DMC-11

MODE LINE UNIT TEST

CZDMEC0

AH-8553C-MC

FICHE 1 OF 1

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MADE IN USA

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IDENTIFICATION

PRODUCT CODE:	AC-8552C-MC
PRODUCT NAME:	CZDMEC0 DDCMP MD LN UNIT TST
DATE:	SEPTEMBER 1978
MAINTAINER:	DIAGNOSTICS

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.

CZDME 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 DDCMP MODE. THE MODEM SIGNALS ARE ALSO CHECKED. CZDME 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. CZDMC [REV] BASIC W/R AND MICRO-PROCESSOR TESTS
2. CZDME [REV] DDCMP MODE 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)

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

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                        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.

                        3.      LOADING PROCEDURE

                        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)
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4. STARTING PROCEDURE

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:

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HOW MANY DMC11'S TO BE TESTED?1

0i
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
SWITCH PAC#1 (DDCMP LINE#)?377
SWITCH PAC#2 (BM873 BOOT ADD)?377
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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 ERROR 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 SW01 IS USED. THE PROGRAM WILL BEGIN AT THE SELECTED TEST 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.

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264                                   4.1.3   DYNAMIC SWITCHES
265
266                                           ERROR SWITCHES
267
268                                           1.      SW 12   DELETE PRINT OUT/BELL ON ERROR.
269                                           2.      SW 13   DELETE ERROR PRINTOUT.
270                                           3.      SW 15   HALT ON THE ERROR.
271                                           4.      SW 08   GOTO BEGINNING OF THE TEST(ON ERROR).
272                                           5.      SW 10   GOTO NEXT TEST(ON ERROR).
273
274                                           SCOPE SWITCHES
275
276                                           1.  SW06    HALT   IN   ROMCLK   ROUTINE   BEFORE   CLOCKING
277                                                       MICRO-PROCESSOR   INSTRUCTION.   THIS  ALLOWS  THE
278                                                       OPERATOR TO SCOPE A MICRO-PROCESSOR INSTRUCTION IN
279                                                       THE  STATIC  STATE  BEFORE  IT  IS  CLOCKED.   HIT
280                                                       CONTINUE TO RESUME RUNNING.
281                                           2.  SW09    (IF ENABLED BY 'SCOP1') ON AN ERROR;  IF AN '*' IS
282                                                       PRINTED  IN FRONT OF THE TEST NO.  (EX.  *TEST NO.
283                                                       10  )  SW09  IS  INCORPORATED  IN  THAT  TEST  AND
284                                                       THEREFORE  SW09 IS USUALLY THE BEST SWITCH FOR THE
285                                                       SCOPE LOOP (SW14=0, SW10=0, SW09=1,  SW08=0).   IF
286                                                       SW09  IS  NOT ENABELED;  AND THERE IS A HARD ERROR
287                                                       (CONSTANT);  SW08  IS  BEST.   (SW14=1,0,  SW10=0,
288                                                       SW09=0, SW08=1).  FOR INTERMITTEMT ERRORS;  SW14=1
289                                                       WILL LOOP ON TEST  REGUARDLESS  OF  ERROR  OR  NOT
290                                                       ERROR.  (SW14=1, SW10=0, SW09=0, SW08=1,0)
291                                           3.  SW11    INHIBIT INTERATIONS.
292                                           4.  SW14    LOOP ON CURRENT TEST.
293
294                                   4.2     STARTING ADDRESS
295
296                                           STARTING ADDRESS IS AT 000200  THERE  ARE  NO  OTHER  STARTING
297                                           ADDRESSES FOR THE DMC11 DIAGNOSTICS.  (SEE SECTION 4.0)
298
299                                           NOTE:   IF ADDRESS 000042 IS NON-ZERO THE PROGRAM  ASSUMES  IT
300                                                   IS   UNDER   ACT11   OR  XXDP  CONTROL  AND  WILL  ACT
301                                                   ACCORDINGLY AFTER ALL AVAILABLE DMC11'S ARE TESTED THE
302                                                   PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.
303
304                                   5.      OPERATING PROCEDURE
305
306                                           WHEN PROGRAM IS INITIALLY STARTED  MESSAGES  AS  DESCRIBED  IN
307                                           SECTION  4.0  WILL  BE PRINTED, AND PROGRAM WILL BEGIN RUNNING
308                                           THE DIAGNOSTIC
309
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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
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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.

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END PASS CZDMC 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 POINTS 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

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470
471
472                     EACH MAP ENTRY CONTAINS  4  WORDS  WHICH  CONTAIN  THE  STATUS
473                     INFORMATION  FOR  1  DMC11.  THE PC SHOWS WHERE IN CORE MEMORY
474                     THE FIRST OF THE 4 WORDS IS.  IN THE EXAMPLE ABOVE  THE  FIRST
475                     DMC'S STATUS IS IN LOCATIONS, 1500, 1502, 1504, AND 1506.  THE
476                     SECOND DMC STATUS IS LOCATED AT 1510, 1512,  1514,  AND  1516.
477                     THE  INFORMATION  CONTAINED IN EACH 4 WORD ENTRY IS DEFINED AS
478                     FOLLOWS:
479
480                     CSR:    CONTAINS DMC11 CSR ADDRESS
481
482                     STAT1:  BITS 00-08 IS DMC11 VECTOR ADDRESS
483                             BIT15=1 MICRO-PROCESSOR HAS CRAM
484                             BIT15=0 MICRO-PROCESSOR HAS CROM
485                             BIT14=1 TURNAROUND CONNECTOR IS ON
486                             BIT14=0 NO TURNAROUND CONNECTOR
487                             BIT13=0 LINE UNIT IS AN M8201
488                             BIT13=1 LINE UNIT IS AN M8202
489                             BIT12=1 NO LINE UNIT
490                             BITS 09-11 IS DMC11 BR PRIORITY LEVEL
491
492                     STAT2:  LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
493                             HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)
494
495                     STAT3:  BIT0=1 RUN FREE RUNNING TESTS ON KMC11
496                             BIT1=0 DMC11-AR (LOW SPEED)
497                             BIT1=1 DMC11-AL (HIGH SPEED)
498
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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 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 A 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:

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SWR=XXXXXX NEW?

WHERE XXXXXX IS THE CURRENT CONTENTS OF THE SOFTWARE SWITCH REGISTER IN OCTAL. THE SOFTWARE CONTROL ROUTINE WILL THEN AWAIT OPERATOR ACTION. AT WHICH TIME THE OPERATOR IS REQUIRED TO TYPE ONE OR MORE OF THE LEGAL CHARACTERS: 1) 0 - 7, 2) LINE FEED(<LF>), 3) CARRIAGE RETURN(<CR>), OR 4) CONTROL-U (CTRL U). NO CHECK IS MADE FOR LEGALITY. IF THE INPUT CHARACTER IS NOT A <LF>, <CR>, OR CTRL U IT IS ASSUMED TO BE AN OCTAL DIGIT.

TO CHANGE THE CONTENTS OF THE SSR THE OPERATOR SIMPLY TYPES THE NEW DESIRED VALUE IN OCTAL - LEADING ZEROS NEED NOT BE TYPED. AND TERMINATES THE INPUT STRING WITH A <CR> OR <LF> DEPENDING ON THE PROGRAM ACTION DESIRED AS DESCRIBED BELOW. THE INPUT VALUE WILL BE TRUNCATED TO THE LAST 6 DIGITS TYPED. AT LEAST ONE DIGIT MUST BE TYPED ON ANY GIVEN INPUT STRING PRIOR TO THE TERMINATOR BEFORE A CHANGE TO THE SSR WILL OCCUR.

WHEN THE INPUT STRING IS TERMINATED WITH A <CR> THE DIAGNOSTIC WILL CONTINUE EXECUTION FROM THE POINT AT WHICH IT WAS INTERRUPTED. IF A <CR> IS THE ONLY THING TYPED THE PROGRAM WILL CONTINUE WITHOUT CHANGING THE SSR. THE <LF> DIFFERS FROM THE <CR> BY RESTARTING THE PROGRAM AS IF IT WERE RESTARTED AT ADDRESS 200.

IF A CTRL U IS TYPED AT ANY POINT IN THE INPUT STRING PRIOR TO THE TERMINATOR THE INPUT VALUE WILL BE DISREGARDED AND THE PROMPT DISPLAYED (SWR = XXXXXX NEW?).

TO SET THE SSR FOR THE STARTING SWITCHES, FIRST LOAD THE DIAGNOSTIC, THEN HIT CTRL G, THEN START THE DIAGNOSTIC.

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                        ;*AC-8552C-MC   DMC11 DDCMP MODE LINE UNIT TESTS
                        ;*COPYRIGHT 1976,1978, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                        ;*-----------------------------------------------------------------

                        ;STARTING PROCEDURE
                        ;LOAD 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 ''AC-8552C-MC   DMC11 DDCMP MODE 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
```

```
                                ;:*****************************************************************************
                                ;-----------------------------------------------------------------------------
                                        ;TRAPCATCHER 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  041501  034055  MTITLE: .ASCII  <377><12>/AC-8552C-MC/<377>
(2)     001016  046504  030503  020061          .ASCIZ  /DMC11 DDCMP MODE 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 CURRENT 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
```

```
                        DMCR05: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 05
                        DMS105: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 05
                        DMS205: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 05
                        DMS305: .BLKW   1               ;3RD STATUS WORD

                        DMCR06: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 06
                        DMS106: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 06
                        DMS206: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 06
                        DMS306: .BLKW   1               ;3RD STATUS WORD

                        DMCR07: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 07
                        DMS107: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 07
                        DMS207: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 07
                        DMS307: .BLKW   1               ;3RD STATUS WORD

                        DMCR10: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 10
                        DMS110: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 10
                        DMS210: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 10
                        DMS310: .BLKW   1               ;3RD STATUS WORD

                        DMCR11: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 11
                        DMS111: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 11
                        DMS211: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 11
                        DMS311: .BLKW   1               ;3RD STATUS WORD

                        DMCR12: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 12
                        DMS112: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 12
                        DMS212: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 12
                        DMS312: .BLKW   1               ;3RD STATUS WORD

                        DMCR13: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 13
                        DMS113: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 13
                        DMS213: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 13
                        DMS313: .BLKW   1               ;3RD STATUS WORD

                        DMCR14: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 14
                        DMS114: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 14
                        DMS214: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 14
                        DMS314: .BLKW   1               ;3RD STATUS WORD

                        DMCR15: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 15
                        DMS115: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 15
                        DMS215: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 15
                        DMS315: .BLKW   1               ;3RD STATUS WORD

                        DMCR16: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 16
                        DMS116: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 16
                        DMS216: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 16
                        DMS316: .BLKW   1               ;3RD STATUS WORD

                        DMCR17: .BLKW   1               ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 17
                        DMS117: .BLKW   1               ;VECTOR FOR DMC11 NUMBER 17
                        DMS217: .BLKW   1               ;DDCMP LINE# FOR DMC11 NUMBER 17
                        DMS317: .BLKW   1               ;3RD STATUS WORD

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                  ERCT01: 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                  ERCT04: 0               ;ERROR COUNT FOR DMC11 NUMBER 04

001726  000000                  PACT05: 0               ;PASS COUNT FOR DMC11 NUMBER 05
001730  000000                  ERCT05: 0               ;ERROR COUNT 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
```

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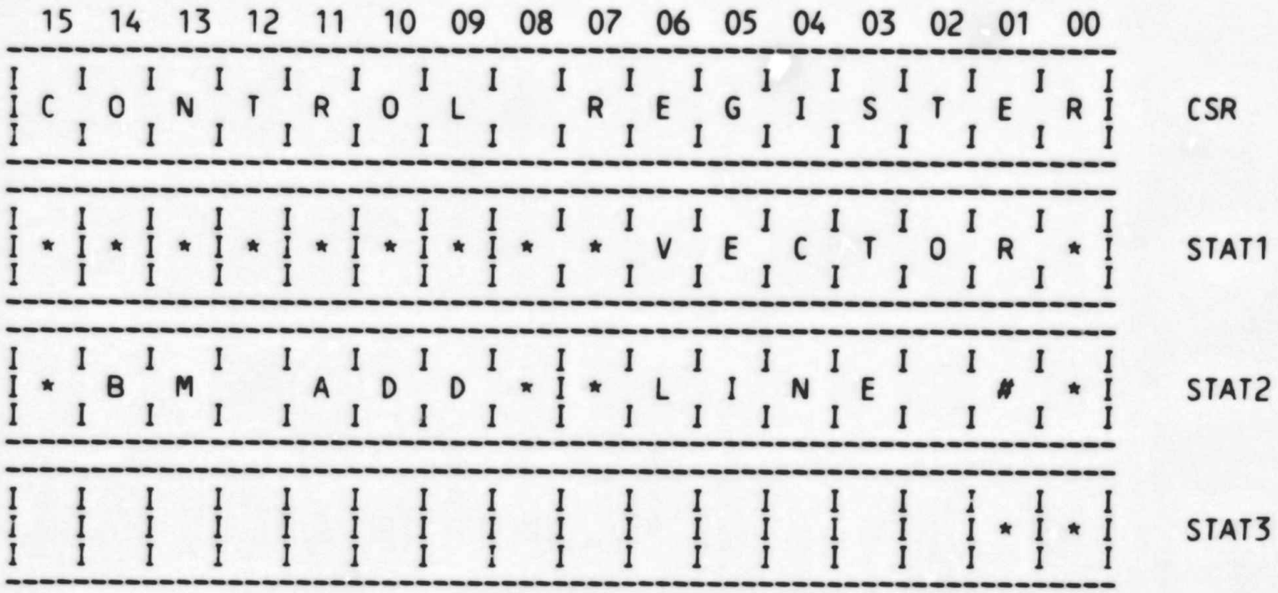
FORMAT OF STATUS TABLE



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

```
1062
1063                                        ;PROGRAM INITIALIZATION
1064                                        ;LOCK OUT INTERRUPTS
1065                                        ;SET UP PROCESSOR STACK
1066                                        ;SET UP POWER FAIL VECTOR
1067                                        ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
1068                                        ;TYPE TITLE MESSAGE
1069
1070  002002  012737  000340  177776  .START: MOV     #340,PS         ;LOCK OUT INTERRUPTS
1071  002010  012706  001200                 MOV     #STACK,SP       ;SET UP STACK
1072  002014  012737  005336  000024         MOV     #.PFAIL,@#24    ;SET UP POWER FAIL VECTOR
1073  002022  013737  001310  001314         MOV     DMNUM,SAVNUM    ;SAVE NUMBER OF DEVICES IN SYSTEM.
1074  002030  005037  010016                 CLR     SWFLG           ;CLEAR SOFT TYPEOUT FLAG
1075  002034  105037  001325                 CLRB    ERRFLG          ;CLEAR ERROR FLAG
1076  002040  105037  001327                 CLRB    QV.FLG          ;ZERO QUICK VERIFY FLAG
1077  002044  012737  001470  001320         MOV     #DM.MAP-10,CREAM;GET MAP POINTER.
1078  002052  012737  001676  001322         MOV     #CNT.MAP-4,MILK ;GET PASS COUNT MAP POINTER
1079  002060  012737  100000  001316         MOV     #BIT15,RUN      ;POINT POINTER TO FIRST DEVICE.
1080  002066  012700  001702                 MOV     #CNT.MAP,R0     ;PASS COUNT POINTER TO R0
1081  002072  005020                 23$:    CLR     (R0)+           ;CLEAR TABLE
1082  002074  022700  002002                 CMP     #CNT.MAP+100,R0 ;DONE YET?
1083  002100  001374                 BNE     23$             ;KEEP GOING
1084  002102  005037  001234                 CLR     LSTERR          ;CLEAR LAST ERROR POINTER
1085  002106  012737  000001  001226         MOV     #1,TSTNO        ;SET UP FOR TEST 1
1086  002114  012737  002002  001214         MOV     #.START,RETURN  ;SET UP FOR POWER FAIL BEFORE
1087                                        ;TESTING STARTS
1088  002122  013746  000006                 MOV     @#6,-(SP)       ;SAVE CURRENT VECTORS
1089  002126  013746  000004                 MOV     @#4,-(SP)       ;
1090  002132  012737  002166  000004         MOV     #6$,@#4         ;SET UP FOR TIMEOUT
1091  002140  012737  177570  001202         MOV     #177570,SWR     ;SET SWR TO HARD SWR ADDRESS
1092  002146  012737  177570  001200         MOV     #177570,DISPLAY ;SET DISPLAY TO HARD SWR ADDRESS
1093  002154  022777  177777  177020         CMP     #-1,@SWR        ;REFERENCE HARDWARE SWITCH REGISTER
1094  002162  001402                 BEQ     6$+2            ;IF = -1 USE SOFT SWR ANYWAY
1095  002164  000407                 BR      7$              ;IF IT EXISTS AND NOT = -1 USE HARD SWR
1096  002166  022625                 6$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1097  002170  012737  000176  001202         MOV     #SWREG,SWR      ;POINTER TO SOFT SWR
1098  002176  012737  000174  001200         MOV     #DISPREG,DISPLAY;POINTER TO SOFT DISPLAY REG
1099  002204  012637  000004                 7$:     MOV     (SP)+,@#4       ;RESTORE VECTORS
1100  002210  012637  000006                 MOV     (SP)+,@#6       ;
1101  002214  105737  001324                 TSTB    INIFLG          ;HAS INITIALIZATION BEEN PERFORMED
1102  002220  001006                 BNE     20$             ;BR IF YES
1103  002222  022737  003522  000042         CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, DON'T TYPE ID
1104  002230  001402                 BEQ     20$
1105  002232  104402  001000                 TYPE    ,MTITLE         ;TYPE TITLE MESSAGE
1106  002236  004737  007606                 20$:    JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
1107  002242  017737  176734  001236         MOV     @SWR,STRTSW     ;STORE STARTING SWITCHES
1108  002250  005737  000042                 TST     @#42            ;IS IT RUNNING IN AUTO MODE?
1109  002254  001402                 BEQ     .+6             ;BR IF NO
1110  002256  005037  001236                 CLR     STRTSW          ;IF YES, CLEAR SWITCHES
1111  002262  032737  000001  001236         BIT     #SW00,STRTSW    ;IF SW00=1, QUESTIONS ARE ASKED.
1112  002270  001012                 BNE     17$             ;BR IF SW00=1
1113  002272  105737  001236                 TSTB    STRTSW          ;BIT7=1??
1114  002276  100007                 BPL     17$             ;BR IF SW07=0
1115  002300  005737  001306                 TST     DMACTV          ;ARE ANY DEVICES SELECTED?
1116  002304  001006                 BNE     16$             ;BR IF YES
1117  002306  104402  007154                 TYPE,   NOACT           ;NO DEVICES SELECTED.
```

```
1118  002312  000000                          HALT                    ;STOP THE SHOW
1119  002314  000776                          BR      .-2             ;DISQUALIFY CONTINUE SWITCH
1120  002316  004737  010512          17$:    JSR     PC,AUTO.SIZE    ;GO DO THE AUTO SIZE
1121  002322  105737  001324          16$:    TSTB    INIFLG          ;FIRST TIME?
1122  002326  001410                          BEQ     21$             ;BR IF YES
1123  002330  105737  001236                  TSTB    STRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
1124  002334  100431                          BMI     1$
1125  002336  032737  000006  001236          BIT     #BIT1!BIT2,STRTSW;IS TEST NO. OR LOCK SELECTED
1126  002344  001403                          BEQ     24$             ;IF NO THEN TYPE STATUS
1127  002346  000424                          BR      1$              ;IF YES DO NOT TYPE STATUS
1128  002350  005137  001324          21$:    COM     INIFLG          ;SET FLAG
1129  002354  104402  006224          24$:    TYPE    ,XHEAD          ;TYPE HEADER
1130  002360  012704  001500                  MOV     #DM.MAP,R4      ;SET POINTER
1131  002364  010437  001246          5$:     MOV     R4,TEMP1        ;SET ADDRESS
1132  002370  012437  001250                  MOV     (R4)+,TEMP2     ;SET CSR
1133  002374  001411                          BEQ     1$              ;ALL DONE IF ZERO
1134  002376  012437  001252                  MOV     (R4)+,TEMP3     ;SET STAT1
1135  002402  012437  001254                  MOV     (R4)+,TEMP4     ;SET STAT2
1136  002406  012437  001256                  MOV     (R4)+,TEMP5     ;SET STAT3
1137  002412  104410                          CONVRT                  ;TYPE OUT STATUS MAP
1138  002414  007454                          XSTATQ                  ;
1139  002416  000762                          BR      5$
1140  002420  012700  001500          1$:     MOV     #DM.MAP,R0      ;R0 POINTS TO STATUS TABLE
1141
1142                                  ;;**************************************************************************
1143                                  ;;*AUTO SIZE TEST
1144                                  ;;*THIS TEST VERIFYS THAT THE DMC11S AND/OR KMC11S ARE AT THE CORRECT FLOATING
1145                                  ;;*ADDRESSES FOR YOUR SYSTEM. IF THIS TEST FAILS, IT IS NOT A HARDWARE ERROR.
1146                                  ;;*CHECK THE ADDRESSES OF ALL FLOATING DEVICES (DJ,DH,DQ,DU,DUP,LK,DMC,DZ,KMC).
1147                                  ;;*IF THERE ARE NO OTHER FLOATING DEVICES BEFORE THE DMC11, THE FIRST
1148                                  ;;*DMC11 ADDRESS IS 760070, KMC11 IS 760110. NO DEVICE SHOULD EVER BE AT
1149                                  ;;*ADDRESS 760000. THIS TEST MAY REQUIRE 2 OR MORE ATTEMPTS TO GET THE
1150                                  ;;*RIGHT ADDRESSES. AFTER YOU HAVE CHANGED THE ADDRESS TO WHAT IT TOLD
1151                                  ;;*YOU THE FIRST TIME, IT MAY COME BACK AND TELL YOU A DIFFERENT ADDRESS
1152                                  ;;*THE NEXT TIME YOU RUN IT. PLEASE HAVE PATIENCE, THE FINAL ADDRESS
1153                                  ;;*WILL BE CORRECT (AS LONG AS ALL DEVICES IN FRONT OF THE DMC'S ARE
1154                                  ;;*CORRECT).
1155                                  ;;**************************************************************************
1156
1157  002424  013746  000004                  MOV     @#4,-(SP)       ;SAVE LOC 4
1158  002430  013746  000006                  MOV     @#6,-(SP)       ;SAVE LOC 6
1159  002434  005037  000006                  CLR     @#6             ;CLEAR VEC+2
1160  002440  005037  001252                  CLR     TEMP3           ;CLEAR FLAG
1161  002444  005005                          CLR     R5              ;R5=0=DMC, R5=-1=KMC
1162  002446  011037  001404          AUSTRT: MOV     (R0),DMCSR      ;GET NEXT DMC CSR
1163  002452  001564                          BEQ     AUDONE          ;BR IF DONE
1164  002454  005705                          TST     R5              ;DMC OR KMC?
1165  002456  001005                          BNE     1$              ;BR IF KMC
1166  002460  032760  100000  000002          BIT     #BIT15,2(R0)    ;CHECK FOR DMC CSR
1167  002466  001061                          BNE     SKIP            ;SKIP IF NOT DMC
1168  002470  000404                          BR      2$              ;ITS A DMC SO CONTINUE
1169  002472  032760  100000  000002  1$:     BIT     #BIT15,2(R0)    ;CHECK FOR KMC CSR
1170  002500  001454                          BEQ     SKIP            ;SKIP IF NOT KMC
1171  002502  012737  002674  000004  2$:     MOV     #NODEV,@#4      ;SET UP FOR TIMEOUT
1172  002510  005705                          TST     R5              ;DMC OR KMC?
1173  002512  001003                          BNE     3$              ;BR IF KMC
```

```
1174  002514  012703  000006            MOV     #6,R3           ;R3 IS COUNT OF DEVICES BEFORE DMC
1175  002520  000402                    BR      4$              ;GO ON
1176  002522  012703  000010      3$:   MOV     #10,R3          ;R3 IS COUNT OF DEVICES BEFORE KMC
1177  002526  012702  003010      4$:   MOV     #DEVTAB,R2      ;R2 IS DEVICE TABLE PONTER
1178  002532  012701  160010            MOV     #160010,R1      ;START WITH ADDRESS 160010
1179  002536  005711              FLOAT: TST     (R1)            ;CHECK ADDRESS IN R1
1180  002540  111204                    MOVB    (R2),R4         ;IF NO TIMEOUT, GET NEXT ADDRESS
1181  002542  060401                    ADD     R4,R1           ;IN R1
1182  002544  005201                    INC     R1              ;
1183  002546  040401                    BIC     R4,R1           ;
1184  002550  005703                    TST     R3              ;ANY MORE DEVICES TO CHECK FOR?
1185  002552  001371                    BNE     FLOAT           ;BR IF YES
1186  002554  012737  002700  000004    MOV     #ERR,@#4        ;OK ONLY DMC'S ARE LEFT, SET UP FOR TIMEOUT
1187  002562  010137  003022            MOV     R1,XLOC         ;SAVE FIRST DMC/KMC ADDRESS
1188  002566  005705              FY:   TST     R5              ;DMC OR KMC?
1189  002570  001005                    BNE     1$              ;BR IF KMC
1190  002572  032760  100000  000002    BIT     #BIT15,2(R0)    ;CHECK FOR DMC CSR
1191  002600  001014                    BNE     SKIP            ;SKIP IF NOT DMC
1192  002602  000404                    BR      2$              ;ITS A DMC SO CONTINUE
1193  002604  032760  100000  000002  1$:   BIT     #BIT15,2(R0)    ;CHECK FOR KMC CSR
1194  002612  001407                    BEQ     SKIP            ;SKIP IF NOT KMC
1195  002614  005711              2$:   TST     (R1)            ;CHECK DMC ADDRESS
1196  002616  020137  001404            CMP     R1,DMCSR        ;DOES IT MATCH
1197  002622  001411                    BEQ     OK              ;BR IF YES
1198  002624  062701  000010            ADD     #10,R1          ;GET NEXT DMC ADDRESS
1199  002630  000756                    BR      FY              ;DO IT AGAIN
1200  002632  062700  000010      SKIP: ADD     #10,R0          ;SKIP TO NEXT CSR IN TABLE
1201  002636  011037  001404            MOV     (R0),DMCSR      ;GET NEXT CSR
1202  002642  001470                    BEQ     AUDONE          ;BR IF DONE
1203  002644  000750                    BR      FY              ;ELSE CONTINUE
1204  002646  062700  000010      OK:   ADD     #10,R0          ;SKIP TO NEXT DMC CSR
1205  002652  062737  000010  003022    ADD     #10,XLOC        ;UPDATE EXPECTED DMC/KMC ADDRESS
1206  002660  011037  001404            MOV     (R0),DMCSR      ;GET NEXT DMC/KMC CSR
1207  002664  001457                    BEQ     AUDONE          ;BR IF DONE
1208  002666  013701  003022            MOV     XLOC,R1         ;GET EXPECTED DMC/KMC ADDRESS
1209  002672  000735                    BR      FY              ;CONTINUE
1210  002674  122243              NODEV: CMPB    (R2)+,-(R3)     ;ON TIMEOUT, INC R2, DEC R3
1211  002676  000002                    RTI                     ;RETURN
1212  002700  005737  001252      ERR:  TST     TEMP3           ;CHECK FLAG IF = 0 TYPE HEADER
1213  002704  001014                    BNE     1$              ;SKIP HEADER
1214  002706  104402                    TYPE                    ;TYPEOUT HEADER MESSAGE
1215  002710  007223                    CONERR                  ;CONFIGURATION ERROR!!!!
1216  002712  012737  002700  001276    MOV     #ERR,SAVPC      ;SAVE PC FOR TYPEOUT
1217  002720  104411                    CNVRT                   ;TYPE OUT ERROR PC
1218  002722  002770                    ERRPC                   ;
1219  002724  104402                    TYPE                    ;TYPE REST OF HEADER
1220  002726  007277                    CNERR                   ;
1221  002730  012737  177777  001252    MOV     #-1,TEMP3       ;SET FLAG SO IT ONLY GETS TYPED ONCE
1222  002736  010137  001262      1$:   MOV     R1,SAVR1        ;SAVE R1 FOR TYPEOUT
1223  002742  104410                    CONVRT
1224  002744  002776                    CONTAB                  ;TYPE CSR VALUES
1225  002746  005705                    TST     R5              ;DMC OR KMC ?
1226  002750  001003                    BNE     3$              ;BR IF KMC
1227  002752  104402                    TYPE
1228  002754  007320                    DMCM
1229  002756  000402                    BR      4$              ;CONTINUE
```

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1230  002760  104402                3$:     TYPE
1231  002762  007330                        KMCM
1232  002764  022626                4$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1233  002766  000727                        BR      OK              ;BR TO GET OUT
1234  002770  000001                ERRPC:  1
1235  002772     006      002              .BYTE   6,2
1236  002774  001276                        SAVPC
1237  002776  000002                CONTAB: 2
1238  003000     006      004              .BYTE   6,4
1239  003002  003022                        XLOC
1240  003004     006      002              .BYTE   6,2
1241  003006  001404                        DMCSR
1242  003010     007                DEVTAB: .BYTE   7               ;DJ
1243  003011     017                        .BYTE   17              ;DH
1244  003012     007                        .BYTE   7               ;DQ
1245  003013     007                        .BYTE   7               ;DU
1246  003014     007                        .BYTE   7               ;DUP
1247  003015     007                        .BYTE   7               ;LK
1248  003016     007                        .BYTE   7               ;DMC
1249  003017     007                        .BYTE   7               ;DZ
1250  003020     007                        .BYTE   7               ;KMC
1251        003022                  .EVEN
1252  003022  000000                XLOC:   0
1253  003024  005705                AUDONE: TST     R5              ;DMC?
1254  003026  001005                        BNE     1$              ;BR IF KMC AND ALL DONE
1255  003030  012705  177777              MOV     #-1,R5          ;SET R5 TO -1 (KMC)
1256  003034  012700  001500              MOV     #DM.MAP,R0      ;RESET R0 TO START OF TABLE
1257  003040  000602                      BR      AUSTRT          ;GO DO KMC'S
1258  003042  012637  000006        1$:     MOV     (SP)+,@#6       ;RESTORE LOC 6
1259  003046  012637  000004              MOV     (SP)+,@#4       ;RESTORE LOC 4
1260  003052  032737  000010  001236        BIT     #SW03,STRTSW    ;SELECT SPECIFIC DEVICES??
1261  003060  001422                      BEQ     3$              ;BR IF NO.
1262  003062  104402  006144              TYPE    ,MNEW           ;TYPE THE MESSAGE.
1263  003066  005000                      CLR     R0              ;ZERO DATA LIGHTS
1264  003070  000000                      HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
1265  003072  027737  176104  001312      CMP     @SWR,SAVACT     ;IS THE NUMBER VALID?
1266  003100  101404                      BLOS    2$              ;BR IF NUMBER IS OK.
1267  003102  104402  006005              TYPE    ,MERR3          ;TELL USER OF INVALID NUMBER.
1268  003106  000000                      HALT                    ;STOP EVERY THING.
1269  003110  000776                      BR      .-2             ;RESTART THE PROGRAM AGAIN.
1270  003112  017737  176064  001306  2$:     MOV     @SWR,DMACTV     ;GET NEW DEVICE PATTERN
1271  003120  013700  001306              MOV     DMACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
1272  003124  000000                      HALT                    ;CONTINUE DYNAMIC SWITCHES.
1273  003126  012700  000300        3$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
1274  003132  012701  000302              MOV     #302,R1         ;VECTOR AREA. 300-776
1275  003136  010120                4$:     MOV     R1,(R0)+        ;START PUTTING 'PC+2 - HALT''
1276  003140  005021                      CLR     (R1)+           ;IN VECTOR AREA.
1277  003142  022021                      CMP     (R0)+,(R1)+     ;POP POINTERS
1278  003144  022700  001000              CMP     #1000,R0        ;ALL DONE??
1279  003150  001372                      BNE     4$              ;BR IF NO.
1280
1281                                  ;TEST START AND RESTART
1282                                  ;----------------------
1283
1284  003152  012706  001200        .BEGIN: MOV     #STACK,SP       ;SET UP STACK
1285  003156  013746  000006              MOV     @#6,-(SP)       ;SAVE LOC 6
```

```
1286  003162  013746  000004                    MOV     @#4,-(SP)       ;SAVE LOC 4
1287  003166  005000                            CLR     R0              ;START AT 0
1288  003170  012737  003234  000004            MOV     #2$,@#4         ;SET UP FOR TIME OUT
1289  003176  005037  000006                    CLR     @#6             ;TO AUTOSIZE MEMORY
1290  003202  005720                    6$:     TST     (R0)+           ;CHECK ADDRESS IN R0
1291  003204  022700  157776                    CMP     #157776,R0      ;IS IT AT LEAST 28K
1292  003210  001374                            BNE     6$              ;BR IF NO
1293  003212  162700  007776                    SUB     #7776,R0        ;SAVE 2K FOR MONITORS
1294  003216  010037  001304            7$:     MOV     R0,MEMLIM       ;STORE MEMORY LIMIT
1295  003222  012637  000004                    MOV     (SP)+,@#4       ;RESTORE LOC 4
1296  003226  012637  000006                    MOV     (SP)+,@#6       ;RESTORE LOC 6
1297  003232  000413                            BR      10$             ;CONTINUE
1298  003234  022626                    2$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1299  003236  162700  000004                    SUB     #4,R0           ;GET LAST GOOD ADDRESS
1300  003242  162700  007776                    SUB     #7776,R0        ;SAVE 2K FOR MONITORS
1301  003246  022700  030000                    CMP     #30000,R0       ;IS IT 8K?
1302  003252  001361                            BNE     7$              ;BR IF NO
1303  003254  012700  037400                    MOV     #37400,R0       ;IF 8K DON'T SAVE 2K
1304  003260  000756                            BR      7$              ;
1305  003262  012737  000340  177776    10$:    MOV     #340,PS         ;LOCK OUT INTERRUPTS
1306  003270  032737  000004  001236            BIT     #BIT2,STRTSW    ;CHECK FOR LOCK ON TEST
1307  003276  001411                            BEQ     1$              ;BR IF NO LOCK DESIRED.
1308  003300  104402  006043                    TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
1309  003304  012737  000240  003612            MOV     #NOP,TTST       ;ADJUST SCOPE ROUTINE.
1310  003312  012737  000240  003614            MOV     #NOP,TTST+2     ;SET UP TO LOCK
1311  003320  000406                            BR      3$              ;CONTINUE ALONG.
1312  003322  013737  003730  003612    1$:     MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
1313  003330  013737  003732  003614            MOV     BRX,TTST+2      ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
1314  003336  012737  010060  001214    3$:     MOV     #CYCLE,RETURN   ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
1315  003344  032737  000002  001236    4$:     BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED?
1316  003352  001002                            BNE     5$              ;BR IF YES
1317  003354  104402  005755                    TYPE    ,MR             ;TYPE R
1318  003360  000177  175630            5$:     JMP     @RETURN         ;START TESTING
```

```
1319                                                    ;END OF PASS
1320                                                    ;TYPE NAME OF TEST
1321                                                    ;UPDATE PASS COUNT
1322                                                    ;CHECK FOR EXIT TO ACT-11
1323                                                    ;RESTART TEST
1324
1325  003364  000005                          .EOP:     RESET                   ;MAKE THE  WORLD CLEAN AGAIN.
1326  003366  005037  001234                            CLR       LSTERR        ;CLEAR LAST ERROR PC
1327  003372  105037  001325                            CLRB      ERRFLG        ;CLEAR ERROR FLAG
1328  003376  005237  001230                            INC       PASCNT        ;UPDATE PASS COUNT
1329  003402  013777  001230  175570                    MOV       PASCNT,@DISPLAY ;DISPLAY PASS COUNT
1330  003410  104402  005733                            TYPE      ,MEPASS       ;TYPE END PASS
1331  003414  104402  006072                            TYPE      ,MCSRX        ;TYPE CSR
1332  003420  104411  003546                            CNVRT     ,XCSR         ;SHOW IT
1333  003424  104402  006100                            TYPE      ,MVECX        ;TYPE VECTOR
1334  003430  104411  003554                            CNVRT     ,XVEC         ;SHOW IT
1335  003434  104402  006106                            TYPE      ,MPASSX       ;TYPE PASSES
1336  003440  104411  003562                            CNVRT     ,XPASS        ;SHOW IT
1337  003444  104402  006117                            TYPE      ,MERRX        ;TYPE ERRORS
1338  003450  104411  003570                            CNVRT     ,XERR         ;SHOW IT
1339  003454  013700  001322                            MOV       MILK,R0       ;GET POINTER TO PASS COUNT
1340  003460  013720  001230                            MOV       PASCNT,(R0)+  ;STORE PASS COUNT FOR THIS DMC11
1341  003464  013720  001232                            MOV       ERRCNT,(R0)+  ;STORE ERROR COUNT FOR THIS DMC11
1342  003470  005337  001314                            DEC       SAVNUM        ;ARE ALL DEVICES TESTED?
1343  003474  001017                                    BNE       RESTRT        ;BR IF NO.
1344  003476  112737  000377  001327                    MOVB      #377,QV.FLG   ;SET THE QUICK VERIFY FLAG.
1345  003504  013737  001310  001314                    MOV       DMNUM,SAVNUM  ;RESTORE THE COUNT
1346  003512  013701  000042                            MOV       @#42,R1       ;CHECK FOR ACT-11 OR DDP
1347  003516  001406                                    BEQ       RESTRT        ;IF NOT, CONTINUE TESTING
1348  003520  000005                                    RESET                   ;STOP THE SHOW--CLEAR THE WORLD
1349  003522                                  $ENDAD:
1350  003522  004711                                    JSR       PC,(R1)
1351  003524  000240                                    NOP
1352  003526  000240                                    NOP
1353  003530  000240                                    NOP
1354  003532  000240                                    NOP
1355  003534  012737  010060  001214          RESTRT:   MOV       #CYCLE,RETURN
1356  003542  000137  010060                            JMP       CYCLE
1357  003546  000001                          XCSR:     1
1358  003550     006     002                            .BYTE     6,2
1359  003552  001404                                    DMCSR
1360  003554  000001                          XVEC:     1
1361  003556     004     002                            .BYTE     4,2
1362  003560  001374                                    DMRVEC
1363  003562  000001                          XPASS:    1
1364  003564     006     002                            .BYTE     6,2
1365  003566  001230                                    PASCNT
1366  003570  000001                          XERR:     1
1367  003572     006     002                            .BYTE     6,2
1368  003574  001232                                    ERRCNT
1369
1370                                                    ;SCOPE LOOP AND INTERATION HANDLER
1371                                                    ;-------------------------------
1372
1373  003576  004737  007606                .SCOPE:   JSR       PC,CKSWR        ;CKECK FOR SOFT SWR
1374  003602  010016                                    MOV       R0,(SP)         ;SAVE R0 ON THE STACK
```

```
1375  003604  032777  040000  175370          BIT     #BIT14,@SWR     ;'LOOP ON THIS TEST'?
1376  003612  001407                  TTST:   BEQ     1$              ;BR IF NO.  (IF LOCK SW01=1; THIS LOC =240)
1377  003614  000437                          BR      3$              ;GOTO 3$    (IF LOCK SW01=1; THIS LOC =240)
1378  003616  005737  003734                  TST     DONE            ;WAS TKCSR DONE SET?
1379  003622  001434                          BEQ     3$              ;BR IF NO (LOCKED ON TEST)
1380  003624  005037  003734                  CLR     DONE            ;YES, CLEAR FLAG
1381  003630  000415                          BR      2$              ;GO TO NEXT TEST
1382  003632  032777  004000  175342  1$:     BIT     #SW11,@SWR      ;DELETE ITERATION?  (QUICK PASS)
1383  003640  001011                          BNE     2$              ;BR IF YES
1384  003642  105737  001327                  TSTB    QV.FLG          ;HAVE PASSES BEECOMPLETED?
1385  003646  001406                          BEQ     2$              ;BR IF QUICK PASS.
1386  003650  005237  001224                  INC     LPCNT           ;UPDATE ITERATION COUNTER
1387  003654  023737  001224  001222          CMP     LPCNT,ICOUNT    ;ARE ALL ITERATIONS DONE??
1388  003662  101414                          BLOS    3$              ;BR IF NOT YET
1389  003664  105037  001325          2$:     CLRB    ERRFLG          ;PREPARE FOR NEW TEST
1390  003670  005037  001224                  CLR     LPCNT           ;START ICOUNTER AT 0
1391  003674  005037  001220                  CLR     LOCK
1392  003700  012737  000020  001222          MOV     #20,ICOUNT      ;RESET ITERATIONS
1393  003706  013737  001216  001214          MOV     NEXT,RETURN     ;GET NEXT TEST
1394  003714  011600                  3$:     MOV     (SP),R0         ;POP R0 OFF OF THE STACK
1395  003716  022626                          POP2SP                  ;FAKE AN 'RTI'
1396  003720  013701  001404                  MOV     DMCSR,R1        ;R1 CONTAINS BASE DMC ADDRESS
1397  003724  000177  175264                  JMP     @RETURN         ;GO DO THE TEST
1398  003730  001407                  BRW:    1407
1399  003732  000437                  BRX:    437
1400  003734  000000                  DONE:   0
1401
1402                                          ;CHECK FOR FREEZE ON CURRENT DATA
1403                                          ;-------------------------------
1404
1405  003736  004737  007606          .SCOP1: JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
1406  003742  032777  001000  175232          BIT     #SW09,@SWR      ;IS SW09=1(SET)?
1407  003750  001405                          BEQ     1$              ;BR IF NOT SET.
1408  003752  005737  001220                  TST     LOCK
1409  003756  001402                          BEQ     1$
1410  003760  013716  001220                  MOV     LOCK,(SP)       ;GOTO THE ADDRESS IN LOCK.
1411  003764  000002                  1$:     RTI                     ;GO BACK.
1412
1413                                          ;TELETYPE OUTPUT ROUTINE
1414                                          ;----------------------
1415
1416  003766  010546                  .TYPE:  MOV     R5,-(SP)        ;SAVE R5 ON THE STACK.
1417  003770  017605  000002                  MOV     @2(SP),R5       ;GET ADDRESS OF MESSAGE.
1418  003774  062766  000002  000002          ADD     #2,2(SP)        ;POP OVER ADDRESS.
1419  004002  005737  010016          4$:     TST     SWFLG           ;SOFT SWR MESSAGE?
1420  004006  001004                          BNE     1$              ;IF YES TYPE IT OUT REGARDLESS OF SW12
1421  004010  032777  010000  175164          BIT     #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
1422  004016  001012                          BNE     3$              ;BR IF NO PRINT OUT WANTED (SW12=1)
1423  004020  105715                  1$:     TSTB    (R5)            ;IS NUMBER MINUS? (MSB=1(BIT7))
1424  004022  100002                          BPL     2$              ;BR IF NUMBER IS PLUS
1425  004024  104402  005672                  TYPE    ,MCRLF          ;TYPE A CR/LF!
1426  004030  105777  175154          2$:     TSTB    @TPCSR          ;TTY READY?
1427  004034  100375                          BPL     2$              ;BR IF NO.
1428  004036  112577  175150                  MOVB    (R5)+,@TPDBR    ;PRINT CURRENT CHAR.
1429  004042  001357                          BNE     4$              ;IF NOT ZERO KEEP PRINTING!
1430  004044  012605                  3$:     MOV     (SP)+,R5        ;END OF OUTPUT. RESTORE R5
```

```
1431  004046  000002                          RTI                         ;GO HOME
1432                                          ;-------------------------
1433
1434  004050  010346                  .INSTR: MOV     R3,-(SP)            ;SAVE R3 ON STACK
1435  004052  010446                          MOV     R4,-(SP)            ;SAVE R4 ON STACK
1436  004054  017637  000004  004072          MOV     @4(SP),.MSG
1437  004062  062766  000002  000004          ADD     #2,4(SP)
1438  004070  104402                  .INST1: TYPE
1439  004072  000000                  .MSG:   0
1440  004074  012704  007502                  MOV     #INBUF,R4
1441  004100  012703  000007                  MOV     #7,R3
1442  004104  105777  175074          1$:     TSTB    @TKCSR
1443  004110  100375                          BPL     1$
1444  004112  117714  175070                  MOVB    @TKDBR,(R4)
1445  004116  142714  000200                  BICB    #200,(R4)
1446  004122  122427  000015                  CMPB    (R4)+,#15
1447  004126  001417                          BEQ     INSTR2
1448  004130  105777  175054          2$:     TSTB    @TPCSR
1449  004134  100375                          BPL     2$
1450  004136  017777  175044  175046          MOV     @TKDBR,@TPDBR
1451  004144  005303                          DEC     R3
1452  004146  001356                          BNE     1$
1453  004150  012604                          MOV     (SP)+,R4
1454  004152  012603                          MOV     (SP)+,R3
1455  004154  104402  005666          .INSTE: TYPE    ,MQM
1456  004160  010346                          MOV     R3,-(SP)
1457  004162  010446                          MOV     R4,-(SP)
1458  004164  000741                          BR      .INST1
1459  004166  012604                  INSTR2: MOV     (SP)+,R4            ;RESTORE R4
1460  004170  012603                          MOV     (SP)+,R3            ;RESTORE R3
1461  004172  000002                          RTI
1462
1463                                          ;CONVERT ASCII STRING TO OCTAL
1464                                          ;----------------------------
1465
1466  004174  010546                  .PARAM: MOV     R5,-(SP)
1467  004176  010446                          MOV     R4,-(SP)
1468  004200  016605  000004                  MOV     4(SP),R5
1469  004204  012537  004364                  MOV     (R5)+,LOLIM
1470  004210  012537  004366                  MOV     (R5)+,HILIM
1471  004214  012537  004370                  MOV     (R5)+,DEVADR
1472  004220  112537  004372                  MOVB    (R5)+,LOBITS
1473  004224  112537  004373                  MOVB    (R5)+,ADRCNT
1474  004230  010566  000004                  MOV     R5,4(SP)
1475  004234  005005                  PARAM1: CLR     R5
1476  004236  012704  007502                  MOV     #INBUF,R4
1477  004242  122714  000015                  CMPB    #15,(R4)
1478  004246  001420                          BEQ     PARERR
1479  004250  121427  000060          1$:     CMPB    (R4),#60
1480  004254  002415                          BLT     PARERR
1481  004256  121427  000067                  CMPB    (R4),#67
1482  004262  003012                          BGT     PARERR
1483  004264  142714  000060                  BICB    #60,(R4)
1484  004270  152405                          BISB    (R4)+,R5
1485  004272  122714  000015                  CMPB    #15,(R4)
1486  004276  001406                          BEQ     LIMITS
```

```
1487  004300  006305                        ASL     R5
1488  004302  006305                        ASL     R5
1489  004304  006305                        ASL     R5
1490  004306  000760                        BR      1$
1491  004310  104404                PARERR: INSTER
1492  004312  000750                        BR      PARAM1
1493
1494                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
1495                                        ;--------------------------------------
1496
1497  004314  020537  004366        LIMITS: CMP     R5,HILIM
1498  004320  101373                        BHI     PARERR
1499  004322  020537  004364                CMP     R5,LOLIM
1500  004326  103770                        BLO     PARERR
1501  004330  133705  004372                BITB    LOBITS,R5
1502  004334  001365                        BNE     PARERR
1503
1504                                        ;STORE NUMBER AT SPECIFIED ADDRESS
1505
1506  004336  013704  004370                MOV     DEVADR,R4
1507  004342  010524                1$:     MOV     R5,(R4)+
1508  004344  062705  000002                ADD     #2,R5
1509  004350  105337  004373                DECB    ADRCNT
1510  004354  001372                        BNE     1$
1511  004356  012604                        MOV     (SP)+,R4
1512  004360  012605                        MOV     (SP)+,R5
1513  004362  000002                        RTI
1514  004364  000000                LOLIM:  0
1515  004366  000000                HILIM:  0
1516  004370  000000                DEVADR: 0
1517  004372  000000                LOBITS: 0
1518          004373                ADRCNT=LOBITS+1
1519
1520                                        ;SAVE PC OF TEST THAT FAILED AND R0-R5
1521                                        ;--------------------------------------
1522
1523  004374  016637  000004  001276  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
1524
1525                                        ;SAVE R0-R5
1526
1527  004402  010537  001272        SV05:   MOV     R5,SAVR5        ;SAVE R5
1528  004406  010437  001270                MOV     R4,SAVR4        ;SAVE R4
1529  004412  010337  001266                MOV     R3,SAVR3        ;SAVE R3
1530  004416  010237  001264                MOV     R2,SAVR2        ;SAVE R2
1531  004422  010137  001262                MOV     R1,SAVR1        ;SAVE R1
1532  004426  010037  001260                MOV     R0,SAVR0        ;SAVE R0
1533  004432  000002                        RTI                     ;LEAVE.
1534
1535                                        ;RESTORE R0-R5
1536
1537  004434  013700  001260        .RES05: MOV     SAVR0,R0        ;RESTORE R0
1538  004440  013701  001262                MOV     SAVR1,R1        ;RESTORE R1
1539  004444  013702  001264                MOV     SAVR2,R2        ;RESTORE R2
1540  004450  013703  001266                MOV     SAVR3,R3        ;RESTORE R3
1541  004454  013704  001270                MOV     SAVR4,R4        ;RESTORE R4
1542  004460  013705  001272                MOV     SAVR5,R5        ;RESTORE R5
```

```
                                        RTI                     ;LEAVE

                                        ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
                                        ;-------------------------------------------------------

004466  104402  005672        .CONVR: TYPE    ,MCRLF
004472  010046                .CNVRT: MOV     R0,-(SP)
004474  010146                        MOV     R1,-(SP)
004476  010346                        MOV     R3,-(SP)
004500  010446                        MOV     R4,-(SP)
004502  010546                        MOV     R5,-(SP)
004504  017601  000012                MOV     @12(SP),R1
004510  062766  000002  000012        ADD     #2,12(SP)
004516  012137  004710                MOV     (R1)+,WRDCNT
004522  112137  004712        1$:     MOVB    (R1)+,CHRCNT
004526  112137  004713                MOVB    (R1)+,SPACNT
004532  013137  004714                MOV     @(R1)+,BINWRD
004536  122737  000003  004712        CMPB    #3,CHRCNT
004544  001003                        BNE     2$
004546  042737  177400  004714        BIC     #177400,BINWRD
004554  013704  004714        2$:     MOV     BINWRD,R4
004560  113705  004712                MOVB    CHRCNT,R5
004564  012700  001416                MOV     #TEMP,R0
004570  010403                3$:     MOV     R4,R3
004572  042703  177770                BIC     #177770,R3
004576  062703  000060                ADD     #060,R3
004602  110320                        MOVB    R3,(R0)+
004604  000241                        CLC
004606  006004                        ROR     R4
004610  000241                        CLC
004612  006004                        ROR     R4
004614  000241                        CLC
004616  006004                        ROR     R4
004620  005305                        DEC     R5
004622  001362                        BNE     3$
004624  012703  007544                MOV     #MDATA,R3
004630  114023                4$:     MOVB    -(R0),(R3)+
004632  105337  004712                DECB    CHRCNT
004636  001374                        BNE     4$
004640  105737  004713                TSTB    SPACNT
004644  001405                        BEQ     6$
004646  112723  000040        5$:     MOVB    #040,(R3)+
004652  105337  004713                DECB    SPACNT
004656  001373                        BNE     5$
004660  105013                6$:     CLRB    (R3)
004662  104402  007544                TYPE    ,MDATA
004666  005337  004710                DEC     WRDCNT
004672  001313                        BNE     1$
004674  012605                        MOV     (SP)+,R5
004676  012604                        MOV     (SP)+,R4
004700  012603                        MOV     (SP)+,R3
004702  012601                        MOV     (SP)+,R1
004704  012600                        MOV     (SP)+,R0
004706  000002                        RTI
004710  000000        WRDCNT: 0
004712  000000        CHRCNT: 0
```

```
1599                004713                  SPACNT=CHRCNT+1
1600    004714      000000                  BINWRD: 0
1601
1602
1603                                        ;TRAP DISPATCH SERVICE
1604                                        ;ARGUMENT OF TRAP IS EXTRACTED
1605                                        ;AND USED AS OFFSET TO OBTAIN POINTER
1606                                        ;TO SELECTED SUBROUTINE
1607
1608    004716      011646          .TRPSR: MOV     (SP),-(SP)      ;GET PC OF RETURN
1609    004720      162716  000002          SUB     #2,(SP)         ;=PC OF TRAP
1610    004724      017616  000000          MOV     @(SP),(SP)      ;GET TRP
1611    004730      006316          TRPOK:  ASL     (SP)            ;MULTIPLY TRAP ARG BY 2
1612    004732      042716  177001          BIC     #177001,(SP)    ;CLEAR UNWANTED BITS
1613    004736      062716  001330          ADD     #.TRPTAB,(SP)   ;POINTER TO SUBROUTINE ADDRESS
1614    004742      017616  000000          MOV     @(SP),(SP)      ;SUBROUTINE ADDRESS
1615    004746      000136                  JMP     @(SP)+          ;GO TO SUBROUTINE
1616
1617                                        ;ERROR HANDLER
1618                                        ;-------------
1619
1620    004750  004737  007606          .HLT:   JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
1621    004754  032777  010000  174220          BIT     #SW12,@SWR      ;BELL ON ERROR?
1622    004762  001406                          BEQ     XBX             ;BR IF NO BELL
1623    004764  105777  174220                  TSTB    @TPCSR          ;TTY READY.
1624    004770  100003                          BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
1625    004772  112777  000207  174212          MOVB    #207,@TPDBR     ;PUSH A BELL AT THE TTY.
1626    005000  032777  020000  174174  XBX:    BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
1627    005006  001105                          BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
1628    005010  021637  001234                  CMP     (SP),LSTERR     ;WAS THIS ERROR FOUND LAST TIME?
1629    005014  001404                          BEQ     1$              ;BR IF YES
1630    005016  011637  001234                  MOV     (SP),LSTERR     ;RECORD BEING HERE
1631    005022  105037  001325                  CLRB    ERRFLG          ;PREPARE HEADER
1632    005026  104406                  1$:     SAV05                   ;SAVE ALL PROC REGISTERS
1633    005030  011605                          MOV     (SP),R5         ;GET THE PC OF ERROR
1634    005032  162705  000002                  SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
1635    005036  011504                          MOV     (R5),R4         ;GET HLT INSTRUCTION
1636    005040  006304                          ASL     R4              ;MULT BY TWO
1637    005042  061504                          ADD     (R5),R4         ;DOUBLE IT
1638    005044  006304                          ASL     R4              ;MULT AGAIN
1639    005046  042704  177001                  BIC     #177001,R4      ;CLEAR JUNK
1640    005052  062704  031704                  ADD     #.ERRTAB,R4     ;GET POINTER
1641    005056  012437  005172                  MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
1642    005062  012437  005204                  MOV     (R4)+,DATAHD    ;GET DATA HEADRER
1643    005066  011437  005216                  MOV     (R4),DATABP     ;GET DATA TABLE
1644    005072  105737  001325                  TSTB    ERRFLG          ;TYPE HEADREER
1645    005076  001403                          BEQ     TYPMSG          ;BR IF YES
1646    005100  005737  005216                  TST     DATABP          ;DOES DATA TABLE EXIST?
1647    005104  001040                          BNE     TYPDAT          ;BR IF YES.
1648    005106  104402  005672  TYPMSG: TYPE    ,MCRLF
1649    005112  104402  005672          TYPE    ,MCRLF
1650    005116  005737  001220          TST     LOCK
1651    005122  001402                  BEQ     1$
1652    005124  104402  006142          TYPE    ,MASTEK
1653    005130  104402  006130  1$:     TYPE    ,XTSTN
1654    005134  104411  005330          CNVRT   ,XTSTN          ;SHOW IT
```

