRXF,R4              ;IF SECONDARY RECEIVE
2788                                                                          ;CAUSED INTERRUPT
2789  012142  001403                          BEQ     ORGTR4                  ;SET SECONDARY RECEIVE
2790  012144  052737  000001  016052          BIS     #1,ORGFLG               ;TRANSITION BIT
2791  012152  032704  170000          ORGTR4: BIT     #RINGF+COF+CSF+SECRXF,R4
2792                                                                          ;IF NO INTERRUPT FLAGS SET
2793  012156  001044                          BNE     TRANEX                  ;EXIT TRANSITION DETECTION
2794  012160  104016                  ORGTRR: ERRORN
2795  012162  000434                          BR      FATEX
2796
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2797                                        ;RECORD TRANSITIONS FOR ANSWER LINE
2798
2799  012164  032704  100000        ANSTR:  BIT     #RINGF,R4               ;IF RING CAUSED INTERRUPT,
2800  012170  001403                        BEQ     ANSTR1                  ;SET RING TRANSITION BIT
2801  012172  052737  000010  016050        BIS     #10,ANSFLG
2802  012200  032704  040000        ANSTR1: BIT     #COF,R4                 ;IF CARRIER CAUSED INTERRUPT
2803  012204  001403                        BEQ     ANSTR2                  ;SET CARRIER TRANSITION BIT
2804  012206  052737  000004  016050        BIS     #4,ANSFLG
2805  012214  032704  020000        ANSTR2: BIT     #CSF,R4                 ;IF CLEAR TO SEND
2806                                                                        ;CAUSED INTERRUPT
2807  012220  001403                        BEQ     ANSTR3                  ;SET CLEAR TO SEND
2808                                                                        ;TRANSITION BIT
2809  012222  052737  000002  016050        BIS     #2,ANSFLG
2810  012230  032704  010000        ANSTR3: BIT     #SECRXF,R4              ;IF SECONDARY RECEIVE
2811                                                                        ;CAUSED INTERRUPT
2812  012234  001403                        BEQ     ANSTR4                  ;SET SECONDARY RECEIVE
2813  012236  052737  000001  016050        BIS     #1,ANSFLG               ;TRANSITION BIT
2814  012244  032704  170000        ANSTR4: BIT     #RINGF+COF+CSF+SECRXF,R4
2815                                                                        ;IF NO INTERRUPT FLAGS SET
2816  012250  001007                        BNE     TRANEX                  ;EXIT TRANSITION DETECTION
2817  012252  104016                ANSTRR: ERRORN
2818  012254  005037  016002        FATEX:  CLR     TSTNO
2819  012260  022626                        POP2SP
2820  012262  000177  000000                JMP     @FATRET
2821  012266  000000                FATRET: 0
2822
2823                                        ;EXIT TRANSITION DETECTION
2824
2825  012270  005704                TRANEX: TST     R4                      ;IF RING FLAG WAS SET
2826  012272  100002                        BPL     .+6                     ;SET UP SPECIAL RETURN
2827  012274  013716  016062                MOV     RNGRET,(SP)
2828  012300  012777  000140  003446  TRANX1: MOV     #SCNENA+INTENA,@DMBCSR  ;RESTART SCANNER
2829  012306  000002                        RTI
2830
2831                                        ;TYPE TRANSITION DATA AND RETURN
2832
2833  012310  017737  003440  013274  TRNTYP: MOV     @DMBCSR,DATA1
2834  012316  017737  003434  013276        MOV     @DMBLSR,DATA2
2835  012324  104004                        TYPE
2836  012326  017623                        MTRNDET
2837  012330  104006                        OCTASC
2838  012332  012336                        TRNTAB
2839  012334  000761                        BR      TRANX1
2840  012336  000002                TRNTAB: 2
2841  012340  000006                        6
2842  012342  013274                        DATA1
2843  012344  000003                        3
2844  012346  013276                        DATA2
2845
2846                                        ;INPUT ORIGINATE AND ANSWER LINES FROM TELETYPE KEYBOARD
2847
2848  012350  000005                GETLIN: RESET
2849  012352  104013                        INSTRG                          ;TYPE 'ORIGINATE LINE-''
2850  012354  016422                        MSELOR                          ;AND GET LINE NUMBER
2851  012356  000000                        0
2852  012360  000007                        7
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2853  012362  016044                          LINORG
2854  012364  104013                          INSTRG                          ;TYPE "ANSWER LINE-"
2855  012366  016446                          MSELANS                         ;AND GET LINE NUMBER
2856  012370  000000                          0
2857  012372  000007                          7
2858  012374  016046                          LINANS
2859  012376  104004                          TYPE
2860  012400  017514                          MCRLF
2861  012402  000002                          RTI                             ;RETURN TO CALLING ROUTINE
2862
2863                                          ;INITIALIZE INTERFACE
2864
2865  012404  000005              SETUPS:     RESET
2866  012406  012737  000340  177776          MOV     #340,PS                 ;LOCK OUT ALL INTERRUPTS
2867  012414  011605                          MOV     (SP),R5
2868  012416  012537  013304                  MOV     (R5)+,NXTTS
2869  012422  012537  013264                  MOV     (R5)+,ERR1
2870  012426  010516                          MOV     R5,(SP)
2871  012430  012777  006000  003316          MOV     #CLRSCN+CLRMUX,@DMBCSR  ;CLEAR LINE SCANNER AND MULTIPLEXER
2872  012436  032777  000020  003310  SETUP1: BIT     #BUSY,@DMBCSR           ;WAIT FOR SCANNER TO CLEAR
2873  012444  001374                          BNE     SETUP1
2874  012446  005037  015774                  CLR     ERRFLG
2875
2876                                          ;ENABLE SELECTED LINES
2877                                          ;SET TERMINAL READY ON SELECTED ORIGINATE LINE
2878
2879  012452  013777  016044  003274  SETUP2: MOV     LINORG,@DMBCSR          ;SET UP TO ENABLE ORIGINATE LINE
2880                                                                          ;ORIGINATE LINE NUMBER
2881  012460  012777  000003  003270          MOV     #LINENA+TRMRDY,@DMBLSR  ;SET LINE ENABLE AND
2882                                                                          ;TERMINAL READY ON ORIGINATE LINE
2883  012466  013777  016046  003260          MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
2884  012474  012777  000001  003254          MOV     #LINENA,@DMBLSR         ;SET LINE ENABLE ON ANSWER LINE
2885
2886                                          ;REQUEST OPERATOR TO DIAL SELECTED ANSWER TERMINAL
2887                                          ;SET UP TO RECEIVE INTERRUPTS
2888                                          ;START LINE SCANNER
2889
2890  012502  012777  012030  003240          MOV     #TRANS,@DMBVEC          ;SET UP INTERRUPT VECTOR
2891                                                                          ;FOR TRANSITION DETECTION
2892  012510  012777  000340  003234          MOV     #340,@DMBLVL            ;SET UP INTERRUPT SERVICE LEVEL
2893  012516  012777  000140  003230          MOV     #SCNENA+INTENA,@DMBCSR  ;START SCANNER, ENABLE INTERRUPTS
2894  012524  005037  016050                  CLR     ANSFLG                  ;CLEAR TRANSITION DETECTED FLAGS
2895  012530  005037  016052                  CLR     ORGFLG
2896  012534  012737  012564  016062          MOV     #SETUP4,RNGRET          ;SET UP RETURN FROM
2897                                                                          ;DETECTION OF RING INTERRUPT
2898  012542  104004                          TYPE                            ;REQUEST OPERATOR TO DIAL
2899  012544  016242                          DIALM
2900  012546  005037  177776                  CLR     PS                      ;CLEAR PROCESSOR STATUS WORD
2901  012552  005037  016054                  CLR     TIME1                   ;CLEAR TIMER
2902  012556  012737  001000  016056          MOV     #1000,TIME2             ;SET UP FOR 5 MINUTE DELAY
2903  012564  005737  016050      SETUP4:     TST     ANSFLG                  ;IF TRANSITION HAS OCCURED,
2904  012570  001014                          BNE     SETUPB                  ;EXIT WAIT LOOP
2905  012572  005737  016052                  TST     ORGFLG
2906  012576  001011                          BNE     SETUPB
2907  012600  005237  016054                  INC     TIME1                   ;ALLOW OPERATOR 5 MINUTES TO DIAL
2908  012604  001367                          BNE     SETUP4
```

```
2909  012606  005337  016056                  DEC     TIME2
2910  012612  001364                          BNE     SETUP4
2911  012614  022626                          POP2SP
2912  012616  000177  000442                  JMP     @ERR1
2913  012622  022626              SETUPB:     POP2SP
2914  012624  000177  000454                  JMP     @NXTTS
2915  012630  012766  000340  000002          MOV     #340,+2(SP)
2916  012636  000002                          RTI
2917
2918                                          ;CHECK FOR RING INTERRUPT ON SELECTED ANSWER LINE
2919
2920  012640  011605              CKRNG:      MOV     (SP),R5
2921  012642  012537  013304                  MOV     (R5)+,NXTTS
2922  012646  012537  013264                  MOV     (R5)+,ERR1
2923  012652  012537  013266                  MOV     (R5)+,ERR2
2924  012656  010516                          MOV     R5,(SP)
2925  012660  012705  000010                  MOV     #10,R5                  ;EXPECT RING ONLY ON ANSWER LINE
2926  012664  013704  016050                  MOV     ANSFLG,R4               ;GET ACTUAL TRANSITION DATA
2927  012670  013703  016046                  MOV     LINANS,R3               ;SET UP LINE NUMBER
2928  012674  020504                          CMP     R5,R4           ;DID RING CAUSE INTERRUPT
2929  012676  001402                          BEQ     CKRNG1                  ;ON ANSWER LINE
2930  012700  004777  000360                  JSR     PC,@ERR1
2931  012704  005005              CKRNG1:     CLR     R5
2932  012706  013704  016052                  MOV     ORGFLG,R4
2933  012712  013703  016044                  MOV     LINORG,R3
2934  012716  005704                          TST     R4                      ;IF TRANSITION OCCURED
2935  012720  001403                          BEQ     CKRNG2                  ;ON ORIGINATE LINE, ERROR
2936  012722  022626                          POP2SP
2937  012724  000177  000336                  JMP     @ERR2
2938  012730  022626              CKRNG2:     POP2SP
2939  012732  000177  000346                  JMP     @NXTTS
2940
2941  012736  005037  016050      WAITR:      CLR     ANSFLG
2942  012742  005037  016052                  CLR     ORGFLG
2943  012746  012777  012030  002774          MOV     #TRANS,@DMBVEC
2944  012754  012737  012774  016062          MOV     #WAITRR,RNGRET          ;SET UP FOR RETURN
2945                                                                          ;FROM RING DETECTION
2946  012762  012777  000140  002764          MOV     #SCNENA+INTENA,@DMBCSR  ;START SCANNER
2947  012770  005037  177776                  CLR     PS
2948  012774  005037  016054      WAITRR:     CLR     TIME1
2949  013000  012737  000025  016056          MOV     #25,TIME2
2950  013006  005237  016054      WAITR1:     INC     TIME1                   ;WAIT FOR TRANSITIONS OF
2951  013012  001375                          BNE     WAITR1                  ;CARRIER AND CLEAR TO SEND
2952  013014  005337  016056                  DEC     TIME2
2953  013020  001372                          BNE     WAITR1
2954  013022  000002                          RTI
2955
2956                                          ;CHECK FOR CORRECT STATUS AND TRANSITIONS ON
2957                                          ;SELECTED ORIGINATE AND ANSWER LINES
2958
2959  013024  012737  000340  177776  CKTRN:  MOV     #340,PS                 ;LOCK OUT FURTHER INTERRUPTS
2960  013032  005077  002716                  CLR     @DMBCSR                 ;STOP LINE SCANNER
2961  013036  011605                          MOV     (SP),R5
2962  013040  012537  013274                  MOV     (R5)+,DATA1
2963  013044  012537  013276                  MOV     (R5)+,DATA2
2964  013050  012537  013300                  MOV     (R5)+,DATA3
```

