DMC11 BTSTUF MD LN UNT TSTS AH-8557C-MC
CZDMFCO FICHE 1 OF 1
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IDENTIFICATION

PRODUCT CODE:	AC-8556C-MC
PRODUCT NAME:	CZDMFC0 BTSTUF MD LN UNI TSTS
DATE:	AUGUST 1980
MAINTAINER:	DIAGNOSTICS-MERRIMACK

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1. ABSTRACT

THE FUNCTION OF THE DMC11 DIAGNOSTICS IS TO VERIFY THAT THE OPTION OPERATES ACCORDING TO SPECIFICATIONS. THE DIAGNOSTICS VERFIY THAT THERE ARE NO MALFUNCTIONS AND THE ALL OPERATIONS OF THE DMC11 ARE CORRECT IN ITS ENVIRONMENT.

PARAMETERS MUST BE SET UP TO ALERT THE DIAGNOSTICS TO THE DMC11 CONFIGURATION. THESE PARAMETERS ARE CONTAINED IN THE STATUS TABLE AND ARE GENERATED IN TWO WAYS: 1) MANUAL INPUT - THE OPERATOR ANSWERS QUESTIONS. 2) AUTOSIZING - THE PROGRAM DETERMINES THE PARAMETERS AUTOMATICALLY.

CZDMF TESTS THE DMC-11 LINE UNIT (M8201 OR M8202). IT PERFORMS WRITE/READ TESTS ON THE DMC LINE UNIT REGISTERS. IT CHECKS FOR PROPER TRANSMITTER, RECEIVER, AND BCC OPERATION IN BITSTUFF MODE. THE MODEM SIGNALS ARE ALSO CHECKED. CZDMF REQUIRES A DMC MICRO-PROCESSOR (M8200 OR M8204, TO RUN. FOR BEST DIAGNOSIS A TURN-AROUND CONNECTOR SHOULD BE INSTALLED, HOWEVER THE DIAGNOSTIC WILL RUN WITHOUT IT (SOME TESTS ARE SKIPPED).

CURRENTLY THERE ARE FIVE OFF LINE DIAGNOSTICS THAT ARE TO BE RUN IN SEQUENCE TO INSURE THAT IF AN ERROR SHOULD OCCUR IT WILL BE DETECTED AT AN EARLY STAGE.

NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE FIVE DIAGNOSTICS ARE:

1. DZDMC [REV] BASIC W/R AND MICRO-PROCESSOR TESTS
2. DZDME [REV] DDCMP LINE UNIT TESTS
3. DZDMF [REV] BITSTUFF LINE UNIT TESTS
4. DZDMG [REV] JUMP AND CROM TESTS
5. DZDMH [REV] FREE-RUNNING TESTS (HEAT TEST TAPE)

NOTE: THE NAMES OF THESE DIAGNOSTICS MAY VARIE AS EACH IS UPDATED.

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (EXCEPT AN LSI-11) WITH MINIMUM 8K MEMORY
ASR 33 (OR EQUILIVALENT)
DMC11-AR WITH DMC11-DA OR DMC11-FA OR
DMC11-AL WITH DMC11-MA OR DMC11-MD

2.2 STORAGE

PROGRAM WILL USE ALL 8K OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP LOADER RESIDE. LOCATIONS 1500 THRU 1640; CONTAIN THE "STATUS TABLE' INFORMATION WHICH IS GENERATED AT START OF DIAGNOSTICS BY MANUAL INPUT (QUESTIONS) OR AUTOMATICALLY (AUTO-SIZING). THIS AREA IS AN OVERLAY AREA AND SHOULD NOT BE ALTERED BY THE OPERATOR.

? LOADING PROCEEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED USING THE ABSOLUTE LOADER. NOTE: IF THE DIAGNOSTICS ARE ON A MEDIA SUCH AS DISK ,MAGTAPE,DECTAPE, OR CASSETTE; FOLLOW INSTRUCTIONS FOR THE MONITOR WHICH HAS BEEN PROVIDED ON THAT SPECIFIC MEDIA.

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY	* SIZE
4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

3.1.1 PLACE ADDRESS OF ABS LOADER INTO SWITCH REGISTER.
(ALSO PLACE 'HALT' SW UP)

3.1.2 DEPRESS 'LOAD ADDRESS' KEY ON CONSOLE AND RELEASE.

3.1.3 DEPRESS 'START KEY' ON CONSOLE AND RELEASE (PROGRAM SHOULD NOW BE LOADING INTO CPU)

4. STARTING PROCEEDURE

A. SET SWITCH REGISTER TO 000200
B. DEPRESS 'LOAD ADDRESS' KEY AND RELEASE
C. SET SWR TO ZERO FOR 'AUTO SIZING' OR SWR BIT0=1 FOR MANUAL INPUT (QUESTIONS) OR SWR BIT7=1 TO USE EXISTING PARAMETERS SET UP BY A PREVIOUS START OR A PREVIOUSLY RUN DMC11 DIAGNOSTIC.
D. DEPRESS 'START KEY' AND RELEASE. THE PROGRAM WILL TYPE MAINDEC NAME AND PROGRAM NAME (IF THIS WAS THE FIRST START UP OF THE PROGRAM) AND ALSO THE FOLLOWING:

MAP OF DMC11 STATUS

PC	CSR	STAT1	STAT2	STAT3
001500	160010	145310	177777	000000
001510	160020	145320	177777	000000

THE PROGRAM WILL TYPE 'R' AND PROCEED TO RUN THE DIAGNOSTIC. THE ABOVE IS ONLY AN EXAMPLE. THIS WOULD INDICATE THE STATUS TABLE STARTING AT ADD. 1500 IN THE PROGRAM. IN THIS EXAMPLE THE TABLE CONTAINS THE INFORMATION AND STATUS OF TWO DMC11'S. THE STATUS TABLE MUST BE VERIFIED BY THE USER IF AUTO SIZING IS DONE. FOR INFORMATION OF STATUS TABLE SEE SECTION 8.4 FOR HELP.
IF THE DIAGNOSTIC WAS STARTED WITH SW00=1 INDICATING MANUAL PARAMETER INPUT THEN THE FOLLOWING SHOWS AN EXAMPLE OF THE QUESTIONS ASKED AND SOME EXAMPLE ANSWERS:

```
HOW MANY DMC11'S TO BE TESTED?1
01
CSR ADDRESS?160010
VECTOR ADDRESS?310
BR PRIORITY LEVEL?  (4,5,6,7)?5
DOES MICRO-PROCESSOR HAVE CRAM?  (Y OR N)N
WHICH LINE UNIT?  IF NONE TYPE "N",  IF  M8201  TYPE  "1",  IF
M8202 TYPE "2"?1
IS THE LOOP BACK CONNECTOR ON?Y
(THE NEXT QUESTION WILL BE ASKED ONLY IF M8201 AND LOOP BACK CONNECTOR)
WHICH MODEM TYPE, TYPE "D" FOR DMC11-DA (RS232C), OR
TYPE "F" FOR DMC11-FA (V.35) ? D
SWITCH PAC#1 (DDCMP LINE#)?377
SWITCH PAC#2 (BM873 BOOT ADD)?377
```

FOLLOWING THE QUESTIONS THE STATUS MAP IS PRINTED OUT AS DESCRIBED ABOVE, THE INFORMATION IN THE MAP REFLECTS THE ANSWERS TO THE QUESTIONS. IF THE DIAGNOSTIC WAS STARTED WITH SW00=0 AND SW07=0 (AUTO-SIZING) THEN NO QUESTIONS ARE ASKED AND ONLY THE STATUS-MAP IS PRINTED OUT. IF AUTO-SIZING IS USED THE STATUS INFORMATION MUST BE VERIFIED TO BE CORRECT (MATCH THE HARDWARE). IF IT DOES NOT MATCH THE HARDWARE THE DIAGNOSTIC MUST BE RESTARTED WITH SW00=1 AND THE QUESTIONS ANSWERED.

```
                        4.1     CONTROL SWITCH SETTINGS

                                SW 15 SET:  HALT ON ERROR
                                SW 14 SET:  LOOP ON CURRENT TEST
                                SW 13 SET:  INHIBIT ERRGR PRINT OUT
                                SW 12 SET:  INHIBIT TYPE OUT/ABELL ON ERROR.
                                SW 11 SET:  INHIBIT ITERATIONS.  (QUICK PASS)
                                SW 10 SET:  ESCAPE TO NEXT TEST ON ERROR
                                SW 09 SET:  LOOP WITH CURRENT DATA
                                SW 08 SET:  CATCH ERROR AND LOOP ON IT
                                SW 07 SET:  USE PREVIOUS STATUS TABLE.
                                SW 06 SET:  HALT IN   ROMCLK   ROUTINE   BEFORE   CLOCKING
                                            MICRO-PROCESSOR
                                SW 05 SET:  RESERVED
                                SW 04 SET:  RESERVED
                                SW 03 SET:  RESELECT DMC11'S DESIRED ACTIVE
                                SW 02 SET:  LOCK ON SELECTED TEST
                                SW 01 SET:  RESTART PROGRAM AT SELECTED TEST
                                SW 00 SET:  BUILD NEW STATUS TABLE FROM QUESTIONS.  (IF SW07=0
                                              AND  SW00=0  A  NEW  STATUS  TABLE  IS  BUILT BY
                                              AUTO-SIZING)

                                SWITCH 06 AND 08-15 ARE DYNAMIC AND CAN BE CHANGED  AS  NEEDED
                                WHILE THE DIAGNOSTIC IS RUNNING.  SWITCHES 00-03 AND SWITCH 07
                                ARE STATIC, AND ARE USED ONLY ON STARTING  OR  RESTARTING  THE
                                DIAGNOSTIC.
```

4.1.2 SWITCH REGISTER OPTIONS (AT START UP)

SW 01 RESTART PROGRAM AT SELECTED TEST. IT IS STRONGLY SUGGESTED THAT AT LEAST ONE PASS HAS BEEN MADE BEFORE TRYING TO SELECT A TEST, THE REASON BEING IS THAT THE PROGRAM HAS TO CLEAR AREAS AND SET UP PARAMETERS. WHEN THIS SWITCH IS USED THE DIAGNOSTIC WILL ASK TEST NO.? ANSWER BY TYPING THE NUMBER OF THE TEST DESIRED AND CARRIGE RETURN TO BEGIN EXECUTION AT THE SELECTED TEST.

SW 02 LOCK ON SELECTED TEST. THIS SWITCH WHEN USED WITH SW01 WILL CAUSE THE PROGRAM TO CONSTANTLY LOOP ON THE SELECTED TEST. HITTING ANY KEY ON THE CONSOLE WILL LET IT ADVANCE TO THE NEXT TEST AND LOOP UNTIL A KEY IS HIT AGAIN. IF SW02=0 WHEN SW0' IS USED. THE PROGRAM WILL BEGIN AT THE SELECTED EST AND CONTINUE NORMAL OPERATIONS.

SW 03 RESELECT DMC11'S DESIRED ACTIVE. PLEASE NOTE THAT A MESSAGE IS TYPED OUT FOR SETTING THE SWITCH REGISTER EQUAL TO DMC11'S ACTIVE. THIS MEANS IF THE SYSTEM HAS FOUR DMC11S; BITS 00,01,02,03 WILL BE SET IN LOC 'DMACTV' FROM THE SWITCH REGISTER. USING THIS SWITCH(SW00) ALTERS THAT LOCATION;THEREFORE IF FOUR DMC11S ARE IN THE SYSTEM ***DO NOT*** SET SWITCHS GREATER THAN SW 03 IN THE UP POSITION. THIS WOULD BE A FATAL ERROR. DO NOT SELECT MORE ACTIVE DMC11S THAN THERE IS INFORMATION ON IN THE STATUS TABLE.

METHOD: A: LOAD ADDRESS 200
B: START WITH SW 00=1
C: PROGRAM WILL TYPE MESSAGE
D: SET A SWITCH FOR EACH DMC DESIRED ACTIVE. EXAMPLE: IF YOU HAVE 4 DMC'S BUT ONLY WANT TO RUN THE FIRST AND THE LAST SET SWR BITS 0 AND 3 = 1. PRESS CONTINUE
E: NUMBER (IF VALID) WILL BE IN DATA LIGHTS (EXCLUDING 11/05)
F: SET WITH ANY OTHER SWITCH SETTINGS DESIRED. PRESS CONTINUE.

4.1.3 DYNAMIC SWITCHES

ERROR SWITCHES

1. SW 12 DELETE PRINT OUT/BELL ON ERROR.
2. SW 13 DELETE ERROR PRINTOUT.
3. SW 15 HALT ON THE ERROR.
4. SW 08 GOTO BEGINNING OF THE TEST(ON ERROR).
5. SW 10 GOTO NEXT TEST(ON ERROR).

SCOPE SWITCHES

1. SW06 HALT IN ROMCLK ROUTINE BEFORE CLOCKING MICRO-PROCESSOR INSTRUCTION. THIS ALLOWS THE OPERATOR TO SCOPE A MICRO-PROCESSOR INSTRUCTION IN THE STATIC STATE BEFORE IT IS CLOCKED. HIT CONTINUE TO RESUME RUNNING.
2. SW09 (IF ENABLED BY 'SCOP1') ON AN ERROR; IF AN '*' IS PRINTED IN FRONT OF THE TEST NO. (EX. *TEST NO. 10) SW09 IS INCORPORATED IN THAT TEST AND THEREFORE SW09 IS USUALLY THE BEST SWITCH FOR THE SCOPE LOOP (SW14=0, SW10=0, SW09=1, SW08=0). IF SW09 IS NOT ENABELED; AND THERE IS A HARD ERROR (CONSTANT); SW08 IS BEST. (SW14=1,0, SW10=0, SW09=0, SW08=1). FOR INTERMITTEMT ERRORS; SW14=1 WILL LOOP ON TEST REGUARDLESS OF ERROR OR NOT ERROR. (SW14=1, SW10=0, SW09=0, SW08=1,0)
3. SW11 INHIBIT INTERATIONS.
4. SW14 LOOP ON CURRENT TEST.

4.2 STARTING ADDRESS

STARTING ADDRESS IS AT 000200 THERE ARE NO OTHER STARTING ADDRESSES FOR THE DMC11 DIAGNOSTICS. (SEE SECTION 4.0)

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY AFTER ALL AVAILABLE DMC11'S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

5. OPERATING PROCEDURE

WHEN PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION 4.0 WILL BE PRINTED, AND PROGRAM WILL BEGIN RUNNING THE DIAGNOSTIC

```
310
311
312                                 5.2     PROGRAM AND/OR OPERATOR ACTION
313
314                                         THE TYPICAL APPROACH SHOULD BE
315
316                                         1.      HALT ON ERROR (VIA SW 15=1) WHEN EVER AN ERROR OCCURS.
317                                         2.      CLEAR SW 15.
318                                         3.      SET SW 14:  (LOOP ON THIS TEST)
319                                         4.      SET SW 13:  (INHIBIT ERROR PRINT OUT)
320
321                                         THE TEST NUMBER AND PC WILL BE  TYPED  OUT  AND  POSSIBILY  AN
322                                         ERROR  MESSAGE (THIS DEPENDS ON THE TEST) TO GIVE THE OPERATOR
323                                         AN IDEA AS TO THE SOURCE OF THE PROBLEM.  IF IT  IS  NECESSARY
324                                         TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT;  LOOK IN
325                                         THE LISTING FOR THAT TEST NUMBER WHICH WAS TYPED OUT AND  THEN
326                                         NOTE THE PC OF THE ERROR REPORT THIS WAY THE EXACT FUNCTION OF
327                                         THE TEST CAN BE DETERMINED.
328
329                                 6.      ERRORS
330
331                                         AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND
332                                         PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW
333                                         12=0).  IN MOST CASES ADDITIONAL INFORMATION WILL BE  SUPPLIED
334                                         IN THE THE ERROR MESSAGE TO GIVE THE OPERATOR AN INDICATION OF
335                                         THE ERROR.
336
337                                 6.2     ERROR RECOVERY
338
339                                         IF FOR SOME REASON THE  DMC11  SHOULD  'HANG  THE  BUS'  (GAIN
340                                         CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED)
341                                         AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR  TO  REGAIN
342                                         CONTROL  OF  CPU.   IF  THIS  SHOULD HAPPEN;  LOOK IN LOCATION
343                                         'TSTNO' (ADDRESS 1226)FOR THE NUMBER  OF  THE  TEST  THAT  WAS
344                                         RUNNING  AT  THE  TIME OF THE CATASTROPHIC ERROR.  IN THIS WAY
345                                         THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DMC11 WAS  DOING
346                                         AT THE TIME OF THE ERROR.
347
348                                 7.      RESTRICTIONS
349
350                                 7.1     STARTING RESTRICTIONS
351
352                                         SEE SECTION 4.  (PLEASE)
353                                         STATUS TABLE SHOULD BE VERIFIED REGUARDLESS OF HOW PROGRAM WAS
354                                         STARTED.  ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH
355                                         THE  INFORMATION  PRINTED  ON  THE  TTY  TO  COMPLETLY  ISOLATE
356                                         PROBLEMS.
357
```

7.2 OPERATING RESTRICTIONS

THE FIRST TIME A DMC11 DIAGNOSTIC IS LOADED INTO CORE AND RUN THE STATUS TABLE MUST BE SET UP. THIS IS DONE BY MANUAL INPUT (SW00=1) OR BY AUTOSIZING (SW00=0 AND SW07=0). THEREAFTER HOWEVER THE STATUS TABLE NEED NOT BE SETUP BY SUBSEQUENT RESTARTS OR EVEN LOADING THE NEXT DMC DIAGNOSTIC BECAUSE THE STATUS TABLE IS OVERLAYED. THE CURRENT PARAMETERS IN THE STATUS TABLE ARE USED WHEN SW07=1 ON START UP.

7.3 HARDWARE CONFIGURATION RESTRICTIONS

DMC11(M8200)- JUMPER W1 MUST BE IN, AND SWITCH 7 OF E76 MUST BE IN THE OFF POSITION.

KMC(M8204)- JUMPER W1 MUST BE IN.

LINE UNIT(M8201)- JUMPERS W1, W2, AND W4 MUST BE IN. JUMPERS W3, AND W5 MUST BE OUT. SW8 OF E26 MUST BE IN THE ON POSITION.

LINE UNIT (M8202)- JUMPER W1 MUST BE IN. SW8 OF E26 MUST BE IN THE OFF POSITION.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ALL DMC11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS' MESSAGE (PROVIDING NO ERRORS AND SW12=0) WITHIN 4 MINS. THIS IS ASSUMING SW11=1 (DELETE ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION. THE ACTUAL EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION AND THE AMOUNT OF MEMORY IN THE SYSTEM.

8.2 PASS COMPLETE

NOTE: EVERY TIME THE PROGRAM IS STARTED; THE TESTS WILL RUN AS IF SW11 (DELETE ITERATIONS) WAS UP (=1). THIS IS TO 'VERIFY NO HARD ERRORS' AS SOON AS POSSIBLE. THEREFORE THE FIRST PASS -EACH TIME PROGRAM IS STARTED- WILL BE A 'QUICK PASS' UNTIL ALL DMC11'S IN SYSTEM ARE TESTED. WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

END PASS CZDMF CSR: 175000 VEC: 0300 PASSES: 000001
ERRORS: 000000

NOTE: THE PASS COUNT AND ERROR COUNTS ARE CUMMULITIVE FOR EACH DMC11 THAT IS RUNNING, AND ARE SET TO ZERO ONLY WHEN THE DIAGNOSTIC IS STARTED. THEREFORE AFTER AN OVERNIGHT RUN FOR EXAMPLE, THE TOTAL PASSES AND ERRORS FOR EACH DMC11 SINCE THE DIAGNOSTIC WAS STARTED ARE REFLECTED IN PASSES: AND ERRORS:.

8.4 KEY LOCATIONS

RETURN (1214) CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.

NEXT (1216) CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PEFORMED.

TSTNO (1226) CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.

RUN (1316) THE BIT IN 'RUN' ALWAYS POIN . TO THE DMC11 CURRENTLY BEING TESTED. EXAMPLE: (RUN) 1302/0000000001000000 MEANS THAT DMC11 NO.06 IS THE DMC11 NOW RUNNING.

DMCR00-DMCR17
DMST00-DMST17
(1500)-(1640)

THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 16 (DECIMAL) DMC11S SEQUENTIALY. THEY CONTAIN THE CSR,VECTOR AND STATUS CONCERNING THE CONFIGURATION OF EACH DMC11.

DMACTV (1306) EACH BIT SET IN THIS LOCATION INDICATES THAT THE ASSOCIATED DMC11 WILL BE TESTED IN TURN. EXAMPLE: (DMACTV) 1276/0000000000011111 MEANS THAT DMC11 NO. 00,01,02,03,04 WILL BE TESTED. EXAMPLE: (DMACTV) 1276/0000000000010001 MEANS THAT DMC11 NO. 00,04 WILL BE TESTED.

DMCSR (1402) CONTAINS THE CSR OF THE CURRENT DMC11 UNDER TEST.

8.4A 'STATUS TABLE' (1500-1640)

THE TABLE IS FILLED BY AUTO SIZING OR BY THE MANUAL PARAMETER INPUT (QUESTIONS) AS DESCRIBED PREVIOUSLY. ALSO IF DESIRED BY USER; THE LOCATIONS MAY BE ALTERED BY HAND (TOGGLED IN) TO SUIT THE SPECIFIC CONFIGURATION.

THE EXAMPLE STATUS MAP SHOWN BELOW CONTAINS INFORMATION FOR TWO DMC11'S. THE TABLE CAN CONTAIN UP TO 16 DMC11'S. FOLLOWING THE MAP IS A DESCRIPTION OF THE BITS FOR EACH MAP ENTRY

MAP OF DMC11 STATUS

PC	CSR	STAT1	STAT2	STAT3
001500	160010	145310	177777	000000
001510	160020	016320	000000	000000

```
                        EACH MAP ENTRY CONTAINS  4  WORDS  WHICH  CONTAIN  THE  STATUS
                        INFORMATION  FOR  1  DMC11.  THE PC SHOWS WHERE IN CORE MEMORY
                        THE FIRST OF THE 4 WORDS IS.  IN THE EXAMPLE ABOVE  THE  FIRST
                        DMC'S STATUS IS IN LOCATIONS, 1500, 1502, 1504, AND 1506.  THE
                        SECOND DMC STATUS IS LOCATED AT 1510, 1512,  1514,  AND  1516.
                        THE  INFORMATION  CONTAINED IN EACH 4 WORD ENTRY IS DEFINED AS
                        FOLLOWS:

                        CSR:    CONTAINS DMC11 CSR ADDRESS

                        STAT1:  BITS 00-08 IS DMC11 VECTOR ADDRESS
                                BIT15=1 MICRO-PROCESSOR HAS CRAM
                                BIT15=0 MICRO-PROCESSOR HAS CROM
                                BIT14=1 TURNAROUND CONNECTOR IS ON
                                BIT14=0 NO TURNAROUND CONNECTOR
                                BIT13=0 LINE UNIT IS AN M8201
                                BIT13=1 LINE UNIT IS AN M8202
                                BIT12=1 NO LINE UNIT
                                BITS 09-11 IS DMC11 BR PRIORITY LEVEL

                        STAT2:  LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
                                HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)

                        STAT3   BIT0=1 RUN FREE RUNNING TESTS ON KMC11
                                BIT1=0 DMC11-AR (LOW SPEED)
                                BIT1=1 DMC11-AL (HIGH SPEED)
                                BIT2=0  DMC11-DA
                                BIT2=1  DMC11-FA
```

8.5 METHOD OF AUTO SIZING

8.5.1 FINDING THE CONTROL STATUS REGISTER.

THE AUTO-SIZING ROUTINE FINDS A DMC11 AS FOLLOWS: IT STARTS AT ADDRESS 160000 AND TESTS ALL ADDRESS IN INCREMENTS OF 10 UP TO AND INCLUDING ADDRESS 167760. IF THE ADDRESS DOES NOT TIME OUT, THE FOLLOWING IS DONE, THE FIRST CROM ADDRESS IS WRITTEN TO A 125252 THEN IT IS READ BACK. IF IT CONTAINS A -1 OR 125252 OR 626 OR A 16520 A DMC11 HAS BEEN FOUND, IF NOT, THE ADDRESS IS UPDATED BY 10 AND THE SEARCH CONTINUES. A -1 INDICATES A DMC11 WITH NO CROM OR CRAM, A 125252 INDICATES A KMC11 WITH CRAM, A 626 INDICATES A DMC11-AL AND A 16520 INDICATES DMC11-AR. FURTHER TESTS ARE PERFORMED AT THIS POINT TO DETERMINE WHICH LINE UNIT, IF ANY, IS INSTALLED, IF A LOOP-BACK CONNECTOR IS INSTALLED AND VARIOUS SWITCH SETTINGS ON THE LINE UNIT. THIS IS WHY THE STATUS TABLE MUST BE VERIFIED BY THE USER AND IF ANY OF THE INFORMATION DOES NOT AGREE WITH THE HARDWARE THE DIAGNOSTIC MUST BE RESTARTED AND THE QUESTIONS MUST BE ANSWERED. ALL DMC11'S IN THE SYSTEM WILL BE FOUND BY THE AUTO-SIZER. IF IT DOES NOT FIND A DMC11 THE DIAGNOSTIC MUST BE RESTARTED AND THE QUESTIONS ANSWERED.

8.5.2 FINDING THE VECTOR AND BR LEVEL

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '.+2' (NEXT ADDRESS). THE PROCESSOR STATUS IS STARTED AT 7 AND THE DMC IS PROGRAMMED TO INTERRUPT. THE PS IS LOWERED BY 1 UNTIL THE DMC INTERRUPTS, A DELAY IS MADE AND IF NO INTERUPT OCCURES AT PS LEVEL 3 (BECAUSE OF A BAD DMC11) THE PROGRAM ASSUMES VECTOR ADDRESS 300 AT BR LEVEL 5 AND THE PROBLEM SHOULD BE FIXED IN THE DIAGNOSTIC. ONCE THE PROBLEM IS FIXED; THE PROGRAM SHOULD BE RE-SETUP AGAIN TO GET CORRECT VECTOR. IF AN INTERUPT OCCURED; THE ADDRESS TO WHICH THE DMC11 INTERUPTED TO IS PICKED UP AND REPORTED AS THE VECTOR. NOTE: IF THE VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU; THERE IS A PROBLEM AND AUTO SIZING SHOULD NOT BE DONE.

8.6 SOFTWARE SWITCH REGISTER

IF THE DIAGNOSTIC IS RUN ON AN 11/04 OR OTHER CPU WITHOUT A SWITCH REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED TO ALLOW USER THE SAME SWITCH OPTIONS AS DESCRIBED PREVIOUSLY. IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES AND IT CONTAINS ALL ONES (177777) THIS SOFTWARE SWITCH REGISTER IS USED.

CONTROL:

TO OBTAIN CONTROL AT ANY ALLOWABLE TIME DURING EXECUTION OF THE DIAGNOSTIC THE OPERATOR TYPES A CTRL G ON THE CONSOLE TERMINAL KEYBOARD. AS SOON AS THE CTRL G IS RECOGNIZED, BY THE DIAGNOSTIC, THE FOLLOWING MESSAGE WILL BE DISPLAYED:

```
558
559
560                                 SWR=XXXXXX NEW?
561
562                 WHERE XXXXXX IS THE CURRENT CONTENTS OF  THE  SOFTWARE  SWITCH
563                 REGISTER  IN  OCTAL.  THE  SOFTWARE CONTROL ROUTINE WILL THEN
564                 AWAIT OPERATOR ACTION.  AT WHICH TIME THE OPERATOR IS REQUIRED
565                 TO  TYPE  ONE  OR  MORE OF THE LEGAL CHARACTERS:  1) 0 - 7, 2)
566                 LINE FEED(<LF>), 3) CARRIAGE  RETURN(<CR>),  OR  4)  CONTROL-U
567                 (CTRL  U).  NO  CHECK  IS  MADE  FOR  LEGALITY.  IF THE INPUT
568                 CHARACTER IS NOT A <LF>, <CR>, OR CTRL U IT IS ASSUMED  TO  BE
569                 AN OCTAL DIGIT.
570
571                 TO CHANGE THE CONTENTS OF THE SSR THE  OPERATOR  SIMPLY  TYPES
572                 THE  NEW  DESIRED  VALUE  IN OCTAL - LEADING ZEROS NEED NOT BE
573                 TYPED.  AND TERMINATES THE INPUT STRING WITH A  <CR>  OR  <LF>
574                 DEPENDING  ON  THE  PROGRAM ACTION DESIRED AS DESCRIBED BELOW.
575                 THE INPUT VALUE WILL BE TRUNCATED TO THE LAST 6 DIGITS  TYPED.
576                 AT  LEAST  ONE  DIGIT  MUST BE TYPED ON ANY GIVEN INPUT STRING
577                 PRIOR TO THE TERMINATOR BEFORE A CHANGE TO THE SSR WILL OCCUR.
578
579                 WHEN THE INPUT STRING IS TERMINATED WITH A <LR> THE DIAGNOSTIC
580                 WILL  CONTINUE  EXECUTION  FROM  THE  POINT  AT  WHICH  IT WAS
581                 INTERRUPTED.  IF A <CR> IS THE ONLY THING  TYPED  THE  PROGRAM
582                 WILL CONTINUE WITHOUT CHANGING THE SSR.  THE <LF> DIFFERS FROM
583                 THE <CR> BY RESTARTING THE PROGRAM AS IF IT WERE RESTARTED  AT
584                 ADDRESS 200.
585
586                 IF A CTRL U IS TYPED AT ANY POINT IN THE INPUT STRING PRIOR TO
587                 THE  TERMINATOR  THE  INPUT  VALUE WILL BE DISREGARDED AND THE
588                 PROMPT DISPLAYED (SWR = XXXXXX NEW?).
589
590                 TO SET THE SSR FOR  THE  STARTING  SWITCHES,  FIRST  LOAD  THE
591                 DIAGNOSTIC, THEN HIT CTRL G, THEN START THE DIAGNOSTIC.
592
593           9.0   HISTORY
594
595                 THIS DIAGNOSTIC WAS UPDATED TO DETECT FOR THE CONDITION OF V.35
596                 AND M8201.  IN THIS CONIFURATION, RING WILL NOT BE LOOPED BACK
597                 AND SHOULD NOT BE TESTED FOR.
598           $
```

```
  599
  600
```

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                                :       .NLIST
                                ;*CZDMFC0 BTSTUF MD LN UNT TSTS   DMC11 DDCMP LINE UNIT TESTS
                                ;*COPYRIGHT 1976, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                                ;*-------------------------------------------------------------

                                ;STARTING PROCEDURE
                                ; OAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;SWR=0  AUTOSIZE DMC11
                                ;SW07=1  USE CURRENT DMC11 PARAMETERS
                                ;SW00=1  INPUT NEW DMC11 PARAMETERS
                                ;PRESS START
                                ;PROGRAM WILL TYPE "CZDMFC0 BTSTUF MD LN UNT TSTS   DMC11 DDCMP LINE UNIT TESTS"
                                ;PROGRAM WILL TYPE STATUS MAP
                                ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                ;AND THEN RESUME TESTING
                                ;SUBSEQUENT RESTARTS WILL NOT TYPE PROGRAM TITLE



                                ;SWITCH REGISTER OPTIONS
                                ;----------------------

100000                          SW15=100000             ;=1,HALT ON ERROR
040000                          SW14=40000              ;=1,LOOP ON CURRENT TEST
020000                          SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
010000                          SW12=10000              ;-1,DELETE TYPEOUT/BELL ON ERROR.
004000                          SW11=4000               ;=1,INHIBIT ITERATIONS
002000                          SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
001000                          SW09=1000               ;=1,LOOP WITH CURRENT DATA
000400                          SW08=400                ;=1,LOOP ON ERROR
000200                          SW07=200                ;=1,USE CURRENT DMC11 PARAMETERS, =0,AUTOSIZE DMC11
000100                          SW06=100                ;=1, HALT BEFORE CLOCKING MICRO-PROCESSOR INSTRUCTION
000040                          SW05=40
000020                          SW04=20
000010                          SW03=10                 ;RESELECT DMC11'S TO BE TESTED (ACTIVE)
000004                          SW02=4                  ;LOCK ON TEST SELECT
000002                          SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
000001                          SW00=1                  ;INPUT DMC11 PARAMETERS
```

```
                        ;REGISTER DEFINITIONS
                        ;--------------------

000000                  R0=%0           ;GENERAL REGISTER
000001                  R1=%1           ;GENERAL REGISTER
000002                  R2=%2           ;GENERAL REGISTER
000003                  R3=%3           ;GENERAL REGISTER
000004                  R4=%4           ;GENERAL REGISTER
000005                  R5=%5           ;GENERAL REGISTER
000006                  SP=%6           ;PROCESSOR STACK POINTER
000007                  PC=%7           ;PROGRAM COUNTER

                        ;LOCATION EQUIVALENCIES
                        ;----------------------

177776                  PS=177776       ;PROCESSOR STATUS WORD
001200                  STACK=1200      ;START OF PROCESSOR STACK

                        ;INSTRUCTION DEFINITIONS
                        ;-----------------------

005746                  PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
005726                  POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
010046                  PUSHR0=10046    ;SAVE R0 ON STACK
012600                  POPR0=12600     ;RESTORE R0 FROM STACK
024646                  PUSH2SP=24646   ;DECREMENT STACK TWICE
022626                  POP2SP=22626    ;INCREMENT STACK TWICE
                        .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL

                        ;BIT DEFINITIONS
                        ;---------------

100000                  BIT15=100000
040000                  BIT14=40000
020000                  BIT13=20000
010000                  BIT12=10000
004000                  BIT11=4000
002000                  BIT10=2000
001000                  BIT9=1000
000400                  BIT8=400
000200                  BIT7=200
000100                  BIT6=100
000040                  BIT5=40
000020                  BIT4=20
000010                  BIT3-10
000004                  BIT2=4
000002                  BIT1=2
000001                  BIT0-1
```

```
                                ;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
                                ;-----------------------------------------------------------------------
                                        ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                                        ;THE STANDARD "TRAP CATCHER" IS PLACED
                                        ;BETWEEN ADDRESS 0 TO ADDRESS 776.
                                        ;IT LOOKS LIKE "PC+2 HALT".
                                ;-----------------------------------------------------------------------
                                ;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

                        000000  .-0
                                ;STANDARD INTERRUPT VECTORS
                                ;-------------------------

                        000024  .-24
000024  005336                        .PFAIL                  ;POWER FAIL HANDLER
000026  000340                        340                     ;SERVICE AT LEVEL 7
000030  004750                        .HLT                    ;ERROR HANDLER
000032  000340                        340                     ;SERVICE AT LEVEL 7
000034  004716                        .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                        340                     ;SERVICE AT LEVEL 7
                        000040  .=40
000040  000000                        0                       ;SAVE FOR ACT-11 OR XXDP
000042  000000                        0                       ;RETURN ADDRESS IF UNDER ACT-11 OR XXDP
000044  000000                        0                       ;SAVE FOR ACT-11 OR XXDP
000046  003522                        $ENDAD                  ;FOR USE WITH ACT-11 OR XXDP
                        000052  .=52
000052  000000                        0                       ;ACT-11 PROGRAM CHARACTERISTICS

                        000174  .=174
000174  000000                DISPREG:0                        ;SOFTWARE DISPLAY REGISTER
000176  000000                SWREG:  0                        ;SOFTWARE SWITCH REGISTER

                        000200  .=200
000200  000137  002002                  JMP     .START         ;GO TO START OF PROGRAM

                        001000  .=1000
001000  005377  055103  046504 MTITLE: .ASCII  <377><12>/CZDMFC0 BTSTUF MD LN UNT TSTS/<377>
(2)     001040  046504  030503  020061        .ASCIZ  /DMC11 DDCMP LINE UNIT TESTS/<377>
(2)
                        001200  .=1200

                                ;INDIRECT POINTERS TO SWITCH REGISTER AND LIGHT DISPLAY
                                ;-----------------------------------------------------

001200  177570                DISPLAY:177570
001202  177570                SWR:    177570
```

```
                                ;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
                                ;--------------------------------------------------

001204  177560                  TKCSR:  177560          ;TELETYPE KEYBOARD CONTROL REGISTER
001206  177562                  TKDBR:  177562          ;TELETYPE KEYBOARD DATA BUFFER
001210  177564                  TPCSR:  177564          ;TELEPRINTER CONTROL REGISTER
001212  177566                  TPDBR:  177566          ;TELEPRINTER DATA BUFFER

                                ;PROGRAM CONTROL PARAMETERS
                                ;--------------------------

001214  000000                  RETURN: 0               ;SCOPE ADDRESS FOR LOOP ON TEST
001216  000000                  NEXT:   0               ;ADDRESS OF NEXT TEST TO BE EXECUTED
001220  000000                  LOCK:   0               ;ADDRESS FOR LOCK ON CURRENT DATA
001222  000003                  ICOUNT: 3               ;NUMBER OF ITERATIONS THAT CUPRENT TEST WILL BE EXECUTED
001224  000000                  LPCNT:  0               ;NUMBER OF ITEREATIONS COMPLETED
001226  000000                  TSTNO:  0               ;NUMBER OF TEST IN PROGRESS
001230  000000                  PASCNT: 0               ;NUMBER OF PASSES COMPLETED
001232  000000                  ERRCNT: 0               ;TOTAL NUMBER OF ERRORS
001234  000000                  LSTERR: 0               ;PC OF LAST ERROR CALL

                                ;PROGRAM VARIABLES
                                ;-----------------

001236  000000                  STRTSW: 0               ;SWITCHES AT START OF PROGRAM
001240  000000                  STAT:   0               ;DM STATUS WORD STORAGE
001242  000000                  CLKX:   0
001244  000000                  MASKX:  0
001246  000000                  TEMP1:  0               ;TEMPORARY STORAGE
001250  000000                  TEMP2:  0               ;TEMPORARY STORAGE
001252  000000                  TEMP3:  0               ;TEMPORARY STORAGE
001254  000000                  TEMP4:  0               ;TEMPORARY STORAGE
001256  000000                  TEMP5:  0               ;TEMPORARY STORAGE
001260  000000                  SAVR0:  0               ;R0 STORAGE
001262  000000                  SAVR1:  0               ;R1 STORAGE
001264  000000                  SAVR2:  0               ;R2 STORAGE
001266  000000                  SAVR3:  0               ;R3 STORAGE
001270  000000                  SAVR4:  0               ;R4 STORAGE
001272  000000                  SAVR5:  0               ;R5 STORAGE
001274  000000                  SAVSP:  0               ;STACK POINTER STORAGE
001276  000000                  SAVPC:  0               ;PROGRAM COUNTER STORAGE
001300  000000                  ZERO:   0
001302  000001                  ONE:    1
001304  000000                  MEMLIM: 0               ;HIGHEST LOCATION FOR NPR'S
001306  000001                  DMACTV: .BLKW 1         ;DMC11'S SELECTED ACTIVE.
001310  000001                  DMNUM:  .BLKW 1         ;OCTAL NUMBER OF DMC11'S.
001312  000001                  SAVACT: .BLKW 1         ;ORIGINAL ACTV  DEVICES
001314  000001                  SAVNUM: .BLKW 1         ;WORKABLE NUMBER
001316  000000                  RUN:    0               ;POINTER TO RUNNING DEVICE.
                                .EVEN
001320  001472                  CREAM:  DM.MAP-6        ;TABLE POINTER.
001322  001676                  MILK:   CNT.MAP-4       ;TABLE POINTER
```

```
                                ;PROGRAM CONTROL FLAGS
                                ;---------------------

001324  000                   INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
001325  000                   ERRFLG: .BYTE   0               ;ERROR OCCURED FLAG
001326  000                   LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG
001327  000                   QV.FLG: .BYTE   0               ;QUICK VERIFY FLAG.
                                                              ;ON FIRST PASS OF EACH DMC11 ITERATIONS WILL BE SUPPRESS

                                .EVEN

                                        ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                                        ;POINTERS TO SUBROUTINES CAN BE FOUND
                                        ;IN THE TABLE IMMEDIATLY FOLLOWING THE DEFINITIONS

                                ;;**********************************************************************
                                ;----------------------------------------------------------------------
001330                          .TRPTAB:
        104400                  SCOPE=TRAP+0            ;CALL TO SCOPE LOOP AND ITERATION HANDLER
001330  003576                          .SCOPE
        104401                  SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
001332  003736                          .SCOP1
        104402                  TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
001334  003766                          .TYPE
        104403                  INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
001336  004050                          .INSTR
        104404                  INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
001340  004154                          .INSTER
        104405                  PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
001342  004174                          .PARAM
        104406                  SAV05=TRAP+6            ;CALL TO REGISTER SAVE ROUTINE
001344  004374                          .SAV05
        104407                  RES05=TRAP+7            ;CALL TO REGISTER RESTORE ROUTINE
001346  004434                          .RES05
        104410                  CONVRT=TRAP+10          ;CALL TO DATA OUTPUT ROUTINE
001350  004466                          .CONVRT
        104411                  CNVRT=TRAP+11           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
001352  004472                          .CNVRT
        104412                  MSTCLR=TRAP+12          ;CALL TO ISUE A MASTER CLEAR
001354  005466                          .MSTCLR
        104413                  DELAY=TRAP+13           ;CALL TO DELAY
001356  005436                          .DELAY
        104414                  ROMCLK=TRAP+14          ;CALL TO CLOCK ROM ONCE
001360  005504                          .ROMCLK
        104415                  DATACLK=TRAP+15         ;CALL TO CLK DATA
001362  005552                          .DATACLK
        104416                  TIMER=TRAP+16           ;CALL TO DELAY A CLOCK TICK
001364  005616                          .TIMER

                                ;----------------------------------------------------------------------
                                ;;**********************************************************************
```

```
                                ;DMC11 CONTROL INDICATORS FOR CURRENT DMC11 UNDER TEST
                                ;----------------------------------------------------

001366  000000                  STAT1:  0
001370  000000                  STAT2:  0
001372  000000                  STAT3:  0

                                ;DMC11 VECTOR AND REGISTER INDIRECT POINTERS
                                ;-------------------------------------------

001374  000000                  DMRVEC: 0               ;POINTER TO DMC11 RECEIVER INTERRUPT VECTOR
001376  000000                  DMRLVL: 0               ;POINTER TO DMC11 RECEIVER INTERRUPT SERVICE PS
001400  000000                  DMTVEC: 0               ;POINTER TO DMC11 TRANSMITTER INTERRUPT VECTOR
001402  000000                  DMTLVL: 0               ;POINTER TO DMC11 TRANSMITTER INTERRUPT SERVICE PS
001404  000000                  DMCSR:  0               ;POINTER TO DMC11 CONTROL STATUS REGISTER
001406  000000                  DMCSRH: 0               ;POINTER TO DMC11 CONTROL STATUS REGISTER HIGH BYTE.
001410  000000                  DMCTL:  0               ;POINTER TO DMC11 CONTOL OUT REGISTER
001412  000000                  DMP04:  0               ;POINTER TO DMC11 PORT REGISTER(SEL 4)
001414  000000                  DMP06:  0               ;POINTER TO DMC11 PORT REGISTER(SEL 6)

                                ;TEMP STORAGE
                                ;------------

001416  000000                  TEMP:   0
        001460                  .=.+40

                                ;DMC11 STATUS TABLE AND ADDRESS ASSIGNMENTS
                                ;------------------------------------------

        001500                  .=1500
001500                          DM.MAP:
001500  000001                  DMCR00: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 00
001502  000001                  DMS100: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 00
001504  000001                  DMS200: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 00
001506  000001                  DMS300: .BLKW   1               ;3RD STATUS WORD

001510  000001                  DMCR01: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 01
001512  000001                  DMS101: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 01
001514  000001                  DMS201: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 01
001516  000001                  DMS301: .BLKW   1               ;3RD STATUS WORD

001520  000001                  DMCR02: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 02
001522  000001                  DMS102: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 02
001524  000001                  DMS202: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 02
001526  000001                  DMS302: .BLKW   1               ;3RD STATUS WORD

001530  000001                  DMCR03: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 03
001532  000001                  DMS103: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 03
001534  000001                  DMS203: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 03
001536  000001                  DMS303: .BLKW   1               ;3RD STATUS WORD

001540  000001                  DMCR04: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 04
001542  000001                  DMS104: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 04
001544  000001                  DMS204: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 04
001546  000001                  DMS304: .BLKW   1               ;3RD STATUS WORD
```

```
  905  001550  000001          DMCR05: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 05
  906  001552  000001          DMS105: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 05
  907  001554  000001          DMS205: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 05
  908  001556  000001          DMS305: .BLKW   1               ;3RD STATUS WORD
  909
  910  001560  000001          DMCR06: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 06
  911  001562  000001          DMS106: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 06
  912  001564  000001          DMS206: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 06
  913  001566  000001          DMS306: .BLKW   1               ;3RD STATUS WORD
  914
  915  001570  000001          DMCR07: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 07
  916  001572  000001          DMS107: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 07
  917  001574  000001          DMS207: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 07
  918  001576  000001          DMS307: .BLKW   1               ;3RD STATUS WORD
  919
  920  001600  000001          DMCR10: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 10
  921  001602  000001          DMS110: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 10
  922  001604  000001          DMS210: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 10
  923  001606  000001          DMS310: .BLKW   1               ;3RD STATUS WORD
  924
  925  001610  000001          DMCR11: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 11
  926  001612  000001          DMS111: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 11
  927  001614  000001          DMS211: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 11
  928  001616  000001          DMS311: .BLKW   1               ;3RD STATUS WORD
  929
  930  001620  000001          DMCR12: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 12
  931  001622  000001          DMS112: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 12
  932  001624  000001          DMS212: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 12
  933  001626  000001          DMS312: .BLKW   1               ;3RD STATUS WORD
  934
  935  001630  000001          DMCR13: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 13
  936  001632  000001          DMS113: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 13
  937  001634  000001          DMS213: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 13
  938  001636  000001          DMS313: .BLKW   1               ;3RD STATUS WORD
  939
  940  001640  000001          DMCR14: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 14
  941  001642  000001          DMS114: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 14
  942  001644  000001          DMS214: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 14
  943  001646  000001          DMS314: .BLKW   1               ;3RD STATUS WORD
  944
  945  001650  000001          DMCR15: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 15
  946  001652  000001          DMS115: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 15
  947  001654  000001          DMS215: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 15
  948  001656  000001          DMS315: .BLKW   1               ;3RD STATUS WORD
  949
  950  001660  000001          DMCR16: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 16
  951  001662  000001          DMS116: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 16
  952  001664  000001          DMS216: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 16
  953  001666  000001          DMS316: .BLKW   1               ;3RD STATUS WORD
  954
  955  001670  000001          DMCR17: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 17
  956  001672  000001          DMS117: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 17
  957  001674  000001          DMS217: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 17
  958  001676  000001          DMS317: .BLKW   1               ;3RD STATUS WORD
  959
  960  001700  000000          DM.END: 000000
```

```
                                ;DMC11 PASS COUNT AND ERROR COUNT TABLE
                                ;--------------------------------------

001702                          CNT.MAP:
001702  000000                  PACT00: 0               ;PASS COUNT FOR DMC11 NUMBER 00
001704  000000                  ERCT00: 0               ;ERROR COUNT FOR DMC11 NUMBER 00

001706  000000                  PACT01: 0               ;PASS COUNT FOR DMC11 NUMBER 01
001710  000000                  EPCT01: 0               ;ERROR COUNT FOR DMC11 NUMBER 01

001712  000000                  PACT02: 0               ;PASS COUNT FOR DMC11 NUMBER 02
001714  000000                  ERCT02: 0               ;ERROR COUNT FOR DMC11 NUMBER 02

001716  000000                  PACT03: 0               ;PASS COUNT FOR DMC11 NUMBER 03
001720  000000                  ERCT03: 0               ;ERROR COUNT FOR DMC11 NUMBER 03

001722  000000                  PACT04: 0               ;PASS COUNT FOR DMC11 NUMBER 04
001724  000000                  FRCT04: 0               ;ERROR COUNT FOR DMC11 NUMBER 04

001726  000000                  PACT05: 0               ;PASS COUN, FOR DMC11 NUMBER 05
001730  000000                  ERCT05: 0               ;ERROR COLNT FOR DMC11 NUMBER 05

001732  000000                  PACT06: 0               ;PASS COUNT FOR DMC11 NUMBER 06
001734  000000                  ERCT06: 0               ;ERROR COUNT FOR DMC11 NUMBER 06

001736  000000                  PACT07: 0               ;PASS COUNT FOR DMC11 NUMBER 07
001740  000000                  ERCT07: 0               ;ERROR COUNT FOR DMC11 NUMBER 07

001742  000000                  PACT10: 0               ;PASS COUNT FOR DMC11 NUMBER 10
001744  000000                  ERCT10: 0               ;ERROR COUNT FOR DMC11 NUMBER 10

001746  000000                  PACT11: 0               ;PASS COUNT FOR DMC11 NUMBER 11
001750  000000                  ERCT11: 0               ;ERROR COUNT FOR DMC11 NUMBER 11

001752  000000                  PACT12: 0               ;PASS COUNT FOR DMC11 NUMBER 12
001754  000000                  ERCT12: 0               ;ERROR COUNT FOR DMC11 NUMBER 12

001756  000000                  PACT13: 0               ;PASS COUNT FOR DMC11 NUMBER 13
001760  000000                  ERCT13: 0               ;ERROR COUNT FOR DMC11 NUMBER 13

001762  000000                  PACT14: 0               ;PASS COUNT FOR DMC11 NUMBER 14
001764  000000                  ERCT14: 0               ;ERROR COUNT FOR DMC11 NUMBER 14

001766  000000                  PACT15: 0               ;PASS COUNT FOR DMC11 NUMBER 15
001770  000000                  ERCT15: 0               ;ERROR COUNT FOR DMC11 NUMBER 15

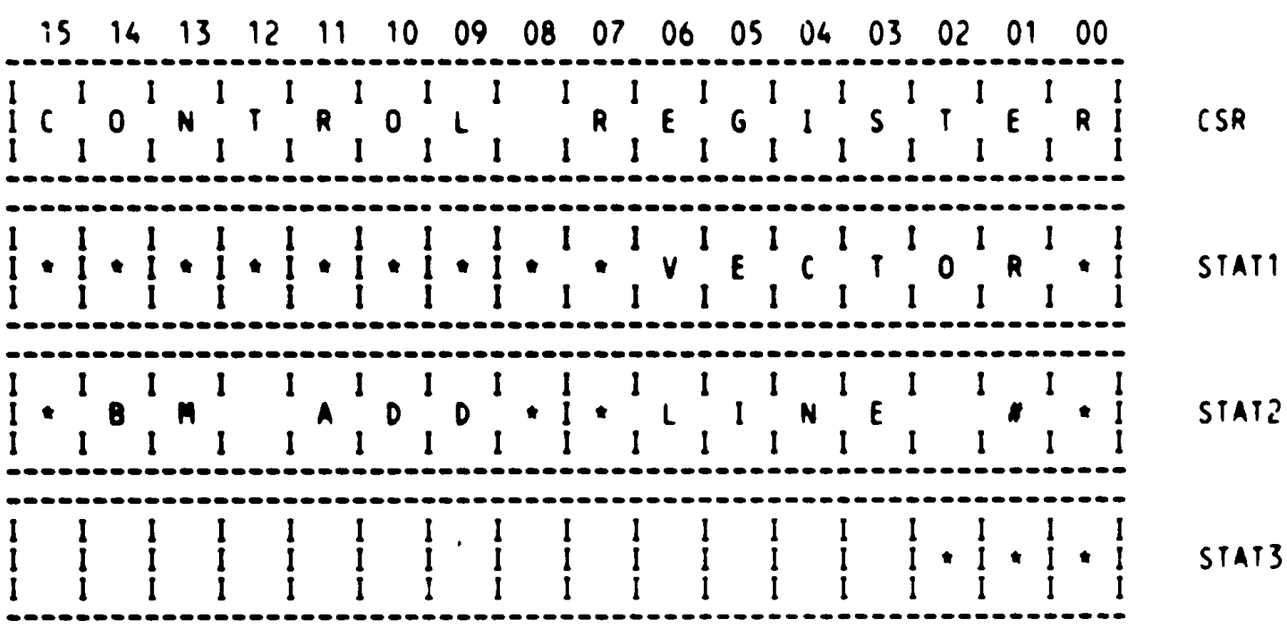
001772  000000                  PACT16: 0               ;PASS COUNT FOR DMC11 NUMBER 16
001774  000000                  ERCT16: 0               ;ERROR COUNT FOR DMC11 NUMBER 16