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1655  005140  104402  006217                  TYPE    ,MERRPC         ;TYPE PC.
1656  005144  104411  005322                  CNVRT   ,ERTAB0         ;SHOW IT
1657  005150  104402  005672                  TYPE    ,MCRLF          ;GIVE A CR/LF
1658  005154  112737  177777  001325          MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
1659  005162  005737  005172                  TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
1660  005166  001402                          BEQ     WRK0.FM         ;BR IF NO.
1661  005170  104402                          TYPE                    ;TYPE
1662  005172  000000                  ERRMSG: 0                       ;    ERROR MESSAGE
1663  005174                          WRK0.FM:                        ;
1664  005174  005737  005204                  TST     DATAHD          ;DATA HEADER?
1665  005200  001402                          BEQ     TYPDAT          ;BR IF NO
1666  005202  104402                          TYPE                    ;TYPE
1667  005204  000000                  DATAHD: 0                       ;    DATA HEADER
1668  005206  005737  005216          TYPDAT: TST     DATABP          ;DATA TABLE?
1669  005212  001402                          BEQ     RESREG          ;BR IF NO.
1670  005214  104410                          CONVRT                  ;SHOW
1671  005216  000000                  DATABP: 0                       ;    DATA TABLE
1672  005220  104407                  RESREG: RES05                   ;RESTORE PROC REGISTERS
1673  005222  022737  003522  000042  HALTS:  CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, HALT!!
1674  005230  001403                          BEQ     1$
1675  005232  005777  173744                  TST     @SWR            ;HALT ON ERROR?
1676  005236  100005                          BPL     EXITER          ;BR IF NO HALT ON ERROR
1677  005240  010046                  1$:     PUSHR0                  ;SAVE R0
1678  005242  016600  000002                  MOV     2(SP),R0        ;SHOW ERROR PC IN DATA LIGHTS
1679  005246  000000                          HALT                    ;HALT
1680  005250  012600                          POPR0                   ;GET R0
1681  005252  005237  001232          EXITER: INC     ERRCNT          ;UPDATE ERROR COUNT
1682  005256  032777  000400  173716          BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
1683  005264  001007                          BNE     1$              ;BR IF YES
1684  005266  032777  002000  173706          BIT     #SW10,@SWR      ;GOTO NEXT TEST?
1685  005274  001411                          BEQ     2$              ;BR IF NO
1686  005276  013737  001216  001214          MOV     NEXT,RETURN     ;SET FOR NEXT TEST
1687  005304  012706  001200          1$:     MOV     #STACK,SP       ;RESET SP
1688  005310  013701  001404                  MOV     DMCSR,R1        ;SET UP R1
1689  005314  000177  173674                  JMP     @RETURN         ;GOTO SPECIFIED TEST
1690  005320  000002                  2$:     RTI                     ;RETURN
1691  005322  000001                  ERTAB0: 1
1692  005324     006     002                  .BYTE   6,2
1693  005326  001276                          SAVPC
1694  005330  000001                  XTSTN:  1
1695  005332     003     002                  .BYTE   3,2
1696  005334  001226                          TSTNO
1697                                          ;ENTER HERE ON POWER FAILURE
1698                                          ;--------------------------
1699
1700
1701  005336                          .PFAIL:
1702  005336  012737  005350  000024          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
1703  005344  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
1704  005346  000777                          BR      .
1705
1706                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
1707
1708  005350                          RESTAR:
1709  005350  012737  005336  000024          MOV     #.PFAIL,24      ;SET UP FOR POWER FAILURE
1710  005356  012706  001200                  MOV     #STACK,SP       ;RESET THE STACK POINTER
```

```
 1711  005362  013701  001404                 MOV     DMCSR,R1          ;RESTORE R1
 1712  005366  005037  001416                 CLR     TEMP              ;READY FOR TIMMER
 1713  005372  005237  001416                 INC     TEMP              ;PLUS ONE TO THE TIMER!
 1714  005376  001375                         BNE     .-4               ;BR IF MORE TO GO
 1715  005400  104402  005675                 TYPE    ,MPFAIL           ;TYPE THE MESSAGE
 1716  005404  104411  005430                 CNVRT   ,PFTAB            ;TELL WHAT TEST TO RETURN TO.
 1717  005410  105037  001325                 CLRB    ERRFLG            ;START CLEAN
 1718  005414  005037  001234                 CLR     LSTERR            ;'''''''''''
 1719  005420  005011                         CLR     (R1)              ;CLEAR MAINT BITS
 1720  005422  104412                         MSTCLR                    ;START CLEAN UP OF DEVICE
 1721  005424  000177  173564                 JMP     @RETURN           ;START DOING THAT TEST AGAIN.
 1722  005430  000001              PFTAB:     1
 1723  005432     003     002      .BYTE      3,2
 1724  005434  001226                         TSTNO
 1725
 1726  005436                      .DELAY:
 1727  005436  012777  000020  173746         MOV     #20,@DMPO4
 1728  005444  104414                         ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 1729  005446  121111                         121111                    ;POKE CLOCK DELAY BIT
 1730  005450                      1$:
 1731  005450  104414                         ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 1732  005452  121224                         121224                    ;PORT4 IBUS*11
 1733  005454  032777  000020  173730         BIT     #BIT4,@DMPO4      ;IS CLOCK BIT SET?
 1734  005462  001772                         BEQ     1$                ;BR IF NO
 1735  005464  000002                         RTI
 1736
 1737  005466                      .MSTCLR:
 1738  005466  152777  000100  173712         BISB    #BIT6,@DMCSRH     ;SET MASTER CLEAR
 1739  005474  142777  000300  173704         BICB    #BIT6!BIT7,@DMCSRH  ;CLEAR MASTER CLEAR AND RUN
 1740  005502  000002                         RTI                       ;RETURN
 1741
 1742  005504                      .ROMCLK:
 1743  005504  152777  000002  173674         BISB    #BIT1,@DMCSRH     ;SET ROMI
 1744  005512  013677  173676                 MOV     @(SP)+,@DMPO6     ;LOAD INSTRUCTION IN SEL6
 1745  005516  062746  000002                 ADD     #2,-(SP)          ;ADJUST STACK
 1746  005522  032777  000100  173452         BIT     #SW06,@SWR        ;HALT IF SW06 =1
 1747  005530  001401                         BEQ     1$                ;BR IF SW06 =0
 1748  005532  000000                         HALT                      ;HALT BEFORE CLOCKING INSTRUCTION
 1749  005534  152777  000003  173644  1$:    BISB    #BIT1!BIT0,@DMCSRH ;CLOCK INSTRUCTION
 1750  005542  142777  000007  173636         BICB    #BIT2!BIT1!BIT0,@DMCSRH  ;CLEAR ROMO, ROMI, STEP
 1751  005550  000002                         RTI
 1752
 1753  005552                      .DATACLK:
 1754  005552  013637  001416                 MOV     @(SP)+,TEMP       ;PUT TICK COUNT IN TEMP
 1755  005556  062746  000002                 ADD     #2,-(SP)          ;ADJUST STACK
 1756  005562  152777  000020  173616  1$:    BISB    #BIT4,@DMCSRH     ;SET STEP LU
 1757  005570  027777  173610  173606         CMP     @DMCSR,@DMCSR     ;WASTE TIME
 1758  005576  142777  000020  173602         BICB    #BIT4,@DMCSRH     ;CLEAR STEP LU
 1759  005604  005337  001416                 DEC     TEMP              ;DEC TICK COUNT
 1760  005610  001364                         BNE     1$                ;BR IF NOT DONE
 1761  005612  000002                         RTI                       ;RETURN
 1762  005614  000001              3$:        .BLKW 1
 1763
 1764  005616                      .TIMER:
 1765  005616  013637  001416                 MOV     @(SP)+,TEMP       ;MOVE COUNT TO TEMP
 1766  005622  062746  000002                 ADD     #2,-(SP)          ;ADJUST STACK
```

```
 1767  005626                                  1$:
 1768  005626  104414                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 1769  005630  021364                                  021364                  ;PORT4 IBUS* REG11
 1770  005632  032777  000002  173552                  BIT     #2,@DMP04       ;IS PGM CLOCK BIT CLEAR?
 1771  005640  001772                                  BEQ     1$              ;BR IF YES
 1772  005642                                  2$:
 1773  005642  104414                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 1774  005644  021364                                  021364                  ;PORT4 IBUS* REG11
 1775  005646  032777  000002  173536                  BIT     #2,@DMP04       ;IS PGM CLOCK BIT SET?
 1776  005654  001372                                  BNE     2$              ;BR IF YES
 1777  005656  005337  001416                          DEC     TEMP            ;DEC COUNT
 1778  005662  001361                                  BNE     1$              ;BR IF NOT DONE
 1779  005664  000002                                  RTI                     ;RETURN
 1780
 1781  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 CZDME  /
   (2) 005755     377  000122          MR:     .ASCIZ  <377>/R/
   (2) 005760  047377  020117  042504  MERR2:  .ASCIZ  <377>/NO DEVICES PRESENT./
   (2) 006005     377  047111  052523  MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
   (2) 006031     377  042524  052123  MTSTPC: .ASCIZ  <377>/TEST PC-/
   (2) 006043     377  047514  045503  MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST/
   (2) 006072  051503  035122  000040  MCSRX:  .ASCIZ   /CSR: /
   (2) 006100  042526  035103  000040  MVECX:  .ASCIZ  /VEC: /
   (2) 006106  040520  051523  051505  MPASSX: .ASCIZ  /PASSES: /
   (2) 006117     105  051122  051117  MERRX:  .ASCIZ  /ERRORS: /
   (2) 006130  042524  052123  047040  MTSTN:  .ASCIZ  /TEST NO: /
   (2) 006142  000052                  MASTEK: .ASCIZ  /*/
   (2) 006144  051777  052105  051440  MNEW:   .ASCIZ  <377>/SET SWITCH REG TO DMC11'S DESIRED ACTIVE./
   (2) 006217     120  035103  000040  MERRPC: .ASCIZ  /PC: /
   (2) 006224  020212  020040  020040  XHEAD:  .ASCII  <212>/           MAP OF DMC11 STATUS/
   (2) 006263     377  020040  020040          .ASCII  <377>/           ------------------/
   (2) 006322  020212  050040  020103          .ASCII  <212>/  PC      CSR     STAT1    STAT2    STAT3/
   (2) 006374  026777  026455  026455          .ASCIZ  <377>/------   ------   ------   ------   ------/
   (2) 006450  044377  053517  046440  NUM:    .ASCIZ  <377>/HOW MANY DMC11'S TO BE TESTED?/
   (2) 006510  041777  051123  040440  CSR:    .ASCIZ  <377>/CSR ADDRESS?/
   (2) 006526  053377  041505  047524  VEC:    .ASCIZ  <377>/VECTOR ADDRESS?/
   (2) 006547     377  051102  050040  PRIO:   .ASCIZ  <377>/BR PRIORITY LEVEL? (4,5,6,7)?/
   (2) 006606  044777  020106  046504  CRAM:   .ASCIZ  <377>/IF DMC HAS CRAM (M8204) TYPE 'Y', IF CROM (M8200) TYPE 'N' ?/
   (2) 006704  053777  044510  044103  MODU:   .ASCIZ  <377>/WHICH LINE UNIT? IF NONE TYPE 'N', IF M8201 TYPE '1', IF M8202 TYP
   (2) 007016  051777  044527  041524  LINE:   .ASCIZ  <377>/SWITCH PAC#1 (DDCMP LINE #)?/
   (2) 007054  051777  044527  041524  BM:     .ASCIZ  <377>/SWITCH PAC#2 (BM873 BOOT ADD)?/
   (2) 007114  044777  020123  044124  CONN:   .ASCIZ  <377>/IS THE LOOP BACK CONNECTOR ON?/
   (2) 007154  047377  020117  042504  NOACT:  .ASCIZ  <377>/NO DEVICES ARE SELECTED/
   (2) 007205     377  051412  051127  SWMES:  .ASCIZ  <377><12>/SWR= /
   (2) 007215     116  053505  020077  SWMES1: .ASCIZ  /NEW? /
   (2) 007223     377  042377  041515  CONERR: .ASCIZ  <377><377>/DMC11 FOUND AT NON-STANDARD ADDRESS  PC: /
   (2) 007277     377  054105  042520  CNERR:  .ASCIZ  <377>/EXPECTED  FOUND/
   (2) 007320  024040  046504  024503  DMCM:   .ASCIZ  / (DMC) /
   (2) 007330  024040  046513  024503  KMCM:   .ASCIZ  / (KMC) /
   (2) 007340  042377  041515  030461  SPEED:  .ASCIZ  <377>/DMC11-AR(REMOTE,LOW SPEED) OR DMC11-AL(LOCAL,HIGH SPEED) TYPE 'R'
   (2)                                  .EVEN
   (2) 007454  000005                  XSTATQ: 5
 1782  007456     006     003                  .BYTE   6,3
 1783  007460  001246                          TEMP1
```

```
1784  007462  006     003                     .BYTE   6,3
1785  007464  001250                          TEMP2
1786  007466  006     003                     .BYTE   6,3
1787  007470  001252                          TEMP3
1788  007472  006     003                     .BYTE   6,3
1789  007474  001254                          TEMP4
1790  007476  006     002                     .BYTE   6,2
1791  007500  001256                          TEMP5
1792                                  .EVEN
1793
1794                                  ;BUFFERS FOR INPUT-OUTPUT
1795
1796  007502  000000                  INBUF:  0
1797          007544                  .=.+40
1798  007544  000000                  MDATA:  0
1799          007606                  .=.+40
1800
1801
1802                                  ;ROUTINE USED TO CHANGE SOFTWARE SWITCH
1803                                  ;REGISTER USING THE CONSOLE TERMINAL
1804                                  ;-------------------------------------
1805
1806  007606  022737  000176  001202  CKSWR:  CMP     #SWREG,SWR      ;IS THE SOFT SWR BEING USED?
1807  007614  001077                          BNE     CKSWR5          ;BR IF NO
1808  007616  105777  171362                  TSTB    @TKCSR          ;IS DONE SET?
1809  007622  100003                          BPL     2$              ;GO ON IF NOT SET
1810  007624  012737  177777  003734          MOV     #-1,DONE        ;IF DONE SET, SET FLAG
1811  007632  022777  000007  171346  2$:     CMP     #7,@TKDBR       ;WAS CTRL G TYPED? (7 BIT ASCII)
1812  007640  001404                          BEQ     1$              ;BR IF YES
1813  007642  022777  000207  171336          CMP     #207,@TKDBR     ;WAS CTRL G TYPED? (8 BIT ASCII)
1814  007650  001061                          BNE     CKSWR5          ;BR IF NO
1815  007652  010246                  1$:     MOV     R2,-(SP)        ;STORE R2
1816  007654  010346                          MOV     R3,-(SP)        ;STORE R3
1817  007656  010446                          MOV     R4,-(SP)        ;STORE R4
1818  007660  012737  177777  010016          MOV     #-1,SWFLG       ;SET SOFT TYPE OUT FLAG
1819  007666  005002                  CKSWR1: CLR     R2              ;CLEAR NEW SWR CONTENTS
1820  007670  012704  177777                  MOV     #-1,R4          ;SET FLAG TO ALL ONES
1821  007674  104402  007205                  TYPE    ,SWMES          ;TYPE 'SWR= '
1822  007700  104411                  CKSWR2: CNVRT                   ;TYPE OUT PRESENT CONTENTS
1823  007702  010052                          SOFTSW                  ;OF SOFT SWITCH REGISTER
1824  007704  104402  007215          CKSWR3: TYPE    ,SWMES1         ;TYPE 'NEW? '
1825  007710  004737  010020          CKSWR4: JSR     PC,INCHAR       ;GET RESPONSE
1826  007714  022703  000015                  CMP     #15,R3          ;WAS IT A CR?
1827  007720  001424                          BEQ     5$              ;BR IF YES
1828  007722  022703  000012                  CMP     #12,R3          ;WAS IT A LF?
1829  007726  001416                          BEQ     4$              ;BR IF YES
1830  007730  022703  000025                  CMP     #25,R3          ;WAS IT CTRL U?
1831  007734  001754                          BEQ     CKSWR1          ;BR IF YES(START OVER)
1832  007736  022703  000007                  CMP     #7,R3           ;IF CNTL G GET NEXT CHAR
1833  007742  001762                          BEQ     CKSWR4
1834  007744  005004                          CLR     R4              ;IT MUST BE A DIGIT SO CLR FLAG
1835  007746  042703  177770                  BIC     #177770,R3      ;ONLY 0-7 ARE LEGAL SO MASK OFF BITS
1836  007752  006302                          ASL     R2              ;SHIFT R2 3 TIMES
1837  007754  006302                          ASL     R2
1838  007756  006302                          ASL     R2
1839  007760  050302                          BIS     R3,R2           ;ADD LAST DIGIT
```

```
1840  007762  000752                        BR      CKSWR4          ;GET NEXT CHARACTER
1841  007764  012766  002002  000006  4$:   MOV     #.START,6(SP)   ;LF WAS TYPED SO GO TO START
1842  007772  005704                  5$:   TST     R4              ;IS FLAG CLEAR?
1843  007774  001002                        BNE     6$              ;IF NOT DON'T CHANGE SOFT SWR
1844  007776  010277  171200                MOV     R2,@SWR         ;IF YES THEN WRITE NEW CONTENTS TO SOFT SWR
1845  010002  005037  010016          6$:   CLR     SWFLG           ;CLEAR TYPEOUT FLAG
1846  010006  012604                        MOV     (SP)+,R4        ;RESTORE R4
1847  010010  012603                        MOV     (SP)+,R3        ;RESTORE R3
1848  010012  012602                        MOV     (SP)+,R2        ;RESTORE R2
1849  010014  000207            CKSWR5:     RTS     PC              ;RETURN
1850
1851  010016  000000            SWFLG:      0
1852
1853  010020  105777  171160    INCHAR:     TSTB    @TKCSR
1854  010024  100375                        BPL     .-4
1855  010026  017703  171154                MOV     @TKDBR,R3
1856  010032  105777  171152                TSTB    @TPCSR
1857  010036  100375                        BPL     .-4
1858  010040  010377  171146                MOV     R3,@TPDBR
1859  010044  042703  000200                BIC     #BIT7,R3
1860  010050  000207                        RTS     PC
1861
1862  010052  000001            SOFTSW:     1
1863  010054     006     002                .BYTE   6,2
1864  010056  000176                        SWREG
```

```
1865
1866                                        ;
1867                                        ;ROUTINE USED TO "CYCLE" THROUGH UP TO 16 DMC11'S
1868                                        ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1869                                        ;AND RUNS THE SPECIFIED DMC11'S.   THIS ROUTINE *MUST*
1870                                        ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1871                                        ;SETUP NECESSARY.
1872                                        ;
1873
1874  010060  005737  001306        CYCLE:  TST     DMACTV          ;ARE ANY DMC11'S TO BE TESTED?
1875  010064  001004                        BNE     1$              ;BR IF OK.
1876  010066  104402  007154                TYPE    ,NOACT          ;NO DMC11'S SELECTED!!
1877  010072  000000                        HALT                    ;STOP THE SHOW.
1878  010074  000776                        BR      .-2             ;DISQUALIFY CONT. SW.
1879  010076  000241                1$:     CLC                     ;CLEAR PROC. CARRY BIT.
1880  010100  006137  001316                ROL     RUN             ;UPDATE POINTER
1881  010104  005537  001316                ADC     RUN             ;CATCH CARRY FROM RUN
1882  010110  062737  000004  001322        ADD     #4,MILK         ;UPDATE POINTER
1883  010116  062737  000010  001320        ADD     #10,CREAM       ;UPDATE ADDRESS POINTER.
1884  010124  022737  001700  001320        CMP     #DM.MAP+200,CREAM
1885  010132  001006                        BNE     2$              ;KEEP GOING; NOT ALL TESTED FOR.
1886  010134  012737  001500  001320        MOV     #DM.MAP,CREAM   ;RESET ADDRESS POINTER.
1887  010142  012737  001702  001322        MOV     #CNT.MAP,MILK   ;RESET PASS COUNT POINTER
1888  010150  033737  001316  001306  2$:   BIT     RUN,DMACTV      ;IS THIS ONE ACTIVE?
1889  010156  001747                        BEQ     1$              ;BR IF NO
1890  010160  013700  001320                MOV     CREAM,R0        ;GET ADDRESS POINTER
1891  010164  013702  001322                MOV     MILK,R2         ;GET PASS COUNT POINTER
1892  010170  012037  001404                MOV     (R0)+,DMCSR     ;LOAD SYSTEM CTRL. REG
1893  010174  011037  001374                MOV     (R0),DMRVEC     ;LOAD VECTOR
1894  010200  042737  177000  001374        BIC     #177000,DMRVEC  ;CLEAR UNWANTED BITS
1895  010206  012037  001366                MOV     (R0)+,STAT1     ;LOAD STAT1
1896  010212  012037  001370                MOV     (R0)+,STAT2     ;LOAD STAT2
1897  010216  012037  001372                MOV     (R0)+,STAT3     ;LOAD STAT3
1898  010222  012237  001230                MOV     (R2)+,PASCNT    ;LOAD PASS COUNT
1899  010226  012237  001232                MOV     (R2)+,ERRCNT    ;LOAD ERROR COUNT
1900  010232  012700  000002                MOV     #2,R0           ;SAVE CORE THIS WAY!
1901  010236  013737  001404  001406        MOV     DMCSR,DMCSRH
1902  010244  005237  001406                INC     DMCSRH
1903  010250  013737  001406  001410        MOV     DMCSRH,DMCTL
1904  010256  005237  001410                INC     DMCTL
1905  010262  013737  001410  001412        MOV     DMCTL,DMP04
1906  010270  060037  001412                ADD     R0,DMP04
1907  010274  013737  001412  001414        MOV     DMP04,DMP06
1908  010302  060037  001414                ADD     R0,DMP06
1909
1910  010306  013737  001374  001376        MOV     DMRVEC,DMRLVL   ;PTY LVL
1911  010314  060037  001376                ADD     R0,DMRLVL       ;
1912  010320  013737  001376  001400        MOV     DMRLVL,DMTVEC   ;TX VEC
1913  010326  060037  001400                ADD     R0,DMTVEC       ;
1914  010332  013737  001400  001402        MOV     DMTVEC,DMTLVL   ;TX LVL
1915  010340  060037  001402                ADD     R0,DMTLVL
1916
1917  010344  032737  000002  001236        BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED
1918  010352  001450                        BEQ     7$              ;BR IF NO
1919  010354                         4$:
1920  010354  005737  000042                TST     @#42            ;RUNNING IN AUTO MODE?
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1921  010360  001045                        BNE     7$              ;BR IF YES
1922  010362  104402  005672                TYPE    ,MCRLF
1923  010366  104403                        INSTR                   ;GET TEST NO.
1924  010370  006130                        MTSTN
1925  010372  104405                        PARAM
1926  010374  000001                        1
1927  010376  001000                        1000
1928  010400  001226                        TSTNO
1929  010402     000                .BYTE   0
1930  010403     001                .BYTE   1
1931  010404  012700  012320                MOV     #TST1,R0
1932  010410  022710                5$:     CMP     (PC)+,(R0)      ;CMP FIRST WORD TO 12737
1933  010412  012737                        MOV     (PC)+,@(PC)+
1934  010414  001020                        BNE     6$              ;BR IF NOT SAME
1935  010416  023760  001226  000002        CMP     TSTNO,2(R0)     ;DOES TSTNO MATCH?
1936  010424  001014                        BNE     6$              ;BR IF NO
1937  010426  022760  001226  000004        CMP     #TSTNO,4(R0)    ;IS LAST WORD OK?
1938  010434  001010                        BNE     6$              ;BR IF NO
1939  010436  010037  001214                MOV     R0,RETURN       ;IT IS A LEGAL TEST SO DO IT
1940  010442  104402  005755                TYPE    ,MR
1941  010446  042737  000002  001236        BIC     #SW01,STRTSW
1942  010454  000412                        BR      8$
1943  010456  005720                6$:     TST     (R0)+           ;POP R0
1944  010460  020027  026034                CMP     R0,#TLAST+10    ;AT END YET?
1945  010464  001351                        BNE     5$              ;BR IF NO
1946  010466  104402  005666                TYPE    ,MQM            ;YES ILLEGAL TEST NO.
1947  010472  000730                        BR      4$              ;TRY AGAIN
1948
1949  010474  012737  012320  001214  7$:   MOV     #TST1,RETURN    ;PREPARE RETURN ADDRESS
1950  010502  013701  001404        8$:     MOV     DMCSR,R1        ;R1 = BASE DMC11 ADDRESS
1951  010506  000177  170502                JMP     @RETURN         ;GO START TESTING.
1952
1953
1954                                        ;ROUTINE USED TO ''AUTO SIZE'' THE DMC11
1955                                        ;CSR AND VECTOR.
1956                                        ;NOTE:  THE CSR MAY BE ANY WHERE IN THE FLOATING
1957                                        ;       ADDRESS RANGE (160000:164000)
1958                                        ;       AND THE VECTOR MAY BE ANY WHERE IN THE
1959                                        ;       FLOATING VECTOR RANGE (300:770)
1960                                        ;
1961
1962  010512                        AUTO.SIZE:
1963  010512  000005                        RESET                   ;INSURE A BUS INIT.
1964  010514  012702  001500        CSRMAP: MOV     #DM.MAP,R2      ;LOAD MAP POINTER.
1965  010520  005022                1$:     CLR     (R2)+           ;ZERO ENTIRE MAP
1966  010522  022702  001700                CMP     #DM.END,R2      ;ALL DONE?
1967  010526  001374                        BNE     1$              ;BR IF NO
1968  010530  005037  001310                CLR     DMNUM           ;SET OCTAL NUMBER OF DMC11'S TO 0
1969  010534  012702  001500                MOV     #DM.MAP,R2      ;R2 POINTS TO DMC MAP
1970  010540  005037  001306                CLR     DMACTV          ;CLEAR ACTIVE
1971  010544  032737  000001  001236        BIT     #SW00,STRTSW    ;QUESTIONS?
1972  010552  001002                        BNE     .+6             ;BR IF YES
1973  010554  000137  011252                JMP     7$              ;IF NO SKIP QUESTIONS
1974  010560  012737  000001  001256        MOV     #1,TEMP5        ;START WITH 1
1975  010566  104403                        INSTR
1976  010570  006450                        NUM
```