```
 2965  013054  012537  013302                  MOV     (R5)+,DATA4
 2966  013060  012537  013264                  MOV     (R5)+,ERR1
 2967  013064  012537  013266                  MOV     (R5)+,ERR2
 2968  013070  012537  013270                  MOV     (R5)+,ERR3
 2969  013074  012537  013272                  MOV     (R5)+,ERR4
 2970  013100  012537  013304                  MOV     (R5)+,NXTTS
 2971  013104  010516                          MOV     R5,(SP)
 2972  013106  013705  013274                  MOV     DATA1,R5
 2973  013112  013777  016046  002634          MOV     LINANS,@DMBCSR          ;SET LINE COUNTER TO ANSWER LINE
 2974  013120  017704  002632                  MOV     @DMBLSR,R4              ;GET ACTUAL ANSWER LINE STATUS
 2975  013124  013703  016046                  MOV     LINANS,R3
 2976  013130  020504                          CMP     R5,R4                   ;COMPARE
 2977  013132  001402                          BEQ     CKTRN1
 2978  013134  004777  000124                  JSR     PC,@ERR1
 2979  013140  013777  016044  002606  CKTRN1: MOV     LINORG,@DMBCSR          ;SET LINE COUNTER TO ORIGINATE LINE
 2980  013146  017704  002604                  MOV     @DMBLSR,R4              ;GET ACTUAL ORIGINATE LINE STATUS
 2981  013152  013705  013276                  MOV     DATA2,R5
 2982  013156  013703  016044                  MOV     LINORG,R3
 2983  013162  020504                          CMP     R5,R4                   ;COMPARE
 2984  013164  001402                          BEQ     CKTRN2
 2985  013166  004777  000074                  JSR     PC,@ERR2
 2986
 2987                                          ;CHECK FOR CORRECT TRANSITIONS ON
 2988                                          ;SELECTED ORIGINATE AND ANSWER LINES
 2989
 2990  013172  105737  013301          CKTRN2: TSTB    DATA3+1
 2991  013176  100003                          BPL     .+10
 2992  013200  042737  000010  016050          BIC     #10,ANSFLG
 2993  013206  113704  016050                  MOVB    ANSFLG,R4               ;GET TRANSITION DATA FOR
 2994  013212  113705  013300                  MOVB    DATA3,R5
 2995  013216  013703  016046                  MOV     LINANS,R3
 2996  013222  020504                          CMP     R5,R4                   ;DID CORRECT TRANSITIONS OCCUR
 2997  013224  001402                          BEQ     CKTRN3
 2998  013226  004777  000036                  JSR     PC,@ERR3
 2999  013232  013704  016052          CKTRN3: MOV     ORGFLG,R4               ;GET TRANSITION DATA FOR
 3000  013236  013705  013302                  MOV     DATA4,R5
 3001  013242  013703  016044                  MOV     LINORG,R3
 3002  013246  020504                          CMP     R5,R4                   ;DID CORRECT TRANSITIONS OCCUR
 3003  013250  001402                          BEQ     CKTRN4
 3004  013252  004777  000014                  JSR     PC,@ERR4
 3005  013256  022626                  CKTRN4: POP2SP
 3006  013260  000177  000020                  JMP     @NXTTS
 3007  013264  000000                  ERR1:   0
 3008  013266  000000                  ERR2:   0
 3009  013270  000000                  ERR3:   0
 3010  013272  000000                  ERR4:   0
 3011  013274  000000                  DATA1:  0
 3012  013276  000000                  DATA2:  0
 3013  013300  000000                  DATA3:  0
 3014  013302  000000                  DATA4:  0
 3015  013304  000000                  NXTTS:  0
 3016
 3017                                          ;END OF PASS
 3018                                          ;UPDATE PASS COUNT
 3019                                          ;TYPE END OF PASS MESSAGE
 3020
```

```
3021  013306                                EOP:
3022  013306  005237  016000                      INC     PASCNT                  ;UPDATE PASS COUNT
3023  013312  012737  000001  016002              MOV     #1,TSTNO                ;START AT FIRST TEST OF GROUP
3024  013320  104004                              TYPE                            ; RING BELL
3025  013322  020102                              MEPASS
3026  013324  013701  000042                      MOV     42,R1                   ;ARE YOU ON ACT11?
3027  013330  001515                              BEQ     TSTENT          ;NO
3028  013332  000005                              RESET
3029  013334  004711                    LOGICAL:  JSR     PC,(R1)
3030  013336  000240                              NOP
3031  013340  000240                              NOP
3032  013342  000240                              NOP
3033  013344  000137  013564                      JMP     TSTENT                  ;GET ADDRESS OF FIRST TEST
3034
3035                                              ;EMT DISPATCH SERVICE
3036                                              ;ARGUMENT OF EMT IS EXTRACTED
3037                                              ;AND USED AS OFFSET TO OBTAIN POINTER
3038                                              ;TO SELECTED SUBROUTINE
3039
3040  013350  011646                    EMTSRV:   MOV     (SP),-(SP)              ;GET PC OF RETURN
3041  013352  162716  000002                      SUB     #2,(SP)                 ;=PC OF EMT
3042  013356  017616  000000                      MOV     @(SP),(SP)              ;GET EMT
3043  013362  006316                    EMTOK:    ASL     (SP)                    ;MULTIPLY EMT ARG BY 2
3044  013364  042716  177001                      BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
3045  013370  062716  020134                      ADD     #EMTTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
3046  013374  017616  000000                      MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
3047  013400  000136                              JMP     @(SP)+                  ;GO TO SUBROUTINE
3048
3049
3050  013402  105777  002352            CKINT:    TSTB    @TKCSR
3051  013406  100001                              BPL     1$
3052  013410  104027                              KBDIN
3053  013412  000002                    1$:       RTI
3054
3055
3056                                              ;END OF SUBTEST SERVICE
3057                                              ;CHECK FOR LOOP ON CURRENT TEST
3058                                              ;CHECK FOR ESCAPE TO NEXT TEST ON ERROR
3059                                              ;UPDATE ITERATION COUNT AND EXIT TO NEXT TEST IF 0
3060
3061                                              ;TEST XOR FLAG (XFLAG) FOR EXISTANCE OF XOR TESTER.
3062
3063  013414  005737  001242            LOOP:     TST     XFLAG   ;IS THERE AN XOR TESTER OUT THERE ?
3064  013420  100022                              BPL     4$      ;NO
3065  013422  013746  000004                      MOV     4,-(SP) ;SAVE 4
3066  013426  012737  013446  000004              MOV     #1$,4   ;SET UP SVC ROUTINE
3067  013434  005737  177060                      TST     177060  ;GOT SOMETHING LIKE SLAVE SYNC
3068  013440  012637  000004                      MOV     (SP)+,4 ;YOU BETCHUM
3069  013444  000404                              BR      2$
3070  013446  022626                    1$:       POP2SP          ;RESTORE STACK
3071  013450  012637  000004                      MOV     (SP)+,4 ;RESTORE 4
3072  013454  000402                              BR      3$
3073  013456  000137  013560            2$:       JMP     LOOPX   ;GO TO NEXT TEST
3074  013462  000137  013564            3$:       JMP     TSTENT  ;GO
3075  013466                            4$:
3076  013466  005037  177776                      CLR     PSW
```

```
3077  013472  012777  000100  002260          MOV     #INTENA,@TKCSR
3078  013500  005737  015774          5$:     TST     ERRFLG                  ;IF ERROR OCCURED FLAG=1,
3079  013504  001404                          BEQ     LOOPS                   ;CHECK FOR ESCAPE TO NEXT TEST
3080  013506  032777  002000  002254          BIT     #SW10,@SWR              ;IF SW10=1,
3081  013514  001021                          BNE     LOOPX                   ;ESCAPE TO NEXT TEST
3082  013516  032777  040000  002244  LOOPS:  BIT     #SW14,@SWR              ;IF SW14=1,
3083  013524  001041                          BNE     LOOPL                   ;LOOP ON CURRENT TEST
3084  013526  032777  004000  002234          BIT     #SW11,@SWR              ;IF SW11=1,
3085  013534  001011                          BNE     LOOPX                   ;INHIBIT ITERATIONS
3086  013536  005337  016006                  DEC     ICOUNT                  ;UPDATE ITERATION COUNT
3087  013542  001406                          BEQ     LOOPX                   ;IF ICOUNT=0, GO TO NEXT TEST
3088  013544  013716  016004  LOOPER: MOV     RETURN,(SP)             ;SET UP FOR RETURN TO CURRENT TEST
3089  013550  042777  000100  002202          BIC     #INTENA,@TKCSR
3090  013556  000002                          RTI                             ;RETURN TO CURRENT TEST
3091  013560  005237  016002  LOOPX:  INC     TSTNO                   ;UPDATE TEST NUMBER
3092  013564  013705  016002  TSTENT: MOV     TSTNO,R5                ;GET TEST NUMBER
3093  013570  006305                          ASL     R5                      ;MULTIPLY TEST NUMBER BY 4
3094  013572  006305                          ASL     R5
3095  013574  063705  016034                  ADD     TSTPNT,R5               ;GET POINTER FOR TEST ENTRY
3096  013600  011537  016004                  MOV     (R5),RETURN             ;GET STARTING ADDRESS OF NEXT TEST
3097  013604  001640                          BEQ     EOP                     ;IF ADDRESS=0, GO TO END OF PASS
3098  013606  012516                          MOV     (R5)+,(SP)              ;PUT STARTING ADDRSS ON STACK
3099  013610  011537  016006                  MOV     (R5),ICOUNT             ;GET ITERATION COUNT FOR TEST
3100  013614  005037  015774                  CLR     ERRFLG                  ;CLEAR ERROR OCCURED FLAG
3101  013620  042777  000100  002132          BIC     #INTENA,@TKCSR
3102  013626  000002                          RTI                             ;GO TO TEST
3103  013630  012737  000001  016006  LOOPL:  MOV     #1,ICOUNT               ;SET UP TO EXIT TEST AFTER LOOP
3104  013636  000742                          BR      LOOPER                  ;GO TO LOOP SERVICE
3105
3106                                  ;CHECK FOR LOOPING WITH SAME DATA
3107                                  ;CHECK FOR ESCAPE TO NEXT TEST ON ERROR
3108
3109  013640  005737  015774  FREEZE: TST     ERRFLG                  ;IF ERROR FLAG=0,
3110  013644  001413                          BEQ     FREEZX                  ;DO NOT TEST FOR ESCAPE
3111  013646  032777  002000  002114          BIT     #SW10,@SWR              ;IF SW10=1,
3112  013654  001341                          BNE     LOOPX                   ;ESCAPE TO NEXT TEST
3113  013656  032777  001000  002104          BIT     #SW09,@SWR              ;IF SW09=1,
3114  013664  001403                          BEQ     FREEZX                  ;FREEZE CURRENT DATA
3115  013666  017616  000000                  MOV     @(SP),(SP)              ;GET LOOPING ADDRESS
3116  013672  000002                          RTI                             ;LOOP
3117  013674  062716  000002  FREEZX: ADD     #2,(SP)                 ;CONTINUE IN CURRENT TEST
3118  013700  000002                          RTI
3119
3120                                  ;GENERAL ERROR SERVICE
3121                                  ;ONLY PC OF FAILING TEST IS OUTPUT TO TELEPRINTER
3122
3123  013702  005037  015774  ERR:    CLR     ERRFLG                          ;ALWAYS TYPE PC+2
3124                                                                  ;OF TEST THAT FAILED
3125  013706  005037  014122          CLR     ERRMSG                  ;NO MESSAGE
3126  013712  005037  014134          CLR     ERTAB                   ;NO TABLE OF DATA
3127  013716  000451                  BR      ERRGEN                  ;OUTPUT ERROR MESSAGE
3128
3129                                  ;TRANSITION DETECTION ERROR SERVICE
3130
3131                                  ;FORMAT FOR ERROR TYPEOUT IS
3132
```

```
3133                                    ;XXXXXX TRANSITION ERROR
3134                                    ;EXP   REC   LINE
3135                                    ;AA    BB    CC
3136
3137                                    ;WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
3138                                    ;      AA=EXPECTED INTERRUPT FLAGS (CORRESPONDS TO 4 MSB OF CONTROL REGISTER
3139                                    ;      BB=RECEIVED INTERRUPT FLAGS (AS ABOVE)
3140                                    ;      CC=LINE ON WHICH ERROR OCCURED
3141  013720  005037  015774        ERRT: CLR    ERRFLG                    ;ALWAYS OUTPUT  ALL DATA
3142  013724  012737  016203  014122      MOV    #MTRANE,ERRMSG            ;TYPE ''TRANSITION ERROR
3143  013732  012737  014210  014134      MOV    #ERTAB1,ERTAB             ;TABLE OF DATA
3144  013740  000440                      BR     ERRGEN                    ;OUTPUT ERROR MESSAGE
3145
3146                                    ;ON-LINE STATUS ERROR SERVICE
3147
3148                                    ;FORMAT FOR LINE STATUS ERROR IS
3149
3150                                    ;XXXX LINE ERROR
3151                                    ;EXP   REC   LINE
3152                                    ;AAA   BBB   CC
3153
3154                                    ;WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
3155                                    ;      AAA=EXPECTED LINE STATUS AT TIME OF ERROR
3156                                    ;      BBB=RECEIVED LINE STATUS AT TIME OF ERROR
3157                                    ;      CC=LINE ON WHICH ERROR OCCURED
3158
3159
3160  013742  005037  015774        ERRS: CLR    ERRFLG                    ;ALWAYS OUTPUT ALL DATA
3161  013746  012737  016152  014122      MOV    #MLINE1,ERRMSG            ;TYPE ''LINE ERROR
3162                                                                        ;EXP REC LINE''
3163  013754  012737  014226  014134      MOV    #ERTAB2,ERTAB             ;TABLE OF DATA
3164  013762  000427                      BR     ERRGEN                    ;OUTPUT ERROR MESSAGE
3165
3166                                    ;FATAL TRANSITION ERROR
3167                                    ;FORMAT FOR FATAL ERROR TYPEOUT IS
3168
3169                                    ;XXXXXX FATAL ERROR
3170                                    ;CSTAT  LSTAT
3171                                    ;AAAAAA BBB
3172
3173                                    ;WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
3174                                    ;      AAAAAA=RECEVICED CONTROL STATUS ON LINE THAT INTERRUPTED
3175                                    ;      BBB=RECEIVED LINE STATUS ON LINE THAT INTERRUPTED
3176
3177  013764  005037  015774        ERRN: CLR    ERRFLG                    ;ALWAYS OUTPUT ALL DATA
3178  013770  012737  017571  014122      MOV    #MFATAL,ERRMSG            ;TYPE ''FATAL ERROR
3179                                                                        ;CSTAT   LSTAT''
3180  013776  012737  014244  014134      MOV    #ERTAB3,ERTAB             ;TABLE OF DATA
3181  014004  000416                      BR     ERRGEN                    ;OUTPUT ERROR MESSAGE
3182
3183                                    ;''CONTROL STATUS'' ERROR SERVICE
3184                                    ;FORMAT FOR CONTROL STATUS ERROR IS
3185
3186                                    ;XXXXXX STATUS ERROR
3187                                    ;EXP    REC
3188                                    ;AAAAAA BBBBBB
```