001776  000000                  PACT17: 0               ;PASS COUNT FOR DMC11 NUMBER 17
002000  000000                  ERCT17: 0               ;ERROR COUNT FOR DMC11 NUMBER 17
```

0010

1014

FORMAT OF STATUS TABLE



DEFINITION OF FORMAT

CSR: CONTAINS DMC11 CSR ADDRESS

STAT1: BITS 00-08 IS DMC11 VECTOR ADDRESS
BIT15=1 MICRO-PROCESSOR HAS CRAM
BIT15=0 MICRO-PROCESSOR HAS CROM
BIT14=1 ???? TURNAROUND CONNECTOR IS ON
BIT14=0 NO TURNAROUND CONNECTOR
BIT13=0 LINE UNIT IS AN M8201
BIT13=1 LINE UNIT IS AN M8202
BIT12=1 NO LINE UNIT
BITS 09-11 IS DMC11 BR PRIORITY LEVEL

STAT2: LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)

STAT3: BIT0=1 DO FREE RUNNING TESTS ON KMC
(MUST BE SET TO A ONE MANUALLY [PROGRAM DZDMI ONLY])
KMC MUST HAVE MICRO-CODE WRITTEN FROM RUNNING
DZDMG TEST 2 FIRST
BIT1=1 DMC11-AL LOCAL HIGH SPEED MICRO-CODE
BIT1=0 DMC11-AR REMOTE LOW SPEED MICRO-CODE
BIT2=0 DMC11-DA (RS232C)
BIT2=1 DMC11-FA (V.35)

0011

```
        $
```

```
1071
1072                                        ;PROGRAM INITIALIZATION
1073                                        ;LOCK OUT INTERRUPTS
1074                                        ;SET UP PROCESSOR STACK
1075                                        ;SET UP POWER FAIL VECTOR
1076                                        ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
1077                                        ;TYPE TITLE MESSAGE
1078
1079  002002  012737  000340  177776  .START: MOV     #340,PS         ;LOCK OUT INTERRUPTS
1080  002010  012706  001200                 MOV     #STACK,SP       ;SET UP STACK
1081  002014  012737  005336  000024         MOV     #.PFAIL,@#24    ;SET UP POWER FAIL VECTOR
1082  002022  013737  001310  001314         MOV     DMNUM,SAVNUM    ;SAVE NUMBER OF DEVICES IN SYSTEM.
1083  002030  005037  010144                 CLR     SWFLG           ;CLEAR SOFT TYPEOUT FLAG
1084  002034  105037  001325                 CLRB    ERRFLG          ;CLEAR ERROR FLAG
1085  002040  105037  001327                 CLRB    QV.FLG          ;ZERO QUICK VERIFY FLAG
1086  002044  012737  001470  001320         MOV     #DM.MAP-10,CREAM;GET MAP POINTER.
1087  002052  012737  001676  001322         MOV     #CNT.MAP-4,MILK ;GET PASS COUNT MAP POINTER
1088  002060  012737  100000  001316         MOV     #BIT15,RUN      ;POINT POINTER TO FIRST DEVICE.
1089  002066  012700  001702                 MOV     #CNT.MAP,R0     ;PASS COUNT POINTER TO R0
1090  002072  005020                 23$:    CLR     (R0)+           ;CLEAR TABLE
1091  002074  022700  002002                 CMP     #CNT.MAP+100,R0 ;DONE YET?
1092  002100  001374                         BNE     23$             ;KEEP GOING
1093  002102  005037  001234                 CLR     LSTERR          ;CLEAR LAST ERROR POINTER
1094  002106  012737  000001  001226         MOV     #1,TSTNO        ;SET UP FOR TEST 1
1095  002114  012737  002002  001214         MOV     #.START,RETURN  ;SET UP FOR POWER FAIL BEFORF
1096                                                                 ;TESTING STARTS
1097  002122  013746  000006                 MOV     @#6,-(SP)       ;SAVE CURRENT VECTORS
1098  002126  013746  000004                 MOV     @#4,-(SP)       ;
1099  002132  012737  002166  000004         MOV     #6$,@#4         ;SET UP FOR TIMEOUT
1100  002140  012737  177570  001202         MOV     #177570,SWR     ;SET SWR TO HARD SWR ADDRESS
1101  002146  012737  177570  001200         MOV     #177570,DISPLAY ;SET DISPLAY TO HARD SWR ADDRESS
1102  002154  022777  177777  177020         CMP     #-1,@SWR        ;REFERENCE HARDWARE SWITCH REGISTER
1103  002162  001402                         BEQ     6$+2            ;IF = -1 USE SOFT SWR ANYWAY
1104  002164  000407                         BR      7$              ;IF IT EXISTS AND NOT = -1 USE HARD SWR
1105  002166  022626                 6$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1106  002170  012737  000176  001202         MOV     #SWREG,SWR      ;POINTER TO SOFT SWR
1107  002176  012737  000174  001200         MOV     #DISPREG,DISPLAY;POINTER TO SOFT DISPLAY REG
1108  002204  012637  000004         7$:     MOV     (SP)+,@#4       ;RESTORE VECTORS
1109  002210  012637  000006                 MOV     (SP)+,@#6       ;
1110  002214  105737  001324                 TSTB    INIFLG          ;HAS INITIALIZATION BEEN PERFORMED
1111  002220  001006                         BNE     20$             ;BR IF YES
1112  002222  022737  003522  000042         CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, DON'T TYPE ID
1113  002230  001402                         BEQ     20$
1114  002232  104402  001000                 TYPE    ,MTITLE         ;TYPE TITLE MESSAGE
1115  002236  004737  007734         20$:    JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
1116  002242  017737  176734  001236         MOV     @SWR,STRTSW     ;STORE STARTING SWITCHES
1117  002250  005737  000042                 TST     @#42            ;IS IT RUNNING IN AUTO MODE?
1118  002254  001402                         BEQ     .+6             ;BR IF NO
1119  002256  005037  001236                 CLR     STRTSW          ;IF YES, CLEAR SWITCHES
1120  002262  032737  000001  001236         BIT     #SW00,STRTSW    ;IF SW00=1, QUESTIONS ARE ASKED.
1121  002270  001012                         BNE     17$             ;BR IF SW00=1
1122  002272  105737  001236                 TSTB    STRTSW          ;BIT7=1??
1123  002276  100007                         BPL     17$             ;BR IF SW07=0
1124  002300  005737  001306                 TST     DMACTV          ;ARE ANY DEVICES SELECTED?
1125  002304  001006                         BNE     16$             ;BR IF YES
1126  002306  104402  007155                 TYPE,   NOACT           ;NO DEVICES SELECTED.
```

0013

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                                                HALT                    ;STOP THE SHOW
                                                BR      .-2             ;DISQUALIFY CONTINUE SWITCH
                                        17$:    JSR     PC,AUTO.SIZE    ;GO DO THE AUTO SIZE
                                        16$:    TSTB    INIFLG          ;FIRST TIME?
                                                BEQ     21$             ;BR IF YES
                                                TSTB    STRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
                                                BMI     1$
                                                BIT     #BIT1!BIT2,STRTSW;IS TEST NO. OR LOCK SELECTED
                                                BEQ     24$             ;IF NO THEN TYPE STATUS
                                                BR      1$              ;IF YES DO NOT TYPE STATUS
                                        21$:    COM     INIFLG          ;SET FLAG
                                        24$:    TYPE    ,XHEAD          ;TYPE HEADER
                                                MOV     #DM.MAP,R4      ;SET POINTER
                                        5$:     MOV     R4,TEMP1        ;SET ADDRESS
                                                MOV     (R4)+,TEMP2     ;SET CSR
                                                BEQ     1$              ;ALL DONE IF ZERO
                                                MOV     (R4)+,TEMP3     ;SET STAT1
                                                MOV     (R4)+,TEMP4     ;SET STAT2
                                                MOV     (R4)+,TEMP5     ;SET STAT3
                                                CONVRT                  ;TYPE OUT STATUS MAP
                                                XSTATQ                  ;
                                                BR      5$
                                        1$:     MOV     #DM.MAP,R0      ;R0 POINTS TO STATUS TABLE

                                        ;;**************************************************************************
                                        ;;*AUTO SIZE TEST
                                        ;;*THIS TEST VERIFYS THAT THE DMC11S AND/OR KMC11S ARE AT THE CORRECT FLOATING
                                        ;;*ADDRESSES FOR YOUR SYSTEM. IF THIS TEST FAILS, IT IS NOT A HARDWARE ERROR.
                                        ;;*CHECK THE ADDRESSES OF ALL FLOATING DEVICES (DJ,DH,DQ,DU,DUP,LK,DMC,DZ,KMC).
                                        ;;*IF THERE ARE NO OTHER FLOATING DEVICES BEFORE THE DMC11, THE FIRST
                                        ;;*DMC11 ADDRESS IS 760070, KMC11 IS 760110. NO DEVICE SHOULD EVER BE AT
                                        ;;*ADDRESS 760000. THIS TEST MAY REQUIRE 2 OR MORE ATTEMPTS TO GET THE
                                        ;;*RIGHT ADDRESSES. AFTER YOU HAVE CHANGED THE ADDRESS TO WHAT IT TOLD
                                        ;;*YOU THE FIRST TIME, IT MAY COME BACK AND TELL YOU A DIFFERENT ADDRESS
                                        ;;*THE NEXT TIME YOU RUN IT. PLEASE HAVE PATIENCE, THE FINAL ADDRESS
                                        ;;*WILL BE CORRECT (AS LONG AS ALL DEVICES IN FRONT OF THE DMC'S ARE
                                        ;;*CORRECT).
                                        ;;**************************************************************************

002424  013746  000004                  MOV     @#4,-(SP)       ;SAVE LOC 4
002430  013746  000006                  MOV     @#6,-(SP)       ;SAVE LOC 6
002434  005037  000006                  CLR     @#6             ;CLEAR VEC+2
002440  005037  001252                  CLR     TEMP3           ;CLEAR FLAG
002444  005005                          CLR     R5              ;R5=0=DMC, R5=-1=KMC
002446  011037  001404          AUSTRT: MOV     (R0),DMCSR      ;GET NEXT DMC CSR
002452  001564                          BEQ     AUDONE          ;BR IF DONE
002454  005705                          TST     R5              ;DMC OR KMC?
002456  001005                          BNE     1$              ;BR IF KMC
002460  032760  100000  000002          BIT     #BIT15,2(R0)    ;CHECK FOR DMC CSR
002466  001061                          BNE     SKIP            ;SKIP IF NOT DMC
002470  000404                          BR      2$              ;ITS A DMC SO CONTINUE
002472  032760  100000  000002  1$      BIT     #BIT15,2(R0)    ;CHECK FOR KMC CSR
002500  001454                          BEQ     SKIP            ;SKIP IF NOT KMC
002502  012737  002674  000004  2$      MOV     #NODEV,@#4      ;SET UP FOR TIMEOUT
002510  005705                          TST     R5              ;DMC OR KMC?
002512  001003                          BNE     3$              ;BR IF KMC
```

```
1183  002514  012703  000006            MOV     #6,R3           ;R3 IS COUNT OF DEVICES BEFORE DMC
1184  002520  000402                    BR      4$              ;GO ON
1185  002522  012703  000010    3$:     MOV     #10,R3          ;R3 IS COUNT OF DEVICES BEFORE KMC
1186  002526  012702  003010    4$:     MOV     #DEVTAB,R2      ;R2 IS DEVICE TABLE PONTER
1187  002532  012701  160010            MOV     #160010,R1      ;START WITH ADDRESS 160010
1188  002536  005711            FLOAT:  TST     (R1)            ;CHECK ADDRESS IN R1
1189  002540  111204                    MOVB    (R2),R4         ;IF NO TIMEOUT, GET NEXT ADDRESS
1190  002542  060401                    ADD     R4,R1           ;IN R1
1191  002544  005201                    INC     R1              ;
1192  002546  040401                    BIC     R4,R1           ;
1193  002550  005703                    TST     R3              ;ANY MORE DEVICES TO CHECK FOR?
1194  002552  001371                    BNE     FLOAT           ;BR IF YES
1195  002554  012737  002700  000004    MOV     #ERR,@#4        ;OK ONLY DMC'S ARE LEFT, SET UP FOR TIMEOUT
1196  002562  010137  003022            MOV     R1,XLOC         ;SAVE FIRST DMC/KMC ADDRESS
1197  002566  005705            FY:     TST     R5              ;DMC OR KMC?
1198  002570  001005                    BNE     1$              ;BR IF KMC
1199  002572  032760  100000  000002    BIT     #BIT15,2(R0)    ;CHECK FOR DMC CSR
1200  002600  001014                    BNE     SKIP            ;SKIP IF NOT DMC
1201  002602  000404                    BR      2$              ;ITS A DMC SO CONTINUE
1202  002604  032760  100000  000002  1$:     BIT     #BIT15,2(R0)    ;CHECK FOR KMC CSR
1203  002612  001407                    BEQ     SKIP            ;SKIP IF NOT KMC
1204  002614  005711            2$:     TST     (R1)            ;CHECK DMC ADDRESS
1205  002616  020137  001404            CMP     R1,DMCSR        ;DOES IT MATCH
1206  002622  001411                    BEQ     OK              ;BR IF YES
1207  002624  062701  000010            ADD     #10,R1          ;GET NEXT DMC ADDRESS
1208  002630  000756                    BR      FY              ;DO IT AGAIN
1209  002632  062700  000010    SKIP:   ADD     #10,R0          ;SKIP TO NEXT CSR IN TABLE
1210  002636  011037  001404            MOV     (R0),DMCSR      ;GET NEXT CSR
1211  002642  001470                    BEQ     AUDONE          ;BR IF DONE
1212  002644  000750                    BR      FY              ;ELSE CONTINUE
1213  002646  062700  000010    OK:     ADD     #10,R0          ;SKIP TO NEXT DMC CSR
1214  002652  062737  000010  003022    ADD     #10,XLOC        ;UPDATE EXPECTED DMC/KMC ADDRESS
1215  002660  011037  001404            MOV     (R0),DMCSR      ;GET NEXT DMC/KMC CSR
1216  002664  001457                    BEQ     AUDONE          ;BR IF DONE
1217  002666  013701  003022            MOV     XLOC,R1         ;GET EXPECTED DMC/KMC ADDRESS
1218  002672  000735                    BR      FY              ;CONTINUE
1219  002674  122243            NODEV:  CMPB    (R2)+,-(R3)     ;ON TIMEOUT, INC R2, DEC R3
1220  002676  000002                    RTI                     ;RETURN
1221  002700  005737  001252    ERR:    TST     TEMP3           ;CHECK FLAG IF = 0 TYPE HEADER
1222  002704  001014                    BNE     1$              ;SKIP HEADER
1223  002706  104402                    TYPE                    ;TYPEOUT HEADER MESSAGE
1224  002710  007224                    CONERR                  ;CONFIGURATION ERROR!!!!
1225  002712  012737  002700  001276    MOV     #ERR,SAVPC      ;SAVE PC FOR TYPEOUT
1226  002720  104411                    CNVRT                   ;TYPE OUT ERROR PC
1227  002722  002770                    ERRPC                   ;
1228  002724  104402                    TYPE                    ;TYPE REST OF HEADER
1229  002726  007300                    CNERR                   ;
1230  002730  012737  177777  001252    MOV     #-1,TEMP3       ;SET FLAG SO IT ONLY GETS TYPED ONCE
1231  002736  010137  001262    1$:     MOV     R1,SAVR1        ;SAVE R1 FOR TYPEOUT
1232  002742  104410                    CONVRT
1233  002744  002776                    CONTAB                  ;TYPE CSR VALUES
1234  002746  005705                    TST     R5              ;DMC OR KMC ?
1235  002750  001003                    BNE     3$              ;BR IF KMC
1236  002752  104402                    TYPE
1237  002754  007321                    DMCM
1238  002756  000402                    BR      4$              ;CONTINUE
```

```
1239  002760  104402                  3$:     TYPE
1240  002762  007331                          KMCM
1241  002764  022626                  4$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1242  002766  000727                          BR      OK              ;BR TO GET OUT
1243  002770  000001                  ERRPC:  1
1244  002772     006      002                 .BYTE   6,2
1245  002774  001276                          SAVPC
1246  002776  000002                  CONTAB: 2
1247  003000     006      004                 .BYTE   6,4
1248  003002  003022                          XLOC
1249  003004     006      002                 .BYTE   6,2
1250  003006  001404                          DMCSR
1251  003010     007                  DEVTAB: .BYTE   7               ;DJ
1252  003011     017                          .BYTE   17              ;DH
1253  003012     007                          .BYTE   7               ;DQ
1254  003013     007                          .BYTE   7               ;DU
1255  003014     007                          .BYTE   7               ;DUP
1256  003015     007                          .BYTE   7               ;LK
1257  003016     007                          .BYTE   7               ;DMC
1258  003017     007                          .BYTE   7               ;DZ
1259  003020     007                          .BYTE   7               ;KMC
1260        003022                    .EVEN
1261  003022  000000                  XLOC:   0
1262  003024  005705                  AUDONE: TST     R5              ;DMC?
1263  003026  001005                          BNE     1$              ;BR IF KMC AND ALL DONE
1264  003030  012705  177777                  MOV     #-1,R5          ;SET R5 TO -1 (KMC)
1265  003034  012700  001500                  MOV     #DM.MAP,R0      ;RESET R0 TO START OF TABLE
1266  003040  000602                          BR      AUSTRT          ;GO DO KMC'S
1267  003042  012637  000006          1$:     MOV     (SP)+,@#6       ;RESTORE LOC 6
1268  003046  012637  000004                  MOV     (SP)+,@#4       ;RESTORE LOC 4
1269  003052  032737  000010  001236          BIT     #SW03,STRTSW    ;SELECT SPECIFIC DEVICES??
1270  003060  001422                          BEQ     3$              ;BR IF
1271  003062  104402  006145                  TYPE    ,MNEW           ;TYPE THE MESSAGE.
1272  003066  005000                          CLR     R0              ;ZERO DATA LIGHTS
1273  003070  000000                          HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
1274  003072  027737  176104  001312          CMP     @SWR,SAVACT     ;IS THE NUMBER VALID?
1275  003100  101404                          BLOS    2$              ;BR IF NUMBER IS OK.
1276  003102  104402  006006                  TYPE    ,MERR3          ;TELL USER OF INVALID NUMBER.
1277  003106  000000                          HALT                    ;STOP EVERY THING.
1278  003110  000776                          BR      .-2             ;RESTART THE PROGRAM AGAIN.
1279  003112  017737  176064  001306  2$:     MOV     @SWR,DMACTV     ;GET NEW DEVICE PATTERN
1280  003120  013700  001306                  MOV     DMACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
1281  003124  000000                          HALT                    ;CONTINUE DYNAMIC SWITCHES.
1282  003126  012700  000300          3$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
1283  003132  012701  000302                  MOV     #302,R1         ;VECTOR AREA. 300-776
1284  003136  010120                  4$:     MOV     R1,(R0)+        ;START PUTTING "PC+2 - HALT"
1285  003140  005021                          CLR     (R1)+           ;IN VECTOR AREA.
1286  003142  022021                          CMP     (R0)+,(R1)+     ;POP POINTERS
1287  003144  022700  001000                  CMP     #1000,R0        ;ALL DONE??
1288  003150  001372                          BNE     4$              ;BR IF NO.
1289
1290                                    ;TEST START AND RESTART
1291                                    ;----------------------
1292
1293  003152  012706  001200          .BEGIN: MOV     #STACK,SP       ;SET UP STACK
1294  003156  013746  000006                  MOV     @#6,-(SP)       ;SAVE LOC 6
```

```
1295  003162  013746  000004                    MOV     @#4,-(SP)       ;SAVE LOC 4
1296  003166  005000                            CLR     R0              ;START AT 0
1297  003170  012737  003234  000004            MOV     #2$,@#4         ;SET UP FOR TIME OUT
1298  003176  005037  000006                    CLR     @#6             ;TO AUTOSIZE MEMORY
1299  003202  005720                    6$:     TST     (R0)+           ;CHECK ADDRESS IN R0
1300  003204  022700  157776                    CMP     #157776,R0      ;IS IT AT LEAST 28K
1301  003210  001374                            BNE     6$              ;BR IF NO
1302  003212  162700  007776                    SUB     #7776,R0        ;SAVE 2K FOR MONITORS
1303  003216  010037  001304            7$:     MOV     R0,MEMLIM       ;STORE MEMORY LIMIT
1304  003222  012637  000004                    MOV     (SP)+,@#4       ;RESTORE LOC 4
1305  003226  012637  000006                    MOV     (SP)+,@#6       ;RESTORE LOC 6
1306  003232  000413                            BR      10$             ;CONTINUE
1307  003234  022626                    2$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1308  003236  162700  000004                    SUB     #4,R0           ;GET LAST GOOD ADDRESS
1309  003242  162700  007776                    SUB     #7776,R0        ;SAVE 2K FOR MONITORS
1310  003246  022700  030000                    CMP     #30000,R0       ;IS IT 8K?
1311  003252  001361                            BNE     7$              ;BR IF NO
1312  003254  012700  037400                    MOV     #37400,R0       ;IF 8K DON'T SAVE 2K
1313  003260  000756                            BR      7$              ;
1314  003262  012737  000340  177776    10$:    MOV     #340,PS         ;LOCK OUT INTERRUPTS
1315  003270  032737  000004  001236            BIT     #BIT2,STRTSW    ;CHECK FOR LOCK ON TEST
1316  003276  001411                            BEQ     1$              ;BR IF NO LOCK DESIRED.
1317  003300  104402  006044                    TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
1318  003304  012737  000240  003612            MOV     #NOP,TTST       ;ADJUST SCOPE ROUTINE.
1319  003312  012737  000240  003614            MOV     #NOP,TTST+2     ;SET UP TO LOCK
1320  003320  000406                            BR      3$              ;CONTINUE ALONG.
1321  003322  013737  003730  003612    1$:     MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
1322  003330  013737  003732  003614            MOV     BRX,TTST+2      ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
1323  003336  012737  010206  001214    3$:     MOV     #CYCLE,RETURN   ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
1324  003344  032737  000002  001236    4$:     BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED?
1325  003352  001002                            BNE     5$              ;BR IF YES
1326  003354  104402  005756                    TYPE    ,MR             ;TYPE R
1327  003360  000177  175630            5$:     JMP     @RETURN         ;START TESTING
```

```
                                                ;END OF PASS
                                                ;TYPE NAME OF TEST
                                                ;UPDATE PASS COUNT
                                                ;CHECK FOR EXIT TO ACT-11
                                                ;RESTART TEST

003364  000005                          .EOP:   RESET                   ;MAKE THE  WORLD CLEAN AGAIN.
003366  005037  001234                          CLR     LSTERR          ;CLEAR LAST ERROR PC
003372  105037  001325                          CLRB    ERRFLG          ;CLEAR ERROR FLAG
003376  005237  001230                          INC     PASCNT          ;UPDATE PASS COUNT
003402  013777  001230  175570                  MOV     PASCNT,@DISPLAY ;DISPLAY PASS COUNT
003410  104402  005733                          TYPE    ,MEPASS         ;TYPE END PASS
003414  104402  006073                          TYPE    ,MCSRX          ;TYPE CSR
003420  104411  003546                          CNVRT   ,XCSR           ;SHOW IT
003424  104402  006101                          TYPE    ,MVECX          ;TYPE VECTOR
003430  104411  003554                          CNVRT   ,XVEC           ;SHOW IT
003434  104402  006107                          TYPE    ,MPASSX         ;TYPE PASSES
003440  104411  003562                          CNVRT   ,XPASS          ;SHOW IT
003444  104402  006120                          TYPE    ,MERRX          ;TYPE ERRORS
003450  104411  003570                          CNVRT   ,XERR           ;SHOW IT
003454  013700  001322                          MOV     MILK,R0         ;GET POINTER TO PASS COUNT
003460  013720  001230                          MOV     PASCNT,(R0)+    ;STORE PASS COUNT FOR THIS DMC11
003464  013720  001232                          MOV     ERRCNT,(R0)+    ;STORE ERROR COUNT FOR THIS DMC11
003470  005337  001314                          DEC     SAVNUM          ;ARE ALL DEVICES TESTED?
003474  001017                                  BNE     RESTRT          ;BR IF NO.
003476  112737  000377  001327                  MOVB    #377,QV.FLG     ;SET THE QUICK VERIFY FLAG.
003504  013737  001310  001314                  MOV     DMNUM,SAVNUM    ;RESTORE THE COUNT
003512  013701  000042                          MOV     @#42,R1         ;CHECK FOR ACT-11 OR DDP
003516  001406                                  BEQ     RESTRT          ;IF NOT, CONTINUE TESTING
003520  000005                                  RESET                   ;STOP THE SHOW--CLEAR THE WORLD
003522                                  $ENDAD:
003522  004711                                  JSR     PC,(R1)
003524  000240                                  NOP
003526  000240                                  NOP
003530  000240                                  NOP
003532  000240                                  NOP
003534  012737  010206  001214          RESTRT: MOV     #CYCLE,RETURN
003542  000137  010206                          JMP     CYCLE
003546  000001                          XCSR:   1
003550     006     002                          .BYTE   6,2
003552  001404                                  DMCSR
003554  000001                          XVEC:   1
003556     004     002                          .BYTE   4,2
003560  001374                                  DMRVEC
003562  000001                          XPASS:  1
003564     006     002                          .BYTE   6,2
003566  001230                                  PASCNT
003570  000001                          XERR:   1
003572     006     002                          .BYTE   6,2
003574  001232                                  ERRCNT

                                                ;SCOPE LOOP AND INTERATION HANDLER
                                                ;--------------------------------

003576  004737  007734                  .SCOPE: JSR     PC,CKSWR        ;CKECK FOR SOFT SWR
003602  010016                                  MOV     R0,(SP)         ;SAVE R0 ON THE STACK
```

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 1384  003604  032777  040000  175370          BIT     #BIT14,@SWR     ;"LOOP ON THIS TEST"?
 1385  003612  001407                  TTST:   BEQ     1$              ;BR IF NO.  (IF LOCK SW01=1; THIS LOC =240)
 1386  003614  000437                          BR      3$              ;GOTO 3$    (IF LOCK SW01=1; THIS LOC =240)
 1387  003616  005737  003734                  TST     DONE            ;WAS TKCSR DONE SET?
 1388  003622  001434                          BEQ     3$              ;BR IF NO (LOCKED ON TEST)
 1389  003624  005037  003734                  CLR     DONE            ;YES, CLEAR FLAG
 1390  003630  000415                          BR      2$              ;GO TO NEXT TEST
 1391  003632  032777  004000  175342  1$:     BIT     #SW11,@SWR      ;DELETE ITERATION?  (QUICK PASS)
 1392  003640  001011                          BNE     2$              ;BR IF YES
 1393  003642  105737  001327                  TSTB    QV.FLG          ;HAVE PASSES BEECOMPLETED?
 1394  003646  001406                          BEQ     2$              ;BR IF QUICK PASS.
 1395  003650  005237  001224                  INC     LPCNT           ;UPDATE ITERATION COUNTER
 1396  003654  023737  001224  001222          CMP     LPCNT,ICOUNT    ;ARE ALL ITERATIONS DONE??
 1397  003662  101414                          BLOS    3$              ;BR IF NOT YET
 1398  003664  105037  001325          2$:     CLRB    ERRFLG          ;PREPARE FOR NEW TEST
 1399  003670  005037  001224                  CLR     LPCNT           ;START ICOUNTER AT 0
 1400  003674  005037  001220                  CLR     LOCK
 1401  003700  012737  000020  001222          MOV     #20,ICOUNT      ;RESET ITERATIONS
 1402  003706  013737  001216  001214          MOV     NEXT,RETURN     ;GET NEXT TEST
 1403  003714  011600                  3$:     MOV     (SP),R0         ;POP R0 OFF OF THE STACK
 1404  003716  022626                          POP2SP                  ;FAKE AN "RTI"
 1405  003720  013701  001404                  MOV     DMCSR,R1        ;R1 CONTAINS BASE DMC ADDRESS
 1406  003724  000177  175264                  JMP     @RETURN         ;GO DO THE TEST
 1407  003730  001407                  BRW:    1407
 1408  003732  000437                  BRX:    437
 1409  003734  000000                  DONE:   0
 1410
 1411                                          ;CHECK FOR FREEZE ON CURRENT DATA
 1412                                          ;-------------------------------
 1413
 1414  003736  004737  007734          .SCOP1: JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
 1415  003742  032777  001000  175232          BIT     #SW09,@SWR      ;IS SW09=1(SET)?
 1416  003750  001405                          BEQ     1$              ;BR IF NOT SET.
 1417  003752  005737  001220                  TST     LOCK
 1418  003756  001402                          BEQ     1$
 1419  003760  013716  001220                  MOV     LOCK,(SP)       ;GOTO THE ADDRESS IN LOCK.
 1420  003764  000002                  1$:     RTI                     ;GO BACK.
 1421
 1422                                          ;TELETYPE OUTPUT ROUTINE
 1423                                          ;----------------------
 1424
 1425  003766  010546                  .TYPE:  MOV     R5,-(SP)        ;SAVE R5 ON THE STACK.
 1426  003770  017605  000002                  MOV     @2(SP),R5       ;GET ADDRESS OF MESSAGE.
 1427  003774  062766  000002  000002          ADD     #2,2(SP)        ;POP OVER ADDRESS.
 1428  004002  005737  010144          4$:     TST     SWFLG           ;SOFT SWR MESSAGE?
 1429  004006  001004                          BNE     1$              ;IF YES TYPE IT OUT REGARDLESS OF SW12
 1430  004010  032777  010000  175164          BIT     #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
 1431  004016  001012                          BNE     3$              ;BR IF NO PRINT OUT WANTED (SW12=1)
 1432  004020  105715                  1$:     TSTB    (R5)            ;IS NUMBER MINUS? (MSB=1(BIT7))
 1433  004022  100002                          BPL     2$              ;BR IF NUMBER IS PLUS
 1434  004024  104402  005672                  TYPE    ,MCRLF          ;TYPE A CR/LF!
 1435  004030  105777  175154          2$.     TSTB    @TPCSR          ;TTY READY?
 1436  004034  100375                          BPL     2$              ;BR IF NO.
 1437  004036  112577  175150                  MOVB    (R5)+,@TPDBR    ;PRINT CURRENT CHAR.
 1438  004042  001357                          BNE     4$              ;IF NOT ZERO KEEP PRINTING
 1439  004044  012605                  3$      MOV     (SP)+,R5        ;END OF OUTPUT. RESTORE R5
```

```
1440  004046  000002                        RTI                     ;GO HOME
1441                                        ;-----------------------
1442
1443  004050  010346                .INSTR:  MOV     R3,-(SP)        ;SAVE R3 ON STACK
1444  004052  010446                         MOV     R4,-(SP)        ;SAVE R4 ON STACK
1445  004054  017637  000004  004072         MOV     @4(SP),.MSG
1446  004062  062766  000002  000004         ADD     #2,4(SP)
1447  004070  104402                .INST1:  TYPE
1448  004072  000000                .MSG:    0
1449  004074  012704  007630                 MOV     #INBUF,R4
1450  004100  012703  000007                 MOV     #7,R3
1451  004104  105777  175074         1$:     TSTB    @TKCSR
1452  004110  100375                         BPL     1$
1453  004112  117714  175070                 MOVB    @TKDBR,(R4)
1454  004116  142714  000200                 BICB    #200,(R4)
1455  004122  122427  000015                 CMPB    (R4)+,#15
1456  004126  001417                         BEQ     INSTR2
1457  004130  105777  175054         2$:     TSTB    @TPCSR
1458  004134  100375                         BPL     2$
1459  004136  017777  175044  175046         MOV     @TKDBR,@TPDBR
1460  004144  005303                         DEC     R3
1461  004146  001356                         BNE     1$
1462  004150  012604                         MOV     (SP)+,R4
1463  004152  012603                         MOV     (SP)+,R3
1464  004154  104402  005666         .INSTE:  TYPE    ,MQM
1465  004160  010346                         MOV     R3,-(SP)
1466  004162  010446                         MOV     R4,-(SP)
1467  004164  000741                         BR      .INST1
1468  004166  012604                INSTR2:  MOV     (SP)+,R4        ;RESTORE R4
1469  004170  012603                         MOV     (SP)+,R3        ;RESTORE R3
1470  004172  000002                         RTI
1471
1472                                        ;CONVERT ASCII STRING TO OCTAL
1473                                        ;-----------------------------
1474
1475  004174  010546                .PARAM:  MOV     R5,-(SP)
1476  004176  010446                         MOV     R4,-(SP)
1477  004200  016605  000004                 MOV     4(SP),R5
1478  004204  012537  004364                 MOV     (R5)+,LOLIM
1479  004210  012537  004366                 MOV     (R5)+,HILIM
1480  004214  012537  004370                 MOV     (R5)+,DEVADR
1481  004220  112537  004372                 MOVB    (R5)+,LOBITS
1482  004224  112537  004373                 MOVB    (R5)+,ADRCNT
1483  004230  010566  000004                 MOV     R5,4(SP)
1484  004234  005005                PARAM1:  CLR     R5
1485  004236  012704  007630                 MOV     #INBUF,R4
1486  004242  122714  000015                 CMPB    #15,(R4)
1487  004246  001420                         BEQ     PARERR
1488  004250  121427  000060         1$:     CMPB    (R4),#60
1489  004254  002415                         BLT     PARERR
1490  004256  121427  000067                 CMPB    (R4),#67
1491  004262  003012                         BGT     PARERR
1492  004264  142714  000060                 BICB    #60,(R4)
1493  004270  152405                         BISB    (R4)+,R5
1494  004272  122714  000015                 CMPB    #15,(R4)
1495  004276  001406                         BEQ     LIMITS
```

```
1496  004300  006305                    ASL     R5
1497  004302  006305                    ASL     R5
1498  004304  006305                    ASL     R5
1499  004306  000760                    BR      1$
1500  004310  104404            PARERR: INSTER
1501  004312  000750                    BR      PARAM1
1502
1503                                    ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
1504                                    ;--------------------------------------
1505
1506  004314  020537  004366    LIMITS: CMP     R5,HILIM
1507  004320  101373                    BHI     PARERR
1508  004322  020537  004364            CMP     R5,LOLIM
1509  004326  103770                    BLO     PARERR
1510  004330  133705  004372            BITB    LOBITS,R5
1511  004334  001365                    BNE     PARERR
1512
1513                                    ;STORE NUMBER AT SPECIFIED ADDRESS
1514
1515  004336  013704  004370            MOV     DEVADR,R4
1516  004342  010524            1$:     MOV     R5,(R4)+
1517  004344  062705  000002            ADD     #2,R5
1518  004350  105337  004373            DECB    ADRCNT
1519  004354  001372                    BNE     1$
1520  004356  012604                    MOV     (SP)+,R4
1521  004360  012605                    MOV     (SP)+,R5
1522  004362  000002                    RTI
1523  004364  000000            LOLIM:  0
1524  004366  000000            HILIM:  0
1525  004370  000000            DEVADR: 0
1526  004372  000000            LOBITS: 0
1527          004373            ADRCNT=LOBITS+1
1528
1529                                    ;SAVE PC OF TEST THAT FAILED AND R0-R5
1530                                    ;-------------------------------------
1531
1532  004374  016637  000004  001276  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
1533
1534                                    ;SAVE R0-R5
1535
1536  004402  010537  001272    SV05:   MOV     R5,SAVR5        ;SAVE R5
1537  004406  010437  001270            MOV     R4,SAVR4        ;SAVE R4
1538  004412  010337  001266            MOV     R3,SAVR3        ;SAVE R3
1539  004416  010237  001264            MOV     R2,SAVR2        ;SAVE R2
1540  004422  010137  001262            MOV     R1,SAVR1        ;SAVE R1
1541  004426  010037  001260            MOV     R0,SAVR0        ;SAVE R0
1542  004432  000002                    RTI                     ;LEAVE.
1543
1544                                    ;RESTORE R0-R5
1545
1546  004434  013700  001260    .RES05: MOV     SAVR0,R0        ;RESTORE R0
1547  004440  013701  001262            MOV     SAVR1,R1        ;RESTORE R1
1548  004444  013702  001264            MOV     SAVR2,R2        ;RESTORE R2
1549  004450  013703  001266            MOV     SAVR3,R3        ;RESTORE R3
1550  004454  013704  001270            MOV     SAVR4,R4        ;RESTORE R4
1551  004460  013705  001272            MOV     SAVR5,R5        ;RESTORE R5
```

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1552  004464  000002                          RTI                     ;LEAVE
1553
1554                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
1555                                          ;-----------------------------------------------------
1556
1557  004466  104402  005672        .CONVR: TYPE    ,MCRLF
1558  004472  010046                .CNVRT: MOV     R0,-(SP)
1559  004474  010146                        MOV     R1,-(SP)
1560  004476  010346                        MOV     R3,-(SP)
1561  004500  010446                        MOV     R4,-(SP)
1562  004502  010546                        MOV     R5,-(SP)
1563  004504  017601  000012                MOV     @12(SP),R1
1564  004510  062766  000002  000012        ADD     #2,12(SP)
1565  004516  012137  004710                MOV     (R1)+,WRDCNT
1566  004522  112137  004712        1$:     MOVB    (R1)+,CHRCNT
1567  004526  112137  004713                MOVB    (R1)+,SPACNT
1568  004532  013137  004714                MOV     @(R1)+,BINWRD
1569  004536  122737  000003  004712        CMPB    #3,CHRCNT
1570  004544  001003                        BNE     2$
1571  004546  042737  177400  004714        BIC     #177400,BINWRD
1572  004554  013704  004714        2$:     MOV     BINWRD,R4
1573  004560  113705  004712                MOVB    CHRCNT,R5
1574  004564  012700  001416                MOV     #TEMP,R0
1575  004570  010403                3$:     MOV     R4,R3
1576  004572  042703  177770                BIC     #177770,R3
1577  004576  062703  000060                ADD     #060,R3
1578  004602  110320                        MOVB    R3,(R0)+
1579  004604  000241                        CLC
1580  004606  006004                        ROR     R4
1581  004610  000241                        CLC
1582  004612  006004                        ROR     R4
1583  004614  000241                        CLC
1584  004616  006004                        ROR     R4
1585  004620  005305                        DEC     R5
1586  004622  001362                        BNE     3$
1587  004624  012703  007672                MOV     #MDATA,R3
1588  004630  114023                4$:     MOVB    -(R0),(R3)+
1589  004632  105337  004712                DECB    CHRCNT
1590  004636  001374                        BNE     4$
1591  004640  105737  004713                TSTB    SPACNT
1592  004644  001405                        BEQ     6$
1593  004646  112723  000040        5$:     MOVB    #040,(R3)+
1594  004652  105337  004713                DECB    SPACNT
1595  004656  001373                        BNE     5$
1596  004660  105013                6$:     CLRB    (R3)
1597  004662  104402  007672                TYPE    ,MDATA
1598  004666  005337  004710                DEC     WRDCNT
1599  004672  001313                        BNE     1$
1600  004674  012605                        MOV     (SP)+,R5
1601  004676  012604                        MOV     (SP)+,R4
1602  004700  012603                        MOV     (SP)+,R3
1603  004702  012601                        MOV     (SP)+,R1
1604  004704  012600                        MOV     (SP)+,R0
1605  004706  000002                        RTI
1606  004710  000000        WRDCNT: 0
1607  004712  000000        CHRCNT: 0
```

```
1608            004713                  SPACNT=CHRCNT+1
1609  004714   000000                   BINWRD: 0
1610
1611
1612                                    ;TRAP DISPATCH SERVICE
1613                                    ;ARGUMENT OF TRAP IS EXTRACTED
1614                                    ;AND USED AS OFFSET TO OBTAIN POINTER
1615                                    ;TO SELECTED SUBROUTINE
1616
1617  004716   011646                   .TRPSR: MOV     (SP),-(SP)      ;GET PC OF RETURN
1618  004720   162716   000002                  SUB     #2,(SP)         ;=PC OF TRAP
1619  004724   017616   000000                  MOV     @(SP),(SP)      ;GET TRP
1620  004730   006316                   TRPOK:  ASL     (SP)            ;MULTIPLY TRAP ARG BY 2
1621  004732   042716   177001                  BIC     #177001,(SP)    ;CLEAR UNWANTED BITS
1622  004736   062716   001330                  ADD     #.TRPTAB,(SP)   ;POINTER TO SUBROUTINE ADDRESS
1623  004742   017616   000000                  MOV     @(SP),(SP)      ;SUBROUTINE ADDRESS
1624  004746   000136                          JMP     @(SP)+          ;GO TO SUBROUTINE
1625
1626                                    ;ERROR HANDLER
1627                                    ;-------------
1628
1629  004750   004737   007734           .HLT:   JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
1630  004754   032777   010000  174220           BIT     #SW12,@SWR      ;BELL ON ERROR?
1631  004762   001406                          BEQ     XBX             ;BR IF NO BELL
1632  004764   105777   174220                  TSTB    @TPCSR          ;TTY READY.
1633  004770   100003                          BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
1634  004772   112777   000207  174212          MOVB    #207,@TPDBR     ;PUSH A BELL AT THE TTY.
1635  005000   032777   020000  174174   XBX:   BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
1636  005006   001105                          BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
1637  005010   021637   001234                  CMP     (SP),LSTERR     ;WAS THIS ERROR FOUND LAST TIME?
1638  005014   001404                          BEQ     1$              ;BR IF YES
1639  005016   011637   001234                  MOV     (SP),LSTERR     ;RECORD BEING HERE
1640  005022   105037   001325                  CLRB    ERRFLG          ;PREPARE HEADER
1641  005026   104406                   1$:    SAV05                   ;SAVE ALL PROC REGISTERS
1642  005030   011605                          MOV     (SP),R5         ;GET THE PC OF ERROR
1643  005032   162705   000002                  SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
1644  005036   011504                          MOV     (R5),R4         ;GET HLT INSTRUCTION
1645  005040   006304                          ASL     R4              ;MULT BY TWO
1646  005042   061504                          ADD     (R5),R4         ;DOUBLE IT
1647  005044   006304                          ASL     R4              ;MULT AGAIN
1648  005046   042704   177001                  BIC     #177001,R4      ;CLEAR JUNK
1649  005052   062704   036070                  ADD     #.ERRTAB,R4     ;GET POINTER
1650  005056   012437   005172                  MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
1651  005062   012437   005204                  MOV     (R4)+,DATAHD    ;GET DATA HEADRER
1652  005066   011437   005216                  MOV     (R4),DATABP     ;GET DATA TABLE
1653  005072   105737   001325                  TSTB    ERRFLG          ;TYPE HEADREER
1654  005076   001403                          BEQ     TYPMSG          ;BR IF YES
1655  005100   005737   005216                  TST     DATABP          ;DOES DATA TABLE EXIST?
1656  005104   001040                          BNE     TYPDAT          ;BR IF YES.
1657  005106   104402   005672           TYPMSG: TYPE    ,MCRLF
1658  005112   104402   005672                  TYPE    ,MCRLF
1659  005116   005737   001220                  TST     LOCK
1660  005122   001402                          BEQ     1$
1661  005124   104402   006143                  TYPE    ,MASTEK
1662  005130   104402   006131           1$:    TYPE    ,MTSTN
1663  005134   104411   005330                  CNVRT   ,XTSTN          ;SHOW IT
```

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1664  005140  104402  006220                  TYPE    ,MERRPC         ;TYPE PC.
1665  005144  104411  005322                  CNVRT   ,ERTABO         ;SHOW IT
1666  005150  104402  005672                  TYPE    ,MCRLF          ;GIVE A CR/LF
1667  005154  112737  177777  001325          MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
1668  005162  005737  005172                  TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
1669  005166  001402                          BEQ     WRKO.FM         ;BR IF NO.
1670  005170  104402                          TYPE                    ;TYPE
1671  005172  000000                  ERRMSG: 0                       ;    ERROR MESSAGE
1672  005174                           WRKO.FM:                       ;
1673  005174  005737  005204                  TST     DATAHD          ;DATA HEADER?
1674  005200  001402                          BEQ     TYPDAT          ;BR IF NO
1675  005202  104402                          TYPE                    ;TYPE
1676  005204  000000                  DATAHD: 0                       ;    DATA HEADER
1677  005206  005737  005216          TYPDAT: TST     DATABP          ;DATA TABLE?
1678  005212  001402                          BEQ     RESREG          ;BR IF NO.
1679  005214  104410                          CONVRT                  ;SHOW
1680  005216  000000                  DATABP: 0                       ;    DATA TABLE
1681  005220  104407                  RESREG: RESOS                   ;RESTORE PROC REGISTERS
1682  005222  022737  003522  000042  nALTS:  CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, HALT.!
1683  005230  001403                          BEQ     1$
1684  005232  005777  173744                  TST     @SWR            ;HALT ON ERROR?
1685  005236  100005                          BPL     EXITER          ;BR IF NO HALT ON ERROR
1686  005240  010046                  1$:     PUSHRO                  ;SAVE RO
1687  005242  016600  000002                  MOV     2(SP),RO        ;SHOW ERROR PC IN DATA LIGHTS
1688  005246  000000                          HALT                    ;HALT
1689  005250  012600                          POPRO                   ;GET RO
1690  005252  005237  001232          EXITER: INC     ERRCNT          ;UPDATE ERROR COUNT
1691  005256  032777  000400  173716          BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
1692  005264  001007                          BNE     1$              ;BR IF YES
1693  005266  032777  002000  173706          BIT     #SW10,@SWR      ;GOTO NEXT TEST?
1694  005274  001411                          BEQ     2$              ;BR IF NO
1695  005276  013737  001216  001214          MOV     NEXT,RETURN     ;SET FOR NEXT TEST
1696  005304  012706  001200          1$:     MOV     #STACK,SP       ;RESET SP
1697  005310  013701  001404                  MOV     DMCSR,R1        ;SET UP R1
1698  005314  000177  173674                  JMP     @RETURN         ;GOTO SPECIFIED TEST
1699  005320  000002                  2$:     RTI                     ;RETURN
1700  005322  000001                  ERTABO: 1
1701  005324     006     002                  .BYTE   6,2
1702  005326  001276                          SAVPC
1703  005330  000001                  XTSTN:  1
1704  005332     003     002                  .BYTE   3,2
1705  005334  001226                          TSTNO
1706                                          ;ENTER HERE ON POWER FAILURE
1707                                          ;--------------------------
1708
1709
1710  005336                          .PFAIL:
1711  005336  012737  005350  000024          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
1712  005344  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
1713  005346  000777                          BR      .
1714
1715                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
1716
1717  005350                          RESTAR:
1718  005350  012737  005336  000024          MOV     #.PFAIL,24      ;SET UP FOR POWER FAILURE
1719  005356  012706  001200                  MOV     #STACK,SP       ;RESET THE STACK POINTER
```

```
1720  005362  013701  001404                  MOV     DMCSR,R1        ;RESTORE R1
1721  005366  005037  001416                  CLR     TEMP            ;READY FOR TIMMER
1722  005372  005237  001416                  INC     TEMP            ;PLUS ONE TO THE TIMER.
1723  005376  001375                          BNE     .-4             ;BR IF MORE TO GO
1724  005400  104402  005675                  TYPE    ,MPFAIL         ;TYPE THE MESSAGE
1725  005404  104411  005430                  CNVRT   ,PFTAB          ;TELL WHAT TEST TO RETURN TO.
1726  005410  105037  001325                  CLRB    ERRFLG          ;START CLEAN
1727  005414  005037  001234                  CLR     LSTERR          ;'''''''''''''''
1728  005420  005011                          CLR     (R1)            ;CLEAR MAINT BITS
1729  005422  104412                          MSTCLR                  ;START CLEAN UP OF DEVICE
1730  005424  000177  173564                  JMP     @RETURN         ;START DOING THAT TEST AGAIN.
1731  005430  000001                  PFTAB:  1
1732  005432     003     002          .BYTE   3,2
1733  005434  001226                          TSTNO
1734
1735  005436                          .DELAY:
1736  005436  012777  000020  173746          MOV     #20,@DMP04
1737  005444  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
1738  005446  121111                          121111                  ;POKE CLOCK DELAY BIT
1739  005450                          1$:
1740  005450  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
1741  005452  121224                          121224                  ;PORT4 IBUS*11
1742  005454  032777  000020  173730          BIT     #BIT4,@DMP04    ;IS CLOCK BIT SET?
1743  005462  001772                          BEQ     1$              ;BR IF NO
1744  005464  000002                          RTI
1745
1746  005466                          .MSTCLR:
1747  005466  152777  000100  173712          BISB    #BIT6,@DMCSRH   ;SET MASTER CLEAR
1748  005474  142777  000300  173704          BICB    #BIT6!BIT7,@DMCSRH  ;CLEAR MASTER CLEAR AND RUN
1749  005502  000002                          RTI                     ;RETURN
1750
1751  005504                          .ROMCLK:
1752  005504  152777  000002  173674          BISB    #BIT1,@DMCSRH   ;SET ROMI
1753  005512  013677  173676                  MOV     @(SP)+,@DMP06   ;LOAD INSTRUCTION IN SEL6
1754  005516  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
1755  005522  032777  000100  173452          BIT     #SW06,@SWR      ;HALT IF SW06 =1
1756  005530  001401                          BEQ     1$              ;BR IF SW06 =0
1757  005532  000000                          HALT                    ;HALT BEFORE CLOCKING INSTRUCTION
1758  005534  152777  000003  173644  1$:     BISB    #BIT1!BIT0,@DMCSRH ;CLOCK INSTRUCTION
1759  005542  142777  000007  173636          BICB    #BIT2!BIT1!BIT0,@DMCSRH  ;CLEAR ROMO, ROMI, STEP
1760  005550  000002                          RTI
1761
1762  005552                          .DATACLK:
1763  005552  013637  001416                  MOV     @(SP)+,TEMP     ;PUT TICK COUNT IN TEMP
1764  005556  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
1765  005562  152777  000020  173616  1$:     BISB    #BIT4,@DMCSRH   ;SET STEP LU
1766  005570  027777  173610  173606          CMP     @DMCSR,@DMCSR   ;WASTE TIME
1767  005576  142777  000020  173602          BICB    #BIT4,@DMCSRH   ;CLEAR STEP LU
1768  005604  005337  001416                  DEC     TEMP            ;DEC TICK COUNT
1769  005610  001364                          BNE     1$              ;BR IF NOT DONE
1770  005612  000002                          RTI                     ;RETURN
1771  005614  000001                  3$:     .BLKW 1
1772
1773  005616                          .TIMER:
1774  005616  013637  001416                  MOV     @(SP)+,TEMP     ;MOVE COUNT TO TEMP
1775  005622  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
```