```
1977  010572  104405                          PARAM
1978  010574  000001                          1
1979  010576  000020                          16.
1980  010600  001252                          TEMP3
1981  010602     000                          .BYTE   0
1982  010603     001                          .BYTE   1
1983  010604  013737  001252  001310          MOV     TEMP3,DMNUM     ;DMNUM = HOW MANY
1984  010612  104402  005672          12$:    TYPE    ,MCRLF
1985  010616  104410                          CONVRT                  ;TYPE WHICH DMC IS BEING DONE
1986  010620  012002                          WHICH                   ;TEMP5 IS WHICH DMC
1987  010622  005237  001256                  INC     TEMP5
1988  010626  104403                          INSTR
1989  010630  006510                          CSR
1990  010632  104405                          PARAM
1991  010634  160000                          160000
1992  010636  164000                          164000
1993  010640  001254                          TEMP4
1994  010642     000                          .BYTE   0
1995  010643     001                          .BYTE   1
1996  010644  013722  001254                  MOV     TEMP4,(R2)+     ;STORE CSR IN MAP
1997  010650  104403                          INSTR
1998  010652  006526                          VEC
1999  010654  104405                          PARAM
2000  010656  000000                          0
2001  010660  000776                          776
2002  010662  001254                          TEMP4
2003  010664     000                          .BYTE   0
2004  010665     001                          .BYTE   1
2005  010666  013712  001254                  MOV     TEMP4,(R2)      ;STORE VECTOR IN MAP
2006  010672  104402          10$:    TYPE
2007  010674  006547                          PRIO                    ;ASK WHAT BR LEVEL
2008  010676  004737  012266                  JSR     PC,INTTY        ;GET RESPONSE
2009  010702  022703  000024                  CMP     #24,R3          ;
2010  010706  101014                          BHI     50$             ;BR IF LESS THAN 4
2011  010710  022703  000027                  CMP     #27,R3          ;
2012  010714  103411                          BLO     50$             ;BR IF GREATER THAN 7
2013  010716  012704  000011                  MOV     #11,R4          ;R4 = NUMBER OF SHIFTS
2014  010722  006303                          ASL     R3              ;SHIFT R3 LEFT
2015  010724  005304                          DEC     R4              ;DEC SHIFT COUNT
2016  010726  001375                          BNE     .-4             ;BR IF NOT DONE
2017  010730  042703  170777                  BIC     #170777,R3      ;BIC UNWANTED BITS
2018  010734  050312                          BIS     R3,(R2)         ;PUT BR LEVEL IN STATUS MAP
2019  010736  000403                          BR      8$              ;CONTINUE
2020  010740  104402          50$:    TYPE
2021  010742  005666                          MQM                     ;RESPONSE IS OUT OF LIMITS
2022  010744  000752                          BR      10$             ;TRY AGAIN
2023  010746  104402          8$:     TYPE
2024  010750  006606                          CRAM                    ;DOES DMC HAVE CRAM?
2025  010752  004737  012266                  JSR     PC,INTTY        ;GET REPLY
2026  010756  022703  000131                  CMP     #131,R3
2027  010762  001427                          BEQ     9$              ;YES
2028  010764  022703  000116                  CMP     #116,R3         ;NO
2029  010770  001403                          BEQ     40$             ;NOT A Y OR N
2030  010772  104402                          TYPE
2031  010774  005666                          MQM                     ;TYPE "?"
2032  010776  000763                          BR      8$              ;ASK AGAIN
```

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2033  011000  104402                    40$:    TYPE
2034  011002  007340                            SPEED                   ;DMC11-AR OR DMC11-AL?
2035  011004  004737  012266                    JSR     PC,INTTY        ;GET RESPONSE
2036  011010  022703  000122                    CMP     #122,R3         ;IS IT R
2037  011014  001414                            BEQ     16$             ;BR IF REMOTE
2038  011016  022703  000114                    CMP     #114,R3         ;IS IT L
2039  011022  001403                            BEQ     41$             ;BR IF LOCAL
2040  011024  104402                            TYPE
2041  011026  005666                            MQM
2042  011030  000763                            BR      40$             ;TRY AGAIN
2043  011032  052762  000002  000004  41$:     BIS     #BIT1,4(R2)     ;SET BIT1 IN STAT3
2044  011040  000402                            BR      16$             ;CONTINUE
2045  011042  052712  100000            9$:     BIS     #BIT15,(R2)     ;SET BIT 15 IF CRAM
2046  011046  104402                    16$:    TYPE
2047  011050  006704                            MODU                    ;ASK WHICH LINE UNIT
2048  011052  004737  012266                    JSR     PC,INTTY        ;GET REPLY
2049  011056  022703  000021                    CMP     #21,R3          ;'1'
2050  011062  001417                            BEQ     30$
2051  011064  022703  000022                    CMP     #22,R3          ;'2'
2052  011070  001412                            BEQ     31$
2053  011072  022703  000116                    CMP     #116,R3         ;'N'
2054  011076  001403                            BEQ     32$
2055  011100  104402                            TYPE
2056  011102  005666                            MQM                     ;IF NOT A 1,2 OR N TYPE '?'
2057  011104  000760                            BR      16$             ;TRY AGIAN
2058  011106  052722  010000            32$:    BIS     #BIT12,(R2)+    ;SET BIT 12 IN STAT2 IF NO LU
2059  011112  022222                            CMP     (R2)+,(R2)+     ;POP OVER STAT2 AND STAT3
2060  011114  000447                            BR      33$
2061  011116  052712  020000            31$:    BIS     #BIT13,(R2)     ;SET BIT 13 IN STAT2 IF M8202
2062  011122  104402                    30$:    TYPE
2063  011124  007114                            CONN                    ;ASK IF LOOP-BACK IS ON
2064  011126  004737  012266                    JSR     PC,INTTY        ;GET REPLY
2065  011132  022703  000131                    CMP     #131,R3         ;Y
2066  011136  001406                            BEQ     17$
2067  011140  022703  000116                    CMP     #116,R3         ;N
2068  011144  001406                            BEQ     18$
2069  011146  104402                            TYPE
2070  011150  005666                            MQM                     ;IF NOT Y OR N TYPE '?'
2071  011152  000763                            BR      30$             ;TRY AGAIN
2072  011154  052722  040000            17$:    BIS     #BIT14,(R2)+    ;TURNAROUND IS CONNECTED
2073  011160  000402                            BR      19$
2074  011162  042722  040000            18$:    BIC     #BIT14,(R2)+    ;NO TURNAROUND
2075  011166                            19$:
2076  011166  104403                            INSTR
2077  011170  007016                            LINE
2078  011172  104405                            PARAM
2079  011174  000000                            0
2080  011176  000377                            377
2081  011200  001254                            TEMP4
2082  011202     000                            .BYTE   0
2083  011203     001                            .BYTE   1
2084  011204  113722  001254                    MOVB    TEMP4,(R2)+     ;STORE SWITCH PAC IN MAP
2085  011210  104403                            INSTR
2086  011212  007054                            BM
2087  011214  104405                            PARAM
2088  011216  000000                            0
```

```
2089  011220  000377                        377
2090  011222  001254                        TEMP4
2091  011224     000                        .BYTE   0
2092  011225     001                        .BYTE   1
2093  011226  113722  001254                MOVB    TEMP4,(R2)+     ;STORE SWITCH PAC IN MAP
2094  011232  005722                        TST     (R2)+           ;POP OVER STAT3
2095  011234  005337  001252          33$:  DEC     TEMP3           ;DEC DMC COUNT
2096  011240  001402                        BEQ     34$             ;BR IF DONE
2097  011242  000137  010612                JMP     12$             ;JUMP IF NOT
2098  011246  000137  011702          34$:  JMP     13$             ;CONTINUE
2099  011252  012701  160000           7$:  MOV     #160000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
2100  011256  012737  011774  000004       MOV     #6$,@#4         ;SET FOR NON-EXISTANT DEVICE TIME OUT
2101  011264  005011                   2$:  CLR     (R1)            ;CLEAR SEL0
2102  011266  005711                        TST     (R1)            ;IF DMC11 DMCSR S/B 0
2103  011270  001172                        BNE     3$              ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DMC11
2104  011272  005061  000006                CLR     6(R1)           ;CLEAR SEL6
2105  011276  005761  000006                TST     6(R1)           ;IF DMC11 THEN DMRIC S/B =0!
2106  011302  001165                        BNE     3$              ;BR IF NOT DMC11
2107  011304  012711  002000                MOV     #BIT10,(R1)     ;SET ROM0
2108  011310  005061  000004                CLR     4(R1)           ;CLEAR SEL4
2109  011314  012761  125252  000006       MOV     #125252,6(R1)   ;WRITE THIS TO SEL6
2110  011322  052711  020000                BIS     #BIT13,(R1)     ;WRITE IT!
2111  011326  022761  125252  000004       CMP     #125252,4(R1)   ;WAS IT WRITTEN?
2112  011334  001004                        BNE     21$             ;IF NO IT IS NOT CRAM
2113  011336  052762  100000  000002       BIS     #BIT15,2(R2)    ;SET BIT15 IF CRAM
2114  011344  000431                        BR      22$
2115  011346  012711  001000          21$:  MOV     #BIT9,(R1)      ;SET ROMI
2116  011352  012761  100430  000006       MOV     #100430,6(R1)   ;PUT INSTRUCTION IN SEL6
2117  011360  012711  001400                MOV     #BIT9!BIT8,(R1) ;CLOCK INSTRUCTION (MICRO PROC PC TO 0)
2118  011364  012711  002000                MOV     #BIT10,(R1)     ;SET ROM0
2119  011370  022761  016472  000006       CMP     #016472,6(R1)   ;IS IT LOCAL CROM?
2120  011376  001411                        BEQ     23$             ;BR IF YES
2121  011400  022761  016461  000006       CMP     #016461,6(R1)   ;IS IT REMOTE CROM?
2122  011406  001410                        BEQ     22$             ;BR IF YES
2123  011410  022761  177777  000006       CMP     #-1,6(R1)       ;NO CROM?
2124  011416  001404                        BEQ     22$             ;BR IF YES
2125  011420  000516                        BR      3$              ;NOT A DMC
2126  011422  052762  000002  000006  23$:  BIS     #BIT1,6(R2)     ;SET BIT 1 IN STAT3
2127                                  ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DMC11 CSR ADDRESS.
2128  011430  010122                   22$:  MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
2129  011432  012711  001000           15$:  MOV     #BIT9,(R1)      ;CLEAR LINE UNIT LOOP
2130  011436  005061  000004                CLR     4(R1)           ;CLEAR PORT4
2131  011442  012761  122113  000006       MOV     #122113,6(R1)   ;LOAD INSTRUCTION (CLR DTR)
2132  011450  052711  000400                BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION
2133  011454  012761  021264  000006       MOV     #021264,6(R1)   ;LOAD INSTRUCTION
2134  011462  052711  000400                BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION
2135  011466  122761  000377  000004       CMPB    #377,4(R1)      ;IS IT ALL ONES?
2136  011474  001003                        BNE     .+10            ;BR IF NO
2137  011476  052712  010000                BIS     #BIT12,(R2)     ;IF YES, NO LINE UNIT, SET STATUS BIT
2138  011502  000436                        BR      20$
2139  011504  032761  000002  000004       BIT     #BIT1,4(R1)     ;IS SWITCH A ONE?
2140  011512  001403                        BEQ     .+10            ;BR IF M8201
2141  011514  052712  060000                BIS     #BIT13!BIT14,(R2) ;M8202 ASSUME CONNECTOR
2142  011520  000427                        BR      20$             ;CONNECTOR ON)
2143  011522  032761  000010  000004       BIT     #BIT3,4(R1)     ;IS MRDY SET
2144  011530  001023                        BNE     20$             ;BR IF M8201 NO CONNECTOR (ON LINE)
```

```
2145  011532  012761  000100  000004          MOV     #BIT6,4(R1)     ;LOAD PORT4
2146  011540  012761  122113  000006          MOV     #122113,6(R1)   ;LOAD INSTRUCTION
2147  011546  052711  000400                  BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION(SET DTR)
2148  011552  012761  021264  000006          MOV     #021264,6(R1)   ;LOAD INSTRUCTION
2149  011560  052711  000400                  BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION(READ MODEM REG)
2150  011564  032761  000010  000004          BIT     #BIT3,4(R1)     ;IS MRDY SET NOW?
2151  011572  001402                          BEQ     20$             ;BR IF NO CONNECTOR
2152  011574  052712  040000                  BIS     #BIT14,(R2)     ;SET STATUS BIT FOR CONNECTOR
2153  011600  005722                  20$:    TST     (R2)+           ;POP POINTER
2154  011602  012761  021324  000006          MOV     #021324,6(R1)   ;PUT INSTRUCTION IN PORT6
2155  011610  012711  001400                  MOV     #BIT9!BIT8,(R1) ;PORT4_LU 15
2156  011614  156122  000004                  BISB    4(R1),(R2)+     ;STORE DDCMP LINE # IN TABLE
2157  011620  012761  021344  000006          MOV     #021344,6(R1)   ;PORT6_INSTRUCTION
2158  011626  012711  001400                  MOV     #BIT8!BIT9,(R1) ;CLOCK_INSTR.
2159  011632  156122  000004                  BISB    4(R1),(R2)+     ;STORE BM873 ADD IN TABLE
2160  011636  005722                          TST     (R2)+           ;POP OVER STAT3
2161  011640  005011                          CLR     (R1)            ;CLEAR ROMI
2162  011642  005237  001310                  INC     DMNUM           ;UPDATE DEVICE COUNTER
2163  011646  022737  000020  001310          CMP     #20,DMNUM       ;ARE MAX. NO. OF DEV FOUND?
2164  011654  001412                          BEQ     13$             ;YES DON'T LOOK FOR ANY MORE.
2165  011656  005011                  3$:     CLR     (R1)            ;CLEAR BIT 10
2166  011660  005061  000006                  CLR     6(R1)           ;CLEAR SEL 6
2167  011664  062701  000010          14$:    ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
2168  011670  022701  164000                  CMP     #164000,R1
2169  011674  001402                          BEQ     13$             ;BR IF DONE
2170  011676  000137  011264                  JMP     2$              ;JUMP IF NOT
2171  011702  005037  001306          13$:    CLR     DMACTV
2172  011706  005737  001310                  TST     DMNUM           ;WERE ANY DMC11'S FOUND AT ALL?
2173  011712  001423                          BEQ     5$              ;ERROR AUTO SIZER FOUND NO DMC11'S IN THIS SYS.
2174  011714  013701  001310                  MOV     DMNUM,R1
2175  011720  010137  001314                  MOV     R1,SAVNUM       ;SAVE NUMBER OF DEVICES
2176  011724  000241                  4$:     CLC
2177  011726  006137  001306                  ROL     DMACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
2178  011732  005237  001306                  INC     DMACTV          ;SET THE BIT
2179  011736  005301                          DEC     R1
2180  011740  001371                          BNE     4$              ;BR IF MORE TO GENERATE
2181  011742  012737  000006  000004          MOV     #6,@#4          ;RESTORE TRAP VECTOR
2182  011750  013737  001306  001312          MOV     DMACTV,SAVACT   ;SAVE ACTIVE REGISTER
2183  011756  000137  012010                  JMP     VECMAP          ;GO FIND THE VECTOR NOW.
2184  011762  104402  005760          5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DMC11'S FOUND.
2185  011766  005000                          CLR     R0              ;MAKE DATA LIGHTS ZERO
2186  011770  000000                          HALT                    ;STOP THE SHOW
2187  011772  000776                          BR      .-2             ;DISABLE CONT. SW.
2188  011774  012716  011664          6$:     MOV     #14$,(SP)       ;ENTERED BY NON-EXISTANT TIME-OUT.
2189  012000  000002                          RTI                     ;RETURN TO MAINSTREAM
2190
2191  012002  000001                  WHICH:  1
2192  012004     002     002                  .BYTE   2,2
2193  012006  001256                          TEMP5
2194
2195  012010  032737  000001  001236  VECMAP: BIT     #SW00,STRTSW
2196  012016  001114                          BNE     5$
2197  012020  012737  000340  000022          MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
2198  012026  012737  012202  000020          MOV     #4$,@#20        ;SET IOT TRAP VECTOR
2199  012034  012702  001500                  MOV     #DM.MAP,R2      ;SET SOFTWARE POINTER
2200  012040  012700  000300                  MOV     #300,R0         ;FLOATING VECTORS START HERE.
```

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2201  012044  012701  000302            MOV     #302,R1          ;PC OF IOT INSTR.
2202  012050  010120                1$: MOV     R1,(R0)+         ;START FILLING VECTOR AREA
2203  012052  012721  000004            MOV     #4,(R1)+         ;WITH .+2; IOT
2204  012056  022021                    CMP     (R0)+,(R1)+      ;ADD 2 TO R0 +R1
2205  012060  020127  001000            CMP     R1,#1000
2206  012064  101771                    BLOS    1$               ;BR IF MORE TO FILL
2207  012066  013737  001306  001246    MOV     DMACTV,TEMP1     ;STORE TEMPORALLY
2208  012074  006037  001246        2$: ROR     TEMP1            ;BRING OUT A BIT
2209  012100  103063                    BCC     5$               ;BR IF ALL DONE
2210  012102  012704  000012            MOV     #12,R4           ;R4 IS INDEX REGISTER
2211  012106  016437  012252  177776    MOV     BRLVL(R4),PS     ;SET PS TO 7
2212  012114  011201                    MOV     (R2),R1
2213  012116  012761  000200  000004    MOV     #200,4(R1)
2214  012124  012711  001000            MOV     #BIT9,(R1)       ;SET ROMI
2215  012130  012761  121111  000006    MOV     #121111,6(R1)    ;PUT INSTRUCTION IN PORT6
2216  012136  012711  001400            MOV     #BIT9!BIT8,(R1)  ;FORCE AN INTERRUPT
2217  012142  105200                7$: INCB    R0               ;STALL
2218  012144  001376                    BNE     .-2              ;FOR TIME TO INTERUPT
2219  012146  162704  000002            SUB     #2,R4            ;GET NEXT LOWEST PS LEVEL
2220  012152  001404                    BEQ     6$               ;BR IF R4 = 0
2221  012154  016437  012252  177776    MOV     BRLVL(R4),PS     ;MOVE NEXT LOWER LEVEL IN PS
2222  012162  000767                    BR      7$               ;BR TO DELAY
2223  012164  052762  005300  000002 6$: BIS     #5300,2(R2)      ;NO INTERUPT ASSUME 300 AT LEVEL 5 AND FIX DMC11 LATER
2224  012172  005011                3$: CLR     (R1)             ;CLEAR ROMI
2225  012174  062702  000010            ADD     #10,R2           ;POP SOFTWARE POINTER
2226  012200  000735                    BR      2$               ;KEEP GOING
2227  012202  051662  000002        4$: BIS     (SP),2(R2)       ;GET VECTOR ADDRESS
2228  012206  042762  000007  000002    BIC     #7,2(R2)         ;CLEAR JUNK
2229  012214  016405  012254            MOV     BRLVL+2(R4),R5   ;GET BR LEVEL OF DMC11
2230  012220  006305                    ASL     R5               ;SHIFT LEVEL 4 PLACES
2231  012222  006305                    ASL     R5               ;TO THE LEFT FOR THE
2232  012224  006305                    ASL     R5               ;STATUS TABLE
2233  012226  006305                    ASL     R5
2234  012230  042705  170777            BIC     #170777,R5       ;CLEAR UNWANTED BITS
2235  012234  050562  000002            BIS     R5,2(R2)         ;PUT BR LEVEL IN STATUS TABLE
2236  012240  022626                    CMP     (SP)+,(SP)+      ;POP IOT JUNK OFF STACK
2237  012242  012716  012172            MOV     #3$,(SP)         ;SET FOR RETURN
2238  012246  000002                    RTI
2239  012250  000207                5$: RTS     PC               ;ALL DONE WITH ''AUTO SIZING''
2240
2241  012252  000000            BRLVL:  0       ;LEVEL 0
2242  012254  000000                    0       ;LEVEL 0
2243  012256  000200                    200     ;LEVEL 4
2244  012260  000240                    240     ;LEVEL 5
2245  012262  000300                    300     ;LEVEL 6
2246  012264  000340                    340     ;LEVEL 7
2247
2248
2249  012266  105777  166712    INTTY:  TSTB    @TKCSR           ;WAIT FOR DONE
2250  012272  100375                    BPL     .-4
2251  012274  017703  166706            MOV     @TKDBR,R3        ;PUT CHAR IN R3
2252  012300  105777  166704            TSTB    @TPCSR           ;WAIT UNTIL PRINTER IS READY
2253  012304  100375                    BPL     .-4
2254  012306  010377  166700            MOV     R3,@TPDBR        ;ECHO CHAR
2255  012312  042703  000240            BIC     #BIT7!BIT5,R3    ;MASK OFF LOWER CASE
2256  012316  000207                    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
                                        ;--------------
012320  012737  000001  001226  TST1:   MOV     #1,TSTNO
012326  012737  012374  001216          MOV     #TST2,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
012334  005077  167044                  CLR     @DMCSR          ;CLEAR SEL0
012340  012702  000011                  MOV     #11,R2          ;SAVE R2 FOR TYPEOUT
012344  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
012346  021224                          021004!<20*11>          ;PORT4 LINE UNIT REG 11
012350  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
012354  042704  000054                  BIC     #54,R4          ;CLEAR UNKNOWN BITS
012360  012705  000020                  MOV     #20,R5          ;PUT 'EXPECTED' IN R5
012364  120504                          CMPB    R5,R4           ;IS OUT READY SET?
012366  001401                          BEQ     1$              ;BR IF YES
012370  104002                          HLT     2               ;ERROR IN LU 11
012372  104400                  1$:     SCOPE                   ;SCOPE THIS TEST

                                        ;***************************** TEST 2 *****************************
                                        ;*IN CONTROL REGISTER READ/ONLY TEST
                                        ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
                                        ;*BITS ARE IN THE CORRECT STATE
                                        ;:***********************************************************************

                                        ;  TEST 2
                                        ;--------------
012374  012737  000002  001226  TST2:   MOV     #2,TSTNO
012402  012737  012442  001216          MOV     #TST3,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
012410  012702  000012                  MOV     #12,R2          ;SAVE R2 FOR TYPEOUT
012414  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
012416  021244                          021004!<20*12>          ;PORT4 LINE UNIT REG 12
012420  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
012424  042704  000017                  BIC     #17,R4          ;CLEAR UNKNOWN BITS
012430  005005                          CLR     R5              ;PUT 'EXPECTED' IN R5
012432  120504                          CMPB    R5,R4           ;ARE ALL BITS CLEARED?
012434  001401                          BEQ     1$              ;BR IF YES
012436  104002                          HLT     2               ;ERROR IN LU 12
012440  104400                  1$:     SCOPE                   ;SCOPE THIS TEST