```
3189
3190                                        ;WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
3191                                        ;      AAAAAA=EXPECTED CONTROL STATUS AT TIME OF ERROR
3192                                        ;      BBBBBB=RECEIVED(ACTUAL) CONTROL STATUS AT TIME OF ERROR
3193
3194
3195  014006  012737  016064  014122  ERRCS:  MOV     #MSTATE,ERRMSG          ;TYPE "STATUS ERROR
3196                                                                          ;"EXP REC"
3197  014014  012737  014256  014134          MOV     #ERTAB4,ERTAB           ;TABLE OF DATA
3198  014022  000407                          BR      ERRGEN                  ;OUTPUT DATA
3199
3200                                        ;LINE STATUS ERROR SERVICE
3201
3202                                        ;FORMAT FOR LINE STATUS ERROR IS
3203
3204                                        ;XXXX LINE ERROR
3205                                        ;EXP   REC   LINE  SEL
3206                                        ;AAA   DDD   CC    DD
3207
3208                                        ;WHERE XXXXXX=PC+2 OF CALL TO ERROR ROUTINE
3209                                        ;      AAA=EXPECTED LINE STATUS AT TIME OF ERROR
3210                                        ;      BBB=RECEIVED LINE STATUS AT TIME OF ERROR
3211                                        ;      CC=LINE ON WHICH ERROR OCCURED
3212                                        ;      DD=THE LINE ON WHICH THE PROGRAM WAS OPERATING
3213
3214
3215  014024  012737  016115  014122  ERRLS:  MOV     #MLINER,ERRMSG
3216  014032  012737  014270  014134          MOV     #ERTAB5,ERTAB
3217  014040  000400                          BR      ERRGEN
3218
3219                                        ;GENERAL ERROR HANDLER
3220                                        ;TYPE PC+2 OF TEST THAT FAILED
3221                                        ;TYPE ERROR MESSAGE (IF ANY)
3222                                        ;TYPE DATA RELATING TO FAILURE (IF ANY)
3223
3224  014042  005037  177776          ERRGEN: CLR     PSW
3225  014046  012777  000100  001704          MOV     #INTENA,@TKCSR
3226  014054  032777  020000  001706          BIT     #SW13,@SWR              ;IF SW13=1, DO NOT
3227  014062  001026                          BNE     .3                      ;TYPE ERROR MESSAGE
3228  014064  021637  016026                  CMP     (SP),SAVPC              ;SAME ERROR AGAIN
3229  014070  001402                          BEQ     .+6
3230  014072  005037  015774                  CLR     ERRFLG
3231  014076  104005                          SAV05P
3232  014100  005737  015774                  TST     ERRFLG                  ;IF ERROR OCCURED FLAG=1,
3233  014104  001007                          BNE     .1                      ;TYPE DATA ONLY
3234  014106  104006                          OCTASC                          ;TYPE PC+2 OF CALL TO ERROR ROUTINE
3235  014110  014202                          ERTAB0
3236  014112  005737  014122                  TST     ERRMSG
3237  014116  001407                          BEQ     .2
3238  014120  104004                          TYPE                            ;TYPE ERROR MESSAGE
3239  014122  000000          ERRMSG: 0
3240  014124  005737  014134          .1:     TST     ERTAB
3241  014130  001402                          BEQ     .2
3242  014132  104006                          OCTASC                          ;TYPE DATA
3243  014134  000000          ERTAB:  0
3244  014136  104007          .2:     RES05                                   ;RESTORE R0-R5
```

```
3245
3246                                        ;ERROR HALT SERVICE
3247
3248  014140  032777  100000  001622  .3:   BIT     #SW15,@SWR          ;IF SW15=0, DO NOT
3249  014146  001406                        BEQ     .4                  ;HALT ON ERROR
3250  014150  000000                        HALT                        ;HALT AND DISPLAY ADDRESS OF FAILING TEST
3251  014152  022737  000176  015770        CMP     #SWREG,SWR
3252  014160  001001                        BNE     .4
3253  014162  104025                        CNTLUU
3254  014164  012737  000001  015774  .4:   MOV     #1,ERRFLG           ;SET ERROR OCCURED FLAG
3255  014172  042777  000100  001560        BIC     #INTENA,@TKCSR
3256  014200  000002                        RTI                         ;RETURN TO TEST
3257
3258
3259
3260                                        ;TABLE S OF DATA FOR ERROR TYPEOUT
3261
3262                                        ;TABLE FOR TRANSITION STATUS ERROR
3263
3264  014202  000001              ERTAB0:   1
3265  014204  000006                        6
3266  014206  016026                        SAVPC
3267  014210  000003              ERTAB1:   3
3268  014212  000002                        2
3269  014214  016022                        SAVR5               ;CONTAINS EXPECTED TRANSITION STATUS
3270  014216  000002                        2
3271  014220  016020                        SAVR4               ;CONTAINS RECEIVED TRANSITION STATUS
3272  014222  000002                        2
3273  014224  016016                        SAVR3               ;CONTAINS NUMBER OF LINE WHERE ERROR OCCURED
3274  014226  000003              ERTAB2:   3
3275  014230  000003                        3
3276  014232  016022                        SAVR5               ;CONTAINS EXPECTED LINE STATUS
3277  014234  000003                        3
3278  014236  016020                        SAVR4               ;CONTAINS RECEIVED LINE STATUS
3279  014240  000002                        2
3280  014242  016016                        SAVR3               ;CONTAINS NUMBER OF LINE WHERE ERROR OCCURED
3281  014244  000002              ERTAB3:   2
3282  014246  000006                        6
3283  014250  016020                        SAVR4
3284  014252  000003                        3
3285  014254  016016                        SAVR3
3286  014256  000002              ERTAB4:   2
3287  014260  000006                        6
3288  014262  016022                        SAVR5               ;CONTAINS EXPECTED CONTROL STATUS
3289  014264  000006                        6
3290  014266  016020                        SAVR4               ;CONTAINS RECEIVED CONTROL STATUS
3291  014270  000004              ERTAB5:   4
3292  014272  000003                        3
3293  014274  016022                        SAVR5               ;CONTAINS EXPECTED LINE STATUS
3294  014276  000003                        3
3295  014300  016020                        SAVR4               ;CONTAINS RECEIVED LINE STATUS
3296  014302  000002                        2
3297  014304  016016                        SAVR3               ;CONTAINS NUMBER OF LINE WHERE ERROR OCCURED
3298  014306  000002                        2
3299  014310  016012                        SAVR1               ;CONTAINS NUMBER OF LINE UNDER TEST
3300
```

```
3301  014312  000001                  SWRTB:  1
3302  014314  000006                          6
3303  014316  000176                          SWREG
3304
3305                                  ;CONVERT OCTAL TO ASCII AND OUTPUT ON TTY
3306  014320  017605  000000          OCTASN: MOV     @(SP),R5                ;GET POINTER TO TABLE OF DATA
3307  014324  062716  000002                  ADD     #2,(SP)
3308  014330  012737  000010  014660          MOV     #10,RADIX
3309  014336  012704  020001                  MOV     #MBCD+2,R4              ;SET UP POINTER FOR CONVERTED DATA
3310  014342  012537  016030                  MOV     (R5)+,WRDCNT            ;GET NUMBER OF WORDS TO BE CONVERTED
3311  014346  012537  016032          OCTAS1: MOV     (R5)+,CHRCNT            ;GET NUMBER OF DIGITS IN WORD
3312  014352  013537  014654                  MOV     @(R5)+,BINWRD           ;GET DATA TO BE CONVERTED
3313  014356  104010                          CONVERT                         ;CONVERT TO ASCII
3314  014360  005337  016030                  DEC     WRDCNT                  ;IF ALL DATA IS NOT CONVERTED
3315  014364  001370                          BNE     OCTAS1                  ;CONTINUE
3316  014366  112714  000100                  MOVB    #100,(R4)               ;PUT TERMINATOR AT END OF MESSAGE
3317  014372  005737  014510                  TST     SMLN
3318  014376  001002                          BNE     1$
3319  014400  104004                          TYPE                            ;OUTPUT CONVERTED DATA
3320  014402  017777                          MBCD                            ;TO TELETYPE
3321  014404  000002                  1$:     RTI                             ;RETURN TO CALLING ROUTINE
3322
3323
3324  014406  005037  014504          CNTLU:  CLR     TMP1
3325  014412  012737  000001  014506          MOV     #1,TMP2
3326  014420  104004                          TYPE
3327  014422  017755                          $SWREQ
3328  014424  052737  000001  014510          BIS     #1,SMLN
3329  014432  104006                          OCTASC
3330  014434  014312                          SWRTB
3331  014436  104004                          TYPE
3332  014440  020001                          MBCD+2
3333  014442  104013                          INSTRG
3334  014444  017765                          $NEWIS
3335  014446  000000                          0
3336  014450  177777                          177777
3337  014452  014504                          TMP1
3338  014454  123727  015324  000015          CMPB    INBUF,#15
3339  014462  001403                          BEQ     1$
3340  014464  013777  014504  001276          MOV     TMP1,@SWR
3341  014472  005037  014506          1$:     CLR     TMP2
3342  014476  005037  014510                  CLR     SMLN
3343  014502  000002                          RTI
3344  014504  000000                  TMP1:   0
3345  014506  000000                  TMP2:   0
3346  014510  000000                  SMLN:   0
3347
3348                                  ;INTEGER BINARY TO ASCII CONVERSION COMMON ROUTINE
3349
3350  014512  013700  016032          BINASC: MOV     CHRCNT,R0               ;SET UP COUNT FOR DIGITS TO BE CONVERTED
3351  014516  012701  020120                  MOV     #TEMTAB,R1              ;SET UP POINTER FOR TEMPORARY STORAGE
3352  014522  104011                  BINASA: EXTRACT                         ;EXTRACT ONE DIGIT
3353  014524  062737  000060  014656          ADD     #60,DIGIT               ;CONVERT FROM BCD TO ASCII
3354  014532  113721  014656                  MOVB    DIGIT,(R1)+             ;STORE DIGIT
3355  014536  005300                          DEC     R0                      ;IF ALL DIGITS NOT DONE,
3356  014540  001370                          BNE     BINASA                  ;CONTINUE
```

```
3357  014542  114124                  BINASB: MOVB    -(R1),(R4)+             ;REVERSE ORDER OF DIGITS
3358  014544  005337  016032                  DEC     CHRCNT                  ;IF ALL CHARACTERS ARE NOT
3359  014550  001374                          BNE     BINASB                  ;IN ORDER, CONTINUE
3360  014552  112724  000040                  MOVB    #40,(R4)+               ;INSERT SPACE AFTER LAST DIGIT
3361  014556  000002                          RTI                             ;RETURN TO CALLING ROUTINE
3362
3363                                          ;SINGLE PRECISION UNSIGNED DIVIDE LOOP
3364
3365  014560  005037  014656          DIVI:   CLR     DIVIDH
3366  014564  023737  014656  014660  DIVIU:  CMP     DIVIDH,DIVIS
3367  014572  103027                          BHIS    DIVIB
3368  014574  012737  000021  014634          MOV     #17.,DIVCNT
3369  014602  000407                          BR      DIVIC
3370  014604  023737  014656  014660  DIVIA:  CMP     DIVIDH,DIVIS
3371  014612  103403                          BLO     DIVIC
3372  014614  163737  014660  014656          SUB     DIVIS,DIVIDH
3373  014622  006137  014654          DIVIC:  ROL     DIVIDL
3374  014626  006137  014656                  ROL     DIVIDH
3375  014632  005327                          DEC     (PC)+
3376  014634  000000                  DIVCNT: 0
3377  014636  001362                          BNE     DIVIA
3378  014640  006037  014656                  ROR     DIVIDH
3379  014644  005137  014654                  COM     DIVIDL
3380  014650  000002                          RTI
3381  014652  000000                  DIVIB:  HALT
3382  014654  000000                  DIVIDL: 0
3383  014656  000000                  DIVIDH: 0
3384  014660  000000                  DIVIS:  0
3385
3386                                          ;SAVE PC OF TEST THAT FAILED AND R0-R5
3387
3388  014662  016637  000004  016026  SV05P:  MOV     4(SP),SAVPC
3389
3390                                          ;SAVE R0-R5
3391
3392  014670  010537  016022          SV05:   MOV     R5,SAVR5
3393  014674  010437  016020                  MOV     R4,SAVR4
3394  014700  010337  016016                  MOV     R3,SAVR3
3395  014704  010237  016014                  MOV     R2,SAVR2
3396  014710  010137  016012                  MOV     R1,SAVR1
3397  014714  010037  016010                  MOV     R0,SAVR0
3398  014720  000002                          RTI
3399
3400                                          ;RESTORE R0-R5
3401
3402  014722  013700  016010          RS05:   MOV     SAVR0,R0
3403  014726  013701  016012                  MOV     SAVR1,R1
3404  014732  013702  016014                  MOV     SAVR2,R2
3405  014736  013703  016016                  MOV     SAVR3,R3
3406  014742  013704  016020                  MOV     SAVR4,R4
3407  014746  013705  016022                  MOV     SAVR5,R5
3408  014752  000002                          RTI
3409
3410                                          ;TELETYPE OUTPUT ROUTINE
3411
3412  014754  017605  000000          TYPER:  MOV     @(SP),R5                ;GET POINTER TO MESSAGE (ON STACK)
```