```
 1776  005626                                 1$:
 1777  005626  104414                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 1778  005630  021364                                 021364                  ;PORT4 IBUS* REG11
 1779  005632  032777  000002  173552                 BIT     #2,@DMP04       ;IS PGM CLOCK BIT CLEAR?
 1780  005640  001772                                 BEQ     1$              ;BR IF YES
 1781  005642                                 2$:
 1782  005642  104414                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 1783  005644  021364                                 021364                  ;PORT4 IBUS* REG11
 1784  005646  032777  000002  173536                 BIT     #2,@DMP04       ;IS PGM CLOCK BIT SET?
 1785  005654  001372                                 BNE     2$              ;BR IF YES
 1786  005656  005337  001416                         DEC     TEMP            ;DEC COUNT
 1787  005662  001361                                 BNE     1$              ;BR IF NOT DONE
 1788  005664  000002                                 RTI                     ;RETURN
 1789
 1790  005666  020040  000077          MQM:    .ASCIZ  /  ?/
  (2)  005672  005015     000          MCRLF:  .ASCIZ   <15><12>
  (2)  005675     377  053520  020122  MPFAIL: .ASCIZ  <377>/PWR FAILED. RESTART AT TEST /
  (2)  005733     377  047105  020104  MEPASS: .ASCIZ  <377>/END PASS CZDMFC  /
  (2)  005756  051377     000          MR:     .ASCIZ  <377>/R/
  (2)  005761     377  047516  042040  MERR2:  .ASCIZ  <377>/NO DEVICES PRESENT./
  (2)  006006  044777  051516  043125  MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
  (2)  006032  052377  051505  020124  MTSTPC: .ASCIZ  <377>/TEST PC-/
  (2)  006044  046377  041517  020113  MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST/
  (2)  006073     103  051123  020072  MCSRX:  .ASCIZ   /CSR: /
  (2)  006101     126  041505  020072  MVECX:  .ASCIZ  /VEC: /
  (2)  006107     120  051501  042523  MPASSX: .ASCIZ  /PASSES: /
  (2)  006120  051105  047522  051522  MERRX:  .ASCIZ  /ERRORS: /
  (2)  006131     124  051505  020124  MTSTN:  .ASCIZ  /TEST NO: /
  (2)  006143     052     000          MASTEK: .ASCIZ  /*/
  (2)  006145     377  042523  020124  MNEW:   .ASCIZ  <377>/SET SWITCH REG TO DMC11'S DESIRED ACTIVE./
  (2)  006220  041520  020072     000  MERRPC: .ASCIZ  /PC: /
  (2)  006225     212  020040  020040  XHEAD:  .ASCII  <212>/            MAP OF DMC11 STATUS/
  (2)  006264  020377  020040  020040          .ASCII  <377>/            ------------------/
  (2)  006323     212  020040  041520          .ASCII  <212>/  PC      CSR     STAT1    STAT2    STAT3/
  (2)  006375     377  026455  026455          .ASCIZ  <377>/------   ------   ------   ------   ------/
  (2)  006451     377  047510  020127  NUM:    .ASCIZ  <377>/HOW MANY DMC11'S TO BE TESTED?/
  (2)  006511     377  051503  020122  CSR:    .ASCIZ  <377>/CSR ADDRESS?/
  (2)  006527     377  042526  052103  VEC:    .ASCIZ  <377>/VECTOR ADDRESS?/
  (2)  006550  041377  020122  051120  PRIO:   .ASCIZ  <377>/BR PRIORITY LEVEL? (4,5,6,7)?/
  (2)  006607     377  043111  042040  CRAM:   .ASCIZ  <377>/IF DMC HAS CRAM (M8204) TYPE "Y", IF CROM (M8200) TYPE "N" ?/
  (2)  006705     377  044127  041511  MODU:   .ASCIZ  <377>/WHICH LINE UNIT? IF NONE TYPE "N", IF M8201 TYPE "1", IF M8202 TYP
  (2)  007017     377  053523  052111  LINE:   .ASCIZ  <377>/SWITCH PAC#1 (DDCMP LINE #)?/
  (2)  007055     377  053523  052111  BM:     .ASCIZ  <377>/SWITCH PAC#2 (BM873 BOOT ADD)?/
  (2)  007115     377  051511  052040  CONN:   .ASCIZ  <377>/IS THE LOOP BACK CONNECTOR ON?/
  (2)  007155     377  047516  042040  NOACT:  .ASCIZ  <377>/NO DEVICES ARE SELECTED/
  (2)  007206  005377  053523  036522  SWMES:  .ASCIZ  <377><12>/SWR= /
  (2)  007216  042516  037527  000040  SWMES1: .ASCIZ  /NEW? /
  (2)  007224  177777  046504  030503  CONERR: .ASCIZ  <377><377>/DMC11 FOUND AT NON-STANDARD ADDRESS  PC: /
  (2)  007300  042777  050130  041505  CNERR:  .ASCIZ  <377>/EXPECTED  FOUND/
  (2)  007321     040  042050  041515  DMCM:   .ASCIZ  / (DMC) /
  (2)  007331     040  045450  041515  KMCM:   .ASCIZ  / (KMC) /
  (2)  007341     377  046504  030503  SPEED:  .ASCIZ  <377>/DMC11-AR(REMOTE,LOW SPEED) OR DMC11-AL(LOCAL,HIGH SPEED) TYPE "R"
  (2)  007455     200  044127  041511  MV35:   .ASCII  <200>/WHICH MODEM TYPE, TYPE "D" FOR DMC11-DA (RS232C),OR/
  (2)  007541     200  054524  042520          .ASCIZ  <200>/TYPE "F" FOR DMC11-FA (V.35) ? /
  (2)
  (2)                                    .EVEN
```

```
                                                N 3
CZDMF  MACY11 30A(1052)  08-JUL-80  08:26  PAGE 40
CZDMF.P11  08-JUL-80 08:25  GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)  SEQ 0039

   (2)  007602  000005                 XSTATQ: 5
  1791  007604     006      003               .BYTE   6,3
  1792  007606  001246                        TEMP1
  1793  007610     006      003               .BYTE   6,3
  1794  007612  001250                        TEMP2
  1795  007614     006      003               .BYTE   6,3
  1796  007616  001252                        TEMP3
  1797  007620     006      003               .BYTE   6,3
  1798  007622  001254                        TEMP4
  1799  007624     006      002               .BYTE   6,2
  1800  007626  001256                        TEMP5
  1801                                 .EVEN
  1802
  1803                                        ;BUFFERS FOR INPUT-OUTPUT
  1804
  1805  007630  000000                 INBUF:  0
  1806          007672                 .=.+40
  1807  007672  000000                 MDATA:  0
  1808          007734                 .=.+40
  1809
  1810
  1811                                        ;ROUTINE USED TO CHANGE SOFTWARE SWITCH
  1812                                        ;REGISTER USING THE CONSOLE TERMINAL
  1813                                        ;-------------------------------------
  1814
  1815  007734  022737  000176  001202 CKSWR:  CMP     #SWREG,SWR      ;IS THE SOFT SWR BEING USED?
  1816  007742  001077                        BNE     CKSWR5          ;BR IF NO
  1817  007744  105777  171234                TSTB    @TKCSR          ;IS DONE SET?
  1818  007750  100003                        BPL     2$              ;GO ON IF NOT SET
  1819  007752  012737  177777  003734        MOV     #-1,DONE        ;IF DONE SET, SET FLAG
  1820  007760  022777  000007  171220 2$:    CMP     #7,@TKDBR       ;WAS CTRL G TYPED? (7 BIT ASCII)
  1821  007766  001404                        BEQ     1$              ;BR IF YES
  1822  007770  022777  000207  171210        CMP     #207,@TKDBR     ;WAS CTRL G TYPED? (8 BIT ASCII)
  1823  007776  001061                        BNE     CKSWR5          ;BR IF NO
  1824  010000  010246                 1$:    MOV     R2,-(SP)        ;STORE R2
  1825  010002  010346                        MOV     R3,-(SP)        ;STORE R3
  1826  010004  010446                        MOV     R4,-(SP)        ;STORE R4
  1827  010006  012737  177777  010144        MOV     #-1,SWFLG       ;SET SOFT TYPE OUT FLAG
  1828  010014  005002                 CKSWR1: CLR     R2              ;CLEAR NEW SWR CONTENTS
  1829  010016  012704  177777                MOV     #-1,R4          ;SET FLAG TO ALL ONES
  1830  010022  104402  007206                TYPE    ,SWMES          ;TYPE "SWR= "
  1831  010026  104411                 CKSWR2: CNVRT                   ;TYPE OUT PRESENT CONTENTS
  1832  010030  010200                         SOFTSW                  ;OF SOFT SWITCH REGISTER
  1833  010032  104402  007216        CKSWR3: TYPE    ,SWMES1         ;TYPE "NEW? "
  1834  010036  004737  010146        CKSWR4: JSR     PC,INCHAR       ;GET RESPONSE
  1835  010042  022703  000015                CMP     #15,R3          ;WAS IT A CR?
  1836  010046  001424                        BEQ     5$              ;BR IF YES
  1837  010050  022703  000012                CMP     #12,R3          ;WAS IT A LF?
  1838  010054  001416                        BEQ     4$              ;BR IF YES
  1839  010056  022703  000025                CMP     #25,R3          ;WAS IT CTRL U?
  1840  010062  001754                        BEQ     CKSWR1          ;BR IF YES(START OVER)
  1841  010064  022703  000007                CMP     #7,R3           ;IF CNTL G GET NEXT CHAR
  1842  010070  001762                        BEQ     CKSWR4
  1843  010072  005004                        CLR     R4              ;IT MUST BE A DIGIT SO CLR FLAG
  1844  010074  042703  177770                BIC     #177770,R3      ;ONLY 0-7 ARE LEGAL SO MASK OFF BITS
  1845  010100  006302                        ASL     R2              ;SHIFT R2 3 TIMES
```

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1846  010102  006302                          ASL     R2
1847  010104  006302                          ASL     R2
1848  010106  050302                          BIS     R3,R2           ;ADD LAST DIGIT
1849  010110  000752                          BR      CKSWR4          ;GET NEXT CHARACTER
1850  010112  012766  002002  000006  4$:     MOV     #.START,6(SP)   ;LF WAS TYPED SO GO TO START
1851  010120  005704                  5$.     TST     R4              ;IS FLAG CLEAR?
1852  010122  001002                          BNE     6$              ;IF NOT DON'T CHANGE SOFT SWR
1853  010124  010277  171052                  MOV     R2,@SWR         ;IF YES THEN WRITE NEW CONTENTS TO SOFT SWR
1854  010130  005037  010144          6$:     CLR     SWFLG           ;CLEAR TYPEOUT FLAG
1855  010134  012604                          MOV     (SP)+,R4        ;RESTORE R4
1856  010136  012603                          MOV     (SP)+,R3        ;RESTORE R3
1857  010140  012602                          MOV     (SP)+,R2        ;RESTORE R2
1858  010142  000207                  CKSWR5: RTS     PC              ;RETURN
1859
1860  010144  000000                  SWFLG:  0
1861
1862  010146  105777  171032          INCHAR: TSTB    @TKCSR
1863  010152  100375                          BPL     .-4
1864  010154  017703  171026                  MOV     @TKDBR,R3
1865  010160  105777  171024                  TSTB    @TPCSR
1866  010164  100375                          BPL     .-4
1867  010166  010377  171020                  MOV     R3,@TPDBR
1868  010172  042703  000200                  BIC     #BIT7,R3
1869  010176  000207                          RTS     PC
1870
1871  010200  000001                  SOFTSW: 1
1872  010202     006     002                  .BYTE   6,2
1873  010204  000176                          SWREG
```

```
1874
1875                                            ;
1876                                            ;ROUTINE USED TO "CYCLE" THROUGH UP TO 16 DMC11'S
1877                                            ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1878                                            ;AND RUNS THE SPECIFIED DMC11'S.   THIS ROUTINE *MUST*
1879                                            ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1880                                            ;SETUP NECESSARY.
1881                                            ;
1882
1883  010206  005737  001306          CYCLE:  TST     DMACTV          ;ARE ANY DMC11'S TO BE TESTED?
1884  010212  001004                          BNE     1$              ;BR IF OK.
1885  010214  104402  007155                  TYPE    ,NOACT          ;NO DMC11'S SELECTED.'
1886  010220  000000                          HALT                    ;STOP THE SHOW.
1887  010222  000776                          BR      .-2             ;DISQUALIFY CONT. SW.
1888  010224  000241                  1$:     CLC                     ;CLEAR PROC. CARRY BIT.
1889  010226  006137  001316                  ROL     RUN             ;UPDATE POINTER
1890  010232  005537  001316                  ADC     RUN             ;CATCH CARRY FROM RUN
1891  010236  062737  000004  001322          ADD     #4,MILK         ;UPDATE POINTER
1892  010244  062737  000010  001320          ADD     #10,CREAM       ;UPDATE ADDRESS POINTER.
1893  010252  022737  001700  001320          CMP     #DM.MAP+200,CREAM
1894  010260  001006                          BNE     2$              ;KEEP GOING; NOT ALL TESTED FOR.
1895  010262  012737  001500  001320          MOV     #DM.MAP,CREAM   ;RESET ADDRESS POINTER.
1896  010270  012737  001702  001322          MOV     #CNT.MAP,MILK   ;RESET PASS COUNT POINTER
1897  010276  033737  001316  001306  2$:     BIT     RUN.DMACTV      ;IS THIS ONE ACTIVE?
1898  010304  001747                          BEQ     1$              ;BR IF NO
1899  010306  013700  001320                  MOV     CREAM,R0        ;GET ADDRESS POINTER
1900  010312  013702  001322                  MOV     MILK,R2         ;GET PASS COUNT POINTER
1901  010316  012037  001404                  MOV     (R0)+,DMCSR     ;LOAD SYSTEM CTRL. REG
1902  010322  011037  001374                  MOV     (R0),DMRVEC     ;LOAD VECTOR
1903  010326  042737  177000  001374          BIC     #177000,DMRVEC  ;CLEAR UNWANTED BITS
1904  010334  012037  001366                  MOV     (R0)+,STAT1     ;LOAD STAT1
1905  010340  012037  001370                  MOV     (R0)+,STAT2     ;LOAD STAT2
1906  010344  012037  001372                  MOV     (R0)+,STAT3     ;LOAD STAT3
1907  010350  012237  001230                  MOV     (R2)+,PASCNT    ;LOAD PASS COUNT
1908  010354  012237  001232                  MOV     (R2)+,ERRCNT    ;LOAD ERROR COUNT
1909  010360  012700  000002                  MOV     #2,R0           ;SAVE CORE THIS WAY.
1910  010364  013737  001404  001406          MOV     DMCSR,DMCSRH
1911  010372  005237  001406                  INC     DMCSRH
1912  010376  013737  001406  001410          MOV     DMCSRH,DMCTL
1913  010404  005237  001410                  INC     DMCTL
1914  010410  013737  001410  001412          MOV     DMCTL,DMP04
1915  010416  060037  001412                  ADD     R0,DMP04
1916  010422  013737  001412  001414          MOV     DMP04,DMP06
1917  010430  060037  001414                  ADD     R0,DMP06
1918
1919  010434  013737  001374  001376          MOV     DMRVEC,DMRLVL   ;PTY LVL
1920  010442  060037  001376                  ADD     R0,DMRLVL       ;
1921  010446  013737  001376  001400          MOV     DMRLVL,DMTVEC   ;TX VEC
1922  010454  060037  001400                  ADD     R0,DMTVEC       ;
1923  010460  013737  001400  001402          MOV     DMTVEC,DMTLVL   ;TX LVL
1924  010466  060037  001402                  ADD     R0,DMTLVL
1925
1926  010472  032737  000002  001236          BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED
1927  010500  001450                          BEQ     7$              ;BR IF NO
1928  010502                          4$:
1929  010502  005737  000042                  TST     @#42            ;RUNNING IN AUTO MODE?
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1930  010506  001045                        BNE     7$              ;BR IF YES
1931  010510  104402  005672                TYPE    ,MCRLF
1932  010514  104403                        INSTR                   ;GET TEST NO.
1933  010516  006131                        MTSTN
1934  010520  104405                        PARAM
1935  010522  000001                        1
1936  010524  001000                        1000
1937  010526  001226                        TSTNO
1938  010530     000                .BYTE   0
1939  010531     001                .BYTE   1
1940  010532  012700  012526                MOV     #TST1,R0
1941  010536  022710                5$:     CMP     (PC)+,(R0)      ;CMP FIRST WORD TO 12737
1942  010540  012737                        MOV     (PC)+,@(PC)+
1943  010542  001020                        BNE     6$              ;BR IF NOT SAME
1944  010544  023760  001226  000002        CMP     TSTNO,2(R0)     ;DOES TSTNO MATCH?
1945  010552  001014                        BNE     6$              ;BR IF NO
1946  010554  022760  001226  000004        CMP     #TSTNO,4(R0)    ;IS LAST WORD OK?
1947  010562  001010                        BNE     6$              ;BR IF NO
1948  010564  010037  001214                MOV     R0,RETURN       ;IT IS A LEGAL TEST SO DO IT
1949  010570  104402  005756                TYPE    ,MR
1950  010574  042737  000002  001236        BIC     #SW01,STRTSW
1951  010602  000412                        BR      8$
1952  010604  005720                6$:     TST     (R0)+           ;POP R0
1953  010606  020027  031762                CMP     R0,#TLAST+10    ;AT END YET?
1954  010612  001351                        BNE     5$              ;BR IF NO
1955  010614  104402  005666                TYPE    ,MQM            ;YES ILLEGAL TEST NO.
1956  010620  000730                        BR      4$              ;TRY AGAIN
1957
1958  010622  012737  012526  001214  7$:     MOV     #TST1,RETURN    ;PREPARE RETURN ADDRESS
1959  010630  013701  001404        8$:     MOV     DMCSR,R1        ;R1 = BASE DMC11 ADDRESS
1960  010634  000177  170354                JMP     @RETURN         ;GO START TESTING.
1961
1962
1963                                        ;ROUTINE USED TO "AUTO SIZE" THE DMC11
1964                                        ;CSR AND VECTOR.
1965                                        ;NOTE:  THE CSR MAY BE ANY WHERE IN THE FLOATING
1966                                        ;       ADDRESS RANGE (160000:164000)
1967                                        ;       AND THE VECTOR MAY BE ANY WHERE IN THE
1968                                        ;       FLOATING VECTOR RANGE (300:770)
1969                                        ;
1970
1971  010640                        AUTO.SIZE:
1972  010640  000005                        RESET                   ;INSURE A BUS INIT.
1973  010642  012702  001500        CSRMAP: MOV     #DM.MAP,R2      ;LOAD MAP POINTER.
1974  010646  005022                1$:     CLR     (R2)+           ;ZERO ENTIRE MAP
1975  010650  022702  001700                CMP     #DM.END,R2      ;ALL DONE?
1976  010654  001374                        BNE     1$              ;BR IF NO
1977  010656  005037  001310                CLR     DMNUM           ;SET OCTAL NUMBER OF DMC11'S TO 0
1978  010662  012702  001500                MOV     #DM.MAP,R2      ;R2 POINTS TO DMC MAP
1979  010666  005037  001306                CLR     DMACTV          ;CLEAR ACTIVE
1980  010672  032737  000001  001236        BIT     #SW00,STRTSW    ;QUESTIONS?
1981  010700  001002                        BNE     .+6             ;BR IF YES
1982  010702  000137  011460                JMP     7$              ;IF NO SKIP QUESTIONS
1983  010706  012737  000001  001256        MOV     #1,TEMP5        ;START WITH 1
1984  010714  104403                        INSTR
1985  010716  006451                        NUM
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1986  010720  104405                          PARAM
1987  010722  000001                          1
1988  010724  000020                          16.
1989  010726  001252                          TEMP3
1990  010730     000                          .BYTE   0
1991  010731     001                          .BYTE   1
1992  010732  013737  001252  001310          MOV     TEMP3,DMNUM     ;DMNUM = HOW MANY
1993  010740  104402  005672          12$:    TYPE    ,MCRLF
1994  010744  104410                          CONVRT                  ;TYPE WHICH DMC IS BEING DONE
1995  010746  012210                          WHICH                   ;TEMP5 IS WHICH DMC
1996  010750  005237  001256                  INC     TEMP5
1997  010754  104403                          INSTR
1998  010756  006511                          CSR
1999  010760  104405                          PARAM
2000  010762  160000                          160000
2001  010764  164000                          164000
2002  010766  001254                          TEMP4
2003  010770     000                          .BYTE   0
2004  010771     001                          .BYTE   1
2005  010772  013722  001254                  MOV     TEMP4,(R2)+     ;STORE CSR IN MAP
2006  010776  104403                          INSTR
2007  011000  006527                          VEC
2008  011002  104405                          PARAM
2009  011004  000000                          0
2010  011006  000776                          776
2011  011010  001254                          TEMP4
2012  011012     000                          .BYTE   0
2013  011013     001                          .BYTE   1
2014  011014  013712  001254                  MOV     TEMP4,(R2)      ;STORE VECTOR IN MAP
2015  011020  104402          10$:    TYPE
2016  011022  006550                          PRIO                    ;ASK WHAT BR LEVEL
2017  011024  004737  012474                  JSR     PC,INITY        ;GET RESPONSE
2018  011030  022703  000024                  CMP     #24,R3          ;
2019  011034  101014                          BHI     50$             ;BR IF LESS THAN 4
2020  011036  022703  000027                  CMP     #27,R3          ;
2021  011042  103411                          BLO     50$             ;BR IF GREATER THAN 7
2022  011044  012704  000011                  MOV     #11,R4          ;R4 = NUMBER OF SHIFTS
2023  011050  006303                          ASL     R3              ;SHIFT R3 LEFT
2024  011052  005304                          DEC     R4              ;DEC SHIFT COUNT
2025  011054  001375                          BNE     .-4             ;BR IF NOT DONE
2026  011056  042703  170777                  BIC     #170777,R3      ;BIC UNWANTED BITS
2027  011062  050312                          BIS     R3,(R2)         ;PUT BR LEVEL IN STATUS MAP
2028  011064  000403                          BR      8$              ;CONTINUE
2029  011066  104402          50$:    TYPE
2030  011070  005666                          MOM                     ;RESPONSE IS OUT OF LIMITS
2031  011072  000752                          BR      10$             ;TRY AGAIN
2032  011074  104402          8$:     TYPE
2033  011076  006607                          CRAM                    ;DOES DMC HAVE CRAM?
2034  011100  004737  012474                  JSR     PC,INITY        ;GET REPLY
2035  011104  022703  000131                  CMP     #131,R3
2036  011110  001427                          BEQ     9$              ;YES
2037  011112  022703  000116                  CMP     #116,R3         ;NO
2038  011116  001403                          BEQ     40$             ;NOT A Y OR N
2039  011120  104402                          TYPE
2040  011122  005666                          MOM                     ;TYPE "?"
2041  011124  000763                          BR      8$              ;ASK AGAIN
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2042  011126  104402                  40$:    TYPE
2043  011130  007341                          SPEED                   ;DMC11-AR OR DMC11-AL?
2044  011132  004737  012474                  JSR     PC,INTTY        ;GET RESPONSE
2045  011136  022703  000122                  CMP     #122,R3         ;IS IT R
2046  011142  001414                          BEQ     16$             ;BR IF REMOTE
2047  011144  022703  000114                  CMP     #114,R3         ;IS IT L
2048  011150  001403                          BEQ     41$             ;BR IF LOCAL
2049  011152  104402                          TYPE
2050  011154  005666                          MQM
2051  011156  000763                          BR      40$             ;TRY AGAIN
2052  011160  052762  000002  000004  41$:    BIS     #BIT1,4(R2)     ;SET BIT1 IN STAT3
2053  011166  000402                          BR      16$             ;CONTINUE
2054  011170  052712  100000          9$:     BIS     #BIT15,(R2)     ;SET BIT 15 IF CRAM
2055  011174                          16$:
2056
2057  011174  104402                          TYPE
2058  011176  006705                          MODU                    ;ASK WHICH LINE UNIT
2059  011200  004737  012474                  JSR     PC,INTTY        ;GET REPLY
2060  011204  022703  000021                  CMP     #21,R3          ;''1''
2061  011210  001417                          BEQ     30$
2062  011212  022703  000022                  CMP     #22,R3          ;''2''
2063  011216  001412                          BEQ     31$
2064  011220  022703  000116                  CMP     #116,R3         ;''N''
2065  011224  001403                          BEQ     32$
2066  011226  104402                          TYPE
2067  011230  005666                          MQM                     ;IF NOT A 1,2 OR N TYPE ''?''
2068  011232  000760                          BR      16$             ;TRY AGIAN
2069  011234  052722  010000          32$:    BIS     #BIT12,(R2)+    ;SET BIT 12 IN STAT2 IF NO LU
2070  011240  022222                          CMP     (R2)+,(R2)+     ;POP OVER STAT2 AND STAT3
2071  011242  000477                          BR      33$
2072  011244  052712  020000          31$:    BIS     #BIT13,(R2)     ;SET BIT 13 IN STAT2 IF M8202
2073  011250  104402                  30$:    TYPE
2074  011252  007115                          CONN                    ;ASK IF LOOP-BACK IS ON
2075  011254  004737  012474                  JSR     PC,INTTY        ;GET REPLY
2076  011260  022703  000131                  CMP     #131,R3         ;Y
2077  011264  001406                          BEQ     17$
2078  011266  022703  000116                  CMP     #116,R3         ;N
2079  011272  001436                          BEQ     18$
2080  011274  104402                          TYPE
2081  011276  005666                          MQM                     ;IF NOT Y OR N TYPE ''?''
2082  011300  000763                          BR      30$             ;TRY AGAIN
2083  011302  052722  040000          17$.    BIS     #BIT14,(R2)+    ;TURNAROUND IS CONNECTED
2084  011306  032762  020000  177776          BIT     #BIT13,-2(R2)   ; M8202?
2085  011314  001027                          BNE     19$
2086  011316                          440$:
2087
2088  011316  104402                          TYPE            ; ASK QUESTION
2089  011320  007455                          MV35            ; ABOUT MODEM TTYPE
2090  011322  004737  012474                  JSR     PC,INTTY        ; GET ANSWER.
2091  011326  122703  000104                  CMPB    #'D,R3          ; IS IT DMC11-DA?
2092  011332  001004                          BNE     442$            ; NO.
2093
2094  011334  042762  000004  000002          BIC     #BIT2,2(R2)     ; YES INDICATE IT IN STAT3
2095  011342  000411                          BR      441$
2096
2097  011344  122703  000106          442$:   CMPB    #'F,R3          ;IS IT A DMC11-FA (V.35)?
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```
 2098  011350  001403                          BEQ     443$            ; YES-TAKE CARE OF IT.
 2099
 2100  011352  104402                          TYPE                    ; NO ASK OPERATER WHATS GOING ON.
 2101  011354  005666                          MQM
 2102  011356  000757                          BR      440$            ; REASK QUESTION
 2103
 2104  011360  052762  000004  000002  443$:   BIS     #BIT2,2(R2)     ; YES V.35, RECORD IN STAT3
 2105
 2106  011366                          441$:                           ; END DECISION POINT.
 2107  011366  000402                          BR      19$
 2108  011370  042722  040000          18$:    BIC     #BIT14,(R2)+    ;NO TURNAROUND
 2109  011374                          19$:
 2110  011374  104403                          INSTR
 2111  011376  007017                          LINE
 2112  011400  104405                          PARAM
 2113  011402  000000                          0
 2114  011404  000377                          377
 2115  011406  001254                          TEMP4
 2116  011410     000                          .BYTE   0
 2117  011411     001                          .BYTE   1
 2118  011412  113722  001254                  MOVB    TEMP4,(R2)+     ;STORE SWITCH PAC IN MAP
 2119  011416  104403                          INSTR
 2120  011420  007055                          BM
 2121  011422  104405                          PARAM
 2122  011424  000000                          0
 2123  011426  000377                          377
 2124  011430  001254                          TEMP4
 2125  011432     000                          .BYTE   0
 2126  011433     001                          .BYTE   1
 2127  011434  113722  001254                  MOVB    TEMP4,(R2)+     ;STORE SWITCH PAC IN MAP
 2128  011440  005722                          TST     (R2)+           ;POP OVER STAT3
 2129  011442  005337  001252          33$:    DEC     TEMP3           ;DEC DMC COUNT
 2130  011446  001402                          BEQ     34$             ;BR IF DONE
 2131  011450  000137  010740                  JMP     12$             ;JUMP IF NOT
 2132  011454  000137  012110          34$:    JMP     13$             ;CONTINUE
 2133  011460  012701  160000          7$:     MOV     #160000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
 2134  011464  012737  012202  000004          MOV     #6$,@#4         ;SET FOR NON-EXISTANT DEVICE TIME OUT
 2135  011472  005011                  2$:     CLR     (R1)            ;CLEAR SEL0
 2136  011474  005711                          TST     (R1)            ;IF DMC11 DMCSR S/B 0
 2137  011476  001172                          BNE     3$              ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DMC11
 2138  011500  005061  000006                  CLR     6(R1)           ;CLEAR SEL6
 2139  011504  005761  000006                  TST     6(R1)           ;IF DMC11 THEN DMRIC S/B =0.
 2140  011510  001165                          BNE     3$              ;BR IF NOT DMC11
 2141  011512  012711  002000                  MOV     #BIT10,(R1)     ;SET ROMO
 2142  011516  005061  000004                  CLR     4(R1)           ;CLEAR SEL4
 2143  011522  012761  125252  000006          MOV     #125252,6(R1)   ;WRITE THIS TO SEL6
 2144  011530  052711  020000                  BIS     #BIT13,(R1)     ;WRITE IT!
 2145  011534  022761  125252  000004          CMP     #125252,4(R1)   ;WAS IT WRITTEN?
 2146  011542  001004                          BNE     21$             ;IF NO IT IS NOT CRAM
 2147  011544  052762  100000  000002          BIS     #BIT15,2(R2)    ;SET BIT15 IF CRAM
 2148  011552  000431                          BR      22$
 2149  011554  012711  001000          21$:    MOV     #BIT9,(R1)      ;SET ROM1
 2150  011560  012761  100430  000006          MOV     #100430,6(R1)   ;PUT INSTRUCTION IN SEL6
 2151  011566  012711  001400                  MOV     #BIT9!BIT8,(R1) ;CLOCK INSTRUCTION (MICRO PROC PC TO 0)
 2152  011572  012711  002000                  MOV     #BIT10,(R1)     ;SET ROMO
 2153  011576  022761  016472  000006          CMP     #016472,6(R1)   ;IS IT LOCAL CROM?
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2154  011604  001411                          BEQ     23$             ;BR IF YES
2155  011606  022761  016461  000006          CMP     #016461,6(R1)   ;IS IT REMOTE CROM?
2156  011614  001410                          BEQ     22$             ;BR IF YES
2157  011616  022761  177777  000006          CMP     #-1,6(R1)       ;NO CROM?
2158  011624  001404                          BEQ     22$             ;BR IF YES
2159  011626  000516                          BR      3$              ;NOT A DMC
2160  011630  052762  000002  000006  23$:    BIS     #BIT1,6(R2)     ;SET BIT 1 IN STAT3
2161                                  ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DMC11 CSR ADDRESS.
2162  011636  010122                  22$:    MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
2163  011640  012711  001000          15$:    MOV     #BIT9,(R1)      ;CLEAR LINE UNIT LOOP
2164  011644  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
2165  011650  012761  122113  000006          MOV     #122113,6(R1)   ;LOAD INSTRUCTION (CLR DTR)
2166  011656  052711  000400                  BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION
2167  011662  012761  021264  000006          MOV     #021264,6(R1)   ;LOAD INSTRUCTION
2168  011670  052711  000400                  BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION
2169  011674  122761  000377  000004          CMPB    #377,4(R1)      ;IS IT ALL ONES?
2170  011702  001003                          BNE     .+10            ;BR IF NO
2171  011704  052712  010000                  BIS     #BIT12,(R2)     ;IF YES, NO LINE UNIT, SET STATUS BIT
2172  011710  000436                          BR      20$
2173  011712  032761  000002  000004          BIT     #BIT1,4(R1)     ;IS SWITCH A ONE?
2174  011720  001403                          BEQ     .+10            ;BR IF M8201
2175  011722  052712  060000                  BIS     #BIT13!BIT14,(R2) ;M8202 ASSUME CONNECTOR
2176  011726  000427                          BR      20$             ;CONNECTOR ON)
2177  011730  032761  000010  000004          BIT     #BIT3,4(R1)     ;IS MRDY SET
2178  011736  001023                          BNE     20$             ;BR IF M8201 NO CONNECTOR (ON LINE)
2179  011740  012761  000100  000004          MOV     #BIT6,4(R1)     ;LOAD PORT4
2180  011746  012761  122113  000006          MOV     #122113,6(R1)   ;LOAD INSTRUCTION
2181  011754  052711  000400                  BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION(SET DTR)
2182  011760  012761  021264  000006          MOV     #021264,6(R1)   ;LOAD INSTRUCTION
2183  011766  052711  000400                  BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION(READ MODEM REG)
2184  011772  032761  000010  000004          BIT     #BIT3,4(R1)     ;IS MRDY SET NOW?
2185  012000  001402                          BEQ     20$             ;BR IF NO CONNECTOR
2186  012002  052712  040000                  BIS     #BIT14,(R2)     ;SET STATUS BIT FOR CONNECTOR
2187  012006  005722                  20$:    TST     (R2)+           ;POP POINTER
2188  012010  012761  021324  000006          MOV     #021324,6(R1)   ;PUT INSTRUCTION IN PORT6
2189  012016  012711  001400                  MOV     #BIT9!BIT8,(R1) ;PORT4_LU 15
2190  012022  156122  000004                  BISB    4(R1),(R2)+     ;STORE DDCMP LINE # IN TABLE
2191  012026  012761  021344  000006          MOV     #021344,6(R1)   ;PORT6_INSTRUCTION
2192  012034  012711  001400                  MOV     #BIT8!BIT9,(R1) ;CLOCK_INSTR.
2193  012040  156122  000004                  BISB    4(R1),(R2)+     ;STORE BM873 ADD IN TABLE
2194  012044  005722                          TST     (R2)+           ;POP OVER STAT3
2195  012046  005011                          CLR     (R1)            ;CLEAR ROMI
2196  012050  005237  001310                  INC     DMNUM           ;UPDATE DEVICE COUNTER
2197  012054  022737  000020  001310          CMP     #20,DMNUM       ;ARE MAX. NO. OF DEV FOUND?
2198  012062  001412                          BEQ     13$             ;YES DON'T LOOK FOR ANY MORE.
2199  012064  005011                  3$:     CLR     (R1)            ;CLEAR BIT 10
2200  012066  005061  000006                  CLR     6(R1)           ;CLEAR SEL 6
2201  012072  062701  000010          14$:    ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
2202  012076  022701  164000                  CMP     #164000,R1
2203  012102  001402                          BEQ     13$             ;BR IF DONE
2204  012104  000137  011472                  JMP     2$              ;JUMP IF NOT
2205  012110  005037  001306          13$:    CLR     DMACTV
2206  012114  005737  001310                  TST     DMNUM           ;WERE ANY DMC11'S FOUND AT ALL?
2207  012120  001423                          BEQ     5$              ;FRROR AUTO SIZER FOUND NO DMC11'S IN THIS SYS.
2208  012122  013701  001310                  MOV     DMNUM,R1
2209  012126  010137  001314                  MOV     R1,SAVNUM       ;SAVE NUMBER OF DEVICES
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2210  012132  000241                    4$:     CLC
2211  012134  006137  001306                    ROL     DMACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
2212  012140  005237  001306                    INC     DMACTV          ;SET THE BIT
2213  012144  005301                            DEC     R1
2214  012146  001371                            BNE     4$              ;BR IF MORE TO GENERATE
2215  012150  012737  000006  000004            MOV     #6,@#4          ;RESTORE TRAP VECTOR
2216  012156  013737  001306  001312            MOV     DMACTV,SAVACT   ;SAVE ACTIVE REGISTER
2217  012164  000137  012216                    JMP     VECMAP          ;GO FIND THE VECTOR NOW.
2218  012170  104402  005761            5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DMC11'S FOUND.
2219  012174  005000                            CLR     R0              ;MAKE DATA LIGHTS ZERO
2220  012176  000000                            HALT                    ;STOP THE SHOW
2221  012200  000776                            BR      .-2             ;DISABLE CONT. SW.
2222  012202  012716  012072            4$:     MOV     #14$,(SP)       ;ENTERED BY NON-EXISTANT TIME-OUT.
2223  012206  000002                            RTI                     ;RETURN TO MAINSTREAM
2224
2225  012210  000001                    WHICH:  1
2226  012212     002     002                    .BYTE   2,2
2227  012214  001256                            TEMP5
2228
2229  012216  032737  000001  001236  VECMAP: BIT     #SW00,STRTSW
2230  012224  001114                            BNE     5$
2231  012226  012737  000340  000022            MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
2232  012234  012737  012410  000020            MOV     #4$,@#20        ;SET IOT TRAP VECTOR
2233  012242  012702  001500                    MOV     #DM.MAP,R2      ;SET SOFTWARE POINTER
2234  012246  012700  000300                    MOV     #300,R0         ;FLOATING VECTORS START HERE.
2235  012252  012701  000302                    MOV     #302,R1         ;PC OF IOT INSTR.
2236  012256  010120                    1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
2237  012260  012721  000004                    MOV     #4,(R1)+        ;WITH .+2; IOT
2238  012264  022021                            CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
2239  012266  020127  001000                    CMP     R1,#1000
2240  012272  101771                            BLOS    1$              ;BR IF MORE TO FILL
2241  012274  013737  001306  001246            MOV     DMACTV,TEMP1    ;STORE TEMPORALLY
2242  012302  006037  001246            2$:     ROR     TEMP1           ;BRING OUT A BIT
2243  012306  103063                            BCC     5$              ;BR IF ALL DONE
2244  012310  012704  000012                    MOV     #12,R4          ;R4 IS INDEX REGISTER
2245  012314  016437  012460  177776            MOV     BRLVL(R4),PS    ;SET PS TO 7
2246  012322  011201                            MOV     (R2),R1
2247  012324  012761  000200  000004            MOV     #200,4(R1)
2248  012332  012711  001000                    MOV     #BIT9,(R1)      ;SET ROMI
2249  012336  012761  121111  000006            MOV     #121111,6(R1)   ;PUT INSTRUCTION IN PORT6
2250  012344  012711  001400                    MOV     #BIT9!BIT8,(R1) ;FORCE AN INTERRUPT
2251  012350  105200                    7$:     INCB    R0              ;STALL
2252  012352  001376                            BNE     .-2             ;FOR TIME TO INTERUPT
2253  012354  162704  000002                    SUB     #2,R4           ;GET NEXT LOWEST PS LEVEL
2254  012360  001404                            BEQ     6$              ;BR IF R4 = 0
2255  012362  016437  012460  177776            MOV     BRLVL(R4),PS    ;MOVE NEXT LOWER LEVEL IN PS
2256  012370  000767                            BR      7$              ;BR TO DELAY
2257  012372  052762  005300  000002    6$:     BIS     #5300,2(R2)     ;NO INTERUPT ASSUME 300 AT LEVEL 5 AND FIX DMC11 LATER
2258  012400  005011                    3$:     CLR     (R1)            ;CLEAR ROMI
2259  012402  062702  000010                    ADD     #10,R2          ;POP SOFTWARE POINTER
2260  012406  000735                            BR      2$              ;KEEP GOING
2261  012410  051662  000002            4$:     BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
2262  012414  042762  000007  000002            BIC     #7,2(R2)        ;CLEAR JUNK
2263  012422  016405  012462                    MOV     BRLVL+2(R4),R5  ;GET BR LEVEL OF DMC11
2264  012426  006305                            ASL     R5              ;SHIFT LEVEL 4 PLACES
2265  012430  006305                            ASL     R5              ;TO THE LEFT FOR THE
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                                        ASL     R5              ;STATUS TABLE
                                        ASL     R5
                                        BIC     #170777,R5      ;CLEAR UNWANTED BITS
                                        BIS     R5,2(R2)        ;PUT BR LEVEL IN STATUS TABLE
                                        CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
                                        MOV     #3$,(SP)        ;SET FOR RETURN
                                        RTI
                                5$:     RTS     PC              ;ALL DONE WITH "AUTO SIZING"

                                BPLVL:  0       ;LEVEL 0
                                        0       ;LEVEL 0
                                        200     ;LEVEL 4
                                        240     ;LEVEL 5
                                        300     ;LEVEL 6
                                        340     ;LEVEL 7


                                INTTY:  TSTB    @TKCSR          ;WAIT FOR DONE
                                        BPL     .-4
                                        MOV     @TKDBR,R3       ;PUT CHAR IN R3
                                        TSTB    @TPCSR          ;WAIT UNTIL PRINTER IS READY
                                        BPL     .-4
                                        MOV     R3,@TPDBR       ;ECHO CHAR
                                        BIC     #BIT7!BIT5,R3   ;MASK OFF LOWER CASE
                                        RTS     PC              ;RETURN


                                ;************************** TEST 1 **************************
                                ;*OUT CONTROL REGISTER READ/ONLY TEST
                                ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
                                ;*BITS ARE IN THE CORRECT STATE
                                ;:********************************************************************

                                ;  TEST 1
                                ;--------------
                        TST1:   MOV     #1,TSTNO
                                MOV     #TST2,NEXT
                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
                                CLR     @DMCSR          ;CLEAR SEL0
                                MOV     #11,R2          ;SAVE R2 FOR TYPEOUT
                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
                                021004!<20*11>          ;PORT4 LINE UNIT REG 11
                                MOV     4(R1),R4        ;PUT "FOUND" IN R4
                                BIC     #54,R4          ;CLEAR UNKNOWN BITS
                                MOV     #20,R5          ;PUT "EXPECTED" IN R5
                                CMPB    R5,R4           ;IS OUT READY SET?
                                BEQ     1$              ;BR IF YES
                                HLT     2               ;ERROR IN LU 11
                        1$:     SCOPE                   ;SCOPE THIS TEST


                                ;************************** TEST 2 **************************
                                ;*IN CONTROL REGISTER READ/ONLY TEST
                                ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
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2322                                    ;*BITS ARE IN THE CORRECT STATE
2323                                    ;*****************************************************************
2324
2325                                    ;  TEST 2
2326                                    ;--------------
2327  012602  012737  000002  001226  TST2:  MOV     #2,TSTNO
2328  012610  012737  012650  001216         MOV     #TST3,NEXT
2329                                                            ;R1 CONTAINS BASE DMC11 ADDRESS
2330  012616  012702  000012                 MOV     #12,R2        ;SAVE R2 FOR TYPEOUT
2331  012622  104414                         ROMCLK                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2332  012624  021244                         021004.<20*12>        ;PORT4 LINE UNIT REG 12
2333  012626  016104  000004                 MOV     4(R1),R4      ;PUT "FOUND" IN R4
2334  012632  042704  000017                 BIC     #17,R4        ;CLEAR UNKNOWN BITS
2335  012636  005005                         CLR     R5            ;PUT "EXPECTED" IN R5
2336  012640  120504                         CMPB    R5,R4         ;ARE ALL BITS CLEARED?
2337  012642  001401                         BEQ     1$            ;BR IF YES
2338  012644  104002                         HLT     2             ;ERROR IN LU 12
2339  012646  104400               1$:       SCOPE                 ;SCOPE THIS TEST
2340
2341
2342                                    ;***************************** TEST 3 ***************************
2343                                    ;*MODEM CONTROL REGISTER READ/ONLY TEST
2344                                    ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
2345                                    ;*BITS ARE IN THE CORRECT STATE
2346                                    ;*****************************************************************
2347
2348                                    ;  TEST 3
2349                                    ;--------------
2350  012650  012737  000003  001226  TST3:  MOV     #3,TSTNO
2351  012656  012737  012722  001216         MOV     #TST4,NEXT
2352                                                            ;R1 CONTAINS BASE DMC11 ADDRESS
2353  012664  104412                         MSTCLR                ;MASTER CLEAR DMC11
2354  012666  012702  000013                 MOV     #13,R2        ;SAVE R2 FOR TYPEOUT
2355  012672  104414                         ROMCLK                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2356  012674  021264                         021004!<20*13>        ;PORT4 LINE UNIT REG 13
2357  012676  016104  000004                 MOV     4(R1),R4      ;PUT "FOUND" IN R4
2358  012702  042704  000213                 BIC     #213,R4       ;CLEAR UNKNOWN BITS
2359  012706  012705  000100                 MOV     #100,R5       ;PUT "EXPECTED" IN R5
2360  012712  120504                         CMPB    R5,R4         ;ARE RING, DTR,  AND MODEM READY SET?
2361  012714  001401                         BEQ     1$            ;BR IF YES
2362  012716  104002                         HLT     2             ;ERROR IN LU 13
2363  012720  104400               1$:       SCOPE                 ;SCOPE THIS TEST
2364
2365
2366                                    ;***************************** TEST 4 ***************************
2367                                    ;*MAINTENANCE REGISTER READ/ONLY TEST
2368                                    ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
2369                                    ;*BITS ARE IN THE CORRECT STATE
2370                                    ;*****************************************************************
2371
2372                                    ;  TEST 4
2373                                    ;--------------
2374  012722  012737  000004  001226  TST4:  MOV     #4,TSTNO
2375  012730  012737  013024  001216         MOV     #TST5,NEXT
2376                                                            ;R1 CONTAINS BASE DMC11 ADDRESS
2377  012736  104412                         MSTCLR                ;MASTER CLEAR DMC11
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2378  012740  012702  000017                MOV     #17,R2          ;SAVE R2 FOR TYPEOUT
2379  012744  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2380  012746  021364                       021004!<20*17>          ;PORT4 LINE UNIT REG 17
2381  012750  016104  000004               MOV     4(R1),R4        ;PUT "FOUND" IN R4
2382  012754  042704  000206               BIC     #206,R4         ;CLEAR UNKNOWN BITS
2383  012760  012705  000051               MOV     #51,R5          ;PUT "EXPECTED" IN R5
2384  012764  032737  020000  001366       BIT     #BIT13,STAT1    ;IS LU AN M8202 OR M8201?
2385  012772  001004                       BNE     2$              ;BR IF M8202
2386  012774  032737  040000  001366       BIT     #BIT14,STAT1    ;CONNECTOR???
2387  013002  001004                       BNE     3$              ;BR IF M8201 WITH CONNECTOR
2388  013004  042704  000040          2$:  BIC     #40,R4          ;MASK OFF SI BIT IF M8202 OR M8201, NO CONNECTOR
2389  013010  042705  000040               BIC     #BIT5,R5        ;SI BIT IS UNKNOWN
2390  013014                         3$:
2391  013014  120504                       CMPB    R5,R4           ;ARE SI AND ICIR SET?
2392  013016  001401                       BEQ     1$              ;BR IF YES
2393  013020  104002                       HLT     2               ;ERROR IN LU 17
2394  013022  104400                  1$:  SCOPE                   ;SCOPE THIS TEST
2395
2396
2397                                       ;************************** TEST 5 **************************
2398                                       ;*LINE UNIT REGISTER WRITE/READ TEST
2399                                       ;*SET BIT5 IN LU REGISTER 12, VERIFY IT IS SET
2400                                       ;*CLEAR BIT5 IN LU REGISTER 12, VERIFY IT IS CLEAR
2401                                       ;;*********************************************************************
2402
2403                                       ;  TEST 5
2404                                       ;--------------
2405  013024  012737  000005  001226  TST5: MOV     #5,TSTNO
2406  013032  012737  013164  001216       MOV     #TST6,NEXT
2407  013040  012737  013054  001220       MOV     #1$,LOCK
2408                                                               ;R1 CONTAINS BASE DMC11 ADDRESS
2409  013046  104412                       MSTCLR                  ;MASTER CLEAR DMC11
2410  013050  012702  000012               MOV     #12,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
2411  013054  012761  000040  000004  1$:  MOV     #40,4(R1)       ;LOAD PORT4
2412  013062  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2413  013064  122112                       122112                  ;SET BIT5 IN LU-12
2414  013066  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2415  013070  021245                       021245                  ;READ LU-12
2416  013072  012705  000040               MOV     #40,R5          ;PUT "EXPECTED" IN R5
2417  013076  116104  000005               MOVB    5(R1),R4        ;PUT "FOUND" IN R4
2418  013102  042704  000337               BIC     #337,R4         ;CLEAR UNWANTED BITS
2419  013106  120504                       CMPB    R5,R4           ;IS BIT5 SET?
2420  013110  001401                       BEQ     2$              ;BR IF YES
2421  013112  104003                       HLT     3               ;ERROR, BIT 5 IS NOT SET
2422  013114  104401                  2$:  SCOP1                   ;SCOPE SUBTEST (SW09-1)
2423  013116  012737  013124  001220       MOV     #3$,LOCK        ;NEW SCOP1
2424  013124  005061  000004          3$:  CLR     4(R1)           ;LOAD PORT4
2425  013130  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2426  013132  122112                       122112                  ;CLEAR BIT 5 IN LU-12
2427  013134  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
2428  013136  021245                       021245                  ;READ LU-12
2429  013140  005005                       CLR     R5              ;PUT "EXPECTED" IN R5
2430  013142  116104  000005               MOVB    5(R1),R4        ;PUT "FOUND" IN R4
2431  013146  042704  000337               BIC     #337,R4         ;CLEAR UNWANTED BITS
2432  013152  120504                       CMPB    R5,R4           ;IS BIT5 CLEAR?
2433  013154  001401                       BEQ     4$              ;BR IF YES
```

```
2434  013156  104003                          HLT     3               ;ERROR, BIT5 IS NOT CLEAR
2435  013160  104401                  4$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
2436  013162  104400                          SCOPE                   ;SCOPE THIS TEST
2437
2438
2439                                          ;*************************** TEST 6 ***************************
2440                                          ;*LINE UNIT REGISTER WRITE/READ TEST
2441                                          ;*SET BIT1 IN LU REGISTER 17, VERIFY IT IS SET
2442                                          ;*CLEAR BIT1 IN LU REGISTER 17, VERIFY IT IS CLEAR
2443                                          ;:*************************************************************
2444
2445                                          ;  TEST 6
2446                                          ;--------------
2447  013164  012737  000006  001226  TST6:   MOV     #6,TSTNO
2448  013172  012737  013324  001216          MOV     #TST7,NEXT
2449  013200  012737  013214  001220          MOV     #1$,LOCK
2450                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
2451  013206  104412                          MSTCLR                  ;MASTER CLEAR DMC11
2452  013210  012702  000017                  MOV     #17,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
2453  013214  012761  000001  000004  1$:     MOV     #1,4(R1)        ;LOAD PORT4
2454  013222  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2455  013224  122117                          122117                  ;SET BIT1 IN LU-17
2456  013226  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2457  013230  021365                          021365                  ;READ LU-17
2458  013232  012705  000001                  MOV     #1,R5           ;PUT "EXPECTED" IN R5
2459  013236  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" IN R4
2460  013242  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
2461  013246  120504                          CMPB    R5,R4           ;IS BIT1 SET?
2462  013250  001401                          BEQ     2$              ;BR IF YES
2463  013252  104003                          HLT     3               ;ERROR, BIT 1 IS NOT SET
2464  013254  104401                  2$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
2465  013256  012737  013264  001220          MOV     #3$,LOCK        ;NEW SCOP1
2466  013264  005061  000004          3$:     CLR     4(R1)           ;LOAD PORT4
2467  013270  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2468  013272  122117                          122117                  ;CLEAR BIT 1 IN LU-17
2469  013274  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2470  013276  021365                          021365                  ;READ LU-17
2471  013300  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
2472  013302  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" IN R4
2473  013306  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
2474  013312  120504                          CMPB    R5,R4           ;IS BIT1 CLEAR?
2475  013314  001401                          BEQ     4$              ;BR IF YES
2476  013316  104003                          HLT     3               ;ERROR, BIT1 IS NOT CLEAR
2477  013320  104401                  4$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
2478  013322  104400                          SCOPE                   ;SCOPE THIS TEST
2479
2480
2481                                          ;*************************** TEST 7 ***************************
2482                                          ;*LINE UNIT REGISTER WRITE/READ TEST
2483                                          ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 13
2484                                          ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 13
2485                                          ;:*************************************************************
2486
2487                                          ;  TEST 7
2488                                          ;--------------
2489  013324  012737  000007  001226  TST7:   MOV     #7,TSTNO
```

```
2490  013332  012737  013534  001216          MOV     #TST10,NEXT
2491  013340  012737  013360  001220          MOV     #64$,LOCK
2492
2493  013346  104412                          MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
2494  013350  012702  000013                  MOV     #13,R2          ;MASTER CLEAR DMC11
2495  013354  012700  000001                  MOV     #1,R0           ;SAVE REGISTER ADDRESS FOR TYPEOUT
2496  013360                          64$:    MOV     #1,R0           ;START WITH BIT 0
2497  013360  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2498  013364  042761  000257  000004          BIC     #257,4(R1)      ;CLEAR UNWANTED BITS
2499  013372  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2500  013374  122113                          122100!13               ;MOV DATA TO IBUS REGISTER 13
2501  013376  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2502  013400  021265                          21005!<13*20>           ;READ FROM IBUS REGISTER 13
2503  013402  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
2504  013404  042705  000257                  BIC     #257,R5         ;CLEAR UNWANTED BITS
2505  013410  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
2506  013414  042704  000257                  BIC     #257,R4         ;CLEAR UNWANTED BITS
2507  013420  120504                          CMPB    R5,R4           ;DATA CORRECT?
2508  013422  001401                          BEQ     65$             ;BR IF YES
2509  013424  104003                          HLT     3               ;ERROR
2510  013426  104401                  65$:    SCOP1                   ;SW09=1?
2511  013430  000241                          CLC                     ;CLEAR CARRY
2512  013432  106100                          ROLB    R0              ;SHIFT BIT IN R0
2513  013434  001351                          BNE     64$             ;IF R0=0 THEN DONE
2514  013436  012737  013452  001220          MOV     #67$,LOCK       ;NEW SCOP1
2515  013444  012700  000001                  MOV     #1,R0           ;START WITH BIT 0
2516  013450  005100                  69$:    COM     R0              ;CHANGE TO FLOATING ZERO
2517  013452                          67$:
2518  013452  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2519  013456  042761  000257  000004          BIC     #257,4(R1)      ;CLEAR UNWANTED BITS
2520  013464  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2521  013466  122113                          122100!13               ;MOV DATA TO IBUS REGISTER 13
2522  013470  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2523  013472  021265                          21005!<13*20>           ;READ FROM IBUS REGISTER 13
2524  013474  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
2525  013476  042705  000257                  BIC     #257,R5         ;CLEAR UNWANTED BITS
2526  013502  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
2527  013506  042704  000257                  BIC     #257,R4         ;CLEAR UNWANTED BITS
2528  013512  120504                          CMPB    R5,R4           ;DATA CORRECT?
2529  013514  001401                          BEQ     68$             ;BR IF YES
2530  013516  104003                          HLT     3               ;ERROR
2531  013520  104401                  68$:    SCOP1                   ;SW09=1?
2532  013522  005100                          COM     R0              ;CHANGE TO FLOATING 1
2533  013524  000241                          CLC                     ;CLEAR CARRY
2534  013526  106100                          ROLB    R0              ;SHIFT BIT IN R0
2535  013530  001347                          BNE     69$             ;IF R0=0 THEN DONE
2536  013532  104400                          SCOPE                   ;SCOPE THIS TEST
2537
2538
2539                                  ;************************** TEST 10 ************************
2540                                  ;*LINE UNIT REGISTER WRITE/READ TEST
2541                                  ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 14
2542                                  ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 14
2543                                  ;;*********************************************************
2544
2545                                  .   TEST 10
```

```
2546
2547  013534  012737  000010  001226  TST10:  MOV     #10,TSTNO
2548  013542  012737  013710  001216          MOV     #TST11,NEXT
2549  013550  012737  013570  001220          MOV     #64$,LOCK
2550
2551  013556  104412                          MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
2552  013560  012702  000014                  MOV     #14,R2          ;MASTER CLEAR DMC11
2553  013564  012700  000001                  MOV     #1,R0           ;SAVE REGISTER ADDRESS FOR TYPEOUT
2554  013570                          64$:    ;START WITH BIT 0
2555  013570  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2556  013574  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2557  013576  122114                          122100!14               ;MOV DATA TO IBUS REGISTER 14
2558  013600  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2559  013602  021305                          21005!<14*20>           ;READ FROM IBUS REGISTER 14
2560  013604  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
2561  013606  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
2562  013612  120504                          CMPB    R5,R4           ;DATA CORRECT?
2563  013614  001401                          BEQ     65$             ;BR IF YES
2564  013616  104003                          HLT     3               ;ERROR
2565  013620  104401                  65$:    SCOP1                   ;SW09=1?
2566  013622  000241                          CLC                     ;CLEAR CARRY
2567  013624  106100                          ROLB    R0              ;SHIFT BIT IN R0
2568  013626  001360                          BNE     64$             ;IF R0=0 THEN DONE
2569  013630  012737  013644  001220          MOV     #67$,LOCK       ;NEW SCOP1
2570  013636  012700  000001                  MOV     #1,R0           ;START WITH BIT 0
2571  013642  005100                  69$:    COM     R0              ;CHANGE TO FLOATING ZERO
2572  013644                          67$:
2573  013644  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2574  013650  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2575  013652  122114                          122100!14               ;MOV DATA TO IBUS REGISTER 14
2576  013654  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2577  013656  021305                          21005!<14*20>           ;READ FROM IBUS REGISTER 14
2578  013660  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
2579  013662  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
2580  013666  120504                          CMPB    R5,R4           ;DATA CORRECT?
2581  013670  001401                          BEQ     68$             ;BR IF YES
2582  013672  104003                          HLT     3               ;ERROR
2583  013674  10440'                  68$:    SCOP1                   ;SW09=1?
2584  013676  005100                          COM     R0              ;CHANGE TO FLOATING 1
2585  013700  000241                          CLC                     ;CLEAR CARRY
2586  013702  106100                          ROLB    R0              ;SHIFT BIT IN R0
2587  013704  001356                          BNE     69$             ;IF R0=0 THEN DONE
2588  013706  104400                          SCOPE                   ;SCOPE THIS TEST
2589
2590
2591                                  ;****************************** TEST 11 ************************
2592                                          ;*SWITCH PAC TEST
2593                                          ;*THIS TEST READS SWITCH PAC#1
2594                                          ;*THIS SWITCH PAC CONTAINS THE DDCMP LINE #
2595                                  ;;*******************************************************************
2596
2597                                  ;  TEST 11
2598                                  ;--------------
2599  013710  012737  000011  001226  TST11:  MOV     #11,TSTNO
2600  013716  012737  013752  001216          MOV     #TST12,NEXT
2601                                                          ;R1 CONTAINS BASE DMC11 ADDRESS
```

```
                                        MSTCLR                  ;MASTER CLEAR DMC11
                                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
013724  104412                                  021324                  ;PORT4 LU15
013726  104414                                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
013730  021324                                  MOVB    STAT2,R5        ;PUT "EXPECTED" IN R5
013732  016104  000004                         CMPB    R5,R4           ;SW OK?
013736  113705  001370                         BEQ     1$              ;BR IF YES
013742  120504                                  HLT     31              ;ERROR, SWITCH PAC READ ERROR
013744  001401                          1$:     SCOPE                   ;SCOPE THIS TEST
013746  104031
013750  104400

                                        ;************************** TEST 12 ************************
                                                ;*SWITCH PAC TEST
                                                ;*THIS TEST READS SWITCH PAC#2
                                                ;*THIS SWITCH PAC CONTAINS THE BM873 BOOT ADD
                                        ;:*******************************************************

                                        ;  TEST 12
                                        ;-------------
013752  012737  000012  001226  TST12:  MOV     #12,TSTNO
013760  012737  014014  001216          MOV     #TST13,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
013766  104412                          MSTCLR                 ;MASTER CLEAR DMC11
013770  104414                          ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
013772  021344                                  021344                  ;PORT4 LU16
013774  016104  000004                         MOV     4(R1),R4        ;PUT "FOUND" IN R4
014000  113705  001371                         MOVB    STAT2+1,R5      ;PUT "EXPECTED" IN R5
014004  120504                                  CMPB    R5,R4           ;SW OK?
014006  001401                                  BEQ     1$              ;BR IF YES
014010  104031                                  HLT     31              ;ERROR, SWITCH PAC READ ERROR
014012  104400                          1$:     SCOPE                   ;SCOPE THIS TEST

                                        ;************************** TEST 13 ************************
                                                ;*LINE UNIT CLOCK TEST
                                                ;*THIS TEST VERIFYS THAT THE LU INTERNAL CLOCK
                                                ;*(BIT 1 IN LU-17) IS WORKING
                                        ;:*******************************************************

                                        ;  TEST 13
                                        ;-------------
014014  012737  000013  001226  TST13:  MOV     #13,TSTNO
014022  012737  014114  001216          MOV     #TST14,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
014030  104412                          MSTCLR                 ;MASTER CLEAR DMC11
014032  005037  001416                          CLR     TEMP            ;PREPARE FOR DELAY
014036                                  1$:
014036  104414                          ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014040  021364                                  021364                  ;PORT4 LU-17
014042  032761  000002  000004                 BIT     #2,4(R1)        ;IS CLOCK BIT SET?
014050  001004                                  BNE     2$              ;BR IF YES
014052  005237  001416                         INC     TEMP            ;DELAY
014056  001367                                  BNE     1$      ;DELAY FINISHED?
014060  104004                                  HLT     4               ;ERROR BIT IS STUCK CLEAR
014062  005037  001416                  2$:     CLR     TEMP            ;PREPARE FOR DELAY
014066                                  3$:
```

```
2658  014066  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2659  014070  021364                                  02'364          ;PORT4 LU-17
2660  014072  032761  000002  000004                  BIT     #2,4(R1)        ;IS CLOCK BIT CLEAR?
2661  014100  001404                                  BEQ     4$              ;BR IF YES
2662  014102  005237  001416                          INC     TEMP            ;DELAY
2663  014106  00'367                                  BNE     3$              ;BR IF DELAY NOT DONE
2664  014110  104004                                  HLT     4               ;ERROR BIT IS STUCK SET
2665  014112  104400                          4$:     SCOPE
2666
2667
2668                                          ;************************** TEST 14 *************************
2669                                          ;*OUT DATA SILO TEST
2670                                          ;*SET SOM AND LOAD OUT DATA SILO
2671                                          ;*VERIFY THAT OCOR SET, INDICATING THAT THE
2672                                          ;*CHARACTER IS AT THE BOTTOM OF THE OUT SILO
2673                                          ;;*********************************************************************
2674
2675                                          ;  TEST 14
2676                                          ;-------------
2677  014114  012737  000014  001226  TST14:  MOV     #14,TSTNO
2678  014122  012737  014230  001216          MOV     #TST15,NEXT
2679                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
2680  014130  104412                          MSTCLR                  ;MASTER CLEAR DMC11
2681  014132  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
2682  014136  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
2683  014140  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
2684  014142  004737  033676                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
2685  014146  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2686  014152  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
2687  014160  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2688  014162  122111                          122111                  ;SET SOM
2689  014164  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2690  014166  122110                          122110                  ;LOAD OUT DATA SILO
2691  014170  104416  000002                  TIMER,  2               ;WAIT FOR OCOR
2692  014174  012702  000017                  MOV     #17,R2          ;SAVE ADDRESS FOR TYPEOUT
2693  014200  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2694  014202  021364                          021364                  ;PORT4 LU 17
2695  014204  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
2696  014210  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
2697  014214  012705  000020                  MOV     #20,R5          ;PUT "EXPECTED" IN R5
2698  014220  120504                          CMPB    R5,R4           ;IS OCOR SET?
2699  014222  001401                          BEQ     1$              ;BR IF YES
2700  014224  104005                          HLT     5
2701  014226                          1$:
2702  014226  104400                          SCOPE                   ;SCOPE THIS TEST
2703
2704
2705                                          ;************************** TEST 15 *************************
2706                                          ;*BITSTUFF TEST OF RTS AND OUT ACTIVE
2707                                          ;*SET SOM AND LOAD OUT DATA SILO
2708                                          ;*SINGLE STEP 2 DATA CLOCKS, VERIFY
2709                                          ;*THAT RTS AND ACTIVE ARE SET
2710                                          ;;*********************************************************************
2711
2712                                          ;  TEST 15
2713                                          ;-------------
```

```
2714  014230  012737  000015  001226  TST15:  MOV     #15,TSTNO
2715  014236  012737  014402  001216          MOV     #TST16,NEXT
2716                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
2717  014244  104412                          MSTCLR                  ;MASTER CLEAR DMC11
2718  014246  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
2719  014252  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2720  014254  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
2721  014256  004737  033676                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
2722  014262  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2723  014266  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
2724  014274  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2725  014276  122111                          122111                  ;SET SOM
2726  014300  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2727  014302  122110                          122110                  ;LOAD OUT DATA SILO
2728  014304  004737  032346                  JSR     PC,OCOR         ;WAIT FOR OCOR
2729  014310  104415  000002                  DATACLK,        2       ;CLOCK DATA FOUR TIMES
2730  014314  012702  000011                  MOV     #11,R2          ;SAVE ADDRESS FOR TYPEOUT
2731  014320  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2732  014322  021224                          021224                  ;PORT4 LU 11
2733  014324  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
2734  014330  042704  000257                  BIC     #257,R4         ;CLEAR UNWANTED BITS
2735  014334  012705  000120                  MOV     #120,R5         ;PUT "EXPECTED" IN R5
2736  014340  120504                          CMPB    R5,R4           ;IS ACTIVE SET?                 :
2737  014342  001401                          BEQ     1$              ;BR IF YES
2738  014344  104005                          HLT     5
2739  014346                          1$:
2740  014346  012702  000013                  MOV     #13,R2          ;SAVE ADDRESS FOR TYPEOUT
2741  014352  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2742  014354  021264                          021264                  ;PORT4 LU 13
2743  014356  016104  000004                  MOV     4(R1),R4        ;PUT EXPECTED IN R4
2744  014362  042704  000337                  BIC     #337,R4         ;CLEAR UNWANTED BITS
2745  014366  012705  000040                  MOV     #BIT5,R5        ;PUT "EXPECTED" IN R5, RTS SHOULD BE SET
2746  014372  120504                          CMPB    R5,R4           ;IS RTS OK?
2747  014374  001401                          BEQ     2$              ;BR IF YES
2748  014376  104005                          HLT     5               ;RTS ERROR
2749  014400                          2$:
2750  014400  104400                          SCOPE                   ;SCOPE THIS TEST
2751
2752
2753                                          ;************************** TEST 16 *************************
2754                                          ;*TEST OF OUT CLEAR
2755                                          ;*SET SOM AND LOAD OUT DATA SILO
2756                                          ;*SINGLE STEP DATA CLOCK, SET OUT CLEAR
2757                                          ;*VERIFY THAT OCOR,RTS, AND ACTIVE ARE CLEARED
2758                                          ;:*********************************************************
2759
2760                                          ;  TEST 16
2761                                          ;--------------
2762  014402  012737  000016  001226  TST16:  MOV     #16,TSTNO
2763  014410  012737  014614  001216          MOV     #TST17,NEXT
2764                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
2765  014416  104412                          MSTCLR                  ;MASTER CLEAR DMC11
2766  014420  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
2767  014424  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2768  014426  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
2769  014430  004737  033676                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
```

```
2770  014434  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2771  014440  012761  000001  000004        MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
2772  014446  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2773  014450  122111                        122111                  ;SET SOM
2774  014452  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2775  014454  122110                        122110                  ;LOAD OUT DATA SILO
2776  014456  004737  032346                JSR     PC,OCOR         ;WAIT FOR OCOR
2777  014462  104415  000002                DATACLK,        2       ;CLOCK DATA FOUR TIMES
2778  014466  012761  000200  000004        MOV     #BIT7,4(R1)     ;SET BIT7 IN PORT4
2779  014474  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2780  014476  122111                        122111                  ;SET OUT CLEAR
2781  014500  104415  000001                DATACLR,        1       ;GIVE A TICK TO CLEAR RTS
2782  014504  012702  000017                MOV     #17,R2          ;SAVE ADDRESS FOR TYPEOUT
2783  014510  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2784  014512  021364                        021364                  ;PORT4 LU 17
2785  014514  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
2786  014520  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
2787  014524  005005                        CLR     R5              ;PUT "EXPECTED" IN R5
2788  014526  120504                        CMPB    R5,R4           ;IS OCOR CLEARED?
2789  014530  001401                        BEQ     1$              ;BR IF YES
2790  014532  104005                        HLT     5
2791  014534                        1$:
2792  014534  012702  000013                MOV     #13,R2          ;SAVE ADDRESS FOR TYPEOUT
2793  014540  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2794  014542  021264                        021264                  ;PORT4 LU 13
2795  014544  016104  000004                MOV     4(R1),R4        ;PUT EXPECTED IN R4
2796  014550  042704  000337                BIC     #337,R4         ;CLEAR UNWANTED BITS
2797  014554  005005                        CLR     R5              ;PUT "EXPECTED" IN R5, RTS SHOULD BE CLEARED
2798  014556  120504                        CMPB    R5,R4           ;IS RTS OK?
2799  014560  001401                        BEQ     2$              ;BR IF YES
2800  014562  104005                        HLT     5               ;RTS ERROR
2801  014564                        2$:
2802  014564  012702  000011                MOV     #11,R2          ;SAVE ADDRESS FOR TYPEOUT
2803  014570  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2804  014572  021224                        021224                  ;PORT4 LU11
2805  014574  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
2806  014600  012705  000020                MOV     #BIT4,R5        ;ONLY OUT READY SHOULD BE SET
2807  014604  120504                        CMPB    R5,R4           ;IS ACTIVE CLEAR?
2808  014606  001401                        BEQ     3$              ;BR IF YES
2809  014610  104005                        HLT     5               ;ERROR ACTIVE NOT CLEARED
2810  014612                        3$:
2811  014612  104400                        SCOPE                   ;SCOPE THIS TEST
```

```
2812
2813
2814
2815                                    ;*************************** TEST 17 ************************
2816                                    ;*BITSTUFF TRANSMITTER TEST
2817                                    ;*SINGLE CLOCK THE CHARACTER 0
2818                                    ;*CHECK FLAG AND DATA IN THE BIT WINDOW
2819                                    ;*VERIFY EACH BIT POSITION AS IT
2820                                    ;*PASSES THE BIT WINDOW (SI BIT)
2821                                    ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2822                                    ;*************************************************************
2823
2824                                    ;  TEST 17
2825                                    ;-------------
2826  014614  012737  000017  001226  TST17:  MOV     #17,TSTNO
2827  014622  012737  015076  001216          MOV     #TST20,NEXT
2828
2829  014630  104412                          MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
2830  014632  005061  000004                  CLR     4(R1)           ;MASTER CLEAR DMC11
2831  014636  104414                          ROMCLK                  ;CLEAR PORT4
2832  014640  122117                          122117                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2833  014642  004737  033676                  JSR     PC,CLRIO        ;PUT LINE UNIT IN BITSTUFF MODE
2834  014646  005037  034114                  CLR     BITCON          ;DO THIS AFTER MODE IS SET
2835  014652  012711  004000                  MOV     #BIT11,(R1)     ;CONSECUTIVE 1'S COUNTER INIT TO 0
2836  014656  004737  032500                  JSR     PC,OUTRDY       ;SET LINE UNIT LOOP
2837  014662  012761  000001  000004          MOV     #1,4(R1)        ;WAIT FOR OUT-READY
2838  014670  104414                          ROMCLK                  ;SET BIT0 IN PORT4
2839  014672  122111                          122111                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2840  014674  104414                          ROMCLK                  ;SET SOM!
2841  014676  122110                          122110                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2842  014700  012705  000000                  MOV     #0,R5   ;LOAD CHARACTER IN R5 FOR TYPEOUT ;LOAD GARBAGE CHAR
2843  014704  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
2844  014710  010561  000004                  MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
2845  014714  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2846  014716  122110                          122110                  ;LOAD OUT DATA
2847  014720  004737  032346                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
2848  014724  005003                          CLR     R3              ;CLEAR BIT COUNTER
2849  014726  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
2850  014730  104415  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
2851  014734  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
2852  014742  104415  000001          64$:    DATACLK,        1       ;CLOCK FLAG ONCE
2853  014746  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
2854  014752  103405                          BCS     65$             ;BR IF BIT IS MARK
2855  014754  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
2856  014760  103006                          BCC     66$             ;BR IF OK
2857  014762  104026                          HLT     26              ;ERROR IN FLAG CHAR
2858  014764  000404                          BR      66$
2859  014766  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
2860  014772  103401                          BCS     66$             ;BR IF OK
2861  014774  104026                          HLT     26              ;ERROR IN FLAG CHAR
2862  014776  005203                  66$:    INC     R3              ;INC BIT COUNT
2863  015000  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
2864  015004  001356                          BNE     64$             ;BR IF NO
2865  015006  005003                          CLR     R3              ;CLEAR BIT COUNT
2866  015010  104415  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
2867  015014  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
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0046
2868  015016  103005                        BCC     2$              ;BR IF CARRY CLEAR
2869  015020  004737  032314                JSR     PC,GETSI        ;GET THE WINDOW
2870  015024  103406                        BCS     3$              ;BR IF BIT IS A MARK
2871  015026  104006                        HLT     6               ;ERROR BIT WAS A SPACE
2872  015030  000404                        BR      3$              ;CONTINE WITH TEST
2873  015032  004737  032314          2$:   JSR     PC,GETSI        ;GET THE WINDOW
2874  015036  103001                        BCC     3$              ;BR IF BIT IS A SPACE
2875  015040  104006                        HLT     6               ;ERROR BIT WAS A MARK
2876  015042                          3$:
2877  015042  005203                        INC     R3              ;NEXT BIT
2878  015044  022703  0000*0                CMP     #10,R3          ;DONE YET?
2879  015050  001357                        BNE     1$              ;BR IF NO
2880  015052  104415  000014                DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
2881  015056  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2882  015060  021264                        021264                  ;PORT4 LU-13
2883  015062  032761  000040  000004        BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
2884  015070  001401                        BEQ     4$              ;BR IF YES
2885  015072  104034                        HLT     34              ;ERROR, RTS NOT CLEAR
2886  015074  104400                  4$.   SCOPE                   ;SCOPE THIS TEST
2887
2888
2889
2890                                        ;*************************** TEST 20 ***************************
2891                                        ;*BITSTUFF TRANSMITTER TEST
2892                                        ;*SINGLE CLOCK THE CHARACTER 125
2893                                        ;*CHECK FLAG AND DATA IN THE BIT WINDOW
2894                                        ;*VERIFY EACH BIT POSITION AS IT
2895                                        ;*PASSES THE BIT WINDOW (SI BIT)
2896                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2897                                        ;;*************************************************************
2898
2899                                        ;  TEST 20
2900                                        ;-------------
2901  015076  012737  000020  001226  TST20:MOV     #20,TSTNO
2902  015104  012737  015360  001216        MOV     #TST21,NEXT
2903                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
2904  015112  104412                        MSTCLR                  ;MASTER CLEAR DMC11
2905  015114  005061  000004                CLR     4(R1)           ;CLEAR PORT4
2906  015120  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2907  015122  122117                        122117                  ;PUT LINE UNIT IN BITSTUFF MODE
2908  015124  004737  033676                JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
2909  015130  005037  034114                CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
2910  015134  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2911  015140  004737  032500                JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
2912  015144  012761  000001  000004        MOV     #1,4(R1)        ;SET BIT0 IN PORT4
2913  015152  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2914  015154  122111                        122111                  ;SET SOM!
2915  015156  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2916  015160  122110                        122110                  ;LOAD GARBAGE CHAR
2917  015162  012705  000125                MOV     #125,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
2918  015166  004737  032500                JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
2919  015172  010561  000004                MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
2920  015176  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2921  015200  122110                        122110                  ;LOAD OUT DATA
2922  015202  004737  032346                JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
2923  015206  005003                        CLR     R3              ;CLEAR BIT COUNTER
```