                                        ;***************************** TEST 3 *****************************
                                        ;*MODEM CONTROL REGISTER READ/ONLY TEST
                                        ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
                                        ;*BITS ARE IN THE CORRECT STATE
                                        ;:***********************************************************************
```

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                                                ;  TEST 3
                                                ;--------------
012442  012737  000003  001226  TST3:   MOV     #3,TSTNO
012450  012737  012514  001216          MOV     #TST4,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
012456  104412                          MSTCLR                  ;MASTER CLEAR DMC11
012460  012702  000013                  MOV     #13,R2          ;SAVE R2 FOR TYPEOUT
012464  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
012466  021264                          021004!<20*13>          ;PORT4 LINE UNIT REG 13
012470  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
012474  042704  000213                  BIC     #213,R4         ;CLEAR UNKNOWN BITS
012500  012705  000100                  MOV     #100,R5         ;PUT 'EXPECTED' IN R5
012504  120504                          CMPB    R5,R4           ;ARE RING, DTR,  AND MODEM READY SET?
012506  001401                          BEQ     1$              ;BR IF YES
012510  104002                          HLT     2               ;ERROR IN LU 13
012512  104400                  $:      SCOPE                   ;SCOPE THIS TEST

                                                ;************************** TEST 4 **************************
                                                ;*MAINTENANCE REGISTER READ/ONLY TEST
                                                ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
                                                ;*BITS ARE IN THE CORRECT STATE
                                                ;:*********************************************************************

                                                ;  TEST 4
                                                ;--------------
012514  012737  000004  001226  TST4:   MOV     #4,TSTNO
012522  012737  012616  001216          MOV     #TST5,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
012530  104412                          MSTCLR                  ;MASTER CLEAR DMC11
012532  012702  000017                  MOV     #17,R2          ;SAVE R2 FOR TYPEOUT
012536  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
012540  021364                          021004!<20*17>          ;PORT4 LINE UNIT REG 17
012542  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
012546  042704  000206                  BIC     #206,R4         ;CLEAR UNKNOWN BITS
012552  012705  000051                  MOV     #51,R5          ;PUT 'EXPECTED' IN R5
012556  032737  020000  001366          BIT     #BIT13,STAT1    ;IS LU AN M8202 OR M8201?
012564  001004                          BNE     2$              ;BR IF M8202
012566  032737  040000  001366          BIT     #BIT14,STAT1    ;CONNECTOR???
012574  001004                          BNE     3$              ;BR IF M8201 WITH CONNECTOR
012576  042704  000040          2$:     BIC     #40,R4          ;MASK OFF SI BIT IF M8202 OR M8201, NO CONNECTOR
012602  042705  000040                  BIC     #BIT5,R5        ;SI BIT IS UNKNOWN
012606                          3$:
012606  120504                          CMPB    R5,R4           ;ARE SI AND ICIR SET?
012610  001401                          BEQ     1$              ;BR IF YES
012612  104002                          HLT     2               ;ERROR IN LU 17
012614  104400                  1$:     SCOPE                   ;SCOPE THIS TEST


                                                ;************************** TEST 5 **************************
                                                ;*LINE UNIT REGISTER WRITE/READ TEST
                                                ;*SET BIT5 IN LU REGISTER 12, VERIFY IT IS SET
                                                ;*CLEAR BIT5 IN LU REGISTER 12, VERIFY IT IS CLEAR
                                                ;:*********.***********************************************************
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2369                                                    ;  TEST 5
2370                                                    ;--------------
2371  012616  012737  000005  001226  TST5:   MOV     #5,TSTNO
2372  012624  012737  012756  001216          MOV     #TST6,NEXT
2373  012632  012737  012646  001220          MOV     #1$,LOCK
2374                                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
2375  012640  104412                          MSTCLR                   ;MASTER CLEAR DMC11
2376  012642  012702  000012                  MOV     #12,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
2377  012646  012761  000040  000004  1$:     MOV     #40,4(R1)        ;LOAD PORT4
2378  012654  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2379  012656  122112                          122112                   ;SET BIT5 IN LU-12
2380  012660  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2381  012662  021245                          021245                   ;READ LU-12
2382  012664  012705  000040                  MOV     #40,R5           ;PUT 'EXPECTED'' IN R5
2383  012670  116104  000005                  MOVB    5(R1),R4         ;PUT 'FOUND'' IN R4
2384  012674  042704  000337                  BIC     #337,R4          ;CLEAR UNWANTED BITS
2385  012700  120504                          CMPB    R5,R4            ;IS BIT5 SET?
2386  012702  001401                          BEQ     2$               ;BR IF YES
2387  012704  104003                          HLT     3                ;ERROR, BIT 5 IS NOT SET
2388  012706  104401                  2$:     SCOP1                    ;SCOPE SUBTEST (SW09=1)
2389  012710  012737  012716  001220          MOV     #3$,LOCK         ;NEW SCOP1
2390  012716  005061  000004          3$:     CLR     4(R1)            ;LOAD PORT4
2391  012722  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2392  012724  122112                          122112                   ;CLEAR BIT 5 IN LU-12
2393  012726  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2394  012730  021245                          021245                   ;READ LU-12
2395  012732  005005                          CLR     R5               ;PUT 'EXPECTED'' IN R5
2396  012734  116104  000005                  MOVB    5(R1),R4         ;PUT 'FOUND'' IN R4
2397  012740  042704  000337                  BIC     #337,R4          ;CLEAR UNWANTED BITS
2398  012744  120504                          CMPB    R5,R4            ;IS BIT5 CLEAR?
2399  012746  001401                          BEQ     4$               ;BR IF YES
2400  012750  104003                          HLT     3                ;ERROR, BIT5 IS NOT CLEAR
2401  012752  104401                  4$:     SCOP1                    ;SCOPE SUBTEST (SW09=1)
2402  012754  104400                          SCOPE                    ;SCOPE THIS TEST
2403
2404
2405                                                    ;*************************** TEST 6 ****************************
2406                                                    ;*LINE UNIT REGISTER WRITE/READ TEST
2407                                                    ;*SET BIT1 IN LU REGISTER 17, VERIFY IT IS SET
2408                                                    ;*CLEAR BIT1 IN LU REGISTER 17, VERIFY IT IS CLEAR
2409                                                    ;:************************************************************************
2410
2411                                                    ;  TEST 6
2412                                                    ;--------------
2413  012756  012737  000006  001226  TST6:   MOV     #6,TSTNO
2414  012764  012737  013116  001216          MOV     #TST7,NEXT
2415  012772  012737  013006  001220          MOV     #1$,LOCK
2416                                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
2417  013000  104412                          MSTCLR                   ;MASTER CLEAR DMC11
2418  013002  012702  000017                  MOV     #17,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
2419  013006  012761  000001  000004  1$:     MOV     #1,4(R1)         ;LOAD PORT4
2420  013014  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2421  013016  122117                          122117                   ;SET BIT1 IN LU-17
2422  013020  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2423  013022  021365                          021365                   ;READ LU-17
2424  013024  012705  000001                  MOV     #1,R5            ;PUT 'EXPECTED'' IN R5
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```
2425  013030  116104  000005              MOVB    5(R1),R4        ;PUT 'FOUND' IN R4
2426  013034  042704  000376              BIC     #376,R4         ;CLEAR UNWANTED BITS
2427  013040  120504                      CMPB    R5,R4           ;IS BIT1 SET?
2428  013042  001401                      BEQ     2$              ;BR IF YES
2429  013044  104003                      HLT     3               ;ERROR, BIT 1 IS NOT SET
2430  013046  104401              2$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
2431  013050  012737  013056  001220      MOV     #3$,LOCK        ;NEW SCOP1
2432  013056  005061  000004      3$:     CLR     4(R1)           ;LOAD PORT4
2433  013062  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2434  013064  122117                      122117                  ;CLEAR BIT 1 IN LU-17
2435  013066  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2436  013070  021365                      021365                  ;READ LU-17
2437  013072  005005                      CLR     R5              ;PUT 'EXPECTED' IN R5
2438  013074  116104  000005              MOVB    5(R1),R4        ;PUT 'FOUND' IN R4
2439  013100  042704  000376              BIC     #376,R4         ;CLEAR UNWANTED BITS
2440  013104  120504                      CMPB    R5,R4           ;IS BIT1 CLEAR?
2441  013106  001401                      BEQ     4$              ;BR IF YES
2442  013110  104003                      HLT     3               ;ERROR, BIT1 IS NOT CLEAR
2443  013112  104401              4$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
2444  013114  104400                      SCOPE                   ;SCOPE THIS TEST
2445
2446
2447                                      ;***************************** TEST 7 ****************************
2448                                      ;*LINE UNIT REGISTER WRITE/READ TEST
2449                                      ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 13
2450                                      ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 13
2451                                      ;;*********************************************************************
2452
2453                                      ;  TEST 7
2454                                      ;--------------
2455  013116  012737  000007  001226  TST7:  MOV     #7,TSTNO
2456  013124  012737  013326  001216      MOV     #TST10,NEXT
2457  013132  012737  013152  001220      MOV     #64$,LOCK
2458
2459  013140  104412                      MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
2460  013142  012702  000013              MOV     #13,R2          ;MASTER CLEAR DMC11
2461  013146  012700  000001              MOV     #1,R0           ;SAVE REGISTER ADDRESS FOR TYPEOUT
2462  013152                      64$:                            ;START WITH BIT 0
2463  013152  010061  000004              MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2464  013156  042761  000257  000004      BIC     #257,4(R1)      ;CLEAR UNWANTED BITS
2465  013164  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2466  013166  122113                      122100!13               ;MOV DATA TO IBUS REGISTER 13
2467  013170  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2468  013172  021265                      21005!<13*20>           ;READ FROM IBUS REGISTER 13
2469  013174  010005                      MOV     R0,R5           ;PUT EXPECTED IN R5
2470  013176  042705  000257              BIC     #257,R5         ;CLEAR UNWANTED BITS
2471  013202  116104  000005              MOVB    5(R1),R4        ;PUT 'FOUND' INTO R4
2472  013206  042704  000257              BIC     #257,R4         ;CLEAR UNWANTED BITS
2473  013212  120504                      CMPB    R5,R4           ;DATA CORRECT?
2474  013214  001401                      BEQ     65$             ;BR IF YES
2475  013216  104003                      HLT     3               ;ERROR
2476  013220  104401              65$:    SCOP1                   ;SW09=1?
2477  013222  000241                      CLC                     ;CLEAR CARRY
2478  013224  106100                      ROLB    R0              ;SHIFT BIT IN R0
2479  013226  001351                      BNE     64$             ;IF R0=0 THEN DONE
2480  013230  012737  013244  001220      MOV     #67$,LOCK       ;NEW SCOP1
```

```
2481  013236  012700  000001              MOV     #1,R0           ;START WITH BIT 0
2482  013242  005100                69$:  COM     R0              ;CHANGE TO FLOATING ZERO
2483  013244                        67$:
2484  013244  010061  000004              MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2485  013250  042761  000257  000004      BIC     #257,4(R1)      ;CLEAR UNWANTED BITS
2486  013256  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2487  013260  122113                      122100!13               ;MOV DATA TO IBUS REGISTER 13
2488  013262  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2489  013264  021265                      21005!<13*20>           ;READ FROM IBUS REGISTER 13
2490  013266  010005                      MOV     R0,R5           ;PUT EXPECTED IN R5
2491  013270  042705  000257              BIC     #257,R5         ;CLEAR UNWANTED BITS
2492  013274  116104  000005              MOVB    5(R1),R4        ;PUT 'FOUND' INTO R4
2493  013300  042704  000257              BIC     #257,R4         ;CLEAR UNWANTED BITS
2494  013304  120504                      CMPB    R5,R4           ;DATA CORRECT?
2495  013306  001401                      BEQ     68$             ;BR IF YES
2496  013310  104003                      HLT     3               ;ERROR
2497  013312  104401                68$:  SCOP1                   ;SW09=1?
2498  013314  005100                      COM     R0              ;CHANGE TO FLOATING 1
2499  013316  000241                      CLC                     ;CLEAR CARRY
2500  013320  106100                      ROLB    R0              ;SHIFT BIT IN R0
2501  013322  001347                      BNE     69$             ;IF R0=0 THEN DONE
2502  013324  104400                      SCOPE                   ;SCOPE THIS TEST
2503
2504
2505                                      ;***************************** TEST 10 *****************************
2506                                      ;*LINE UNIT REGISTER WRITE/READ TEST
2507                                      ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 14
2508                                      ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 14
2509                                      ;;*************************************************************************
2510
2511                                      ;  TEST 10
2512                                      ;--------------
2513  013326  012737  000010  001226  TST10:  MOV     #10,TSTNO
2514  013334  012737  013502  001216          MOV     #TST11,NEXT
2515  013342  012737  013362  001220          MOV     #64$,LOCK
2516                                                          ;R1 CONTAINS BASE DMC11 ADDRESS
2517  013350  104412                      MSTCLR                  ;MASTER CLEAR DMC11
2518  013352  012702  000014              MOV     #14,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
2519  013356  012700  000001              MOV     #1,R0           ;START WITH BIT 0
2520  013362                        64$:
2521  013362  010061  000004              MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2522  013366  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2523  013370  122114                      122100!14               ;MOV DATA TO IBUS REGISTER 14
2524  013372  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2525  013374  021305                      21005!<14*20>           ;READ FROM IBUS REGISTER 14
2526  013376  010005                      MOV     R0,R5           ;PUT EXPECTED IN R5
2527  013400  116104  000005              MOVB    5(R1),R4        ;PUT 'FOUND' INTO R4
2528  013404  120504                      CMPB    R5,R4           ;DATA CORRECT?
2529  013406  001401                      BEQ     65$             ;BR IF YES
2530  013410  104003                      HLT     3               ;ERROR
2531  013412  104401                65$:  SCOP1                   ;SW09=1?
2532  013414  000241                      CLC                     ;CLEAR CARRY
2533  013416  106100                      ROLB    R0              ;SHIFT BIT IN R0
2534  013420  001360                      BNE     64$             ;IF R0=0 THEN DONE
2535  013422  012737  013436  001220      MOV     #67$,LOCK       ;NEW SCOP1
2536  013430  012700  000001              MOV     #1,R0           ;START WITH BIT 0
```

```
2537  013434  005100                  69$:    COM     R0              ;CHANGE TO FLOATING ZERO
2538  013436                          67$:
2539  013436  010061  000004                MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
2540  013442  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2541  013444  122114                        122100!14               ;MOV DATA TO IBUS REGISTER 14
2542  013446  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2543  013450  021305                        21005!<14*20>           ;READ FROM IBUS REGISTER 14
2544  013452  010005                        MOV     R0,R5           ;PUT EXPECTED IN R5
2545  013454  116104  000005                MOVB    5(R1),R4        ;PUT 'FOUND' INTO R4
2546  013460  120504                        CMPB    R5,R4           ;DATA CORRECT?
2547  013462  001401                        BEQ     68$             ;BR IF YES
2548  013464  104003                        HLT     3               ;ERROR
2549  013466  104401                  68$:  SCOP1                   ;SW09=1?
2550  013470  005100                        COM     R0              ;CHANGE TO FLOATING 1
2551  013472  000241                        CLC                     ;CLEAR CARRY
2552  013474  106100                        ROLB    R0              ;SHIFT BIT IN R0
2553  013476  001356                        BNE     69$             ;IF R0=0 THEN DONE
2554  013500  104400                        SCOPE                   ;SCOPE THIS TEST
2555
2556
2557                                        ;***************************** TEST 11 *****************************
2558                                        ;*SWITCH PAC TEST
2559                                        ;*THIS TEST READS SWITCH PAC#1
2560                                        ;*THIS SWITCH PAC CONTAINS THE DDCMP LINE #
2561                                        ;:*************************************************************************
2562
2563                                        ;  TEST 11
2564                                        ;--------------
2565  013502  012737  000011  001226  TST11:  MOV     #11,TSTNO
2566  013510  012737  013544  001216          MOV     #TST12,NEXT
2567                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
2568  013516  104412                        MSTCLR                  ;MASTER CLEAR DMC11
2569  013520  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2570  013522  021324                        021324                  ;PORT4_LU15
2571  013524  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
2572  013530  113705  001370                MOVB    STAT2,R5        ;PUT 'EXPECTED' IN R5
2573  013534  120504                        CMPB    R5,R4           ;SW OK?
2574  013536  001401                        BEQ     1$              ;BR IF YES
2575  013540  104031                        HLT     31              ;ERROR, SWITCH PAC READ ERROR
2576  013542  104400                  1$:   SCOPE                   ;SCOPE THIS TEST
2577
2578
2579                                        ;***************************** TEST 12 *****************************
2580                                        ;*SWITCH PAC TEST
2581                                        ;*THIS TEST READS SWITCH PAC#2
2582                                        ;*THIS SWITCH PAC CONTAINS THE BM873 BOOT ADD
2583                                        ;:*************************************************************************
2584
2585                                        ;  TEST 12
2586                                        ;--------------
2587  013544  012737  000012  001226  TST12:  MOV     #12,TSTNO
2588  013552  012737  013606  001216          MOV     #TST13,NEXT
2589                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
2590  013560  104412                        MSTCLR                  ;MASTER CLEAR DMC11
2591  013562  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2592  013564  021344                        021344                  ;PORT4_LU16
```

```
2593  013566  016104  000004              MOV     4(R1),R4        ;PUT 'FOUND' IN R4
2594  013572  113705  001371              MOVB    STAT2+1,R5      ;PUT 'EXPECTED' IN R5
2595  013576  120504                      CMPB    R5,R4           ;SW OK?
2596  013600  001401                      BEQ     1$              ;BR IF YES
2597  013602  104031                      HLT     31              ;ERROR, SWITCH PAC READ ERROR
2598  013604  104400              1$:     SCOPE                   ;SCOPE THIS TEST
2599
2600
2601                                      ;***************************** TEST 13 *****************************
2602                                      ;*LINE UNIT CLOCK TEST
2603                                      ;*THIS TEST VERIFYS THAT THE LU INTERNAL CLOCK
2604                                      ;*(BIT 1 IN LU-17) IS WORKING
2605                                      ;:*************************************************************************
2606
2607                                      ;  TEST 13
2608                                      ;--------------
2609  013606  012737  000013  001226  TST13:  MOV     #13,TSTNO
2610  013614  012737  013706  001216          MOV     #TST14,NEXT
2611                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
2612  013622  104412                      MSTCLR                  ;MASTER CLEAR DMC11
2613  013624  005037  001416              CLR     TEMP            ;PREPARE FOR DELAY
2614  013630                      1$:
2615  013630  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2616  013632  021364                      021364                  ;PORT4 LU-17
2617  013634  032761  000002  000004      BIT     #2,4(R1)        ;IS CLOCK BIT SET?
2618  013642  001004                      BNE     2$              ;BR IF YES
2619  013644  005237  001416              INC     TEMP            ;DELAY
2620  013650  001367                      BNE     1$      ;DELAY FINISHED?
2621  013652  104004                      HLT     4               ;ERROR BIT IS STUCK CLEAR
2622  013654  005037  001416      2$:     CLR     TEMP            ;PREPARE FOR DELAY
2623  013660                      3$:
2624  013660  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2625  013662  021364                      021364                  ;PORT4 LU-17
2626  013664  032761  000002  000004      BIT     #2,4(R1)        ;IS CLOCK BIT CLEAR?
2627  013672  001404                      BEQ     4$              ;BR IF YES
2628  013674  005237  001416              INC     TEMP            ;DELAY
2629  013700  001367                      BNE     3$              ;BR IF DELAY NOT DONE
2630  013702  104004                      HLT     4               ;ERROR BIT IS STUCK SET
2631  013704  104400              4$:     SCOPE
2632
2633
2634                                      ;***************************** TEST 14 *****************************
2635                                      ;*OUT DATA SILO TEST
2636                                      ;*SET SOM AND LOAD OUT DATA SILO
2637                                      ;*VERIFY THAT OCOR SET, INDICATING THAT THE
2638                                      ;*CHARACTER IS AT THE BOTTOM OF THE OUT SILO
2639                                      ;:*************************************************************************
2640
2641                                      ;  TEST 14
2642                                      ;--------------
2643  013706  012737  000014  001226  TST14:  MOV     #14,TSTNO
2644  013714  012737  014006  001216          MOV     #TST15,NEXT
2645                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
2646  013722  104412                      MSTCLR                  ;MASTER CLEAR DMC11
2647  013724  012711  004000              MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2648  013730  012761  000001  000004      MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
```

```
2649  013736  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2650  013740  122111                          122111                  ;SET SOM
2651  013742  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2652  013744  122110                          122110                  ;LOAD OUT DATA SILO
2653  013746  104416  000002                  TIMER,  2               ;WAIT FOR OCOR
2654  013752  012702  000017                  MOV     #17,R2          ;SAVE ADDRESS FOR TYPEOUT
2655  013756  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2656  013760  021364                          021364                  ;PORT4 LU 17
2657  013762  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
2658  013766  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
2659  013772  012705  000020                  MOV     #20,R5          ;PUT 'EXPECTED' IN R5
2660  013776  120504                          CMPB    R5,R4           ;IS OCOR SET?
2661  014000  001401                          BEQ     1$              ;BR IF YES
2662  014002  104005                          HLT     5
2663  014004                          1$:
2664  014004  104400                          SCOPE                   ;SCOPE THIS TEST
2665
2666
2667                                          ;***************************** TEST 15 *****************************
2668                                          ;*DDCMP TEST OF RTS AND OUT ACTIVE
2669                                          ;*SET SOM AND LOAD OUT DATA SILO
2670                                          ;*SINGLE STEP 2 DATA CLOCKS, VERIFY
2671                                          ;*THAT RTS AND ACTIVE ARE SET
2672                                          ;;*************************************************************************
2673
2674                                          ;  TEST 15
2675                                          ;--------------
2676  014006  012737  000015  001226  TST15:  MOV     #15,TSTNO
2677  014014  012737  014144  001216          MOV     #TST16,NEXT
2678
2679  014022  104412                          MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
2680  014024  012711  004000                  MOV     #BIT11,(R1)     ;MASTER CLEAR DMC11
2681  014030  012761  000001  000004          MOV     #1,4(R1)        ;SET LINE UNIT LOOP
2682  014036  104414                          ROMCLK                  ;LOAD PORT4 WITH BIT0
2683  014040  122111                          122111                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2684  014042  104414                          ROMCLK                  ;SET SOM
2685  014044  122110                          122110                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2686  014046  004737  026374                  JSR     PC,OCOR         ;LOAD OUT DATA SILO
2687  014052  104415  000002                  DATACLK,        2       ;WAIT FOR OCOR
2688  014056  012702  000011                  MOV     #11,R2          ;CLOCK DATA FOUR TIMES
2689  014062  104414                          ROMCLK                  ;SAVE ADDRESS FOR TYPEOUT
2690  014064  021224                          021224                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2691  014066  016104  000004                  MOV     4(R1),R4        ;PORT4 LU 11
2692  014072  042704  000257                  BIC     #257,R4         ;PUT 'FOUND' IN R4
2693  014076  012705  000120                  MOV     #120,R5         ;CLEAR UNWANTED BITS
2694  014102  120504                          CMPB    R5,R4           ;PUT 'EXPECTED' IN R5
2695  014104  001401                          BEQ     1$              ;IS ACTIVE SET?
2696  014106  104005                          HLT     5               ;BR IF YES
2697  014110                          1$:
2698  014110  012702  000013                  MOV     #13,R2          ;SAVE ADDRESS FOR TYPEOUT
2699  014114  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2700  014116  021264                          021264                  ;PORT4 LU 13
2701  014120  016104  000004                  MOV     4(R1),R4        ;PUT EXPECTED IN R4
2702  014124  042704  000337                  BIC     #337,R4         ;CLEAR UNWANTED BITS
2703  014130  012705  000040                  MOV     #BIT5,R5        ;PUT 'EXPECTED' IN R5, RTS SHOULD BE SET
2704  014134  120504                          CMPB    R5,R4           ;IS RTS OK?
```

```
2705  014136  001401                        BEQ     2$              ;BR IF YES
2706  014140  104005                        HLT     5               ;RTS ERROR
2707  014142                          2$:
2708  014142  104400                        SCOPE                   ;SCOPE THIS TEST
2709
2710
2711                                        ;*************************** TEST 16 ****************************
2712                                        ;*TEST OF OUT CLEAR
2713                                        ;*SET SOM AND LOAD OUT DATA SILO
2714                                        ;*SINGLE STEP DATA CLOCK, SET OUT CLEAR
2715                                        ;*VERIFY THAT OCOR,RTS, AND ACTIVE ARE CLEARED
2716                                        ;:************************************************************************
2717
2718                                        ;  TEST 16
2719                                        ;--------------
2720  014144  012737  000016  001226  TST16: MOV     #16,TSTNO
2721  014152  012737  014342  001216        MOV     #TST17,NEXT
2722                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
2723  014160  104412                        MSTCLR                  ;MASTER CLEAR DMC11
2724  014162  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2725  014166  012761  000001  000004        MOV     #1,4(R1)        ;LOAD PORT4 WITH BITO
2726  014174  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2727  014176  122111                        122111                  ;SET SOM
2728  014200  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2729  014202  122110                        122110                  ;LOAD OUT DATA SILO
2730  014204  004737  026374                JSR     PC,OCOR         ;WAIT FOR OCOR
2731  014210  104415  000002                DATACLK,        2       ;CLOCK DATA FOUR TIMES
2732  014214  012761  000200  000004        MOV     #BIT7,4(R1)     ;SET BIT7 IN PORT4
2733  014222  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2734  014224  122111                        122111                  ;SET OUT CLEAR
2735  014226  104415  000001                DATACLK,        1       ;GIVE A TICK TO CLEAR RTS
2736  014232  012702  000017                MOV     #17,R2          ;SAVE ADDRESS FOR TYPEOUT
2737  014236  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2738  014240  021364                        021364                  ;PORT4 LU 17
2739  014242  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
2740  014246  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
2741  014252  005005                        CLR     R5              ;PUT 'EXPECTED' IN R5
2742  014254  120504                        CMPB    R5,R4           ;IS OCOR CLEARED?
2743  014256  001401                        BEQ     1$              ;BR IF YES
2744  014260  104005                        HLT     5
2745  014262                          1$:
2746  014262  012702  000013                MOV     #13,R2          ;SAVE ADDRESS FOR TYPEOUT
2747  014266  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2748  014270  021264                        021264                  ;PORT4 LU 13
2749  014272  016104  000004                MOV     4(R1),R4        ;PUT EXPECTED IN R4
2750  014276  042704  000337                BIC     #337,R4         ;CLEAR UNWANTED BITS
2751  014302  005005                        CLR     R5              ;PUT 'EXPECTED' IN R5, RTS SHOULD BE CLEARED
2752  014304  120504                        CMPB    R5,R4           ;IS RTS OK?
2753  014306  001401                        BEQ     2$              ;BR IF YES
2754  014310  104005                        HLT     5               ;RTS ERROR
2755  014312                          2$:
2756  014312  012702  000011                MOV     #11,R2          ;SAVE ADDRESS FOR TYPEOUT
2757  014316  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2758  014320  021224                        021224                  ;PORT4 LU11
2759  014322  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
2760  014326  012705  000020                MOV     #BIT4,R5        ;ONLY OUT READY SHOULD BE SET
```

```
2761  014332  120504                        CMPB    R5,R4           ;IS ACTIVE CLEAR?
2762  014334  001401                        BEQ     3$              ;BR IF YES
2763  014336  104005                        HLT     5               ;ERROR ACTIVE NOT CLEARED
2764  014340                          3$:
2765  014340  104400                        SCOPE                   ;SCOPE THIS TEST
2766
2767
2768                                        ;***************************** TEST 17 *****************************
2769                                        ;*DDCMP TRANSMITTER TEST
2770                                        ;*SINGLE CLOCK THE CHARACTER 0
2771                                        ;*VERIFY EACH BIT POSITION AS IT
2772                                        ;*PASSES THE BIT WINDOW (SI BIT)
2773                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2774                                        ;*******************************************************************
2775
2776                                        ;  TEST 17
2777                                        ;--------------
2778  014342  012737  000017  001226  TST17: MOV     #17,TSTNO
2779  014350  012737  014524  001216        MOV     #TST20,NEXT
2780                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
2781  014356  104412                        MSTCLR                  ;MASTER CLEAR DMC11
2782  014360  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
2783  014364  004737  026526                JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
2784  014370  012761  000001  000004        MOV     #1,4(R1)        ;SET BIT0 IN PORT4
2785  014376  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2786  014400  122111                        122111                  ;SET SOM!
2787  014402  012705  000000                MOV     #0,R5   ;LOAD CHARACTER IN R5 FOR TYPEOUT
2788  014406  004737  026526                JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
2789  014412  010561  000004                MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
2790  014416  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2791  014420  122110                        122110                  ;LOAD OUT DATA
2792  014422  004737  026374                JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
2793  014426  005003                        CLR     R3              ;CLEAR BIT COUNTER
2794  014430  010502                        MOV     R5,R2           ;LOAD CHARACTER IN R2
2795  014432  104415  000002                DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
2796  014436  104415  000001          1$:   DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
2797  014442  106002                        RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
2798  014444  103005                        BCC     2$              ;BR IF CARRY CLEAR
2799  014446  004737  026342                JSR     PC,GETSI        ;GET THE WINDOW
2800  014452  103406                        BCS     3$              ;BR IF BIT IS A MARK
2801  014454  104006                        HLT     6               ;ERROR BIT WAS A SPACE
2802  014456  000404                        BR      3$              ;CONTINE WITH TEST
2803  014460  004737  026342          2$:   JSR     PC,GETSI        ;GET THE WINDOW
2804  014464  103001                        BCC     3$              ;BR IF BIT IS A SPACE
2805  014466  104006                        HLT     6               ;ERROR BIT WAS A MARK
2806  014470                          3$:
2807  014470  005203                        INC     R3              ;NEXT BIT
2808  014472  022703  000010                CMP     #10,R3          ;DONE YET?
2809  014476  001357                        BNE     1$              ;BR IF NO
2810  014500  104415  000014                DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
2811  014504  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2812  014506  021264                        021264                  ;PORT4 LU-13
2813  014510  032761  000040  000004        BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
2814  014516  001401                        BEQ     4$              ;BR IF YES
2815  014520  104034                        HLT     34              ;ERROR, RTS NOT CLEAR
2816  014522  104400                  4$:   SCOPE                   ;SCOPE THIS TEST
```

```
                                        ;***************************** TEST 20 *****************************
                                        ;*DDCMP TRANSMITTER TEST
                                        ;*SINGLE CLOCK THE CHARACTER 125
                                        ;*VERIFY EACH BIT POSITION AS IT
                                        ;*PASSES THE BIT WINDOW (SI BIT)
                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
                                        ;*********************************************************************

                                        ;  TEST 20
                                        ;--------------
014524  012737  000020  001226  TST20:  MOV     #20,TSTNO
014532  012737  014706  001216          MOV     #TST21,NEXT
                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
014540  104412                          MSTCLR          ;MASTER CLEAR DMC11
014542  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
014546  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
014552  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
014560  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014562  122111                          122111          ;SET SOM!
014564  012705  000125                  MOV     #125,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
014570  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
014574  010561  000004                  MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
014600  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014602  122110                          122110          ;LOAD OUT DATA
014604  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
014610  005003                          CLR     R3              ;CLEAR BIT COUNTER
014612  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
014614  104415  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
014620  104415  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
014624  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
014626  103005                          BCC     2$              ;BR IF CARRY CLEAR
014630  004737  026342                  JSR     PC,GETSI        ;GET THE WINDOW
014634  103406                          BCS     3$              ;BR IF BIT IS A MARK
014636  104006                          HLT     6               ;ERROR BIT WAS A SPACE
014640  000404                          BR      3$              ;CONTINE WITH TEST
014642  004737  026342          2$:     JSR     PC,GETSI        ;GET THE WINDOW
014646  103001                          BCC     3$              ;BR IF BIT IS A SPACE
014650  104006                          HLT     6               ;ERROR BIT WAS A MARK
014652                          3$:
014652  005203                          INC     R3              ;NEXT BIT
014654  022703  000010                  CMP     #10,R3          ;DONE YET?
014660  001357                          BNE     1$              ;BR IF NO
014662  104415  000014                  DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
014666  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014670  021264                          021264          ;PORT4 LU-13
014672  032761  000040  000004          BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
014700  001401                          BEQ     4$              ;BR IF YES
014702  104034                          HLT     34              ;ERROR, RTS NOT CLEAR
014704  104400                  4$:     SCOPE                   ;SCOPE THIS TEST

                                        ;***************************** TEST 21 *****************************
                                        ;*DDCMP TRANSMITTER TEST
                                        ;*SINGLE CLOCK THE CHARACTER 252
```

```
2873                                        ;*VERIFY EACH BIT POSITION AS IT
2874                                        ;*PASSES THE BIT WINDOW (SI BIT)
2875                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2876                                        ;:**********************************************************************
2877
2878                                        ;  TEST 21
2879                                        ;--------------
2880  014706  012737  000021  001226  TST21: MOV     #21,TSTNO
2881  014714  012737  015070  001216        MOV     #TST22,NEXT
2882                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
2883  014722  104412                       MSTCLR                    ;MASTER CLEAR DMC11
2884  014724  012711  004000               MOV     #BIT11,(R1)       ;SET LINE UNIT LOOP
2885  014730  004737  026526               JSR     PC,OUTRDY         ;WAIT FOR OUT-READY
2886  014734  012761  000001  000004       MOV     #1,4(R1)          ;SET BIT0 IN PORT4
2887  014742  104414                       ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2888  014744  122111                       122111                    ;SET SOM!
2889  014746  012705  000252               MOV     #252,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
2890  014752  004737  026526               JSR     PC,OUTRDY         ;WAIT FOR OUT-READY
2891  014756  010561  000004               MOV     R5,4(R1)          ;LOAD PORT4 WITH CHARACTER
2892  014762  104414                       ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2893  014764  122110                       122110                    ;LOAD OUT DATA
2894  014766  004737  026374               JSR     PC,OCOR           ;WAIT FOR OCOR TO SET
2895  014772  005003                       CLR     R3                ;CLEAR BIT COUNTER
2896  014774  010502                       MOV     R5,R2             ;LOAD CHARACTER IN R2
2897  014776  104415  000002               DATACLK,        2         ;2 TICKS TO SET UP TRANSMITTER
2898  015002  104415  000001         1$:   DATACLK,        1         ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
2899  015006  106002                       RORB    R2                ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
2900  015010  103005                       BCC     2$                ;BR IF CARRY CLEAR
2901  015012  004737  026342               JSR     PC,GETSI          ;GET THE WINDOW
2902  015016  103406                       BCS     3$                ;BR IF BIT IS A MARK
2903  015020  104006                       HLT     6                 ;ERROR BIT WAS A SPACE
2904  015022  000404                       BR      3$                ;CONTINE WITH TEST
2905  015024  004737  026342         2$:   JSR     PC,GETSI          ;GET THE WINDOW
2906  015030  103001                       BCC     3$                ;BR IF BIT IS A SPACE
2907  015032  104006                       HLT     6                 ;ERROR BIT WAS A MARK
2908  015034                         3$:
2909  015034  005203                       INC     R3                ;NEXT BIT
2910  015036  022703  000010               CMP     #10,R3            ;DONE YET?
2911  015042  001357                       BNE     1$                ;BR IF NO
2912  015044  104415  000014               DATACLK,        14        ;CLOCK TRANSMITTER 14 MORE TICKS
2913  015050  104414                       ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2914  015052  021264                       021264                    ;PORT4 LU-13
2915  015054  032761  000040  000004       BIT     #BIT5,4(R1)       ;RTS SHOULD BE CLEAR NOW
2916  015062  001401                       BEQ     4$                ;BR IF YES
2917  015064  104034                       HLT     34                ;ERROR, RTS NOT CLEAR
2918  015066  104400                 4$:   SCOPE                     ;SCOPE THIS TEST
2919
2920
2921                                        ;********************** TEST 22 ****************************
2922                                        ;*DDCMP TRANSMITTER TEST
2923                                        ;*SINGLE CLOCK THE CHARACTER 377
2924                                        ;*VERIFY EACH BIT POSITION AS IT
2925                                        ;*PASSES THE BIT WINDOW (SI BIT)
2926                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2927                                        ;:**********************************************************************
2928
```

```
                                                ;  TEST 22
                                                ;--------------
015070  012737  000022  001226  TST22:  MOV     #22,TSTNO
015076  012737  015252  001216          MOV     #TST23,NEXT
                                        ;R1 CONTAINS BASE DMC11 ADDRESS
015104  104412                          MSTCLR                  ;MASTER CLEAR DMC11
015106  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
015112  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
015116  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
015124  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015126  122111                          122111                  ;SET SOM!
015130  012705  000377                  MOV     #377,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
015134  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
015140  010561  000004                  MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
015144  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015146  122110                          122110                  ;LOAD OUT DATA
015150  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
015154  005003                          CLR     R3              ;CLEAR BIT COUNTER
015156  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
015160  104415  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
015164  104415  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
015170  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
015172  103005                          BCC     2$              ;BR IF CARRY CLEAR
015174  004737  026342                  JSR     PC,GETSI        ;GET THE WINDOW
015200  103406                          BCS     3$              ;BR IF BIT IS A MARK
015202  104006                          HLT     6               ;ERROR BIT WAS A SPACE
015204  000404                          BR      3$              ;CONTINE WITH TEST
015206  004737  026342          2$:     JSR     PC,GETSI        ;GET THE WINDOW
015212  103001                          BCC     3$              ;BR IF BIT IS A SPACE
015214  104006                          HLT     6               ;ERROR BIT WAS A MARK
015216                          3$:
015216  005203                          INC     R3              ;NEXT BIT
015220  022703  000010                  CMP     #10,R3          ;DONE YET?
015224  001357                          BNE     1$              ;BR IF NO
015226  104415  000014                  DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
015232  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015234  021264                          021264                  ;PORT4 LU-13
015236  032761  000040  000004          BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
015244  001401                          BEQ     4$              ;BR IF YES
015246  104034                          HLT     34              ;ERROR, RTS NOT CLEAR
015250  104400                  4$:     SCOPE                   ;SCOPE THIS TEST


                                        ;***************************** TEST 23 *****************************
                                        ;*DDCMP TRANSMITTER TEST
                                        ;*SINGLE CLOCK A BINARY COUNT PATTERN
                                        ;*VERIFY EACH BIT POSITION AS IT
                                        ;*PASSES THE BIT WINDOW (SI BIT)
                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
                                        ;*AND R5 CONTAINS THE CHARACTER THAT FAILED
                                        ;:*************************************************************


                                        ;  TEST 23
                                        ;--------------
015252  012737  000023  001226  TST23:  MOV     #23,TSTNO
015260  012737  015460  001216          MOV     #TST24,NEXT
```

```
2985
2986  015266  104412                          MSTCLR                  ;R1 CONTAINS BASE DMC11 ADDRESS
2987  015270  012711  004000                  MOV     #BIT11,(R1)     ;MASTER CLEAR DMC11
2988  015274  005003                          CLR     R3              ;SET LINE UNIT LOOP
2989  015276  005004                          CLR     R4              ;R3 CONTAINS BIT COUNT
2990  015300  005005                          CLR     R5              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
2991  015302  004737  026526                  JSR     PC,OUTRDY       ;R5 CONTAINS CHARACTER CURRENTLY BEING SHIFTED OUT
2992  015306  012761  000001  000004          MOV     #1,4(R1)        ;WAIT FOR OUT-READY
2993  015314  104414                          ROMCLK                  ;SET BIT0 IN PORT4
2994  015316  122111                          122111                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2995  015320  004737  026526                  JSR     PC,OUTRDY       ;SET SOM!
2996  015324  010461  000004                  MOV     R4,4(R1)        ;WAIT FOR OUT-READY
2997  015330  104414                          ROMCLK                  ;LOAD PORT4 WITH CHARACTER
2998  015332  122110                          122110                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2999  015334  005204                          INC     R4              ;LOAD OUT DATA
3000  015336  004737  026526                  JSR     PC,OUTRDY       ;INCREMENT TO NEXT CHARACTER
3001  015342  010461  000004                  MOV     R4,4(R1)        ;WAIT FOR OUT-READY
3002  015346  104414                          ROMCLK                  ;LOAD PORT4 WITH CHARACTER
3003  015350  122110                          122110                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3004  015352  004737  026374                  JSR     PC,OCOR         ;LOAD OUT DATA
3005  015356  104415  000002                  DATACLK,        2       ;WAIT FOR OCOR TO SET
3006  015362  005003                  4$:     CLR     R3              ;2 TICKS TO SET UP TRANSMITTER
3007  015364  010502                          MOV     R5,R2           ;CLEAR BIT COUNTER
3008  015366  104415  000001          1$:     DATACLK,        1       ;LOAD CHARACTER IN R2
3009  015372  106002                          RORB    R2              ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
3010  015374  103005                          BCC     2$              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
3011  015376  004737  026342                  JSR     PC,GETSI        ;BR IF CARRY CLEAR
3012  015402  103406                          BCS     3$              ;GET THE WINDOW
3013  015404  104006                          HLT     6               ;BR IF BIT IS A MARK
3014  015406  000404                          BR      3$              ;ERROR BIT WAS A SPACE
3015  015410  004737  026342          2$:     JSR     PC,GETSI        ;CONTINE WITH TEST
3016  015414  103001                          BCC     3$              ;GET THE WINDOW
3017  015416  104006                          HLT     6               ;BR IF BIT IS A SPACE
3018  015420                          3$:                             ;ERROR BIT WAS A MARK
3019  015420  005203                          INC     R3              ;NEXT BIT
3020  015422  022703  000010                  CMP     #10,R3          ;DONE YET?
3021  015426  001357                          BNE     1$              ;BR IF NO
3022  015430  005204                          INC     R4              ;NEXT CHARACTER
3023  015432  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3024  015436  010461  000004                  MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
3025  015442  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3026  015444  122110                          122110                  ;LOAD OUT DATA
3027  015446  005205                          INC     R5              ;NEXT CHARACTER
3028  015450  022705  000400                  CMP     #400,R5         ;DONE YET?
3029  015454  001342                          BNE     4$              ;BR IF NO
3030  015456  104400                  5$:     SCOPE                   ;SCOPE THIS TEST
3031
3032
3033                                  ;********************************** TEST 24 ****************************
3034                                  ;*DDCMP STRIP SYNC TEST
3035                                  ;*SET LU LOOP, SINGLE STEP 5 SYNCS,
3036                                  ;*VERIFY THAT IN ACTIVE DOES NOT SET
3037                                  ;:************************************************************************
3038
3039                                  ;  TEST 24
3040                                  ;--------------
```