```
3413  014760  062716  000002                  ADD     #2,(SP)                 ;CORRECT STACK FOR RETURN
3414  014764  105777  000774          TYPERA: TSTB    @TPCSR                  ;WAIT FOR TELEPRINTER READY
3415  014770  100375                          BPL     TYPERA
3416  014772  122715  000100                  CMPB    #100,(R5)               ;IF CHARACTER IS NOT TERMINATOR, TYPE IT
3417  014776  001001                          BNE     TYPER1
3418  015000  000002                          RTI                             ;CHARACTER IS TERMINATOR, EXIT
3419  015002  122715  000042          TYPER1: CMPB    #42,(R5)                ;IF CHARACTER-42,
3420  015006  001406                          BEQ     TYPECL                  ;TYPE LINE FEED
3421  015010  122715  000045                  CMPB    #45,(R5)                ;IF CHARACTER=45,
3422  015014  001403                          BEQ     TYPECL                  ;TYPE CARRIAGE RETURN
3423  015016  112577  000744          TYPER2: MOVB    (R5)+,@TPDBR            ;GET CHARACTER
3424  015022  000760                          BR      TYPERA                  ;TYPE IT
3425  015024  142715  000040          TYPECL: BICB    #40,(R5)                ;CONVERT CODE OF 42 OR 45
3426  015030  152715  000010                  BISB    #10,(R5)                ;TO 12 OR 15
3427  015034  000770                          BR      TYPER2                  ;TYPE IT
3428
3429
3430                                          ;INPUT OCTAL CHARACTER STRING
3431                                          ;TERMINATOR IS CARRIAGE RETURN
3432                                          ;IF MORE THAN SEVEN (7) CHARACTERS INCLUDING
3433                                          ;CARRIAGE RETURN ARE TYPED, THE IN  PUT WILL
3434                                          ;BE RE-REQUESTED
3435
3436  015036                          INSTR:
3437  015036  011605                          MOV     (SP),R5                 ;GET POINTER TO ARGUMENTS
3438  015040  012537  015064                  MOV     (R5)+,MSG               ;GET MESAGE TO BE TYPED
3439  015044  012537  015316                  MOV     (R5)+,LOLIM             ;GET LOWER LIMIT
3440  015050  012537  015320                  MOV     (R5)+,HILIM             ;GET UPPER LIMIT
3441  015054  012537  015322                  MOV     (R5)+,STORE             ;GET DATA STORAGE LOCATION
3442  015060  010516                          MOV     R5,(SP)                 ;RESTORE STACK
3443  015062  104004          INSTR1: TYPE                                    ;TYPE MESSAGE
3444  015064  000000          MSG:    0
3445  015066  012704  015324                  MOV     #INBUF,R4               ;SET UP CHARACTER INPUT BUFFER
3446  015072  012703  000007                  MOV     #7,R3                   ;SET UP INPUT COUNT
3447  015076  105777  000656          INSTRB: TSTB    @TKCSR                  ;WAIT FOR CHARACTER
3448  015102  100375                          BPL     INSTRB
3449  015104  005037  002152          INSTBB: CLR     SINTFL
3450  015110  117737  000646  014504          MOVB    @TKDBR,TMP1
3451  015116  142737  000200  014504          BICB    #200,TMP1
3452  015124  113714  014504                  MOVB    TMP1,(R4)
3453  015130  121427  000007                  CMPB    (R4),#7
3454  015134  001420                          BEQ     INSTER
3455  015136  121427  000015                  CMPB    (R4),#15                ;IS CHARACTER TERMINATOR
3456  015142  001420                          BEQ     INSTR2                  ;IF IT IS, CONVERT INPUT STRING
3457  015144  121427  000025                  CMPB    (R4),#25
3458  015150  001003                          BNE     1$
3459  015152  005037  014504                  CLR     TMP1
3460  015156  000741                          BR      INSTR1
3461  015160  112477  000602          1$:     MOVB    (R4)+,@TPDBR            ;TYPE CHARACTER IF NOT TERMINATOR
3462  015164  105777  000574          INSTRC: TSTB    @TPCSR                  ;WAIT TO FINISH TYPING
3463  015170  100375                          BPL     INSTRC
3464  015172  005303                          DEC     R3                      ;UPDATE RECEIVED COUNT
3465  015174  001340                          BNE     INSTRB                  ;AND CONTINUE
3466  015176  104004          INSTER: TYPE                                    ;TYPE "?" AND RE-REQUEST INPUT
3467  015200  017510                          MOM
3468  015202  000727                          BR      INSTR1
```

```
3469
3470                                    ;CONVERT ASCII STRING TO OCTAL
3471
3472  015204  104004                INSTR2: TYPE
3473  015206  017514                        MCRLF
3474  015210  012704  015324              MOV     #INBUF,R4               ;GET POINTER TO ASCII STRING
3475  015214  005003                      CLR     R3
3476  015216  122714  000015              CMPB    #15,(R4)                ;IS TERMINATOR FIRST
3477                                                                        ;CHARACTER IN STRING
3478  015222  001431                      BEQ     CHCK
3479  015224  121427  000060        INSTRD: CMPB    (R4),#60                ;IS CHARACTER OCTAL DIGIT
3480  015230  002762                      BLT     INSTER                  ;IF 67>=CHAR>=60
3481  015232  121427  000067              CMPB    (R4),#67                ;CHARACTER IS OCTAL DIGIT
3482  015236  003357                      BGT     INSTER
3483  015240  142714  000060              BICB    #60,(R4)                ;STRIP ASCII
3484  015244  152403                      BISB    (R4)+,R3                ;GENERATE OCTAL NUMBER
3485  015246  121427  000015              CMPB    (R4),#15                ;IF END OF STRING, CHECK LIMITS
3486  015252  001404                      BEQ     INSTR3
3487  015254  006303                      ASL     R3                      ;MULTIPLY DIGIT BY 10 (OCTAL
3488  015256  006303                      ASL     R3
3489  015260  006303                      ASL     R3
3490  015262  000760                      BR      INSTRD                  ;GET NEXT DIGIT
3491
3492                                    ;TEST NUMBER TO SEE IF IT IS WITHIN LIMITS
3493
3494  015264  020337  015320        INSTR3: CMP     R3,HILIM                ;TEST HI LIMIT
3495  015270  101342                      BHI     INSTER                  ;IF R3>HILIM, ERROR
3496  015272  020337  015316              CMP     R3,LOLIM                ;TEST LOW LIMIT
3497  015276  103737                      BLO     INSTER                  ;IF R3<LOLIM, ERROR
3498  015300  010377  000016              MOV     R3,@STORE               ;STORE NUMBER
3499  015304  000002                      RTI                             ;EXIT
3500  015306  005737  014506        CHCK:   TST     TMP2
3501  015312  001731                      BEQ     INSTER
3502  015314  000002                      RTI
3503  015316  000000                LOLIM: 0
3504  015320  000000                HILIM: 0
3505  015322  000000                STORE: 0
3506  015324  000000                INBUF: 0
3507          015346                .=.+20
3508                                    ;ENTER HERE ON POWER FAILURE
3509
3510
3511  015346  010046                PFAIL:  MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3512  015350  010146                        MOV     R1,-(SP)
3513  015352  010246                        MOV     R2,-(SP)
3514  015354  010346                        MOV     R3,-(SP)
3515  015356  010446                        MOV     R4,-(SP)
3516  015360  010546                        MOV     R5,-(SP)
3517  015362  013746  000024                MOV     24,-(SP)
3518  015366  010637  016024                MOV     SP,SAVSP                ;SAVE STACK POINTER
3519  015372  012737  015404  000024        MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3520  015400  000000                        HALT                            ;HALT ON POWER DOWN NORMAL
3521  015402  000776                        BR      .-2
3522
3523                                    ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3524
```

```
3525  015404  013706  016024          RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
3526  015410  012605                          MOV     (SP)+,R5                ;RESTORE R0-R5
3527  015412  012604                          MOV     (SP)+,R4
3528  015414  012603                          MOV     (SP)+,R3
3529  015416  012602                          MOV     (SP)+,R2
3530  015420  012601                          MOV     (SP)+,R1
3531  015422  012600                          MOV     (SP)+,R0
3532  015424  012737  015346  000024          MOV     #PFAIL,24               ;SET UP FOR POWER FAILURE
3533  015432  005726                          POP1SP
3534  015434  104004                          TYPE
3535  015436  017667                          MPFAIL
3536  015440  005737  001730                  TST     TIPFLG
3537  015444  001002                          BNE     RESTA1
3538  015446  000137  001254                  JMP     START0
3539  015452  104004                  RESTA1: TYPE
3540  015454  017707                          MPF1
3541  015456  012716  000340                  MOV     #340,(SP)
3542  015462  005746                          PUSH1SP
3543  015464  000137  013564                  JMP     TSTENT
3544
3545
3546                                          ;THE FOLLOWING AUTO VECTORS USING THE FIRST BASE ADDRESS
3547  015470  013746  000020          XOR:    MOV     20,-(SP)                ;SAVE 20
3548  015474  013746  000022                  MOV     22,-(SP)                ;SAVE 22
3549  015500  012737  015672  000020          MOV     #2$,20                  ;IOT INTR VECTOR
3550  015506  012737  000340  000022          MOV     #340,22                 ;IOT INTR LVL
3551  015514  012737  000300  013274          MOV     #300,DATA1
3552  015522  012737  000302  013276          MOV     #302,DATA2
3553  015530  013777  013276  175536  1$:     MOV     DATA2,@DATA1
3554  015536  012777  000004  175532          MOV     #IOT,@DATA2             ;IOT TRAP
3555  015544  062737  000004  013274          ADD     #4,DATA1
3556  015552  062737  000004  013276          ADD     #4,DATA2
3557  015560  023727  013274  001000          CMP     DATA1,#1000
3558  015566  001360                          BNE     1$
3559  015570  012737  000000  016002          MOV     #0,TSTNO                ;SET UP DEFAULT
3560  015576  012737  020246  016034          MOV     #TSTTBO,TSTPNT          ;
3561  015604  052737  000340  177776          BIS     #340,PS                 ;PREVENT INTERRUPTS
3562  015612  005077  000136                  CLR     @DMBCSR                 ;
3563  015616  012777  000100  000130          MOV     #INTENA,@DMBCSR ;SET INTERRUPT ENABLE
3564  015624  042737  000340  177776          BIC     #340,PS ;ALLOW INTERRUPTS
3565  015632  052777  000200  000114          BIS     #DONE,@DMBCSR           ;SET DONE..AND INTERRUPT
3566  015640  000240                          NOP
3567  015642  012637  000022                  MOV     (SP)+,22                ;YOU DIDN'T INTERRUPT ?
3568  015646  012637  000020                  MOV     (SP)+,20                ;RESTORE 20 & 22
3569  015652  005077  000076                  CLR     @DMBCSR                 ;STOP ALL INTERRUPT
3570  015656  052737  000340  177776          BIS     #340,PS                 ;
3571  015664  104012                          ERROR
3572  015666  000000                          HALT                            ;YOU SHOULD HAVE INTERRUPTED
3573  015670  000426                          BR      3$
3574  015672  011637  015750          2$:     MOV     (SP),DMBVEC             ;EXTRACT VECTOR +4
3575  015676  162737  000002  015750          SUB     #2,DMBVEC               ;CREATE LVL
3576  015704  013737  015750  015752          MOV     DMBVEC,DMBLVL           ;SAVE
3577  015712  162737  000002  015750          SUB     #2,DMBVEC               ;CREATE AND SAVE VEC
3578  015720  012737  000340  177776          MOV     #340,PS                 ;PREVENT INTERRUPTS
3579  015726  005077  000022                  CLR     @DMBCSR                 ;
3580  015732  022626                          POP2SP
```