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2924  015210  010502                        MOV     R5,R2           ;LOAD CHARACTER IN R2
2925  015212  104415  000002                DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
2926  015216  012737  000176  001252        MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
2927  015224  104415  000001        64$:    DATACLK,        1       ;CLOCK FLAG ONCE
2928  015230  106037  001252                RORB    TEMP3           ;SHIFT SOFT FLAG
2929  015234  103405                        BCS     65$             ;BR IF BIT IS MARK
2930  015236  004737  032314                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
2931  015242  103006                        BCC     66$             ;BR IF OK
2932  015244  104026                        HLT     26              ;ERROR IN FLAG CHAR
2933  015246  000404                        BR      66$
2934  015250  004737  032314        65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
2935  015254  103401                        BCS     66$             ;BR IF OK
2936  015256  104026                        HLT     26              ;ERROR IN FLAG CHAR
2937  015260  005203                66$:    INC     R3              ;INC BIT COUNT
2938  015262  022703  000010                CMP     #10,R3          ;FLAG DONE YET?
2939  015266  001356                        BNE     64$             ;BR IF NO
2940  015270  005003                        CLR     R3              ;CLEAR BIT COUNT
2941  015272  104415  000001        1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
2942  015276  106002                        RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
2943  015300  103005                        BCC     2$              ;BR IF CARRY CLEAR
2944  015302  004737  032314                JSR     PC,GETSI        ;GET THE WINDOW
2945  015306  103406                        BCS     3$              ;BR IF BIT IS A MARK
2946  015310  104006                        HLT     6               ;ERROR BIT WAS A SPACE
2947  015312  000404                        BR      3$              ;CONTINE WITH TEST
2948  015314  004737  032314        2$:     JSR     PC,GETSI        ;GET THE WINDOW
2949  015320  103001                        BCC     3$              ;BR IF BIT IS A SPACE
2950  015322  104006                        HLT     6               ;ERROR BIT WAS A MARK
2951  015324                        3$:
2952  015324  005203                        INC     R3              ;NEXT BIT
2953  015326  022703  000010                CMP     #10,R3          ;DONE YET?
2954  015332  001357                        BNE     1$              ;BR IF NO
2955  015334  104415  000014                DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
2956  015340  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2957  015342  021264                        021264                  ;PORT4 LU-13
2958  015344  032761  000040  000004        BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
2959  015352  001401                        BEQ     4$              ;BR IF YES
2960  015354  104034                        HLT     34              ;ERROR, RTS NOT CLEAR
2961  015356  104400                4$:     SCOPE                   ;SCOPE THIS TEST
2962
2963
2964
2965                                        ;************************** TEST 21 **************************
2966                                        ;*BITSTUFF TRANSMITTER TEST
2967                                        ;*SINGLE CLOCK THE CHARACTER 252
2968                                        ;*CHECK FLAG AND DATA IN THE BIT WINDOW
2969                                        ;*VERIFY EACH BIT POSITION AS IT
2970                                        ;*PASSES THE BIT WINDOW (SI BIT)
2971                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2972                                        ;;**********************************************************
2973
2974                                        ;  TEST 21
2975                                        ;--------------
2976  015360  012737  000021  001226  TST21:  MOV     #21,TSTNO
2977  015366  012737  015642  001216        MOV     #TST22,NEXT
2978                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
2979  015374  104412                        MSTCLR                  ;MASTER CLEAR DMC11
```

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 2980  015376  005061  000004                    CLR     4(R1)              ;CLEAR PORT4
 2981  015402  104414                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 2982  015404  122117                            122117                     ;PUT LINE UNIT IN BITSTUFF MODE
 2983  015406  004737  033676                    JSR     PC,CLRIO           ;DO THIS AFTER MODE IS SET
 2984  015412  005037  034114                    CLR     BITCON             ;CONSECUTIVE 1'S COUNTER INIT TO C
 2985  015416  012711  004000                    MOV     #BIT11,(R1)        ;SE' LINE UNIT LOOP
 2986  015422  004737  032500                    JSR     PC,OUTRDY          ;WAIT FOR OUT-READY
 2987  015426  012761  000001  000004            MOV     #1,4(R1)           ;SET BIT0 IN PORT4
 2988  015434  104414                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 2989  015436  122111                            122111                     ;SET SOM!
 2990  015440  104414                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 2991  015442  122110                            122110                     ;LOAD GARBAGE CHAR
 2992  015444  012705  000252                    MOV     #252,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
 2993  015450  004737  032500                    JSR     PC,OUTRDY          ;WAIT FOR OUT-READY
 2994  015454  010561  000004                    MOV     R5,4(R1)           ;LOAD PORT4 WITH CHARACTER
 2995  015460  104414                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 2996  015462  122110                            122110                     ;LOAD OUT DATA
 2997  015464  004737  032346                    JSR     PC,OCOR            ;WAIT FOR OCOR TO SET
 2998  015470  005003                            CLR     R3                 ;CLEAR BIT COUNTER
 2999  015472  010502                            MOV     R5,R2              ;LOAD CHARACTER IN R2
 3000  015474  104415  000002                    DATACLK,        2          ;2 TICKS TO SET UP TRANSMITTER
 3001  015500  012737  000176  001252            MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
 3002  015506  104415  000001          64$:      DATACLK,        1          ;CLOCK FLAG ONCE
 3003  015512  106037  001252                    RORB    TEMP3              ;SHIFT SOFT FLAG
 3004  015516  103405                            BCS     65$                ;BR IF BIT IS MARK
 3005  015520  004737  032314                    JSR     PC,GETSI           ;LOOK AT BIT WINDOW
 3006  015524  103006                            BCC     66$                ;BR IF OK
 3007  015526  104026                            HLT     26                 ;ERROR IN FLAG CHAR
 3008  015530  000404                            BR      66$
 3009  015532  004737  032314          65$:      JSR     PC,GETSI           ;LOOK AT BIT WINDOW
 3010  015536  103401                            BCS     66$                ;BR IF OK
 3011  015540  104026                            HLT     26                 ;ERROR IN FLAG CHAR
 3012  015542  005203                    66$:    INC     R3                 ;INC BIT COUNT
 3013  015544  022703  000010                    CMP     #10,R3             ;FLAG DONE YET?
 3014  015550  001356                            BNE     64$                ;BR IF NO
 3015  015552  005003                            CLR     R3                 ;CLEAR BIT COUNT
 3016  015554  104415  000001          1$:       DATACLK,        1          ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
 3017  015560  106002                            RORB    R2                 ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
 3018  015562  103005                            BCC     2$                 ;BR IF CARRY CLEAR
 3019  015564  004737  032314                    JSR     PC,GETSI           ;GET THE WINDOW
 3020  015570  103406                            BCS     3$                 ;BR IF BIT IS A MARK
 3021  015572  104006                            HLT     6                  ;ERROR BIT WAS A SPACE
 3022  015574  000404                            BR      3$                 ;CONTINE WITH TEST
 3023  015576  004737  032314          2$:       JSR     PC,GETSI           ;GET THE WINDOW
 3024  015602  103001                            BCC     3$                 ;BR IF BIT IS A SPACE
 3025  015604  104006                            HLT     6                  ;ERROR BIT WAS A MARK
 3026  015606                            3$:
 3027  015606  005203                            INC     R3                 ;NEXT BIT
 3028  015610  022703  000010                    CMP     #10,R3             ;DONE YET?
 3029  015614  001357                            BNE     1$                 ;BR IF NO
 3030  015616  104415  000014                    DATACLK,        14         ;CLOCK TRANSMITTER 14 MORE TICKS
 3031  015622  104414                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
 3032  015624  021264                            021264                     ;PORT4 LU-13
 3033  015626  032761  000040  000004            BIT     #BIT5,4(R1)        ;RTS SHOULD BE CLEAR NOW
 3034  015634  001401                            BEQ     4$                 ;BR IF YES
 3035  015636  104034                            HLT     34                 ;ERROR, RTS NOT CLEAR
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3036  015640  104400                  4$:     SCOPE                   ;SCOPE THIS TEST
3037
3038
3039                                          ;*************************** TEST 22 ***************************
3040                                                  ;*BIT STUFF TEST
3041                                                  ;*THIS TEST CHECKS ZERO BIT STUFFING OF
3042                                                  ;* THE TRANSMITTER IN THE BIT WINDOW
3043                                          ;;*************************************************************
3044
3045                                          ;  TEST 22
3046                                          ;-------------
3047  015642  012737  000022  001226  TST22:  MOV     #22,TSTNO
3048  015650  012737  016152  001216          MOV     #TST23,NEXT
3049                                                          ;R1 CONTAINS BASE DMC11 ADDRESS
3050  015656  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3051  015660  005061  000004                          CLR     4(R1)           ;CLEAR PORT4
3052  015664  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3053  015666  122117                                  122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3054  015670  004737  033676                          JSR     PC,CLR10        ;DO THIS AFTER MODE IS SET
3055  015674  012711  004000                          MOV     #BIT11,(R1)     ;SET LU LOOP
3056  015700  004737  032500                          JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3057  015704  012761  000001  000004                  MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3058  015712  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
3059  015714  122111                                  122111                  ;SET SOM!
3060  015716  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3061  015720  122110                                  122110                  ;LOAD GARBAGE CHAR
3062  015722  004537  033634                          JSR     R5,MESLD        ;LOAD OUT SILO DATA
3063  015726  034142                                  STUFDT          ;MESSAGE ADDRESSS
3064  015730  000024                                  20.                     ;NUMBER OF CHARACTERS
3065  015732  012704  034142                          MOV     #STUFDT,R4      ;R4=CHARACTER POINTER
3066  015736  005003                                  CLR     R3              ;R3= BIT COUNTER
3067  015740  012700  000006                          MOV     #6,R0           ;BIT COUNTER FOR FLAG CHARACTER
3068  015744  104415  000002                          DATACLK,        2       ;SET UP TRANSMITTER
3069  015750  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
3070  015756  104415  000001          64$:    DATACLK,        1       ;CLOCK FLAG ONCE
3071  015762  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
3072  015766  103405                          BCS     65$             ;BR IF BIT IS MARK
3073  015770  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3074  015774  103006                          BCC     66$             ;BR IF OK
3075  015776  104026                          HLT     26              ;ERROR IN FLAG CHAR
3076  016000  000404                          BR      66$
3077  016002  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3078  016006  103401                          BCS     66$             ;BR IF OK
3079  016010  104026                          HLT     26              ;ERROR IN FLAG CHAR
3080  016012  005203                  66$:    INC     R3              ;INC BIT COUNT
3081  016014  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
3082  016020  001356                          BNE     64$             ;BR IF NO
3083  016022  005003                          CLR     R3              ;CLEAR BIT COUNT
3084  016024  012700  000024                  MOV     #20.,R0         ;R0=CHARACTER COUNTER
3085  016030  005037  034114                  CLR     BITCON          ;CLEAR BIT STUFF COUNTER
3086  016034  112405                  3$:     MOVB    (R4)+,R5        ;LOAD CHARACTER IN R5
3087  016036  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
3088  016040  104415  000001          4$:     DATACLK,        1       ;SHIFT DTAT ONCE
3089  016044  106002                          RORB    R2              ;SHIFT SOFT DATA
3090  016046  103407                          BCS     5$              ;BR IF CARRY SET
3091  016050  005037  034114                  CLR     BITCON          ;CLEAR BIT STUFF COUNTER
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0050

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3092  016054  004737  032314                        JSR     PC,GETSI        ;LOOK AT WINDOW
3093  016060  103010                                BCC     6$              ;BR IF SPACE
3094  016062  104006                                HLT     6               ;ERROR, WINDOW WAS A MARK
3095  016064  000406                                BR      6$              ;CONTINUE
3096  016066  005237  034114              5$:       INC     BITCON          ;ADD 1 TO BIT STUFF COUNTER
3097  016072  004737  032314                        JSR     PC,GETSI        ;LOOK AT WINDOW
3098  016076  103401                                BCS     6$              ;BR IF MARK
3099  016100  104006                                HLT     6               ;ERROR, WINDOW WAS A SPACE
3100  016102  022737  000005  034114        6$:     CMP     #5,BITCON       ;HAVE THERE BEEN 5 1'S IN A ROW
3101  016110  001010                                BNE     7$              ;BR IF NO
3102  016112  005037  034114                        CLR     BITCON          ;IF YES CLR BIT STUFF COUNTER
3103  016116  104415  000001                        DATACLK,        1       ;AND CLOCK TRANSMITTER ONCE
3104  016122  004737  032314                        JSR     PC,GETSI        ;CHECK WINDOW FOR A ZEOR STUFF!!
3105  016126  103001                                BCC     7$              ;BR IF WINDOW IS A SPACE
3106  016130  104030                                HLT     30              ;ERROR, TRANSMITTER DID NOT STUFF A ZERO
3107  016132  005203                        7$:     INC     R3              ;BUMP BIT COUNTER
3108  016134  022703  000010                        CMP     #10,R3          ;DONE THIS CHARACTER YET?
3109  016140  001337                                BNE     4$              ;BR IF NO
3110  016142  005003                                CLR     R3              ;RESTART BIT COUNTER AT ZERO
3111  016144  005300                                DEC     R0              ;DEC CHARACTER COUNTER
3112  016146  001332                                BNE     3$              ;BR IF NOT DONE YET
3113  016150  104400                        8$:     SCOPE                   ;SCOPE THIS TEST
3114
3115
3116                                          ;***************************** TEST 23 *****************************
3117                                          ;*BITSTUFF TRANSMITTER TEST
3118                                          ;*SINGLE CLOCK THE CHARACTER 377
3119                                          ;*CHECK FLAG AND DATA IN THE BIT WINDOW
3120                                          ;*VERIFY EACH BIT POSITION AS IT
3121                                          ;*PASSES THE BIT WINDOW (SI BIT)
3122                                          ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
3123                                          ;;*************************************************************
3124
3125                                          ;  TEST 23
3126                                          ;--------------
3127  016152  012737  000023  001226  TST23:  MOV     #23,TSTNO
3128  016160  012737  016460  001216          MOV     #TST24,NEXT
3129                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3130  016166  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3131  016170  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
3132  016174  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3133  016176  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3134  016200  004737  033676                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3135  016204  005037  034114                  CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
3136  016210  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3137  016214  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3138  016220  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3139  016226  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3140  016230  122111                          122111                  ;SET SOM!
3141  016232  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3142  016234  122110                          122110                  ;LOAD GARBAGE CHAR
3143  016236  012705  000377                  MOV     #377,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
3144  016242  010537  016414                  MOV     R5,5$           ;LOAD CHAR FOR STUFF CHECK
3145  016246  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3146  016252  010561  000004                  MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
3147  016256  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

0051

```
3148  016260  122110                          122110                  ;LOAD OUT DATA
3149  016262  004737  032346                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
3150  016266  005003                          CLR     R3              ;CLEAR BIT COUNTER
3151  016270  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
3152  016272  104415  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
3153  016276  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
3154  016304  104415  000001          64$:    DATACLK,        1       ;CLOCK FLAG ONCE
3155  016310  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
3156  016314  103405                          BCS     65$             ;BR IF BIT IS MARK
3157  016316  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3158  016322  103006                          BCC     66$             ;BR IF OK
3159  016324  104026                          HLT     26              ;ERROR IN FLAG CHAR
3160  016326  000404                          BR      66$
3161  016330  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3162  016334  103401                          BCS     66$             ;BR IF OK
3163  016336  104026                          HLT     26              ;ERROR IN FLAG CHAR
3164  016340  005203                  66$:    INC     R3              ;INC BIT COUNT
3165  016342  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
3166  016346  001356                          BNE     64$             ;BR IF NO
3167  016350  005003                          CLR     R3              ;CLEAR BIT COUNT
3168  016352  005037  034114                  CLR     BITCON          ;CLEAR STUFF COUNT
3169  016356  104415  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
3170  016362  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
3171  016364  103005                          BCC     2$              ;BR IF CARRY CLEAR
3172  016366  004737  032314                  JSR     PC,GETSI        ;GET THE WINDOW
3173  016372  103406                          BCS     3$              ;BR IF BIT IS A MARK
3174  016374  104006                          HLT     6               ;ERROR BIT WAS A SPACE
3175  016376  000404                          BR      3$              ;CONTINE WITH TEST
3176  016400  004737  032314          2$:     JSR     PC,GETSI        ;GET THE WINDOW
3177  016404  103001                          BCC     3$              ;BR IF BIT IS A SPACE
3178  016406  104006                          HLT     6               ;ERROR BIT WAS A MARK
3179  016410                          3$:
3180  016410  004537  033776                  JSR     R5,STFFCK       ;CHECK FOR BIT STUFF
3181  016414  000377                  5$:     377                     ;DATA CHARACTER
3182  016416  000001                          1                       ;SHIFT COUNT
3183  016420  010237  016414                  MOV     R2,5$           ;LOAD CHAR FOR STUFF CHECK
3184  016424  005203                          INC     R3              ;NEXT BIT
3185  016426  022703  000010                  CMP     #10,R3          ;DONE YET?
3186  016432  001351                          BNE     1$              ;BR IF NO
3187  016434  104415  000014                  DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
3188  016440  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
3189  016442  021264                          021264                  ;PORT4 LU-13
3190  016444  032761  000040  000004          BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
3191  016452  001401                          BEQ     4$              ;BR IF YES
3192  016454  104034                          HLT     34              ;ERROR, RTS NOT CLEAR
3193  016456  104400                  4$:     SCOPE                   ;SCOPE THIS TEST
3194
3195
3196                                  ;********************************* TEST 24 *************************
3197                                  ;*BITSTUFF TRANSMITTER TEST
3198                                  ;*SINGLE CLOCK A BINARY COUNT PATTERN
3199                                  ;*VERIFY EACH BIT POSITION AS IT
3200                                  ;*PASSES THE BIT WINDOW (SI BIT)
3201                                  ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
3202                                  ;*AND R5 CONTAINS THE CHARACTER THAT FAILED
3203                                  ;;*********************************************** ****************
```

```
                                        ;  TEST 24
                                        ;-------------
016460  012737  000024  001226  TST24:  MOV     #24,TSTNO
016466  012737  017012  001216           MOV     #TST25,NEXT
                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
016474  104412                          MSTCLR                  ;MASTER CLEAR DMC11
016476  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
016502  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016504  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
016506  004737  033676                  JSR     PC,CLR10        ;DO THIS AFTER MODE IS SET
016512  005037  034114                  CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
016516  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
016522  005003                          CLR     R3              ;R3 CONTAINS BIT COUNT
016524  005004                          CLR     R4              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
016526  005005                          CLR     R5              ;R5 CONTAINS CHARACTER CURRENTLY BEING SHIFTED OUT
016530  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
016534  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
016542  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016544  122111                          122111                  ;SET SOM!
016546  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016550  122110                          122110                  ;LOAD GARBAGE CHAR
016552  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
016556  010461  000004                  MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
016562  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016564  122110                          122110                  ;LOAD OUT DATA
016566  005204                          INC     R4              ;INCREMENT TO NEXT CHARACTER
016570  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
016574  010461  000004                  MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
016600  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016602  122110                          122110                  ;LOAD OUT DATA
016604  004737  032346                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
016610  104415  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
016614  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
016622  104415  000001          64$:    DATACLK,        1       ;CLOCK FLAG ONCE
016626  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
016632  103405                          BCS     65$             ;BR IF BIT IS MARK
016634  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
016640  103006                          BCC     66$             ;BR IF OK
016642  104026                          HLT     26              ;ERROR IN FLAG CHAR
016644  000404                          BR      66$
016646  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
016652  103401                          BCS     66$             ;BR IF OK
016654  104026                          HLT     26              ;ERROR IN FLAG CHAR
016656  005203                  66$:    INC     R3              ;INC BIT COUNT
016660  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
016664  001356                          BNE     64$             ;BR IF NO
016666  005003                          CLR     R3              ;CLEAR BIT COUNT
016670  005037  034114                  CLR     BITCON          ;CLEAR BIT STUFF COUNTER
016674  005003                  4$:     CLR     R3              ;CLEAR BIT COUNTER
016676  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
016700  010237  016742                  MOV     R2,6$                   ;LOAD CHAR FOR STUFF CHECK
016704  104415  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
016710  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
016712  103005                          BCC     2$              ;BR IF CARRY CLEAR
016714  004737  032314                  JSR     PC,GETSI        ;GET THE WINDOW
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3260  016720  103406                  BCS     3$              ;BR IF BIT IS A MARK
3261  016722  104006                  HLT     6               ;ERROR BIT WAS A SPACE
3262  016724  000404                  BR      3$              ;CONTINE WITH TEST
3263  016726  004737  032314  2$:     JSR     PC,GETSI        ;GET THE WINDOW
3264  016732  103001                  BCC     3$              ;BR IF BIT IS A SPACE
3265  016734  104006                  HLT     6               ;ERROR BIT WAS A MARK
3266  016736                  3$:
3267  016736  004537  033776          JSR     R5,STFFCK       ;CHECK FOR BIT STUFF
3268  016742  000000          6$:     0                       ;DATA CHARACTER
3269  016744  000001                  1                       ;SHIFT COUNT
3270  016746  010237  016742          MOV     R2,6$           ;LOAD CHAR FOR STUFF CHECK
3271  016752  005203                  INC     R3              ;NEXT BIT
3272  016754  022703  000010          CMP     #10,R3          ;DONE YET?
3273  016760  001351                  BNE     1$              ;BR IF NO
3274  016762  005204                  INC     R4              ;NEXT CHARACTER
3275  016764  004737  032500          JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3276  016770  010461  000004          MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
3277  016774  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3278  016776  122110                  122110                  ;LOAD OUT DATA
3279  017000  005205                  INC     R5              ;NEXT CHARACTER
3280  017002  022705  000400          CMP     #400,R5         ;DONE YET?
3281  017006  001332                  BNE     4$              ;BR IF NO
3282  017010  104400          5$:     SCOPE                   ;SCOPE THIS TEST
3283
3284
3285                                  ;****************************** TEST 25 ****************************
3286                                  ;*MULTIPLE FLAG AND TRANSMITTER ABORT TEST
3287                                  ;*LOAD SILO WITH 5 FLAGS AND A CHAR (000)
3288                                  ;*VERIFIY IN THE BIT WINDOW THAT THE FLAGS
3289                                  ;*AND DATA ARE CORRECT AND FOLLOWED BY AN ABORT
3290                                  ;*SEQUENCE (8 CONTIGUOUS 1'S)
3291                                  ;;**************************************************************
3292
3293                                  ;  TEST 25
3294                                  ;--------------
3295  017012  012737  000025  001226  TST25:  MOV     #25,TSTNO
3296  017020  012737  017300  001216          MOV     #TST26,NEXT
3297                                                          ;R1 CONTAINS BASE DMC11 ADDRESS
3298  017026  104412                  MSTCLR                  ;MASTER CLEAR DMC11
3299  017030  005061  000004                  CLR     4(R1)          ;CLEAR PORT4
3300  017034  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5504
3301  017036  122117                  122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3302  017040  004737  033676                  JSR     PC,CLRIO       ;DO THIS AFTER MODE IS SET
3303  017044  012711  004000                  MOV     #BIT11,(R1)    ;SET LU LOOP
3304  017050  012700  000005                  MOV     #5,R0          ;FLAG COUNT
3305  017054  005003                          CLR     R3             ;CLEAR BIT COUNTER
3306  017056  004737  032500          1$:     JSR     PC,OUTRDY      ;WAIT FOR OUT-READY
3307  017062  012761  000001  000004          MOV     #1,4(R1)       ;SET BIT0 IN PORT4
3308  017070  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3309  017072  122111                  122111                  ;SET SOM!
3310  017074  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3311  017076  122110                  122110                  ;LOAD GARBAGE CHAR
3312  017100  005300                          DEC     R0             ;DEC COUNT
3313  017102  001365                          BNE     1$             ;LOAD ANOTHER
3314  017104  004737  032500                  JSR     PC,OUTRDY      ;WAIT FOR OUTRDY
3315  017110  005061  000004                  CLR     4(R1)          ;CLEAR PORT4
```

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3316  017114  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3317  017116  122110                                  122110          ;LOAD A ZERO
3318  017120  004737  032346                        JSR     PC,OCOR         ;WAIT
3319  017124  012700  000005                        MOV     #5,R0           ;R0 = FLAG COUNT
3320  017130  104415  000002                        DATACLK,        2       ;SET UP TRANSMITTER
3321  017134                                  2$:
3322  017134  012737  000176  001252              MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
3323  017142  104415  000001          64$:    DATACLK,        1       ;CLOCK FLAG ONCE
3324  017146  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
3325  017152  103405                          BCS     65$             ;BR IF BIT IS MARK
3326  017154  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3327  017160  103006                          BCC     66$             ;BR IF OK
3328  017162  104026                          HLT     26              ;ERROR IN FLAG CHAR
3329  017164  000404                          BR      66$
3330  017166  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3331  017172  103401                          BCS     66$             ;BR IF OK
3332  017174  104026                          HLT     26              ;ERROR IN FLAG CHAR
3333  017176  005203                  66$:    INC     R3              ;INC BIT COUNT
3334  017200  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
3335  017204  001356                          BNE     64$             ;BR IF NO
3336  017206  005003                          CLR     R3              ;CLEAR BIT COUNT
3337  017210  005300                          DEC     R0                      ;DEC COUNT
3338  017212  001350                          BNE     2$                      ;BR IF NOT DONE
3339  017214  005003                          CLR     R3                      ;R3 = BIT COUNT
3340  017216  005005                          CLR     R5                      ;R5 = ''EXPECTED''
3341  017220  104415  000001          3$:     DATACLK,        1               ;CLOCK ONCE
3342  017224  004737  032314                  JSR     PC,GETSI                ;GO LOOK AT WINDOW
3343  017230  103001                          BCC     4$                      ;BR IF A SPACE
3344  017232  104006                          HLT     6                       ;ERROR, A MARK WAS SEEN
3345  017234  005203                  4$:     INC     R3                      ;INC BIT COUNT
3346  017236  022703  000010                  CMP     #10,R3                  ;DONE YET?
3347  017242  001366                          BNE     3$                      ;BR IF NO
3348  017244  005003                          CLR     R3                      ;CLEAR BIT COUNT
3349  017246  012705  000377                  MOV     #377,R5                 ;R5 = ''EXPECTED''
3350  017252  104415  000001          5$:     DATACLK,        1               ;CLOCK ONCE
3351  017256  004737  032314                  JSR     PC,GETSI                ;LOOK AT WINDOW
3352  017262  103401                          BCS     6$                      ;BR IF A MARY
3353  017264  104033                          HLT     33                      ;ERROR, A SPACE WAS SEEN
3354  017266  005203                  6$:     INC     R3                      ;INC BIT COUNT
3355  017270  022703  000010                  CMP     #10,R3                  ;DONE YET?
3356  017274  001366                          BNE     5$                      ;BR IF NO
3357  017276  104400                          SCOPE                           ;SCOPE THIS TEST
3358
3359
3360                                  ;************************** TEST 26 ************************
3361                                          ;*LEADING ZEROS TEST
3362                                          ;*VERIFY THAT THE SETTING OF SOM AND EOM TOGETHER
3363                                          ;*AND THEN SOM ALONE WILL GENERATE 16 LEADING ZEROS
3364                                          ;*AND A FLAG.THE CHECK IS MADE USING THE BIT WINDOW
3365                                  ;;**********************************************************
3366
3367                                  ;  TEST 26
3368                                  ;--------------
3369  017300  012737  000026  001226  TST26:  MOV     #26,TSTNO
3370  017306  012737  017520  001216          MOV     #TST27,NEXT
3371                                                          ;R1 CONTAINS BASE BUC11 ADDRESS
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0055

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3372  017314  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3373  017316  005061  000004                          CLR     4(R1)           ;CLEAR PORT4
3374  017322  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
3375  017324  122117                                  122117                  ;SET TO BITSTUFF MODE
3376  017326  004737  033676                          JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SE
3377  017332  012711  004000                          MOV     #BIT11,(R1)     ;SET LU LOOP
3378  017336  004737  032500                          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
3379  017342  012761  000003  000004                  MOV     #3,4(R1)        ;LOAD PORT4
3380  017350  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3381  017352  122111                                  122111                  ;SET SOM & EOM
3382  017354  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3383  017356  122110                                  122110                  ;GARBAGE CHARACTER
3384  017360  012761  000001  000004                  MOV     #1,4(R1)        ;LOAD PORT4
3385  017366  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3386  017370  122111                                  122111                  ;SET SOM
3387  017372  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3388  017374  122110                                  122110                  ;GARBAGE CHAR
3389  017376  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3390  017400  122110                                  122110                  ;GARBAGE CHAR
3391  017402  004737  032346                          JSR     PC,OCOR         ;WAIT FOR OCOR
3392  017406  005000                                  CLR     R0              ;R0 = BIT COUNT
3393  017410  104415  000002                          DATACLK,2               ;SET UP TRANSMITTER
3394  017414  104415  000001                  1$:     DATACLK,1               ;SINGLE CLOCK TRANSMITTER
3395  017420  004737  032314                          JSR     PC,GETSI        ;LOOK AT BITWINDOW
3396  017424  103001                                  BCC     .+4
3397  017426  104041                                  HLT     41              ;ERROR WINDOW WAS A MARK
3398  017430  005200                                  INC     R0
3399  017432  022700  000020                          CMP     #16.,R0         ;16 ZEROS YET?
3400  017436  001366                                  BNE     1$              ;BR IF NO
3401  017440  005003                                  CLR     R3              ;R3 = BIT COUNT
3402  017442  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
3403  017450  104415  000001          64$:    DATACLK,        1       ;CLOCK FLAG ONCE
3404  017454  106037  001252          RORB    TEMP3           ;SHIFT SOFT FLAG
3405  017460  103405                  BCS     65$             ;BR IF BIT IS MARK
3406  017462  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3407  017466  103006                  BCC     66$             ;BR IF OK
3408  017470  104026                  HLT     26              ;ERROR IN FLAG CHAR
3409  017472  000404                  BR      66$
3410  017474  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
3411  017500  103401                  BCS     66$             ;BR IF OK
3412  017502  104026                  HLT     26              ;ERROR IN FLAG CHAR
3413  017504  005203                  66$:    INC     R3              ;INC BIT COUNT
3414  017506  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
3415  017512  001356                  BNE     64$             ;BR IF NO
3416  017514  005003                  CLR     R3              ;CLEAR BIT COUNT
3417  017516  104400                          SCOPE                   ;SCOPE THIS TEST
3418
3419
3420                                  ;************************** TEST 27 ************************
3421                                  ;*BITSTUFF STRIP FLAG TEST
3422                                  ;*SET LU LOOP, SINGLE STEP 5 FLAGS,
3423                                  ;*VERIFY THAT IN ACTIVE DOES NOT SET
3424                                  ;;*********************************************************
3425
3426                                  ;  TEST 27
3427                                  ;-------------
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0056

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3428  017520  012737  000027  001226  TST27:  MOV     #27,TSTNO
3429  017526  012737  017622  001216           MOV     #TST30,NEXT
3430                                           ;R1 CONTAINS BASE DMC11 ADDRESS
3431  017534  104412                           MSTCLR                  ;MASTER CLEAR DMC11
3432  017536  005061  000004                   CLR     4(R1)           ;CLEAR PORT4
3433  017542  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3434  017544  122117                           122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3435  017546  004737  033676                   JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3436  017552  012711  004000                   MOV     #BIT11,(R1)     ;SET LU LOOP
3437  017556  012702  000012                   MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3438  017562  004737  032364                   JSR     PC,SYNC         ;SINGLE CLOCK 5 SYNC CHARACTERS
3439  017566  000005                           5
3440  017570  104415  000054                   DATACLK,        54
3441  017574  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3442  017576  021244                           021244                  ;PORT4 LU12
3443  017600  016104  000004                   MOV     4(R1),R4        ;PUT "FOUND" IN R4
3444  017604  042704  000277                   BIC     #277,R4         ;CLEAR UNWANTED BITS
3445  017610  005005                           CLR     R5              ;PUT "EXPECTED" IN R5
3446  017612  120504                           CMPB    R5,R4           ;IS ACTIVE CLEAR?
3447  017614  001401                           BEQ     1$              ;BR IF YES
3448  017616  104040                           HLT     40              ;ERROR ACTIVE IS NOT CLEAR
3449  017620  104400                   1$:     SCOPE                   ;SCOPE THIS TEST
3450
3451
3452                                           ;************************** TEST 30 ************************
3453                                           ;*BITSTUFF IN ACTIVE TEST
3454                                           ;*SET LU LOOP, SINGLE STEP 5 FLAGS AND A NON-FLAG (301)
3455                                           ;*VERIFY THAT IN ACTIVE IS SET
3456                                           ;;*********************************************************************
3457
3458                                           ;  TEST 30
3459                                           ;-------------
3460  017622  012737  000030  001226  TST30:  MOV     #30,TSTNO
3461  017630  012737  017726  001216           MOV     #TST31,NEXT
3462                                           ;R1 CONTAINS BASE DMC11 ADDRESS
3463  017636  104412                           MSTCLR                  ;MASTER CLEAR DMC11
3464  017640  005061  000004                   CLR     4(R1)           ;CLEAR PORT4
3465  017644  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3466  017646  122117                           122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3467  017650  004737  033676                   JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3468  017654  012711  004000                   MOV     #BIT11,(R1)     ;SET LU LOOP
3469  017660  012702  000012                   MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3470  017664  004737  032364                   JSR     PC,SYNC         ;SINGLE CLOCK 5 SYNC CHARACTERS
3471  017670  000005                           5
3472  017672  104415  000064                   DATACLK,        64
3473  017676  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3474  017700  021244                           021244                  ;PORT4 LU12
3475  017702  016104  000004                   MOV     4(R1),R4        ;PUT "FOUND" IN R4
3476  017706  042704  000277                   BIC     #277,R4         ;CLEAR UNWANTED BITS
3477  017712  012705  000100                   MOV     #BIT6,R5                ;PUT "EXPECTED" IN R5
3478  017716  120504                           CMPB    R5,R4           ;IS ACTIVE SET?
3479  017720  001401                           BEQ     1$              ;BR IF YES
3480  017722  104040                           HLT     40              ;ERROR ACTIVE IS NOT SET
3481  017724  104400                   1$:     SCOPE                   ;SCOPE THIS TEST
3482
3483
```

```
3484                                    ;************************** TEST 31 **************************
3485                                    ;*BITSTUFF IN ACTIVE TEST
3486                                    ;*SET LINE UNIT LOOP,SINGLE STEP ONE FLAG AND A CHAR (301)
3487                                    ;*VERIFY THAT IN ACTIVE IS SET
3488                                    ;:**********************************************************
3489
3490                                    ;  TEST 31
3491                                    ;-------------
3492  017726  012737  000031  001226 TST31:  MOV     #31,TSTNO
3493  017734  012737  020064  001216         MOV     #TST32,NEXT
3494                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3495  017742  104412                        MSTCLR                  ;MASTER CLEAR DMC11
3496  017744  005061  000004                CLR     4(R1)           ;CLEAR PORT4
3497  017750  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3498  017752  122117                        122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3499  017754  004737  033676                JSR     PC,CLRIO        ;MUST DO THIS AFTER MODE IS SET
3500  017760  012711  004000                MOV     #BIT11,(R1)
3501  017764  012702  000012                MOV     #12,R2          ;SAVE REG ADDRESS FOR TYPEOUT
3502  017770  004737  032500                JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
3503  017774  012761  000001  000004        MOV     #1,4(R1)        ;LOAD PORT4
3504  020002  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
3505  020004  122111                        122111                  ;SET SOM
3506  020006  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3507  020010  122110                        122110                  ;LOAD GARBAGE CHAR
3508  020012  012761  000301  000004        MOV     #301,4(R1)      ;LOAD PORT4
3509  020020  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3510  020022  122110                        122110                  ;LOAD OUT DATA
3511  020024  004737  032346                JSR     PC,OCOR         ;WAIT FOR OCOR
3512  020030  104415  000023                DATACLK,        23      ;SINGLE CLOCK THE DATA
3513  020034  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3514  020036  021244                        021244                  ;PORT4 LU-12
3515  020040  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3516  020044  042704  000277                BIC     #277,R4         ;CLEAR UNWANTED BITS
3517  020050  012705  000100                MOV     #BIT6,R5                ;PUT "EXPECTED" IN R5
3518  020054  120504                        CMPB    R5,R4           ;IS IN ACTIVE SET?
3519  020056  001401                        BEQ     1$
3520  020060  104040                        HLT     40              ;ERROR, IN ACTIVE NOT SET
3521  020062  104400                 1$:    SCOPE                   ;SCOPE THIS TEST
3522
3523
3524                                    ;************************** TEST 32 **************************
3525                                    ;*BITSTUFF IN ACTIVE TEST
3526                                    ;*SET LU LOOP, SINGLE STEP 2 FLAGS AND A NON-FLAG (301)
3527                                    ;*VERIFY THAT IN ACTIVE IS SET
3528                                    ;:**********************************************************
3529
3530                                    ;  TEST 32
3531                                    ;-------------
3532  020064  012737  000032  001226 TST32:  MOV     #32,TSTNO
3533  020072  012737  020170  001216         MOV     #TST33,NEXT
3534                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3535  020100  104412                        MSTCLR                  ;MASTER CLEAR DMC11
3536  020102  005061  000004                CLR     4(R1)           ;CLEAR PORT4
3537  020106  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
3538  020110  122117                        122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3539  020112  004737  033676                JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
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3540  020116  012711  004000                MOV     #BIT11,(R1)     ;SET LU LOOP
3541  020122  012702  000012                MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3542  020126  004737  032364                JSR     PC,SYNC         ;SINGLE CLOCK 2 SYNC CHARACTERS
3543  020132  000002                        2
3544  020134  104415  000033                DATACLK,        33
3545  020140  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3546  020142  021244                        021244                  ;PORT4 LU12
3547  020144  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3548  020150  042704  000277                BIC     #277,R4         ;CLEAR UNWANTED BITS
3549  020154  012705  000100                MOV     #BIT6,R5                ;PUT "EXPECTED" IN R5
3550  020160  120504                        CMPB    R5,R4           ;IS ACTIVE SET?
3551  020162  001401                        BEQ     1$              ;BR IF YES
3552  020164  104040                        HLT     40              ;ERROR ACTIVE IS NOT SET
3553  020166  104400                1$      SCOPE                   ;SCOPE THIS TEST
3554
3555
3556                                        ;************************** TEST 33 ************************
3557                                        ;*IN CLEAR TEST
3558                                        ;*SYNC UP RECEIVER AND TRANSMIT A CHARACTER
3559                                        ;*WAIT FOR IN RDY, THEN SET IN CLEAR
3560                                        ;*VERIFY THAT IN ACTIVE AND IN RDY ARE CLEARED
3561                                        ;;*********************************************************************
3562
3563                                        ;  TEST 33
3564                                        ;-------------
3565  020170  012737  000033  001226  TST33: MOV     #33,TSTNO
3566  020176  012737  020374  001216        MOV     #TST34,NEXT
3567                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3568  020204  104412                        MSTCLR                  ;MASTER CLEAR DMC11
3569  020206  005061  000004                CLR     4(R1)           ;CLEAR PORT4
3570  020212  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3571  020214  122117                        122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3572  020216  004737  033676                JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3573  020222  012702  000012                MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3574  020226  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3575  020232  012761  000001  000004        MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3576  020240  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3577  020242  122111                        122111                  ;SET SOM!
3578  020244  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3579  020246  122110                        122110                  ;LOAD GARBAGE CHAR
3580  020250  004737  032644                JSR     PC,CHARSD       ;LOAD SILO WITH CHARACTER
3581  020254  000026                        26                      ;CHARACTER
3582  020256  104415  000033                DATACLK,        33      ;SINGLE CLOCK THE DATA
3583  020262  104416  000002                TIMER,  2               ;WAIT FOR INRDY
3584  020266  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3585  020270  021244                        021244                  ;PORT4 LU 12
3586  020272  016 04  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3587  020276  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3588  020302  012705  000020                MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
3589  020306  120504                        CMPB    R5,R4           ;IS INRDY SET?
3590  020310  001401                        BEQ     1$
3591  020312  104040                        HLT     40              ;ERROR, INRDY IS NOT SET
3592  020314                        1$:
3593  020314  012761  000200  000004        MOV     #BIT7,4(R1)     ;LOAD PORT4
3594  020322  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3595  020324  122112                        122112                  ;SET IN CLEAR
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3596  020326  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3597  020330  021244                          021244                  ;PORT4_LU 12
3598  020332  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3599  020336  042704  000277                  BIC     #277,R4         ;CLEAR UNWANTED BITS
3600  020342  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
3601  020344  120504                          CMPB    R5,R4           ;IS IN ACTIVE CLEAR?
3602  020346  001401                          BEQ     2$
3603  020350  104040                          HLT     40              ;ERROR, IN ACTIVE IS NOT CLEAR
3604  020352                          2$:
3605  020352  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3606  020356  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
3607  020362  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
3608  020364  120504                          CMPB    R5,R4           ;IS INRDY CLEARED?
3609  020366  001401                          BEQ     3$
3610  020370  104040                          HLT     40              ;ERROR, INRDY IS NOT CLEARED
3611  020372  104400                  3$:     SCOPE                   ;SCOPE THIS TEST
3612
3613
3614                                          ;************************** TEST 34 **************************
3615                                          ;*BITSTUFF BASIC RECEICER TEST
3616                                          ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 0
3617                                          ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3618                                          ;;**********************************************************
3619
3620                                          ;  TEST 34
3621                                          ;-------------
3622  020374  012737  000034  001226  TST34:  MOV     #34,TSTNO
3623  020402  012737  020542  001216          MOV     #TST35,NEXT
3624                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3625  020410  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3626  020412  005061  000004                  CLR     4(R1)           ;CLEAR PORT4
3627  020416  104414                          ROMCLK                  ,NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3628  020420  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3629  020422  004737  033676                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3630  020426  012702  000012                  MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3631  020432  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3632  020436  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3633  020444  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3634  020446  122111                          122111                  ;SET SOM.
3635  020450  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3636  020452  122110                          122110                  ;LOAD GARBAGE CHAR
3637  020454  004737  032644                  JSR     PC,CHARSD       ;LOAD SILO WITH CHARACTER
3638  020460  000000                          0                       ;CHARACTER
3639  020462  104415  000033                  DATACLK,        33      ;SINGLE CLOCK THE DATA
3640  020466  104416  000002                  TIMER,  2               ;WAIT FOR INRDY
3641  020472  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3642  020474  021244                          021244                  ;PORT4_LU 12
3643  020476  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3644  020502  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
3645  020506  012705  000020                  MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
3646  020512  120504                          CMPB    R5,R4           ;IS INRDY SET?
3647  020514  001401                          BEQ     1$
3648  020516  104040                          HLT     40              ;ERROR, INRDY IS NOT SET
3649  020520                          1$:
3650  020520  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3651  020522  021204                          021204                  ;PORT4_IN DATA
```