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3041  015460  012737  000024  001226  TST24:  MOV     #24,TSTNO
3042  015466  012737  015546  001216           MOV     #TST25,NEXT
3043                                           ;R1 CONTAINS BASE DMC11 ADDRESS
3044  015474  104412                         MSTCLR                  ;MASTER CLEAR DMC11
3045  015476  012711  004000                 MOV     #BIT11,(R1)     ;SET LU LOOP
3046  015502  012702  000012                 MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3047  015506  004737  026412                 JSR     PC,SYNC         ;SINGLE CLOCK 5 SYNC CHARACTERS
3048  015512  000005                         5
3049  015514  104415  000054                 DATACLK,        54
3050  015520  104414                         ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3051  015522  021244                         021244                  ;PORT4 LU12
3052  015524  016104  000004                 MOV     4(R1),R4        ;PUT 'FOUND'' IN R4
3053  015530  042704  000277                 BIC     #277,R4         ;CLEAR UNWANTED BITS
3054  015534  005005                         CLR     R5              ;PUT 'EXPECTED'' IN R5
3055  015536  120504                         CMPB    R5,R4           ;IS ACTIVE CLEAR?
3056  015540  001401                         BEQ     1$              ;BR IF YES
3057  015542  104040                         HLT     40              ;ERROR ACTIVE IS NOT CLEAR
3058  015544  104400           1$:           SCOPE                   ;SCOPE THIS TEST
3059
3060
3061                                         ;***************************** TEST 25 *****************************
3062                                         ;*DDCMP IN ACTIVE TEST
3063                                         ;*SET LU LOOP, SINGLE STEP 5 SYNCS AND A NON-SYNC (301)
3064                                         ;*VERIFY THAT IN ACTIVE IS SET
3065                                         ;:*************************************************************
3066
3067                                         ;  TEST 25
3068                                         ;--------------
3069  015546  012737  000025  001226  TST25:  MOV     #25,TSTNO
3070  015554  012737  015636  001216           MOV     #TST26,NEXT
3071                                           ;R1 CONTAINS BASE DMC11 ADDRESS
3072  015562  104412                         MSTCLR                  ;MASTER CLEAR DMC11
3073  015564  012711  004000                 MOV     #BIT11,(R1)     ;SET LU LOOP
3074  015570  012702  000012                 MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3075  015574  004737  026412                 JSR     PC,SYNC         ;SINGLE CLOCK 5 SYNC CHARACTERS
3076  015600  000005                         5
3077  015602  104415  000064                 DATACLK,        64
3078  015606  104414                         ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3079  015610  021244                         021244                  ;PORT4 LU12
3080  015612  016104  000004                 MOV     4(R1),R4        ;PUT 'FOUND'' IN R4
3081  015616  042704  000277                 BIC     #277,R4         ;CLEAR UNWANTED BITS
3082  015622  012705  000100                 MOV     #BIT6,R5                ;PUT 'EXPECTED'' IN R5
3083  015626  120504                         CMPB    R5,R4           ;IS ACTIVE SET?
3084  015630  001401                         BEQ     1$              ;BR IF YES
3085  015632  104040                         HLT     40              ;ERROR ACTIVE IS NOT SET
3086  015634  104400           1$:           SCOPE                   ;SCOPE THIS TEST
3087
3088
3089                                         ;***************************** TEST 26 *****************************
3090                                         ;*DDCMP IN ACTIVE TEST
3091                                         ;*SET LU LOOP, SINGLE STEP 1 SYNC AND A NON-SYNC (301)
3092                                         ;*VERIFY THAT IN ACTIVE DOES NOT SET
3093                                         ;:*************************************************************
3094
3095                                         ;  TEST 26
3096                                         ;--------------
```

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3097  015636  012737  000026  001226  TST26:  MOV     #26,TSTNO
3098  015644  012737  015724  001216          MOV     #TST27,NEXT
3099                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3100  015652  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3101  015654  012711  004000                  MOV     #BIT11,(R1)     ;SET LU LOOP
3102  015660  012702  000012                  MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3103  015664  004737  026412                  JSR     PC,SYNC         ;SINGLE CLOCK 1 SYNC CHARACTERS
3104  015670  000001                          1
3105  015672  104415  000024                  DATACLK,        24
3106  015676  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3107  015700  021244                          021244                  ;PORT4 LU12
3108  015702  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND'' IN R4
3109  015706  042704  000277                  BIC     #277,R4         ;CLEAR UNWANTED BITS
3110  015712  005005                          CLR     R5              ;PUT 'EXPECTED'' IN R5
3111  015714  120504                          CMPB    R5,R4           ;IS ACTIVE CLEAR?
3112  015716  001401                          BEQ     1$              ;BR IF YES
3113  015720  104040                          HLT     40              ;ERROR ACTIVE IS NOT CLEAR
3114  015722  104400          1$:             SCOPE                   ;SCOPE THIS TEST
3115
3116
3117                                          ;*************************** TEST 27 ****************************
3118                                          ;*DDCMP IN ACTIVE TEST
3119                                          ;*SET LU LOOP, SINGLE STEP 2 SYNCS AND A NON-SYNC (301)
3120                                          ;*VERIFY THAT IN ACTIVE IS SET
3121                                          ;:************************************************************************
3122
3123                                          ;  TEST 27
3124                                          ;--------------
3125  015724  012737  000027  001226  TST27:  MOV     #27,TSTNO
3126  015732  012737  016014  001216          MOV     #TST30,NEXT
3127                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3128  015740  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3129  015742  012711  004000                  MOV     #BIT11,(R1)     ;SET LU LOOP
3130  015746  012702  000012                  MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3131  015752  004737  026412                  JSR     PC,SYNC         ;SINGLE CLOCK 2 SYNC CHARACTERS
3132  015756  000002                          2
3133  015760  104415  000034                  DATACLK,        34
3134  015764  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3135  015766  021244                          021244                  ;PORT4 LU12
3136  015770  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND'' IN R4
3137  015774  042704  000277                  BIC     #277,R4         ;CLEAR UNWANTED BITS
3138  016000  012705  000100                  MOV     #BIT6,R5                ;PUT 'EXPECTED'' IN R5
3139  016004  120504                          CMPB    R5,R4           ;IS ACTIVE SET?
3140  016006  001401                          BEQ     1$              ;BR IF YES
3141  016010  104040                          HLT     40              ;ERROR ACTIVE IS NOT SET
3142  016012  104400          1$:             SCOPE                   ;SCOPE THIS TEST
3143
3144
3145                                          ;*************************** TEST 30 ****************************
3146                                          ;*IN CLEAR TEST
3147                                          ;*SYNC UP RECEIVER AND TRANSMIT A CHARACTER
3148                                          ;*WAIT FOR IN RDY, THEN SET IN CLEAR
3149                                          ;*VERIFY THAT IN ACTIVE AND IN RDY ARE CLEARED
3150                                          ;:************************************************************************
3151
3152                                          ;  TEST 30
```

```
3153                                            ;--------------
3154  016014  012737  000030  001226  TST30:  MOV     #30,TSTNO
3155  016022  012737  016166  001216           MOV     #TST31,NEXT
3156                                                            ;R1 CONTAINS BASE DMC11 ADDRESS
3157  016030  104412                           MSTCLR                  ;MASTER CLEAR DMC11
3158  016032  012702  000012                   MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3159  016036  012711  004000                   MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3160  016042  004737  026560                   JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3161  016046  000301                           301                     ;AND A NON-SYNC  (301)
3162  016050  104415  000053                   DATACLK,        53      ;SINGLE CLOCK THE DATA
3163  016054  104416  000002                   TIMER,  2               ;WAIT FOR INRDY
3164  016060  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3165  016062  021244                           021244                  ;PORT4 LU 12
3166  016064  016104  000004                   MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3167  016070  042704  000357                   BIC     #357,R4         ;CLEAR UNWANTED BITS
3168  016074  012705  000020                   MOV     #BIT4,R5                ;PUT 'EXPECTED' IN R5
3169  016100  120504                           CMPB    R5,R4           ;IS INRDY SET?
3170  016102  001401                           BEQ     1$
3171  016104  104040                           HLT     40              ;ERROR, INRDY IS NOT SET
3172  016106                           1$:
3173  016106  012761  000200  000004           MOV     #BIT7,4(R1)     ;LOAD PORT4
3174  016114  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3175  016116  122112                           122112                  ;SET IN CLEAR
3176  016120  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3177  016122  021244                           021244                  ;PORT4 LU 12
3178  016124  016104  000004                   MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3179  016130  042704  000277                   BIC     #277,R4         ;CLEAR UNWANTED BITS
3180  016134  005005                           CLR     R5              ;PUT 'EXPECTED' IN R5
3181  016136  120504                           CMPB    R5,R4           ;IS IN ACTIVE CLEAR?
3182  016140  001401                           BEQ     2$
3183  016142  104040                           HLT     40              ;ERROR, IN ACTIVE IS NOT CLEAR
3184  016144                           2$:
3185  016144  016104  000004                   MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3186  016150  042704  000357                   BIC     #357,R4         ;CLEAR UNWANTED BITS
3187  016154  005005                           CLR     R5              ;PUT 'EXPECTED' IN R5
3188  016156  120504                           CMPB    R5,R4           ;IS INRDY CLEARED?
3189  016160  001401                           BEQ     3$
3190  016162  104040                           HLT     40              ;ERROR, INRDY IS NOT CLEARED
3191  016164  104400                   3$:     SCOPE                   ;SCOPE THIS TEST
3192
3193
3194                                           ;*************************** TEST 31 ****************************
3195                                           ;*DDCMP BASIC RECEICER TEST
3196                                           ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 0
3197                                           ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3198                                           ;:************************************************************************
3199
3200                                           ;  TEST 31
3201                                           ;--------------
3202  016166  012737  000031  001226  TST31:  MOV     #31,TSTNO
3203  016174  012737  016302  001216           MOV     #TST32,NEXT
3204                                                            ;R1 CONTAINS BASE DMC11 ADDRESS
3205  016202  104412                           MSTCLR                  ;MASTER CLEAR DMC11
3206  016204  012702  000012                   MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3207  016210  012711  004000                   MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3208  016214  004737  026560                   JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
```

```
3209  016220  000000                        0                       ;AND THE CHARACTER 0
3210  016222  104415  000053                DATACLK,        53      ;SINGLE CLOCK THE DATA
3211  016226  104416  000002                TIMER,  2               ;WAIT FOR INRDY
3212  016232  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3213  016234  021244                        021244                  ;PORT4 LU 12
3214  016236  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3215  016242  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3216  016246  012705  000020                MOV     #BIT4,R5                ;PUT 'EXPECTED' IN R5
3217  016252  120504                        CMPB    R5,R4           ;IS INRDY SET?
3218  016254  001401                        BEQ     1$
3219  016256  104040                        HLT     40              ;ERROR, INRDY IS NOT SET
3220  016260                        1$:
3221  016260  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3222  016262  021204                        021204                  ;PORT4 IN DATA
3223  016264  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3224  016270  005005                        CLR     R5              ;PUT 'EXPECTED' IN R5
3225  016272  120504                        CMPB    R5,R4           ;WAS A 0 RECEIVED?
3226  016274  001401                        BEQ     2$
3227  016276  104010                        HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3228  016300  104400                2$:     SCOPE                   ;SCOPE THIS TEST
3229
3230
3231                                        ;***************************** TEST 32 *****************************
3232                                        ;*DDCMP BASIC RECEICER TEST
3233                                        ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 125
3234                                        ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3235                                        ;:*************************************************************
3236
3237                                        ;  TEST 32
3238                                        ;--------------
3239  016302  012737  000032  001226  TST32: MOV     #32,TSTNO
3240  016310  012737  016420  001216        MOV     #TST33,NEXT
3241                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3242  016316  104412                        MSTCLR                  ;MASTER CLEAR DMC11
3243  016320  012702  000012                MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3244  016324  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3245  016330  004737  026560                JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3246  016334  000125                        125                     ;AND THE CHARACTER 125
3247  016336  104415  000053                DATACLK,        53      ;SINGLE CLOCK THE DATA
3248  016342  104416  000002                TIMER,  2               ;WAIT FOR INRDY
3249  016346  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3250  016350  021244                        021244                  ;PORT4 LU 12
3251  016352  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3252  016356  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3253  016362  012705  000020                MOV     #BIT4,R5                ;PUT 'EXPECTED' IN R5
3254  016366  120504                        CMPB    R5,R4           ;IS INRDY SET?
3255  016370  001401                        BEQ     1$
3256  016372  104040                        HLT     40              ;ERROR, INRDY IS NOT SET
3257  016374                        1$:
3258  016374  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3259  016376  021204                        021204                  ;PORT4 IN DATA
3260  016400  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3261  016404  012705  000125                MOV     #125,R5         ;PUT 'EXPECTED' IN R5
3262  016410  120504                        CMPB    R5,R4           ;WAS A 125 RECEIVED?
3263  016412  001401                        BEQ     2$
3264  016414  104010                        HLT     10              ;ERROR, RECEIVED DATA IS WRONG
```

```
3265  016416  104400                  2$:     SCOPE                   ;SCOPE THIS TEST
3266
3267
3268                                          ;***************************** TEST 33 *****************************
3269                                          ;*DDCMP BASIC RECEICER TEST
3270                                          ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 252
3271                                          ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3272                                          ;:*************************************************************************
3273
3274                                          ;  TEST 33
3275                                          ;-------------
3276  016420  012737  000033  001226  TST33:  MOV     #33,TSTNO
3277  016426  012737  016536  001216          MOV     #TST34,NEXT
3278                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3279  016434  104412                         MSTCLR                  ;MASTER CLEAR DMC11
3280  016436  012702  000012                 MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3281  016442  012711  004000                 MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3282  016446  004737  026560                 JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3283  016452  000252                         252                     ;AND THE CHARACTER 252
3284  016454  104415  000053                 DATACLK,        53      ;SINGLE CLOCK THE DATA
3285  016460  104416  000002                 TIMER,  2               ;WAIT FOR INRDY
3286  016464  104414                         ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3287  016466  021244                         021244                  ;PORT4 LU 12
3288  016470  016104  000004                 MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3289  016474  042704  000357                 BIC     #357,R4         ;CLEAR UNWANTED BITS
3290  016500  012705  000020                 MOV     #BIT4,R5                ;PUT 'EXPECTED' IN R5
3291  016504  120504                         CMPB    R5,R4           ;IS INRDY SET?
3292  016506  001401                         BEQ     1$
3293  016510  104040                         HLT     40              ;ERROR, INRDY IS NOT SET
3294  016512                          1$:
3295  016512  104414                         ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3296  016514  021204                         021204                  ;PORT4 IN DATA
3297  016516  016104  000004                 MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3298  016522  012705  000252                 MOV     #252,R5         ;PUT 'EXPECTED' IN R5
3299  016526  120504                         CMPB    R5,R4           ;WAS A 252 RECEIVED?
3300  016530  001401                         BEQ     2$
3301  016532  104010                         HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3302  016534  104400                  2$:     SCOPE                   ;SCOPE THIS TEST
3303
3304
3305                                          ;***************************** TEST 34 *****************************
3306                                          ;*DDCMP BASIC RECEICER TEST
3307                                          ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 377
3308                                          ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3309                                          ;:*************************************************************************
3310
3311                                          ;  TEST 34
3312                                          ;-------------
3313  016536  012737  000034  001226  TST34:  MOV     #34,TSTNO
3314  016544  012737  016654  001216          MOV     #TST35,NEXT
3315                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3316  016552  104412                         MSTCLR                  ;MASTER CLEAR DMC11
3317  016554  012702  000012                 MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3318  016560  012711  004000                 MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3319  016564  004737  026560                 JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3320  016570  000377                         377                     ;AND THE CHARACTER 377
```

```
3321  016572  104415  000053                DATACLK,        53      ;SINGLE CLOCK THE DATA
3322  016576  104416  000002                TIMER,  2               ;WAIT FOR INRDY
3323  016602  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3324  016604  021244                        021244                  ;PORT4 LU 12
3325  016606  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3326  016612  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3327  016616  012705  000020                MOV     #BIT4,R5                ;PUT 'EXPECTED' IN R5
3328  016622  120504                        CMPB    R5,R4           ;IS INRDY SET?
3329  016624  001401                        BEQ     1$
3330  016626  104040                        HLT     40              ;ERROR, INRDY IS NOT SET
3331  016630                        1$:
3332  016630  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3333  016632  021204                        021204                  ;PORT4 IN DATA
3334  016634  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3335  016640  012705  000377                MOV     #377,R5         ;PUT 'EXPECTED' IN R5
3336  016644  120504                        CMPB    R5,R4           ;WAS A 377 RECEIVED?
3337  016646  001401                        BEQ     2$
3338  016650  104010                        HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3339  016652  104400                2$:     SCOPE                   ;SCOPE THIS TEST
3340
3341
3342                                        ;****************************** TEST 35 ******************************
3343                                        ;*DDCMP DATA TEST
3344                                        ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
3345                                        ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
3346                                        ;:************************************************************************
3347
3348                                        ;  TEST 35
3349                                        ;--------------
3350  016654  012737  000035  001226  TST35: MOV     #35,TSTNO
3351  016662  012737  017004  001216        MOV     #TST36,NEXT
3352                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3353  016670  104412                        MSTCLR                  ;MASTER CLEAR DMC11
3354  016672  005037  027176                CLR     SCHAR           ;START BINARY COUNT AT ZERO
3355  016676  005037  027200                CLR     STUFLG          ;CLEAR BITSTUFF FLAG
3356  016702  005002                        CLR     R2              ;R2 IS 'EXPECTED' DATA
3357  016704  012703  000073                MOV     #73,R3          ;R3 IS CHARACTER COUNT
3358  016710  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3359  016714  004737  026736                JSR     PC,SILOLD       ;LOAD SILO WITH COUNT PATTERN
3360  016720  104415  000043                DATACLK,        43      ;SYNC RECEIVER AND GET IT ACTIVE
3361  016724  104415  000730        1$:     DATACLK,        730     ;CLOCK IN 73 CHARACTERS
3362  016730  004737  027202        4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3363  016734  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3364  016736  021204                        021204                  ;PORT4 IN DATA
3365  016740  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3366  016744  010205                        MOV     R2,R5           ;PUT 'EXPECTED' IN R5
3367  016746  120504                        CMPB    R5,R4           ;IS DATA CORRECT?
3368  016750  001401                        BEQ     2$              ;BR IF YES
3369  016752  104010                        HLT     10              ;DATA ERROR
3370  016754  005202                2$:     INC     R2              ;NEXT CHARACTER
3371  016756  022702  000400                CMP     #400,R2         ;ALL DONE?
3372  016762  001407                        BEQ     3$              ;BR IF YES
3373  016764  005303                        DEC     R3              ;DECREMENT CHARACTER COUNT
3374  016766  001360                        BNE     4$              ;BR IF SILO NOT EMPTY
3375  016770  004737  026736                JSR     PC,SILOLD       ;LOAD SILO WITH MORE OF COUNT PATTERN
3376  016774  012703  000073                MOV     #73,R3          ;RELOAD CHARACTER COUNT
```

```
3377  017000  000751                      BR      1$              ;CONTINUE
3378  017002  104400              3$:     SCOPE                   ;SCOPE THIS TEST
3379
3380
3381                                      ;*************************** TEST 36 ****************************
3382                                      ;*DDCMP DATA TEST
3383                                      ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
3384                                      ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
3385                                      ;*THIS TEST IS EXACTLY THE SAME AS THE LAST TEST,
3386                                      ;*EXCEPT LINE UNIT LOOP IS SET IN LU REGISTER 12
3387                                      ;:************************************************************************
3388
3389                                      ;  TEST 36
3390                                      ;--------------
3391  017004  012737  000036  001226  TST36:  MOV     #36,TSTNO
3392  017012  012737  017144  001216          MOV     #TST37,NEXT
3393                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
3394  017020  104412                         MSTCLR                  ;MASTER CLEAR DMC11
3395  017022  005037  027176                 CLR     SCHAR           ;START BINARY COUNT AT ZERO
3396  017026  005037  027200                 CLR     STUFLG          ;CLEAR BITSTUFF FLAG
3397  017032  005002                         CLR     R2              ;R2 IS 'EXPECTED' DATA
3398  017034  012703  000073                 MOV     #73,R3          ;R3 IS CHARACTER COUNT
3399  017040  005011                         CLR     (R1)            ;CLEAR LU LOOP IN MAINT REG
3400  017042  012761  000040  000004         MOV     #BIT5,4(R1)     ;LOAD PORT4
3401  017050  104414                         ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3402  017052  122112                         122112                  ;SET LU LOOP IN LU REG 12
3403  017054  004737  026736                 JSR     PC,SILOLD       ;LOAD SILO WITH COUNT PATTERN
3404  017060  104415  000043                 DATACLK,        43      ;SYNC RECEIVER AND GET IT ACTIVE
3405  017064  104415  000730          1$:     DATACLK,        730     ;CLOCK IN 73 CHARACTERS
3406  017070  004737  027202          4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3407  017074  104414                         ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3408  017076  021204                         021204                  ;PORT4 IN DATA
3409  017100  016104  000004                 MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3410  017104  010205                         MOV     R2,R5           ;PUT 'EXPECTED' IN R5
3411  017106  120504                         CMPB    R5,R4           ;IS DATA CORRECT?
3412  017110  001401                         BEQ     2$              ;BR IF YES
3413  017112  104010                         HLT     10              ;DATA ERROR
3414  017114  005202                 2$:     INC     R2              ;NEXT CHARACTER
3415  017116  022702  000400                 CMP     #400,R2         ;ALL DONE?
3416  017122  001407                         BEQ     3$              ;BR IF YES
3417  017124  005303                         DEC     R3              ;DECREMENT CHARACTER COUNT
3418  017126  001360                         BNE     4$              ;BR IF SILO NOT EMPTY
3419  017130  004737  026736                 JSR     PC,SILOLD       ;LOAD SILO WITH MORE OF COUNT PATTERN
3420  017134  012703  000073                 MOV     #73,R3          ;RELOAD CHARACTER COUNT
3421  017140  000751                         BR      1$              ;CONTINUE
3422  017142  104400              3$:     SCOPE                   ;SCOPE THIS TEST
3423
3424
3425                                      ;*************************** TEST 37 ****************************
3426                                      ;*TRANSMITTER MARK TEST
3427                                      ;*SINGLE CLOCK 3 SYNCS AND A 301 AND 20 EXTRA
3428                                      ;*CLOCK TICKS, VERIFY THAT A 301, A 377 AND A 377
3429                                      ;*WERE RECEIVED INDICATING THAT THE TRANSMITTER WENT
3430                                      ;*TO A MARK STATE FOR 16 BITS WHEN OUT SILO WAS EMPTY
3431                                      ;:************************************************************************
3432
```

```
3433                                            ;  TEST 37
3434                                            ;--------------
3435  017144  012737  000037  001226  TST37:   MOV     #37,TSTNO
3436  017152  012737  017304  001216           MOV     #TST40,NEXT
3437
                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3438  017160  104412                           MSTCLR                  ;MASTER CLEAR DMC11
3439  017162  012711  004000                   MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3440  017166  004737  026560                   JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3441  017172  000301                           301                     ;AND A 301
3442  017174  104415  000073                   DATACLK,        73      ;CLOCK THE 301 IN AND 20 EXTRA TICKS
3443  017200  004737  027202                   JSR     PC,INRDY        ;WAIT FOR INRDY
3444  017204  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3445  017206  021204                           021204                  ;PORT4 IN DATA
3446  017210  016104  000004                   MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3447  017214  012705  000301                   MOV     #301,R5         ;PUT 'EXPECTED' IN R5
3448  017220  120504                           CMPB    R5,R4           ;WAS A 301 RECEIVED?
3449  017222  001401                           BEQ     1$
3450  017224  104010                           HLT     10              ;ERROR FIRST CHARACTER INCORRECT
3451  017226  004737  027202           1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3452  017232  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3453  017234  021204                           021204                  ;PORT4 IN DATA
3454  017236  016104  000004                   MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3455  017242  012705  000377                   MOV     #377,R5         ;PUT 'EXPECTED' IN R5
3456  017246  120504                           CMPB    R5,R4           ;WAS A 377 RECEIVED?
3457  017250  001401                           BEQ     2$
3458  017252  104010                           HLT     10              ;ERROR, 377 WAS NOT RECEIVED
3459  017254  004737  027202           2$:     JSR     PC,INRDY        ;WAIT FOR INRDY
3460  017260  104414                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3461  017262  021204                           021204                  ;PORT4 IN DATA
3462  017264  016104  000004                   MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3463  017270  012705  000377                   MOV     #377,R5         ;PUT 'EXPECTED' IN R5
3464  017274  120504                           CMPB    R5,R4           ;WAS A 377 RECEIVED?
3465  017276  001401                           BEQ     3$
3466  017300  104010                           HLT     10              ;ERROR, 377 WAS NOT RECEIVED
3467  017302  104400           3$:     SCOPE                           ;SCOPE THIS TEST
3468
3469
3470                                            ;***************************** TEST 40 *****************************
3471                                            ;*CABLE TURNAROUND TEST
3472                                            ;*CLEAR LINE UNIT LOOP, SET DTR
3473                                            ;*VERIFY THAT MODEM READY IS SET
3474                                            ;*CLEAR DTR, VERIFY THAT MRDY IS CLEARED
3475                                            ;:*************************************************************
3476
3477                                            ;  TEST 40
3478                                            ;--------------
3479  017304  012737  000040  001226  TST40:   MOV     #40,TSTNO
3480  017312  012737  017466  001216           MOV     #TST41,NEXT
3481
                                                ;R1 CONTAINS BASE DMC11 ADDRESS
3482  017320  104412                           MSTCLR                  ;MASTER CLEAR DMC11
3483  017322  032737  020000  001366           BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
3484  017330  001004                           BNE     .+12            ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
3485  017332  032737  040000  001366           BIT     #BIT14,STAT1    ;IS TURNAROUND CONNECTOR ON?
3486  017340  001451                           BEQ     2$              ;SKIP TEST IF NO
3487  017342  005011                           CLR     (R1)            ;CLEAR LINE UNIT LOOP
3488  017344  012761  000100  000004           MOV     #100,4(R1)      ;LOAD PORT4
```

```
3489  017352  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3490  017354  122113                          122113                  ;SET DTR
3491  017356  104416  000002                  TIMER,  2               ;WAIT
3492  017362  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3493  017364  021264                          021264                  ;PORT4 LU13
3494  017366  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3495  017372  042704  000223                  BIC     #223,R4         ;CLEAR UNWANTED BITS
3496  017376  012705  000110                  MOV     #110,R5         ;PUT 'EXPECTED' IN R5
3497  017402  120504                          CMPB    R5,R4           ;IS MRDY SET?
3498  017404  001401                          BEQ     1$
3499  017406  104011                          HLT     11              ;ERROR, MRDY NOT SET
3500  017410  005061  000004          1$:     CLR     4(R1)           ;CLEAR PORT4
3501  017414  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3502  017416  122113                          122113                  ;CLEAR DTR
3503  017420  104416  000002                  TIMER,  2
3504  017424  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3505  017426  021264                          021264                  ;PORT4 LU13
3506  017430  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3507  017434  042704  000223                  BIC     #223,R4         ;CLEAR UNWANTED BITS
3508  017440  005005                          CLR     R5              ;PUT 'EXPECTED' IN R5
3509  017442  032737  020000  001366          BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
3510  017450  001402                          BEQ     .+6             ;BR IF NO
3511  017452  052705  000010                  BIS     #BIT3,R5        ;MRDY SET ON M8202
3512  017456  120504                          CMPB    R5,R4           ;IS MRDY CLEAR?
3513  017460  001401                          BEQ     2$
3514  017462  104011                          HLT     11              ;ERROR, MRDY NOT CLEAR
3515  017464  104400                2$:       SCOPE                   ;SCOPE THIS TEST
3516
3517
3518                                          ;***************************** TEST 41 *****************************
3519                                          ;*CABLE TURNAROUND TEST
3520                                          ;*CLEAR LINE UNIT LOOP, LOAD OUT DATA SILO
3521                                          ;*VERIFY THAT ALL MODEM SIGNALS ARE SET
3522                                          ;:*************************************************************
3523
3524                                          ;  TEST 41
3525                                          ;--------------
3526  017466  012737  000041  001226  TST41:  MOV     #41,TSTNO
3527  017474  012737  017632  001216          MOV     #TST42,NEXT
3528                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3529  017502  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3530  017504  032737  020000  001366          BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
3531  017512  001004                          BNE     .+12            ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
3532  017514  032737  040000  001366          BIT     #BIT14,STAT1    ;IS TURNAROUND CONNECTOR ON?
3533  017522  001442                          BEQ     1$              ;SKIP TEST IF NO
3534  017524  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3535  017530  012761  000100  000004          MOV     #100,   4(R1)           ;LOAD PORT4
3536  017536  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3537  017540  122113                          122113                  ;CLEAR ALL MODEM SIGNALS,EXCEPT DTR
3538  017542  104416  000002                  TIMER,  2               ;WAIT
3539  017546  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4
3540  017554  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3541  017556  122111                          122111                  ;SET SOM
3542  017560  004537  027644                  JSR     R5,MESLD        ;FILL OUT DATA SILO
3543  017564  030126                          MESDAT                  ;WITH 64 CHARACTERS
3544  017566  000100                          64.
```

```
3545  017570  012700  000050          MOV     #50,R0          ;PREPARE FOR DELAY
3546  017574  005011                  CLR     (R1)            ;CLEAR LINE UNIT LOOP
3547  017576                  2$:
3548  017576  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3549  017600  021264                  021264                  ;PORT4 LU13
3550  017602  016104  000004          MOV     4(R1),R4        ;PUT 'FOUND' IN R4
3551  017606  042704  000223          BIC     #223,R4         ;CLEAR UNWANTED BITS
3552  017612  012705  000154          MOV     #154,R5         ;PUT 'EXPECTED' IN R5
3553  017616  120504                  CMPB    R5,R4           ;COMPARE EXPECTED AND FOUND
3554  017620  001403                  BEQ     1$              ;BR IF OK
3555  017622  005300                  DEC     R0              ;DEC DELAY COUNT
3556  017624  001364                  BNE     2$              ;BR IF NOT ZERO
3557  017626  104011                  HLT     11              ;ERROR, ALL SIGNALS ARE NOT SET
3558  017630  104400          1$:     SCOPE                   ;SCOPE THIS TEST
3559
3560
3561                                  ;*************************** TEST 42 ****************************
3562                                  ;*TEST OF CRC OPERATION
3563                                  ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
3564                                  ;*0, VERIFY THE LSB OF THE BCC ON EACH SHIFT
3565                                  ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
3566                                  ;;************************************************************************
3567
3568                                  ;  TEST 42
3569                                  ;--------------
3570  017632  012737  000042  001226  TST42:  MOV     #42,TSTNO
3571  017640  012737  020146  001216          MOV     #TST43,NEXT
3572  017646  012737  017662  001220          MOV     #64$,LOCK
3573
3574  017654  104412                  MSTCLR                  ;MASTER CLEAR DMC11
3575  017656  012711  004000          MOV     #BIT11,(R1)     ;SET LU LOOP
3576  017662  004737  027706  64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
3577  017666  005000                  CLR     R0              ;START SHIFT COUNTER AT ZERO
3578  017670  012737  120001  027342  MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
3579  017676  012737  000000  017736  MOV     #0,66$          ;LOAD CHAR FOR SOFTWARE BCC
3580  017704  005037  017740          CLR     67$             ;CLEAR OLD SOFTWARE BCC
3581  017710  004737  027346          JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
3582  017714  000000                  0                       ;AND THE CHARACTER 0
3583  017716  104415  000021          DATACLK,        21      ;GET TRANSMITTER ACTIVE
3584  017722  104415  000001  65$:    DATACLK,        1       ;SHIFT BCC ONCE
3585  017726  005200                  INC     R0              ;BUMP SHIFT COUNT
3586  017730  004537  027236          JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
3587  017734  000001                  1                       ;ONE SHIFT
3588  017736  000000  66$:    0                               ;DATA CHARACTER
3589  017740  000000  67$:    0                               ;OLD BCC
3590  017742  103405                  BCS     68$             ;BR IF SOFT BCC LSB IS SET
3591  017744  004737  027460          JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
3592  017750  103006                  BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
3593  017752  104012                  HLT     12              ;ERROR, BCC LSB IS SET
3594  017754  000404                  BR      69$             ;CONTINUE
3595  017756  004737  027460  68$:    JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
3596  017762  103401                  BCS     69$             ;BR IF HARD BCC LSB IS SET
3597  017764  104016                  HLT     16              ;ERROR, HARD BCC LSB IS CLEAR
3598  017766                  69$:
3599  017766  006037  017736          ROR     66$             ;SHIFT SOFT DATA
3600  017772  013737  027344  017740  MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
```

```
3601  020000  022700  000010              CMP     #10,R0          ;DONE YET?
3602  020004  001346                      BNE     65$             ;BR IF NOT DONE
3603  020006  104401                      SCOP1                   ;SCOPE SUBTEST (SW09=1)
3604  020010  012737  020016  001220      MOV     #71$,LOCK       ;NEW SCOPE1
3605  020016  004737  027706      71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
3606  020022  005000                      CLR     R0              ;START SHIFT COUNTER AT ZERO
3607  020024  012737  120001  027342      MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
3608  020032  012737  000000  020072      MOV     #0,73$          ;LOAD CHAR FOR SOFTWARE BCC
3609  020040  005037  020074              CLR     74$             ;CLEAR OLD SOFTWARE BCC
3610  020044  004737  027346              JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
3611  020050  000000                      0                       ;AND THE CHARACTER 0
3612  020052  104415  000032              DATACLK,        32      ;GET RECEIVER ACTIVE
3613  020056  104415  000001      72$:    DATACLK,        1       ;SHIFT BCC ONCE
3614  020062  005200                      INC     R0              ;BUMP SHIFT COUNT
3615  020064  004537  027236              JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
3616  020070  000001                      1                       ;ONE SHIFT
3617  020072  000000      73$:            0                       ;DATA CHARACTER
3618  020074  000000      74$:            0                       ;OLD BCC
3619  020076  103405                      BCS     75$             ;BR IF SOFT BCC LSB IS SET
3620  020100  004737  027472              JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3621  020104  103006                      BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
3622  020106  104013                      HLT     13              ;ERROR, BCC LSB IS SET
3623  020110  000404                      BR      76$             ;CONTINUE
3624  020112  004737  027472      75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3625  020116  103401                      BCS     76$             ;BR IF HARD BCC LSB IS SET
3626  020120  104017                      HLT     17              ;ERROR, BCC LSB IS CLEAR
3627  020122                      76$:
3628  020122  006037  020072              ROR     73$             ;SHIFT SOFT DATA
3629  020126  013737  027344  020074      MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
3630  020134  022700  000010              CMP     #10,R0          ;DONE YET?
3631  020140  001346                      BNE     72$             ;BR IF NOT DONE
3632  020142  104401                      SCOP1                   ;SCOPE SUBTEST (SW09=1)
3633  020144  104400      77$:            SCOPE                   ;SCOPE THIS TEST
3634
3635
3636                                      ;***************************** TEST 43 *****************************
3637                                      ;*TEST OF CRC OPERATION
3638                                      ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
3639                                      ;*377, VERIFY THE LSB OF THE BCC ON EACH SHIFT
3640                                      ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
3641                                      ;:*************************************************************
3642
3643                                      ;  TEST 43
3644                                      ;--------------
3645  020146  012737  000043  001226  TST43:  MOV     #43,TSTNO
3646  020154  012737  020462  001216          MOV     #TST44,NEXT
3647  020162  012737  020176  001220          MOV     #64$,LOCK
3648                                                          ;R1 CONTAINS BASE DMC11 ADDRESS
3649  020170  104412                      MSTCLR              ;MASTER CLEAR DMC11
3650  020172  012711  004000              MOV     #BIT11,(R1)     ;SET LU LOOP
3651  020176  004737  027706      64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
3652  020202  005000                      CLR     R0              ;START SHIFT COUNTER AT ZERO
3653  020204  012737  120001  027342      MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
3654  020212  012737  000377  020252      MOV     #377,66$;       ;LOAD CHAR FOR SOFTWARE BCC
3655  020220  005037  020254              CLR     67$             ;CLEAR OLD SOFTWARE BCC
3656  020224  004737  027346              JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
```

```
3657  020230  000377                          377                     ;AND THE CHARACTER 377
3658  020232  104415  000021                  DATACLK,        21      ;GET TRANSMITTER ACTIVE
3659  020236  104415  000001        65$:      DATACLK,        1       ;SHIFT BCC ONCE
3660  020242  005200                          INC     R0              ;BUMP SHIFT COUNT
3661  020244  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
3662  020250  000001                          1                       ;ONE SHIFT
3663  020252  000000        66$:      0                               ;DATA CHARACTER
3664  020254  000000        67$:      0                               ;OLD BCC
3665  020256  103405                          BCS     68$             ;BR IF SOFT BCC LSB IS SET
3666  020260  004737  027460                  JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
3667  020264  103006                          BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
3668  020266  104012                          HLT     12              ;ERROR, BCC LSB IS SET
3669  020270  000404                          BR      69$             ;CONTINUE
3670  020272  004737  027460        68$:      JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
3671  020276  103401                          BCS     69$             ;BR IF HARD BCC LSB IS SET
3672  020300  104016                          HLT     16              ;ERROR, HARD BCC LSB IS CLEAR
3673  020302                        69$:
3674  020302  006037  020252                  ROR     66$             ;SHIFT SOFT DATA
3675  020306  013737  027344  020254          MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
3676  020314  022700  000010                  CMP     #10,R0          ;DONE YET?
3677  020320  001346                          BNE     65$             ;BR IF NOT DONE
3678  020322  104401                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
3679  020324  012737  020332  001220          MOV     #71$,LOCK       ;NEW SCOPE1
3680  020332  004737  027706        71$:      JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
3681  020336  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
3682  020340  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
3683  020346  012737  000377  020406          MOV     #377,73$;       ;LOAD CHAR FOR SOFTWARE BCC
3684  020354  005037  020410                  CLR     74$             ;CLEAR OLD SOFTWARE BCC
3685  020360  004737  027346                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
3686  020364  000377                          377                     ;AND THE CHARACTER 377
3687  020366  104415  000032                  DATACLK,        32      ;GET RECEIVER ACTIVE
3688  020372  104415  000001        72$:      DATACLK,        1       ;SHIFT BCC ONCE
3689  020376  005200                          INC     R0              ;BUMP SHIFT COUNT
3690  020400  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
3691  020404  000001                          1                       ;ONE SHIFT
3692  020406  000000        73$:      0                               ;DATA CHARACTER
3693  020410  000000        74$:      0                               ;OLD BCC
3694  020412  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
3695  020414  004737  027472                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3696  020420  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
3697  020422  104013                          HLT     13              ;ERROR, BCC LSB IS SET
3698  020424  000404                          BR      76$             ;CONTINUE
3699  020426  004737  027472        75$:      JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3700  020432  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
3701  020434  104017                          HLT     17              ;ERROR, BCC LSB IS CLEAR
3702  020436                        76$:
3703  020436  006037  020406                  ROR     73$             ;SHIFT SOFT DATA
3704  020442  013737  027344  020410          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
3705  020450  022700  000010                  CMP     #10,R0          ;DONE YET?
3706  020454  001346                          BNE     72$             ;BR IF NOT DONE
3707  020456  104401                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
3708  020460  104400        77$:      SCOPE                           ;SCOPE THIS TEST
3709
3710
3711                                          ;******** ****************** TEST 44 ****************************
3712                                          ;*TEST OF CRC OPERATION
```

```
                                                ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
                                                ;*125, VERIFY THE LSB OF THE BCC ON EACH SHIFT
                                                ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
                                                ;;*****************************************************************

                                                ;   TEST 44
                                                ;---------------
020462  012737  000044  001226  TST44:  MOV     #44,TSTNO
020470  012737  020776  001216          MOV     #TST45,NEXT
020476  012737  020512  001220          MOV     #64$,LOCK
                                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
020504  104412                          MSTCLR                          ;MASTER CLEAR DMC11
020506  012711  004000                  MOV     #BIT11,(R1)             ;SET LU LOOP
020512  004737  027706          64$:    JSR     PC,CLRIO                ;CLEAR BCC REGISTERS
020516  005000                          CLR     R0                      ;START SHIFT COUNTER AT ZERO
020520  012737  120001  027342          MOV     #CRC16,XPOLY            ;LOAD POLYNOMIAL FOR SOFTWARE BCC
020526  012737  000125  020566          MOV     #125,66$;               ;LOAD CHAR FOR SOFTWARE BCC
020534  005037  020570                  CLR     67$                     ;CLEAR OLD SOFTWARE BCC
020540  004737  027346                  JSR     PC,BCCLD                ;LOAD OUT SILO WITH 2 SYNCS
020544  000125                          125                             ;AND THE CHARACTER 125
020546  104415  000021                  DATACLK,        21              ;GET TRANSMITTER ACTIVE
020552  104415  000001          65$:    DATACLK,        1               ;SHIFT BCC ONCE
020556  005200                          INC     R0                      ;BUMP SHIFT COUNT
020560  004537  027236                  JSR     R5,SIMBCC               ;CALCULATE SOFTWARE BCC LSB
020564  000001                          1                               ;ONE SHIFT
020566  000000                  66$:    0                               ;DATA CHARACTER
020570  000000                  67$:    0                               ;OLD BCC
020572  103405                          BCS     68$                     ;BR IF SOFT BCC LSB IS SET
020574  004737  027460                  JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
020600  103006                          BCC     69$                     ;BR IF HARD BCC LSB IS CLEAR
020602  104012                          HLT     12                      ;ERROR, BCC LSB IS SET
020604  000404                          BR      69$                     ;CONTINUE
020606  004737  027460          68$:    JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
020612  103401                          BCS     69$                     ;BR IF HARD BCC LSB IS SET
020614  104016                          HLT     16                      ;ERROR, HARD BCC LSB IS CLEAR
020616                          69$:
020616  006037  020566                  ROR     66$                     ;SHIFT SOFT DATA
020622  013737  027344  020570          MOV     CALBCC,67$              ;LOAD OLD SOFT BCC
020630  022700  000010                  CMP     #10,R0                  ;DONE YET?
020634  001346                          BNE     65$                     ;BR IF NOT DONE
020636  104401                          SCOP1                           ;SCOPE SUBTEST (SW09=1)
020640  012737  020646  001220          MOV     #71$,LOCK               ;NEW SCOPE1
020646  004737  027706          71$:    JSR     PC,CLRIO                ;CLEAR BCC REGISTERS
020652  005000                          CLR     R0                      ;START SHIFT COUNTER AT ZERO
020654  012737  120001  027342          MOV     #CRC16,XPOLY            ;LOAD POLYNOMIAL FOR SOFTWARE BCC
020662  012737  000125  020722          MOV     #125,73$;               ;LOAD CHAR FOR SOFTWARE BCC
020670  005037  020724                  CLR     74$                     ;CLEAR OLD SOFTWARE BCC
020674  004737  027346                  JSR     PC,BCCLD                ;LOAD OUT SILO WITH 2 SYNCS
020700  000125                          125                             ;AND THE CHARACTER 125
020702  104415  000032                  DATACLK,        32              ;GET RECEIVER ACTIVE
020706  104415  000001          72$:    DATACLK,        1               ;SHIFT BCC ONCE
020712  005200                          INC     R0                      ;BUMP SHIFT COUNT
020714  004537  027236                  JSR     R5,SIMBCC               ;CALCULATE SOFTWARE BCC LSB
020720  000001                          1                               ;ONE SHIFT
020722  000000                  73$:    0                               ;DATA CHARACTER
020724  000000                  74$:    0                               ;OLD BCC
```

```
3769  020726  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
3770  020730  004737  027472                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3771  020734  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
3772  020736  104013                          HLT     13              ;ERROR, BCC LSB IS SET
3773  020740  000404                          BR      76$             ;CONTINUE
3774  020742  004737  027472          75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3775  020746  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
3776  020750  104017                          HLT     17              ;ERROR, BCC LSB IS CLEAR
3777  020752                          76$:
3778  020752  006037  020722                  ROR     73$             ;SHIFT SOFT DATA
3779  020756  013737  027344  020724          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
3780  020764  022700  000010                  CMP     #10,R0          ;DONE YET?
3781  020770  001346                          BNE     72$             ;BR IF NOT DONE
3782  020772  104401                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
3783  020774  104400          77$:    SCOPE                           ;SCOPE THIS TEST
3784
3785
3786                                          ;***************************** TEST 45 *****************************
3787                                          ;*TEST OF CRC OPERATION
3788                                          ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
3789                                          ;*252, VERIFY THE LSB OF THE BCC ON EACH SHIFT
3790                                          ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
3791                                          ;:*************************************************************
3792
3793                                          ;  TEST 45
3794                                          ;-------------
3795  020776  012737  000045  001226  TST45:  MOV     #45,TSTNO
3796  021004  012737  021312  001216          MOV     #TST46,NEXT
3797  021012  012737  021026  001220          MOV     #64$,LOCK
3798                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3799  021020  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3800  021022  012711  004000                  MOV     #BIT11,(R1)     ;SET LU LOOP
3801  021026  004737  027706          64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
3802  021032  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
3803  021034  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
3804  021042  012737  000252  021102          MOV     #252,66$;       ;LOAD CHAR FOR SOFTWARE BCC
3805  021050  005037  021104                  CLR     67$             ;CLEAR OLD SOFTWARE BCC
3806  021054  004737  027346                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
3807  021060  000252                          252                     ;AND THE CHARACTER 252
3808  021062  104415  000021                  DATACLK,        21      ;GET TRANSMITTER ACTIVE
3809  021066  104415  000001          65$:    DATACLK,        1       ;SHIFT BCC ONCE
3810  021072  005200                          INC     R0              ;BUMP SHIFT COUNT
3811  021074  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
3812  021100  000001                          1                       ;ONE SHIFT
3813  021102  000000          66$:    0                               ;DATA CHARACTER
3814  021104  000000          67$:    0                               ;OLD BCC
3815  021106  103405                          BCS     68$             ;BR IF SOFT BCC LSB IS SET
3816  021110  004737  027460                  JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
3817  021114  103006                          BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
3818  021116  104012                          HLT     12              ;ERROR, BCC LSB IS SET
3819  021120  000404                          BR      69$             ;CONTINUE
3820  021122  004737  027460          68$:    JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
3821  021126  103401                          BCS     69$             ;BR IF HARD BCC LSB IS SET
3822  021130  104016                          HLT     16              ;ERROR, HARD BCC LSB IS CLEAR
3823  021132                          69$:
3824  021132  006037  021102                  ROR     66$             ;SHIFT SOFT DATA
```

```
3825  021136  013737  027344  021104          MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
3826  021144  022700  000010                  CMP     #10,R0          ;DONE YET?
3827  021150  001346                          BNE     65$             ;BR IF NOT DONE
3828  021152  104401                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
3829  021154  012737  021162  001220          MOV     #71$,LOCK       ;NEW SCOPE1
3830  021162  004737  027706          71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
3831  021166  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
3832  021170  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
3833  021176  012737  000252  021236          MOV     #252,73$;       ;LOAD CHAR FOR SOFTWARE BCC
3834  021204  005037  021240                  CLR     74$             ;CLEAR OLD SOFTWARE BCC
3835  021210  004737  027346                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
3836  021214  000252                          252                     ;AND THE CHARACTER 252
3837  021216  104415  000032                  DATACLK,        32      ;GET RECEIVER ACTIVE
3838  021222  104415  000001          72$:    DATACLK,        1       ;SHIFT BCC ONCE
3839  021226  005200                          INC     R0              ;BUMP SHIFT COUNT
3840  021230  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
3841  021234  000001                          1                       ;ONE SHIFT
3842  021236  000000          73$:    0                               ;DATA CHARACTER
3843  021240  000000          74$:    0                               ;OLD BCC
3844  021242  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
3845  021244  004737  027472                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3846  021250  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
3847  021252  104013                          HLT     13              ;ERROR, BCC LSB IS SET
3848  021254  000404                          BR      76$             ;CONTINUE
3849  021256  004737  027472          75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
3850  021262  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
3851  021264  104017                          HLT     17              ;ERROR, BCC LSB IS CLEAR
3852  021266                          76$:
3853  021266  006037  021236                  ROR     73$             ;SHIFT SOFT DATA
3854  021272  013737  027344  021240          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
3855  021300  022700  000010                  CMP     #10,R0          ;DONE YET?
3856  021304  001346                          BNE     72$             ;BR IF NOT DONE
3857  021306  104401                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
3858  021310  104400          77$:    SCOPE                           ;SCOPE THIS TEST
3859
3860
3861                                  ;*************************** TEST 46 ****************************
3862                                  ;*TRANSMITTER CRC TEST
3863                                  ;*USING THE CRC16 POLYNOMINAL, SINGLE CLOCK A BINARY
3864                                  ;*COUNT PATTERN, VERIFY THE LSB OF THE TRANSMITTER BCC ON EACH SHIFT
3865                                  ;:************************************************************************
3866
3867                                  ;  TEST 46
3868                                  ;--------------
3869  021312  012737  000046  001226  TST46:  MOV     #46,TSTNO
3870  021320  012737  021550  001216          MOV     #TST47,NEXT
3871                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
3872  021326  104412                          MSTCLR                  ;MASTER CLEAR DMC11
3873  021330  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3874  021334  005003                          CLR     R3              ;ZERO BIT COUNT
3875  021336  005004                          CLR     R4              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
3876  021340  005005                          CLR     R5              ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
3877  021342  005037  021444                  CLR     4$              ;CLEAR SOFT BCC
3878  021346  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMINAL
3879  021354  004737  027510                  JSR     PC,SYNLD        ;LOAD SILO WITH 2 SYNCS, SOM SET
3880  021360  010461  000004                  MOV     R4,4(R1)        ;PORT4_CHAR
```

```
3881  021364  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3882  021366  122110                        122110                  ;LOAD OUT DATA
3883  021370  005204                        INC     R4              ;INCREMENT TO NEXT CHARACTER
3884  021372  010461  000004                MOV     R4,4(R1)        ;PORT4 CHAR
3885  021376  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3886  021400  122110                        122110                  ;LOAD OUT DATA
3887  021402  005204                        INC     R4              ;INCREMENT TO NEXT CHARACTER
3888  021404  010461  000004                MOV     R4,4(R1)        ;PORT4 CHAR
3889  021410  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3890  021412  122110                        122110                  ;LOAD OUT DATA
3891  021414  004737  026374                JSR     PC,OCOR         ;WAIT FOR OCOR
3892  021420  104415  000021                DATACLK,21              ;CLOCK DATA
3893  021424  010537  021442        1$:     MOV     R5,3$           ;LOAD CHAR FOR SOFT CRC
3894  021430  104415  000001        2$:     DATACLK,1               ;SHIFT BCC ONCE
3895  021434  004537  027236                JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
3896  021440  000001                        1                       ;SOFT SHIFT COUNT
3897  021442  000000                3$:     0                       ;SOFT CHARACTER
3898  021444  000000                4$:     0                       ;OLD SOFT BCC
3899  021446  103405                        BCS     5$              ;BR IF SOFT BCC LSB IS SET
3900  021450  004737  027460                JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
3901  021454  103006                        BCC     6$              ;BR IF OK (CLEARED)
3902  021456  104020                        HLT     20              ;ERROR, BCC LSB WAS SET
3903  021460  000404                        BR      6$              ;CONTINUE WITH TEST
3904  021462  004737  027460        5$:     JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
3905  021466  103401                        BCS     6$              ;BR IF OK (SET)
3906  021470  104021                        HLT     21              ;ERROR, BCC LSB WAS CLEAR
3907
3908  021472                        6$:
3909  021472  006037  021442                ROR     3$              ;SHIFT SOFT DATA
3910  021476  013737  027344  021444        MOV     CALBCC,4$       ;LOAD OLD SOFT BCC
3911  021504  005203                        INC     R3              ;INCREMENT BIT COUNTER
3912  021506  022703  000010                CMP     #10,R3          ;DONE A FULL CHARACTER YET?
3913  021512  001346                        BNE     2$              ;BR IF NO
3914  021514  005003                        CLR     R3              ;RESTART BIT COUNTER
3915  021516  005204                        INC     R4              ;INCREMENT DATA FOR SILO
3916  021520  022704  000400                CMP     #400,R4         ;DONE BINARY COUNT YET?
3917  021524  003404                        BLE     9$              ;BR IF YES
3918  021526  010461  000004                MOV     R4,4(R1)        ;PORT4 DATA
3919  021532  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3920  021534  122110                        122110                  ;LOAD OUT DATA
3921  021536  005205                9$:     INC     R5              ;INCREMENT DATA
3922  021540  022705  000400                CMP     #400,R5         ;DONE BINARY PATTERN YET?
3923  021544  001327                        BNE     1$              ;BR IF NO
3924  021546  104400                7$:     SCOPE                   ;SCOPE THIS TEST
3925
3926
3927                                        ;***************************** TEST 47 *****************************
3928                                        ;*RECEIVER CRC TEST
3929                                        ;*USING THE CRC16 POLYNOMINAL, SINGLE CLOCK A BINARY
3930                                        ;*COUNT PATTERN, VERIFY THE LSB OF THE RECEIVER BCC ON EACH SHIFT
3931                                        ;:*************************************************************
3932
3933                                        ;  TEST 47
3934                                        ;--------------
3935  021550  012737  000047  001226  TST47:  MOV     #47,TSTNO
3936  021556  012737  022006  001216          MOV     #TST50,NEXT
```

```
                                                        ;R1 CONTAINS BASE DMC11 ADDRESS
021564  104412                          MSTCLR          ;MASTER CLEAR DMC11
021566  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
021572  005003                          CLR     R3      ;ZERO BIT COUNT
021574  005004                          CLR     R4      ;R4 CONTAINS CHAR TO BE LOADED IN SILO
021576  005005                          CLR     R5      ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
021600  005037  021702                  CLR     4$      ;CLEAR SOFT BCC
021604  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMINAL
021612  004737  027510                  JSR     PC,SYNLD        ;LOAD SILO WITH 2 SYNCS, SOM SET
021616  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
021622  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021624  122110                          122110          ;LOAD OUT DATA
021626  005204                          INC     R4      ;INCREMENT TO NEXT CHARACTER
021630  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
021634  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021636  122110                          122110          ;LOAD OUT DATA
021640  005204                          INC     R4      ;INCREMENT TO NEXT CHARACTER
021642  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
021646  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021650  122110                          122110          ;LOAD OUT DATA
021652  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR
021656  104415  000032                  DATACLK,32      ;CLOCK DATA
021662  010537  021700          1$:     MOV     R5,3$   ;LOAD CHAR FOR SOFT CRC
021666  104415  000001          2$:     DATACLK,1       ;SHIFT BCC ONCE
021672  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
021676  000001                          1               ;SOFT SHIFT COUNT
021700  000000                  3$:     0               ;SOFT CHARACTER
021702  000000                  4$:     0               ;OLD SOFT BCC
021704  103405                          BCS     5$      ;BR IF SOFT BCC LSB IS SET
021706  004737  027472                  JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
021712  103006                          BCC     6$      ;BR IF OK (CLEARED)
021714  104022                          HLT     22      ;ERROR, BCC LSB WAS SET
021716  000404                          BR      6$      ;CONTINUE WITH TEST
021720  004737  027472          5$:     JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
021724  103401                          BCS     6$      ;BR IF OK (SET)
021726  104023                          HLT     23      ;ERROR, BCC LSB WAS CLEAR

021730                          6$:
021730  006037  021700                  ROR     3$      ;SHIFT SOFT DATA
021734  013737  027344  021702          MOV     CALBCC,4$       ;LOAD OLD SOFT BCC
021742  005203                          INC     R3      ;INCREMENT BIT COUNTER
021744  022703  000010                  CMP     #10,R3  ;DONE A FULL CHARACTER YET?
021750  001346                          BNE     2$      ;BR IF NO
021752  005003                          CLR     R3      ;RESTART BIT COUNTER
021754  005204                          INC     R4      ;INCREMENT DATA FOR SILO
021756  022704  000400                  CMP     #400,R4 ;DONE BINARY COUNT YET?
021762  003404                          BLE     9$      ;BR IF YES
021764  010461  000004                  MOV     R4,4(R1)        ;PORT4 DATA
021770  104414                          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021772  122110                          122110          ;LOAD OUT DATA
021774  005205          9$:     INC     R5      ;INCREMENT DATA
021776  022705  000400                  CMP     #400,R5 ;DONE BINARY PATTERN YET?
022002  001327                          BNE     1$      ;BR IF NO
022004  104400                  7$:     SCOPE           ;SCOPE THIS TEST
```

```
                                        ;****************************** TEST 50 ******************************
                                        ;*TRANSMITTER DDCMP CRC TEST
                                        ;*THIS TEST TRANSMITS A FOUR CHARACTER MESSAGE WITH CRC
                                        ;*BOTH DATA AND THE BCC ARE VERIFIED IN THE BIT
                                        ;*WINDOW. THE FOUR CHARACTERS ARE 0,125,252,377
                                        ;*THE TRANSMITTER IS CHECKED FOR GOING TO A MARK STATE AFTER THE BCC
                                        ;**********************************************************************
                                        ;  TEST 50
                                        ;--------------
022006  012737  000050  001226  TST50:  MOV     #50,TSTNO
022014  012737  022340  001216          MOV     #TST51,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
022022  104412                          MSTCLR                 ;MASTER CLEAR DMC11

                                        ;LOAD OUT DATA SILO

022024  012711  004000                  MOV     #BIT11,(R1)    ;SET LINE UNIT LOOP
022030  012704  030126                  MOV     #MESDAT,R4     ;LOAD POINTER TO DATA
022034  005037  022130                  CLR     10$            ;CLEAR SOFT BCC
022040  012700  000004                  MOV     #4,R0          ;LOAD CHARACTER COUNT
022044  004737  027510                  JSR     PC,SYNLD       ;LOAD 2 SYNCS IN OUT SILO
022050  004737  026526                  JSR     PC,OUTRDY      ;WAIT FOR OUTRDY
022054  004537  027644                  JSR     R5,MESLD       ;LOAD SILO WITH 4 CHAR MESS
022060  030126                          MESDAT                 ;ADDRESS OF MESSAGE
022062  000004                          4                      ;NUMBER OF CHARACTERS
022064  004737  027620                  JSR     PC,EOM         ;LOAD GARBAGE CHARACTER, WITH EOM SET
022070  004737  026374                  JSR     PC,OCOR        ;WAIT FOR OCOR
022074  005003                          CLR     R3             ;CLEAR BIT COUNTER
022076  104415  000022                  DATACLK,22             ;CLOCK DATA
022102  112405                  12$:    MOVB    (R4)+,R5       ;LOAD R5 WITH CHAR
022104  010502                          MOV     R5,R2          ;LOAD R2 WITH CHAR

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

022106  012737  120001  027342          MOV     #CRC16,XPOLY   ;LOAD POLYNOMIAL
022114  010537  022126                  MOV     R5,67$         ;LOAD SOFT CHAR FOR BCC
022120  004537  027236                  JSR     R5,SIMBCC      ;CALCULATE SOFT BCC
022124  000010                          10                     ;SHIFT COUNT
022126  000000                  67$:    0                      ;CHARACTER
022130  000000                  10$:    0                      ;OLD BCC
022132  013737  027344  022130          MOV     CALBCC,10$     ;LOAD SOFT BCC FOR NEXT SHIFT
022140  104415  000001          64$:    DATACLK,       1       ;SHIFT DATA IN TO BIT WINDOW
022144  106002                          RORB    R2             ;SHIFT SOFT DATA
022146  103005                          BCC     65$            ;BR IF A SPACE
022150  004737  026342                  JSR     PC,GETSI       ;LOOK AT BIT WINDOW
022154  103406                          BCS     66$            ;BR IF OK (MARK)
022156  104006                          HLT     6              ;ERROR, BIT WINDOW WAS A SPACE
022160  000404                          BR      66$            ;CONTINUE
022162  004737  026342          65$:    JSR     PC,GETSI       ;LOOK AT BIT WINDOW
022166  103001                          BCC     66$            ;BR IF OK (SPACE)
022170  104006                          HLT     6              ;ERROR, BIT WINDOW WAS A MARK
022172                          66$:
022172  005203                          INC     R3             ;BUMP BIT COUNTER
022174  022703  000010                  CMP     #10,R3         ;DONE FULL 8 BITS YET
```

```
4049  022200  001357                    BNE     64$             ;BR IF NO
4050  022202  005003                    CLR     R3              ;CLEAR BIT COUNTER
4051  022204  005300                    DEC     R0              ;DEC CHARACTER COUNT
4052  022206  001335                    BNE     12$             ;BR IF NOT DONE YET
4053
4054                                    ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4055
4056  022210  013700  027344            MOV     CALBCC,R0       ;PUT BCC IN R0
4057  022214  104415  000001    68$:    DATACLK,1               ;SHIFT HARDWARE BCC
4058  022220  006000                    ROR     R0              ;SHIFT SOFT BCC
4059  022222  103005                    BCC     69$             ;BR IF CARRY CLEAR
4060  022224  004737  026342            JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4061  022230  103406                    BCS     70$             ;BR IF OK (MARK)
4062  022232  104014                    HLT     14              ;ERROR, CRC WRONG (SPACE)
4063  022234  000404                    BR      70$             ;CONTINUE
4064  022236  004737  026342    69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4065  022242  103001                    BCC     70$             ;BR IF OK (SPACE)
4066  022244  104014                    HLT     14              ;ERROR, CRC WRONG (MARK)
4067  022246                    70$:
4068  022246  005203                    INC     R3              ;BUMP BIT COUNTER
4069  022250  022703  000020            CMP     #20,R3          ;FINISHED BCC YET?
4070  022254  001357                    BNE     68$             ;BR IF NO
4071  022256  005003                    CLR     R3              ;CLEAR BIT COUNTER
4072
4073                                    ;CHECK TO SEE IF TRANSMITTER IS MARKING
4074
4075  022260  104415  000001    2$:     DATACLK,        1       ;CLOCK TRANSMITTER
4076  022264  004737  026342            JSR     PC,GETSI        ;LOOK AT WINDOW
4077  022270  103401                    BCS     3$              ;IT SHOULD BE MARKING
4078  022272  104024                    HLT     24              ;ERROR, BIT WAS A SPACE
4079  022274  005203    3$:             INC     R3              ;BUMP BIT COUNTER
4080  022276  022703  000007            CMP     #7,R3           ;DONE YET
4081  022302  001366                    BNE     2$              ;BR IF NO
4082  022304  104415  000010            DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
4083  022310  005003                    CLR     R3              ;CLEAR BIT COUNTER
4084  022312  104415  000001    4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
4085  022316  004737  026342            JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4086  022322  103401                    BCS     .+4             ;BR IF IT IS A MARK
4087  022324  104024                    HLT     24              ;ERROR, TRANSMITTER IS NOT MARKING
4088  022326  005203                    INC     R3              ;INC BIT COUNT
4089  022330  022703  000020            CMP     #20,R3          ;DONE YET?
4090  022334  001366                    BNE     4$              ;BR IF NO
4091  022336  104400    5$:             SCOPE                   ;SCOPE THIS TEST
4092
4093
4094                                    ;***************************** TEST 51 *****************************
4095                                    ;*RECEIVER DDCMP CRC TEST
4096                                    ;*THIS TEST CLOCKS A FOUR CHARACTER MESSAGE WITH BCC
4097                                    ;*AND VERIFYS CORRECT DATA RECEPTION AND BCC MATCH.
4098                                    ;*IN BCC MATCH IS CHECKED TO SEE THAT IT IS NOT ASSERTED
4099                                    ;*UNTIL THE LAST HALF OF THE CRC IS RECEIVED
4100                                    ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
4101                                    ;:*************************************************************
4102
4103                                    ;  TEST 51
4104                                    ;--------------
```

```
 4105  022340  012737  000051  001226  TST51:  MOV     #51,TSTNO
 4106  022346  012737  022566  001216          MOV     #TST52,NEXT
 4107
                                                ;R1 CONTAINS BASE DMC11 ADDRESS
 4108  022354  104412                          MSTCLR                  ;MASTER CLEAR DMC11
 4109  022356  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4110  022362  012702  030126                  MOV     #MESDAT,R2      ;LOAD POINTER TO DATA
 4111  022366  012700  000004                  MOV     #4,R0           ;LOAD CHARACTER COUNT
 4112  022372  004737  027510                  JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
 4113  022376  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 4114  022402  004537  027644                  JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
 4115  022406  030126                          MESDAT                  ;ADDRESS OF MESSAGE
 4116  022410  000004                          4                       ;NUMBER OF CHARACTERS
 4117  022412  004737  027620                  JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
 4118  022416  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR
 4119  022422  104415  000114                  DATACLK,114             ;CLOCK DATA
 4120  022426  004737  027202          3$:     JSR     PC,INRDY        ;WAIT FOR INRDY
 4121  022432  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4122  022434  021204                          021204                  ;GET IN DATA
 4123  022436  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
 4124  022442  112205                          MOVB    (R2)+,R5        ;PUT 'EXPECTED' IN R5
 4125  022444  120504                          CMPB    R5,R4           ;COMPARE RECEIVED DATA
 4126  022446  001401                          BEQ     1$              ;BR IF OK
 4127  022450  104010                          HLT     10              ;DATA ERROR
 4128  022452                          1$:
 4129  022452  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4130  022454  021244                          021244
 4131  022456  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
 4132  022462  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
 4133  022466  005005                          CLR     R5              ;PUT 'EXPECTED' IN R5
 4134  022470  120504                          CMPB    R5,R4           ;IS IN BCC MATCH STILL CLEAR?
 4135  022472  001401                          BEQ     4$
 4136  022474  104015                          HLT     15              ;IN BCC MATCH ERROR
 4137  022476  005300                  4$:     DEC     R0              ;DEC CHARACTER COUNT
 4138  022500  001352                          BNE     3$              ;BR IF NOT DONE YET
 4139
 4140                                           ;CHECK TO SEE THAT IN BCC MATCH IS SET
 4141
 4142  022502  004737  027202                  JSR     PC,INRDY        ;WAIT FOR INRDY
 4143  022506  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4144  022510  021204                          021204                  ;GET FIRST HALF OF CRC
 4145  022512  116137  000004  001252          MOVB    4(R1),TEMP3     ;PUT IN TEMP3
 4146  022520  042737  177400  001252          BIC     #177400,TEMP3   ;CLEAR HI BYTE
 4147  022526  004737  027202                  JSR     PC,INRDY        ;WAIT FOR INRDY
 4148  022532  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4149  022534  021244                          021244
 4150  022536  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
 4151  022542  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
 4152  022546  012705  000001                  MOV     #1,R5           ;PUT 'EXPECTED' IN R5
 4153  022552  120504                          CMPB    R5,R4           ;IS IN BCC MATCH SET?
 4154  022554  001401                          BEQ     25$
 4155  022556  104015                          HLT     15              ;IN BCC MATCH ERROR
 4156  022560                          25$:
 4157  022560  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4158  022562  021204                          021204                  ;GET LAST HALF
 4159  022564  104400                  2$:     SCOPE                   ;SCOPE THIS TEST
 4160
```

```
                                        ;****************************** TEST 52 ******************************
                                        ;*DDCMP EOM FUNCTION TEST
                                        ;*THIS TEST LOADS OUT SILO WITH: 2 SYNCS,4 CHAR MESSAGE,EOM
                                        ;*4 CHARACTER MESS,EOM. THE DATA STREAM IS CHECKED TO BE
                                        ;*4 CHAR,BCC,4 CHAR,BCC,MARKS. THIS TEST VERIFYS THAT
                                        ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
                                        ;*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 52
                                        ;--------------
022566  012737  000052  001226  TST52:  MOV     #52,TSTNO
022574  012737  023666  001216          MOV     #TST53,NEXT
                                                                ;R1 CONTAINS BASE DMC11 ADDRESS
022602  104412                          MSTCLR                  ;MASTER CLEAR DMC11

                                        ;LOAD OUT DATA SILO

022604  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
022610  012704  030126                  MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
022614  005037  022724                  CLR     10$             ;CLEAR SOFT BCC
022620  012700  000004                  MOV     #4,R0           ;LOAD CHARACTER COUNT
022624  004737  027510                  JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
022630  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
022634  004537  027644                  JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
022640  030126                          MESDAT                  ;ADDRESS OF MESSAGE
022642  000004                          4                       ;NUMBER OF CHARACTERS
022644  004737  027620                  JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
022650  004537  027644                  JSR     R5,MESLD        ;LOAD FOUR MORE CHARACTERS
022654  030126                          MESDAT                  ;ADDRESS OF MESSAGE
022656  000004                          4                       ;NUMBER OF CHACTERS
022660  004737  027620                  JSR     PC,EOM          ;SET EOM
022664  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR
022670  005003                          CLR     R3              ;CLEAR BIT COUNTER
022672  104415  000022                  DATACLK,22              ;CLOCK DATA
022676  112405                  12$:    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
022700  010502                          MOV     R5,R2           ;LOAD R2 WITH CHAR

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

022702  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
022710  010537  022722                  MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
022714  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
022720  000010                          10                      ;SHIFT COUNT
022722  000000                  67$:    0                       ;CHARACTER
022724  000000                  10$:    0                       ;OLD BCC
022726  013737  027344  022724          MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
022734  104415  000001          64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
022740  106002                          RORB    R2              ;SHIFT SOFT DATA
022742  103005                          BCC     65$             ;BR IF A SPACE
022744  004737  026342                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
022750  103406                          BCS     66$             ;BR IF OK (MARK)
```

```
4217  022752  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
4218  022754  000404                        BR      66$             ;CONTINUE
4219  022756  004737  026342        65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4220  022762  103001                        BCC     66$             ;BR IF OK (SPACE)
4221  022764  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A MARK
4222  022766                        66$:
4223  022766  005203                        INC     R3              ;BUMP BIT COUNTER
4224  022770  022703  000010              CMP     #10,R3          ;DONE FULL 8 BITS YET
4225  022774  001357                        BNE     64$             ;BR IF NO
4226  022776  005003                        CLR     R3              ;CLEAR BIT COUNTER
4227  023000  005300                        DEC     R0              ;DEC CHARACTER COUNT
4228  023002  001335                        BNE     12$             ;BR IF NOT DONE YET
4229
4230                                        ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4231
4232  023004  013700  027344                MOV     CALBCC,R0       ;PUT BCC IN R0
4233  023010  104415  000001        68$:    DATACLK,1               ;SHIFT HARDWARE BCC
4234  023014  006000                        ROR     R0              ;SHIFT SOFT BCC
4235  023016  103005                        BCC     69$             ;BR IF CARRY CLEAR
4236  023020  004737  026342              JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4237  023024  103406                        BCS     70$             ;BR IF OK (MARK)
4238  023026  104014                        HLT     14              ;ERROR, CRC WRONG (SPACE)
4239  023030  000404                        BR      70$             ;CONTINUE
4240  023032  004737  026342        69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4241  023036  103001                        BCC     70$             ;BR IF OK (SPACE)
4242  023040  104014                        HLT     14              ;ERROR, CRC WRONG (MARK)
4243  023042                        70$:
4244  023042  005203                        INC     R3              ;BUMP BIT COUNTER
4245  023044  022703  000020              CMP     #20,R3          ;FINISHED BCC YET?
4246  023050  001357                        BNE     68$             ;BR IF NO
4247  023052  005003                        CLR     R3              ;CLEAR BIT COUNTER
4248  023054  012700  000004              MOV     #4,R0           ;RESET CHARACTER COUNTER
4249  023060  012704  030126              MOV     #MESDAT,R4      ;LOAD MESSAGE POINTER
4250  023064  005037  023116              CLR     11$             ;CLR SOFT BCC
4251  023070  112405                13$:    MOVB    (R4)+,R5        ;LOAD CHAR IN R5
4252  023072  010502                        MOV     R5,R2           ;LOAD CHAR IN R2
4253
4254                                        ;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
4255
4256  023074  012737  120001  027342        MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
4257  023102  010537  023114              MOV     R5,76$          ;LOAD SOFT CHAR FOR BCC
4258  023106  004537  027236              JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
4259  023112  000010                        10                      ;SHIFT COUNT
4260  023114  000000                76$:    0                       ;CHARACTER
4261  023116  000000                11$:    0                       ;OLD BCC
4262  023120  013737  027344  023116        MOV     CALBCC,11$      ;LOAD SOFT BCC FOR NEXT SHIFT
4263  023126  104415  000001        73$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
4264  023132  106002                        RORB    R2              ;SHIFT SOFT DATA
4265  023134  103005                        BCC     74$             ;BR IF A SPACE
4266  023136  004737  026342              JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4267  023142  103406                        BCS     75$             ;BR IF OK (MARK)
4268  023144  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
4269  023146  000404                        BR      75$             ;CONTINUE
4270  023150  004737  026342        74$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4271  023154  103001                        BCC     75$             ;BR IF OK (SPACE)
4272  023156  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A MARK
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4273  023160                          75$:
4274  023160  005203                        INC     R3              ;BUMP BIT COUNTER
4275  023162  022703  000010                CMP     #10,R3          ;DONE FULL 8 BITS YET
4276  023166  001357                        BNE     73$             ;BR IF NO
4277  023170  005003                        CLR     R3              ;CLEAR BIT COUNTER
4278  023172  005300                        DEC     R0              ;DEC CHARACTER COUNT
4279  023174  001335                        BNE     13$             ;BR IF NOT DONE YET
4280
4281                                        ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4282
4283  023176  013700  027344                MOV     CALBCC,R0       ;PUT BCC IN R0
4284  023202  104415  000001          77$:  DATACLK,1               ;SHIFT HARDWARE BCC
4285  023206  006000                        ROR     R0              ;SHIFT SOFT BCC
4286  023210  103005                        BCC     78$             ;BR IF CARRY CLEAR
4287  023212  004737  026342                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4288  023216  103406                        BCS     79$             ;BR IF OK (MARK)
4289  023220  104014                        HLT     14              ;ERROR, CRC WRONG (SPACE)
4290  023222  000404                        BR      79$             ;CONTINUE
4291  023224  004737  026342          78$:  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4292  023230  103001                        BCC     79$             ;BR IF OK (SPACE)
4293  023232  104014                        HLT     14              ;ERROR, CRC WRONG (MARK)
4294  023234                          79$:
4295  023234  005203                        INC     R3              ;BUMP BIT COUNTER
4296  023236  022703  000020                CMP     #20,R3          ;FINISHED BCC YET?
4297  023242  001357                        BNE     77$             ;BR IF NO
4298  023244  005003                        CLR     R3              ;CLEAR BIT COUNTER
4299
4300                                        ;CHECK TO SEE IF TRANSMITTER IS MARKING
4301
4302  023246  104415  000001          2$:   DATACLK,        1       ;CLOCK TRANSMITTER
4303  023252  004737  026342                JSR     PC,GETSI        ;LOOK AT WINDOW
4304  023256  103401                        BCS     3$              ;IT SHOULD BE MARKING
4305  023260  104024                        HLT     24              ;ERROR, BIT WAS A SPACE
4306  023262  005203                  3$:   INC     R3              ;BUMP BIT COUNTER
4307  023264  022703  000007                CMP     #7,R3           ;DONE YET
4308  023270  001366                        BNE     2$              ;BR IF NO
4309  023272  104415  000010                DATACLK,       10       ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
4310  023276  005003                        CLR     R3              ;CLEAR BIT COUNTER
4311  023300  104415  000001          4$:   DATACLK,        1       ;SHIFT OUT NEXT BIT
4312  023304  004737  026342                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4313  023310  103401                        BCS     .+4             ;BR IF IT IS A MARK
4314  023312  104024                        HLT     24              ;ERROR, TRANSMITTER IS NOT MARKING
4315  023314  005203                        INC     R3              ;INC BIT COUNT
4316  023316  022703  000020                CMP     #20,R3          ;DONE YET?
4317  023322  001366                        BNE     4$              ;BR IF NO
4318
4319                                        ;CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
4320                                        ;WAS RECEIVED CORRECTLY (0,125,252,377)
4321
4322  023324  104415  000001                DATACLK,        1       ;GET LAST BIT IN RECEIVER
4323  023330  012703  000004                MOV     #4,R3           ;R3=CHARACTER COUNT
4324  023334  012702  030126                MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
4325  023340  004737  027202          40$:  JSR     PC,INRDY        ;WAIT FOR INRDY
4326  023344  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4327  023346  021204                        021204
4328  023350  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
```

```
4329  023354  112205                        MOVB    (R2)+,R5        ;PUT 'EXPECTED' IN R5
4330  023356  120504                        CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
4331  023360  001401                        BEQ     41$             ;BR IF YES
4332  023362  104010                        HLT     10              ;RECEIVE DATA ERROR
4333  023364  005303                 41$:   DEC     R3              ;DEC CHARACTER COUNT
4334  023366  001364                        BNE     40$             ;BR IF NOT DONE YET
4335
4336                                         ;CHECK TO SEE THAT IN BCC MATCH IS SET
4337                                         ;AND THAT THE BCC WAS RECEIVED CORRECTLY
4338
4339  023370  004737  027202                JSR     PC,INRDY        ;WAIT FOR INRDY
4340  023374  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4341  023376  021204                        021204                  ;GET FIRST HALF OF CRC
4342  023400  116137  000004  001252        MOVB    4(R1),TEMP3     ;PUT IN TEMP3
4343  023406  042737  177400  001252        BIC     #177400,TEMP3   ;CLEAR HI BYTE
4344  023414  004737  027202                JSR     PC,INRDY        ;WAIT FOR INRDY
4345  023420  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4346  023422  021244                        021244
4347  023424  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4348  023430  042704  000376                BIC     #376,R4         ;CLEAR UNWANTED BITS
4349  023434  012705  000001                MOV     #1,R5           ;PUT 'EXPECTED' IN R5
4350  023440  120504                        CMPB    R5,R4           ;IS IN BCC MATCH SET?
4351  023442  001401                        BEQ     50$
4352  023444  104015                        HLT     15              ;IN BCC MATCH ERROR
4353  023446                           50$:
4354  023446  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4355  023450  021204                        021204                  ;GET LAST HALF
4356  023452  116137  000004  001251        MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
4357  023460  042737  000377  001250        BIC     #377,TEMP2      ;CLEAR LO BYTE
4358  023466  053737  001250  001252        BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
4359  023474  023737  027344  001252        CMP     CALBCC,TEMP3    ;IS IT CORRECT?
4360  023502  001401                        BEQ     42$             ;BR IF OK
4361  023504  104027                        HLT     27
4362
4363                                         ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
4364                                         ;WAS RECEIVED CORRECTLY (0,125,252,377)
4365
4366  023506  012703  000004           42$:   MOV     #4,R3           ;R3=CHARACTER COUNT
4367  023512  012702  030126                MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
4368  023516  004737  027202           43$:   JSR     PC,INRDY        ;WAIT FOR INRDY
4369  023522  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4370  023524  021204                        021204
4371  023526  016104  000004                MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4372  023532  112205                        MOVB    (R2)+,R5        ;PUT 'EXPECTED' IN R5
4373  023534  120504                        CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
4374  023536  001401                        BEQ     44$             ;BR IF YES
4375  023540  104010                        HLT     10              ;RECEIVE DATA ERROR
4376  023542  005303                 44$:   DEC     R3              ;DEC CHARACTER COUNT
4377  023544  001364                        BNE     43$             ;BR IF NOT DONE YET
4378
4379                                         ;CHECK TO SEE THAT IN BCC MATCH IS SET
4380                                         ;AND THAT THE BCC WAS RECEIVED CORRECTLY
4381
4382  023546  004737  027202                JSR     PC,INRDY        ;WAIT FOR INRDY
4383  023552  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4384  023554  021204                        021204                  ;GET FIRST HALF OF CRC
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4385  023556  116137  000004  001252          MOVB    4(R1),TEMP3     ;PUT IN TEMP3
4386  023564  042737  177400  001252          BIC     #177400,TEMP3   ;CLEAR HI BYTE
4387  023572  004737  027202                  JSR     PC,INRDY        ;WAIT FOR INRDY
4388  023576  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4389  023600  021244                          021244
4390  023602  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4391  023606  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
4392  023612  012705  000001                  MOV     #1,R5           ;PUT 'EXPECTED' IN R5
4393  023616  120504                          CMPB    R5,R4           ;IS IN BCC MATCH SET?
4394  023620  001401                          BEQ     51$
4395  023622  104015                          HLT     15              ;IN BCC MATCH ERROR
4396  023624                          51$:
4397  023624  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4398  023626  021204                          021204                  ;GET LAST HALF
4399  023630  116137  000004  001251          MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
4400  023636  042737  000377  001250          BIC     #377,TEMP2      ;CLEAR LO BYTE
4401  023644  053737  001250  001252          BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
4402  023652  023737  027344  001252          CMP     CALBCC,TEMP3    ;IS IT CORRECT?
4403  023660  001401                          BEQ     5$              ;BR IF OK
4404  023662  104027                          HLT     27
4405  023664  104400                  5$:     SCOPE                   ;SCOPE THIS TEST
4406
4407
4408                                          ;***************************** TEST 53 *****************************
4409                                          ;*DDCMP EOM FUNCTION TEST
4410                                          ;*THIS TEST LOADS OUT SILO WITH: 2 SYNCS,4 CHAR MESSAGE,EOM
4411                                          ;*SOM,4 CHAR MESS,EOM. THE DATA STREAM IS CHECKED TO BE
4412                                          ;*4 CHAR,BCC,4 CHAR,BCC,MARKS. THIS TEST VERIFYS THAT
4413                                          ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
4414                                          ;*ALSO THAT THE CHAR LOADED WITH SOM IS NOT IN THE BCC
4415                                          ;*ALL DATA AND BCC'S ARE CHECKED IN THE BIT WINDOW
4416                                          ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
4417                                          ;*RECEIVED DATA IS VERIFIED, AND IN BCC MATCH IS CHECKED
4418                                          ;:*************************************************************************
4419
4420                                          ;  TEST 53
4421                                          ;--------------
4422  023666  012737  000053  001226  TST53:  MOV     #53,TSTNO
4423  023674  012737  025066  001216          MOV     #TST54,NEXT
4424                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
4425  023702  104412                          MSTCLR                  ;MASTER CLEAR DMC11
4426
4427                                          ;LOAD OUT DATA SILO
4428
4429  023704  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4430  023710  012704  030126                  MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
4431  023714  005037  024030                  CLR     10$             ;CLEAR SOFT BCC
4432  023720  012700  000004                  MOV     #4,R0           ;LOAD CHARACTER COUNT
4433  023724  004737  027510                  JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
4434  023730  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
4435  023734  004537  027644                  JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
4436  023740  030126                          MESDAT                  ;ADDRESS OF MESSAGE
4437  023742  000004                          4                       ;NUMBER OF CHARACTERS
4438  023744  004737  027620                  JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
4439  023750  004737  027570                  JSR     PC,SOM          ;LOAD GARBAGE CHAR WITH SOM SET
4440  023754  004537  027644                  JSR     R5,MESLD        ;LOAD FOUR MORE CHARACTERS
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4441  023760  030126                          MESDAT                  ;ADDRESS OF MESSAGE
4442  023762  000004                          4                       ;NUMBER OF CHACTERS
4443  023764  004737  027620                  JSR     PC,EOM          ;SET EOM
4444  023770  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR
4445  023774  005003                          CLR     R3              ;CLEAR BIT COUNTER
4446  023776  104415  000022                  DATACLK,22              ;CLOCK DATA
4447  024002  112405                  12$:    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
4448  024004  010502                          MOV     R5,R2           ;LOAD R2 WITH CHAR
4449
4450                                          ;CHECK FIRST FOUR CHARACTER MESSAGE
4451                                          ;IN THE BIT WINDOW (0,125,252,377)
4452
4453  024006  012737  120001  027342          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
4454  024014  010537  024026                  MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
4455  024020  004537  027236                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
4456  024024  000010                          10                      ;SHIFT COUNT
4457  024026  000000                  67$:    0                       ;CHARACTER
4458  024030  000000                  10$:    0                       ;OLD BCC
4459  024032  013737  027344  024030          MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
4460  024040  104415  000001          64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
4461  024044  106002                          RORB    R2              ;SHIFT SOFT DATA
4462  024046  103005                          BCC     65$             ;BR IF A SPACE
4463  024050  004737  026342                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4464  024054  103406                          BCS     66$             ;BR IF OK (MARK)
4465  024056  104006                          HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
4466  024060  000404                          BR      66$             ;CONTINUE
4467  024062  004737  026342          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4468  024066  103001                          BCC     66$             ;BR IF OK (SPACE)
4469  024070  104006                          HLT     6               ;ERROR, BIT WINDOW WAS A MARK
4470  024072                          66$:
4471  024072  005203                          INC     R3              ;BUMP BIT COUNTER
4472  024074  022703  000010                  CMP     #10,R3          ;DONE FULL 8 BITS YET
4473  024100  001357                          BNE     64$             ;BR IF NO
4474  024102  005003                          CLR     R3              ;CLEAR BIT COUNTER
4475  024104  005300                          DEC     R0              ;DEC CHARACTER COUNT
4476  024106  001335                          BNE     12$             ;BR IF NOT DONE YET
4477
4478                                          ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4479
4480  024110  013700  027344                  MOV     CALBCC,R0       ;PUT BCC IN R0
4481  024114  104415  000001          68$:    DATACLK,1               ;SHIFT HARDWARE BCC
4482  024120  006000                          ROR     R0              ;SHIFT SOFT BCC
4483  024122  103005                          BCC     69$             ;BR IF CARRY CLEAR
4484  024124  004737  026342                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4485  024130  103406                          BCS     70$             ;BR IF OK (MARK)
4486  024132  104014                          HLT     14              ;ERROR, CRC WRONG (SPACE)
4487  024134  000404                          BR      70$             ;CONTINUE
4488  024136  004737  026342          69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4489  024142  103001                          BCC     70$             ;BR IF OK (SPACE)
4490  024144  104014                          HLT     14              ;ERROR, CRC WRONG (MARK)
4491  024146                          70$:
4492  024146  005203                          INC     R3              ;BUMP BIT COUNTER
4493  024150  022703  000020                  CMP     #20,R3          ;FINISHED BCC YET?
4494  024154  001357                          BNE     68$             ;BR IF NO
4495  024156  005003                          CLR     R3              ;CLEAR BIT COUNTER
4496
```

```
4497                                        ;CHECK CHARACTER LOADED WITH SOM (000), IN THE BIT WINDOW
4498
4499  024160  005005                        CLR     R5              ;CHARACTER LOADED WITH SOM
4500  024162  010502                        MOV     R5,R2           ;LOAD R2 WITH CHAR
4501  024164  104415  000001          32$:  DATACLK,        1       ;CLOCK TRANSMITTER
4502  024170  106002                        RORB    R2              ;SHIFT SOFT DATA
4503  024172  103005                        BCC     30$             ;BR IF SPACE
4504  024174  004737  026342                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4505  024200  103406                        BCS     31$             ;BR IF OK (MARK)
4506  024202  104006                        HLT     6               ;ERROR,BIT WINDOW WAS A SPACE
4507  024204  000404                        BR      31$             ;CONTINUE
4508  024206  004737  026342          30$:  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4509  024212  103001                        BCC     31$             ;BR IF OK (SPACE)
4510  024214  104006                        HLT     6               ;ERROR,BIT WINDOW WAS A MARK
4511  024216  005203                  31$:  INC     R3              ;BUMP BIT COUNTER
4512  024220  022703  000010                CMP     #10,R3          ;DONE CHARACTER YET?
4513  024224  001357                        BNE     32$             ;BR IF NO
4514  024226  005003                        CLR     R3              ;RESET BIT COUNTER
4515  024230  012700  000004                MOV     #4,R0           ;RESET CHARACTER COUNTER
4516  024234  012704  030126                MOV     #MESDAT,R4      ;LOAD MESSAGE POINTER
4517  024240  005037  024272                CLR     11$             ;CLR SOFT BCC
4518  024244  112405                  13$:  MOVB    (R4)+,R5        ;LOAD CHAR IN R5
4519  024246  010502                        MOV     R5,R2           ;LOAD CHAR IN R2
4520
4521                                        ;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
4522
4523  024250  012737  120001  027342        MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
4524  024256  010537  024270                MOV     R5,76$          ;LOAD SOFT CHAR FOR BCC
4525  024262  004537  027236                JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
4526  024266  000010                        10                      ;SHIFT COUNT
4527  024270  000000                  76$:  0                       ;CHARACTER
4528  024272  000000                  11$:  0                       ;OLD BCC
4529  024274  013737  027344  024272        MOV     CALBCC,11$      ;LOAD SOFT BCC FOR NEXT SHIFT
4530  024302  104415  000001          73$:  DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
4531  024306  106002                        RORB    R2              ;SHIFT SOFT DATA
4532  024310  103005                        BCC     74$             ;BR IF A SPACE
4533  024312  004737  026342                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4534  024316  103406                        BCS     75$             ;BR IF OK (MARK)
4535  024320  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A SPACE
4536  024322  000404                        BR      75$             ;CONTINUE
4537  024324  004737  026342          74$:  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4538  024330  103001                        BCC     75$             ;BR IF OK (SPACE)
4539  024332  104006                        HLT     6               ;ERROR, BIT WINDOW WAS A MARK
4540  024334                            75$:
4541  024334  005203                        INC     R3              ;BUMP BIT COUNTER
4542  024336  022703  000010                CMP     #10,R3          ;DONE FULL 8 BITS YET
4543  024342  001357                        BNE     73$             ;BR IF NO
4544  024344  005003                        CLR     R3              ;CLEAR BIT COUNTER
4545  024346  005300                        DEC     R0              ;DEC CHARACTER COUNT
4546  024350  001335                        BNE     13$             ;BR IF NOT DONE YET
4547
4548                                        ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
4549
4550  024352  013700  027344                MOV     CALBCC,R0       ;PUT BCC IN R0
4551  024356  104415  000001          77$:  DATACLK,1               ;SHIFT HARDWARE BCC
4552  024362  006000                        ROR     R0              ;SHIFT SOFT BCC
```

```
4553  024364  103005                  BCC     78$             ;BR IF CARRY CLEAR
4554  024366  004737  026342          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4555  024372  103406                  BCS     79$             ;BR IF OK (MARK)
4556  024374  104014                  HLT     14              ;ERROR, CRC WRONG (SPACE)
4557  024376  000404                  BR      79$             ;CONTINUE
4558  024400  004737  026342  78$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4559  024404  103001                  BCC     79$             ;BR IF OK (SPACE)
4560  024406  104014                  HLT     14              ;ERROR, CRC WRONG (MARK)
4561  024410                  79$:
4562  024410  005203                  INC     R3              ;BUMP BIT COUNTER
4563  024412  022703  000020          CMP     #20,R3          ;FINISHED BCC YET?
4564  024416  001357                  BNE     77$             ;BR IF NO
4565  024420  005003                  CLR     R3              ;CLEAR BIT COUNTER
4566
4567                                  ;CHECK TO SEE IF TRANSMITTER IS MARKING
4568
4569  024422  104415  000001  2$:     DATACLK,        1       ;CLOCK TRANSMITTER
4570  024426  004737  026342          JSR     PC,GETSI        ;LOOK AT WINDOW
4571  024432  103401                  BCS     3$              ;IT SHOULD BE MARKING
4572  024434  104024                  HLT     24              ;ERROR, BIT WAS A SPACE
4573  024436  005203  3$:     INC     R3              ;BUMP BIT COUNTER
4574  024440  022703  000007          CMP     #7,R3           ;DONE YET
4575  024444  001366                  BNE     2$              ;BR IF NO
4576  024446  104415  000010          DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
4577  024452  005003                  CLR     R3              ;CLEAR BIT COUNTER
4578  024454  104415  000001  4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
4579  024460  004737  026342          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
4580  024464  103401                  BCS     .+4             ;BR IF IT IS A MARK
4581  024466  104024                  HLT     24              ;ERROR, TRANSMITTER IS NOT MARKING
4582  024470  005203                  INC     R3              ;INC BIT COUNT
4583  024472  022703  000020          CMP     #20,R3          ;DONE YET?
4584  024476  001366                  BNE     4$              ;BR IF NO
4585
4586                                  ;CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
4587                                  ;WAS RECEIVED CORRECTLY (0,125,252,377)
4588
4589  024500  104415  000001          DATACLK,        1       ;GET LAST BIT IN RECEIVER
4590  024504  012703  000004          MOV     #4,R3           ;R3=CHARACTER COUNT
4591  024510  012702  030126          MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
4592  024514  004737  027202  40$:    JSR     PC,INRDY        ;WAIT FOR INRDY
4593  024520  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4594  024522  021204                  021204
4595  024524  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
4596  024530  112205                  MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
4597  024532  120504                  CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
4598  024534  001401                  BEQ     41$             ;BR IF YES
4599  024536  104010                  HLT     10              ;RECEIVE DATA ERROR
4600  024540  005303  41$:    DEC     R3              ;DEC CHARACTER COUNT
4601  024542  001364                  BNE     40$             ;BR IF NOT DONE YET
4602
4603                                  ;CHECK TO SEE THAT IN BCC MATCH IS SET
4604                                  ;AND THAT THE BCC WAS RECEIVED CORRECTLY
4605
4606  024544  004737  027202          JSR     PC,INRDY        ;WAIT FOR INRDY
4607  024550  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4608  024552  021204                  021204                  ;GET FIRST HALF OF CRC
```

```
4609  024554  116137  000004  001252          MOVB    4(R1),TEMP3     ;PUT IN TEMP3
4610  024562  042737  177400  001252          BIC     #177400,TEMP3   ;CLEAR HI BYTE
4611  024570  004737  027202                  JSR     PC,INRDY        ;WAIT FOR INRDY
4612  024574  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4613  024576  021244                          021244
4614  024600  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4615  024604  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
4616  024610  012705  000001                  MOV     #1,R5           ;PUT 'EXPECTED' IN R5
4617  024614  120504                          CMPB    R5,R4           ;IS IN BCC MATCH SET?
4618  024616  001401                          BEQ     50$
4619  024620  104015                          HLT     15              ;IN BCC MATCH ERROR
4620  024622                          50$:
4621  024622  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4622  024624  021204                          021204                  ;GET LAST HALF
4623  024626  116137  000004  001251          MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
4624  024634  042737  000377  001250          BIC     #377,TEMP2      ;CLEAR LO BYTE
4625  024642  053737  001250  001252          BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
4626  024650  023737  027344  001252          CMP     CALBCC,TEMP3    ;IS IT CORRECT?
4627  024656  001401                          BEQ     45$             ;BR IF OK
4628  024660  104027                          HLT     27
4629
4630                                          ;CHECK THAT CHARACTER LOADED WITH SOM WAS RECEIVED (000)
4631
4632  024662  004737  027202          45$:    JSR     PC,INRDY        ;WAIT FOR INRDY
4633  024666  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4634  024670  021204                          021204                  ;GET RECEIVE DATA
4635  024672  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4636  024676  005005                          CLR     R5              ;PUT 'EXPECTED' IN R5
4637  024700  120504                          CMPB    R5,R4           ;IS RECEVIED DATA CORRECT?
4638  024702  001401                          BEQ     42$             ;BR IF YES
4639  024704  104010                          HLT     10              ;RECEIVE DATA ERROR
4640
4641                                          ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
4642                                          ;WAS RECEIVED CORRECTLY (0,125,252,377)
4643
4644  024706  012703  000004          42$:    MOV     #4,R3           ;R3=CHARACTER COUNT
4645  024712  012702  030126                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
4646  024716  004737  027202          43$:    JSR     PC,INRDY        ;WAIT FOR INRDY
4647  024722  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4648  024724  021204                          021204
4649  024726  016104  000004                  MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4650  024732  112205                          MOVB    (R2)+,R5        ;PUT 'EXPECTED' IN R5
4651  024734  120504                          CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
4652  024736  001401                          BEQ     44$             ;BR IF YES
4653  024740  104010                          HLT     10              ;RECEIVE DATA ERROR
4654  024742  005303                  44$:    DEC     R3              ;DEC CHARACTER COUNT
4655  024744  001364                          BNE     43$             ;BR IF NOT DONE YET
4656
4657                                          ;CHECK TO SEE THAT IN BCC MATCH IS SET
4658                                          ;AND THAT THE BCC WAS RECEIVED CORRECTLY
4659
4660  024746  004737  027202                  JSR     PC,INRDY        ;WAIT FOR INRDY
4661  024752  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4662  024754  021204                          021204                  ;GET FIRST HALF OF CRC
4663  024756  116137  000004  001252          MOVB    4(R1),TEMP3     ;PUT IN TEMP3
4664  024764  042737  177400  001252          BIC     #177400,TEMP3   ;CLEAR HI BYTE
```

```
4665  024772  004737  027202              JSR     PC,INRDY        ;WAIT FOR INRDY
4666  024776  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4667  025000  021244                      021244
4668  025002  016104  000004              MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4669  025006  042704  000376              BIC     #376,R4         ;CLEAR UNWANTED BITS
4670  025012  012705  000001              MOV     #1,R5           ;PUT 'EXPECTED' IN R5
4671  025016  120504                      CMPB    R5,R4           ;IS IN BCC MATCH SET?
4672  025020  001401                      BEQ     51$
4673  025022  104015                      HLT     15              ;IN BCC MATCH ERROR
4674  025024                      51$:
4675  025024  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4676  025026  021204                      021204                  ;GET LAST HALF
4677  025030  116137  000004  001251      MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
4678  025036  042737  000377  001250      BIC     #377,TEMP2      ;CLEAR LO BYTE
4679  025044  053737  001250  001252      BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
4680  025052  023737  027344  001252      CMP     CALBCC,TEMP3    ;IS IT CORRECT?
4681  025060  001401                      BEQ     5$              ;BR IF OK
4682  025062  104027                      HLT     27
4683  025064  104400              5$:     SCOPE                   ;SCOPE THIS TEST
4684
4685
4686                                      ;****************************** TEST 54 ******************************
4687                                      ;*EMPTY SILO TEST
4688                                      ;*LOAD SILO WITH 2 SYNCS, 4 CHAR MESSAGE, SINGLE CLOCK
4689                                      ;*UNTIL THE SILO IS EMPTY, LOAD 4 MORE CHARACTERS IN THE
4690                                      ;*SILO. GIVE MORE TICKS, AND VERIFY THAT ONLY THE FIRST
4691                                      ;*4 CHARACTER MESSAGE WAS RECEIVED AND THAT RTS IS CLEAR
4692                                      ;:**************************************************************
4693
4694                                      ;  TEST 54
4695                                      ;--------------
4696  025066  012737  000054  001226  TST54:  MOV     #54,TSTNO
4697  025074  012737  025320  001216          MOV     #TST55,NEXT
4698                                                              ;R1 CONTAINS BASE DMC11 ADDRESS
4699  025102  104412                      MSTCLR                  ;MASTER CLEAR DMC11
4700  025104  012711  004000              MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4701  025110  012702  030126              MOV     #MESDAT,R2      ;R2 POINTS TO MESSAGE
4702  025114  012700  000004              MOV     #4,R0           ;R0 = CHAR COUNT
4703  025120  004737  027510              JSR     PC,SYNLD        ;LOAD SILO WITH TWO SYNCS
4704  025124  004737  026526              JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
4705  025130  004537  027644              JSR     R5,MESLD        ;LOAD MESSAGE IN SILO
4706  025134  030126                      MESDAT                  ;START OF MESSAGE
4707  025136  000004                      4                       ;CHARACTER COUNT
4708  025140  004737  026374              JSR     PC,OCOR         ;WAIT FOR OCOR
4709  025144  104415  000065              DATACLK,        65      ;CLOCK DATA (EMPTY SILO)
4710  025150  004537  027644              JSR     R5,MESLD        ;PUT MORE CHARACTERS IN SILO
4711  025154  030126                      MESDAT
4712  025156  000004                      4
4713  025160  004737  026374              JSR     PC,OCOR
4714  025164  104415  000005              DATACLK,        5       ;CLOCK UNTIL RTS IS CLEARED
4715  025170  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4716  025172  021264                      021264                  ;GET RTS
4717  025174  032761  000040  000004      BIT     #BIT5,4(R1)     ;IS IT CLEAR?
4718  025202  001401                      BEQ     5$              ;BR IF YES
4719  025204  104034                      HLT     34              ;ERROR, RTS NOT CLEAR
4720  025206  104415  000041          5$:     DATACLK,        41      ;CLOCK XMITTER SOME MORE
```

```
4721  025212  004737  027202          1$:     JSR     PC,INRDY        ;OK LETS CHECK WHAT WAS RECEIVED
4722  025216  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4723  025220  021204                          021204                  ;GET RECEIVE DATA
4724  025222  016104  000004                  MOV     4(R1),R4        ;PUT IT IN R4
4725  025226  112205                          MOVB    (R2)+,R5        ;R5 = 'EXPECTED'
4726  025230  120504                          CMPB    R5,R4           ;IS DATA CORRECT?
4727  025232  001401                          BEQ     2$              ;BR IF OK
4728  025234  104010                          HLT     10              ;DATA ERROR
4729  025236  005300                  2$:     DEC     R0              ;DEC CHAR COUNT
4730  025240  001364                          BNE     1$              ;BR IF NOT DONE YET
4731  025242  004737  027202          3$:     JSR     PC,INRDY        ;WAIT FOR INRDY
4732  025246  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4733  025250  021204                          021204                  ;GET RECEIVE DATA
4734  025252  016104  000004                  MOV     4(R1),R4        ;PUT IT IN 'FOUND'
4735  025256  012705  000377                  MOV     #377,R5         ;R5 = 'EXPECTED'
4736  025262  120504                          CMPB    R5,R4           ;SHOULD SEE 377
4737  025264  001401                          BEQ     4$              ;BR IF OK
4738  025266  104010                          HLT     10              ;ERROR, TRANSMITTER DID NOT ABORT
4739  025270  004737  027202          4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
4740  025274  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4741  025276  021204                          021204                  ;GET RECEIVE DATA
4742  025300  016104  000004                  MOV     4(R1),R4        ;PUT IT IN 'FOUND'
4743  025304  012705  000377                  MOV     #377,R5         ;R5 = 'EXPECTED'
4744  025310  120504                          CMPB    R5,R4           ;SHOULD SEE 377
4745  025312  001401                          BEQ     10$             ;BR IF OK
4746  025314  104010                          HLT     10              ;ERROR, TRANSMITTER DID NOT ABORT
4747  025316                          10$:
4748  025316  104400                          SCOPE                   ;SCOPE THIS TEST
4749
4750
4751                                          ;***************************** TEST 55 *****************************
4752                                          ;*HALF DUPLEX TEST
4753                                          ;*SET LINE UNIT LOOP AND HALF DUPLEX, SEND SYNCS AND A
4754                                          ;*MESSAGE. VERIFY THAT IN-ACTIVE AND IN-READY ARE CLEAR
4755                                          ;:*************************************************************************
4756
4757                                          ;  TEST 55
4758                                          ;--------------
4759  025320  012737  000055  001226  TST55:  MOV     #55,TSTNO
4760  025326  012737  025436  001216          MOV     #TST56,NEXT
4761                                                                  ;R1 CONTAINS BASE DMC11 ADDRESS
4762  025334  104412                          MSTCLR                  ;MASTER CLEAR DMC11
4763  025336  012702  000012                  MOV     #12,R2          ;SAVE R2 FOR TYPEOUT
4764  025342  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4765  025346  012761  000020  000004          MOV     #BIT4,4(R1)     ;LOAD PORT4
4766  025354  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4767  025356  122113                          122113                  ;SET H/D BIT
4768  025360  004737  027510                  JSR     PC,SYNLD        ;LOAD 2 SYNCS
4769  025364  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
4770  025370  004537  027644                  JSR     R5,MESLD        ;LOAD 4 CHAR MESSAGE
4771  025374  030126                          MESDAT                  ;ADDRESS OF MESSAGE
4772  025376  000004                          4                       ;CHARACTER COUNT
4773  025400  004737  026374                  JSR     PC,OCOR         ;WAIT FOR OCOR
4774  025404  104415  000073                  DATACLK,        73      ;SEND MESSAGE
4775  025410  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4776  025412  021244                          021244                  ;READ LU-12
```