```
3581  015734  022626                          POP2SP
3582  015736  012637  000022                  MOV     (SP)+,22        ;RESTORE 22
3583  015742  012637  000020                  MOV     (SP)+,20        ;RESTORE 20
3584  015746  000207                  3$:     RTS     PC
3585
3586
3587                                          ;INDIRECT POINTERS
3588
3589  015750  000540                  DMBVEC: 540                     ;DM11-BA INTERRUPT VECTOR
3590  015752  000542                  DMBLVL: 542                     ;DM11-BA ONTERRUPT PRIORITY
3591  015754  164200                  DMBCSR: 164200                  ;DM11-BA CONTROL STATUS REGISTER
3592  015756  164202                  DMBLSR: 164202                  ;DM11-BA CONTROL STATUS REGISTER
3593  015760  177560                  TKCSR:  177560
3594  015762  177562                  TKDBR:  177562
3595  015764  177564                  TPCSR:  177564
3596  015766  177566                  TPDBR:  177566
3597  015770  177570                  SWR:    177570
3598  015772  177570                  DISPLAY:177570
3599
3600                                          ;PROGRAM VARIABLES
3601
3602  015774  000000                  ERRFLG: 0
3603  015776  000000                  TRACON: 0
3604  016000  000000                  PASCNT: 0
3605  016002  000000                  TSTNO:  0
3606  016004  000000                  RETURN: 0
3607  016006  000000                  ICOUNT: 0
3608  016010  000000                  SAVR0:  0
3609  016012  000000                  SAVR1:  0
3610  016014  000000                  SAVR2:  0
3611  016016  000000                  SAVR3:  0
3612  016020  000000                  SAVR4:  0
3613  016022  000000                  SAVR5:  0
3614  016024  000000                  SAVSP:  0
3615  016026  000000                  SAVPC:  0
3616  016030  000000                  WRDCNT: 0
3617  016032  000000                  CHRCNT: 0
3618  016034  020246                  TSTPNT: TSTTBO
3619  016036  000000                  TSTMAX: 0
3620  016040  000000                  LINFLG: 0
3621  016042  000000                  LINE:   0
3622  016044  000000                  LINORG: 0
3623  016046  000000                  LINANS: 0
3624  016050  000000                  ANSFLG: 0
3625  016052  000000                  ORGFLG: 0
3626  016054  000000                  TIME1:  0
3627  016056  000000                  TIME2:  0
3628  016060  000000                  TIFLG:  0
3629  016062  000000                  RNGRET: 0
3630
3631  016064  052123  052101  051525  MSTATE: .ASCII  ;STATUS ERROR%'EXP    REC@;
3632  016072  042440  051122  051117
3633  016100  021045  054105  020120
3634  016106  020040  051040  041505
3635  016114     100
3636  016115     114  047111  020105  MLINER: .ASCII  ;LINE ERROR%'EXP REC LINE SEL@;
```

```
 3637  016122  051105  047522  022522
 3638  016130  042442  050130  051040
 3639  016136  041505  046040  047111
 3640  016144  020105  042523  040114
 3641  016152  044514  042516  042440  MLINE1: .ASCII  ;LINE ERROR%''EXP REC LINE@;
 3642  016160  051122  051117  021045
 3643  016166  054105  020120  042522
 3644  016174  020103  044514  042516
 3645  016202     100
 3646  016203     124  040522  051516  MTRANE: .ASCII  ;TRANSITION ERROR%''EXP REC LINE@;
 3647  016210  052111  047511  020116
 3648  016216  051105  047522  022522
 3649  016224  042442  050130  051040
 3650  016232  041505  046040  047111
 3651  016240  040105
 3652  016242  021045  021045  044504  DIALM:  .ASCII  ;%''%''DIAL ANSWERING DATA SET%''@;
 3653  016250  046101  040440  051516
 3654  016256  042527  044522  043516
 3655  016264  042040  052101  020101
 3656  016272  042523  022524  040042
 3657  016300  021045  021045  030061  MT103T: .ASCII  ;%''%''103A MODEM CONNECT-DISCONNECT TEST%''@;
 3658  016306  040463  046440  042117
 3659  016314  046505  041440  047117
 3660  016322  042516  052103  042055
 3661  016330  051511  047503  047116
 3662  016336  041505  020124  042524
 3663  016344  052123  021045     100
 3664  016351     045  022442  031042  MT202T: .ASCII  ;%''%''202C MODEM CONNECT-DISCONNECT TEST%''@;
 3665  016356  031060  020103  047515
 3666  016364  042504  020115  047503
 3667  016372  047116  041505  026524
 3668  016400  044504  041523  047117
 3669  016406  042516  052103  052040
 3670  016414  051505  022524  040042
 3671  016422  021045  021045  051117  MSELOR: .ASCII  ;%''%''ORIGINATE LINE-@;
 3672  016430  043511  047111  052101
 3673  016436  020105  044514  042516
 3674  016444  040055
 3675  016446  021045  047101  053523  MSELAN: .ASCII  ;%''ANSWER LINE-@;
 3676  016454  051105  046040  047111
 3677  016462  026505     100
 3678  016465     045  030442  031460  MT103A: .ASCII  ;%''103A TEST COMPLETE%''@;
 3679  016472  020101  042524  052123
 3680  016500  041440  046517  046120
 3681  016506  052105  022505  040042
 3682  016514  021045  030062  041462  MT202A: .ASCII  ;%''202C TEST COMPLETE%''@;
 3683  016522  052040  051505  020124
 3684  016530  047503  050115  042514
 3685  016536  042524  021045     100
 3686  016543     045  051442  051124  MDISC:  .ASCII  ;%''STRIKE ANY TTY KEY TO TEST DISCONNECT@;
 3687  016550  045511  020105  047101
 3688  016556  020131  052124  020131
 3689  016564  042513  020131  047524
 3690  016572  052040  051505  020124
 3691  016600  044504  041523  047117
 3692  016606  042516  052103     100
```

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 3693  016613     045  022442  034042  M16:    .ASCII  ;%''%''8 LINE SCANNER TEST%''ə;
 3694  016620  046040  047111  020105
 3695  016626  041523  047101  042516
 3696  016634  020122  042524  052123
 3697  016642  021045     100
 3698  016645     045  022442  041442  MTITLE: .ASCII  ;%''%''CZKMGA0 DM11-BA MODEM CONTRL%'';
 3699  016652  045532  043515  030101
 3700  016660  042040  030515  026461
 3701  016666  040502  046440  042117
 3702  016674  046505  041440  047117
 3703  016702  051124  022514     042
 3704  016707     045     042          .ASCII ;%'';
 3705  016711     124  051505  020124  .ASCII ;TEST GROUP 0:%'';
 3706  016716  051107  052517  020120
 3707  016724  035060  021045
 3708  016730  043117  020106  044514  .ASCII ;OFF LINE TESTS USEING 54-14700 TEST CONNECTORS. FIRST TEST= 0%'';
 3709  016736  042516  052040  051505
 3710  016744  051524  052440  042523
 3711  016752  047111  020107  032065
 3712  016760  030455  033464  030060
 3713  016766  052040  051505  020124
 3714  016774  047503  047116  041505
 3715  017002  047524  051522  020056
 3716  017010  044506  051522  020124
 3717  017016  042524  052123  020075
 3718  017024  022460     042
 3719  017027     124  051505  020124  .ASCII ;TEST GROUP 1:%'';
 3720  017034  051107  052517  020120
 3721  017042  035061  021045
 3722  017046  043117  020106  044514  .ASCII ;OFF LINE TESTS USEING H3256 TEST CONNECTORS AND H317-M PANEL.%'';
 3723  017054  042516  052040  051505
 3724  017062  051524  052440  042523
 3725  017070  047111  020107  031510
 3726  017076  032462  020066  042524
 3727  017104  052123  041440  047117
 3728  017112  042516  052103  051117
 3729  017120  020123  047101  020104
 3730  017126  031510  033461  046455
 3731  017134  050040  047101  046105
 3732  017142  022456     042
 3733  017145     106  044522  052123  .ASCII ;FRIST TEST= 100%'';
 3734  017152  052040  051505  036524
 3735  017160  030440  030060  021045
 3736  017166  042524  052123  043440  .ASCII ;TEST GROUP 2:%'';
 3737  017174  047522  050125  031040
 3738  017202  022472     042
 3739  017205     103  047117  042516  .ASCII ;CONNECT/DISCONNECT TEST FOR BELL 103A MODEMS-FIRST TEST= 200:%'';
 3740  017212  052103  042057  051511
 3741  017220  047503  047116  041505
 3742  017226  020124  042524  052123
 3743  017234  043040  051117  041040
 3744  017242  046105  020114  030061
 3745  017250  040463  046440  042117
 3746  017256  046505  026523  044506
 3747  017264  051522  020124  042524
 3748  017272  052123  020075  030062
```

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3749  017300  035060  021045
3750  017304  042524  052123  043440          .ASCII ;TEST GROUP 3:%'';
3751  017312  047522  050125  031440
3752  017320  022472     042
3753  017323     103  047117  042516          .ASCII ;CONNECT/DISCONNECT TEST FOR BELL 202C MODEMS-FRIST TEST= 300%'@;
3754  017330  052103  042057  051511
3755  017336  047503  047116  041505
3756  017344  020124  042524  052123
3757  017352  043040  051117  041040
3758  017360  046105  020114  030062
3759  017366  041462  046440  042117
3760  017374  046505  026523  051106
3761  017402  051511  020124  042524
3762  017410  052123  020075  030063
3763  017416  022460  040042
3764  017422  021045  042526  052103  MVECTO: .ASCII  ;%''VECTOR ADDRESS-@;
3765  017430  051117  040440  042104
3766  017436  042522  051523  040055
3767  017444  021045  047503  052116  MREGAD: .ASCII  ;%''CONTROL REGISTER ADDRESS-@;
3768  017452  047522  020114  042522
3769  017460  044507  052123  051105
3770  017466  040440  042104  042522
3771  017474  051523  040055
3772  017500  021045  042524  052123  MTEST:  .ASCII  ;%''TEST-@;
3773  017506  040055
3774  017510  020040  040077          MQM:    .ASCII  ;  ?@;
3775  017514  021045     100          MCRLF:  .ASCII  ;%'@;
3776  017517     045  051442  047111  MLINE:  .ASCII  ;%''SINGLE LINE CABLE TEST%'@;
3777  017524  046107  020105  044514
3778  017532  042516  041440  041101
3779  017540  042514  052040  051505
3780  017546  022524  040042
3781  017552  021045  044514  042516  MLINEI: .ASCII  ;%''LINE NUMBER-@;
3782  017560  047040  046525  042502
3783  017566  026522     100
3784  017571     106  052101  046101  MFATAL: .ASCII  ;FATAL ERROR%''CSTAT  LSTAT@;
3785  017576  042440  051122  051117
3786  017604  021045  051503  040524
3787  017612  020124  046040  052123
3788  017620  052101     100
3789  017623     045  052042  040522  MTRNDE: .ASCII  ;%''TRANSITION DETECTED%''CSTAT  LSTAT@;
3790  017630  051516  052111  047511
3791  017636  020116  042504  042524
3792  017644  052103  042105  021045
3793  017652  051503  040524  020124
3794  017660  046040  052123  052101
3795  017666     100
3796  017667     045  050042  053517  MPFAIL: .ASCII  ;%''POWER FAILURE@;
3797  017674  051105  043040  044501
3798  017702  052514  042522     100
3799  017707     055  052503  051122  MPF1:   .ASCII  ;-CURRENT TEST WILL RESTART%'@;
3800  017714  047105  020124  042524
3801  017722  052123  053440  046111
3802  017730  020114  042522  052123
3803  017736  051101  022524  040042
3804  017744  041536     100          MCONTC: .ASCII  ;^C@;
```

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3805  017747  000136  040126          MCONTV: .ASCII  ;^V@;
3806  017752  046136  000100          MCONTL: .ASCII  ;^L@;
3807  017755  000045  051442  051127  $SWREQ: .ASCII  ;%'SWR= @;
3808  017762  020075  000100
3809  017765  000040  020040  047040  $NEWIS: .ASCII  ;    NEW= @;
3810  017772  053505  020075  000100
3811  017777  000045  000042          MBCD:   .ASCII  ;%';
3812          020101                  .=.+100
3813          020102                  .EVEN
3814  020102  021045  047105  020104  MEPASS: .ASCII ;%'END PASS   @;
3815  020110  040520  051523  020040
3816  020116  040040
3817  020120  000000                  TEMTAB: 0
3818          020132                  .=.+10
3819
3820  020132  000000                          0
3821
3822                                          ;EMT DISPATCH TABLE
3823
3824  020134  014006                  EMTTAB: ERRCS
3825  020136  014024                          ERRLS
3826  020140  013414                          LOOP
3827  020142  013640                          FREEZE
3828  020144  014754                          TYPER
3829  020146  014662                          SV05P
3830  020150  014320                          OCTASN
3831  020152  014722                          RS05
3832  020154  014512                          BINASC
3833  020156  014560                          DIVI
3834  020160  013702                          ERR
3835  020162  015036                          INSTR
3836  020164  013720                          ERRT
3837  020166  013742                          ERRS
3838  020170  013764                          ERRN
3839  020172  012350                          GETLIN
3840  020174  012404                          SETUPS
3841  020176  012640                          CKRNG
3842  020200  012736                          WAITR
3843  020202  013024                          CKTRN
3844  020204  012774                          WAITRR
3845  020206  014406                          CNTLU           ;CALLED BY EMT CNTLUU
3846  020210  013402                          CKINT           ;CALLED BY EMT CKINTT
3847  020212  001732                          KBDINT          ;CALLED BY EMT KBDIN
3848  020214  000000          EMTLIM:         0
3849  020216  020246          TSTLST:         TSTTB0
3850  020220  020450                          TSTTB1
3851  020222  020512                          TSTTB2
3852  020224  020520                          TSTTB3
3853  020226  000000                          0
3854  020230  000000                          0
3855  020232  000000                          0
3856  020234  000000                          0
3857  020236  000037          GR0:            N0-1
3858  020240  000007                          N1-100-1
3859  020242  000001                          N2-200-1
3860  020244  000000                          N3-300-1
```

```
3861  020246  002154                TSTTB0: T0
3862  020250  000001                        1
3863  020252  0022C2                        T1
3864  020254  004000                        TIMES
3865  020256  002244                        T2
3866  020260  004000                        TIMES
3867  020262  002306                        T3
3868  020264  004000                        TIMES
3869  020266  002350                        T4
3870  020270  004000                        TIMES
3871  020272  002412                        T5
3872  020274  004000                        TIMES
3873  020276  002454                        T6
3874  020300  004000                        TIMES
3875  020302  002530                        T7
3876  020304  004000                        TIMES
3877  020306  002604                        T10
3878  020310  004000                        TIMES
3879  020312  002674                        T11
3880  020314  004000                        TIMES
3881  020316  002764                        T12
3882  020320  004000                        TIMES
3883  020322  003054                        T13
3884  020324  004000                        TIMES
3885  020326  003144                        T14
3886  020330  004000                        TIMES
3887  020332  003234                        T15
3888  020334  004000                        TIMES
3889  020336  003322                        T16
3890  020340  004000                        TIMES
3891  020342  003410                        T17
3892  020344  004000                        TIMES
3893  020346  003476                        T20
3894  020350  004000                        TIMES
3895  020352  003564                        T21
3896  020354  004000                        TIMES
3897  020356  003636                        T22
3898  020360  000400                        TIMES
3899  020362  003720                        T23
3900  020364  000400                        TIMES
3901  020366  004116                        T24
3902  020370  000400                        TIMES
3903  020372  004274                        T25
3904  020374  000200                        TIMES
3905  020376  004444                        T26
3906  020400  000200                        TIMES
3907  020402  004636                        T27
3908  020404  000200                        TIMES
3909  020406  005030                        T30
3910  020410  000200                        TIMES
3911  020412  005222                        T31
3912  020414  000200                        TIMES
3913  020416  005414                        T32
3914  020420  000200                        TIMES
3915  020422  005610                        T33
3916  020424  000200                        TIMES
```