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3652  020524  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3653  020530  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
3654  020532  120504                          CMPB    R5,R4           ;WAS A 0 RECEIVED?
3655  020534  001401                          BEQ     2$
3656  020536  104010                          HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3657  020540  104400              2$:         SCOPE                   ;SCOPE THIS TEST
3658
3659
3660                                          ;************************** TEST 35 ************************
3661                                          ;*BITSTUFF BASIC RECEICER TEST
3662                                          ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 125
3663                                          ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3664                                          ;:*******************************************************************
3665
3666                                          ;  TEST 35
3667                                          ;-------------
3668  020542  012737  000035  001226  TST35:  MOV     #35,TSTNO
3669  020550  012737  020712  001216          MOV     #TST36,NEXT
3670
3671  020556  104412                          MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
3672  020560  005061  000004                  CLR     4(R1)           ;MASTER CLEAR DMC11
3673  020564  104414                          ROMCLK                  ;CLEAR PORT4
3674  020566  122117                          122117                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3675  020570  004737  033676                  JSR     PC,CLRIO        ;PUT LINE UNIT IN BITSTUFF MODE
3676  020574  012702  000012                  MOV     #12,R2          ;DO THIS AFTER MODE IS SET
3677  020600  012711  004000                  MOV     #BIT11,(R1)     ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3678  020604  012761  000001  000004          MOV     #1,4(R1)        ;SET LINE UNIT LOOP
3679  020612  104414                          ROMCLK                  ;SET BIT0 IN PORT4
3680  020614  122111                          122111                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3681  020616  104414                          ROMCLK                  ;SET SOM!
3682  020620  122110                          122110                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3683  020622  004737  032644                  JSR     PC,CHARSD       ;LOAD GARBAGE CHAR
3684  020626  000125                          125                     ;LOAD SILO WITH CHARACTER
3685  020630  104415  000033                  DATACLK,        33      ;CHARACTER
3686  020634  104416  000002                  TIMER,  2               ;SINGLE CLOCK THE DATA
3687  020640  104414                          ROMCLK                  ;WAIT FOR INRDY
3688  020642  021244                          021244                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3689  020644  016104  000004                  MOV     4(R1),R4        ;PORT4 LU 12
3690  020650  042704  000357                  BIC     #357,R4         ;PUT "FOUND" IN R4
3691  020654  012705  000020                  MOV     #BIT4,R5        ;CLEAR UNWANTED BITS
3692  020660  120504                          CMPB    R5,R4                   ;PUT "EXPECTED" IN R5
3693  020662  001401                          BEQ     1$              ;IS INRDY SET?
3694  020664  104040                          HLT     40              ;ERROR, INRDY IS NOT SET
3695  020666                          1$:
3696  020666  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3697  020670  021204                          021204                  ;PORT4 IN DATA
3698  020672  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3699  020676  012705  000125                  MOV     #125,R5         ;PUT "EXPECTED" IN R5
3700  020702  120504                          CMPB    R5,R4           ;WAS A 125 RECEIVED?
3701  020704  001401                          BEQ     2$
3702  020706  104010                          HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3703  020710  104400              2$:         SCOPE                   ;SCOPE THIS TEST
3704
3705
3706                                          ;************************** TEST 36 ************************
3707                                          ;*BITSTUFF BASIC RECEICER TEST
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0061

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3708                                        ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 252
3709                                        ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3710                                        ;:*****************************************************************
3711
3712                                        ;  TEST 36
3713                                        ;--------------
3714  020712  012737  000036  001226  TST36: MOV     #36,TSTNO
3715  020720  012737  021062  001216        MOV     #TST37,NEXT
3716                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3717  020726  104412                       MSTCLR                  ;MASTER CLEAR DMC11
3718  020730  005061  000004               CLR     4(R1)           ;CLEAR PORT4
3719  020734  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3720  020736  122117                       122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3721  020740  004737  033676               JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3722  020744  012702  000012               MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3723  020750  012711  004000               MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3724  020754  012761  000001  000004       MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3725  020762  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3726  020764  122111                       122111                  ;SET SOM!
3727  020766  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3728  020770  122110                       122110                  ;LOAD GARBAGE CHAR
3729  020772  004737  032644               JSR     PC,CHARSD       ;LOAD SILO WITH CHARACTER
3730  020776  000252                       252                     ;CHARACTER
3731  021000  104415  000033               DATACLK,        33      ;SINGLE CLOCK THE DATA
3732  021004  104416  000002               TIMER,  2               ;WAIT FOR INRDY
3733  021010  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3734  021012  021244                       021244                  ;PORT4 LU 12
3735  021014  016104  000004               MOV     4(R1),R4        ;PUT "FOUND" IN R4
3736  021020  042704  000357               BIC     #357,R4         ;CLEAR UNWANTED BITS
3737  021024  012705  000020               MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
3738  021030  120504                       CMPB    R5,R4           ;IS INRDY SET?
3739  021032  001401                       BEQ     1$
3740  021034  104040                       HLT     40              ;ERROR, INRDY IS NOT SET
3741  021036                        1$:
3742  021036  104414                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3743  021040  021204                       021204                  ;PORT4 IN DATA
3744  021042  016104  000004               MOV     4(R1),R4        ;PUT "FOUND" IN R4
3745  021046  012705  000252               MOV     #252,R5         ;PUT "EXPECTED" IN R5
3746  021052  120504                       CMPB    R5,R4           ;WAS A 252 RECEIVED?
3747  021054  001401                       BEQ     2$
3748  021056  104010                       HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3749  021060  104400                2$:    SCOPE                   ;SCOPE THIS TEST
3750
3751
3752                                        ;***************************** TEST 37 ****************************
3753                                        ;*BITSTUFF BASIC RECEICER TEST
3754                                        ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 377
3755                                        ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3756                                        ;:*****************************************************************
3757
3758                                        ;  TEST 37
3759                                        ;--------------
3760  021062  012737  000037  001226  TST37: MOV     #37,TSTNO
3761  021070  012737  021232  001216        MOV     #TST40,NEXT
3762                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3763  021076  104412                       MSTCLR                  ;MASTER CLEAR DMC11
```

0062

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3764  021100  005061  000004              CLR     4(R1)           ;CLEAR PORT4
3765  021104  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3766  021106  122117                      122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3767  021110  004737  033676              JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3768  021114  012702  000012              MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3769  021120  012711  004000              MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3770  021124  012761  000001  000004      MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3771  021132  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3772  021134  122111                      122111                  ;SET SOM!
3773  021136  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3774  021140  122110                      122110                  ;LOAD GARBAGE CHAR
3775  021142  004737  032644              JSR     PC,CHARSD       ;LOAD SILO WITH CHARACTER
3776  021146  000377                      377                     ;CHARACTER
3777  021150  104415  000034              DATACLK,        34      ;SINGLE CLOCK THE DATA
3778  021154  104416  000002              TIMER,  2               ;WAIT FOR INRDY
3779  021160  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3780  021162  021244                      021244                  ;PORT4 LU 12
3781  021164  016104  000004              MOV     4(R1),R4        ;PUT "FOUND" IN R4
3782  021170  042704  000357              BIC     #357,R4         ;CLEAR UNWANTED BITS
3783  021174  012705  000020              MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
3784  021200  120504                      CMPB    R5,R4           ;IS INRDY SET?
3785  021202  001401                      BEQ     1$
3786  021204  104040                      HLT     40              ;ERROR, INRDY IS NOT SET
3787  021206                      1$:
3788  021206  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3789  021210  021204                      021204                  ;PORT4 IN DATA
3790  021212  016104  000004              MOV     4(R1),R4        ;PUT "FOUND" IN R4
3791  021216  012705  000377              MOV     #377,R5         ;PUT "EXPECTED" IN R5
3792  021222  120504                      CMPB    R5,R4           ;WAS A 377 RECEIVED?
3793  021224  001401                      BEQ     2$
3794  021226  104010                      HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3795  021230  104400              2$:     SCOPE                   ;SCOPE THIS TEST
3796
3797
3798                                      ;*************************** TEST 40 ***************************
3799                                      ;*BITSTUFF DATA TEST
3800                                      ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
3801                                      ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
3802                                      ;;***********************************************************
3803
3804                                      ;  TEST 40
3805                                      ;--------------
3806  021232  012737  000040  001226  TST40:  MOV     #40,TSTNO
3807  021240  012737  021406  001216          MOV     #TST41,NEXT
3808                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
3809  021246  104412                      MSTCLR                  ;MASTER CLEAR DMC11
3810  021250  005061  000004              CLR     4(R1)           ;CLEAR PORT4
3811  021254  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3812  021256  122117                      122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3813  021260  004737  033676              JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3814  021264  005037  033150              CLR     SCHAR           ;START BINARY COUNT AT ZERO
3815  021270  005137  033150              COM     SCHAR           ;IF BITSTUFF SCHAR IS MINUS NUMBER
3816  021274  005037  034114              CLR     BITCON          ;START  1'S COUNT AT 0
3817  021300  005037  033152              CLR     STUFLG          ;CLEAR BITSTUFF FLAG
3818  021304  005002                      CLR     R2              ;R2 IS "EXPECTED" DATA
3819  021306  012703  000073              MOV     #73,R3          ;R3 IS CHARACTER COUNT
```

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```
3820  021312  012711  004000              MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3821  021316  004737  032710              JSR     PC,SILOLD       ;LOAD SILO WITH COUNT PATTERN
3822  021322  104415  000023              DATACLK,        23      ;SYNC RECEIVER AND GET IT ACTIVE
3823  021326  104415  000730      1$:     DATACLK,        730     ;CLOCK IN 73 CHARACTERS
3824  021332  004737  033154      4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3825  021336  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3826  021340  021204                      021204                  ;PORT4 IN DATA
3827  021342  016104  000004              MOV     4(R1),R4        ;PUT "FOUND" IN R4
3828  021346  010205                      MOV     R2,R5           ;PUT "EXPECTED" IN R5
3829  021350  120504                      CMPB    R5,R4           ;IS DATA CORRECT?
3830  021352  001401                      BEQ     2$              ;BR IF YES
3831  021354  104010                      HLT     10              ;DATA ERROR
3832  021356  005202              2$:     INC     R2              ;NEXT CHARACTER
3833  021360  022702  000400              CMP     #400,R2         ;ALL DONE?
3834  021364  001407                      BEQ     3$              ;BR IF YES
3835  021366  005303                      DEC     R3              ;DECREMENT CHARACTER COUNT
3836  021370  001360                      BNE     4$              ;BR IF SILO NOT EMPTY
3837  021372  004737  032710              JSR     PC,SILOLD       ;LOAD SILO WITH MORE OF COUNT PATTERN
3838  021376  012703  000073              MOV     #73,R3          ;RELOAD CHARACTER COUNT
3839  021402  000751                      BR      1$              ;CONTINUE
3840  021404  104400              3$:     SCOPE                   ;SCOPE THIS TEST
3841
3842
3843                                      ;************************** TEST 41 **************************
3844                                      ;*BITSTUFF DATA TEST
3845                                      ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
3846                                      ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
3847                                      ;*THIS TEST IS EXACTLY THE SAME AS THE LAST TEST,
3848                                      ;*EXCEPT LINE UNIT LOOP IS SET IN LU REGISTER 12
3849                                      ;;**********************************************************************
3850
3851                                      ;  TEST 41
3852                                      ;--------------
3853  021406  012737  000041  001226  TST41:  MOV     #41,TSTNO
3854  021414  012737  021572  001216          MOV     #TST42,NEXT
3855                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
3856  021422  104412                      MSTCLR                  ;MASTER CLEAR DMC11
3857  021424  005061  000004              CLR     4(R1)           ;CLEAR PORT4
3858  021430  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3859  021432  122117                      122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3860  021434  004737  033676              JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3861  021440  005037  033150              CLR     SCHAR           ;START BINARY COUNT AT ZERO
3862  021444  005137  033150              COM     SCHAR           ;IF BITSTUFF SCHAR IS MINUS NUMBER
3863  021450  005037  034114              CLR     BITCON          ;START  1'S COUNT AT 0
3864  021454  005037  033152              CLR     STUFLG          ;CLEAR BITSTUFF FLAG
3865  021460  005002                      CLR     R2              ;R2 IS "EXPECTED" DATA
3866  021462  012703  000073              MOV     #73,R3          ;R3 IS CHARACTER COUNT
3867  021466  005011                      CLR     (R1)            ;CLEAR LU LOOP IN MAINT REG
3868  021470  012761  000040  000004      MOV     #BIT5,4(R1)     ;LOAD PORT4
3869  021476  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3870  021500  122112                      122112                  ;SET LU LOOP IN LU REG 12
3871  021502  004737  032710              JSR     PC,SILOLD       ;LOAD SILO WITH COUNT PATTERN
3872  021506  104415  000023              DATACLK,        23      ;SYNC RECEIVER AND GET IT ACTIVE
3873  021512  104415  000730      1$:     DATACLK,        730     ;CLOCK IN 73 CHARACTERS
3874  021516  004737  033154      4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3875  021522  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
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3876  021524  021204                          021204                  ;PORT4 IN DATA
3877  021526  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3878  021532  010205                          MOV     R2,R5           ;PUT "EXPECTED" IN R5
3879  021534  120504                          CMPB    R5,R4           ;IS DATA CORRECT?
3880  021536  001401                          BEQ     2$              ;BR IF YES
3881  021540  104010                          HLT     10              ;DATA ERROR
3882  021542  005202                  2$:     INC     R2              ;NEXT CHARACTER
3883  021544  022702  000400                  CMP     #400,R2         ;ALL DONE?
3884  021550  001407                          BEQ     3$              ;BR IF YES
3885  021552  005303                          DEC     R3              ;DECREMENT CHARACTER COUNT
3886  021554  001360                          BNE     4$              ;BR IF SILO NOT EMPTY
3887  021556  004737  032710                  JSR     PC,SILOLD       ;LOAD SILO WITH MORE OF COUNT PATTERN
3888  021562  012703  000073                  MOV     #73,R3          ;RELOAD CHARACTER COUNT
3889  021566  000751                          BR      1$              ;CONTINUE
3890  021570  104400                  3$:     SCOPE                   ;SCOPE THIS TEST
3891
3892
3893                                          ;***************************** TEST 42 ****************************
3894                                          ;*RECEIVER ABORT TEST
3895                                          ;*SINGLE CLOCK 3 FLAGS, A 301, ANOTHER 301 AND 10 EXTRA
3896                                          ;*CLOCK TICKS, VERIFY THAT A 301 AND A BLOCK END
3897                                          ;*WERE RECEIVED INDICATING THAT THE RECEIVER RECOGINIZED
3898                                          ;*THE ABORT SEQUENCE (8 CONTIGUIOUS 1'S)
3899                                          ;*******************************************************************
3900
3901                                          ;  TEST 42
3902                                          ;--------------
3903  021572  012737  000042  001226  TST42:  MOV     #42,TSTNO
3904  021600  012737  021734  001216          MOV     #TST43,NEXT
3905                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3906  021606  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3907  021610  005061  000004                  CLR     4(R1)
3908  021614  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3909  021616  122117                          122117                  ;PUT LINE UNIT IN BITSTUFF MODE
3910  021620  004737  033676                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
3911  021624  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3912  021630  004737  032532                  JSR     PC,CHAR         ;LOAD SILO WITH 3 FLAGS
3913  021634  000301                          301                     ;AND A 301
3914  021636  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
3915  021642  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3916  021644  122110                          122110                  ;LOAD 2ND 301 CHARACTER
3917  021646  104415  000073                  DATACLK,        73      ;CLOCK THE 301 IN AND 10 EXTRA TICKS
3918  021652  004737  033154                  JSR     PC,INRDY        ;WAIT FOR INRDY
3919  021656  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3920  021660  021204                          021204                  ;PORT4 IN DATA
3921  021662  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3922  021666  012705  000301                  MOV     #301,R5         ;PUT "EXPECTED" IN R5
3923  021672  120504                          CMPB    R5,R4           ;WAS A 301 RECEIVED?
3924  021674  001401                          BEQ     1$
3925  021676  104010                          HLT     10              ;ERROR FIRST CHARACTER INCORRECT
3926  021700  004737  033154          1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3927  021704  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
3928  021706  021244                          021244                  ;READ LU-12
3929  021710  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3930  021714  042704  000375                  BIC     #375,R4         ;CLEAR UNWANTED BITS
3931  021720  012705  000002                  MOV     #2,R5           ;PUT "EXPECTED" IN R5
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0065

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3932  021724  120504                        CMPB    R5,R4           ;IS BLOCK END SET?
3933  021726  001401                        BEQ     3$              ;BR IF YES
3934  021730  104032                        HLT     32              ;ERROR, BLOCK END NOT SET
3935  021732  104400                3$:     SCOPE                   ;SCOPE THIS TEST
3936
3937
3938                                        ;*************************** TEST 43 ***************************
3939                                        ;*CABLE TURNAROUND TEST
3940                                        ;*CLEAR LINE UNIT LOOP, SET DTR
3941                                        ;*VERIFY THAT RING AND MODEM READY ARE SET
3942                                        ;*CLEAR DTR, VERIFY THAT MRDY IS CLEARED
3943                                        ;:*************************************************************
3944
3945                                        ;  TEST 43
3946                                        ;-------------
3947  021734  012737  000043  001226  TST43: MOV     #43,TSTNO
3948  021742  012737  022162  001216        MOV     #TST44,NEXT
3949                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
3950  021750  104412                        MSTCLR                  ;MASTER CLEAR DMC11
3951  021752  032737  020000  001366                BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
3952  021760  001004                        BNE     .+12            ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
3953  021762  032737  040000  001366        BIT     #BIT14,STAT1    ;IS TURNAROUND CONNECTOR ON?
3954  021770  001473                        BEQ     2$              ;SKIP TEST IF NO
3955  021772  005011                        CLR     (R1)            ;CLEAR LINE UNIT LOOP
3956  021774  012761  000100  000004        MOV     #100,4(R1)      ;LOAD PORT4
3957  022002  104414                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3958  022004  122113                        122113                  ;SET DTR
3959  022006  104416  000002                TIMER,  2               ;WAIT
3960  022012  104414                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3961  022014  021264                        021264                  ;PORT4_LU13
3962  022016  016104  000004        MOV     4(R1),R4        ; PUT FOUND IN R4       ++++NEW
3963  022022  042704  000023        BIC     #23,R4          ; CLEAR JUNK
3964  022026  012705  000310        MOV     #310,R5         ; GET EXPECTED.
3965  022032  032737  020000  001366  BIT     #BIT13,STAT1    ; IS LINE UNIT M8202?
3966  022040  001402                BEQ     .+6
3967  022042  042705  000200        BIC     #BIT7,R5        ; NO RING ON M8202
3968
3969  022046  032737  000004  001372  BIT     #BIT2,STAT3     ; IS THIS V.35 MODEM?
3970  022054  001402                BEQ     3$              ; NO THEN GO AHEAD.
3971
3972  022056  042705  000200        BIC     #BIT7,R5        ; YES-NO RING ON V.35 MODEM
3973  022062                        3$:
3974  022062  020504                CMP     R5,R4           ; ARE RING AND MODEM READY SET?
3975  022064  001401                BEQ     1$              ; WARNING! IF V.35 AND AUTO STARTED,
3976                                                        ; YOU WILL GET THIS ERROR. YOU MUST
3977                                                        ; MANUALL NASWER THE QUESTIONS FOR V.35.
3978  022066  104011                        HLT     11              ;ERROR, MRDY NOT SET
3979  022070  005061  000004        1$:     CLR     4(R1)           ;CLEAR PORT4
3980  022074  104414                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3981  022076  122113                        122113                  ;CLEAR DTR
3982  022100  104416  000002                TIMER,  2
3983  022104  104414                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3984  022106  021264                        021264                  ;PORT4_LU13
3985  022110  016104  000004        MOV     4(R1),R4        ; PUR FOUND IN R4               +++NEW
3986  022114  042704  000023        BIC     #23,R4          ; STRIP JUNK
3987  022120  005005                CLR     R5              ; SET EXPECTED.
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3988  022122  032737  020000  001366          BIT     #BIT13,STAT1    ; IS THIS A M8202?
3989  022130  001402                          BEQ     .+6
3990  022132  052705  000010                  BIS     #BIT3,R5        ; YES THEN EXPECT MRDY SET.
3991  022136  032737  000004  001372          BIT     #BIT2,STAT3     ; IS THIS V.35?
3992  022144  001402                          BEQ     4$
3993  022146  042704  000200                  BIC     #BIT7,R4
3994  022152                          4$:
3995  022152  120405                          CMPB    R4,R5           ; ARE RING AND MRDY CLEAR?
3996  022154  001401                          BEQ     2$
3997
3998                                                                  ; WARNING! YOU MAY GET THIS ERROR IF V.35
3999                                                                  ; AND AUTOSTART. YOU MUST MANNUALLY ANSWER
                                                                      ; ALL QUESTIONS IF V.35.
4000  022156  104011                          HLT     11              ;ERROR, MRDY NOT CLEAR
4001  022160  104400                  2$:     SCOPE                   ;SCOPE THIS TEST
4002
4003
4004                                          ;************************** TEST 44 ************************
4005                                                  ;*CABLE TURNAROUND TEST
4006                                                  ;*CLEAR LINE UNIT LOOP, LOAD OUT DATA SILO
4007                                                  ;*VERIFY THAT ALL MODEM SIGNALS ARE SET
4008                                          ;:*******************************************************************
4009
4010                                          ;  TEST 44
4011                                          ;--------------
4012  022162  012737  000044  001226  TST44:  MOV     #44,TSTNO
4013  022170  012737  022356  001216          MOV     #TST45,NEXT
4014
4015  022176  104412                                  ;R1 CONTAINS BASE DMC11 ADDRESS
4016  022200  032737  020000  001366  MSTCLR          ;MASTER CLEAR DMC11
4017  022206  001004                  BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
4018  022210  032737  040000  001366  BNE     .+12            ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
4019  022216  001456                  BIT     #BIT14,STAT1    ;IS TURNAROUND CONNECTOR ON?
4020  022220  012711  004000          BEQ     1$              ;SKIP TEST IF NO
4021  022224  012761  000100  000004  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4022  022232  104414                  MOV     #100,   4(R1)           ;LOAD PORT4
4023  022234  122113          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4024  022236  104416  000002        122113                  ;CLEAR ALL MODEM SIGNALS,EXCEPT DTR
4025  022242  012761  000001  000004  TIMER,  2               ;WAIT
4026  022250  104414                  MOV     #1,4(R1)        ;LOAD PORT4
4027  022252  122111          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4028  022254  004537  033634        122111                  ;SET SOM
4029  022260  034116                  JSP     R5,MESLD        ;FILL OUT DATA SILO
4030  022262  000100                  MESDAT                  ;WITH 64 CHARACTERS
4031  022264  012700  000050        64.
4032  022270  005011                  MOV     #50,R0          ;PREPARE FOR DELAY
4033  022272                          CLR     (R1)            ;CLEAR LINE UNIT LOOP
4034  022272  104414          2$:
4035  022274  021264          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4036  022276  016104  000004        021264                  ;PORT4 LU13
4037  022302  042704  000023        MOV     4(R1),R4        ;PUT "FOUND" IN R4
4038  022306  012705  000354        BIC     #23,R4          ;CLEAR UNWANTED BITS
4039                                 MOV     #354,R5         ;PUT "EXPECTED" IN R5
4040  022312  032737  000004  001372          BIT     #BIT2,STAT3     ; SEE IF V.35
4041  022320  001402                          BEQ     40$
4042  022322  042705  000200                  BIC     #BIT7,R5        ; IF SO, NO RING.
4043  022326  032737  020000  001366  40$:    BIT     #BIT13,STAT1            ; IS THIS M8202?
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4044  022334  001402                        BEQ     4$                      ; NO,SKIP
4045  022336  042705  000200                BIC     #BIT7,R5
4046  022342                          4$:
4047  022342  120504                        CMPB    R5,R4                   ;COMPARE EXPECTED AND FOUND
4048  022344  001403                        BEQ     1$                      ;BR IF OK
4049  022346  005300                        DEC     R0                      ;DEC DELAY COUNT
4050  022350  001350                        BNE     2$                      ;BR IF NOT ZERO
4051  022352  104011                        HLT     11                      ;ERROR, ALL SIGNALS ARE NOT SET
4052                                                                        ; YOU MUST ANSWER ALL QUESTIONS
4053                                                                        ; MAUNALLY IF V.35 .
4054  022354  104400                  1$:   SCOPE                           ;SCOPE THIS TEST
4055
4056
4057                                  ;************************** TEST 45 *************************
4058                                          ;*TEST OF CRC OPERATION
4059
4060                                          ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4061                                          ;*0, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4062
4063                                          ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4064                                  ;;*********************************************************
4065
4066                                  ;  TEST 45
4067                                  ;--------------
4068  022356  012737  000045  001226  TST45: MOV     #45,TSTNO
4069  022364  012737  022722  001216        MOV     #TST46,NEXT
4070  022372  012737  022426  001220        MOV     #64$,LOCK
4071
4072  022400  104412                        MSTCLR                          ;R1 CONTAINS BASE DMC11 ADDRESS
4073  022402  005061  000004                CLR     4(R1)                   ;MASTER CLEAR DMC11
4074  022406  104414                        ROMCLK                          ;CLEAR PORT4
4075  022410  122117                        122117                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4076                                                                        ;PUT LINE UNIT IN BITSTUFF MODE
4077  022412  004737  033676                JSR     PC,CLRIO                ;DO THIS AFTER MODE IS SET
4078  022416  005037  034114                CLR     BITCON                  ;CONSECUTIVE 1'S COUNTER INIT TO 0
4079  022422  012711  004000                MOV     #BIT11,(R1)             ;SET LU LOOP
4080  022426  004737  033676          64$:  JSR     PC,CLRIO                ;CLEAR BCC REGISTERS
4081  022432  005000                        CLR     R0                      ;START SHIFT COUNTER AT ZERO
4082  022434  012737  102010  033332        MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4083  022442  012737  000000  022506        MOV     #0,66$                  ;LOAD CHAR FOR SOFTWARE BCC
4084  022450  005037  022510                CLR     67$                     ;CLEAR OLD SOFTWARE BCC
4085  022454  005137  022510                COM     67$                     ;START AT -1
4086  022460  004737  033336                JSR     PC,BCCLD                ;LOAD OUT SILO WITH 2 SYNCS
4087  022464  000000                        0                               ;AND THE CHARACTER 0
4088  022466  104415  000021                DATACLK,        21              ;GET TRANSMITTER ACTIVE
4089  022472  104415  000001          65$:  DATACLK,        1               ;SHIFT BCC ONCE
4090
4091  022476  005200                        INC     R0                      ;BUMP SHIFT COUNT
4092
4093  022500  004537  033210                JSR     R5,SIMBCC               ;CALCULATE SOFTWARE BCC LSB
4094  022504  000001                        1                               ;ONE SHIFT
4095  022506  000000                  66$:  0                               ;DATA CHARACTER
4096  022510  000000                  67$:  0                               ;OLD BCC
4097  022512  103405                        BCS     68$                     ;BR IF SOFT BCC LSB IS SET
4098  022514  004737  033450                JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
4099  022520  103006                        BCC     69$                     ;BR IF HARD BCC LSB IS CLEAR
```

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4100  022522  104012                                    HLT     12              ;ERROR, BCC LSB IS SET
4101  022524  000404                                    BR      69$             ;CONTINUE
4102  022526  004737  033450                  68$:     JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
4103  022532  103401                                    BCS     69$             ;BR IF HARD BCC LSB IS SET
4104  022534  104016                                    HLT     16              ;ERROR, HARD BCC LSB IS CLEAR
4105  022536                                    69$:
4106  022536  006037  022506                            ROR     66$             ;SHIFT SOFT DATA
4107  022542  013737  033334  022510                    MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
4108  022550  022700  000010                            CMP     #10,R0          ;DONE YET?
4109  022554  001346                                    BNE     65$             ;BR IF NOT DONE
4110  022556  104401                                    SCOP*                   ;SCOPE SUBTEST (SW09=1)
4111  022560  012737  022566  001220                    MOV     #71$,LOCK       ;NEW SCOPE1
4112  022566  004737  033676                  71$:     JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4113  022572  005000                                    CLR     R0              ;START SHIFT COUNTER AT ZERO
4114  022574  012737  102010  033332                    MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4115  022602  012737  000000  022646                    MOV     #0,73$          ;LOAD CHAR FOR SOFTWAPE BCC
4116  022610  005037  022650                            CLR     74$             ;CLEAR OLD SOFTWARE BCC
4117  022614  005137  022650                            COM     74$             ;START AT -1
4118  022620  004737  033336                            JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4119  022624  000000                                    0                       ;AND THE CHARACTER 0
4120  022626  104415  000032                            DATACLK,        32      ;GET RECEIVER ACTIVE
4121  022632  104415  000001                  72$:     DATACLK,        1       ;SHIFT BCC ONCE
4122
4123  022636  005200                                    INC     R0              ;BUMP SHIFT COUNT
4124
4125  022640  004537  033210                            JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4126  022644  000001                                    1                       ;ONE SHIFT
4127  022646  000000                            73$:    0                       ;DATA CHARACTER
4128  022650  000000                            74$:    0                       ;OLD BCC
4129  022652  103405                                    BCS     75$             ;BR IF SOFT BCC LSB IS SET
4130  022654  004737  033462                            JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4131  022660  103006                                    BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
4132  022662  104013                                    HLT     13              ;ERROR, BCC LSB IS SET
4133  022664  000404                                    BR      76$             ;CONTINUE
4134  022666  004737  033462                  75$:     JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4135  022672  103401                                    BCS     76$             ;BR IF HARD BCC LSB IS SET
4136  022674  104017                                    HLT     17              ;ERROR, BCC LSB IS CLEAR
4137  022676                                    76$:
4138  022676  006037  022646                            ROR     73$             ;SHIFT SOFT DATA
4139  022702  013737  033334  022650                    MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
4140  022710  022700  000010                            CMP     #10,R0          ;DONE YET?
4141  022714  001346                                    BNE     72$             ;BR IF NOT DONE
4142  022716  104401                                    SCOP1                   ;SCOPE SUBTEST (SW09=1)
4143  022720  104400                  77$:     SCOPE                   ;SCOPE THIS TEST
4144
4145
4146                                            ;************************** TEST 46 ************************
4147                                                    ;*TEST OF CRC OPERATION
4148
4149                                                    ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4150                                                    ;*377, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4151
4152                                                    ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4153                                            ;:**********************************************************
4154
4155                                            ;  TEST 46
```

```
4156                                                    ;--------------
4157  022722  012737  000046  001226  TST46:  MOV     #46,TSTNO
4158  022730  012737  023314  001216           MOV     #TST47,NEXT
4159  022736  012737  022772  001220           MOV     #64$,LOCK
4160                                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
4161  022744  104412                           MSTCLR                  ;MASTER CLEAR DMC11
4162  022746  005061  000004                           CLR     4(R1)           ;CLEAR PORT4
4163  022752  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4164  022754  122117                                   122117                  ;PUT LINE UNIT IN BITSTUFF MODE
4165
4166  022756  004737  033676                           JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
4167  022762  005037  034114                           CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
4168  022766  012711  004000                           MOV     #BIT11,(R1)     ;SET LU LOOP
4169  022772  004737  033676                   64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4170  022776  005000                                   CLR     R0              ;START SHIFT COUNTER AT ZERO
4171  023000  012737  102010  033332                   MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4172  023006  012737  000377  023072                   MOV     #377,66$;       ;LOAD CHAR FOR SOFTWARE BCC
4173  023014  005037  023074                           CLR     67$             ;CLEAR OLD SOFTWARE BCC
4174  023020  005137  023074                           COM     67$             ;START AT -1
4175  023024  004737  033336                           JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4176  023030  000377                                   377                     ;AND THE CHARACTER 377
4177  023032  104415  000021                           DATACLK,        21      ;GET TRANSMITTER ACTIVE
4178  023036  005037  034114                           CLR     BITCON          ;CLEAR BIT COUNTER
4179  023042  005037  023056                           CLR     60$
4180  023046  104415  000001                   65$:    DATACLK,        1       ;SHIFT BCC ONCE
4181  023052  004537  033776                           JSR     R5,STFFCK       ;CHECK FOR STUFFING ZEROS
4182  023056  000000                           60$:    0                       ;CHARACTER
4183  023060  000001                                   1                       ;SHIFT COUNT
4184
4185  023062  005200                                   INC     R0              ;BUMP SHIFT COUNT
4186
4187  023064  004537  033210                           JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4188  023070  000001                                   1                       ;ONE SHIFT
4189  023072  000000                           66$:    0                       ;DATA CHARACTER
4190  023074  000000                           67$:    0                       ;OLD BCC
4191  023076  103405                                   BCS     68$             ;BR IF SOFT BCC LSB IS SET
4192  023100  004737  033450                           JSR     PC,GETQQ        ;GET HARDWARE TRANSMITTER BCC LSB
4193  023104  103006                                   BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
4194  023106  104012                                   HLT     12              ;ERROR, BCC LSB IS SET
4195  023110  000404                                   BR      69$             ;CONTINUE
4196  023112  004737  033450                   68$:    JSR     PC,GETQQ        ;GET HARDWARE TRANSMITTER BCC LSB
4197  023116  103401                                   BCS     69$             ;BR IF HARD BCC LSB IS SET
4198  023120  104016                                   HLT     16              ;ERROR, HARD BCC LSB IS CLEAR
4199  023122                                   69$:
4200  023122  013737  023072  023056                   MOV     66$,60$
4201  023130  006037  023072                           ROR     66$             ;SHIFT SOFT DATA
4202  023134  013737  033334  023074                   MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
4203  023142  022700  000010                           CMP     #10,R0          ;DONE YET?
4204  023146  001337                                   BNE     65$             ;BR IF NOT DONE
4205  023150  104401                                   SCOP1                   ;SCOPE SUBTEST (SW09=1)
4206  023152  012737  023160  001220                   MOV     #71$,LOCK       ;NEW SCOPE1
4207  023160  004737  033676                   71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4208  023164  005000                                   CLR     R0              ;START SHIFT COUNTER AT ZERO
4209  023166  012737  102010  033332                   MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4210  023174  012737  000377  023240                   MOV     #377,73$;       ;LOAD CHAR FOR SOFTWARE BCC
4211  023202  005037  023242                           CLR     74$             ;CLEAR OLD SOFTWARE BCC
```

```
4212  023206  005137  023242                          COM     74$             ;START AT -1
4213  023212  004737  033336                          JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4214  023216  000377                                  377                     ;AND THE CHARACTER 377
4215  023220  104415  000033                          DATACLK,        33      ;GET RECEIVER ACTIVE
4216  023224  104415  000001              72$:        DATACLK,        1       ;SHIFT BCC ONCE
4217
4218  023230  005200                                  INC     R0              ;BUMP SHIFT COUNT
4219
4220  023232  004537  033210                          JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4221  023236  000001                                  1                       ;ONE SHIFT
4222  023240  000000              73$:                0                       ;DATA CHARACTER
4223  023242  000000              74$:                0                       ;OLD BCC
4224  023244  103405                                  BCS     75$             ;BR IF SOFT BCC LSB IS SET
4225  023246  004737  033462                          JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4226  023252  103006                                  BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
4227  023254  104013                                  HLT     13              ;ERROR, BCC LSB IS SET
4228  023256  000404                                  BR      76$             ;CONTINUE
4229  023260  004737  033462              75$:        JSR     PC,GETQI        ;GET HARDWARE RECEIVFR BCC LSB
4230  023264  103401                                  BCS     76$             ;BR IF HARD BCC LSB IS SET
4231  023266  104017                                  HLT     17              ;ERROR, BCC LSB IS CLEAR
4232  023270                                  76$
4233  023270  006037  023240                          ROR     73$             ;SHIFT SOFT DATA
4234  023274  013737  033334  023242                  MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
4235  023302  022700  000010                          CMP     #10,R0          ;DONE YET?
4236  023306  001346                                  BNE     72$             ;BR IF NOT DONE
4237  023310  104401                                  SCOP1                   ;SCOPE SUBTEST (SW09=1)
4238  023312  104400                      77$:        SCOPE                   ;SCOPE THIS TEST
4239
4240
4241                                                  ;*************************** TEST 47 ***************************
4242                                                          ;*TEST OF CRC OPERATION
4243
4244                                                          ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4245                                                          ;*125, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4246
4247                                                          ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4248                                                  ;;*************************************************************
4249
4250                                                  ;  TEST 47
4251                                                  ;--------------
4252  023314  012737  000047  001226      TST47:      MOV     #47,TSTNO
4253  023322  012737  023660  001216                  MOV     #TST50,NEXT
4254  023330  012737  023364  001220                  MOV     #64$,LOCK
4255                                                                          ;R1 CONTAINS BASE DMC11 ADDRESS
4256  023336  104412                                  MSTCLR                  ;MASTER CLEAR DMC11
4257  023340  005061  000004                                  CLR     4(R1)          ;CLEAR PORT4
4258  023344  104414                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4259  023346  122117                                          122117                 ;PUT LINE UNIT IN BITSTUFF MODE
4260
4261  023350  004737  033676                                  JSR     PC,CLRIO       ;DO THIS AFTER MODE IS SET
4262  023354  005037  034114                                  CLR     BITCON         ;CONSECUTIVE 1'S COUNTER INIT TO 0
4263  023360  012711  004000                                  MOV     #BIT11,(R1)    ;SET LU LOOP
4264  023364  004737  033676              64$:                JSR     PC,CLRIO       ;CLEAR BCC REGISTERS
4265  023370  005000                                          CLR     R0             ;START SHIFT COUNTER AT ZERO
4266  023372  012737  102010  033332                          MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4267  023400  012737  000125  023444                          MOV     #125,66$;      ;LOAD CHAR FOR SOFTWARE BCC
```

```
4268  023406  005037  023446                          CLR     67$             ;CLEAR OLD SOFTWARE BCC
4269  023412  005137  023446                          COM     67$             ;START AT -1
4270  023416  004737  033336                          JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4271  023422  000125                                  125                     ;AND THE CHARACTER 125
4272  023424  104415  000021                          DATACLK,        21      ;GET TRANSMITTER ACTIVE
4273  023430  104415  000001              65$:        DATACLK,        1       ;SHIFT BCC ONCE
4274
4275  023434  005200                                  INC     R0              ;BUMP SHIFT COUNT
4276
4277  023436  004537  033210                          JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4278  023442  000001                                  1                       ;ONE SHIFT
4279  023444  000000              66$:        0                               ;DATA CHARACTER
4280  023446  000000              67$:        0                               ;OLD BCC
4281  023450  103405                          BCS     68$                     ;BR IF SOFT BCC LSB IS SET
4282  023452  004737  033450                  JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
4283  023456  103006                          BCC     69$                     ;BR IF HARD BCC LSB IS CLEAR
4284  023460  104012                          HLT     12                      ;ERROR, BCC LSB IS SET
4285  023462  000404                          BR      69$                     ;CONTINUE
4286  023464  004737  033450              68$:        JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
4287  023470  103401                          BCS     69$                     ;BR IF HARD BCC LSB IS SET
4288  023472  104016                          HLT     16                      ;ERROR, HARD BCC LSB IS CLEAR
4289  023474                              69$:
4290  023474  006037  023444                  ROR     66$                     ;SHIFT SOFT DATA
4291  023500  013737  033334  023446          MOV     CALBCC,67$              ;LOAD OLD SOFT BCC
4292  023506  022700  000010                  CMP     #10,R0                  ;DONE YET?
4293  023512  001346                          BNE     65$                     ;BR IF NOT DONE
4294  023514  104401                          SCOP1                           ;SCOPE SUBTEST (SW09-1)
4295  023516  012737  023524  001220          MOV     #71$,LOCK               ;NEW SCOPE1
4296  023524  004737  033676              71$:        JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4297  023530  005000                          CLR     R0                      ;START SHIFT COUNTER AT ZERO
4298  023532  012737  102010  033332          MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4299  023540  012737  000125  023604          MOV     #125,73$;               ;LOAD CHAR FOR SOFTWARE BCC
4300  023546  005037  023606                  CLR     74$                     ;CLEAR OLD SOFTWARE BCC
4301  023552  005137  023606                  COM     74$                     ;START AT -1
4302  023556  004737  033336                  JSR     PC,BCCLD                ;LOAD OUT SILO WITH 2 SYNCS
4303  023562  000125                          125                             ;AND THE CHARACTER 125
4304  023564  104415  000032                  DATACLK,        32              ;GET RECEIVER ACTIVE
4305  023570  104415  000001              72$:        DATACLK,        1       ;SHIFT BCC ONCE
4306
4307  023574  005200                          INC     R0                      ;BUMP SHIFT COUNT
4308
4309  023576  004537  033210                  JSR     R5,SIMBCC               ;CALCULATE SOFTWARE BCC LSB
4310  023602  000001                          1                               ;ONE SHIFT
4311  023604  000000              73$:        0                               ;DATA CHARACTER
4312  023606  000000              74$:        0                               ;OLD BCC
4313  023610  103405                          BCS     75$                     ;BR IF SOFT BCC LSB IS SET
4314  023612  004737  033462                  JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
4315  023616  103006                          BCC     76$                     ;BR IF HARD BCC LSB IS CLEAR
4316  023620  104013                          HLT     13                      ;ERROR, BCC LSB IS SET
4317  023622  000404                          BR      76$                     ;CONTINUE
4318  023624  004737  033462              75$:        JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4319  023630  103401                          BCS     76$                     ;BR IF HARD BCC LSB IS SET
4320  023632  104017                          HLT     17                      ;ERROR, BCC LSB IS CLEAR
4321  023634                              76$:
4322  023634  006037  023604                  ROR     73$                     ;SHIFT SOFT DATA
4323  023640  013737  033334  023606          MOV     CALBCC,74$              ;LOAD OLD SOFT BCC
```

```
4324  023646  022700  000010                    CMP     #^O0,R0         ;DONE YET?
4325  023652  001346                            BNE     72$             ;BR IF NOT DONE
4326  023654  104401                            SCOP1                   ;SCOPE SUBTEST (SW09=1)
4327  023656  104400                77$:        SCOPE                   ;SCOPE THIS TEST
4328
4329
4330                                            ;*************************** TEST 50 ***************************
4331                                            ;*TEST OF CRC OPERATION
4332
4333                                            ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4334                                            ;*252, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4335
4336                                            ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4337                                            ;;*************************************************************
4338
4339                                            ;  TEST 50
4340                                            ;--------------
4341  023660  012737  000050  001226  TST50:    MOV     #50,TSTNO
4342  023666  012737  024224  001216            MOV     #TST51,NEXT
4343  023674  012737  023730  001220            MOV     #64$,LOCK
4344                                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
4345  023702  104412                           MSTCLR                  ;MASTER CLEAR DMC11
4346  023704  005061  000004                            CLR     4(R1)           ;CLEAR PORT4
4347  023710  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4348  023712  122117                                     122117                ;PUT LINE UNIT IN BITSTUFF MODE
4349
4350  023714  004737  033676                            JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
4351  023720  005037  034114                            CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
4352  023724  012711  004000                            MOV     #BIT11,(R1)     ;SET LU LOOP
4353  023730  004737  033676                64$:        JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4354  023734  005000                                     CLR     R0              ;START SHIFT COUNTER AT ZERO
4355  023736  012737  102010  033332                    MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
4356  023744  012737  000252  024010                    MOV     #252,66$;       ;LOAD CHAR FOR SOFTWARE BCC
4357  023752  005037  024012                            CLR     67$             ;CLEAR OLD SOFTWARE BCC
4358  023756  005137  024012                            COM     67$             ;START AT -1
4359  023762  004737  033336                            JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4360  023766  000252                                     252                     ;AND THE CHARACTER 252
4361  023770  104415  000021                            DATACLK,        21      ;GET TRANSMITTER ACTIVE
4362  023774  104415  000001                65$:        DATACLK,        1       ;SHIFT BCC ONCE
4363
4364  024000  005200                                     INC     R0              ;BUMP SHIFT COUNT
4365
4366  024002  004537  033210                            JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4367  024006  000001                                     1                       ;ONE SHIFT
4368  024010  000000                66$:        0                               ;DATA CHARACTER
4369  024012  000000                67$:        0                               ;OLD BCC
4370  024014  103405                                     BCS     68$             ;BR IF SOFT BCC LSB IS SET
4371  024016  004737  033450                            JSR     PC,GETQQ        ;GET HARDWARE TRANSMITTER BCC LSB
4372  024022  103006                                     BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
4373  024024  104012                                     HLT     12              ;ERROR, BCC LSB IS SET
4374  024026  000404                                     BR      69$             ;CONTINUE
4375  024030  004737  033450                68$:        JSR     PC,GETQQ        ;GET HARDWARE TRANSMITTER BCC LSB
4376  024034  103401                                     BCS     69$             ;BR IF HARD BCC LSB IS SET
4377  024036  104016                                     HLT     16              ;ERROR, HARD BCC LSB IS CLEAR
4378  024040                                69$:
4379  024040  006037  024010                            ROR     66$             ;SHIFT SOFT DATA
```