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 4777  025414  016104  000004                 MOV     4(R1),R4        ;PUT 'FOUND'' IN R4
 4778  025420  042704  000257                 BIC     #257,R4         ;CLEAR UNWANTED BITS
 4779  025424  005005                         CLR     R5              ;R5 = 'EXPECTED''
 4780  025426  120504                         CMPB    R5,R4           ;IN-ACTIVE AND IN-RDY SHOULD BE CLEAR
 4781  025430  001401                         BEQ     1$              ;BR IF OK
 4782  025432  104035                         HLT     35              ;ERROR BOTH ARE NOT CLEAR
 4783  025434  104400             1$:         SCOPE
 4784
 4785
 4786                                         ;****************************** TEST 56 ******************************
 4787                                         ;*DDCMP CABLE DATA TEST
 4788                                         ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
 4789                                         ;*4 SYNCS,16 CHAR,EOM,16 CHAR,EOM,16 CHAR,EOM
 4790                                         ;*THE 16 CHARACTERS INCLUDE A FLOATING ONE AND ZERO
 4791                                         ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
 4792                                         ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
 4793                                         ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
 4794                                         ;:*************************************************************************
 4795
 4796                                         ;  TEST 56
 4797                                         ;--------------
 4798  025436  012737  000056  001226  TST56: MOV     #56,TSTNO
 4799  025444  012737  026024  001216         MOV     #TST57,NEXT
 4800                                                                 ;R1 CONTAINS BASE DMC11 ADDRESS
 4801  025452  104412                         MSTCLR                  ;MASTER CLEAR DMC11
 4802  025454  032737  040000  001366         BIT     #BIT14,STAT1    ;SKIP TEST IF NO
 4803  025462  001557                         BEQ     3$              ;LOOPBACK CONNECTOR ON
 4804  025464  012711  004000                 MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4805  025470  004737  027510                 JSR     PC,SYNLD        ;LOAD 2 SYNCS
 4806  025474  004737  027510                 JSR     PC,SYNLD        ;LOAD 2 MORE SYNCS
 4807  025500  012737  120001  027342         MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFT CRC CALC
 4808  025506  005037  025536                 CLR     6$              ;CLEAR OLD BCC
 4809  025512  012703  000020                 MOV     #16.,R3         ;CHARACTER COUNT
 4810  025516  012702  030132                 MOV     #FLTDAT,R2      ;R2= POINTER
 4811  025522  112237  025534         7$:     MOVB    (R2)+,5$        ;LOAD CHAR FOR SOFT BCC CALC.
 4812  025526  004537  027236                 JSR     R5,SIMBCC       ;CALC SOFT BCC
 4813  025532  000010                         10                      ;SHIFT COUNT
 4814  025534  000000                 5$:     0                       ;CHARACTER
 4815  025536  000000                 6$:     0                       ;OLD BCC
 4816  025540  013737  027344  025536         MOV     CALBCC,6$       ;LOAD OLD BCC
 4817  025546  005303                         DEC     R3              ;DEC COUNT
 4818  025550  001364                         BNE     7$              ;BR IF NOT DONE YET
 4819  025552  004537  027644                 JSR     R5,MESLD        ;LOAD SILO
 4820  025556  030132                         FLTDAT                  ;MESSAGE ADDRESS
 4821  025560  000020                         16.                     ;CHARACTER COUNT
 4822  025562  004737  027620                 JSR     PC,EOM          ;LOAD AN EOM
 4823  025566  004537  027644                 JSR     R5,MESLD        ;LOAD SILO
 4824  025572  030132                         FLTDAT                  ;MESSAGE ADDRESS
 4825  025574  000020                         16.                     ;CHARACTER COUNT
 4826  025576  004737  027620                 JSR     PC,EOM          ;LOAD AN EOM
 4827  025602  004537  027644                 JSR     R5,MESLD        ;LOAD SILO
 4828  025606  030132                         FLTDAT                  ;MESSAGE ADDRESS
 4829  025610  000020                         16.                     ;CHARACTER COUNT
 4830  025612  004737  027620                 JSR     PC,EOM          ;LOAD AN EOM
 4831  025616  004737  026374                 JSR     PC,OCOR         ;WAIT FOR OCOR
 4832  025622  005011                         CLR     (R1)            ;CLEAR LINE UNIT LOOP
```