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3917  020426  006004                          T34
3918  020430  000200                          TIMES
3919  020432  006200                          T35
3920  020434  004000                          TIMES
3921  020436  006340                          T36
3922  020440  004000                          TIMES
3923  020442  006554                          T37
3924  020444  004000                          TIMES
3925  020446  000000                          0
3926  020450  007000                TSTTB1:   T100
3927  020452  000001                          1
3928  020454  007036                          T101
3929  020456  004000                          TIMES
3930  020460  007214                          T102
3931  020462  004000                          TIMES
3932  020464  007372                          T103
3933  020466  004000                          TIMES
3934  020470  007550                          T104
3935  020472  004000                          TIMES
3936  020474  007726                          T105
3937  020476  004000                          TIMES
3938  020500  010102                          T106
3939  020502  004000                          TIMES
3940  020504  010256                          T107
3941  020506  004000                          TIMES
3942  020510  000000                          0
3943  020512  010432                TSTTB2:   T200
3944  020514  000001                          1
3945  020516  000000                          0
3946  020520  011006                TSTTB3:   T300
3947  020522  000001                          1
3948          000001                .END
```

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ANSFLG  016050            2801* 2804* 2809* 2813* 2894* 2903  2926  2941* 2992* 2993  3624#
ANSTR   012164            2768  2799#
ANSTRR  012252            2817#
ANSTR1  012200            2800  2802#
ANSTR2  012214            2803  2805#
ANSTR3  012230            2807  2810#
ANSTR4  012244            2812  2814#
BINASA  014522            3352# 3356
BINASB  014542            3357# 3359
BINASC  014512            3350# 3832
BINWRD= 014654             778# 3312*
BUSY  = 000020             783# 1115  1119  1390  1416  1895  2872
CHCK    015306            3478  3500#
CHRCNT  016032            3311* 3350  3358* 3617#
CKINT   013402            3050# 3846
CKINTT= 104026             846# 2274  2338  2377  2436  2477  2521  2562  2602  2646  2711  2745
CKRING= 104021             841# 2252  2413
CKRNG   012640            2920# 3841
CKRNG1  012704            2929  2931#
CKRNG2  012730            2935  2938#
CKTRAN= 104023             843# 2280  2344  2442  2483  2527  2568  2608  2652  2717
CKTRN   013024            2959# 3843
CKTRN1  013140            2977  2979#
CKTRN2  013172            2984  2990#
CKTRN3  013232            2997  2999#
CKTRN4  013256            3003  3005#
CLRMUX= 002000             789# 1369  1489  1534  1579  1624  1813  1842  1887  1954  1993  2032  2071
                          2871
CLRSCN= 004000             790# 1389  1415  1894  2871
CNTLU   014406            3324# 3845
CNTLUU= 104025             845#  919  1033  2235  2396  3253
CO    = 000100             804# 1680  2121  2283  2287  2445  2448  2486  2490  2571  2575  2611  2616
COF   = 040000             793# 2779  2791  2802  2814
CONVER= 104010             832# 3313
CS    = 000040             803# 1680  2121  2283  2287  2448  2490  2571  2611
CSF   = 020000             792# 2782  2791  2805  2814
CSTR1   002202            1059#
CSTR2   002244            1072#
CSTR3   002306            1085#
CSTR4   002350            1098#
CSTR5   002412            1114#
DATA1   013274             923*  925*  928*  930  2833* 2842  2962* 2972  3011# 3551* 3553* 3555* 3557
DATA2   013276             924*  925   926*  929* 2834* 2844  2963* 2981  3012# 3552* 3553  3554* 3556*
DATA3   013300            2964* 2990  2994  3013#
DATA4   013302            2965* 3000  3014#
DIALM   016242            2899  3652#
DIGIT = 014656             779# 3353* 3354
DISPLA  015772             891* 3598#
DISPRE  000174             865#  891
DIVCNT  014634            3368* 3376#
DIVI    014560            3365# 3833
DIVIA   014604            3370# 3377
DIVIB   014652            3367  3381#
DIVIC   014622            3369  3371  3373#
DIVIDH  014656             779  3365* 3366  3370  3372* 3374* 3378* 3383#
DIVIDL  014654             778  3373* 3379* 3382#
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DIVIS   014660   777  3366  3370  3372  3384#
DIVIU   014564  3366#
DMBCSR  015754   951   952   956  1008*  1016*  1026*  1047  1059*  1060  1063*  1064  1072*  1073
                1076*  1077  1085*  1086  1089*  1090  1098*  1099  1103*  1104  1114*  1115  1118*
                1119  1129*  1132*  1145*  1148*  1161*  1163*  1166*  1169*  1179*  1184*  1185*  1188*
                1197*  1202*  1203*  1206*  1215*  1220*  1221*  1224*  1233*  1238*  1239*  1242*  1252*
                1257*  1258*  1261*  1270*  1275*  1276*  1279*  1288*  1293*  1294*  1297*  1306*  1311*
                1312*  1315*  1325*  1329*  1330  1346*  1349*  1350*  1351  1369*  1372*  1373*  1378*
                1379*  1380  1389*  1390  1394*  1395*  1396  1411*  1415*  1416  1418*  1419*  1420*
                1421*  1423*  1426*  1427  1449*  1454*  1455*  1458*  1459*  1461*  1464*  1465  1485*
                1489*  1491*  1493*  1496  1507*  1511*  1530*  1534*  1536*  1538*  1541  1552*  1556*
                1575*  1579*  1581*  1583*  1586  1597*  1601*  1620*  1624*  1626*  1628*  1631  1642*
                1646*  1666*  1671*  1673*  1676  1687*  1692*  1712*  1717*  1719*  1722  1733*  1738*
                1758*  1763*  1765*  1768  1779*  1784*  1804*  1808*  1813*  1814*  1842*  1843*  1846*
                1847*  1855*  1857*  1859  1863  1869  1875*  1887*  1888*  1891*  1894*  1895  1901*
                1903*  1905  1909  1915  1921*  1951*  1954*  1956*  1958*  1961  1972*  1976*  1990*
                1993*  1995*  1997*  2000  2011*  2015*  2029*  2032*  2034*  2036*  2039  2050*  2054*
                2068*  2071*  2073*  2075*  2078  2089*  2093*  2108*  2112*  2114*  2117  2128*  2133*
                2147*  2151*  2153*  2156  2167*  2172*  2186*  2190*  2192*  2195  2206*  2211*  2270*
                2328*  2335*  2336*  2432*  2434*  2475*  2517*  2519*  2560*  2600*  2642*  2644*  2696*
                2707*  2708*  2761  2769*  2828*  2833  2871*  2872  2879*  2883*  2893*  2946*  2960*
                2973*  2979*  3562*  3563*  3565*  3569*  3579*  3591#
DMBLSR  015756   956*  957*  1050  1492*  1495  1513*  1516  1537*  1540  1558*  1561  1582*  1585
                1603*  1606  1627*  1630  1648*  1651  1672*  1675  1693*  1696  1703*  1718*  1721
                1739*  1742  1749*  1764*  1767  1785*  1788  1795*  1807*  1815  1823*  1824  1831*
                1848*  1890*  1957*  1960  1978*  1981  1996*  1999  2017*  2020  2035*  2038  2056*
                2059  2074*  2077  2095*  2098  2113*  2116  2134*  2137  2152*  2155  2173*  2176
                2191*  2194  2212*  2215  2272*  2337*  2433*  2435*  2476*  2518*  2520*  2561*  2601*
                2643*  2645*  2709*  2770  2834  2881*  2884*  2974  2980  3592#
DMBLVL  015752   945*  946*  1131*  1147*  1164*  1183*  1201*  1219*  1237*  1255*  1273*  1291*  1309*
                1853*  1900*  2892*  3576*  3590#
DMBVEC  015750   940  941  945  1130*  1146*  1162*  1182*  1200*  1218*  1236*  1254*  1272*  1290*
                1308*  1852*  1899*  2324*  2693*  2890*  2943*  3574*  3575*  3576  3577*  3589#
DMYRTI  002146   986  1023  1024  1036#
DONE  = 000200   786#  1072  1073  1076  1077  1132  1166  1185  1203  1221  1239  1258  1276
                1294  1312  1875  1921  3565
EMTLIM  020214  3848#
EMTOK   013362  3043#
EMTSRV  013350   856  3040#
EMTTAB  020134  3045  3824#
EOP     013306  3021#  3097
ERR     013702  3123#  3834
ERRCS   014006  3195#  3824
ERRFLG  015774  2874*  3078  3100*  3109  3123*  3141*  3160*  3177*  3230*  3232  3254*  3602#
ERRGEN  014042  3127  3144  3164  3181  3198  3217  3224#
ERRLS   014024  3215#  3825
ERRMSG  014122  3125*  3142*  3161*  3178*  3195*  3215*  3236  3239#
ERRN    013764  3177#  3838
ERROR  = 104012   834#  1049  1052  1062  1066  1075  1079  1088  1092  1102  1107  1117  1121
                1137  1153  1170  1191  1209  1227  1245  1262  1280  1298  1316  2244  2405
                3571
ERRORC= 104000   824#  1333  1354  1383  1399  1434  1472  1864  1872  1910  1918
ERRORL= 104001   825#  1504  1519  1549  1564  1594  1609  1639  1654  1684  1699  1730  1745
                1776  1791  1819  1827  1969  1984  2008  2023  2047  2062  2086  2101  2125
                2140  2164  2179  2203  2218
ERRORN= 104016   838#  2771  2794  2817
```

```
ERRORS= 104015           837#  2303  2305  2364  2366  2463  2465  2504  2506  2547  2549  2588  2590
                        2630  2632  2672  2674  2734  2736
ERRORT= 104014           836#  2262  2264  2307  2309  2368  2370  2423  2425  2467  2469  2508  2510
                        2551  2553  2592  2594  2634  2636  2676  2678  2738  2740
ERRS    013742          3160#  3837
ERRT    013720          3141#  3836
ERR1    013264          2869*  2912  2922*  2930  2966*  2978  3007#
ERR2    013266          2923*  2937  2967*  2985  3008#
ERR3    013270          2968*  2998  3009#
ERR4    013272          2969*  3004  3010#
ERTAB   014134          3126*  3143*  3163*  3180*  3197*  3216*  3240  3243#
ERTAB0  014202          3235   3264#
ERTAB1  014210          3143   3267#
ERTAB2  014226          3163   3274#
ERTAB3  014244          3180   3281#
ERTAB4  014256          3197   3286#
ERTAB5  014270          3216   3291#
EXTRAC= 104011           833#  3352
FATEX   012254          2772   2795  2818#
FATRET  012266          2236*  2397*  2820  2821#
FREEZE  013640          3109#  3827
FREEZX  013674          3110   3114  3117#
FST     001244           903#
GETLIN  012350          2848#  3839
GETLNS= 104017           839#  2238  2399
GR0     020236           972   3857#
HILIM   015320          3440*  3494  3504#
ICOUNT  016006          3086*  3099*  3103*  3607#
INBUF   015324          3338   3445  3474  3506#
INIT1   002160          1047#
INSTBB  015104          3449#
INSTER  015176           944    955   977  3454  3466#  3480  3482  3495  3497  3501
INSTR   015036          3436#  3835
INSTRB  015076          3447#  3448  3465
INSTRC  015164          3462#  3463
INSTRD  015224          3479#  3490
INSTRG= 104013           835#   936   947   960  1939  2849  2854  3333
INSTR1  015062          3443#  3460  3468
INSTR2  015204          3456   3472#
INSTR3  015264          3486   3494#
INTENA= 000100           785#  1059  1060  1063  1064  1148  1163  1184  1202  1220  1238  1257  1275
                        1293  1311  1855  1901  2328  2696  2828  2893  2946  3077  3089  3101  3225
                        3255  3563
INT1    002454          1128#
INT1A   002522          1130   1136#
INT1B   002526          1135   1138#
INT10   003234          1252#
INT10A  003316          1254   1264#
INT10B  003320          1263   1265#
INT11   003322          1270#
INT11A  003404          1272   1282#
INT11B  003406          1281   1283#
INT12   003410          1288#
INT12A  003472          1290   1300#
INT12B  003474          1299   1301#
INT13   003476          1306#
```

```
INT1SA  003560            1308    1318#
INT13B  003562            1317    1319#
INT2    002530            1144#
INT2A   002576            1146    1152#
INT2B   002602            1151    1154#
INT3    002604            1160#
INT3A   002670            1162    1172#
INT3B   002672            1171    1173#
INT4    002674            1179#
INT4A   002756            1182    1190#
INT4B   002762            1189    1192#
INT5    002764            1197#
INT5A   003046            1200    1208#
INT5B   003052            1207    1210#
INT6    003054            1215#
INT6A   003136            1218    1226#
INT6B   003142            1225    1228#
INT7    003144            1233#
INT7A   003226            1236    1244#
INT7B   003232            1243    1246#
KBDIN = 104027             847#   3052
KBDINT  001732             860     998#   3847
KBDIN1  002014            1004    1011#
KBDIN2  002046            1012    1019#
KBDIN3  002110            1020    1029#
KRET    002150             986*   1023    1028    1038#   1935*   2237*   2398*
LINANS  016046            2270    2432    2475    2519    2560    2642    2767    2858    2883    2927    2973    2975    2995
                          3623#
LINE    016042            1943    1953    1992    2031    2070    2110    2149    2188    3621#
LINENA= 000001             798#   1492    1500    1672    1680    1690    1718    1726    1736    1764    1772    1782    1823
                          1848    1957    1965    2113    2121    2131    2152    2160    2170    2191    2199    2209    2283
                          2287    2347    2350    2445    2448    2486    2490    2530    2533    2571    2575    2611    2616
                          2655    2658    2720    2723    2881    2884
LINFLG  016040             987*   3620#
LINORG  016044            2336    2434    2517    2600    2644    2708    2765    2853    2879    2933    2979    2982    3001
                          3622#
LINT1   003564            1325#
LINT1A  003604            1329#   1335    1338
LINT1B  003622            1332    1334#
LINT2   003636            1345#   1356
LINT2A  003664            1350#   1359
LINT2B  003704            1353    1355#
LOGICA  013334            3029#
LOLIM   015316            3439*   3496    3503#
LOOP    013414            3063#   3826
LOOPER  013544            3088#   3104
LOOPL   013630            3083    3103#
LOOPS   013516            3079    3082#
LOOPX   013560            3073    3081    3085    3087    3091#   3112
LVL   = 000004            1175#   1193#   1211#   1229#   1247#   1248#   1266#   1284#   1302#   1320#
MAINT = 001000             788#   1085    1086    1089    1090    1372    1418    1421    1454    1846
MBCD    017777            3309    3320    3332    3811#
MCONTC  017744            1006    3804#
MCONTL  017752            1022    3806#
MCONTV  017747            1014    3805#
MCRLF   017514             991    1945    2860    3473    3775#
```

```
MDISC   016543            2322    2691    3686#
MEMT1   003720            1369#   1385
MEMT1A  003746            1373#   1375
MEMT1B  003776            1379#   1388
MEMT1C  004022            1382    1386#
MEMT1D  004030            1389#   1401
MEMT1E  004062            1395#   1404
MEMT1F  004106            1398    1402#
MEMT2   004116            1411#
MEMT2A  004140            1415#   1436    1441
MEMT2B  004222            1426#   1439
MEMT2C  004246            1430    1432#
MEMT2D  004260            1433    1437#
MEMT3   004274            1449#
MEMT3A  004316            1453#   1474    1479
MEMT3B  004330            1455#   1457
MEMT3C  004372            1464#   1477
MEMT3D  004416            1468    1470#
MEMT3E  004430            1471    1475#
MEPASS  020102            3025    3814#
MFATAL  017571            3178    3784#
MLINE   017517            1938    3776#
MLINEI  017552            1940    3781#
MLINER  016115            3215    3636#
MLINE1  016152            3161    3641#
MPFAIL  017667            3535    3796#
MPF1    017707            3540    3799#
MQM     017510            3467    3774#
MREGAD  017444             948    3767#
MSELAN  016446            2855    3675#
MSELOR  016422            2850    3671#
MSG     015064            3438*   3444#
MSTATE  016064            3195    3631#
MTEST   017500             961    3772#
MTITLE  016645             909    3698#
MTRANE  016203            3142    3646#
MTRNDE  017623            2836    3789#
MT103A  016465            2375    3678#
MT103T  016300            2232    3657#
MT202A  016514            2744    3682#
MT202T  016351            2393    3664#
MUX1    004444            1485#
MUX1A   004464            1489#   1521    1524
MUX1B   004514            1494#   1509
MUX1C   004542            1499    1502#
MUX1D   004554            1503    1506    1507#
MUX1E   004570            1511#
MUX1F   004622            1518    1520#
MUX11   007036            1951#
MUX11A  007054            1954#
MUX11B  007104            1959#   1974
MUX11C  007132            1964    1967#
MUX11D  007144            1968    1971    1972#
MUX11E  007160            1976#
MUX11F  007212            1983    1985#
MUX12   007214            1990#
```

```
MUX12A  007232          1993#
MUX12B  007262          1998#   2013
MUX12C  007310          2003    2006#
MUX12D  007322          2007    2010    2011#
MUX12E  007336          2015#
MUX12F  007370          2022    2024#
MUX13   007372          2029#
MUX13A  007410          2032#
MUX13B  007440          2037#   2052
MUX13C  007466          2042    2045#
MUX13D  007500          2046    2049    2050#
MUX13E  007514          2054#
MUX13F  007546          2061    2063#
MUX14   007550          2068#
MUX14A  007566          2071#
MUX14B  007616          2076#   2091
MUX14C  007644          2081    2084#
MUX14D  007656          2085    2088    2089#
MUX14E  007672          2093#
MUX14F  007724          2100    2102#
MUX15   007726          2108#
MUX15A  007744          2111#
MUX15B  007766          2115#   2130
MUX15C  010014          2120    2123#
MUX15D  010026          2124    2127    2128#
MUX15E  010044          2132#
MUX15F  010100          2139    2141#
MUX16   010102          2147#
MUX16A  010120          2150#
MUX16B  010142          2154#   2169
MUX16C  010170          2159    2162#
MUX16D  010202          2163    2166    2167#
MUX16E  010220          2171#
MUX16F  010254          2178    2180#
MUX17   010256          2186#
MUX17A  010274          2189#
MUX17B  010316          2193#   2208
MUX17C  010344          2198    2201#
MUX17D  010356          2202    2205    2206#
MUX17E  010374          2210#
MUX17F  010430          2217    2219#
MUX2    004636          1530#
MUX2A   004656          1534#   1566    1569
MUX2B   004706          1539#   1554
MUX2C   004734          1544    1547#
MUX2D   004746          1548    1551    1552#
MUX2E   004762          1556#
MUX2F   005014          1563    1565#
MUX3    005030          1575#
MUX3A   005050          1579#   1611    1614
MUX3B   005100          1584#   1599
MUX3C   005126          1589    1592#
MUX3D   005140          1593    1596    1597#
MUX3E   005154          1601#
MUX3F   005206          1608    1610#
MUX4    005222          1620#
```

```
MUX4A   005242          1624#   1656    1659
MUX4B   005272          1629#   1644
MUX4C   005320          1634    1637#
MUX4D   005332          1638    1641    1642#
MUX4E   005346          1646#
MUX4F   005400          1653    1655#
MUX5    005414          1666#
MUX5A   005434          1670#   1701    1705
MUX5B   005456          1674#   1689
MUX5C   005504          1679    1682#
MUX5D   005516          1683    1686    1687#
MUX5E   005534          1691#
MUX5F   005570          1698    1700#
MUX6    005610          1712#
MUX6A   005630          1716#   1747    1751
MUX6B   005652          1720#   1735
MUX6C   005700          1725    1728#
MUX6D   005712          1729    1732    1733#
MUX6E   005730          1737#
MUX6F   005764          1744    1746#
MUX7    006004          1758#
MUX7A   006024          1762#   1793    1797
MUX7B   006046          1766#   1781
MUX7C   006074          1771    1774#
MUX7D   006106          1775    1778    1779#
MUX7E   006124          1783#
MUX7F   006160          1790    1792#
MUX8    006200          1804#
MUX8A   006216          1807#   1810
MUX8B   006244          1813#   1821    1829
MUX8C   006252          1814#   1833
MUX8D   006276          1818    1822#
MUX8E   006324          1826    1830#
MVECTO  017422           937    3764#
M0      = 000040        3863#   3865#   3867#   3869#   3871#   3873#   3875#   3877#   3879#   3881#   3883#   3885#   3887#
                        3889#   3891#   3893#   3895#   3897#   3899#   3901#   3903#   3905#   3907#   3909#   3911#   3913#
                        3915#   3917#   3919#   3921#   3923#   3925#   3928    3930    3932    3934    3936    3938    3940
M1      = 000110        3928#   3930#   3932#   3934#   3936#   3938#   3940#   3942#
M16       016613        1046    3693#
N       = 000300        1044#   1934#   2228#   2389#
NXTTS     013304        2868*   2914    2921*   2939    2970*   3006    3015#
NO      = 000040        1044#   1045#   1058    1059#   1071    1072#   1084    1085#   1097    1098#   1113    1114#   1127
                        1128#   1143    1144#   1159    1160#   1178    1179#   1193    1196    1197#   1211    1214    1215#
                        1229    1232    1233#   1247    1251    1252#   1266    1269    1270#   1284    1287    1288#   1302
                        1305    1306#   1320    1324    1325#   1344    1345#   1368    1369#   1410    1411#   1448    1449#
                        1484    1485#   1529    1530#   1574    1575#   1619    1620#   1665    1666#   1711    1712#   1757
                        1758#   1803    1804#   1841    1842#   1885    1886#   3857    3863
N1      = 000110        1934#   1935#   1950    1951#   1989    1990#   2028    2029#   2067    2068#   2107    2108#   2146
                        2147#   2185    2186#   3858    3928
N2      = 000202        2228#   2229#   2373    2374#   3859
N3      = 000301        2389#   2390#   3860
OCTASC= 104006           830#   2837    3234    3242    3329
OCTASN  014320          3306#   3830
OCTAS1  014346          3311#   3315
ORGFLG  016052          2778*   2781*   2786*   2790*   2895*   2905    2932    2942*   2999    3625#
ORGTR   012072          2766    2776#
```

```
ORGTRR  012160            2794#
ORGTR1  012106            2777    2779#
ORGTR2  012122            2780    2782#
ORGTR3  012136            2784    2787#
ORGTR4  012152            2789    2791#
PASCNT  016000             989*   3022*   3604#
PFAIL   015346             854     878    3511#   3532
POPR0 = 012600             818#
POP1SP= 005726             816#   3533
POP2SP= 022626             820#    904    1007    1015    1025    1136    1152    1172    1190    1208    1226    1244    1264
                          1282    1300    1318    1868    1914    2819    2911    2913    2936    2938    3005    3070    3580
                          3581
PS    = 1777.6             775#    776    1128*   1131    1133*   1144*   1147    1149*   1160*   1164    1165*   1180*   1181*
                          1183    1198*   1199*   1201    1216*   1217*   1219    1234*   1235*   1237    1253*   1256*   1271*
                          1274*   1289*   1292*   1307*   1310*   1326*   1345*   1370*   1412*   1450*   1486*   1531*   1576*
                          1621*   1667*   1713*   1759*   1805*   1844*   1853    1856*   1858*   1862*   1889*   1900    1902*
                          1904*   1908*   1936*   1952*   1991*   2030*   2069*   2109*   2148*   2187*   2230*   2323*   2329*
                          2334*   2391*   2692*   2698*   2706*   2866*   2900*   2947*   2959*   3561*   3564*   3570*   3578*
PSW   = 177776             776#   3076*   3224*
PUSHR0= 010046             817#
PUSH1S= 005746             815#    984    3542
PUSH2S= 024646             819#
RADIX = 014660             777#   3308*
REGST1  001532             953     956#
RESTAR  015404            3519    3525#
RESTA1  015452            3537    3539#
RES05 = 104007             831#   3244
RETURN  016004            3088    3096*   3606#
RING  = 000200             805#   1726    2160
RINGF = 100000             794#   2291    2452    2776    2791    2799    2814
RNGRET  016062            2326*   2694*   2827    2896*   2944*   3629#
RS    = 000004             800#   1582    1590    1718    1726    1739    2035    2043    2152    2160    2173    2435    2448
                          2490    2518    2561    2571    2611    2643
RS05    014722            3402#   3831
SAVPC   016026            3228    3266    3388*   3615#
SAVR0   016010            3397*   3402    3608#
SAVR1   016012            3299    3396*   3403    3609#
SAVR2   016014            3395*   3404    3610#
SAVR3   016016            3273    3280    3285    3297    3394*   3405    3611#
SAVR4   016020            3271    3278    3283    3290    3295    3393*   3406    3612#
SAVR5   016022            3269    3276    3288    3293    3392*   3407    3613#
SAVSP   016024            3518*   3525    3614#
SAV05P= 104005             829#   3231
SCNENA= 000040             784#   1098    1099    1103    1104    1114    1118    1857    1875    1903    1921    2328    2696
                          2828    2893    2946
SCNT1   006340            1842#   1866    1874
SCNT1A  006372            1847#   1850
SCNT1B  006444            1856#   1878
SCNT1C  006516            1852    1868#
SCNT1D  006536            1867    1871    1875#
SCNT2   006554            1886#   1912    1920
SCNT2A  006600            1890#   1893
SCNT2B  006670            1902#   1924
SCNT2C  006742            1899    1914#
SCNT2D  006762            1913    1917    1921#
SCOPE = 104002             826#   1053    1067    1080    1093    1108    1122    1138    1154    1173    1192    1210    1228
```