0073

```
 4380  024044  013737  033334  024012                  MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
 4381  024052  022700  000010                          CMP     #10,R0          ;DONE YET?
 4382  024056  001346                                  BNE     65$             ;BR IF NOT DONE
 4383  024060  104401                                  SCOP1                   ;SCOPE SUBTEST (SW09=1)
 4384  024062  012737  024070  001220                  MOV     #71$,LOCK       ;NEW SCOPE?
 4385  024070  004737  033676              71$:        JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
 4386  024074  005000                                  CLR     R0              ;START SHIFT COUNTER AT ZERO
 4387  024076  012737  102010  033332                  MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFTWARE BCC
 4388  024104  012737  000252  024150                  MOV     #252,73$;       ;LOAD CHAR FOR SOFTWARE BCC
 4389  024112  005037  024152                          CLR     74$             ;CLEAR OLD SOFTWARE BCC
 4390  024116  005137  024152                          COM     74$             ;START AT -1
 4391  024122  004737  033336                          JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
 4392  024126  000252                                  252                     ;AND THE CHARACTER 252
 4393  024130  104415  000032                          DATACLK,        32      ;GET RECEIVER ACTIVE
 4394  024134  104415  000001              72$:        DATACLK,        1       ;SHIFT BCC ONCE
 4395
 4396  024140  005200                                  INC     R0              ;BUMP SHIFT COUNT
 4397
 4398  024142  004537  033210                          JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
 4399  024146  000001                                  1                       ;ONE SHIFT
 4400  024150  000000              73$:                0                       ;DATA CHARACTER
 4401  024152  000000              74$:                0                       ;OLD BCC
 4402  024154  103405                                  BCS     75$             ;BR IF SOFT BCC LSB IS SET
 4403  024156  004737  033462                          JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
 4404  024162  103006                                  BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
 4405  024164  104013                                  HLT     13              ;ERROR, BCC LSB IS SET
 4406  024166  000404                                  BR      76$             ;CONTINUE
 4407  024170  004737  033462              75$:        JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
 4408  024174  103401                                  BCS     76$             ;BR IF HARD BCC LSB IS SET
 4409  024176  104017                                  HLT     17              ;ERROR, BCC LSB IS CLEAR
 4410  024200                                  76$:
 4411  024200  006037  024150                          ROR     73$             ;SHIFT SOFT DATA
 4412  024204  013737  033334  024152                  MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
 4413  024212  022700  000010                          CMP     #10,R0          ;DONE YET?
 4414  024216  001346                                  BNE     72$             ;BR IF NOT DONE
 4415  024220  104401                                  SCOP1                   ;SCOPE SUBTEST (SW09=1)
 4416  024222  104400              77$:        SCOPE                           ;SCOPE THIS TEST
 4417
 4418
 4419                                          ;************************** TEST 51 ************************
 4420                                                  ;*TRANSMITTER CRC TEST
 4421                                                  ;*USING THE CRC.CCITT POLYNOMINAL, SINGLE CLOCK A BINARY
 4422                                                  ;*COUNT PATTERN, VERIFY THE LSB OF THE TRANSMITTER BCC ON EACH SHIFT
 4423                                          ;;**********************************************************
 4424
 4425                                          ;  TEST 51
 4426                                          ;--------------
 4427  024224  012737  000051  001226  TST51:  MOV     #51,TSTNO
 4428  024232  012737  024546  001216          MOV     #TST52,NEXT
 4429
 4430  024240  104412                          MSTCLR                          ;R1 CONTAINS BASE DMC11 ADDRESS
 4431  024242  005061  000004                  CLR     4(R1)                   ;MASTER CLEAR DMC11
 4432  024246  104414                          ROMCLK                          ;CLEAR PORT4
 4433  024250  122117                          122117                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4434  024252  004737  033676                  JSR     PC,CLRIO                ;PUT LINE UNIT IN BITSTUFF MODE
 4435  024256  005037  034114                  CLR     BITCON                  ;DO THIS AFTER MODE IS SET
                                                                                ;CONSECUTIVE 1'S COUNTER INIT TO 0
```

```
 4436  024262  012711  004000                          MOV     #BIT1*,(R1)      ;SET LINE UNIT LOOP
 4437  024266  005003                                  CLR     R3               ;ZERO BIT COUNT
 4438  024270  005004                                  CLR     R4               ;R4 CONTAINS CHAR TO BE LOADED IN SILO
 4439  024272  005005                                  CLR     R5               ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
 4440  024274  005037  024422                          CLR     4$               ;CLEAR SOFT BCC
 4441  024300  005137  024422                          COM     4$               ;START AT -1
 4442  024304  012737  102010  033332                  MOV     #CRC.CCITT,XPOLY         ;LOAD POLYNOMINAL
 4443  024312  004737  033500                          JSR     PC,SYNLD         ;LOAD SILO WITH 2 SYNCS, SOM SET
 4444  024316  010461  000004                          MOV     R4,4(R1)         ;PORT4 CHAR
 4445  024322  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4446  024324  122110                                  122110                   ;LOAD OUT DATA
 4447  024326  005204                                  INC     R4               ;INCREMENT TO NEXT CHARACTER
 4448  024330  010461  000004                          MOV     R4,4(R1)         ;PORT4 CHAR
 4449  024334  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4450  024336  122110                                  122110                   ;LOAD OUT DATA
 4451  024340  005204                                  INC     R4               ;INCREMENT TO NEXT CHARACTER
 4452  024342  010461  000004                          MOV     R4,4(R1)         ;PORT4 CHAR
 4453  024346  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4454  024350  122110                                  122110                   ;LOAD OUT DATA
 4455  024352  004737  032346                          JSR     PC,OCOR          ;WAIT FOR OCOR
 4456  024356  104415  000021                          DATACLK,21               ;CLOCK DATA
 4457  024362  010537  024406                          MOV     R5,10$           ;START WITH ZERO
 4458  024366  012700  000001                          MOV     #1,R0            ;START COUNT AT 1
 4459  024372  010537  024420                  1$:     MOV     R5,3$            ;LOAD CHAR FOR SOFT CRC
 4460  024376  104415  000001                  2$:     DATACLK,1                ;SHIFT BCC ONCE
 4461  024402  004537  033776                          JSR     R5,STFFCK        ;CHECK BIT STUFFING
 4462  024406  000000                          10$:    0                        ;CHARACTER
 4463  024410  000001                                  1                        ;SHIFT COUNT
 4464  024412  004537  033210                          JSR     R5,SIMBCC        ;CALCULATE SOFT BCC
 4465  024416  000001                                  1                        ;SOFT SHIFT COUNT
 4466  024420  000000                          3$:     0                        ;SOFT CHARACTER
 4467  024422  000000                          4$      0                        ;OLD SOFT BCC
 4468  024424  103405                                  BCS     5$               ;BR IF SOFT BCC LSB IS SET
 4469  024426  004737  033450                          JSR     PC,GETQO                 ;GET HARDWARE TRANSMITTER BCC LSB
 4470  024432  103006                                  BCC     6$               ;BR IF OK (CLEARED)
 4471  024434  104020                                  HLT     20               ;ERROR, BCC LSB WAS SET
 4472  024436  000404                                  BR      6$               ;CONTINUE WITH TEST
 4473  024440  004737  033450                  5$:     JSR     PC,GETQO                 ;GET HARDWARE TRANSMITTER BCC LSB
 4474  024444  103401                                  BCS     6$               ;BR IF OK (SET)
 4475  024446  104021                                  HLT     21               ;ERROR, BCC LSB WAS CLEAR
 4476
 4477  024450                                  6$:
 4478  024450  006037  024406                          ROR     10$              ;SHIFT CHAR FOR STUFF CHECK
 4479  024454  005300                                  DEC     R0               ;DEC STUFF CHECK SHIFT COUNT
 4480  024456  001004                                  BNE     11$              ;BR IF NOT DONE THIS CHARACTER
 4481  024460  012700  000010                          MOV     #10,R0           ;RESET BIT COUNT TO 10
 4482  024464  010537  024406                          MOV     R5,10$           ;LOAD NEXT CHAR FOR STUFF CHECK
 4483  024470                                  11$:
 4484  024470  006037  024420                          ROR     3$               ;SHIFT SOFT DATA
 4485  024474  013737  033334  024422                  MOV     CALBCC,4$        ;LOAD OLD SOFT BCC
 4486  024502  005203                                  INC     R3               ;INCREMENT BIT COUNTER
 4487  024504  022703  000010                          CMP     #10,R3           ;DONE A FULL CHARACTER YET?
 4488  024510  001332                                  BNE     2$               ;BR IF NO
 4489  024512  005003                                  CLR     R3               ;RESTART BIT COUNTER
 4490  024514  005204                                  INC     R4               ;INCREMENT DATA FOR SILO
 4491  024516  022704  000400                          CMP     #400,R4          ;DONE BINARY COUNT YET?
```

```
4492  024522  003404                              BLE     9$              ;BR IF YES
4493  024524  010461  000004                      MOV     R4,4(R1)        ;PORT4 DATA
4494  024530  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4495  024532  122110                              122110          ;LOAD OUT DATA
4496  024534  005205                      9$:     INC     R5              ;INCREMENT DATA
4497  024536  022705  000400                      CMP     #400,R5         ;DONE BINARY PATTERN YET?
4498  024542  001313                              BNE     1$              ;BR IF NO
4499  024544  104400                      7$:     SCOPE                   ;SCOPE THIS TEST
4500
4501
4502                                      ;************************** TEST 52 **************************
4503                                              ;*RECEIVER CRC TEST
4504                                              ;*USING THE CRC.CCITT POLYNOMINAL, SINGLE CLOCK A BINARY
4505                                              ;*COUNT PATTERN, VERIFY THE LSB OF THE RECEIVER BCC ON EACH SHIFT
4506                                      ;;*************************************************************
4507
4508                                      ;  TEST 52
4509                                      ;-------------
4510  024546  012737  000052  001226  TST52:  MOV     #52,TSTNO
4511  024554  012737  025104  001216          MOV     #TST53,NEXT
4512                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
4513  024562  104412                      MSTCLR                  ;MASTER CLEAR DMC11
4514  024564  005061  000004                      CLR     4(R1)           ;CLEAR PORT4
4515  024570  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4516  024572  122117                              122117          ;PUT LINE UNIT IN BITSTUFF MODE
4517  024574  004737  033676                      JSR     PC,CLR10        ;DO THIS AFTER MODE IS SET
4518  024600  005037  034114                      CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
4519  024604  012711  004000                      MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4520  024610  005003                              CLR     R3              ;ZERO BIT COUNT
4521  024612  005004                              CLR     R4              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
4522  024614  005005                              CLR     R5              ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
4523  024616  005037  024750                      CLR     4$              ;CLEAR SOFT BCC
4524  024622  005137  024750                      COM     4$              ;START AT -1
4525  024626  012737  102010  033332              MOV     #CRC.CCITT,XPOLY        ;LOAD POLYNOMINAL
4526  024634  004737  033500                      JSR     PC,SYNLD        ;LOAD SILO WITH 2 SYNCS, SOM SET
4527  024640  010461  000004                      MOV     R4,4(R1)        ;PORT4 CHAR
4528  024644  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4529  024646  122110                              122110          ;LOAD OUT DATA
4530  024650  005204                              INC     R4              ;INCREMENT TO NEXT CHARACTER
4531  024652  010461  000004                      MOV     R4,4(R1)        ;PORT4 CHAR
4532  024656  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
4533  024660  122110                              122110          ;LOAD OUT DATA
4534  024662  005204                              INC     R4              ;INCREMENT TO NEXT CHARACTER
4535  024664  010461  000004                      MOV     R4,4(R1)        ;PORT4 CHAR
4536  024670  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4537  024672  122110                              122110          ;LOAD OUT DATA
4538  024674  004737  032346                      JSR     PC,OCOR         ;WAIT FOR OCOR
4539  024700  104415  000032                      DATACLK,32              ;CLOCK DATA
4540  024704  010537  024734                      MOV     R5,10$          ;START WITH ZERO
4541  024710  005237  024734                      INC     10$             ;TRANSMITTER IS ONE CHAR AHEAD
4542  024714  012700  000010                      MOV     #10,R0          ;R0 = CHAR COUNT
4543  024720  010537  024746  1$:     MOV     R5,3$           ;LOAD CHAR FOR SOFT CRC
4544  024724  104415  000001  2$:     DATACLK,1               ;SHIFT BCC ONCE
4545  024730  004537  03377o              JSR     R5,STFFCK       ;CHECK BIT STUFFING
4546  024734  000000                      0                       ;CHARACTER
4547  024736  000001                      1                       ;SHIFT COUNT
```

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4548  024740  004537  033210                        JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
4549  024744  000001                                1                       ;SOFT SHIFT COUNT
4550  024746  000000                        3$:     0                       ;SOFT CHARACTER
4551  024750  000000                        4$:     0                       ;OLD SOFT BCC
4552  024752  103405                                BCS     5$              ;BR IF SOFT BCC LSB IS SET
4553  024754  004737  033462                        JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
4554  024760  103006                                BCC     6$              ;BR IF OK (CLEARED)
4555  024762  104022                                HLT     22              ;ERROR, BCC LSB WAS SET
4556  024764  000404                                BR      6$              ;CONTINUE WITH TEST
4557  024766  004737  033462                5$:     JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
4558  024772  103401                                BCS     6$              ;BR IF OK (SET)
4559  024774  104023                                HLT     23              ;ERROR, BCC LSB WAS CLEAR
4560
4561  024776                                6$:
4562  024776  006037  024734                        ROR     10$             ;SHIFT CHAR FOR STUFF CHECK
4563  025002  005300                                DEC     R0              ;DEC STUFF CHECK SHIFT COUNT
4564  025004  001010                                BNE     11$             ;BR IF NOT DONE THIS CHARACTER
4565  025006  012700  000010                        MOV     #10,R0          ;RESET BIT COUNT TO 10
4566  025012  010537  024734                        MOV     R5,10$          ;LOAD NEXT CHAR FOR STUFF CHECK
4567  025016  005237  024734                        INC     10$             ;TRANSMITTER IS 2 CHAR AHEAD
4568  025022  005237  024734                        INC     10$             ;
4569  025026                                11$:
4570  025026  006037  024746                        ROR     3$              ;SHIFT SOFT DATA
4571  025032  013737  033334  024750                MOV     CALBCC,4$       ;LOAD OLD SOFT BCC
4572  025040  005203                                INC     R3              ;INCREMENT BIT COUNTER
4573  025042  022703  000010                        CMP     #10,R3          ;DONE A FULL CHARACTER YET?
4574  025046  001326                                BNE     2$              ;BR IF NO
4575  025050  005003                                CLR     R3              ;RESTART BIT COUNTER
4576  025052  005204                                INC     R4              ;INCREMENT DATA FOR SILO
4577  025054  022704  000400                        CMP     #400,R4         ;DONE BINARY COUNT YET?
4578  025060  003404                                BLE     9$              ;BR IF YES
4579  025062  010461  000004                        MOV     R4,4(R1)        ;PORT4 DATA
4580  025066  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4581  025070  122110                                122110                  ;LOAD OUT DATA
4582  025072  005205                        9$:     INC     R5              ;INCREMENT DATA
4583  025074  022705  000400                        CMP     #400,R5         ;DONE BINARY PATTERN YET?
4584  025100  001307                                BNE     1$              ;BR IF NO
4585  025102  104400                        7$:     SCOPE                   ;SCOPE THIS TEST
4586
4587
4588                                        ;************************** TEST 53 **************************
4589                                                ;*TRANSMITTER BITSTUFF CRC TEST
4590                                                ;*THIS TEST TRANSMITS A FOUR CHARACTER MESSAGE WITH CRC
4591                                                ;*BOTH DATA AND THE BCC ARE VERIFIED IN THE BIT
4592                                                ;*WINDOW. THE FOUR CHARACTERS ARE 0,125,252,377
4593                                                ;*THE TRANSMITTER IS CHECKED FOR GOING TO A MARK STATE AFTER THE BCC
4594                                        ;;**********************************************************
4595
4596                                        ;  TEST 53
4597                                        ;--------------
4598  025104  012737  000053  001226  TST53:  MOV     #53,TSTNO
4599  025112  012737  025606  001216         MOV     #TST54,NEXT
4600                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
4601  025120  104412                        MSTCLR                  ;MASTER CLEAR DMC11
4602  025122  005061  000004                        CLR     4(R1)           ;CLEAR PORT4
4603  025126  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
```

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0077

 4604  025130  122117                                  122117                  ;PUT LINE UNIT IN BITSTUFF MODE
 4605  025132  004737  033676                          JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
 4606  025136  005037  034114                          CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
 4607
 4608                                                  ;LOAD OUT DATA SILO
 4609
 4610  025142  012711  004000                          MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4611  025146  012704  034116                          MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
 4612  025152  005037  025262                          CLR     10$             ;CLEAR SOFT BCC
 4613  025156  005137  025262                          COM     10$             ;START AT -1
 4614  025162  012700  000004                          MOV     #4,R0           ;LOAD CHARACTER COUNT
 4615  025166  004737  033500                          JSR     PC,SYNLD        ;LOAD 2 FLAG CHARACTERS IN OUT SILO
 4616  025172  004737  032500                          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 4617  025176  004537  033634                          JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
 4618  025202  034116                                  MESDAT                  ;ADDRESS OF MESSAGE
 4619  025204  000004                                  4                       ;NUMBER OF CHARACTERS
 4620  025206  004737  033610                          JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
 4621  025212  004737  033610                          JSR     PC,EOM
 4622  025216  004737  032346                          JSR     PC,OCOR         ;WAIT FOR OCOR
 4623  025222  005003                                  CLR     R3              ;CLEAR BIT COUNTER
 4624  025224  104415  000022                          DATACLK,22              ;CLOCK DATA
 4625  025230  112405                          12$:    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
 4626  025232  010502                                  MOV     R5,R2           ;LOAD R2 WITH CHAR
 4627
 4628                                                  ;CHECK FIRST FOUR CHARACTER MESSAGE
 4629                                                  ;IN THE BIT WINDOW (0,125,252,377)
 4630
 4631  025234  010537  025330                          MOV     R5,71$          ;LOAD FOR STUFF CHECK
 4632  025240  012737  102010  033332                  MOV     #CRC.CCITT,XPOLY        ;LOAD POLYNOMIAL
 4633  025246  010537  025260                          MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
 4634  025252  004537  033210                          JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
 4635  025256  000010                                  10                      ;SHIFT COUNT
 4636  025260  000000                          67$:    0                       ;CHARACTER
 4637  025262  000000                          10$:    0                       ;OLD BCC
 4638  025264  013737  033334  025262                  MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
 4639  025272  104415  000001                  64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
 4640  025276  106002                                  RORB    R2              ;SHIFT SOFT DATA
 4641  025300  103005                                  BCC     65$             ;BR IF A SPACE
 4642  025302  004737  032314                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4643  025306  103406                                  BCS     66$             ;BR IF OK (MARK)
 4644  025310  104006                                  HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
 4645  025312  000404                                  BR      66$             ;CONTINUE
 4646  025314  004737  032314                  65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4647  025320  103001                                  BCC     66$             ;BR IF OK (SPACE)
 4648  025322  104006                                  HLT     6               ;ERROR, BIT WINDOW WAS A MARK
 4649  025324                                  66$:
 4650  025324  004537  033776                          JSR     R5,STFFCK
 4651  025330  000000                          71$:    0
 4652  025332  000001                                  1
 4653  025334  110237  025330                          MOVB    R2,71$          ;SHIFT FOR NEXT STUFF CHECK
 4654  025340  005203                                  INC     R3              ;BUMP BIT COUNTER
 4655  025342  022703  000010                          CMP     #10,R3          ;DONE FULL 8 BITS YET
 4656  025346  001351                                  BNE     64$             ;BR IF NO
 4657  025350  005003                                  CLR     R3              ;CLEAR BIT COUNTER
 4658  025352  005300                                  DEC     R0              ;DEC CHARACTER COUNT
 4659  025354  001325                                  BNE     12$             ;BR IF NOT DONE YET
```

```
4660
4661                                                    ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4662
4663  025356  005137  033334                          COM     CALBCC          ;ADJUST BCC FOR SDLC
4664  025362  013700  033334                          MOV     CALBCC,R0       ;PUT BCC IN R0
4665  025366  010037  025430                          MOV     R0,72$          ;LOAD BCC FOR STUFF CHECK
4666  025372  104415  000001              68$:        DATACLK,1               ;SHIFT HARDWARE BCC
4667  025376  006000                                  ROR     R0              ;SHIFT SOFT BCC
4668  025400  103005                                  BCC     69$             ;BR IF CARRY CLEAR
4669  025402  004737  032314                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4670  025406  103406                                  BCS     70$             ;BR IF OK (MARK)
4671  025410  104014                                  HLT     14              ;ERROR, CRC WRONG (SPACE)
4672  025412  000404                                  BR      70$             ;CONTINUE
4673  025414  004737  032314              69$:        JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4674  025420  103001                                  BCC     70$             ;BR IF OK (SPACE)
4675  025422  104014                                  HLT     14              ;ERROR, CRC WRONG (MARK)
4676  025424                                70$:
4677  025424  004537  033776                          JSR     R5,STFFCK       ;CHECK BCC CHAR FOR ZERO STUFFS
4678  025430  000000                        72$:      0                       ;CHARACTER
4679  025432  000001                                  1                       ;SHIFT COUNT
468^  025434  010037  025430                          MOV     R0,72$          ;SHIFT SOFTBCC ONCE
4681  025440  005203                                  INC     R3              ;BUMP BIT COUNTER
4682  025442  022703  000020                          CMP     #20,R3          ;FINISHED BCC YET?
4683  025446  001351                                  BNE     68$             ;BR IF NO
4684  025450  005003                                  CLR     R3              ;CLEAR BIT COUNTER
4685
4686                                                    ;CHECK FOR FLAG TO FOLLOW BCC
4687
4688  025452  012737  000176  001252                  MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
4689  025460  104415  000001              73$:        DATACLK,        1       ;CLOCK FLAG ONCE
4690  025464  106037  001252                          RORB    TEMP3           ;SHIFT SOFT FLAG
4691  025470  103405                                  BCS     74$             ;BR IF BIT IS MARK
4692  025472  004737  032314                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4693  025476  103006                                  BCC     75$             ;BR IF OK
4694  025500  104026                                  HLT     26              ;ERROR IN FLAG CHAR
4695  025502  000404                                  BR      75$
4696  025504  004737  032314              74$:        JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4697  025510  103401                                  BCS     75$             ;BR IF OK
4698  025512  104026                                  HLT     26              ;ERROR IN FLAG CHAR
4699  025514  005203                        75$:      INC     R3              ;INC BIT COUNT
4700  025516  022703  000010                          CMP     #10,R3          ;FLAG DONE YET?
4701  025522  001356                                  BNE     73$             ;BR IF NO
4702  025524  005003                                  CLR     R3              ;CLEAR BIT COUNT
4703
4704                                                    ;CHECK TO SEE IF TRANSMITTER IS MARKING
4705
4706  025526  104415  000001              2$:       DATACLK,        1       ;CLOCK TRANSMITTER
4707  025532  004737  032314                          JSR     PC,GETSI        ;LOOK AT WINDOW
4708  025536  103401                                  BCS     3$              ;IT SHOULD BE MARKING
4709  025540  104024                                  HLT     24              ;ERROR, BIT WAS A SPACE
4710  025542  005203                        3$:       INC     R3              ;BUMP BIT COUNTER
4711  025544  022703  000007                          CMP     #7,R3           ;DONE YET
4712  025550  001366                                  BNE     2$              ;BR IF NO
4713  025552  104415  000010                          DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
4714  025556  005003                                  CLR     R3              ;CLEAR BIT COUNTER
4715  025560  104415  000001              4$        DATACLK,        1       ;SHIFT OUT NEXT BIT
```

```
 4716  025564  004737  032314                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4717  025570  103401                                  BCS     .+4             ;BR IF IT IS A MARK
 4718  025572  104024                                  HLT     24              ;ERROR, TRANSMITTER IS NOT MARKING
 4719  025574  005203                                  INC     R3              ;INC BIT COUNT
 4720  025576  022703  000020                          CMP     #20,R3          ;DONE YET?
 4721  025602  001366                                  BNE     4$              ;BR IF NO
 4722  025604  104400                          5$:     SCOPE                   ;SCOPE THIS TEST
 4723
 4724
 4725                                          ;************************** TEST 54 *************************
 4726                                                  ;*RECEIVER BITSTUFF CRC TEST
 4727                                                  ;*THIS TEST CLOCKS A FOUR CHARACTER MESSAGE WITH BCC
 4728                                                  ;*AND VERIFYS CORRECT DATA RECEPTION AND BCC MATCH
 4729                                                  ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
 4730                                          ;;*********************************************************
 4731
 4732                                          ;  TEST 54
 4733                                          ;-------------
 4734  025606  012737  000054  001226  TST54:  MOV     #54,TSTNO
 4735  025614  012737  026030  001216          MOV     #TST55,NEXT
 4736                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
 4737  025622  104412                          MSTCLR                  ;MASTER CLEAR DMC11
 4738  025624  005061  000004                          CLR     4(R1)           ;CLEAR PORT4
 4739  025630  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4740  025632  122117                                  122117                  ;PUT LINE UNIT IN BITSTUFF MODE
 4741  025634  004737  033676                          JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
 4742  025640  012711  004000                          MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4743  025644  012702  034116                          MOV     #MESDAT,R2      ;LOAD POINTER TO DATA
 4744  025650  012700  000004                          MOV     #4,R0           ;LOAD CHARACTER COUNT
 4745  025654  004737  033500                          JSR     PC,SYNLD        ;LOAD 2 FLAG CHARACTERS IN OUT SILO
 4746  025660  004737  032500                          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 4747  025664  004537  033634                          JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
 4748  025670  034116                                  MESDAT                  ;ADDRESS OF MESSAGE
 4749  025672  000004                                  4                       ;NUMBER OF CHARACTERS
 4750  025674  004737  033610                          JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
 4751  025700  004737  033610                          JSR     PC,EOM
 4752  025704  004737  032346                          JSR     PC,OCOR         ;WAIT FOR OCOR
 4753  025710  104415  000115                          DATACLK,115             ;CLOCK DATA
 4754  025714  004737  033154                  3$:     JSR     PC,INRDY        ;WAIT FOR INRDY
 4755  025720  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
 4756  025722  021204                                  021204                  ;GET IN DATA
 4757  025724  016104  000004                          MOV     4(R1),R4        ;PUT "FOUND" IN R4
 4758  025730  112205                                  MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
 4759  025732  120504                                  CMPB    R5,R4           ;COMPARE RECEIVED DATA
 4760  025734  001401                                  BEQ     1$              ;BR IF OK
 4761  025736  104010                                  HLT     10              ;DATA ERROR
 4762  025740  005300                          1$:     DEC     R0              ;DEC CHARACTER COUNT
 4763  025742  001364                                  BNE     3$              ;BR IF NOT DONE YET
 4764
 4765
 4766                                                  ;CHECK TO SEE THAT IN BCC MATCH IS SET
 4767
 4768  025744  004737  033154                          JSR     PC,INRDY        ;WAIT FOR INRDY
 4769  025750  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
 4770  025752  021204                                  021204                  ;GET FIRST HALF OF CRC
 4771  025754  116137  000004  001252                  MOVB    4(R1),TEMP3     ;PUT IN TEMP3
```

```
4772  025762  042737  177400  001252                  BIC     #177400,TEMP3   ;CLEAR HI BYTE
4773  025770  004737  033154                          JSR     PC,INRDY        ;WAIT FOR INRDY
4774  025774  104414                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4775  025776  021244                                  021244
4776  026000  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
4777  026004  042704  000374                  BIC     #374,R4         ;CLEAR UNWANTED BITS
4778  026010  012705  000003                  MOV     #3,R5           ;PUT "EXPECTED" IN R5
4779  026014  120504                          CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
4780  026016  001401                          BEQ     25$
4781  026020  104042                                  HLT     42              ;IN BCC MATCH ERROR
4782  026022                                  25$:
4783  026022  104414                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4784  026024  021204                                  021204                  ;GET LAST HALF
4785  026026  104400                          2$:     SCOPE                   ;SCOPE THIS TEST
4786
4787
4788                                          ;************************** TEST 55 *************************
4789                                                  ;*BITSTUFF EOM FUNCTION TEST
4790                                                  ;*THIS TEST LOADS OUT SILO WITH: 2 FLAGS,4 CHAR MESSAGE,EOM
4791                                                  ;*4 CHARACTER MESS,EOM. THE DATA STREAM IS CHECKED TO BE
4792                                                  ;*4 CHAR,BCC,FLAG,4 CHAR,BCC,FLAG,MARKS. THIS TEST VERIFYS THAT
4793                                                  ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
4794                                                  ;*ALL DATA AND BCC'S ARE CHECKED IN THE BIT WINDOW
4795                                                  ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
4796                                                  ;*RECEIVED DATA IS VERIFIED, AND IN BCC MATCH IS CHECKED
4797                                          ;;*************************************************************
4798
4799                                          ;  TEST 55
4800                                          ;-------------
4801  026030  012737  000055  001226  TST55:  MOV     #55,TSTNO
4802  026036  012737  027430  001216          MOV     #TST56,NEXT
4803
4804  026044  104412                          MSTCLR                          ;R1 CONTAINS BASE DMC11 ADDRESS
4805  026046  005061  000004                                                  ;MASTER CLEAR DMC11
                                                        CLR     4(R1)           ;CLEAR PORT4
4806  026052  104414                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4807  026054  122117                                  122117                  ;PUT LINE UNIT IN BITSTUFF MODE
4808  026056  004737  033676                          JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
4809  026062  005037  034114                          CLR     BITCON          ;CONSECUTIVE 1'S COUNTER INIT TO 0
4810
4811
4812                                                  ;LOAD OUT DATA SILO
4813  026066  012711  004000                          MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4814  026072  012704  034116                          MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
4815  026076  005037  026226                          CLR     10$             ;CLEAR SOFT BCC
4816  026102  005137  026226                          COM     10$             ;START AT -1
4817  026106  012700  000004                          MOV     #4,R0           ;LOAD CHARACTER COUNT
4818  026112  004737  033500                          JSR     PC,SYNLD        ;LOAD 2 FLAG CHARACTERS IN OUT SILO
4819  026116  004737  032500                          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
4820  026122  004537  033634                          JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
4821  026126  034116                                  MESDAT                  ;ADDRESS OF MESSAGE
4822  026130  000004                                  4                       ;NUMBER OF CHARACTERS
4823  026132  004737  033610                          JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
4824  026136  004737  033610                          JSR     PC,EOM
4825  026142  004537  033634                          JSR     R5,MESLD        ;LOAD FOUR MORE CHARACTERS
4826  026146  034116                                  MESDAT                  ;ADDRESS OF MESSAGE
4827  026150  000004                                  4                       ;NUMBER OF CHACTERS
```

```
4828  026152  004737  033610                      JSR     PC,EOM          ;SET EOM
4829  026156  004737  033610                      JSR     PC,EOM          ;SET EOM
4830  026162  004737  032346                      JSR     PC,OCOR         ;WAIT FOR OCOR
4831  026166  005003                              CLR     R3              ;CLEAR BIT COUNTER
4832  026170  104415  000022                      DATACLK,22              ;CLOCK DATA
4833  026174  112405                      12$.    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
4834  026176  010502                              MOV     R5,R2           ;LOAD R2 WITH CHAR
4835
4836                                              ;CHECK FIRST FOUR CHARACTER MESSAGE
4837                                              ;IN THE BIT WINDOW (0,125,252,377)
4838
4839  026200  010537  026274                      MOV     R5,71$          ;LOAD FOR STUFF CHECK
4840  026204  012737  102010  033332              MOV     #CRC.CCITT,XPOLY        ;LOAD POLYNOMIAL
4841  026212  010537  026224                      MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
4842  026216  004537  033210                      JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
4843  026222  000010                              10                      ;SHIFT COUNT
4844  026224  000000                      67$:    0                       ;CHARACTER
4845  026226  000000                      10$:    0                       ;OLD BCC
4846  026230  013737  033334  026226              MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
4847  026236  104415  000001                      DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
4848  026242  106002                              RORB    R2              ;SHIFT SOFT DATA
4849  026244  103005                              BCC     65$             ;BR IF A SPACE
4850  026246  004737  032314                      JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4851  026252  103406                              BCS     66$             ;BR IF OK (MARK)
4852  026254  104006                              HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
4853  026256  000404                              BR      66$             ;CONTINUE
4854  026260  004737  032314                      JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4855  026264  103001                              BCC     66$             ;BR IF OK (SPACE)
4856  026266  104006                              HLT     6               ;ERROR, BIT WINDOW WAS A MARK
4857  026270                              66$:
4858  026270  004537  033776                      JSR     R5,STFFCK
4859  026274  000000                      71$:    0
4860  026276  000001                              1
4861  026300  110237  026274                      MOVB    R2,71$          ;SHIFT FOR NEXT STUFF CHECK
4862  026304  005203                              INC     R3              ;BUMP BIT COUNTER
4863  026306  022703  000010                      CMP     #10,R3          ;DONE FULL 8 BITS YET
4864  026312  001351                              BNE     64$             ;BR IF NO
4865  026314  005003                              CLR     R3              ;CLEAR BIT COUNTER
4866  026316  005300                              DEC     R0              ;DEC CHARACTER COUNT
4867  026320  001325                              BNE     12$             ;BR IF NOT DONE YET
4868
4869                                              ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4870
4871  026322  005137  033334                      COM     CALBCC          ;ADJUST BCC FOR SDLC
4872  026326  013700  033334                      MOV     CALBCC,R0       ;PUT BCC IN R0
4873  026332  010037  026374                      MOV     R0,72$          ;LOAD BCC FOR STUFF CHECK
4874  026336  104415  000001              68$:    DATACLK,1               ;SHIFT HARDWARE BCC
4875  026342  006000                              ROR     R0              ;SHIFT SOFT BCC
4876  026344  103005                              BCC     69$             ;BR IF CARRY CLEAR
4877  026346  004737  032314                      JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4878  026352  103406                              BCS     70$             ;BR IF OK (MARK)
4879  026354  104014                              HLT     14              ;ERROR, CRC WRONG (SPACE)
4880  026356  000404                              BR      70$             ;CONTINUE
4881  026360  004737  032314              69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4882  026364  103001                              BCC     70$             ;BR IF OK (SPACE)
4883  026366  104014                              HLT     14              ;ERROR, CRC WRONG (MARK)
```

```
4884  026370                                  70$:
4885  026370  004537  033776                        JSR     R5,STFFCK       ;CHECK BCC CHAR FOR ZERO STUFFS
4886  026374  000000                          72$:  0                       ;CHARACTER
4887  026376  000001                                1                       ;SHIFT COUNT
4888  026400  010037  026374                        MOV     R0,72$          ;SHIFT SOFTBCC ONCE
4889  026404  005203                                INC     R3              ;BUMP BIT COUNTER
4890  026406  022703  000020                        CMP     #20,R3          ;FINISHED BCC YET?
4891  026412  001351                                BNE     68$             ;BR IF NO
489   026414  005003                                CLR     R3              ;CLEAR BIT COUNTER
489_
4894                                              ;CHECK FOR FLAG TO FOLLOW BCC
4895
4896  026416  012737  000176  001252              MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
4897  026424  104415  000001          73$    DATACLK,        1               ;CLOCK FLAG ONCE
4898  026430  106037  001252                RORB    TEMP3                   ;SHIFT SOFT FLAG
4899  026434  103405                        BCS     74$                     ;BR IF BIT IS MARK
4900  026436  004737  032314                JSR     PC,GETSI                ;LOOK AT BIT WINDOW
4901  026442  103006                        BCC     75$                     ;BR IF OK
4902  026444  104026                        HLT     26                      ;ERROR IN FLAG CHAR
4903  026446  000404                        BR      75$
4904  026450  004737  032314          74$:  JSR     PC,GETSI                ;LOOK AT BIT WINDOW
4905  026454  103401                        BCS     75$                     ;BR IF OK
4906  026456  104026                        HLT     26                      ;ERROR IN FLAG CHAR
4907  026460  005203                  75$:  INC     R3                      ;INC BIT COUNT
4908  026462  022703  000010                CMP     #10,R3                  ;FLAG DONE YET?
4909  026466  001356                        BNE     73$                     ;BR IF NO
4910  026470  005003                        CLR     R3                      ;CLEAR BIT COUNT
4911  026472  012700  000004                MOV     #4,R0                   ;RESET CHARACTER COUNTER
4912  026476  012704  034116                MOV     #MESDAT,R4              ;LOAD MESSAGE POINTER
4913  026502  005037  026544                CLR     11$                     ;CLR SOFT BCC
4914  026506  005137  026544                COM     11$                     ;ADJUST TO -1 FOR SDLC
4915  026512  112405                  13$:  MOVB    (R4)+,R5                ;LOAD CHAR IN R5
4916  026514  010502                        MOV     R5,R2                   ;LOAD CHAR IN R2
4917
4918                                              ;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
4919
4920  026516  010537  026612                MOV     R5,83$                  ;LOAD FOR STUFF CHECK
4921  026522  012737  102010  033332        MOV     #CRC.CCITT,XPOLY        ;LOAD POLYNOMIAL
4922  026530  010537  026542                MOV     R5,79$                  ;LOAD SOFT CHAR FOR BCC
4923  026534  004537  033210                JSR     R5,SIMBCC               ;CALCULATE SOFT BCC
4924  026540  000010                        10                              ;SHIFT COUNT
4925  026542  000000                  79$.  0                               ;CHARACTER
4926  026544  000000                  11$:  0                               ;OLD BCC
4927  026546  013737  033334  026544        MOV     CALBCC,11$              ;LOAD SOFT BCC FOR NEXT SHIFT
4928  026554  104415  000001          76$:  DATACLK,        1               ;SHIFT DATA IN TO BIT WINDOW
4929  026560  106002                        RORB    R2                      ;SHIFT SOFT DATA
4930  026562  103005                        BCC     77$                     ;BR IF A SPACE
4931  026564  004737  032314                JSR     PC,GETSI                ;LOOK AT BIT WINDOW
4932  026570  103406                        BCS     78$                     ;BR IF OK (MARK)
4933  026572  104006                        HLT     6                       ;ERROR, BIT WINDOW WAS A SPACE
4934  026574  000404                        BR      78$                     ;CONTINUE
4935  026576  004737  032314          77$:  JSR     PC,GETSI                ;LOOK AT BIT WINDOW
4936  026602  103001                        BCC     78$                     ;BR IF OK (SPACE)
4937  026604  104006                        HLT     6                       ;ERROR, BIT WINDOW WAS A MARK
4938  026606                            78$:
4939  026606  004537  033776                JSR     R5,STFFCK
```

```
 4940  026612  000000                          83$:    0
 4941  026614  000001                                  1
 4942  026616  110237  026612                          MOVB    R2,83$          ;SHIFT FOR NEXT STUFF CHECK
 4943  026622  005203                          INC     R3              ;BUMP BIT COUNTER
 4944  026624  022703  000010                  CMP     #10,R3          ;DONE FULL 8 BITS YET
 4945  026630  001351                          BNE     76$             ;BR IF NO
 4946  026632  005003                          CLR     R3              ;CLEAR BIT COUNTER
 4947  026634  005300                          DEC     R0              ;DEC CHARACTER COUNT
 4948  026636  001325                          BNE     13$             ;BR IF NOT DONE YET
 4949
 4950                                          ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
 4951
 4952  026640  005137  033334                  COM     CALBCC          ;ADJUST BCC FOR SDLC
 4953  026644  013700  033334                  MOV     CALBCC,R0       ;PUT BCC IN R0
 4954  026650  010037  026712                  MOV     R0,84$          ;LOAD BCC FOR STUFF CHECK
 4955  026654  104415  000001          80$:    DATACLK,1               ;SHIFT HARDWARE BCC
 4956  026660  006000                          ROR     R0              ;SHIFT SOFT BCC
 4957  026662  103005                          BCC     81$             ;BR IF CARRY CLEAR
 4958  026664  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4959  026670  103406                          BCS     82$             ;BR IF OK (MARK)
 4960  026672  104014                          HLT     14              ;ERROR, CRC WRONG (SPACE)
 4961  026674  000404                          BR      82$             ;CONTINUE
 4962  026676  004737  032314          81$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4963  026702  103001                          BCC     82$             ;BR IF OK (SPACE)
 4964  026704  104014                          HLT     14              ;ERROR, CRC WRONG (MARK)
 4965  026706                          82$:
 4966  026706  004537  033776                  JSR     R5,STFFCK       ;CHECK BCC CHAR FOR ZERO STUFFS
 4967  026712  000000                  84$:    0                       ;CHARACTER
 4968  026714  000001                          1                       ;SHIFT COUNT
 4969  026716  010037  026712                  MOV     R0,84$          ;SHIFT SOFTBCC ONCE
 4970  026722  005203                          INC     R3              ;BUMP BIT COUNTER
 4971  026724  022703  000020                  CMP     #20,R3          ;FINISHED BCC YET?
 4972  026730  001351                          BNE     80$             ;BR IF NO
 4973  026732  005003                          CLR     R3              ;CLEAR BIT COUNTER
 4974
 4975                                          ;CHECK FOR FLAG TO FOLLOW BCC
 4976
 4977  026734  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
 4978  026742  104415  000001          85$:    DATACLK,        1       ;CLOCK FLAG ONCE
 4979  026746  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
 4980  026752  103405                          BCS     86$             ;BR IF BIT IS MARK
 4981  026754  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4982  026760  103006                          BCC     87$             ;BR IF OK
 4983  026762  104026                          HLT     26              ;ERROR IN FLAG CHAR
 4984  026764  000404                          BR      87$
 4985  026766  004737  032314          86$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4986  026772  103401                          BCS     87$             ;BR IF OK
 4987  026774  104026                          HLT     26              ;ERROR IN FLAG CHAR
 4988  026776  005203                  87$:    INC     R3              ;INC BIT COUNT
 4989  027000  022703  000010                  CMP     #10,R3          ;FLAG DONE YET?
 4990  027004  001356                          BNE     85$             ;BR IF NO
 4991  027006  005003                          CLR     R3              ;CLEAR BIT COUNT
 4992
 4993                                          ;CHECK TO SEE IF TRANSMITTER IS MARKING
 4994
 4995  027010  104415  000001          2$:     DATACLK,        1       ;CLOCK TRANSMITTER
```

```
 4996  027014  004737  032314                    JSR     PC,GETSI        ;LOOK AT WINDOW
 4997  027020  103401                            BCS     3$              ;IT SHOULD BE MARKING
 4998  027022  104024                            HLT     24              ;ERROR, BIT WAS A SPACE
 4999  027024  005203                    3$:     INC     R3              ;BUMP BIT COUNTER
 5000  027026  022703  000007                    CMP     #7,R3           ;DONE YET
 5001  027032  001366                            BNE     2$              ;BR IF NO
 5002  027034  104415  000010                    DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
 5003  027040  005003                            CLR     R3              ;CLEAR BIT COUNTER
 5004  027042  104415  000001            4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
 5005  027046  004737  032314                    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 5006  027052  103401                            BCS     .+4             ;BR IF IT IS A MARK
 5007  027054  104024                            HLT     24              ;ERROR, TRANSMITTER IS NOT MARKING
 5008  027056  005203                            INC     R3              ;INC BIT COUNT
 5009  027060  022703  000020                    CMP     #20,R3          ;DONE YET?
 5010  027064  001366                            BNE     4$              ;BR IF NO
 5011
 5012                                            ;CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
 5013                                            ;WAS RECEIVED CORRECTLY (0,125,252,377)
 5014
 5015  027066  104415  000001                    DATACLK,        1       ;GET LAST BIT IN RECEIVER
 5016  027072  012703  000004                    MOV     #4,R3           ;R3=CHARACTER COUNT
 5017  027076  012702  034116                    MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
 5018  027102  004737  033154            40$:    JSR     PC,INRDY        ;WAIT FOR INRDY
 5019  027106  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 5020  027110  021204                            021204
 5021  027112  016104  000004                    MOV     4(R1),R4        ;PUT "FOUND" IN R4
 5022  027116  112205                            MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
 5023  027120  120504                            CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
 5024  027122  001401                            BEQ     41$             ;BR IF YES
 5025  027124  104010                            HLT     10              ;RECEIVE DATA ERROR
 5026  027126  005303                    41$:    DEC     R3              ;DEC CHARACTER COUNT
 5027  027130  001364                            BNE     40$             ;BR IF NOT DONE YET
 5028
 5029
 5030                                            ;CHECK TO SEE THAT IN BCC MATCH IS SET
 5031                                            ;AND THAT THE BCC WAS RECEIVED CORRECTLY
 5032
 5033  027132  004737  033154                    JSR     PC,INRDY        ;WAIT FOR INRDY
 5034  027136  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 5035  027140  021204                            021204                  ;GET FIRST HALF OF CRC
 5036  027142  116137  000004  001252            MOVB    4(R1),TEMP3     ;PUT IN TEMP3
 5037  027150  042737  177400  001252            BIC     #177400,TEMP3   ;CLEAR HI BYTE
 5038  027156  004737  033154                    JSR     PC,INRDY        ;WAIT FOR INRDY
 5039  027162  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 5040  027164  021244                            021244
 5041  027166  016104  000004            MOV     4(R1),R4        ;PUT "FOUND" IN R4
 5042  027172  042704  000374            BIC     #374,R4         ;CLEAR UNWANTED BITS
 5043  027176  012705  000003            MOV     #3,R5           ;PUT "EXPECTED" IN R5
 5044  027202  120504                    CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
 5045  027204  001401                    BEQ     50$
 5046  027206  104042                            HLT     42              ;IN BCC MATCH ERROR
 5047  027210                            50$:
 5048  027210  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
 5049  027212  021204                            021204                  ;GET LAST HALF
 5050  027214  116137  000004  001251            MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
 5051  027222  042737  000377  001250            BIC     #377,TEMP2      ;CLEAR LO BYTE
```

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5052  027230  053737  001250  001252          BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
5053  027236  023737  033334  001252          CMP     CALBCC,TEMP3    ;IS IT CORRECT?
5054  027244  001401                          BEQ     42$             ;BR IF OK
5055  027246  104027                          HLT     27
5056
5057                                          ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
5058                                          ;WAS RECEIVED CORRECTLY (0,125,252,377)
5059
5060  027250  012703  000004          42$:    MOV     #4,R3           ;R3=CHARACTER COUNT
5061  027254  012702  034116                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5062  027260  004737  033154          43$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5063  027264  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5504
5064  027266  021204                          021204
5065  027270  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5066  027274  112205                          MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5067  027276  120504                          CMPB    R5,R4           ;IS RECEIVED DATA CORPECT?
5068  027300  001401                          BEQ     44$             ;BR IF YES
5069  027302  104010                          HLT     10              ;RECEIVE DATA ERROR
5070  027304  005303                  44$:    DEC     R3              ;DEC CHARACTER COUNT
5071  027306  001364                          BNE     43$             ;BR IF NOT DONE YET
5072
5073
5074                                          ;CHECK TO SEE THAT IN BCC MATCH IS SET
5075                                          ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5076
5077  027310  004737  033154                  JSR     PC,INRDY        ;WAIT FOR INRDY
5078  027314  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5079  027316  021204                          021204                  ;GET FIRST HALF OF CRC
5080  027320  116137  000004  001252          MOVB    4(R1),TEMP3     ;PUT IN TEMP3
5081  027326  042737  177400  001252          BIC     #177400,TEMP3   ;CLEAR HI BYTE
5082  027334  004737  033154                  JSR     PC,INRDY        ;WAIT FOR INRDY
5083  027340  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5084  027342  021244                          021244
5085  027344  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
5086  027350  042704  000374          BIC     #374,R4         ;CLEAR UNWANTED BITS
5087  027354  012705  000003          MOV     #3,R5           ;PUT "EXPECTED" IN R5
5088  027360  120504                  CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
5089  027362  001401                  BEQ     51$
5090  027364  104042                          HLT     42              ;IN BCC MATCH ERROR
5091  027366                          51$:
5092  027366  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5093  027370  021204                          021204                  ;GET LAST HALF
5094  027372  116137  000004  001251          MOVB    4(R1),TEMP2+1   ;PUT IN TFMP2
5095  027400  042737  000377  001250          BIC     #377,TEMP2      ;CLEAR LO BYTE
5096  027406  053737  001250  001252          BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
5097  027414  023737  033334  001252          CMP     CALBCC,TEMP3    ;IS IT CORRECT?
5098  027422  001401                          BEQ     5$              ;BR IF OK
5099  027424  104027                          HLT     27
5100  027426  104400                  5$:     SCOPE                   ;SCOPE THIS TEST
5101
5102
5103                                  ;************************** TEST 56 **************************
5104                                          ;*BITSTUFF EOM FUNCTION TEST
5105                                          ;*THIS TEST LOADS OUT SILO WITH: 2 FLAGS,4 CHAR MESSAGE,EOM
5106                                          ;*SOM,4 CHAR MESS,EOM. THE DATA STREAM IS CHECKED TO BE
5107                                          ;*4 CHAR,BCC,FLAG,4 CHAR,BCC,FLAG,MARKS. THIS TEST VERIFYS THAT
```