```
4833  025624  012700  000003              MOV     #3,R0           ;R0 = MESSAGE COUNT
4834  025630  012703  000020              MOV     #16.,R3         ;R3= CHARACTER COUNT
4835  025634  012702  030132              MOV     #FLTDAT,R2      ;LOAD MESSAGE POINTER IN R2
4836  025640  004737  027202      1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
4837  025644  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4838  025646  021204                      021204                  ;GET DATA FROM IN SILO
4839  025650  016104  000004              MOV     4(R1),R4        ;PUT CHARACTER IN 'FOUND'
4840  025654  112205                      MOVB    (R2)+,R5        ;PUT 'EXPECTED' IN R5
4841  025656  120504                      CMPB    R5,R4           ;IS RECEIVED DATA CORRECT
4842  025660  001401                      BEQ     2$              ;BR IF OK
4843  025662  104025                      HLT     25              ;DATA ERROR
4844  025664                      2$:
4845  025664  005303                      DEC     R3              ;DEC CHARACTER COUNT
4846  025666  001364                      BNE     1$              ;BR IF NOT DONE THIS MESSAGE
4847  025670  012703  000020              MOV     #16.,R3         ;RESET CHARACTER COUNT
4848
4849                                      ;CHECK TO SEE THAT IN BCC MATCH IS SET
4850                                      ;AND THAT THE BCC WAS RECEIVED CORRECTLY
4851
4852  025674  004737  027202              JSR     PC,INRDY        ;WAIT FOR INRDY
4853  025700  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4854  025702  021204                      021204                  ;GET FIRST HALF OF CRC
4855  025704  116137  000004  001252      MOVB    4(R1),TEMP3     ;PUT IN TEMP3
4856  025712  042737  177400  001252      BIC     #177400,TEMP3   ;CLEAR HI BYTE
4857  025720  004737  027202              JSR     PC,INRDY        ;WAIT FOR INRDY
4858  025724  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4859  025726  021244                      021244
4860  025730  016104  000004              MOV     4(R1),R4        ;PUT 'FOUND' IN R4
4861  025734  042704  000376              BIC     #376,R4         ;CLEAR UNWANTED BITS
4862  025740  012705  000001              MOV     #1,R5           ;PUT 'EXPECTED' IN R5
4863  025744  120504                      CMPB    R5,R4           ;IS IN BCC MATCH SET?
4864  025746  001401                      BEQ     25$
4865  025750  104015                      HLT     15              ;IN BCC MATCH ERROR
4866  025752                      25$:
4867  025752  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4868  025754  021204                      021204                  ;GET LAST HALF
4869  025756  116137  000004  001251      MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
4870  025764  042737  000377  001250      BIC     #377,TEMP2      ;CLEAR LO BYTE
4871  025772  053737  001250  001252      BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
4872  026000  023737  027344  001252      CMP     CALBCC,TEMP3    ;IS IT CORRECT?
4873  026006  001401                      BEQ     4$              ;BR IF OK
4874  026010  104027                      HLT     27
4875  026012  012702  030132      4$:     MOV     #FLTDAT,R2      ;RESET MESSAGE POINTER
4876  026016  005300                      DEC     R0              ;DECREMENT COUNTER
4877  026020  001307                      BNE     1$              ;BR IF NOT DONE
4878  026022  104400              3$:     SCOPE                   ;SCOPE THIS TEST
4879
4880
4881                                      ;********************************* TEST 57 ****************************
4882                                      ;*DDCMP CABLE DATA TEST
4883                                      ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
4884                                      ;*4 SYNCS,59 DATA CHARACTERS,EOM WITH GARBAGE CHARACTER
4885                                      ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
4886                                      ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
4887                                      ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
4888                                      ;;*************************************************************************
```

```
4889
4890                                            ;  TEST 57
4891                                            ;--------------
4892  026024  012737  000057  001226  TST57:  MOV     #57,TSTNO
4893  026032  012737  003364  001216           MOV     #.EOP,NEXT
4894                                                                    ;R1 CONTAINS BASE DMC11 ADDRESS
4895  026040  104412                          MSTCLR                   ;MASTER CLEAR DMC11
4896  026042  032737  040000  001366          BIT     #BIT14,STAT1     ;SKIP TEST IF NO
4897  026050  001533                          BEQ     3$               ;LOOPBACK CONNECTOR ON
4898  026052  012711  004000                  MOV     #BIT11,(R1)      ;SET LINE UNIT LOOP
4899  026056  004737  027510                  JSR     PC,SYNLD         ;LOAD 2 SYNCS
4900  026062  004737  027510                  JSR     PC,SYNLD         ;LOAD 2 MORE SYNCS
4901  026066  012737  120001  027342          MOV     #CRC16,XPOLY     ;LOAD POLYNOMIAL FOR SOFT CRC CALC
4902  026074  005037  026124                  CLR     6$               ;CLEAR OLD BCC
4903  026100  012703  000073                  MOV     #59.,R3          ;CHARACTER COUNT
4904  026104  012702  030126                  MOV     #MESDAT,R2       ;R2= POINTER
4905  026110  112237  026122          7$:     MOVB    (R2)+,5$         ;LOAD CHAR FOR SOFT BCC CALC.
4906  026114  004537  027236                  JSR     R5,SIMBCC        ;CALC SOFT BCC
4907  026120  000010                          10                       ;SHIFT COUNT
4908  026122  000000                  5$:     0                        ;CHARACTER
4909  026124  000000                  6$:     0                        ;OLD BCC
4910  026126  013737  027344  026124          MOV     CALBCC,6$        ;LOAD OLD BCC
4911  026134  005303                          DEC     R3               ;DEC COUNT
4912  026136  001364                          BNE     7$               ;BR IF NOT DONE YET
4913  026140  004537  027644                  JSR     R5,MESLD         ;LOAD SILO
4914  026144  030126                          MESDAT                   ;MESSAGE ADDRESS
4915  026146  000073                          59.                      ;CHARACTER COUNT
4916  026150  004737  027620                  JSR     PC,EOM           ;LOAD AN EOM
4917  026154  004737  026374                  JSR     PC,OCOR          ;WAIT FOR OCOR
4918  026160  005011                          CLR     (R1)             ;CLEAR LINE UNIT LOOP
4919  026162  012700  000073                  MOV     #59.,R0          ;R0= CHARACTER COUNT
4920  026166  012702  030126                  MOV     #MESDAT,R2       ;LOAD MESSAGE POINTER IN R2
4921  026172  004737  027202          1$:     JSR     PC,INRDY         ;WAIT FOR INRDY
4922  026176  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4923  026200  021204                          021204                   ;GET DATA FROM IN SILO
4924  026202  016104  000004                  MOV     4(R1),R4         ;PUT CHARACTER IN 'FOUND'
4925  026206  112205                          MOVB    (R2)+,R5         ;PUT 'EXPECTED' IN R5
4926  026210  120504                          CMPB    R5,R4            ;IS RECEIVED DATA CORRECT
4927  026212  001401                          BEQ     2$               ;BR IF OK
4928  026214  104025                          HLT     25               ;DATA ERROR
4929  026216                          2$:
4930  026216  005300                          DEC     R0               ;DECREMENT COUNTER
4931  026220  001364                          BNE     1$               ;BR IF NOT DONE
4932
4933                                            ;CHECK TO SEE THAT IN BCC MATCH IS SET
4934                                            ;AND THAT THE BCC WAS RECEIVED CORRECTLY
4935
4936  026222  004737  027202                  JSR     PC,INRDY         ;WAIT FOR INRDY
4937  026226  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4938  026230  021204                          021204                   ;GET FIRST HALF OF CRC
4939  026232  116137  000004  001252          MOVB    4(R1),TEMP3      ;PUT IN TEMP3
4940  026240  042737  177400  001252          BIC     #177400,TEMP3    ;CLEAR HI BYTE
4941  026246  004737  027202                  JSR     PC,INRDY         ;WAIT FOR INRDY
4942  026252  104414                          ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4943  026254  021244                          021244
4944  026256  016104  000004                  MOV     4(R1),R4         ;PUT 'FOUND' IN R4
```

```
4945  026262  042704  000376              BIC     #376,R4         ;CLEAR UNWANTED BITS
4946  026266  012705  000001              MOV     #1,R5           ;PUT 'EXPECTED' IN R5
4947  026272  120504                      CMPB    R5,R4           ;IS IN BCC MATCH SET?
4948  026274  001401                      BEQ     25$
4949  026276  104015                      HLT     15              ;IN BCC MATCH ERROR
4950  026300                      25$:
4951  026300  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4952  026302  021204                      021204                  ;GET LAST HALF
4953  026304  116137  000004  001251      MOVB    4(R1),TEMP2+1   ;PUT IN TEMP2
4954  026312  042737  000377  001250      BIC     #377,TEMP2      ;CLEAR LO BYTE
4955  026320  053737  001250  001252      BIS     TEMP2,TEMP3     ;16 BIT BCC NOW IN TEMP3
4956  026326  023737  027344  001252      CMP     CALBCC,TEMP3    ;IS IT CORRECT?
4957  026334  001401                      BEQ     3$              ;BR IF OK
4958  026336  104027                      HLT     27
4959  026340  104400              3$:     SCOPE                   ;SCOPE THIS TEST
4960
4961
4962                              ;SUBROUTINES
4963                              ;-----------
4964
4965  026342                      GETSI:
4966                                      ;THIS SUBROUTINE READS LU 17, AND PUTS IT INTO NITCH.
4967                                      ;NITCH IS ROTATED LEFT UNTILL THE SI BIT IS IN CARRY
4968
4969  026342  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4970  026344  021364                      021364                  ;PORT4_LU 17
4971  026346  017737  153040  026372      MOV     @DMP04,NITCH    ;STORE LU 17
4972  026354  106137  026372              ROLB    NITCH
4973  026360  106137  026372              ROLB    NITCH
4974  026364  106137  026372              ROLB    NITCH           ;PUT SI IN THE CARRY BIT
4975  026370  000207                      RTS     PC
4976  026372  000000              NITCH:  0
4977
4978
4979  026374                      OCOR:
4980                                      ;THIS SUBROUTINE SPINS ON OCOR
4981
4982  026374  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4983  026376  021364                      021364                  ;PORT4_LU 17
4984  026400  032777  000020  153004      BIT     #BIT4,@DMP04    ;IS OCOR SET?
4985  026406  001772                      BEQ     OCOR            ;BR IF NO
4986  026410  000207                      RTS     PC              ;OK OCOR IS SET, GO BACK
4987
4988
4989  026412                      SYNC:
4990                                      ;THIS SUBROUNTINE LOADS THE SILO WITH THE NUMBER OF SYNC
4991                                      ;CHARACTERS PASSED TO IT IN THE WORD AFTER THE JSR CALL
4992                                      ;AND A NON-SYNC CHARACTER (301)
4993
4994  026412  013637  001246              MOV     @(SP)+,TEMP1    ;GET COUNT
4995  026416  062746  000002              ADD     #2,-(SP)        ;ADJUST STACK
4996  026422  012761  000026  000004      MOV     #26,4(R1)       ;LOAD PORT4
4997  026430  104414                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4998  026432  122114                      122114                  ;LOAD SYNC REGISTER
4999  026434  004737  026526      1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5000  026440  012761  000001  000004      MOV     #1,4(R1)        ;LOAD PORT4
```

```
5001  026446  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5002  026450  122111                        122111                  ;SET SOM
5003  026452  012761  000026  000004        MOV     #26,4(R1)       ;LOAD PORT4
5004  026460  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5005  026462  122110                        122110                  ;LOAD OUT DATA
5006  026464  005337  001246                DEC     TEMP1           ;ALL DONE?
5007  026470  001361                        BNE     1$              ;BR IF NOT
5008  026472  004737  026526                JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5009  026476  005061  000004                CLR     4(R1)           ;LOAD PORT4
5010  026502  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5011  026504  122111                        122111                  ;SET SOM
5012  026506  012761  000301  000004        MOV     #301,4(R1)      ;LOAD PORT4
5013  026514  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5014  026516  122110                        122110                  ;LOAD OUT DATA
5015  026520  004737  026374                JSR     PC,OCOR         ;WAIT FOR OCOR
5016  026524  000207                        RTS     PC
5017
5018
5019  026526                        OUTRDY:
5020                                        ;THIS SUBROUTINE SPINS ON OUT READY
5021
5022  026526  005037  001256                CLR     TEMP5           ;CLEAR TIMER
5023  026532                        1$:
5024  026532  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5025  026534  021224                        021224                  ;PORT4 LU11
5026  026536  032777  000020  152646        BIT     #BIT4,@DMP04    ;IS OUT RDY SET?
5027  026544  001004                        BNE     2$              ;BR IF YES
5028  026546  005237  001256                INC     TEMP5           ;INC TIMER
5029  026552  001367                        BNE     1$              ;KEEP CHECKING IF NOT DONE
5030  026554  104036                        HLT     36              ;ERROR, OUT READY NOT SET
5031  026556  000207                2$:     RTS     PC
5032
5033
5034  026560                        CHAR:
5035                                        ;THIS SUBROUTINE LOADS THE SILO WITH 3 SYNCS
5036                                        ;AND THE CHARACTER PASSED TO IT.
5037
5038  026560  013637  001250                MOV     @(SP)+,TEMP2    ;GET CHARACTER
5039  026564  062746  000002                ADD     #2,-(SP)        ;ADJUST STACK
5040  026570  012737  000003  001246        MOV     #3,TEMP1        ;SET FOR 3 SYNCS
5041  026576  012761  000026  000004        MOV     #26,4(R1)       ;LOAD PORT4
5042  026604  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5043  026606  122114                        122114                  ;LOAD SYNC REGISTER
5044  026610  004737  026526        1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5045  026614  012761  000001  000004        MOV     #1,4(R1)        ;LOAD PORT4
5046  026622  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5047  026624  122111                        122111                  ;SET SOM
5048  026626  012761  000026  000004        MOV     #26,4(R1)       ;LOAD PORT4
5049  026634  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5050  026636  122110                        122110                  ;LOAD OUT DATA
5051  026640  005337  001246                DEC     TEMP1           ;ALL DONE?
5052  026644  001361                        BNE     1$              ;BR IF NOT
5053  026646  004737  026526                JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5054  026652  013761  001250  000004        MOV     TEMP2,4(R1)     ;LOAD PORT4
5055  026660  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5056  026662  122110                        122110                  ;LOAD OUT DATA
```

```
5057  026664  004737  026374          JSR     PC,OCOR         ;WAIT FOR OCOR
5058  026670  000207                  RTS     PC
5059
5060
5061  026672                  CHARSD:
5062                          ;THIS SUBROUTINE LOADS THE SILO WITH THE CHARACTER PASSED TO IT.
5063
5064  026672  013637  001250          MOV     @(SP)+,TEMP2    ;GET CHARACTER
5065  026676  062746  000002          ADD     #2,-(SP)        ;ADJUST STACK
5066  026702  004737  026526          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5067  026706  013761  001250  000004  MOV     TEMP2,4(R1)     ;LOAD PORT4
5068  026714  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5069  026716  122110                  122110                  ;LOAD OUT DATA
5070  026720  004737  026526          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5071  026724  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5072  026726  122110                  122110                  ;LOAD GARBAGE CHAR
5073  026730  004737  026374          JSR     PC,OCOR         ;WAIT FOR OCOR
5074  026734  000207                  RTS     PC
5075
5076
5077  026736                  SILOLD:
5078                          ;THIS SUBROUTINE FILLS THE OUT SILO
5079                          ; WITH A BINARY COUNT PATTERN
5080
5081  026736  012737  000073  001250  MOV     #73,TEMP2       ;LOAD COUNT
5082  026744  005737  027176          TST     SCHAR           ;FIRST TIME HERE?
5083  026750  100470                  BMI     4$              ;BR IF BITSTUFF
5084  026752  001032                  BNE     2$              ;BR IF NO
5085  026754  062737  000002  001250  ADD     #2,TEMP2        ;ADD 2 TO CHARACTER COUNT
5086  026762  012737  000003  001246  MOV     #3,TEMP1        ;SET FOR 3 SYNCS
5087  026770  012761  000026  000004  MOV     #26,4(R1)       ;LOAD PORT4
5088  026776  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5089  027000  122114                  122114                  ;LOAD SYNC REGISTER
5090  027002  004737  026526  1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5091  027006  012761  000001  000004  MOV     #1,4(R1)        ;LOAD PORT4
5092  027014  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5093  027016  122111                  122111                  ;SET SOM
5094  027020  012761  000026  000004  MOV     #26,4(R1)       ;LOAD PORT4
5095  027026  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5096  027030  122110                  122110                  ;LOAD OUT DATA
5097  027032  005337  001246          DEC     TEMP1           ;ALL DONE?
5098  027036  001361                  BNE     1$              ;BR IF NOT
5099  027040  004737  026526  2$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5100  027044  013761  027176  000004  MOV     SCHAR,4(R1)     ;LOAD PORT4
5101  027052  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5102  027054  122110                  122110                  ;LOAD OUT DATA
5103  027056  005737  027200          TST     STUFLG          ;BITSTUFF???
5104  027062  001407                  BEQ     6$              ;BR IF NO
5105  027064  013737  027176  027076  MOV     SCHAR,5$        ;IT IS SDLD SO CHECK BITSTUFFING
5106  027072  004537  027726          JSR     R5,STFFCL       ;ADD ANY BIT STUFF CLOCK TICKS
5107  027076  000000          5$:     0                       ;CHARACTER
5108  027100  000010                  10                      ;CHIFT COUNT
5109  027102  005237  027176  6$:     INC     SCHAR           ;NEXT CHARACTER
5110  027106  022737  000400  027176  CMP     #400,SCHAR      ;ALL DONE?
5111  027114  001403                  BEQ     3$
5112  027116  005337  001250          DEC     TEMP2           ;DECREMENT COUNT
```

```
5113  027122  001346                        BNE     2$              ;BR IF NOT DONE
5114  027124  004737  026374          3$:   JSR     PC,OCOR         ;WAIT FOR OCOR
5115  027130  000207                        RTS     PC
5116  027132  005037  027176          4$:   CLR     SCHAR           ;START PATTERN AT ZERO
5117  027136  012737  177777  027200        MOV     #-1,STUFLG      ;SET BITSTUFF FLAG
5118  027144  005037  030124                CLR     BITCON          ;CLEAR STUFF COUNT
5119  027150  062737  000002  001250        ADD     #2,TEMP2        ;ADD 2 TO CHARACTER COUNT
5120  027156  012761  000001  000004        MOV     #1,4(R1)        ;SET BIT0 IN PORT4
5121  027164  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5122  027166  122111                        122111                  ;SET SOM!
5123  027170  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5124  027172  122110                        122110                  ;LOAD GARBAGE CHAR
5125  027174  000721                        BR      2$              ;GO LOAD SILO
5126  027176  000000            SCHAR:  0
5127  027200  000000            STUFLG: 0
5128
5129
5130  027202                    INRDY:
5131                                        ;THIS SUBROUTINE SPINS ON INRDY
5132                                        ;IF INRDY FAILS TO SET THE DELAY TIMES OUT AND AN
5133                                        ;ERROR IS REPORTED. FOR BETTER SCOPE LOOPS THIS
5134                                        ;DELAY CAN BE MADE SHORTER BY ALTERING THE NUMBER
5135                                        ;INITIALLY LOADED INTO TEMP1, THE SMALLER THE NUMBER
5136                                        ;THE SHORTER THE DELAY. 0 IS THE LONGEST DELAY.
5137
5138  027202  012737  000000  001246        MOV     #0,TEMP1        ;SET UP DELAY COUNTER
5139  027210                          1$:
5140  027210  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5141  027212  021244                        021244                  ;PORT4 LU12
5142  027214  032777  000020  152170        BIT     #BIT4,@DMP04    ;IS INRDY SET?
5143  027222  001004                        BNE     2$              ;BR IF YES
5144  027224  005237  001246                INC     TEMP1           ;INC DELAY
5145  027230  001367                        BNE     1$              ;TRY AGAIN
5146  027232  104037                        HLT     37              ;ERROR,NO INRDY
5147  027234  000207                2$:     RTS     PC              ;RETURN
5148
5149
5150  027236                    SIMBCC:
5151                                        ;THIS SUBROUTINE CALCULATES THE CRC USING POLYNOMIAL GIVEN
5152                                        ;IN XPOLY. THE CORRECT CRC IS RETURNED IN CALBCC, AND THE
5153                                        ;STATE OF THE LSB OF THE BCC IS RETURNED IN THE C BIT.
5154
5155  027236  010046                        MOV     R0,-(SP)        ;SAVE R0 ON STACK
5156  027240  012537  001246                MOV     (R5)+,TEMP1     ;TEMP1 = SHIFT COUNT
5157  027244  012537  001250                MOV     (R5)+,TEMP2     ;TEMP2 = CHARACTER
5158  027250  012537  027344                MOV     (R5)+,CALBCC    ;CALBCC = OLD BCC
5159  027254  013700  027344          1$:   MOV     CALBCC,R0       ;PUT OLD BCC IN R0
5160  027260  000241                        CLC
5161  027262  006037  027344                ROR     CALBCC          ;SHIFT OLD BCC
5162  027266  006037  001250                ROR     TEMP2           ;SHIFT CHARACTER
5163  027272  005500                        ADC     R0              ;ADD CHAR CARRY TO OLD BCC
5164  027274  006000                        ROR     R0              ;PUT BIT0 TO CARRY BIT
5165  027276  103011                        BCC     2$              ;CARRY IS FEEDBACK BIT
5166  027300  013700  027342                MOV     XPOLY,R0        ;IF FEEDBACK = 1
5167  027304  043700  027344                BIC     CALBCC,R0       ;EXCLUSIVLY OR XPOLY TO CALBCC
5168  027310  043737  027342  027344        BIC     XPOLY,CALBCC
```

```
5169  027316  050037  027344          BIS     R0,CALBCC
5170  027322  005337  001246  2$:     DEC     TEMP1           ;DEC SHIFT COUNT
5171  027326  001352                  BNE     1$              ;BR IF NOT DONE
5172  027330  013700  027344          MOV     CALBCC,R0       ;PUT RESULT IN R0
5173  027334  006000                  ROR     R0              ;SHIFT BIT0 TO CARRY
5174  027336  012600                  MOV     (SP)+,R0        ;RESTORE R0
5175  027340  000205                  RTS     R5              ;RETURN
5176  027342  000000          XPOLY:  0
5177  027344  000000          CALBCC: 0
5178          000200          LRC8=200
5179          120001          CRC16=120001
5180          102010          CRC.CCITT=102010
5181
5182
5183  027346                  BCCLD:
5184                                  ;THIS SUBROUTINE LOADS THE OUT SILO WITH 2 SYNCS
5185                                  ;WITH SOM SET, AND ONE CHARACTER PASSED TO IT
5186                                  ;WITH THE SOM BIT CLEAR (ENABLE CRC)
5187
5188  027346  013637  001250          MOV     @(SP)+,TEMP2    ;GET CHARACTER
5189  027352  062746  000002          ADD     #2,-(SP)        ;ADJUST STACK
5190  027356  012737  000002  001246  MOV     #2,TEMP1        ;SET FOR 2 SYNCS
5191  027364  012761  000026  000004  MOV     #26,4(R1)       ;LOAD PORT4
5192  027372  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5193  027374  122114                  122114                  ;LOAD SYNC REGISTER
5194  027376  004737  026526  1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5195  027402  012761  000001  000004  MOV     #1,4(R1)        ;LOAD PORT4
5196  027410  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5197  027412  122111                  122111                  ;SET SOM
5198  027414  012761  000026  000004  MOV     #26,4(R1)       ;LOAD PORT4
5199  027422  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5200  027424  122110                  122110                  ;LOAD OUT DATA
5201  027426  005337  001246          DEC     TEMP1           ;ALL DONE?
5202  027432  001361                  BNE     1$              ;BR IF NOT
5203  027434  004737  026526          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5204  027440  013761  001250  000004  MOV     TEMP2,4(R1)     ;LOAD PORT4
5205  027446  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5206  027450  122110                  122110                  ;LOAD OUT DATA
5207  027452  004737  026374          JSR     PC,OCOR         ;WAIT FOR OCOR
5208  027456  000207                  RTS     PC
5209
5210
5211  027460                  GETQO:
5212                                  ;THIS SUBROUTINE READS THE STATE OF THE TRANSMIT
5213                                  ;BCC LSB AND PUTS IT IN THE CARRY BIT
5214
5215  027460  104414                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5216  027462  021364                  021364                  ;PORT4 LU-17
5217  027464  106177  151722          ROLB    @DIAP04         ;PUT Q0 IN CARRY
5218  027470  000207                  RTS     PC              ;RETURN
5219
5220
5221  027472                  GETQI:
5222                                  ;THIS SUBROUTINE READS THE STATE OF THE RECEIVE
5223                                  ;BCC LSB AND PUTS IT IN THE CARRY BIT
5224
```

```
5225  027472  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5226  027474  021364                          021364                  ;PORT4_LU-17
5227  027476  106177  151710                  ROLB    @DMP04          ;PUT QO IN CARRY
5228  027502  106177  151704                  ROLB    @DMP04          ;PUT QI IN CARRY
5229  027506  000207                          RTS     PC              ;RETURN
5230
5231
5232  027510                          SYNLD:
5233                                          ;THIS SUBROUTINE LOADS OUT SILO WITH
5234                                          ;2 SYNC CHARACTERS WITH SOM SET
5235
5236  027510  012737  000002  001246          MOV     #2,TEMP1        ;LOAD COUNTER FOR 2 SYNCS
5237  027516  012761  000026  000004          MOV     #26,4(R1)       ;PORT4_26
5238  027524  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5239  027526  122114                          122114                  ;LOAD SYNC REG
5240  027530  004737  026526          1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5241  027534  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4
5242  027542  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5243  027544  122111                          122111                  ;SET SOM
5244  027546  012761  000026  000004          MOV     #26,4(R1)       ;PORT_26
5245  027554  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5246  027556  122110                          122110                  ;LOAD OUT DATA WITH SYNC
5247  027560  005337  001246                  DEC     TEMP1           ;DECREMENT COUNTER
5248  027564  001361                          BNE     1$              ;BR IF NOT DONE
5249  027566  000207                          RTS     PC              ;RETURN
5250
5251
5252  027570                          SOM:
5253                                          ;THIS SUBROUTINE LOADS SOM AND OUT DATA WITH A
5254                                          ;GARBAGE CHARACTER (0)
5255
5256  027570  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5257  027574  012761  000001  000004          MOV     #1,4(R1)        ;PORT4_1
5258  027602  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5259  027604  122111                          122111                  ;SET SOM
5260  027606  005061  000004                  CLR     4(R1)           ;CLEAR DATA CHAR
5261  027612  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5262  027614  122110                          122110                  ;LOAD GARBAGE CHARACTER
5263  027616  000207                          RTS     PC              ;RETURN
5264
5265
5266  027620                          EOM:
5267                                          ;THIS SUBROUTINE LOADS EOM AND OUT DATA WITH A
5268                                          ;GARBAGE CHARACTER (2) TO ENABLE TRANSMISSION OF BCC
5269
5270  027620  004737  026526                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5271  027624  012761  000002  000004          MOV     #2,4(R1)        ;PORT4_2
5272  027632  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5273  027634  122111                          122111                  ;SET EOM
5274  027636  104414                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5275  027640  122110                          122110                  ;LOAD GARBAGE CHARACTER
5276  027642  000207                          RTS     PC              ;RETURN
5277
5278
5279  027644                          MESLD:
5280                                          ;THIS SUBROUTINE LOADS SILO WITH MESSAGE
```

```
5281                                        ;THE FIRST ARUGUMENT IS THE ADDRESS OF THE MESSAGE
5282                                        ;THE SECOND ARGUMENT IS THE NUMBER OF CHARACTERS IN THE MESSAGE
5283
5284  027644  010046                        MOV     R0,-(SP)        ;SAVE R0
5285  027646  012500                        MOV     (R5)+,R0        ;R0=MESSAGE POINTER
5286  027650  012537  001246                MOV     (R5)+,TEMP1     ;TEMP1=CHARACTER COUNT
5287  027654  004737  026526        1$:     JSR     PC,OUTRDY       ;WAIT FOR OUT RDY
5288  027660  112061  000004                MOVB    (R0)+,4(R1)     ;LOAD PORT4 WITH CHARACTER
5289  027664  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5290  027666  122110                        122110                  ;LOAD OUT DATA SILO
5291  027670  005337  001246                DEC     TEMP1           ;DEC CHAR COUNT
5292  027674  001367                        BNE     1$              ;BR IF NOT DONE
5293  027676  004737  026374                JSR     PC,OCOR         ;WAIT FOR OCOR
5294  027702  012600                        MOV     (SP)+,R0        ;RESTORE R0
5295  027704  000205                        RTS     R5              ;RETURN
5296
5297
5298  027706                        CLRIO:
5299                                        ;THIS SUBROUTINE SETS IN CLR AND OUT CLR TO
5300                                        ;CLEAR THE TRANSMIT AND RECEIVE BCC REGISTERS
5301
5302  027706  012761  000200  000004        MOV     #BIT7,4(R1)     ;LOAD PORT4
5303  027714  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5304  027716  122112                        122112                  ;SET IN CLR!
5305  027720  104414                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5306  027722  122111                        122111                  ;SET OUT CLR!
5307  027724  000207                        RTS     PC              ;RETURN
5308
5309
5310  027726                        STFFCL:
5311                                        ;THIS SUBROUTINE ADDS ANY NECESSSARY BIT STUFF CLOCK TICKS
5312                                        ;FIRST ARGUMENT IS CHAR, SECOND ARGUMENT IS SHIFT COUNT.
5313
5314  027726  010046                        MOV     R0,-(SP)        ;SAVE R0
5315  027730  012500                        MOV     (R5)+,R0        ;PUT CHAR IN R0
5316  027732  012537  001252                MOV     (R5)+,TEMP3     ;PUT SHIFT COUNT IN TEMP3
5317  027736  106000                1$:     RORB    R0              ;LOOK AT NEXT BIT
5318  027740  103403                        BCS     2$              ;BR IF A MARK
5319  027742  005037  030124                CLR     BITCON          ;IT WAS A SPACE, CLEAR 1'S COUNTER
5320  027746  000412                        BR      3$              ;CONTINUE
5321  027750  005237  030124        2$:     INC     BITCON          ;INC CONSECUTIVE 1'S COUNTER
5322  027754  022737  000005  030124        CMP     #5,BITCON       ;IS IT 5 YET?
5323  027762  001004                        BNE     3$              ;BR IF NO
5324  027764  005037  030124                CLR     BITCON          ;YES!  SO START AGAIN
5325  027770  104415  000001                DATACLK,        1       ;GIVE EXTRA TICK TO STUFF ZERO
5326  027774  005337  001252        3$:     DEC     TEMP3           ;DEC SHIFT COUNT
5327  030000  001356                        BNE     1$              ;BR IF NOT DONE
5328  030002  012600                        MOV     (SP)+,R0        ;RESTORE R0
5329  030004  000205                        RTS     R5              ;RETURN
5330
5331
5332  030006                        STFFCK:
5333                                        ;THIS SUBROUTINE CHECKS TO SEE IF TRANSMITTER
5334                                        ;IS STUFFING ZEROS WHEN IT SHOULD. FIRST ARGUMENT
5335                                        ;IS THE CHARACTER, SECOND ARGUMENT IS SHIFT COUNT.
5336
```