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                    1246    1265    1283    1301    1319    1339    1360    1405    1442    1480    1525    1570    1615
                    1660    1706    1752    1798    1834    1879    1925    1985    2024    2063    2102    2141    2180
                    2219
SCOPEF= 104003       827#   1334    1355    1384    1400    1435    1473    1505    1520    1550    1565    1595    1610
                    1640    1655    1685    1700    1731    1746    1777    1792    1820    1828    1865    1873    1911
                    1919    1970    2009    2048    2087    2126    2165    2204
SECRX = 000020       802#   1772    2199    2486    2490    2611    2616
SECRXF= 010000       791#   2787    2791    2810    2814
SECTX = 000010       801#   1627    1635    1764    1772    1785    2074    2082    2191    2199    2212    2476    2486
                    2520    2601    2616    2645
SETUP = 104020       840#   2240    2401
SETUPB  012622      2904    2906    2913#
SETUPS  012404      2865#   3840
SETUP1  012436      2872#   2873
SETUP2  012452      2879#
SETUP4  012564      2896    2903#   2908    2910
SINGLE= 000001       761#   1484    1529    1574    1619    1665    1711    1757    1927#   1950    1989    2028    2067
                    2107    2146    2185
SINTFL  002152      1000*   1034*   1039#   3449*
SMLN    014510      3317    3328*   3342*   3346#
ST    = 000200      1175#   1193#   1211#   1229#   1247#   1248#   1266#   1284#   1302#   1320#
STACK   001100       877#    882     922     959
START   001100       869     878#
STARTN  001546       921     959#   1010
STARTO  001254       901     906#   3538
START1  001316       914     917#
STEP  = 000400       787#   1350    1373    1379    1395    1420    1426    1455    1459    1464    1507    1552    1597
                    1642    1687    1733    1779    1808    1847    1891    1972    2011    2050    2089    2128    2167
                    2206
STORE   015322      3441*   3498*   3505#
STRLIN  007000      1935#
STRLNA  007020      1935    1939#
STRTOA  001640       975     978#
ST103A  010432      2229#
ST103B  010474      2237    2238#   2245    2265    2378
ST202A  011006      2390#
ST202B  011050      2398    2399#   2406    2426    2746
SUSWR   001122       883#
SV05    014670      3392#
SV05P   014662      3388#   3829
SWR     015770       886     890*    917     920    1029    2233    2394    3080    3082    3084    3111    3113    3226
                    3248    3251   3340*   3597#
SWREG   000176       866#    890     917    1029    2233    2394    3251    3303
SWRTB   014312      3301#   3330
SW06  = 000100       754#
SW08  = 000400       753#
SW09  = 001000       752#   3113
SW10  = 002000       751#   3080    3111
SW11  = 004000       750#   3084
SW12  = 010000       749#
SW13  = 020000       748#   3226
SW14  = 040000       747#   3082
SW15  = 100000       746#   3248
T     = 000014      1175#   1193#   1211#   1229#   1247#   1248#   1266#   1284#   1302#   1320#
TEMTAB  020120      3351    3817#
TIFLG   016060       906     910*   3628#
```