```
                                                        ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
                                                        ;*ALSO THAT THE CHAR LOADED WITH SOM IS NOT IN THE BCC
                                                        ;*ALL DATA AND BCC'S ARE CHECKED IN THE BIT WINDOW
                                                        ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
                                                        ;*RECEIVED DATA IS VERIFIED, AND IN BCC MATCH IS CHECKED
                                                    ;;**********************************************************

                                                    ;  TEST 56
                                                    ;-------------
027430  012737  000056  001226  TST56:  MOV     #56,TSTNO
027436  012737  031110  001216          MOV     #TST57,NEXT

                                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
027444  104412                          MSTCLR                      ;MASTER CLEAR DMC11
027446  005061  000004                          CLR     4(R1)               ;CLEAR PORT4
027452  104414                          ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027454  122117                                  122117                      ;PUT LINE UNIT IN BITSTUFF MODE
027456  004737  033676                          JSR     PC,CLRIO            ;DO THIS AFTER MODE IS SET
027462  005037  034114                          CLR     BITCON              ;CONSECUTIVE 1'S COUNTER INIT TO 0

                                                    ;LOAD OUT DATA SILO

027466  012711  004000                          MOV     #BIT11,(R1)         ;SET LINE UNIT LOOP
027472  012704  034116                          MOV     #MESDAT,R4          ;LOAD POINTER TO DATA
027476  005037  027632                          CLR     10$                 ;CLEAR SOFT BCC
027502  005137  027632                          COM     10$                 ;START AT -1
027506  012700  000004                          MOV     #4,R0               ;LOAD CHARACTER COUNT
027512  004737  033500                          JSR     PC,SYNLD            ;LOAD 2 FLAG CHARACTERS IN OUT SILO
027516  004737  032500                          JSR     PC,OUTRDY           ;WAIT FOR OUTRDY
027522  004537  033634                          JSR     R5,MESLD            ;LOAD SILO WITH 4 CHAR MESS
027526  034116                                  MESDAT                      ;ADDRESS OF MESSAGE
027530  000004                                  4                           ;NUMBER OF CHARACTERS
027532  004737  033610                          JSR     PC,EOM              ;LOAD GARBAGE CHARACTER, WITH EOM SET
027536  004737  033610                          JSR     PC,EOM
027542  004737  033560                          JSR     PC,SOM              ;LOAD GARBAGE CHAR WITH SOM SET
027546  004537  033634                          JSR     R5,MESLD            ;LOAD FOUR MORE CHARACTERS
027552  034116                                  MESDAT                      ;ADDRESS OF MESSAGE
027554  000004                                  4                           ;NUMBER OF CHACTERS
027556  004737  033610                          JSR     PC,EOM              ;SET EOM
027562  004737  033610                          JSR     PC,EOM              ;SET EOM
027566  004737  032346                          JSR     PC,OCOR             ;WAIT FOR OCOR
027572  005003                                  CLR     R3                  ;CLEAR BIT COUNTER
027574  104415  000022                          DATACLK,22                  ;CLOCK DATA
027600  112405                  12$:    MOVB    (R4)+,R5            ;LOAD R5 WITH CHAR
027602  010502                          MOV     R5,R2               ;LOAD R2 WITH CHAR

                                                    ;CHECK FIRST FOUR CHARACTER MESSAGE
                                                    ;IN THE BIT WINDOW (0,125,252,377)

027604  010537  027700                          MOV     R5,71$              ;LOAD FOR STUFF CHECK
027610  012737  102010  033332                  MOV     #CRC.CCITT,XPOLY            ;LOAD POLYNOMIAL
027616  010537  027630                          MOV     R5,67$              ;LOAD SOFT CHAR FOR BCC
027622  004537  033210                          JSR     R5,SIMBCC           ;CALCULATE SOFT BCC
027626  000010                                  10                          ;SHIFT COUNT
027630  000000                  67$:    0                           ;CHARACTER
027632  000000                  10$:    0                           ;OLD BCC
027634  013737  033334  027632                  MOV     CALBCC,10$          ;LOAD SOFT BCC FOR NEXT SHIFT
```

```
5164  027642  104415  000001          64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
5165  027646  106002                          RORB    R2              ;SHIFT SOFT DATA
5166  027650  103005                          BCC     65$             ;BR IF A SPACE
5167  027652  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5168  027656  103406                          BCS     66$             ;BR IF OK (MARK)
5169  027660  104006                          HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
5170  027662  000404                          BR      66$             ;CONTINUE
5171  027664  004737  032314          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5172  027670  103001                          BCC     66$             ;BR IF OK (SPACE)
5173  027672  104006                          HLT     6               ;ERROR, BIT WINDOW WAS A MARK
5174  027674                          66$:
5175  027674  004537  033776                  JSR     R5,STFFCK
5176  027700  000000                  71$:    0
5177  027702  000001                          1
5178  027704  110237  027700                  MOVB    R2,71$          ;SHIFT FOR NEXT STUFF CHECK
5179  027710  005203                          INC     R3              ;BUMP BIT COUNTER
5180  027712  022703  000010                  CMP     #10,R3          ;DONE FULL 8 BITS YET
5181  027716  001351                          BNE     64$             ;BR IF NO
5182  027720  005003                          CLR     R3              ;CLEAR BIT COUNTER
5183  027722  005300                          DEC     R0              ;DEC CHARACTER COUNT
5184  027724  001325                          BNE     12$             ;BR IF NOT DONE YET
5185
5186                                          ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
5187
5188  027726  005137  033334                  COM     CALBCC          ;ADJUST BCC FOR SDLC
5189  027732  013700  033334                  MOV     CALBCC,R0       ;PUT BCC IN R0
5190  027736  010037  030000                  MOV     R0,72$          ;LOAD BCC FOR STUFF CHECK
5191  027742  104415  000001          68$:    DATACLK,1               ;SHIFT HARDWARE BCC
5192  027746  006000                          ROR     R0              ;SHIFT SOFT BCC
5193  027750  103005                          BCC     69$             ;BR IF CARRY CLEAR
5194  027752  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5195  027756  103406                          BCS     70$             ;BR IF OK (MARK)
5196  027760  104014                          HLT     14              ;ERROR, CRC WRONG (SPACE)
5197  027762  000404                          BR      70$             ;CONTINUE
5198  027764  004737  032314          69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5199  027770  103001                          BCC     70$             ;BR IF OK (SPACE)
5200  027772  104014                          HLT     14              ;ERROR, CRC WRONG (MARK)
5201  027774                          70$:
5202  027774  004537  033776                  JSR     R5,STFFCK       ;CHECK BCC CHAR FOR ZERO STUFFS
5203  030000  000000                  72$:    0                       ;CHARACTER
5204  030002  000001                          1                       ;SHIFT COUNT
5205  030004  010037  030000                  MOV     R0,72$          ;SHIFT SOFTBCC ONCE
5206  030010  005203                          INC     R3              ;BUMP BIT COUNTER
5207  030012  022703  000020                  CMP     #20,R3          ;FINISHED BCC YET?
5208  030016  001351                          BNE     68$             ;BR IF NO
5209  030020  005003                          CLR     R3              ;CLEAR BIT COUNTER
5210
5211                                          ;CHECK FOR FLAG TO FOLLOW BCC
5212
5213  030022  012737  000176  001252          MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
5214  030030  104415  000001          73$:    DATACLK,        1       ;CLOCK FLAG ONCE
5215  030034  106037  001252                  RORB    TEMP3           ;SHIFT SOFT FLAG
5216  030040  103405                          BCS     74$             ;BR IF BIT IS MARK
5217  030042  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5218  030046  103006                          BCC     75$             ;BR IF OK
5219  030050  104026                          HLT     26              ;ERROR IN FLAG CHAR
```

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5220  030052  000404                        BR      75$
5221  030054  004737  032314        74$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5222  030060  103401                        BCS     75$             ;BR IF OK
5223  030062  104026                        HLT     26              ;ERROR IN FLAG CHAR
5224  030064  005203        75$:            INC     R3              ;INC BIT COUNT
5225  030066  022703  000010                CMP     #10,R3          ;FLAG DONE YET?
5226  030072  001356                        BNE     73$             ;BR IF NO
5227  030074  005003                        CLR     R3              ;CLEAR BIT COUNT
5228
5229                                        ;CHECK FOR ANOTHER FLAG CAUSED BY THE SOM
5230
5231  030076  012737  000176  001252        MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
5232  030104  104415  000001        76$:    DATACLK,        1       ;CLOCK FLAG ONCE
5233  030110  106037  001252                RORB    TEMP3           ;SHIFT SOFT FLAG
5234  030114  103405                        BCS     77$             ;BR IF BIT IS MARK
5235  030116  004737  032314                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5236  030122  103006                        BCC     78$             ;BR IF OK
5237  030124  104026                        HLT     26              ;ERROR IN FLAG CHAR
5238  030126  000404                        BR      78$
5239  030130  004737  032314        77$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5240  030134  103401                        BCS     78$             ;BR IF OK
5241  030136  104026                        HLT     26              ;ERROR IN FLAG CHAR
5242  030140  005203        78$:            INC     R3              ;INC BIT COUNT
5243  030142  022703  000010                CMP     #10,R3          ;FLAG DONE YET?
5244  030146  001356                        BNE     76$             ;BR IF NO
5245  030150  005003                        CLR     R3              ;CLEAR BIT COUNT
5246  030152  012700  000004                MOV     #4,R0           ;RESET CHARACTER COUNTER
5247  030156  012704  034116                MOV     #MESDAT,R4      ;LOAD MESSAGE POINTER
5248  030162  005037  030224                CLR     11$             ;CLR SOFT BCC
5249  030166  005137  030224                COM     11$             ;ADJUST TO -1 FOR SDLC
5250  030172  112405        13$:            MOVB    (R4)+,R5        ;LOAD CHAR IN R5
5251  030174  010502                        MOV     R5,R2           ;LOAD CHAR IN R2
5252
5253                                        ;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
5254
5255  030176  010537  030272                MOV     R5,86$          ;LOAD FOR STUFF CHECK
5256  030202  012737  102010  033332        MOV     #CRC.CCITT,XPOLY        ;LOAD POLYNOMIAL
5257  030210  010537  030222                MOV     R5,82$          ;LOAD SOFT CHAR FOR BCC
5258  030214  004537  033210                JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
5259  030220  000010                        10                      ;SHIFT COUNT
5260  030222  000000        82$:            0                       ;CHARACTER
5261  030224  000000        11$:            0                       ;OLD BCC
5262  030226  013737  033334  030224        MOV     CALBCC,11$      ;LOAD SOFT BCC FOR NEXT SHIFT
5263  030234  104415  000001        79$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
5264  030240  106002                        RORB    R2              ;SHIFT SOFT DATA
5265  030242  103005                        BCC     80$             ;BR IF A SPACE
5266  030244  004737  032314                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5267  030250  103406                        BCS     81$             ;BR IF OK (MARK)
5268  030252  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
5269  030254  000404                        BR      81$             ;CONTINUE
5270  030256  004737  032314        80$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5271  030262  103001                        BCC     81$             ;BR IF OK (SPACE)
5272  030264  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A MARK
5273  030266                        81$:
5274  030266  004537  033776                JSR     R5,STFFCK
5275  030272  000000        86$:            0
```

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5276  030274  000001                                  1
5277  030276  110237  030272                          MOVB    R2,86$          ;SHIFT FOR NEXT STUFF CHECK
5278  030302  005203                                  INC     R3              ;BUMP BIT COUNTER
5279  030304  022703  000010                          CMP     #10,R3          ;DONE FULL 8 BITS YET
5280  030310  001351                                  BNE     79$             ;BR IF NO
5281  030312  005003                                  CLR     R3              ;CLEAR BIT COUNTER
5282  030314  005300                                  DEC     R0              ;DEC CHARACTER COUNT
5283  030316  001325                                  BNE     13$             ;BR IF NOT DONE YET
5284
5285                                                  ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
5286
5287  030320  005137  033334                          COM     CALBCC          ;ADJUST BCC FOR SDLC
5288  030324  013700  033334                          MOV     CALBCC,R0       ;PUT BCC IN R0
5289  030330  010037  030372                          MOV     R0,87$          ;LOAD BCC FOR STUFF CHECK
5290  030334  104415  000001              83$:        DATACLK,1               ;SHIFT HARDWARE BCC
5291  030340  006000                                  ROR     R0              ;SHIFT SOFT BCC
5292  030342  103005                                  BCC     84$             ;BR IF CARRY CLEAR
5293  030344  004737  032314                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5294  030350  103406                                  BCS     85$             ;BR IF OK (MARK)
5295  030352  104014                                  HLT     14              ;ERROR, CRC WRONG (SPACE)
5296  030354  000404                                  BR      85$             ;CONTINUE
5297  030356  004737  032314              84$:        JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5298  030362  103001                                  BCC     85$             ;BR IF OK (SPACE)
5299  030364  104014                                  HLT     14              ;ERROR, CRC WRONG (MARK)
5300  030366                                85$:
5301  030366  004537  033776                          JSR     R5,STFFCK       ;CHECK BCC CHAR FOR ZERO STUFFS
5302  030372  000000                        87$:        0                       ;CHARACTER
5303  030374  000001                                  1                       ;SHIFT COUNT
5304  030376  010037  030372                          MOV     R0,87$          ;SHIFT SOFTBCC ONCE
5305  030402  005203                                  INC     R3              ;BUMP BIT COUNTER
5306  030404  022703  000020                          CMP     #20,R3          ;FINISHED BCC YET?
5307  030410  001351                                  BNE     83$             ;BR IF NO
5308  030412  005003                                  CLR     R3              ;CLEAR BIT COUNTER
5309
5310                                                  ;CHECK FOR FLAG TO FOLLOW BCC
5311
5312  030414  012737  000176  001252          88$:    MOV     #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
5313  030422  104415  000001                          DATACLK,        1       ;CLOCK FLAG ONCE
5314  030426  106037  001252                          RORB    TEMP3           ;SHIFT SOFT FLAG
5315  030432  103405                                  BCS     89$             ;BR IF BIT IS MARK
5316  030434  004737  032314                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5317  030440  103006                                  BCC     90$             ;BR IF OK
5318  030442  104026                                  HLT     26              ;ERROR IN FLAG CHAR
5319  030444  000404                                  BR      90$
5320  030446  004737  032314              89$:        JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5321  030452  103401                                  BCS     90$             ;BR IF OK
5322  030454  104026                                  HLT     26              ;ERROR IN FLAG CHAR
5323  030456  005203                        90$:      INC     R3              ;INC BIT COUNT
5324  030460  022703  000010                          CMP     #10,R3          ;FLAG DONE YET?
5325  030464  001356                                  BNE     88$             ;BR IF NO
5326  030466  005003                                  CLR     R3              ;CLEAR BIT COUNT
5327
5328                                                  ;CHECK TO SEE IF TRANSMITTER IS MARKING
5329
5330  030470  104415  000001                2$:       DATACLK,        1       ;CLOCK TRANSMITTER
5331  030474  004737  032314                          JSR     PC,GETSI        ;LOOK AT WINDOW
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5332  030500  103401                          BCS     3$              ;IT SHOULD BE MARKING
5333  030502  104024                          HLT     24              ;ERROR, BIT WAS A SPACE
5334  030504  005203                  3$:     INC     R3              ;BUMP BIT COUNTER
5335  030506  022703  000007                  CMP     #7,R3           ;DONE YET
5336  030512  001366                          BNE     2$              ;BR IF NO
5337  030514  104415  000010                  DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
5338  030520  005003                          CLR     R3              ;CLEAR BIT COUNTER
5339  030522  104415  000001          4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
5340  030526  004737  032314                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5341  030532  103401                          BCS     .+4             ;BR IF IT IS A MARK
5342  030534  104024                          HLT     24              ;ERROR, TRANSMITTER IS NOT MARKING
5343  030536  005203                          INC     R3              ;INC BIT COUNT
5344  030540  022703  000020                  CMP     #20,R3          ;DONE YET?
5345  030544  001366                          BNE     4$              ;BR IF NO
5346
5347                                          ;CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
5348                                          ;WAS RECEIVED CORRECTLY (0,125,252,377)
5349
5350  030546  104415  000001                  DATACLK,        1       ;GET LAST BIT IN RECEIVER
5351  030552  012703  000004                  MOV     #4,R3           ;R3=CHARACTER COUNT
5352  030556  012702  034116                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5353  030562  004737  033154          40$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5354  030566  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5355  030570  021204                          021204
5356  030572  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5357  030576  112205                          MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5358  030600  120504                          CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
5359  030602  001401                          BEQ     41$             ;BR IF YES
5360  030604  104010                          HLT     10              ;RECEIVE DATA ERROR
5361  030606  005303                  41$:    DEC     R3              ;DEC CHARACTER COUNT
5362  030610  001364                          BNE     40$             ;BR IF NOT DONE YET
5363
5364
5365                                          ;CHECK TO SEE THAT IN BCC MATCH IS SET
5366                                          ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5367
5368  030612  004737  033154                  JSR     PC,INRDY        ;WAIT FOR INRDY
5369  030616  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5370  030620  021204                          021204                  ;GET FIRST HALF OF CRC
5371  030622  116137  000004  001252          MOVB    4(R1),TEMP3     ;PUT IN TEMP3
5372  030630  042737  177400  001252          BIC     #177400,TEMP3   ;CLEAR HI BYTE
5373  030636  004737  033154                  JSR     PC,INRDY        ;WAIT FOR INRDY
5374  030642  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5375  030644  021244                          021244
5376  030646  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
5377  030652  042704  000374          BIC     #374,R4         ;CLEAR UNWANTED BITS
5378  030656  012705  000003          MOV     #3,R5           ;PUT "EXPECTED" IN R5
5379  030662  120504                  CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
5380  030664  001401                  BEQ     50$
5381  030666  104042                          HLT     42              ;IN BCC MATCH ERROR
5382  030670                          50$:
5383  030670  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5384  030672  021204                          021204                  ;GET LAST HALF
5385  030674  116137  000004  001251          MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
5386  030702  042737  000377  001250          BIC     #377,TEMP2      ;CLEAR LO BYTE
5387  030710  053737  001250  001252          BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
```

```
5388  030716  023737  033334  001252                  CMP     CALBCC,TEMP3    ;IS IT CORRECT?
5389  030724  001401                                  BEQ     42$             ;BR IF OK
5390  030726  104027                                  HLT     27
5391
5392                                                  ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
5393                                                  ;WAS RECEIVED CORRECTLY (0,125,252,377)
5394
5395  030730  012703  000004              42$:      MOV     #4,R3           ;R3=CHARACTER COUNT
5396  030734  012702  034116                        MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5397  030740  004737  033154              43$:      JSR     PC,INRDY        ;WAIT FOR INRDY
5398  030744  104414                      ROMC K                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5399  030746  021204                              G21204
5400  030750  016104  000004                        MOV     4(R1),R4        ;PUT "FOUND" IN R4
5401  030754  112205                                MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5402  030756  120504                                CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
5403  030760  001401                                BEQ     44$             ;BR IF YES
5404  030762  104010                                HLT     10              ;RECEIVE DATA ERROR
5405  030764  005303                      44$:      DEC     R3              ;DEC CHARACTER COUNT
5406  030766  001364                                BNE     43$             ;BR IF NOT DONE YET
5407
5408
5409                                                  ;CHECK TO SEE THAT IN BCC MATCH IS SET
5410                                                  ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5411
5412  030770  004737  033154                        JSR     PC,INRDY        ;WAIT FOR INRDY
5413  030774  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
5414  030776  021204                              021204                  ;GET FIRST HALF OF CRC
5415  031000  116137  000004  001252              MOVB    4(R1),TEMP3     ;PUT IN TEMP3
5416  031006  042737  177400  001252              BIC     #177400,TEMP3   ;CLEAR HI BYTE
5417  031014  004737  033154                      JSR     PC,INRDY        ;WAIT FOR INRDY
5418  031020  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5419  031022  021244                              021244
5420  031024  016104  000004              MOV     4(R1),R4        ;PUT "FOUND" IN R4
5421  031030  042704  000374              BIC     #374,R4         ;CLEAR UNWANTED BITS
5422  031034  012705  000003              MOV     #3,R5           ;PUT "EXPECTED" IN R5
5423  031040  120504                      CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
5424  031042  001401                      BEQ     51$
5425  031044  104042                              HLT     42              ;IN BCC MATCH ERROR
5426  031046                              51$:
5427  031046  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
5428  031050  021204                              021204                  ;GET LAST HALF
5429  031052  116137  000004  001251              MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
5430  031060  042737  000377  001250              BIC     #377,TEMP2      ;CLEAR LO BYTE
5431  031066  053737  001250  001252              BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
5432  031074  023737  033334  001252              CMP     CALBCC,TEMP3    ;IS IT CORRECT?
5433  031102  001401                              BEQ     5$              ;BR IF OK
5434  031104  104027                              HLT     27
5435  031106  104400                      5$:     SCOPE                   ;SCOPE THIS TEST
5436
5437
5438                                      ;************************** TEST 57 **************************
5439                                              ;*EMPTY SILO TEST
5440                                              ;*LOAD SILO WITH 2 SYNCS, 4 CHAR MESSAGE, SINGLE CLOCK
5441                                              ;*UNTIL THE SILO IS EMPTY, LOAD 4 MORE CHARACTERS IN THE
5442                                              ;*SILO. GIVE MORE TICKS, AND VERIFY THAT ONLY THE FIRST
5443                                              ;*4 CHARACTERS  AND A BLOCK END WERE RECEIVED, AND IN ACTIVE IS CLEAR
```

```
5444                                                ;;*****************************************************************
5445
5446                                                ;  TEST 57
5447                                                ;--------------
5448  031110  012737  000057  001226  TST57:  MOV     #57,TSTNO
5449  031116  012737  031330  001216           MOV     #TST60,NEXT
5450
5451  031124  104412                           MSTC_R                  ;R1 CONTAINS BASE DMC11 ADDRESS
5452  031126  005061  000004                                          ;MASTER CLEAR DMC11
                                                        CLR     4(R1)           ;CLEAR PORT4
5453  031132  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5454  031134  122117                                   122117                  ;PUT LU IN BITSTUFF MODE
5455  031136  004737  033676                           JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
5456  031142  012711  004000                           MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5457  031146  012702  034116                           MOV     #MESDAT,R2      ;R2 POINTS TO MESSAGE
5458  031152  012700  000003                           MOV     #3,R0           ;R0 = CHAR COUNT
5459  031156  004737  033500                           JSR     PC,SYNLD        ;LOAD SILO WITH TWO FLAGS
5460  031162  004737  032500                           JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5461  031166  004537  033634                           JSR     R5,MESLD        ;LOAD MESSAGE IN SILO
5462  031172  034116                                   MESDAT                  ;START OF MESSAGE
5463  031174  000004                                   4                       ;CHARACTER COUNT
5464  031176  004737  032346                           JSR     PC,OCOR         ;WAIT FOR OCOR
5465  031202  104415  000065                           DATACLK,        65      ;CLOCK DATA (EMPTY SILO)
5466  031206  004537  033634                           JSR     R5,MESLD        ;PUT MORE CHARACTERS IN SILO
5467  031212  034116                                   MESDAT
5468  031214  000004                                   4
5469  031216  004737  032346                           JSR     PC,OCOR
5470  031222  104415  000006                           DATACLK,        6       ;CLOCK UNTIL RTS IS CLEARED
5471  031226  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5472  031230  021264                                   021264                  ;GET RTS
5473  031232  032761  000040  000004                   BIT     #BIT5,4(R1)     ;IS IT CLEAR?
5474  031240  001401                                   BEQ     5$              ;BR IF YES
5475  031242  104034                                   HLT     34              ;ERROR, RTS NOT CLEAR
5476  031244  104415  000041                   5$:     DATACLK,        4       ;CLOCK XMITTER SOME MORE
5477  031250  004737  033154                   1$:     JSR     PC,INRDY        ;OK LETS CHECK WHAT WAS RECEIVED
5478  031254  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5479  031256  021204                                   021204                  ;GET RECEIVE DATA
5480  031260  016104  000004                           MOV     4(R1),R4        ;PUT IT IN R4
5481  031264  112205                                   MOVB    (R2)+,R5        ;R5 = "EXPECTED"
5482  031266  120504                                   CMPB    R5,R4           ;IS DATA CORRECT?
5483  031270  001401                                   BEQ     2$              ;BR IF OK
5484  031272  104010                                   HLT     10              ;DATA ERROR
5485  031274  005300                           2$:     DEC     R0              ;DEC CHAR COUNT
5486  031276  001364                                   BNE     1$              ;BR IF NOT DONE YET
5487  031300  004737  033154                           JSR     PC,INRDY        ;WAIT FOR INRDY
5488  031304  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5489  031306  021244                                   021244                  ;READ LU-12
5490  031310  016104  000004                           MOV     4(R1),R4        ;PUT "FOUND" IN R4
5491  031314  012705  000022                           MOV     #22,R5          ;PUT "EXPECTED" IN R5
5492  031320  120504                                   CMPB    R5,R4           ;ARE BLOCK END AND IN RDY SET?
5493                                                                           ;AND IN ACTIVE AND IN BCC MATCH CLEAR?
5494  031322  001401                                   BEQ     6$              ;BR IF YES
5495  031324  104032                                   HLT     32              ;ERROR, BLOCK END NOT SET
5496                                                                           ;OR IN BCC MATCH NOT CLEAR
5497                                                                           ;OR IN ACTIVE NOT CLEAR
5498  031326                                   6$:
5499  031326  104400                                   SCOPE                   ;SCOPE THIS TEST
```

```
5500
5501
5502                                    ;************************** TEST 60 *************************
5503                                            ;*BITSTUFF CABLE DATA TEST
5504                                            ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
5505                                            ;*2 FLAGS,16 CHAR,EOM,16 CHAR,EOM,16 CHAR,EOM
5506                                            ;*THE 16 CHARACTERS INCLUDE A FLOATING ONE AND ZERO
5507                                            ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
5508                                            ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
5509                                            ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
5510                                    ;:*******************************************************************
5511
5512                                    ;  TEST 60
5513                                    ;--------------
5514  031330  012737  000060  001226  TST60:  MOV     #60,TSTNO
5515  031336  012737  031752  001216          MOV     #TST61,NEXT
5516
5517  031344  104412                         MSTCLR                          ;R1 CONTAINS BASE DMC11 ADDRESS
5518  031346  032737  040000  001366                                          ;MASTER CLEAR DMC11
5519  031354  001575                                 BIT     #BIT14,STAT1    ;SKIP TEST IF NO
5520  031356  005061  000004                         BEQ     3$              ;LOOPBACK CONNECTOR ON
5521  031362  104414                                 CLR     4(R1)           ;CLEAR PORT4
5522  031364  122117                         ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5523  031366  004737  033676                                                  122117          ;PUT LINE UNIT IN BITSTUFF MODE
5524  031372  012711  004000                                                  JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
5525  031376  004737  033500                                                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5526  031402  012737  102010  033332                                          JSR     PC,SYNLD        ;LOAD TWO FLAGS
5527  031410  005037  031444                                                  MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFT CRC CALC
5528  031414  005137  031444                                                  CLR     6$              ;CLEAR OLD BCC
5529  031420  012703  000020                                                  COM     6$              ;ADJUST TO -1 FOR SDLC
5530  031424  012702  034122                                                  MOV     #16.,R3         ;CHARACTER COUNT
5531  031430  112237  031442                                                  MOV     #FLTDAT,R2      ;R2= POINTER
5532  031434  004537  033210                                          7$:     MOVB    (R2)+,5$        ;LOAD CHAR FOR SOFT BCC CALC.
5533  031440  000010                                                  JSR     R5,SIMBCC       ;CALC SOFT BCC
5534  031442  000000                                                  10                      ;SHIFT COUNT
5535  031444  000000                                          5$:     0                       ;CHARACTER
5536  031446  013737  033334  031444                          6$:     0                       ;OLD BCC
5537  031454  005303                                                  MOV     CALBCC,6$       ;LOAD OLD BCC
5538  031456  001364                                                  DEC     R3              ;DEC COUNT
5539  031460  005137  033334                                          BNE     7$              ;BR IF NOT DONE YET
5540  031464  004537  033634                                          COM     CALBCC          ;ADJUST CALBCC FOR SDLC
5541  031470  034122                                                  JSR     R5,MESLD        ;LOAD SILO
5542  031472  000020                                                  FLTDAT                  ;MESSAGE ADDRESS
5543  031474  004737  033610                                          16.                     ;CHARACTER COUNT
5544  031500  004737  033610                                          JSR     PC,EOM          ;LOAD AN EOM
5545  031504  004537  033634                                          JSR     PC,EOM
5546  031510  034122                                                  JSR     R5,MESLD        ;LOAD SILO
5547  031512  000020                                                  FLTDAT                  ;MESSAGE ADDRESS
5548  031514  004737  033610                                          16.                     ;CHARACTER COUNT
5549  031520  004737  033610                                          JSR     PC,EOM          ;LOAD AN EOM
5550  031524  004537  033634                                          JSR     PC,EOM
5551  031530  034122                                                  JSR     R5,MESLD        ;LOAD SILO
5552  031532  000020                                                  FLTDAT                  ;MESSAGE ADDRESS
5553  031534  004737  033610                                          16.                     ;CHARACTER COUNT
5554  031540  004737  033610                                          JSR     PC,EOM          ;LOAD AN EOM
5555  031544  004737  032346                                          JSR     PC,EOM
                                                                      JSR     PC,OCOR         ;WAIT FOR OCOR
```

```
5556  031550  005011
5557  031552  012700  000003                    CLR     (R1)            ;CLEAR LINE UNIT LOOP
5558  031556  012703  000020                    MOV     #3,R0           ;R0 = MESSAGE COUNT
5559  031562  012702  034122                    MOV     #16.,R3         ;R3= CHARACTER COUNT
5560  031566  004737  033154                    MOV     #FLTDAT,R2      ;LOAD MESSAGE POINTER IN R2
5561  031572  104414                    1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
5562  031574  021204                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5563  031576  016104  000004                    021204                  ;GET DATA FROM IN SILO
5564  031602  112205                            MOV     4(R1),R4        ;PUT CHARACTER IN ''FOUND''
5565  031604  120504                            MOVB    (R2)+,R5        ;PUT ''EXPECTED'' IN R5
5566  031606  001401                            CMPB    R5,R4           ;IS RECEIVED DATA CORRECT
5567  031610  104025                            BEQ     2$              ;BR IF OK
5568  031612                                    HLT     25              ;DATA ERROR
5569  031612  005303                    2$:
5570  031614  001364                            DEC     R3              ;DEC CHARACTER COUNT
5571  031616  012703  000020                    BNE     1$              ;BR IF NOT DONE THIS MESSAGE
5572                                            MOV     #16.,R3         ;RESET CHARACTER COUNT
5573
5574                                    ;CHECK TO SEE THAT IN BCC MATCH IS SET
5575                                    ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5576
5577  031622  004737  033154                    JSR     PC,INRDY        ;WAIT FOR INRDY
5578  031626  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5579  031630  021204                    021204                  ;GET FIRST HALF OF CRC
5580  031632  116137  000004  001252            MOVB    4(R1),TEMP3     ;PUT IN TEMP3
5581  031640  042737  177400  001252            BIC     #177400,TEMP3   ;CLEAR HI BYTE
5582  031646  004737  033154                    JSR     PC,INRDY        ;WAIT FOR INRDY
5583  031652  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5584  031654  021244                    021244
5585  031656  016104  000004            MOV     4(R1),R4        ;PUT ''FOUND'' IN R4
5586  031662  042704  000374            BIC     #374,R4         ;CLEAR UNWANTED BITS
5587  031666  012705  000003            MOV     #3,R5           ;PUT ''EXPECTED'' IN R5
5588  031672  120504                    CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
5589  031674  001401                    BEQ     25$
5590  031676  104042                            HLT     42              ;IN BCC MATCH ERROR
5591  031700                            25$:
5592  031700  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5593  031702  021204                            021204                  ;GET LAST HALF
5594  031704  116137  000004  001251            MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
5595  031712  042737  000377  001250            BIC     #377,TEMP2      ;CLEAR LO BYTE
5596  031720  053737  001250  001252            BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
5597  031726  023737  033334  001252            CMP     CALBCC,TEMP3    ;IS IT CORRECT?
5598  031734  001401                            BEQ     4$              ;BR IF OK
5599  031736  104027                            HLT     27
5600  031740  012702  034122            4$:     MOV     #FLTDAT,R2      ;RESET MESSAGE POINTER
5601  031744  005300                            DEC     R0              ;DECREMENT COUNTER
5602  031746  001307                            BNE     1$              ;BR IF NOT DONE
5603  031750  104400                    3$:     SCOPE                   ;SCOPE THIS TEST
5604
5605
5606                                    ;***************************** TEST 61 ****************************
5607                                            ;*BITSTUFF CABLE DATA TEST
5608                                            ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
5609                                            ;*2 FLAGS,59 DATA CHARACTERS,EOM WITH GARBAGE CHARACTER
5610                                            ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
5611                                            ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
```

```
5612                                                    ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
5613                                                ;;**********************************************************
5614
5615                                                ;  TEST 61
5616                                                ;--------------
5617  031752  012737  000061  001226  TST61:  MOV     #61,TSTNO
5618  031760  012737  003364  001216         MOV     #.EOP,NEXT
5619                                                            ;R1 CONTAINS BASE DMC11 ADDRESS
5620  031766  104412                        MSTCLR              ;MASTER CLEAR DMC11
5621  031770  032737  040000  001366                 BIT     #BIT14,STAT1    ;SKIP TEST IF NO
5622  031776  001545                                 BEQ     3$              ;LOOPBACK CONNECTOR ON
5623  032000  005061  000004                         CLR     4(R1)           ;CLEAR PORT4
5624  032004  104414                        ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5625  032006  122117                                 122117                  ;PUT LINE UNIT IN BITSTUFF MODE
5626  032010  004737  033676                         JSR     PC,CLRIO        ;DO THIS AFTER MODE IS SET
5627  032014  012711  004000                         MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5628  032020  004737  033500                         JSR     PC,SYNLD        ;LOAD TWO FLAGS
5629  032024  012737  102010  033332                 MOV     #CRC.CCITT,XPOLY;LOAD POLYNOMIAL FOR SOFT CRC CALC
5630  032032  005037  032066                         CLR     6$              ;CLEAR OLD BCC
5631  032036  005137  032066                         COM     6$              ;ADJUST TO -1 FOR SDLC
5632  032042  012703  000073                         MOV     #59.,R3         ;CHARACTER COUNT
5633  032046  012702  034116                         MOV     #MESDAT,R2      ;R2= POINTER
5634  032052  112237  032064                7$:      MOVB    (R2)+,5$        ;LOAD CHAR FOR SOFT BCC CALC.
5635  032056  004537  033210                         JSR     R5,SIMBCC       ;CALC SOFT BCC
5636  032062  000010                                 10                      ;SHIFT COUNT
5637  032064  000000                        5$:      0                       ;CHARACTER
5638  032066  000000                        6$:      0                       ;OLD BCC
5639  032070  013737  033334  032066                 MOV     CALBCC,6$       ;LOAD OLD BCC
5640  032076  005303                                 DEC     R3              ;DEC COUNT
5641  032100  001364                                 BNE     7$              ;BR IF NOT DONE YET
5642  032102  005137  033334                         COM     CALBCC          ;ADJUST CALBCC FOR SDLC
5643  032106  004537  033634                         JSR     R5,MESLD        ;LOAD SILO
5644  032112  034116                                 MESDAT                  ;MESSAGE ADDRESS
5645  032114  000073                                 59.                     ;CHARACTER COUNT
5646  032116  004737  033610                         JSR     PC,EOM          ;LOAD AN EOM
5647  032122  004737  033610                         JSR     PC,EOM
5648  032126  004737  032346                         JSR     PC,OCOR         ;WAIT FOR OCOR
5649  032132  005011                                 CLR     (R1)            ;CLEAR LINE UNIT LOOP
5650  032134  012700  000073                         MOV     #59.,R0         ;R0= CHARACTER COUNT
5651  032140  012702  034116                         MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5652  032144  004737  033154                1$:      JSR     PC,INRDY        ;WAIT FOR INRDY
5653  032150  104414                        ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5654  032152  021204                                 021204                  ;GET DATA FROM IN SILO
5655  032154  016104  000004                         MOV     4(R1),R4        ;PUT CHARACTER IN "FOUND"
5656  032160  112205                                 MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5657  032162  120504                                 CMPB    R5,R4           ;IS RECEIVED DATA CORRECT
5658  032164  001401                                 BEQ     2$              ;BR IF OK
5659  032166  104025                                 HLT     25              ;DATA ERROR
5660  032170                                2$:
5661  032170  005300                                 DEC     R0              ;DECREMENT COUNTER
5662  032172  001364                                 BNE     1$              ;BR IF NOT DONE
5663
5664
5665                                                ;CHECK TO SEE THAT IN BCC MATCH IS SET
5666                                                ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5667
```

```
5668  032174  004737  033154                      JSR     PC,INRDY        ;WAIT FOR INRDY
5669  032200  104414                        ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5670  032202  021204                                021204                  ;GET FIRST HALF OF CRC
5671  032204  116137  000004  001252                MOVB    4(R1),TEMP3     ;PUT IN TEMP3
5672  032212  042737  177400  001252                BIC     #177400,TEMP3   ;CLEAR HI BYTE
5673  032220  004737  033154                      JSR     PC,INRDY        ;WAIT FOR INRDY
5674  032224  104414                        ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5675  032226  021244                                021244
5676  032230  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
5677  032234  042704  000374                BIC     #374,R4         ;CLEAR-UNWANTED BITS
5678  032240  012705  000003                MOV     #3,R5           ;PUT "EXPECTED" IN R5
5679  032244  120504                        CMPB    R5,R4           ;ARE IN BCC MATCH AND BLOCK END SET?
5680  032246  001401                        BEQ     25$
5681  032250  104042                                HLT     42              ;IN BCC MATCH ERROR
5682  032252                                25$:
5683  032252  104414                        ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5684  032254  021204                                021204                  ;GET LAST HALF
5685  032256  116137  000004  001251                MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
5686  032264  042737  000377  001250                BIC     #377,TEMP2      ;CLEAR LO BYTE
5687  032272  053737  001250  001252                BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
5688  032300  023737  033334  001252                CMP     CALBCC,TEMP3    ;IS IT CORRECT?
5689  032306  001401                                BEQ     3$              ;BR IF OK
5690  032310  104027                                HLT     27
5691  032312  104400                        3$:     SCOPE                   ;SCOPE THIS TEST
5692
5693
5694                                        ;SUBROUTINES
5695                                        ;-----------
5696
5697  032314                                GETSI:
5698                                                ;THIS SUBROUTINE READS LU 17, AND PUTS IT INTO NITCH.
5699                                                ;NITCH IS ROTATED LEFT UNTILL THE SI BIT IS IN CARRY
5700
5701  032314  104414                        ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5702  032316  021364                                021364                  ;PORT4_LU 17
5703  032320  017737  147066  032344                MOV     @DMP04,NITCH    ;STORE LU 17
5704  032326  106137  032344                        ROLB    NITCH
5705  032332  106137  032344                        ROLB    NITCH
5706  032336  106137  032344                        ROLB    NITCH           ;PUT SI IN THE CARRY BIT
5707  032342  000207                                RTS     PC
5708  032344  000000                        NITCH:  0
5709
5710
5711  032346                                OCOR:
5712                                                ;THIS SUBROUTINE SPINS ON OCOR
5713
5714  032346  104414                        ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5715  032350  021364                                021364                  ;PORT4_LU 17
5716  032352  032777  000020  147032                BIT     #BIT4,@DMP04    ;IS OCOR SET?
5717  032360  001772                                BEQ     OCOR            ;BR IF NO
5718  032362  000207                                RTS     PC              ;OK OCOR IS SET, GO BACK
5719
5720
5721  032364                                SYNC:
5722                                                ;THIS SUBROUNTINE LOADS THE SILO WITH THE NUMBER OF SYNC
5723                                                ;CHARACTERS PASSED TO IT IN THE WORD AFTER THE JSR CALL
```

```
5724
5725
5726  032364  013637  001246                    ;AND A NON-SYNC CHARACTER (301)
5727  032370  062746  000002
5728  032374  012761  000026  000004            MOV     @(SP)+,TEMP1    ;GET COUNT
5729  032402  104414                            ADD     #2,-(SP)        ;ADJUST STACK
5730  032404  122114                            MOV     #26,4(R1)       ;LOAD PORT4
5731  032406  004737  032500                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5732  032412  012761  000001  000004            122114                  ;LOAD SYNC REGISTER
5733  032420  104414                    1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5734  032422  122111                            MOV     #1,4(R1)        ;LOAD PORT4
5735  032424  012761  000026  000004            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5736  032432  104414                            122111                  ;SET SOM
5737  032434  122110                            MOV     #26,4(R1)       ;LOAD PORT4
5738  032436  005337  001246                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5739  032442  001361                            122110                  ;LOAD OUT DATA
5740  032444  004737  032500                    DEC     TEMP1           ;ALL DONE?
5741  032450  005061  000004                    BNE     1$              ;BR IF NOT
5742  032454  104414                            JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5743  032456  122111                            CLR     4(R1)           ;LOAD PORT4
5744  032460  012761  000301  000004            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5745  032466  104414                            122111                  ;SET SOM
5746  032470  122110                            MOV     #301,4(R1)      ;LOAD PORT4
5747  032472  004737  032346                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5748  032476  000207                            122110                  ;LOAD OUT DATA
5749                                            JSR     PC,OCOR         ;WAIT FOR OCOR
5750                                            RTS     PC
5751  032500                            OUTRDY:
5752                                    ;THIS SUBROUTINE SPINS ON OUT READY
5753
5754  032500  005037  001256                    CLR     TEMP5           ;CLEAR TIMER
5755  032504                            1$:
5756  032504  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5757  032506  021224                            021224                  ;PORT4 LU11
5758  032510  032777  000020  146674            BIT     #BIT4,@DMP04    ;IS OUT RDY SET?
5759  032516  001004                            BNE     2$              ;BR IF YES
5760  032520  005237  001256                    INC     TEMP5           ;INC TIMER
5761  032524  001367                            BNE     1$              ;KEEP CHECKING IF NOT DONE
5762  032526  104036                            HLT     36              ;ERROR, OUT READY NOT SET
5763  032530  000207                    2$:     RTS     PC
5764
5765
5766  032532                            CHAR:
5767                                    ;THIS SUBROUTINE LOADS THE SILO WITH 3 SYNCS
5768                                    ;AND THE CHARACTER PASSED TO IT.
5769
5770  032532  013637  001250                    MOV     @(SP)+,TEMP2    ;GET CHARACTER
5771  032536  062746  000002                    ADD     #2,-(SP)        ;ADJUST STACK
5772  032542  012737  000003  001246            MOV     #3,TEMP1        ;SET FOR 3 SYNCS
5773  032550  012761  000026  000004            MOV     #26,4(R1)       ;LOAD PORT4
5774  032556  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5775  032560  122114                            122114                  ;LOAD SYNC REGISTER
5776  032562  004737  032500                    JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5777  032566  012761  000001  000004            MOV     #1,4(R1)        ;LOAD PORT4
5778  032574  104414                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5779  032576  122111                            122111                  ;SET SOM
```

```
5780  032600  012761  000026  000004          MOV     #26,4(R1)       ;LOAD PORT4
5781  032606  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5782  032610  122110                          122110                  ;LOAD OUT DATA
5783  032612  005337  001246                  DEC     TEMP1           ;ALL DONE?
5784  032616  001361                          BNE     1$              ;BR IF NOT
5785  032620  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5786  032624  013761  001250  000004          MOV     TEMP2,4(R1)     ;LOAD PORT4
5787  032632  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5788  032634  122110                          122110                  ;LOAD OUT DATA
5789  032636  004737  032346                  JSR     PC,OCOR         ;WAIT FOR OCOR
5790  032642  000207                          RTS     PC
5791
5792
5793  032644                          CHARSD:
5794                                          ;THIS SUBROUTINE LOADS THE SILO WITH THE CHARACTER PASSED TO IT.
5795
5796  032644  013637  001250                  MOV     @(SP)+,TEMP2    ;GET CHARACTER
5797  032650  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
5798  032654  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5799  032660  013761  001250  000004          MOV     TEMP2,4(R1)     ;LOAD PORT4
5800  032666  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5801  032670  122110                          122110                  ;LOAD OUT DATA
5802  032672  004737  032500                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5803  032676  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5804  032700  122110                          122110                  ;LOAD GARBAGE CHAR
5805  032702  004737  032346                  JSR     PC,OCOR         ;WAIT FOR OCOR
5806  032706  000207                          RTS     PC
5807
5808
5809  032710                          SILOLD:
5810                                          ;THIS SUBROUTINE FILLS THE OUT SILO
5811                                          ; WITH A BINARY COUNT PATTERN
5812
5813  032710  012737  000073  001250          MOV     #73,TEMP2       ;LOAD COUNT
5814  032716  005737  033150                  TST     SCHAR           ;FIRST TIME HERE?
5815  032722  100470                          BMI     4$              ;BR IF BITSTUFF
5816  032724  001032                          BNE     2$              ;BR IF NO
5817  032726  062737  000002  001250          ADD     #2,TEMP2        ;ADD 2 TO CHARACTER COUNT
5818  032734  012737  000003  001246          MOV     #3,TEMP1        ;SET FOR 3 SYNCS
5819  032742  012761  000026  000004          MOV     #26,4(R1)       ;LOAD PORT4
5820  032750  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5821  032752  122114                          122114                  ;LOAD SYNC REGISTER
5822  032754  004737  032500          1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5823  032760  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4
5824  032766  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5825  032770  122111                          122111                  ;SET SOM
5826  032772  012761  000026  000004          MOV     #26,4(R1)       ;LOAD PORT4
5827  033000  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5828  033002  122110                          122110                  ;LOAD OUT DATA
5829  033004  005337  001246                  DEC     TEMP1           ;ALL DONE?
5830  033010  001361                          BNE     1$              ;BR IF NOT
5831  033012  004737  032500          2$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5832  033016  013761  033150  000004          MOV     SCHAR,4(R1)     ;LOAD PORT4
5833  033024  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5834  033026  122110                          122110                  ;LOAD OUT DATA
5835  033030  005737  033152                  TST     STUFLG          ;BITSTUFF???
```

```
5836  033034  001407                          BEQ     6$              ;BR IF NO
5837  033036  013737  033150  033050          MOV     SCHAR,5$        ;IT IS SDLC SO CHECK BITSTUFFING
5838  033044  004537  033716                  JSR     R5,STFFCL       ;ADD ANY BIT STUFF CLOCK TICKS
5839  033050  000000                  5$:     0                       ;CHARACTER
5840  033052  000010                          10                      ;CHIFT COUNT
5841  033054  005237  033150          6$:     INC     SCHAR           ;NEXT CHARACTER
5842  033060  022737  000400  033150          CMP     #400,SCHAR      ;ALL DONE?
5843  033066  001403                          BEQ     3$
5844  033070  005337  001250                  DEC     TEMP2           ;DECREMENT COUNT
5845  033074  001346                          BNE     2$              ;BR IF NOT DONE
5846  033076  004737  032346          3$:     JSR     PC,OCOR         ;WAIT FOR OCOR
5847  033102  000207                          RTS     PC
5848  033104  005037  033150          4$:     CLR     SCHAR           ;START PATTERN AT ZERO
5849  033110  012737  177777  033152          MOV     #-1,STUFLG      ;SET BITSTUFF FLAG
5850  033116  005037  034114                  CLR     BITCON          ;CLEAR STUFF COUNT
5851  033122  062737  000002  001250          ADD     #2,TEMP2        ;ADD 2 TO CHARACTER COUNT
5852  033130  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
5853  033136  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5854  033140  122111                          122111          ;SET SOM!
5855  033142  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5856  033144  122110                          122110          ;LOAD GARBAGE CHAR
5857  033146  000721                          BR      2$              ;GO LOAD SILO
5858  033150  000000                  SCHAR:  0
5859  033152  000000                  STUFLG: 0
5860
5861
5862  033154                          INRDY:
5863                                          ;THIS SUBROUTINE SPINS ON INRDY
5864                                          ;IF INRDY FAILS TO SET THE DELAY TIMES OUT AND AN
5865                                          ;ERROR IS REPORTED. FOR BETTER SCOPE LOOPS THIS
5866                                          ;DELAY CAN BE MADE SHORTER BY ALTERING THE NUMBER
5867                                          ;INITIALLY LOADED INTO TEMP1, THE SMALLER THE NUMBER
5868                                          ;THE SHORTER THE DELAY. 0 IS THE LONGEST DELAY.
5869
5870  033154  012737  000000  001246          MOV     #0,TEMP1        ;SET UP DELAY COUNTER
5871  033162                          1$.
5872  033162  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5873  033164  021244                          021244          ;PORT4 LU12
5874  033166  032777  000020  146216          BIT     #BIT4,@DMP04    ;IS INRDY SET?
5875  033174  001004                          BNE     2$              ;BR IF YES
5876  033176  005237  001246                  INC     TEMP1           ;INC DELAY
5877  033202  001367                          BNE     1$              ;TRY AGAIN
5878  033204  104037                          HLT     37              ;ERROR,NO INRDY
5879  033206  000207                  2$:     RTS     PC              ;RETURN
5880
5881
5882  033210                  SIMBCC:
5883                                          ;THIS SUBROUTINE CALCULATES THE CRC USING POLYNOMIAL GIVEN
5884                                          ;IN XPOLY. THE CORRECT CRC IS RETURNED IN CALBCC, AND THE
5885                                          ;STATE OF THE LSB OF THE BCC IS RETURNED IN THE C BIT.
5886
5887  033210  010046                          MOV     R0,-(SP)        ;SAVE R0 ON STACK
5888  033212  012537  001246                  MOV     (R5)+,TEMP1     ;TEMP1 = SHIFT COUNT
5889  033216  012537  001250                  MOV     (R5)+,TEMP2     ;TEMP2 = CHARACTER
5890  033222  012537  033334                  MOV     (R5)+,CALBCC    ;CALBCC = OLD BCC
5891  033226  013700  033334          1$:     MOV     CALBCC,R0       ;PUT OLD BCC IN R0
```

```
5892  033232  000241                          CLC
5893  033234  006037  033334                  ROR     CALBCC          ;SHIFT OLD BCC
5894  033240  006037  001250                  ROR     TEMP2           ;SHIFT CHARACTER
5895  033244  005500                          ADC     R0              ;ADD CHAR CARRY TO OLD BCC
5896  033246  006000                          ROR     R0              ;PUT BIT0 TO CARRY BIT
5897  033250  103011                          BCC     2$              ;CARRY IS FEEDBACK BIT
5898  033252  013700  033332                  MOV     XPOLY,R0        ;IF FEEDBACK = 1
5899  033256  043700  033334                  BIC     CALBCC,R0       ;EXCLUSIVLY OR XPOLY TO CALBCC
5900  033262  043737  033332  033334          BIC     XPOLY,CALBCC
5901  033270  050037  033334                  BIS     R0,CALBCC
5902  033274  005337  001246          2$:     DEC     TEMP1           ;DEC SHIFT COUNT
5903  033300  001352                          BNE     1$              ;BR IF NOT DONE
5904  033302  012737  000001  001246          MOV     #1,TEMP1        ;GET SET TO INVERT BIT0
5905  033310  013700  033334                  MOV     CALBCC,R0       ;PUT RESULT IN R0
5906  033314  006000                          ROR     R0              ;SHIFT BIT0 TO CARRY
5907  033316  005537  001246                  ADC     TEMP1           ;INVERT CARRY TO BIT0 OF TEMP1
5908  033322  006037  001246                  ROR     TEMP1           ;PUT INVERTED BIT IN CARRY
5909  033326  012600                          MOV     (SP)+,R0        ;RESTORE R0
5910  033330  000205                          RTS     R5              ;RETURN
5911  033332  000000          XPOLY:  0
5912  033334  000000          CALBCC: 0
5913          000200          LRC8=200
5914          120001          CRC16=120001
5915          102010          CRC.CCITT=102010
5916
5917
5918  033336                  BCCLD:
5919                          ;THIS SUBROUTINE LOADS THE OUT SILO WITH 2 SYNCS
5920                          ;WITH SOM SET, AND ONE CHARACTER PASSED TO IT
5921                          ;WITH THE SOM BIT CLEAR (ENABLE CRC)
5922
5923  033336  013637  001250          MOV     @(SP)+,TEMP2    ;GET CHARACTER
5924  033342  062746  000002          ADD     #2,-(SP)        ;ADJUST STACK
5925  033346  012737  000002  001246  MOV     #2,TEMP1        ;SET FOR 2 SYNCS
5926  033354  012761  000026  000004  MOV     #26,4(R1)       ;LOAD PORT4
5927  033362  104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5928  033364  122114          122114          ;LOAD SYNC REGISTER
5929  033366  004737  032500  1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5930  033372  012761  000001  000004  MOV     #1,4(R1)        ;LOAD PORT4
5931  033400  104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5932  033402  122111          122111          ;SET SOM
5933  033404  012761  000026  000004  MOV     #26,4(R1)       ;LOAD PORT4
5934  033412  104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5935  033414  122110          122110          ;LOAD OUT DATA
5936  033416  005337  001246          DEC     TEMP1           ;ALL DONE?
5937  033422  001361          BNE     1$              ;BR IF NOT
5938  033424  004737  032500  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5939  033430  013761  001250  000004  MOV     TEMP2,4(R1)     ;LOAD PORT4
5940  033436  104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5941  033440  122110          122110          ;LOAD OUT DATA
5942  033442  004737  032346  JSR     PC,OCOR         ;WAIT FOR OCOR
5943  033446  000207          RTS     PC
5944
5945
5946  033450                  GETQO:
5947                          ;THIS SUBROUTINE READS THE STATE OF THE TRANSMIT
```

```
                                                        ;BCC LSB AND PUTS IT IN THE CARRY BIT
                                                        
033450  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033452  021364                                      021364          ;PORT4_LU-17
033454  106177  145732                              ROLB    @DMP04  ;PUT Q0 IN CARRY
033460  000207                                      RTS     PC      ;RETURN
                                                        
                                                        
033462                                      GETQI:
                                                        ;THIS SUBROUTINE READS THE STATE OF THE RECEIVE
                                                        ;BCC LSB AND PUTS IT IN THE CARRY BIT
                                                        
033462  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033464  021364                                      021364          ;PORT4_LU-17
033466  106177  145720                              ROLB    @DMP04  ;PUT Q0 IN CARRY
033472  106177  145714                      ROLB    @DMP04          ;PUT QI IN CARRY
033476  000207                                      RTS     PC      ;RETURN
                                                        
                                                        
033500                                      SYNLD:
                                                        ;THIS SUBROUTINE LOADS OUT SILO WITH
                                                        ;2 SYNC CHARACTERS WITH SOM SET
                                                        
033500  012737  000002  001246                        MOV     #2,TEMP1        ;LOAD COUNTER FOR 2 SYNCS
033506  012761  000026  000004                        MOV     #26,4(R1)       ;PORT4_26
033514  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033516  122114                                      122114          ;LOAD SYNC REG
033520  004737  032500                      1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
033524  012761  000001  000004                        MOV     #1,4(R1)        ;LOAD PORT4
033532  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033534  122111                                      122111          ;SET SOM
033536  012761  000026  000004                        MOV     #26,4(R1)       ;PORT_26
033544  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033546  122110                                      122110          ;LOAD OUT DATA WITH SYNC
033550  005337  001246                              DEC     TEMP1           ;DECREMENT COUNTER
033554  001361                                      BNE     1$              ;BR IF NOT DONE
033556  000207                                      RTS     PC              ;RETURN
                                                        
                                                        
033560                                      SOM:
                                                        ;THIS SUBROUTINE LOADS SOM AND OUT DATA WITH A
                                                        ;GARBAGE CHARACTER (0)
                                                        
033560  004737  032500                              JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
033564  012761  000001  000004                        MOV     #1,4(R1)        ;PORT4_1
033572  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033574  122111                                      122111          ;SET SOM
033576  005061  000004                              CLR     4(R1)           ;CLEAR DATA CHAR
033602  104414                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033604  122110                                      122110          ;LOAD GARBAGE CHARACTER
033606  000207                                      RTS     PC              ;RETURN
                                                        
                                                        
033610                                      EOM:
                                                        ;THIS SUBROUTINE LOADS EOM AND OUT DATA WITH A
                                                        ;GARBAGE CHARACTER (2) TO ENABLE TRANSMISSION OF BCC
```

```
6004
6005  033610  004737  032500                        JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
6006  033614  012761  000002  0C0004                MOV     #2,4(R1)        ;PORT4_2
6007  033622  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6008  033624  122111                                122111          ;SET EOM
6009  033626  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6010  033630  122110                                122110          ;LOAD GARBAGE CHARACTER
6011  033632  000207                                RTS     PC              ;RETURN
6012
6013
6014  033634                                MESLD:  .
6015                                                ;THIS SUBROUTINE LOADS SILO WITH MESSAGE
6016                                                ;THE FIRST ARUGUMENT IS THE ADDRESS OF THE MESSAGE
6017                                                ;THE SECOND ARGUMENT IS THE NUMBER OF CHARACTERS IN THE MESSAGE
6018
6019  033634  010046                                MOV     R0,-(SP)        ;SAVE R0
6020  033636  012500                                MOV     (R5)+,R0        ;R0=MESSAGE POINTER
6021  033640  012537  001246                        MOV     (R5)+,TEMP1     ;TEMP1=CHARACTER COUNT
6022  033644  004737  032500                1$:     JSR     PC,OUTRDY       ;WAIT FOR OUT RDY
6023  033650  112061  000004                        MOVB    (R0)+,4(R1)     ;LOAD PORT4 WITH CHARACTER
6024  033654  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6025  033656  122110                                122110          ;LOAD OUT DATA SILO
6026  033660  005337  001246                        DEC     TEMP1           ;DEC CHAR COUNT
6027  033664  001367                                BNE     1$              ;BR IF NOT DONE
6028  033666  004737  032346                        JSR     PC,OCOR         ;WAIT FOR OCOR
6029  033672  012600                                MOV     (SP)+,R0        ;RESTORE R0
6030  033674  000205                                RTS     R5              ;RETURN
6031
6032
6033  033676                                CLRIO:
6034                                                ;THIS SUBROUTINE SETS IN CLR AND OUT CLR TO
6035                                                ;CLEAR THE TRANSMIT AND RECEIVE BCC REGISTERS
6036
6037  033676  012761  000200  000004                MOV     #BIT7,4(R1)     ;LOAD PORT4
6038  033704  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6039  033706  122112                                122112          ;SET IN CLR!
6040  033710  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6041  033712  122111                                122111          ;SET OUT CLR!
6042  033714  000207                                RTS     PC              ;RETURN
6043
6044
6045  033716                                STFFCL:
6046                                                ;THIS SUBROUTINE ADDS ANY NECESSSARY BIT STUFF CLOCK TICKS
6047                                                ;FIRST ARGUMENT IS CHAR, SECOND ARGUMENT IS SHIFT COUNT.
6048
6049  033716  010046                                MOV     R0,-(SP)        ;SAVE R0
6050  033720  012500                                MOV     (R5)+,R0        ;PUT CHAR IN R0
6051  033722  012537  001252                        MOV     (R5)+,TEMP3     ;PUT SHIFT COUNT IN TEMP3
6052  033726  106000                        1$:     RORB    R0              ;LOOK AT NEXT BIT
6053  033730  103403                                BCS     2$              ;BR IF A MARK
6054  033732  005037  034114                        CLR     BITCON          ;IT WAS A SPACE, CLEAR 1'S COUNTER
6055  033736  000412                                BR      3$              ;CONTINUE
6056  033740  005237  034114                2$:     INC     BITCON          ;INC CONSECUTIVE 1'S COUNTER
6057  033744  022737  000005  034114                CMP     #5,BITCON       ;IS IT 5 YET?
6058  033752  001004                                BNE     3$              ;BR IF NO
6059  033754  005037  034114                        CLR     BITCON          ;YES!  SO START AGAIN
```

```
6060  033760  104415  000001                    DATACLK,        1       ;GIVE EXTRA TICK TO STUFF ZERO
6061  033764  005337  001252            3$:     DEC     TEMP3           ;DEC SHIFT COUNT
6062  033770  001356                            BNE     1$              ;BR IF NOT DONE
6063  033772  012600                            MOV     (SP)+,R0        ;RESTORE R0
6064  033774  000205                            RTS     R5              ;RETURN
6065
6066
6067  033776                            STFFCK:
6068                                            ;THIS SUBROUTINE CHECKS TO SEE IF TRANSMITTER
6069                                            ;IS STUFFING ZEROS WHEN IT SHOULD. FIRST ARGUMENT
6070                                            ;IS THE CHARACTER, SECOND ARGUMENT IS SHIFT COUNT.
6071
6072  033776  010046                            MOV     R0,-(SP)        ;SAVE R0
6073  034000  012500                            MOV     (R5)+,R0        ;PUT CHAR IN R0
6074  034002  012537  001252                    MOV     (R5)+,TEMP3     ;PUT SHIFT COUNT IN TEMP3
6075  034006  106000                    1$:     RORB    R0              ;SHIFT OUT NEXT BIT
6076  034010  103403                            BCS     2$              ;BR IF IT IS A MARK
6077  034012  005037  034114                    CLR     BITCON          ;IT WAS A SPACE, CLEAR 1'S COUNTER
6078  034016  000416                            BR      3$              ;CONTINUE
6079  034020  005237  034114            2$:     INC     BITCON          ;INC CONSECUTIVE I'S COUNTER
6080  034024  022737  000005  034114            CMP     #5,BITCON       ;5 IN A ROW YET?
6081  034032  001010                            BNE     3$              ;BR IF NO
6082  034034  005037  034114                    CLR     BITCON          ;YES, SO START OVER
6083  034040  104415  000001                    DATACLK,        1       ;EXTRA TICK TO STUFF ZERO
6084  034044  004737  032314                    JSR     PC,GETSI        ;LOOK AT WINDOW
6085  034050  103001                            BCC     3$              ;IS IT A ZERO, BR IF YES
6086  034052  104030                            HLT     30              ;NO, ERROR ZERO WAS NOT STUFFED
6087  034054  005337  001252            3$:     DEC     TEMP3           ;DEC SHIFT COUNT
6088  034060  001352                            BNE     1$              ;BR IF NOT DONE
6089  034062  012600                            MOV     (SP)+,R0        ;RESTORE R0
6090  034064  000205                            RTS     R5              ;RETURN
6091
6092
6093  034066                            CTSDLY:
6094                                            ;THIS SUBROUTINE WASTES TIME UNTIL CTS SETS,
6095                                            ;BUT HOPEFULLY NOT SO LONG THAT THE SILO RUNS OUT
6096
6097  034066  010046                            MOV     R0,-(SP)        ;SAVE R0
6098  034070  012700  000032                    MOV     #32,R0          ;LOAD R0 WITH COUNT
6099  034074  027777  145104  145102    1$:     CMP     @TKCSR,@TKCSR   ;WASTE TIME
6100  034102  005300                            DEC     R0              ;DECREMENT COUNTER
6101  034104  001373                            BNE     1$              ;DO IT AGAIN IF NOT = 0
6102  034106  012600                            MOV     (SP)+,R0        ;RESTORE R0
6103  034110  000207                            RTS     PC              ;RETURN
6104
6105
6106  034112  000176                    FLAG:   ^B<01111110>            ;FLAG CHARACTER
6107  034114  000000                    BITCON: 0
6108  034116     000      125      252  MESDAT: .BYTE   0,125,252,377
6109  034121     377
6110  034122     001      002      004  FLTDAT: .BYTE   1,2,4,10,20,40,100,200,376,375,373,367,357,337,277,177
6111  034125     010      020      040
6112  034130     100      200      376
6113  034133     375      373      367
6114  034136     357      337      277
6115  034141     177
```

```
 6116  034142      100      140      160          STUFDT: .BYTE   100,140,160,170,3,300,174,176,177,1
 6117  034145      170      003      300
 6118  034150      174      176      177
 6119  034153      001
 6120  034154      363      347      317                  .BYTE   363,347,317,200,0,377,377,377,200,37
 6121  034157      200      000      377
 6122  034162      377      377      200
 6123  034165      037
 6124                                               .EVEN
 6125  034166  046377  047111  020105               EM1:    .ASCIZ  <377>/LINE UNIT INITALIZATION TEST/
       034224  046377  047111  020105               EM2:    .ASCIZ  <377>^LINE UNIT REGISTER READ/ONLY TEST^
       034267     377  044514  042516               EM3:    .ASCIZ  <377>^LINE UNIT REGISTER WRITE/READ TEST^
       034333     377  044514  042516               EM4:    .ASCIZ  <377>/LINE UNIT INTERNAL CLOCK FAILURE/
       034375     377  051124  047101               EM5:    .ASCIZ  <377>/TRANSMITTER DATA ERROR/
       034425     377  042522  042503               EM6:    .ASCIZ  <377>/RECEIVER TEST/
       034444  051377  041505  044505               EM7:    .ASCIZ  <377>/RECEIVER DATA ERROR/
       034471     377  047515  042504               EM10:   .ASCII  <377>/MODEM SIGNAL ERROR/
       034514  052377  044510  020123               .ASCII  <377>/THIS ERROR COULD BE CAUSED IF YOU HAVE V.35 AND/
       034574  040777  052125  051517               .ASCII  <377>/AUTOSIZED.  YOU MUST MANUALLY ANSWER QUESTIONS IF/
       034656  054777  052517  044040               .ASCIZ  <377>/YOU HAVE V.35 (DMC11-FA)/
       034710  052377  040522  051516               EM11:   .ASCIZ  <377>/TRANSMITTER CRC ERROR/
       034737     377  042522  042503               EM12:   .ASCIZ  <377>/RECEIVER CRC ERROR/
       034763     377  047111  041040               EM13:   .ASCIZ  <377>/IN BCC MATCH ERROR (LU REG 12)/
       035023     377  051124  047101               EM14:   .ASCIZ  <377>/TRANSMITTER FAILED TO GO TO MARK STATE/
       035073     377  040503  046102               EM15:   .ASCIZ  <377>/CABLE DATA TEST/
       035114  043377  040514  020107               EM16:   .ASCIZ  <377>/FLAG ERROR/
       035130  052377  040522  051516               EM17:   .ASCIZ  <377>/TRANSMITTER FAILED TO STUFF A ZERO/
       035174  051777  044527  041524               EM20:   .ASCIZ  <377>/SWITCH PAC TEST/
       035215     377  041101  051117               EM21:   .ASCIZ  <377>/ABORT ERROR/
       035232  052377  040522  051516               EM22:   .ASCIZ  <377>/TRANSMITTER ERROR/
       035255     377  040510  043114               EM23:   .ASCIZ  <377>/HALF DUPLEX TEST/
       035277     377  052517  020124               EM24:   .ASCIZ  <377>/OUT READY NOT SET/
       035322  044777  020116  042522               EM25:   .ASCIZ  <377>/IN READY NOT SET/

       035344  042777  050130  041505               DH1:    .ASCIZ  <377>/EXPECTED  FOUND/
       035365     377  054105  042520               DH2:    .ASCIZ  <377>/EXPECTED  FOUND  LU-REGISTER/
       035423     377  044103  051101               DH3:    .ASCIZ  <377>/CHARACTER    BIT THAT FAILED/
       035461     377  047503  051122               DH4:    .ASCIZ  <377>/CORRECT CRC    BIT THAT FAILED/
       035521     377  054105  042520               DH5:    .ASCIZ  <377>/EXPECTED   FOUND   SHIFT/
       035553     377  054105  042520               DH6:    .ASCIZ  <377>/EXPECTED   FOUND   CHARACTER   SHIFT/
       035621     377  046102  041517               DH7:    .ASCIZ  <377>/BLOCK END NOT SET/
       035644  051377  051524  042040               DH10:   .ASCIZ  <377>/RTS DID NOT CLEAR/
               035670                               .EVEN

       035670  000002                               DT1:    2
       035672     003      007                              .BYTE   3,7
       035674  001272                                       SAVR5
       035676     003      002                              .BYTE   3,2
       035700  001270                                       SAVR4
       035702  000003                               DT2:    3
       035704     003      007                              .BYTE   3,7
       035706  001272                                       SAVR5
       035710     003      010                              .BYTE   3,10
       035712  001270                                       SAVR4
       035714     003      002                              .BYTE   3,2
       035716  001264                                       SAVR2
```

```
035720  000002                          DT3:    2
035722      003     017                         .BYTE   3,17
035724  001272                                  SAVR5
035726      002     002                         .BYTE   2,2
035730  001266                                  SAVR3
035732  000002                          DT4:    2
035734      006     021                         .BYTE   6,21
035736  033334                                  CALBCC
035740      002     002                         .BYTE   2,2
035742  001266                                  SAVR3
035744  000003                          DT5:    3
035746      001     011                         .BYTE   1,11
035750  001300                                  ZERO
035752      001     011                         .BYTE   1,11
035754  001302                                  ONE
035756      002     002                         .BYTE   2,2
035760  001260                                  SAVR0
035762  000003                          DT6:    3
035764      001     011                         .BYTE   1,11
035766  001302                                  ONE
035770      001     011                         .BYTE   1,11
035772  001300                                  ZERO
035774      002     002                         .BYTE   2,2
035776  001260                                  SAVR0
036000  000004                          DT7:    4
036002      001     011                         .BYTE   1,11
036004  001300                                  ZERO
036006      001     011                         .BYTE   1,11
036010  001302                                  ONE
036012      003     007                         .BYTE   3,7
036014  001272                                  SAVR5
036016      002     001                         .BYTE   2,1
036020  001266                                  SAVR3
036022  000004                          DT10:   4
036024      001     011                         .BYTE   1,11
036026  001302                                  ONE
036030      001     011                         .BYTE   1,11
036032  001300                                  ZERO
036034      003     007                         .BYTE   3,7
036036  001272                                  SAVR5
036040      002     001                         .BYTE   2,1
036042  001266                                  SAVR3
036044  000002                          DT11:   2
036046      003     007                         .BYTE   3,7
036050  034112                                  FLAG
036052      002     002                         .BYTE   2,2
036054  001266                                  SAVR3
036056  000002                          DT12:   2
036060      006     004                         .BYTE   6,4
036062  033334                                  CALBCC
036064      006     002                         .BYTE   6,2
036066  001252                                  TEMP3

036070                                  .ERRTAB:
036070  000000                                  0
036072  000000                                  0
```

```
036074  000000                          0
036076  034166          EM1
036100  035365          DH2     ;HLT    1
036102  035702          DT2
036104  034224          EM2
036106  035365          DH2     ;HLT    2
036110  035702          DT2
036112  034267          EM3
036114  035365          DH2     ;HLT    3
036116  035702          DT2
036120  034333          EM4
036122  000000          0       ;HLT    4
036124  000000          0
036126  034375          EM5
036130  035365          DH2     ;HLT    5
036132  035702          DT2
036134  034375          EM5
036136  035423          DH3     ;HLT    6
036140  035720          DT3
036142  034425          EM6
036144  035344          DH1     ;HLT    7
036146  035670          DT1
036150  034444          EM7
036152  035344          DH1     ;HLT    10
036154  035670          DT1
036156  034471          EM10
036160  035344          DH1     ;HLT    11
036162  035670          DT1
036164  034710          EM11
036166  035521          DH5     ;HLT    12
036170  035744          DT5
036172  034737          EM12
036174  035521          DH5     ;HLT    13
036176  035744          DT5
036200  034710          EM11
036202  035461          DH4     ;HLT    14
036204  035732          DT4
036206  034763          EM13
036210  000000          0       ;HLT    15
036212  000000          0
036214  034710          EM11
036216  035521          DH5     ;HLT    16
036220  035762          DT6
036222  034737          EM12
036224  035521          DH5     ;HLT    17
036226  035762          DT6
036230  034710          EM11
036232  035553          DH6     ;HLT    20
036234  036000          DT7
036236  034710          EM11
036240  035553          DH6     ;HLT    21
036242  036022          DT10
036244  034737          EM12
036246  035553          DH6     ;HLT    22
036250  036000          DT7
036252  034737          EM12
```

```
036254  035553                          DH6     ;HLT    23
036256  036022                          DT10
036260  035023                          EM14
036262  000000                          0       ;HLT    24
036264  000000                          0
036266  035073                          EM15
036270  035344                          DH1     ;HLT    25
036272  035670                          DT1
036274  035114                          EM16
036276  035423                          DH3     ;HLT    26
036300  036044                          DT11
036302  034737                          EM12
036304  035344                          DH1     ;HLT    27
036306  036056                          DT12
036310  035130                          EM17
036312  000000                          0       ;HLT    30
036314  000000                          0
036316  035174                          EM20
036320  035344                          DH1     ;HLT    31
036322  035670                          DT1
036324  035215                          EM21
036326  035621                          DH7     ;HLT    32
036330  000000                          0
036332  035215                          EM21
036334  035423                          DH3     ;HLT    33
036336  035720                          DT3
036340  035232                          EM22
036342  035644                          DH10    ;HLT    34
036344  000000                          0
036346  035255                          EM23
036350  035365                          DH2     ;HLT    35
036352  035702                          DT2
036354  035277                          EM24
036356  000000                          0       ;HLT    36
036360  000000                          0
036362  035322                          EM25
036364  000000                          0       ;HLT    37
036366  000000                          0
036370  034425                          EM6
036372  035365                          DH2     ;HLT    40
036374  035702                          DT2
036376  034375                          EM5
036400  035521                          DH5     ;HLT    41
036402  035744                          DT5
036404  034763                          EM13
036406  035344                          DH1     ;H T    42
036410  035670                          DT1


036412                                  CORMAX:
        000001                          .END
```

```
ADRCNT= 004373   1482*  1518*  1527#
AUDONE  003024   1172   1211   1216   1262#
AUSTRT  002446   1171#  1266
AUTO.S  010640   1129   1971#
BCCLD   033336   4086   4118   4175   4213   4270   4302   4359   4391   5918#
BINWRD  004714   1568*  1571*  1572   1609#
BITCON  034114   2834*  2909*  2984*  3085*  3091*  3096*  3100   3102*  3135*  3168*  3215*  3252*  3816*
                 3863*  4078*  4167*  4178*  4262*  4351*  4435*  4518*  4606*  4809*  5125*  5850*  6054*
                 6056*  6057   6059*  6077*  6079*  6080   6082*  6107#
BIT0  = 000001    696#  1758   1759
BIT1  = 000002    695#  1134   1752   1758   1759   2052   2160   2173
BIT10 = 002000    686#  2141   2152
BIT11 = 004000    685#  2685   2722   2770   2835   2910   2985   3055   3136   3216   3303   3377   3436
                 3468   3500   3540   3574   3631   3677   3723   3769   3820   3911   4020   4079   4168
                 4263   4352   4436   4519   4610   4742   4813   5129   5456   5524   5627
BIT12 = 010000    684#  2069   2171
BIT13 = 020000    683#  2072   2084   2144   2175   2384   3951   3965   3988   4016   4043
BIT14 = 040000    682#  1384   2083   2108   2175   2186   2386   3953   4018   5518   5621
BIT15 = 100000    681#  1088   1175   1178   1199   1202   2054   2147
BIT2  = 000004    694#  1134   1315   1759   2094   2104   3969   3991   4040
BIT3  = 000010    693#  2177   2184   3990
BIT4  = 000020    692#  1742   1765   1767   2806   3588   3645   3691   3737   3783   5716   5758   5874
BIT5  = 000040    691#  2289   2389   2745   2883   2958   3033   3190   3868   5473
BIT6  = 000100    690#  1747   1748   2179   3477   3517   3549
BIT7  = 000200    689#  1748   1868   2289   2778   3593   3967   3972   3993   4042   4045   6037
BIT8  = 000400    688#  2151   2166   2168   2181   2183   2189   2192   2250
BIT9  = 001000    687#  2149   2151   2163   2189   2192   2248   2250
BM      007055   1790#  2120
BRLVL   012460   2245   2255   2263   2275#
BRW     003730   1321   1407#
BRX     003732   1322   1408#
CALBCC  033334   4107   4139   4202   4234   4291   4323   4380   4412   4485   4571   4638   4663*  4664
                 4846   4871*  4872   4927   4952*  4953   5053   5097   5163   5188*  5189   5262   5287*
                 5288   5388   5432   5536   5539*  5597   5639   5642*  5688   5890*  5891   5893*  5899
                 5900*  5901*  5905   5912#  6125
CHAR    032532   3912   5766#
CHARSD  032644   3580   3637   3683   3729   3775   5793#
CHRCNT  004712   1566*  1569   1573   1589*  1607#  1608
CKSWR   007734   1115   1382   1414   1629   1815#
CKSWR1  010014   1828#  1840
CKSWR2  010026   1831#
CKSWR3  010032   1833#
CKSWR4  010036   1834#  1842   1849
CKSWR5  010142   1816   1823   1858#
CLKX    001242    772#
CLRIO   033676   2684   2721   2769   2833   2908   2983   3054   3134   3214   3302   3376   3435   3467
                 3499   3539   3572   3629   3675   3721   3767   3813   3860   3910   4077   4080   4112
                 4166   4169   4207   4261   4264   4296   4350   4353   4385   4434   4517   4605   4741
                 4808   5124   5455   5523   5626   6033#
CNERR   007300   1229   1790#
CNT.MA  001702    797    965#  1087   1089   1091   1896
CNVRT = 104411    834#  1226   1341   1343   1345   1347   1663   1665   1725   1831
CONERR  007224   1224   1790#
CONN    007115   1790#  2074
CONTAB  002776   1233   1246#
CONVRT= 104410    832#  1146   1232   1679   1994
```

```
CORMAX  036412          6125#
CRAM    006607          1790#   2033
CRC.CC= 102010          4082    4114    4171    4209    4266    4298    4355    4387    4442    4525    4632    4840    4921
                        5157    5256    5526    5629    5915#
CRC16 = 120001          5914#
CREAM   001320           796#   1086*   1892*   1893    1895*   1899
CSR     006511          1790#   1998
CSRMAP  010642          1973#
CTSDLY  034066          6093#
CYCLE   010206          1323    1364    1365    1883#
DATABP  005216          1652*   1655    1677    1680#
DATALL= 104415           842#   2729    2777    2781    2850    2852    2866    2880    2925    2927    2941    2955    3000
                        3002    3016    3030    3068    3070    3088    3103    3152    3154    3169    3187    3236    3238
                        3256    3320    3323    3341    3350    3393    3394    3403    3440    3472    3512    3544    3582
                        3639    3685    3731    3777    3822    3823    3872    3873    3917    4088    4089    4120    4121
                        4177    4180    4215    4216    4272    4273    4304    4305    4361    4362    4393    4394    4456
                        4460    4539    4544    4624    4639    4666    4689    4706    4713    4715    4753    4832    4847
                        4874    4897    4928    4955    4978    4995    5002    5004    5015    5149    5164    5191    5214
                        5232    5263    5290    5313    5330    5337    5339    5350    5465    5470    5476    6060    6083
DATAHD  005204          1651*   1673    1676#
DELAY = 104413           838#
DEVADR  004370          1480*   1515    1525#
DEVTAB  003010          1186    1251#
DH1     035344          6125#
DH10    035644          6125#
DH2     035365          6125#
DH3     035423          6125#
DH4     035461          6125#
DH5     035521          6125#
DH6     035553          6125#
DH7     035621          6125#
DISPLA  001200           743#   1101*   1107*   1338*
DISPRE  000174           729#   1107
DMACTV  001306           790#   1124    1279*   1280    1883    1897    1979*   2205*   2211*   2212*   2216    2241
DMCM    007321          1237    1790#
DMCR00  001500           880#
DMCR01  001510           885#
DMCR02  001520           890#
DMCR03  001530           895#
DMCR04  001540           900#
DMCR05  001550           905#
DMCR06  001560           910#
DMCR07  001570           915#
DMCR10  001600           920#
DMCR11  001610           925#
DMCR12  001620           930#
DMCR13  001630           935#
DMCR14  001640           940#
DMCR15  001650           945#
DMCR16  001660           950#
DMCR17  001670           955#
DMCSR   001404           863#   1171*   1205    1210*   1215*   1250    1368    1405    1697    1720    1766    1901*   1910
                        1959    2306*
DMCSRH  001406           864#   1747*   1748*   1752*   1758*   1759*   1765*   1767*   1910*   1911*   1912
DMCTL   001410           865#   1912*   1913*   1914
DMNUM   001310           791#   1082    1354    1977*   1992*   2196*   2197    2206    2208
```

```
DMPO4   001412          866#   1736*  1742   1779   1784   1914*  1915*  1916   5703   5716   5758   5874   5952*
                       5962*  5963*
DMPO6   001414          867#   1753*  1916*  1917*
DMRLVL  001376          860#   1919*  1920*  1921
DMRVEC  001374          859#   1371   1902*  1903*  1919
DMS100  001502          881#
DMS101  001512          886#
DMS102  001522          891#
DMS103  001532          896#
DMS104  001542          901#
DMS105  001552          906#
DMS106  001562          911#
DMS107  001572          916#
DMS110  001602          921#
DMS111  001612          926#
DMS112  001622          931#
DMS113  001632          936#
DMS114  001642          941#
DMS115  001652          946#
DMS116  001662          951#
DMS117  001672          956#
DMS200  001504          882#
DMS201  001514          887#
DMS202  001524          892#
DMS203  001534          897#
DMS204  001544          902#
DMS205  001554          907#
DMS206  001564          912#
DMS207  001574          917#
DMS210  001604          922#
DMS211  001614          927#
DMS212  001624          932#
DMS213  001634          937#
DMS214  001644          942#
DMS215  001654          947#
DMS216  001664          952#
DMS217  001674          957#
DMS300  001506          883#
DMS301  001516          888#
DMS302  001526          893#
DMS303  001536          898#
DMS304  001546          903#
DMS305  001556          908#
DMS306  001566          913#
DMS307  001576          918#
DMS310  001606          923#
DMS311  001616          928#
DMS312  001626          933#
DMS313  001636          938#
DMS314  001646          943#
DMS315  001656          948#
DMS316  001666          953#
DMS317  001676          958#
DMTLVL  001402          862#   1923*  1924*
DMTVEC  001400          861#   1921*  1922*  1923
DM.END  001700          960#   1975
```

```
DM.MAP  001500            796     879#   1086    1139    1149    1265    1893    1895    1973    1978    2233
DONE    003734           1387    1389*   1409#   1819*
DT1     035670           6125#
DT10    036022           6125#
DT11    036044           6125#
DT12    036056           6125#
DT2     035702           6125#
DT3     035720           6125#
DT4     035732           6125#
DT5     035744           6125#
DT6     035762           6125#
DT7     036000           6125#
EM1     034166           6125#
EM10    034471           6125#
EM11    034710           6125#
EM12    034737           6125#
EM13    034763           6125#
EM14    035023           6125#
EM15    035073           6125#
EM16    035114           6125#
EM17    035130           6125#
EM2     034224           6125#
EM20    035174           6125#
EM21    035215           6125#
EM22    035232           6125#
EM23    035255           6125#
EM24    035277           6125#
EM25    035322           6125#
EM3     034267           6125#
EM4     034333           6125#
EM5     034375           6125#
EM6     034425           6125#
EM7     034444           6125#
EOM     033610           4620    4621    4750    4751    4823    4824    4828    4829    5139    5140    5145    5146    5543
                         5544    5548    5549    5553    5554    5646    5647    6001#
ERCT00  001704            967#
ERCT01  001710            970#
ERCT02  001714            973#
ERCT03  001720            976#
ERCT04  001724            979#
ERCT05  001730            982#
ERCT06  001734            985#
ERCT07  001740            988#
ERCT10  001744            991#
ERCT11  001750            994#
ERCT12  001754            997#
ERCT13  001760           1000#
ERCT14  001764           1003#
ERCT15  001770           1006#
ERCT16  001774           1009#
ERCT17  002000           1012#
ERR     002700           1195    1221#   1225
ERRCNT  001232            764#   1350    1377    1690*   1908*
ERRFLG  001325            803#   1084*   1336*   1398*   1640*   1653    1667*   1726*
ERRMSG  005172           1650*   1668    1671#
ERRPC   002770           1227    1243#
```

```
ERTABO  005322  1665  1700#
EXIT  = 000205   697#
EXITER  005252  1685  1690#
FLAG    034112  6106#  6125
FLCAT   002536  1188#  1194
FLTDAT  034122  5530  5541  5546  5551  5559  5600  6110#
FY      002566  1197#  1208  1212  1218
GETQI   033462  4130  4134  4225  4229  4314  4318  4403  4407  4553  4557  5956#
GETQO   033450  4098  4102  4192  4196  4282  4286  4371  4375  4469  4473  5946#
GETSI   032314  2855  2859  2869  2873  2930  2934  2944  2948  3005  3009  3019  3023  3073
                3077  3092  3097  3104  3157  3161  3172  3176  3241  3245  3259  3263  3326
                3330  3342  3351  3395  3406  3410  4642  4646  4669  4673  4692  4696  4707
                4716  4850  4854  4877  4881  4900  4904  4931  4935  4958  4962  4981  4985
                4996  5005  5167  5171  5194  5198  5217  5221  5235  5239  5266  5270  5293
                5297  5316  5320  5331  5340  5697#  6084
HALTS   005222  1636  1682#
HILIM   004366  1479*  1506  1524#
ICOUNT  001222   760#  1396  1401*
INBUF   007630  1449  1485  1805#
INCHAR  010146  1834  1862#
INIFLG  001324   802#  1110  1130  1137*
INRDY   033154  3824  3874  3918  3926  4754  4768  4773  5018  503:  5038  5062  5077  5082
                5353  5368  5373  5397  5412  5417  5477  5487  5560  5577  5582  5652  5668
                5673  5862#
INSTER= 104404   824#  1500
INSTR = 104403   822#  1932  1984  1997  2006  2110  2119
INSTR2  004166  1456  1468#
INTTY   012474  2017  2034  2044  2059  2075  2090  2283#
KMCM    007331  1240  1790#
LIMITS  004314  1495  1506#
LINE    007017  1790#  2111
LOBITS  004372  1481*  1510  1526#  1527
LOCK    001220   759#  1400*  1417  1419  1659  2407*  2423*  2449*  2465*  2491*  2514*  2549*  2569*
                4070*  4111*  4159*  4206*  4254*  4295*  4343*  4384*
LOKFLG  001326   804#
LOLIM   004364  1478*  1508  1523#
LPCNT   001224   761#  1395*  1396  1399*
LRCB  = 000200  5913#
LSTERR  001234   765#  1093*  1335*  1637  1639*  1727*
LUTYPE= 000000   602  5882
MASKX   001244   773#
MASTER  006143  1661  1790#
MCRLF   005672  1434  1557  1657  1658  1666  1790#  1931  1993
MCSRX   006073  1340  1790#
MDATA   007672  1587  1597  1807#
MEMLIM  001304   789#  1303*
MEPASS  005733  1339  1790#
MERRPC  006220  1664  1790#
MERRX   006120  1346  1790#
MERR2   005761  1790#  2218
MERR3   006006  1276  1790#
MESDAT  034116  4029  4611  4618  4743  4748  4814  4821  4826  4912  5017  5061  5130  5137
                5143  5247  5352  5396  5457  5462  5467  5633  5644  5651  6108#
MESLD   033634  3062  4028  4617  4747  4820  4825  5136  5142  5461  5466  5540  5545  5550
                5643  6014#
MILK    001322   797#  1087*  1348  1891*  1896*  1900
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MLOCK	006044	1317	1790#											
MNEW	006145	1271	1790#											
MODU	006705	1790#	2058											
MPASSX	006107	1344	1790#											
MPFAIL	005675	1724	1790#											
MQM	005666	1464	1790#	1955	2030	2040	2050	2067	2081	2101				
MR	005756	1326	1790#	1949										
MRESET=	004000	697#												
MSTCLR=	104412	836#	1729	2353	2377	2409	2451	2493	2551	2602	2624	2646	2680	2717
		2765	2829	2904	2979	3050	3130	3210	3298	3372	3431	3463	3495	3535
		3568	3625	3671	3717	3763	3809	3856	3906	3950	4015	4072	4161	4256
		4345	4430	4513	4601	4737	4804	5120	5451	5517	5620			
MTITLE	001000	737#	1114											
MTSTN	006131	1662	1790#	1933										
MTSTPC	006032	1790#												
MVECX	006101	1342	1790#											
MV35	007455	1790#	2089											
NEXT	001216	758#	1402	1695	2304*	2328*	2351*	2375*	2406*	2448*	2490*	2548*	2600*	2622*
		2644*	2678*	2715*	2763*	2827*	2902*	2977*	3048*	3128*	3208*	3296*	3370*	3429*
		3461*	3493*	3533*	3566*	3623*	3669*	3715*	3761*	3807*	3854*	3904*	3948*	4013*
		4069*	4158*	4253*	4342*	4428*	4511*	4599*	4735*	4802*	5118*	5449*	5515*	5618*
NITCH	032344	5703*	5704*	5705*	5706*	5708#								
NOACT	007155	1126	1790#	1885										
NODEV	002674	1180	1219#											
NUM	006451	1790#	1985											
OCOR	032346	2728	2776	2847	2922	2997	3149	3235	3318	3391	3511	4455	4538	4622
		4752	4830	5147	5464	5469	5555	5648	5711#	5717	5747	5789	5805	5846
		5942	6028											
OK	002646	1206	1213#	1242										
ONE	001302	788#	6125											
OUTRDY	032500	2836	2843	2911	2918	2986	2993	3056	3137	3145	3220	3226	3231	3275
		3306	3314	3378	3502	3914	4616	4746	4819	5135	5460	5731	5740	5751#
		5776	5785	5798	5802	5822	5831	5929	5938	5975	5991	6005	6022	
PACT00	001702	966#												
PACT01	001706	969#												
PACT02	001712	972#												
PACT03	001716	975#												
PACT04	001722	978#												
PACT05	001726	981#												
PACT06	001732	984#												
PACT07	001736	987#												
PACT10	001742	990#												
PACT11	001746	993#												
PACT12	001752	996#												
PACT13	001756	999#												
PACT14	001762	1002#												
PACT15	001766	1005#												
PACT16	001772	1008#												
PACT17	001776	1011#												
PARAM =	104405	826#	1934	1986	1999	2008	2112	2121						
PARAM1	004234	1494#	1501											
PARBIT=	040000	697#												
PARERR	004310	1487	1489	1491	1500#	1507	1509	1511						
PASCNT	001230	763#	1337*	1338	1349	1374	1907*							
PERFOR=	004537	697#												
PFTAB	005430	1725	1731#											

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POPRO = 012600   673#  1689
POP1SP= 005726   671#
POP2SP= 022626   675#  1404
PRIO    006550  1790#  2016
PS    = 177776   664#  1079*  1314*  2245*  2255*
PUSHRO= 010046   672#  1686
PUSH1S= 005746   670#
PUSH2S= 024646   674#
QV.FLG  001327   805#  1085*  1353*  1393
RESREG  005220  1678   1681#
RESTAR  005350  1717*  1717#
RESTRT  003534  1352   1356   1364#
RESOS = 104407   830#  1681
RETURN  001214   757#  1095*  1323*  1327  1364*  1402*  1406  1695*  1698  1730  1948*  1958*  1960
ROMCLK= 104414   840#  1737   1740   1777  1782   2308   2331  2355   2379  2412  2414   2425   2427
                2454   2456   2467   2469  2499   2501   2520  2522   2556  2558  2574   2576   2603
                2625   2649   2658   2682  2687   2689   2693  2719   2724  2726  2731   2741   2767
                2772   2774   2779   2783  2793   2803   2831  2838   2840  2845  2881   2906   2913
                2915   2920   2956   2981  2988   2990   2995  3031   3052  3058  3060   3132   3139
                3141   3147   3188   3212  3222   3224   3228  3233   3277  3300  3308   3310   3316
                3374   3380   3382   3385  3387   3389   3433  3441   3465  3473  3497   3504   3506
                3509   3513   3537   3545  3570   3576   3578  3584   3594  3596  3627   3633   3635
                3641   3650   3673   3679  3681   3687   3696  3719   3725  3727  3733   3742   3765
                3771   3773   3779   3788  3811   3825   3858  3869   3875  3908  3915   3919   3927
                3957   3960   3980   3983  4022   4026   4034  4074   4163  4258  4347   4432   4445
                4449   4453   4494   4515  4528   4532   4536  4580   4603  4739  4755   4769   4774
                4783   4806   5019   5034  5039   5048   5063  5078   5083  5092  5122   5354   5369
                5374   5383   5398   5413  5418   5427   5453  5471   5478  5488  5521   5561   5578
                5583   5592   5624   5653  5669   5674   5683  5701   5714  5729  5733   5736   5742
                5745   5756   5774   5778  5781   5787   5800  5803   5820  5824  5827   5833   5853
                5855   5872   5927   5931  5934   5940   5950  5960   5973  5977  5980   5993   5996
                6007   6009   6024   6038  6040
RUN     001316   794#  1088*  1889*  1890*  1897
SAVACT  001312   792#  1274   2216*
SAVNUM  001314   793#  1082*  1351*  1354*  2209*
SAVPC   001276   786#  1225*  1245   1532*  1702
SAVR0   001260   779#  1541*  1546   6125
SAVR1   001262   780#  1231*  1540*  1547
SAVR2   001264   781#  1539*  1548   6125
SAVR3   001266   782#  1538*  1549   6125
SAVR4   001270   783#  1537*  1550   6125
SAVR5   001272   784#  1536*  1551   6125
SAVSP   001274   785#
SAVOS = 104406   828#  1641
SCHAR   033150  3814*  3815*  3861*  3862*  5814  5832  5837  5841*  5842  5848*  5858#
SCOPE = 104400   816#  2316   2339   2363  2394   2436  2478  2536   2588  2610  2632   2665   2702
                2750   2811   2886   2961  3036   3113  3193  3282   3357  3417  3449   3481   3521
                3553   3611   3657   3703  3749   3795  3840  3890   3935  4001  4054   4143   4238
                4327   4416   4499   4585  4722   4785  5100  5435   5499  5603  5691
SCOP1 = 104401   818#  2422   2435   2464  2477   2510  2531  2565   2583  4110  4142   4205   4237
                4294   4326   4383   4415
SILOLD  032710  3821   3837   3871   3887  5809#
SIMBCC  033210  4093   4125   4187   4220  4277   4309  4366  4398   4464  4548  4634   4842   4923
                5159   5258   5532   5635  5882#
SKIP    002632  1176   1179   1200   1203  1209#
SOFTSW  010200  1832   1871#
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SOM      033560            5141    5987#
SPACNT=  004713            1567*   1591    1594*   1608#
SPEED    007341            1790#   2043
STACK =  001200             665#   1080    1293    1696    1719
STAT     001240             771#
STAT1    001366             852#   1904*   2384    2386    3951    3953    3965    3988    4016    4018    4043    5518    5621
STAT2    001370             853#   1905*   2606    2628
STAT3    001372             854#   1906*   3969    3991    4040
STFFCK   033776            3180    3267    4181    4461    4545    4650    4677    4858    4885    4939    4966    5175    5202
                           5274    5301    6067#
STFFCL   033716            5838    6045#
STRTSW   001236             770#   1116*   1119*   1120    1122    1132    1134    1269    1315    1324    1926    1950*   1980
                           2229
STUFDT   034142            3063    3065    6116#
STUFLG   033152            3817*   3864*   5835    5849*   5859#
SV05     004402            1536#
SWFLG    010144            1083*   1428    1827*   1854*   1860#
SWMES    007206            1790#   1830
SWMES1   007216            1790#   1833
SWR      001202             744#   1100*   1102    1106*   1116    1274    1279    1384    1391    1415    1430    1630    1635
                           1684    1691    1693    1755    1815    1853*
SWREG    000176             730#   1106    1815    1873
SW00  =  000001             646#   1120    1980    2229
SW01  =  000002             645#   1324    1926    1950
SW02  =  000004             644#
SW03  =  000010             643#    269
SW04  =  000020             642#
SW05  =  000040             641#
SW06  =  000100             640#   1755
SW07  =  000200             639#
SW08  =  000400             638#   1691
SW09  =  001000             637#   1415
SW10  =  002000             636#   1693
SW11  =  004000             635#   1391
SW12  =  010000             634#   1430    1630
SW13  =  020000             633#   1635
SW14  =  040000             632#
SW15  =  100000             631#
SYNC     032364            3438    3470    3542    5721#
SYNLD    033500            4443    4526    4615    4745    4818    5134    5459    5525    5628    5967#
TEMP     001416             872#   1574    1721*   1722*   1763*   1768*   1774*   1786*   2647*   2653*   2656*   2662*
TEMP1    001246             774#   1140*   1792    2241*   2242*   5726*   5738*   5772*   5783*   5818*   5829*   5870*   5876*
                           5888*   5902*   5904*   5907*   5908*   5925*   5936*   5971*   5982*   6021*   6026*
TEMP2    001250             775#   1141*   1794    5050*   5051*   5052    5094*   5095*   5096    5385*   5386*   5387    5429*
                           5430*   5431    5594*   5595*   5596    5685*   5686*   5687    5770*   5786    5796*   5799    5813*
                           5817*   5844*   5851*   5889*   5894*   5923*   5939
TEMP3    001252             776#   1143*   1169*   1221    1230*   1796    1989    1992    2129*   2851*   2853*   2926*   2928*
                           3001*   3003*   3069*   3071*   3153*   3155*   3237*   3239*   3322*   3324*   3402*   3404    4688*
                           4690*   4771*   4772*   4896*   4898*   4977*   4979*   5036*   5037*   5052*   5053    5080*   5081*
                           5096*   5097    5213*   5215*   5231*   5233*   5312*   5314*   5371*   5372*   5387*   5388    5415*
                           5416*   5431*   5432    5580*   5581*   5596*   5597    5671*   5672*   5687*   5688    6051*   6061*
                           6074*   6087*   6125
TEMP4    001254             777#   1144*   1798    2002    2005    2011    2014    2115    2118    2124    2127
TEMP5    001256             778#   1145*   1800    1983*   1996*   2227    5754*   5760*
TIMER =  104416             844#   2691    3583    3640    3686    3732    3778    3959    3982    4024
TKCSR    001204             749#   1451    1817    1862    2283    6099
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TKDBR   001206            750#  1453   1459   1820   1822   1864   2285
TLAST = 031752           1953   5692#
TPCSR   001210            751#  1435   1457   1632   1865   2286
TPDBR   001212            752#  1437*  1459*  1634*  1867*  2288*
TRPOK   004730           1620#
TSTNO   001226            762#  1094*  1705   1733   1937   1944   1946   2303*  2327*  2350*  2374*  2405*  2447*
                         2489*  2547*  2599*  2621*  2643*  2677*  2714*  2762*  2826*  2901*  2976*  3047*  3127*
                         3207*  3295*  3369*  3428*  3460*  3492*  3532*  3565*  3622*  3668*  3714*  3760*  3806*
                         3853*  3903*  3947*  4012*  4068*  4157*  4252*  4341*  4427*  4510*  4598*  4734*  4801*
                         5117*  5448*  5514*  5617*
TST1    012526           1940   1958   2303#
TST10   013534           2490   2547#
TST11   013710           2548   2599#
TST12   013752           2600   2621#
TST13   014014           2622   2643#
TST14   014114           2644   2677#
TST15   014230           2678   2714#
TST16   014402           2715   2762#
TST17   014614           2763   2826#
TST2    012602           2304   2327#
TST20   015076           2827   2901#
TST21   015360           2902   2976#
TST22   015642           2977   3047#
TST23   016152           3048   3127#
TST24   016460           3128   3207#
TST25   017012           3208   3295#
TST26   017300           3296   3369#
TST27   017520           3370   3428#
TST3    012650           2328   2350#
TST30   017622           3429   3460#
TST31   017726           3461   3492#
TST32   020064           3493   3532#
TST33   020170           3533   3565#
TST34   020374           3566   3622#
TST35   020542           3623   3668#
TST36   020712           3669   3714#
TST37   021062           3715   3760#
TST4    012722           2351   2374#
TST40   021232           3761   3806#
TST41   021406           3807   3853#
TST42   021572           3854   3903#
TST43   021734           3904   3947#
TST44   022162           3948   4012#
TST45   022356           4013   4068#
TST46   022722           4069   4157#
TST47   023314           4158   4252#
TST5    013024           2375   2405#
TST50   023660           4253   4341#
TST51   024224           4342   4427#
TST52   024546           4428   4510#
TST53   025104           4511   4598#
TST54   025606           4599   4734#
TST55   026030           4735   4801#
TST56   027430           4802   5117#
TST57   031110           5118   5448#
TST6    013164           2406   2447#
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TST60   031330            5449    5514#
TST61   031752            5515    5617#   5692
TST62 = ****** U          5618
TST7    013324            2448    2489#
TTST    003612            1318*   1319*   1321*   1322*   1385#
TWOSYN= 010000             697#
TYPDAT  005206            1656    1674    1677#
TYPE  = 104402             820#   1114    1126    1138    1223    1228    1236    1239    1271    1276    1317    1326    1339
                          1340    1342    1344    1346    1434    1447    1464    1557    1597    1657    1658    1661    1662
                          1664    1666    1670    1675    1724    1330    1833    1885    1931    1949    1955    1993    2015
                          2029    2032    2039    2042    2049    2057    2066    2073    2080    2088    2100    2218
TYPMSG  005106            1654    1657#
VEC     006527            1790#   2007
VECMAP  012216            2217    2229#
WHICH   012210            1995    2225#
WRDCNT  004710            1565*   1598*   1606#
WRKO.F  005174            1669    1672#
XBX     005000            1631    1633    1635#
XCSR    003546            1341    1366#
XERR    003570            1347    1375#
XHEAD   006225            1138    1790#
XLOC    003022            1196*   1214*   1217    1248    1261#
XPASS   003562            1345    1372#
XPOLY   033332            4082*   4114*   4171*   4209*   4266*   4298*   4355*   4387*   4442*   4525*   4632*   4840*   4921*
                          5157*   5256*   5526*   5629*   5898    5900    5911#
XSTATQ  007602            1147    1790#
XTSTN   005330            1663    1703#
XVEC    003554            1343    1369#
ZERO    001300             787#   6125
$COD  = ****** U           602
$CRAP = 177777               1#   2293#   2296    2299#   2317#   2320    2323#   2340#   2343    2346#   2364#   2367    2370#
                          2395#   2398    2401#   2437#   2440    2443#   2479#   2482    2485#   2537#   2540    2543#   2589#
                          2592    2595#   2611#   2614    2617#   2633#   2636    2639#   2666#   2669    2673#   2703#   2706
                          2710#   2751#   2754    2758#   2813#   2816    2822#   2888#   2891    2897#   2963#   2966    2972#
                          3037#   3040    3043#   3114#   3117    3123#   3194#   3197    3203#   3283#   3286    3291#   3358#
                          3361    3365#   3418#   3421    3424#   3450#   3453    3456#   3482#   3485    3488#   3522#   3525
                          3528#   3554#   3557    3561#   3612#   3615    3618#   3658#   3661    3664#   3704#   3707    3710#
                          3750#   3753    3756#   3796#   3799    3802#   3841#   3844    3849#   3891#   3894    3899#   3936#
                          3939    3943#   4002#   4005    4008#   4055#   4058    4064#   4144#   4147    4153#   4239#   4242
                          4248#   4328#   4331    4337#   4417#   4420    4423#   4500#   4503    4506#   4586#   4589    4594#
                          4723#   4726    4730#   4786#   4789    4797#   5101#   5104    5113#   5436#   5439    5444#   5500#
                          5503    5510#   5604#   5607    5613#
$ENDAD  003522             724    1112    1358#   1682
$N    = 000061               1#   2293    2299    2301    2306#   2317    2323    2325    2330#   2340    2346    2348    2353
                          2354#   2364    2370    2372    2377    2378#   2395    2401    2403    2409    2410#   2437    2443
                          2445    2451    2452#   2479    2485    2487    2493    2494#   2537    2543    2545    2551    2552#
                          2589    2595    2597    2602    2603#   2611    2617    2619    2624    2625#   2633    2639    2641
                          2646    2647#   2666    2673    2675    2680    2681#   2703    2710    2712    2717    2718#   2751
                          2758    2760    2765    2766#   2813    2822    2824    2829    2830#   2888    2897    2899    2904
                          2905#   2963    2972    2974    2979    2980#   3037    3043    3045    3050    3051#   3114    3123
                          3125    3130    3131#   3194    3203    3205    3210    3211#   3283    3291    3293    3298    3299#
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```

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.CUNVR  004466       833    1557#
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.EOP    003364      1334#   5618
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$WINDO   599#   2813    2888    2963    3114
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$ZEROS   602#   3358


. ABS.  036412      000


 ERRORS DETECTED:  0

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 RUN-TIME: 15 22 1 SECONDS
 RUN-TIME RATIO: 48/39=1.2
 CORE USED:  33K  (65 PAGES)
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