```
TIMES = 004000          3863#  3864   3865#  3866   3867#  3868   3869#  3870   3871#  3872   3873#  3874   3875#
                        3876   3877#  3878   3879#  3880   3881#  3882   3883#  3884   3885#  3886   3887#  3888
                        3889#  3890   3891#  3892   3893#  3894   3895#  3896   3897#  3898   3899#  3900   3901#
                        3902   3903#  3904   3905#  3906   3907#  3908   3909#  3910   3911#  3912   3913#  3914
                        3915#  3916   3917#  3918   3919#  3920   3921#  3922   3923#  3924   3928#  3929   3930#
                        3931   3932#  3933   3934#  3935   3936#  3937   3938#  3939   3940#  3941
TIME1   016054          2901*  2907*  2948*  2950*  3626#
TIME2   016056          2902*  2909*  2949*  2952*  3627#
TIPFLG  001730           880*   992*   994#   998*  1035*  3536
TKCSR   015760           881*  1009*  1017*  1027*  2331   2700   3050   3077*  3089*  3101*  3225*  3255*  3447
                        3593#
TKDBR   015762          1001   2330*  2333   2699*  2702   3450   3594#
TMP1    014504           999*  1001*  1002*  1003   1011   1019   1031   3324*  3337   3340   3344#  3450*  3451*
                        3452   3459*
TMP2    014506          3325*  3341*  3345#  3500
TPCSR   015764          3414   3462   3595#
TPDBR   015766          3423*  3461*  3596#
TRACON  015776           988*  3603#
TRANEX  012270          2793   2816   2825#
TRANS   012030          2761#  2890   2943
TRANX1  012300          2828#  2839
TRMRDY= 000002           799#  1537   1545   1672   1680   1693   1996   2004   2113   2121   2134   2272   2283
                        2287   2337   2347   2433   2445   2448   2486   2490   2530   2533   2571   2575   2611
                        2616   2655   2658   2709   2720   2881
TRNTAB  012336          2838   2840#
TRNTYP  012310          2324   2693   2833#
TSTENT  013564           993   3027   3033   3074   3092#  3543
TSTGO   001660           933    935    981    983#
TSTLST  020216           973   3849#
TSTMAX  016036           972*   980   3619#
TSTNO   016002           964    965    978*   980   2376*  2818*  3023*  3091*  3092   3559*  3605#
TSTPNT  016034           973*   974   3095   3560*  3618#
TSTTB0  020246          3560   3618   3849   3861#
TSTTB1  020450          3850   3926#
TSTTB2  020512          3851   3943#
TSTTB3  020520          3852   3946#
TYPE  = 104004           828#   908    990   1005   1013   1021   1045   1937   1944   2231   2321   2374   2392
                        2690   2743   2835   2859   2898   3024   3238   3319   3326   3331   3443   3466   3472
                        3534   3539
TYPECL  015024          3420   3422   3425#
TYPER   014754          3412#  3828
TYPERA  014764          3414#  3415   3424
TYPER1  015002          3417   3419#
TYPER2  015016          3423#  3427
T0      002154          1044#  3861
T1      002202          1058#  3863
T10     002604          1159#  3877
T100    007000          1934#  3926
T101    007036          1950#  3928
T102    007214          1989#  3930
T103    007372          2028#  3932
T103A   010476          2236   2240#
T103A1  010504          2243   2244#
T103B   010510          2242   2252#
T103B1  010520          2258   2262#
T103B2  010524          2260   2264#
```

T103C	010530	2256	2270#
T103D1	010574	2297	2303#
T103D2	010600	2299	2305#
T103D3	010604	2300	2307#
T103D4	010610	2301	2309#
T103E	010614	2302	2321#
T103EN	010770	2363	2374#
T103ES	010654	2326	2330#
T103E1	010750	2358	2364#
T103E2	010754	2360	2366#
T103E3	010760	2361	2368#
T103E4	010764	2362	2370#
T104	007550	2067#	3934
T105	007726	2107#	3936
T106	010102	2146#	3938
T107	010256	2185#	3940
T11	002674	1178#	3879
T12	002764	1196#	3881
T13	003054	1214#	3883
T14	003144	1232#	3885
T15	003234	1251#	3887
T16	003322	1269#	3889
T17	003410	1287#	3891
T2	002244	1071#	3865
T20	003476	1305#	3893
T200	010432	2228#	3943
T201	010770	2373#	
T202A	011052	2397	2401#
T202A1	011060	2404	2405#
T202B	011064	2403	2413#
T202B1	011074	2419	2423#
T202B2	011100	2421	2425#
T202C	011104	2417	2432#
T202D	011120	2434#	
T202D1	011164	2458	2463#
T202D2	011170	2459	2465#
T202D3	011174	2460	2467#
T202D4	011200	2461	2469#
T202E	011204	2462	2475#
T202E1	011250	2499	2504#
T202E2	011254	2500	2506#
T202E3	011260	2501	2508#
T202E4	011264	2502	2510#
T202F	011270	2503	2517#
T202F2	011350	2542	2547#
T202F3	011354	2543	2549#
T202F4	011360	2544	2551#
T202F5	011364	2545	2553#
T202G	011370	2546	2560#
T202G1	011434	2583	2588#
T202G2	011440	2584	2590#
T202G3	011444	2585	2592#
T202G4	011450	2586	2594#
T202H	011454	2587	2600#
T202H2	011520	2625	2630#
T202H3	011524	2626	2632#

```
T202H4  011530            2627    2634#
T202H5  011534            2628    2636#
T202I   011540            2629    2642#
T202I2  011620            2667    2672#
T202I3  011624            2668    2674#
T202I4  011630            2669    2676#
T202I5  011634            2670    2678#
T202J   011640            2671    2690#
T202JN  012016            2733    2743#
T202JS  011700            2694    2699#
T202J1  011776            2729    2734#
T202J2  012002            2730    2736#
T202J3  012006            2731    2738#
T202J4  012012            2732    2740#
T21     003564            1324#   3895
T22     003636            1344#   3897
T23     003720            1368#   3899
T24     004116            1410#   3901
T25     004274            1448#   3903
T26     004444            1484#   3905
T27     004636            1529#   3907
T3      002306            1084#   3867
T30     005030            1574#   3909
T300    011006            2389#   3946
T31     005222            1619#   3911
T32     005414            1665#   3913
T33     005610            1711#   3915
T34     006004            1757#   3917
T35     006200            1803#   3919
T36     006340            1841#   3921
T37     006554            1885#   3923
T4      002350            1097#   3869
T5      002412            1113#   3871
T6      002454            1127#   3873
T7      002530            1143#   3875
VECSTA  001360             925#    931
VECSTR  001340             912     916     922#    1018
VECST1  001464             942     945#
WAITR   012736            2941#   3842
WAITRN= 104022             842#   2275    2339    2437    2478    2522    2563    2603    2647    2712
WAITRR  012774            2944    2948#   3844
WAITR1  013006            2950#   2951    2953
WAITS = 104024             844#   2710
WRDCNT  016030            3310*   3314*   3616#
X     = 000000             824     825#    826#    827#    828#    829#    830#    831#    832#    833#    834#    835#    836#
                           837#    838#    839#    840#    841#    842#    843#    844#    845#    846#    847#    848#    874#
XCO   = 000004             809#   2291    2294    2352    2355    2452    2455    2536    2539    2578    2581    2661    2664
XCS   = 000002             810#   2291    2294    2352    2355    2455    2539    2578    2661
XFLAG   001242             894*    899*    902#    911     932    3063
XM    = 000101            3863#   3928#
XN    = 000300            1044#   1934#   2226#   2389#
XOR     015470             900     915    3547#
XORSVC  001246             896     904#
XSCRX = 000001             811#   2495    2497    2536    2539    2621    2623    2661    2664
X1A     001564             965#    976
X1B     001630             976#    982
```

```
$NEWIS  017765          3334    3809#
$SWREQ  017755          3327    3807#
.     = 020524           850#    853#    859#    864#    868#    876#     907    1048    1051    1061    1065    1074    1078
                        1087    1091    1100    1105    1116    1120    1391    1417    1515    1560    1605    1650    1695
                        1741    1787    1860    1896    1906    1980    2019    2058    2097    2136    2175    2214    2826
                        2991    3229    3507#   3521    3812#   3813#   3818#
.1      014124          3233    3240#
.2      014136          3237    3241    3244#
.3      014140          3227    3248#
.4      014164          3249    3252    3254#
```

```
COMMEN    760#   874#  1044#  1175#  1248#  1927#  1934#  2228#  2389#  3963#  3928#
EMTDEF    824    825    826    827    828    829    830    831    832    833    834    835    836    837    838
          839    840    841    842    843    844    845    846    847    874#
INTS     1040#  1248   1266   1284   1302
MUXS1    1040#  1481   1526   1571   1616   1947   1986   2025   2064
MUXS2    1040#  1661   1707   1753   2103   2142   2181
NOINT    1040#  1175   1193   1211   1229
TM        875#  3863   3865   3867   3869   3871   3873   3875   3877   3879   3881   3883   3885   3887   3889
         3891   3893   3895   3897   3899   3901   3903   3905   3907   3909   3911   3913   3915   3917   3919
         3921   3923   3928   3930   3932   3934   3936   3938   3940
TS        873#  1044   1058   1071   1084   1097   1113   1127   1143   1159   1178   1196   1214   1232   1251
         1269   1287   1305   1324   1344   1368   1410   1448   1484   1529   1574   1619   1665   1711   1757
         1803   1841   1885   1934   1950   1989   2028   2067   2107   2146   2185   2228   2373   2389
TSS       873#

. ABS.  020524     000

 ERRORS DETECTED:  0

 CZKMGA,CZKMGA/CRF/SOL/NL:TOC=CZKMGA
 RUN-TIME: 29 55 8 SECONDS
 RUN-TIME RATIO: 467/93=4.9
 CORE USED:  11K  (21 PAGES)
```