```
5337  030006  010046                        MOV     R0,-(SP)        ;SAVE R0
5338  030010  012500                        MOV     (R5)+,R0        ;PUT CHAR IN R0
5339  030012  012537  001252                MOV     (R5)+,TEMP3     ;PUT SHIFT COUNT IN TEMP3
5340  030016  106000                1$:     RORB    R0              ;SHIFT OUT NEXT BIT
5341  030020  103403                        BCS     2$              ;BR IF IT IS A MARK
5342  030022  005037  030124                CLR     BITCON          ;IT WAS A SPACE, CLEAR 1'S COUNTER
5343  030026  000416                        BR      3$              ;CONTINUE
5344  030030  005237  030124        2$:     INC     BITCON          ;INC CONSECUTIVE I'S COUNTER
5345  030034  022737  000005  030124        CMP     #5,BITCON       ;5 IN A ROW YET?
5346  030042  001010                        BNE     3$              ;BR IF NO
5347  030044  005037  030124                CLR     BITCON          ;YES, SO START OVER
5348  030050  104415  000001                DATACLK,        1       ;EXTRA TICK TO STUFF ZERO
5349  030054  004737  026342                JSR     PC,GETSI        ;LOOK AT WINDOW
5350  030060  103001                        BCC     3$              ;IS IT A ZERO, BR IF YES
5351  030062  104030                        HLT     30              ;NO, ERROR ZERO WAS NOT STUFFED
5352  030064  005337  001252        3$:     DEC     TEMP3           ;DEC SHIFT COUNT
5353  030070  001352                        BNE     1$              ;BR IF NOT DONE
5354  030072  012600                        MOV     (SP)+,R0        ;RESTORE R0
5355  030074  000205                        RTS     R5              ;RETURN
5356
5357
5358  030076                        CTSDLY:
5359                                        ;THIS SUBROUTINE WASTES TIME UNTIL CTS SETS,
5360                                        ;BUT HOPEFULLY NOT SO LONG THAT THE SILO RUNS OUT
5361
5362  030076  010046                        MOV     R0,-(SP)        ;SAVE R0
5363  030100  012700  000032                MOV     #32,R0          ;LOAD R0 WITH COUNT
5364  030104  027777  151074  151072  1$:     CMP     @TKCSR,@TKCSR   ;WASTE TIME
5365  030112  005300                        DEC     R0              ;DECREMENT COUNTER
5366  030114  001373                        BNE     1$              ;DO IT AGAIN IF NOT = 0
5367  030116  012600                        MOV     (SP)+,R0        ;RESTORE R0
5368  030120  000207                        RTS     PC              ;RETURN
5369
5370
5371  030122  000176                FLAG:   ^B<01111110>            ;FLAG CHARACTER
5372  030124  000000                BITCON: 0
5373  030126     000      125      252     MESDAT: .BYTE   0,125,252,377
5374  030131     377
5375  030132     001      002      004     FLTDAT: .BYTE   1,2,4,10,20,40,100,200,376,375,373,367,357,337,277,177
5376  030135     010      020      040
5377  030140     100      200      376
5378  030143     375      373      367
5379  030146     357      337      277
5380  030151     177
5381  030152     100      140      160     STUFDT: .BYTE   100,140,160,170,3,300,174,176,177,1
5382  030155     170      003      300
5383  030160     174      176      177
5384  030163     001
5385  030164     363      347      317             .BYTE   363,347,317,200,0,377,377,377,200,37
5386  030167     200      000      377
5387  030172     377      377      200
5388  030175     037
5389                                    .EVEN
5390  030176  046377  047111  020105    EM1:    .ASCIZ  <377>/LINE UNIT INITALIZATION TEST/
      030234  046377  047111  020105    EM2:    .ASCIZ  <377>^LINE UNIT REGISTER READ/ONLY TEST^
      030277     377  044514  042516    EM3:    .ASCIZ  <377>^LINE UNIT REGISTER WRITE/READ TEST^
```

```
030343     377  044514  042516  EM4:    .ASCIZ  <377>/LINE UNIT INTERNAL CLOCK FAILURE/
030405     377  051124  047101  EM5:    .ASCIZ  <377>/TRANSMITTER DATA ERROR/
030435     377  042522  042503  EM6:    .ASCIZ  <377>/RECEIVER TEST/
030454  051377  041505  044505  EM7:    .ASCIZ  <377>/RECEIVER DATA ERROR/
030501     377  047515  042504  EM10:   .ASCIZ  <377>/MODEM SIGNAL ERROR/
030525     377  051124  047101  EM11:   .ASCIZ  <377>/TRANSMITTER CRC ERROR/
030554  051377  041505  044505  EM12:   .ASCIZ  <377>/RECEIVER CRC ERROR/
030600  044777  020116  041502  EM13:   .ASCIZ  <377>/IN BCC MATCH ERROR (LU REG 12)/
030640  052377  040522  051516  EM14:   .ASCIZ  <377>/TRANSMITTER FAILED TO GO TO MARK STATE/
030710  041777  041101  042514  EM15:   .ASCIZ  <377>/CABLE DATA TEST/
030731     377  046106  043501  EM16:   .ASCIZ  <377>/FLAG ERROR/
030745     377  051124  047101  EM17:   .ASCIZ  <377>/TRANSMITTER FAILED TO STUFF A ZERO/
031011     377  053523  052111  EM20:   .ASCIZ  <377>/SWITCH PAC TEST/
031032  040777  047502  052122  EM21:   .ASCIZ  <377>/ABORT ERROR/
031047     377  051124  047101  EM22:   .ASCIZ  <377>/TRANSMITTER ERROR/
031072  044377  046101  020106  EM23:   .ASCIZ  <377>/HALF DUPLEX TEST/
031114  047777  052125  051040  EM24:   .ASCIZ  <377>/OUT READY NOT SET/
031137     377  047111  051040  EM25:   .ASCIZ  <377>/IN READY NOT SET/

031161     377  054105  042520  DH1:    .ASCIZ  <377>/EXPECTED  FOUND/
031202  042777  050130  041505  DH2:    .ASCIZ  <377>/EXPECTED  FOUND  LU-REGISTER/
031240  041777  040510  040522  DH3:    .ASCIZ  <377>/CHARACTER    BIT THAT FAILED/
031276  041777  051117  042522  DH4:    .ASCIZ  <377>/CORRECT CRC    BIT THAT FAILED/
031336  042777  050130  041505  DH5:    .ASCIZ  <377>/EXPECTED   FOUND   SHIFT/
031370  042777  050130  041505  DH6:    .ASCIZ  <377>/EXPECTED   FOUND   CHARACTER   SHIFT/
031436  041377  047514  045503  DH7:    .ASCIZ  <377>/BLOCK END NOT SET/
031461     377  052122  020123  DH10:   .ASCIZ  <377>/RTS DID NOT CLEAR/
                                .EVEN

031504  000002                  DT1:    2
031506     003  007                     .BYTE   3,7
031510  001272                          SAVR5
031512     003  002                     .BYTE   3,2
031514  001270                          SAVR4
031516  000003                  DT2:    3
031520     003  007                     .BYTE   3,7
031522  001272                          SAVR5
031524     003  010                     .BYTE   3,10
031526  001270                          SAVR4
031530     003  002                     .BYTE   3,2
031532  001264                          SAVR2
031534  000002                  DT3:    2
031536     003  017                     .BYTE   3,17
031540  001272                          SAVR5
031542     002  002                     .BYTE   2,2
031544  001266                          SAVR3
031546  000002                  DT4:    2
031550     006  021                     .BYTE   6,21
031552  027344                          CALBCC
031554     002  002                     .BYTE   2,2
031556  001266                          SAVR3
031560  000003                  DT5:    3
031562     001  011                     .BYTE   1,11
031564  001300                          ZERO
031566     001  011                     .BYTE   1,11
031570  001302                          ONE
```

```
031572      002     002                 .BYTE   2,2
031574   001260                         SAVR0
031576   000003             DT6:        3
031600      001     011                 .BYTE   1,11
031602   001302                         ONE
031604      001     011                 .BYTE   1,11
031606   001300                         ZERO
031610      002     002                 .BYTE   2,2
031612   001260                         SAVR0
031614   000004             DT7:        4
031616      001     011                 .BYTE   1,11
031620   001300                         ZERO
031622      001     011                 .BYTE   1,11
031624   001302                         ONE
031626      003     007                 .BYTE   3,7
031630   001272                         SAVR5
031632      002     001                 .BYTE   2,1
031634   001266                         SAVR3
031636   000004             DT10:       4
031640      001     011                 .BYTE   1,11
031642   001302                         ONE
031644      001     011                 .BYTE   1,11
031646   001300                         ZERO
031650      003     007                 .BYTE   3,7
031652   001272                         SAVR5
031654      002     001                 .BYTE   2,1
031656   001266                         SAVR3
031660   000002             DT11:       2
031662      003     007                 .BYTE   3,7
031664   030122                         FLAG
031666      002     002                 .BYTE   2,2
031670   001266                         SAVR3
031672   000002             DT12:       2
031674      006     004                 .BYTE   6,4
031676   027344                         CALBCC
031700      006     002                 .BYTE   6,2
031702   001252                         TEMP3

031704             .ERRTAB:
031704   000000                        0
031706   000000                        0
031710   000000                        0
031712   030176             EM1
031714   031202             DH2        ;HLT    1
031716   031516             DT2
031720   030234             EM2
031722   031202             DH2        ;HLT    2
031724   031516             DT2
031726   030277             EM3
031730   031202             DH2        ;HLT    3
031732   031516             DT2
031734   030343             EM4
031736   000000             0          ;HLT    4
031740   000000             0
031742   030405             EM5
031744   031202             DH2        ;HLT    5
```

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031746  031516                  DT2
031750  030405                  EM5
031752  031240                  DH3     ;HLT    6
031754  031534                  DT3
031756  030435                  EM6
031760  031161                  DH1     ;HLT    7
031762  031504                  DT1
031764  030454                  EM7
031766  031161                  DH1     ;HLT    10
031770  031504                  DT1
031772  030501                  EM10
031774  031161                  DH1     ;HLT    11
031776  031504                  DT1
032000  030525                  EM11
032002  031336                  DH5     ;HLT    12
032004  031560                  DT5
032006  030554                  EM12
032010  031336                  DH5     ;HLT    13
032012  031560                  DT5
032014  030525                  EM11
032016  031276                  DH4     ;HLT    14
032020  031546                  DT4
032022  030600                  EM13
032024  031161                  DH1     ;HLT    15
032026  031504                  DT1
032030  030525                  EM11
032032  031336                  DH5     ;HLT    16
032034  031576                  DT6
032036  030554                  EM12
032040  031336                  DH5     ;HLT    17
032042  031576                  DT6
032044  030525                  EM11
032046  031370                  DH6     ;HLT    20
032050  031614                  DT7
032052  030525                  EM11
032054  031370                  DH6     ;HLT    21
032056  031636                  DT10
032060  030554                  EM12
032062  031370                  DH6     ;HLT    22
032064  031614                  DT7
032066  030554                  EM12
032070  031370                  DH6     ;HLT    23
032072  031636                  DT10
032074  030640                  EM14
032076  000000                  0       ;HLT    24
032100  000000                  0
032102  030710                  EM15
032104  031161                  DH1     ;HLT    25
032106  031504                  DT1
032110  030731                  EM16
032112  031240                  DH3     ;HLT    26
032114  031660                  DT11
032116  030554                  EM12
032120  031161                  DH1     ;HLT    27
032122  031672                  DT12
032124  030745                  EM17
```

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032126  000000                  0       ;HLT    30
032130  000000                  0
032132  031011                  EM20
032134  031161                  DH1     ;HLT    31
032136  031504                  DT1
032140  031032                  EM21
032142  031436                  DH7     ;HLT    32
032144  000000                  0
032146  031032                  EM21
032150  031240                  DH3     ;HLT    33
032152  031534                  DT3
032154  031047                  EM22
032156  031461                  DH10    ;HLT    34
032160  000000                  0
032162  031072                  EM23
032164  031202                  DH2     ;HLT    35
032166  031516                  DT2
032170  031114                  EM24
032172  000000                  0       ;HLT    36
032174  000000                  0
032176  031137                  EM25
032200  000000                  0       ;HLT    37
032202  000000                  0
032204  030435                  EM6
032206  031202                  DH2     ;HLT    40
032210  031516                  DT2
032212  030405                  EM5
032214  031336                  DH5     ;HLT    41
032216  031560                  DT5
032220  030600                  EM13
032222  031161                  DH1     ;HLT    42
032224  031504                  DT1


032226                          CORMAX:
        000001                  .END
```

```
ADRCNT= 004373  1473* 1509* 1518#
AUDONE  003024  1163  1202  1207  1253#
AUSTRT  002446  1162# 1257
AUTO.S  010512  1120  1962#
BCCLD   027346  3581  3610  3656  3685  3731  3760  3806  3835  5183#
BINWRD  004714  1559* 1562* 1563  1600#
BITCON  030124  5118* 5319* 5321* 5322  5324* 5342* 5344* 5345  5347* 5372#
BIT0  = 000001   689# 1749  1750
BIT1  = 000002   688# 1125  1743  1749  1750  2043  2126  2139
BIT10 = 002000   679# 2107  2118
BIT11 = 004000   678# 2647  2680  2724  2782  2833  2884  2935  2987  3045  3073  3101  3129
                3159  3207  3244  3281  3318  3358  3439  3534  3575  3650  3725  3800  3873
                3939  4010  4109  4182  4429  4700  4764  4804  4898
BIT12 = 010000   677# 2058  2137
BIT13 = 020000   676# 2061  2110  2141  2350  3483  3509  3530
BIT14 = 040000   675# 1375  2072  2074  2141  2152  2352  3485  3532  4802  4896
BIT15 = 100000   674# 1079  1166  1169  1190  1193  2045  2113
BIT2  = 000004   687# 1125  1306  1750
BIT3  = 000010   686# 2143  2150  3511
BIT4  = 000020   685# 1733  1756  1758  2760  3168  3216  3253  3290  3327  4765  4984  5026
                5142
BIT5  = 000040   684# 2255  2355  2703  2813  2864  2915  2966  3400  4717
BIT6  = 000100   683# 1738  1739  2145  3082  3138
BIT7  = 000200   682# 1739  1859  2255  2732  3173  5302
BIT8  = 000400   681# 2117  2132  2134  2147  2149  2155  2158  2216
BIT9  = 001000   680# 2115  2117  2129  2155  2158  2214  2216
BM      007054  1781# 2086
BRLVL   012252  2211  2221  2229  2241#
BRW     003730  1312  1398#
BRX     003732  1313  1399#
CALBCC  027344  3600  3629  3675  3704  3750  3779  3825  3854  3910  3976  4035  4056  4211
                4232  4262  4283  4359  4402  4459  4480  4529  4550  4626  4680  4816  4872
                4910  4956  5158* 5159  5161* 5167  5168* 5169* 5172  5177# 5390
CHAR    026560  3160  3208  3245  3282  3319  3440  5034#
CHARSD  026672  5061#
CHRCNT  004712  1557* 1560  1564  1580* 1598# 1599
CKSWR   007606  1106  1373  1405  1620  1806#
CKSWR1  007666  1819# 1831
CKSWR2  007700  1822#
CKSWR3  007704  1824#
CKSWR4  007710  1825# 1833  1840
CKSWR5  010014  1807  1814  1849#
CLKX    001242   765#
CLRIO   027706  3576  3605  3651  3680  3726  3755  3801  3830  5298#
CNERR   007277  1220  1781#
CNT.MA  001702   790   958#  1078  1080  1082  1887
CNVRT = 104411   827# 1217  1332  1334  1336  1338  1654  1656  1716  1822
CONERR  007223  1215  1781#
CONN    007114  1781# 2063
CONTAB  002776  1224  1237#
CONVRT= 104410   825# 1137  1223  1670  1985
CORMAX  032226  5390#
CRAM    006606  1781# 2024
CRC.CC= 102010  5180#
CRC16 = 120001  3578  3607  3653  3682  3728  3757  3803  3832  3878  3944  4029  4205  4256
                4453  4523  4807  4901  5179#
```

```
CREAM   001320            789#  1077*  1883*  1884   1886*  1890
CSR     006510           1781#  1989
CSRMAP  010514           1964#
CTSDLY  030076           5358#
CYCLE   010060           1314   1355   1356   1874#
DATABP  005216           1643*  1646   1668   1671#
DATACL= 104415            835#  2687   2731   2735   2795   2796   2810   2846   2847   2861   2897   2898   2912
                         2948   2949   2963   3005   3008   3049   3077   3105   3133   3162   3210   3247   3284
                         3321   3360   3361   3404   3405   3442   3583   3584   3612   3613   3658   3659   3687
                         3688   3733   3734   3762   3763   3808   3809   3837   3838   3892   3894   3958   3960
                         4022   4036   4057   4075   4082   4084   4119   4198   4212   4233   4263   4284   4302
                         4309   4311   4322   4446   4460   4481   4501   4530   4551   4569   4576   4578   4589
                         4709   4714   4720   4774   5325   5348
DATAHD  005204           1642*  1664   1667#
DELAY = 104413            831#
DEVADR  004370           1471*  1506   1516#
DEVTAB  003010           1177   1242#
DH1     031161           5390#
DH10    031461           5390#
DH2     031202           5390#
DH3     031240           5390#
DH4     031276           5390#
DH5     031336           5390#
DH6     031370           5390#
DH7     031436           5390#
DISPLA  001200            736#  1092*  1098*  1329*
DISPRE  000174            722#  1098
DMACTV  001306            783#  1115   1270*  1271   1874   1888   1970*  2171*  2177*  2178*  2182   2207
DMCM    007320           1228   1781#
DMCR00  001500            873#
DMCR01  001510            878#
DMCR02  001520            883#
DMCR03  001530            888#
DMCR04  001540            893#
DMCR05  001550            898#
DMCR06  001560            903#
DMCR07  001570            908#
DMCR10  001600            913#
DMCR11  001610            918#
DMCR12  001620            923#
DMCR13  001630            928#
DMCR14  001640            933#
DMCR15  001650            938#
DMCR16  001660            943#
DMCR17  001670            948#
DMCSR   001404            856#  1162*  1196   1201*  1206*  1241   1359   1396   1688   1711   1757   1892*  1901
                         1950   2272*
DMCSRH  001406            857#  1738*  1739*  1743*  1749*  1750*  1756*  1758*  1901*  1902*  1903
DMCTL   001410            858#  1903*  1904*  1905
DMNUM   001310            784#  1073   1345   1968*  1983*  2162*  2163   2172   2174
DMPO4   001412            859#  1727*  1733   1770   1775   1905*  1906*  1907   4971   4984   5026   5142   5217*
                         5227*  5228*
DMPO6   001414            860#  1744*  1907*  1908*
DMRLVL  001376            853#  1910*  1911*  1912
DMRVEC  001374            852#  1362   1893*  1894*  1910
DMS100  001502            874#
```

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DMS101  001512            879#
DMS102  001522            884#
DMS103  001532            889#
DMS104  001542            894#
DMS105  001552            899#
DMS106  001562            904#
DMS107  001572            909#
DMS110  001602            914#
DMS111  001612            919#
DMS112  001622            924#
DMS113  001632            929#
DMS114  001642            934#
DMS115  001652            939#
DMS116  001662            944#
DMS117  001672            949#
DMS200  001504            875#
DMS201  001514            880#
DMS202  001524            885#
DMS203  001534            890#
DMS204  001544            895#
DMS205  001554            900#
DMS206  001564            905#
DMS207  001574            910#
DMS210  001604            915#
DMS211  001614            920#
DMS212  001624            925#
DMS213  001634            930#
DMS214  001644            935#
DMS215  001654            940#
DMS216  001664            945#
DMS217  001674            950#
DMS300  001506            876#
DMS301  001516            881#
DMS302  001526            886#
DMS303  001536            891#
DMS304  001546            896#
DMS305  001556            901#
DMS306  001566            906#
DMS307  001576            911#
DMS310  001606            916#
DMS311  001616            921#
DMS312  001626            926#
DMS313  001636            931#
DMS314  001646            936#
DMS315  001656            941#
DMS316  001666            946#
DMS317  001676            951#
DMTLVL  001402            855#  1914*  1915*
DMTVEC  001400            854#  1912*  1913*  1914
DM.END  001700            953#  1966
DM.MAP  001500             789   872#  1077  1130  1140  1256  1884  1886  1964  1969  2199
DONE    003734           1378  1380*  1400#  1810*
DT1     031504           5390#
DT10    031636           5390#
DT11    031660           5390#
DT12    031672           5390#
```

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DT2     031516          5390#
DT3     031534          5390#
DT4     031546          5390#
DT5     031560          5390#
DT6     031576          5390#
DT7     031614          5390#
EM1     030176          5390#
EM10    030501          5390#
EM11    030525          5390#
EM12    030554          5390#
EM13    030600          5390#
EM14    030640          5390#
EM15    030710          5390#
EM16    030731          5390#
EM17    030745          5390#
EM2     030234          5390#
EM20    031011          5390#
EM21    031032          5390#
EM22    031047          5390#
EM23    031072          5390#
EM24    031114          5390#
EM25    031137          5390#
EM3     030277          5390#
EM4     030343          5390#
EM5     030405          5390#
EM6     030435          5390#
EM7     030454          5390#
EOM     027620          4019    4117    4191    4195    4438    4443    4822    4826    4830    4916    5266#
ERCT00  001704           960#
ERCT01  001710           963#
ERCT02  001714           966#
ERCT03  001720           969#
ERCT04  001724           972#
ERCT05  001730           975#
ERCT06  001734           978#
ERCT07  001740           981#
ERCT10  001744           984#
ERCT11  001750           987#
ERCT12  001754           990#
ERCT13  001760           993#
ERCT14  001764           996#
ERCT15  001770           999#
ERCT16  001774          1002#
ERCT17  002000          1005#
ERR     002700          1186    1212#   1216
ERRCNT  001232           757#   1341    1368    1681*   1899*
ERRFLG  001325           796#   1075*   1327*   1389*   1631*   1644    1658*   1717*
ERRMSG  005172          1641*   1659    1662#
ERRPC   002770          1218    1234#
ERTAB0  005322          1656    1691#
EXIT  = 000205           690#
EXITER  005252          1676    1681#
FLAG    030122          5371#   5390
FLOAT   002536          1179#   1185
FLTDAT  030132          4810    4820    4824    4828    4835    4875    5375#
FY      002566          1188#   1199    1203    1209
```

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GETQI   027472          3620  3624  3695  3699  3770  3774  3845  3849  3966  3970  5221#
GETQO   027460          3591  3595  3666  3670  3741  3745  3816  3820  3900  3904  5211#
GETSI   026342          2799  2803  2850  2854  2901  2905  2952  2956  3011  3015  4039  4043  4060
                        4064  4076  4085  4215  4219  4236  4240  4266  4270  4287  4291  4303  4312
                        4463  4467  4484  4488  4504  4508  4533  4537  4554  4558  4570  4579  4965#
                        5349
HALTS   005222          1627  1673#
HILIM   004366          1470* 1497  1515#
ICOUNT  001222           753# 1387  1392*
INBUF   007502          1440  1476  1796#
INCHAR  010020          1825  1853#
INIFLG  001324           795# 1101  1121  1128*
INRDY   027202          3362  3406  3443  3451  3459  4120  4142  4147  4325  4339  4344  4368  4382
                        4387  4592  4606  4611  4632  4646  4660  4665  4721  4731  4739  4836  4852
                        4857  4921  4936  4941  5130#
INSTER= 104404           817# 1491
INSTR = 104403           815# 1923  1975  1988  1997  2076  2085
INSTR2  004166          1447  1459#
INTTY   012266          2008  2025  2035  2048  2064  2249#
KMCM    007330          1231  1781#
LIMITS  004314          1486  1497#
LINE    007016          1781# 2077
LOBITS  004372          1472* 1501  1517#  1518
LOCK    001220           752# 1391* 1408  1410  1650  2373* 2389* 2415* 2431* 2457* 2480* 2515* 2535*
                        3572* 3604* 3647* 3679* 3722* 3754* 3797* 3829*
LOKFLG  001326           797#
LOLIM   004364          1469* 1499  1514#
LPCNT   001224           754# 1386* 1387  1390*
LRC8  = 000200          5178#
LSTERR  001234           758# 1084* 1326* 1628  1630* 1718*
LUTYPE= ****** U         595  5150
MASKX   001244           766#
MASTEK  006142          1652  1781#
MCRLF   005672          1425  1548  1648  1649  1657  1781#  1922  1984
MCSRX   006072          1331  1781#
MDATA   007544          1578  1588  1798#
MEMLIM  001304           782# 1294*
MEPASS  005733          1330  1781#
MERRPC  006217          1655  1781#
MERRX   006117          1337  1781#
MERR2   005760          1781# 2184
MERR3   006005          1267  1781#
MESDAT  030126          3543  4011  4017  4110  4115  4183  4189  4193  4249  4324  4367  4430  4436
                        4441  4516  4591  4645  4701  4706  4711  4771  4904  4914  4920  5373#
MESLD   027644          3542  4016  4114  4188  4192  4435  4440  4705  4710  4770  4819  4823  4827
                        4913  5279#
MILK    001322           790# 1078* 1339  1882* 1887* 1891
MLOCK   006043          1308  1781#
MNEW    006144          1262  1781#
MODU    006704          1781# 2047
MPASSX  006106          1335  1781#
MPFAIL  005675          1715  1781#
MQM     005666          1455  1781#  1946  2021  2031  2041  2056  2070
MR      005755          1317  1781#  1940
MRESET= 004000           690#
MSTCLR= 104412           829# 1720  2319  2343  2375  2417  2459  2517  2568  2590  2612  2646  2679
```

```
                    2723    2781    2832    2883    2934    2986    3044    3072    3100    3128    3157    3205    3242
                    3279    3316    3353    3394    3438    3482    3529    3574    3649    3724    3799    3872    3938
                    4006    4108    4178    4425    4699    4762    4801    4895
MTITLE  001000       730#    1105
MTSTN   006130      1653    1781#   1924
MTSTPC  006031      1781#
MVECX   006100      1333    1781#
NEXT    001216       751#    1393    1686    2270*   2294*   2317*   2341*   2372*   2414*   2456*   2514*   2566*   2588*
                    2610*   2644*   2677*   2721*   2779*   2830*   2881*   2932*   2984*   3042*   3070*   3098*   3126*
                    3155*   3203*   3240*   3277*   3314*   3351*   3392*   3436*   3480*   3527*   3571*   3646*   3721*
                    3796*   3870*   3936*   4004*   4106*   4176*   4423*   4697*   4760*   4799*   4893*
NITCH   026372      4971*   4972*   4973*   4974*   4976#
NOACT   007154      1117    1781#   1876
NODEV   002674      1171    1210#
NUM     006450      1781#   1976
OCOR    026374      2686    2730    2792    2843    2894    2945    3004    3891    3957    4020    4118    4196    4444
                    4708    4713    4773    4831    4917    4979#   4985    5015    5057    5073    5114    5207    5293
OK      002646      1197    1204#   1233
ONE     001302       781#    5390
OUTRDY  026526      2783    2788    2834    2839    2885    2890    2936    2941    2991    2995    3000    3023    4015
                    4113    4187    4434    4704    4769    4999    5008    5019#   5044    5053    5066    5070    5090
                    5099    5194    5203    5240    5256    5270    5287
PACT00  001702       959#
PACT01  001706       962#
PACT02  001712       965#
PACT03  001716       968#
PACT04  001722       971#
PACT05  001726       974#
PACT06  001732       977#
PACT07  001736       980#
PACT10  001742       983#
PACT11  001746       986#
PACT12  001752       989#
PACT13  001756       992#
PACT14  001762       995#
PACT15  001766       998#
PACT16  001772      1001#
PACT17  001776      1004#
PARAM = 104405       819#    1925    1977    1990    1999    2078    2087
PARAM1  004234      1475#    1492
PARBIT= 040000       690#
PARERR  004310      1478    1480    1482    1491#   1498    1500    1502
PASCNT  001230       756#    1328*   1329    1340    1365    1898*
PERFOR= 004537       690#
PFTAB   005430      1716    1722#
POPR0 = 012600       666#    1680
POP1SP= 005726       664#
POP2SP= 022626       668#    1395
PRIO    006547      1781#    2007
PS      = 177776     657#    1070*   1305*   2211*   2221*
PUSHR0= 010046       665#    1677
PUSH1S= 005746       663#
PUSH2S= 024646       667#
QV.FLG  001327       798#    1076*   1344*   1384
RESREG  005220      1669    1672#
RESTAR  005350      1702    1708#
```

```
RESTRT  003534  1343  1347  1355#
RESO5 = 104407   823#  1672
RETURN  001214   750#  1086*  1314*  1318  1355*  1393*  1397  1686*  1689  1721  1939*  1949*  1951
ROMCLK= 104414   833#  1728  1731  1768  1773  2274  2297  2321  2345  2378  2380  2391  2393
                2420  2422  2433  2435  2465  2467  2486  2488  2522  2524  2540  2542  2569
                2591  2615  2624  2649  2651  2655  2682  2684  2689  2699  2726  2728  2733
                2737  2747  2757  2785  2790  2811  2836  2841  2862  2887  2892  2913  2938
                2943  2964  2993  2997  3002  3025  3050  3078  3106  3134  3164  3174  3176
                3212  3221  3249  3258  3286  3295  3323  3332  3363  3401  3407  3444  3452
                3460  3489  3492  3501  3504  3536  3540  3548  3881  3885  3889  3919  3947
                3951  3955  3985  4121  4129  4143  4148  4157  4326  4340  4345  4354  4369
                4383  4388  4397  4593  4607  4612  4621  4633  4647  4661  4666  4675  4715
                4722  4732  4740  4766  4775  4837  4853  4858  4867  4922  4937  4942  4951
                4969  4982  4997  5001  5004  5010  5013  5024  5042  5046  5049  5055  5068
                5071  5088  5092  5095  5101  5121  5123  5140  5192  5196  5199  5205  5215
                5225  5238  5242  5245  5258  5261  5272  5274  5289  5303  5305
RUN     001316   787#  1079*  1880*  1881*  1888
SAVACT  001312   785#  1265  2182*
SAVNUM  001314   786#  1073*  1342*  1345*  2175*
SAVPC   001276   779#  1216*  1236  1523*  1693
SAVR0   001260   772#  1532*  1537  5390
SAVR1   001262   773#  1222*  1531*  1538
SAVR2   001264   774#  1530*  1539  5390
SAVR3   001266   775#  1529*  1540  5390
SAVR4   001270   776#  1528*  1541  5390
SAVR5   001272   777#  1527*  1542  5390
SAVSP   001274   778#
SAV05 = 104406   821#  1632
SCHAR   027176  3354*  3395*  5082  5100  5105  5109*  5110  5116*  5126#
SCOPE = 104400   809#  2282  2305  2329  2360  2402  2444  2502  2554  2576  2598  2631  2664
                2708  2765  2816  2867  2918  2969  3030  3058  3086  3114  3142  3191  3228
                3265  3302  3339  3378  3422  3467  3515  3558  3633  3708  3783  3858  3924
                3990  4091  4159  4405  4683  4748  4783  4878  4959
SCOP1 = 104401   811#  2388  2401  2430  2443  2476  2497  2531  2549  3603  3632  3678  3707
                3753  3782  3828  3857
SILOLD  026736  3359  3375  3403  3419  5077#
SIMBCC  027236  3586  3615  3661  3690  3736  3765  3811  3840  3895  3961  4031  4207  4258
                4455  4525  4812  4906  5150#
SKIP    002632  1167  1170  1191  1194  1200#
SOFTSW  010052  1823  1862#
SOM     027570  4439  5252#
SPACNT= 004713  1558*  1582  1585*  1599#
SPEED   007340  1781#  2034
STACK = 001200   658#  1071  1284  1687  1710
STAT    001240   764#
STAT1   001366   845#  1895*  2350  2352  3483  3485  3509  3530  3532  4802  4896
STAT2   001370   846#  1896*  2572  2594
STAT3   001372   847#  1897*
STFFCK  030006  5332#
STFFCL  027726  5106  5310#
STRTSW  001236   763#  1107*  1110*  1111  1113  1123  1125  1260  1306  1315  1917  1941*  1971
                2195
STUFDT  030152  5381#
STUFLG  027200  3355*  3396*  5103  5117*  5127#
SV05    004402  1527#
SWFLG   010016  1074*  1419  1818*  1845*  1851#
```

```
SWMES   007205          1781#   1821
SWMES1  007215          1781#   1824
SWR     001202           737#   1091*   1093    1097*   1107    1265    1270    1375    1382    1406    1421    1621    1626
                        1675    1682    1684    1746    1806    1844*
SWREG   000176           723#   1097    1806    1864
SW00  = 000001           639#   1111    1971    2195
SW01  = 000002           638#   1315    1917    1941
SW02  = 000004           637#
SW03  = 000010           636#   1260
SW04  = 000020           635#
SW05  = 000040           634#
SW06  = 000100           633#   1746
SW07  = 000200           632#
SW08  = 000400           631#   1682
SW09  = 001000           630#   1406
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SW11  = 004000           628#   1382
SW12  = 010000           627#   1421    1621
SW13  = 020000           626#   1626
SW14  = 040000           625#
SW15  = 100000           624#
SYNC    026412          3047    3075    3103    3131    4989#
SYNLD   027510          3879    3945    4014    4112    4186    4433    4703    4768    4805    4806    4899    4900    5232#
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TEMP1   001246           767#   1131*   1783    2207*   2208*   4994*   5006*   5040*   5051*   5086*   5097*   5138*   5144*
                        5156*   5170*   5190*   5201*   5236*   5247*   5286*   5291*
TEMP2   001250           768#   1132*   1785    4356*   4357*   4358    4399*   4400*   4401    4623*   4624*   4625    4677*
                        4678*   4679    4869*   4870*   4871    4953*   4954*   4955    5038*   5054    5064*   5067    5081*
                        5085*   5112*   5119*   5157*   5162*   5188*   5204
TEMP3   001252           769#   1134*   1160*   1212    1221*   1787    1980    1983    2095*   4145*   4146*   4342*   4343*
                        4358*   4359    4385*   4386*   4401*   4402    4609*   4610*   4625*   4626    4663*   4664*   4679*
                        4680    4855*   4856*   4871*   4872    4939*   4940*   4955*   4956    5316*   5326*   5339*   5352*
                        5390
TEMP4   001254           770#   1135*   1789    1993    1996    2002    2005    2081    2084    2090    2093
TEMP5   001256           771#   1136*   1791    1974*   1987*   2193    5022*   5028*
TIMER = 104416           837#   2653    3163    3211    3248    3285    3322    3491    3503    3538
TKCSR   001204           742#   1442    1808    1853    2249    5364
TKDBR   001206           743#   1444    1450    1811    1813    1855    2251
TLAST = 026024          1944    4960#
TPCSR   001210           744#   1426    1448    1623    1856    2252
TPDBR   001212           745#   1428*   1450*   1625*   1858*   2254*
TRPOK   004730          1611#
TSTNO   001226           755#   1085*   1696    1724    1928    1935    1937    2269*   2293*   2316*   2340*   2371*   2413*
                        2455*   2513*   2565*   2587*   2609*   2643*   2676*   2720*   2778*   2829*   2880*   2931*   2983*
                        3041*   3069*   3097*   3125*   3154*   3202*   3239*   3276*   3313*   3350*   3391*   3435*   3479*
                        3526*   3570*   3645*   3720*   3795*   3869*   3935*   4003*   4105*   4175*   4422*   4696*   4759*
                        4798*   4892*
TST1    012320          1931    1949    2269#
TST10   013326          2456    2513#
TST11   013502          2514    2565#
TST12   013544          2566    2587#
TST13   013606          2588    2609#
TST14   013706          2610    2643#
TST15   014006          2644    2676#
TST16   014144          2677    2720#
TST17   014342          2721    2778#
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TST2    012374          2270    2293#
TST20   014524          2779    2829#
TST21   014706          2830    2880#
TST22   015070          2881    2931#
TST23   015252          2932    2983#
TST24   015460          2984    3041#
TST25   015546          3042    3069#
TST26   015636          3070    3097#
TST27   015724          3098    3125#
TST3    012442          2294    2316#
TST30   016014          3126    3154#
TST31   016166          3155    3202#
TST32   016302          3203    3239#
TST33   016420          3240    3276#
TST34   016536          3277    3313#
TST35   016654          3314    3350#
TST36   017004          3351    3391#
TST37   017144          3392    3435#
TST4    012514          2317    2340#
TST40   017304          3436    3479#
TST41   017466          3480    3526#
TST42   017632          3527    3570#
TST43   020146          3571    3645#
TST44   020462          3646    3720#
TST45   020776          3721    3795#
TST46   021312          3796    3869#
TST47   021550          3870    3935#
TST5    012616          2341    2371#
TST50   022006          3936    4003#
TST51   022340          4004    4105#
TST52   022566          4106    4175#
TST53   023666          4176    4422#
TST54   025066          4423    4696#
TST55   025320          4697    4759#
TST56   025436          4760    4798#
TST57   026024          4799    4892#   4960
TST6    012756          2372    2413#
TST60 = ****** U        4893
TST7    013116          2414    2455#
TTST    003612          1309*   1310*   1312*   1313*   1376#
TWOSYN= 010000           690#
TYPDAT  005206          1647    1665    1668#
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                        1331    1333    1335    1337    1425    1438    1455    1548    1588    1648    1649    1652    1653
                        1655    1657    1661    1666    1715    1821    1824    1876    1922    1940    1946    1984    2006
                        2020    2023    2030    2033    2040    2046    2055    2062    2069    2184
TYPMSG  005106          1645    1648#
VEC     006526          1781#   1998
VECMAP  012010          2183    2195#
WHICH   012002          1986    2191#
WRDCNT  004710          1556*   1589*   1597#
WRKO.F  005174          1660    1663#
XBX     005000          1622    1624    1626#
XCSR    003546          1332    1357#
XERR    003570          1338    1366#
XHEAD   006224          1129    1781#
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XPASS   003562          1336  1363#
XPOLY   027342          3578* 3607* 3653* 3682* 3728* 3757* 3803* 3832* 3878* 3944* 4029* 4205* 4256*
                        4453* 4523* 4807* 4901* 5166  5168  5176#
XSTATQ  007454          1138  1781#
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ZERO    001300           780# 5390
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.CONVR  004466      826  1548#
.DATAC  005552      836  1753#
.DELAY  005436      832  1726#
.EOP    003364     1325#  4893
.ERRTA  031704     1640  5390#
.HLT    004750      709  1620#
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.INSTR  004050      816  1434#
.INST1  004070     1438#  1458
.MSG    004072     1436*  1439#
.MSTCL  005466      830  1737#
.PARAM  004174      820  1466#
.PFAIL  005336      707  1072  1701#  1709
.RESO5  004434      824  1537#
.ROMCL  005504      834  1742#
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.SCOPE  003576      810  1373#
.SCOP1  003736      812  1405#
.START  002002      726  1070#  1086  1841
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.TYPE   003766      814  1416#
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          2907  2917  2954  2958  2968  3013  3017  3057  3085  3113  3141  3171  3183  3190  3219
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          5030  5146  5351
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$LU12     595#  2361
$LU17     595#  2403
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$MULT     595#
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                5010    5013    5024    5042    5046    5049    5055    5068    5071    5088    5092    5095    5101    5121    5123
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$SINAC          595#
$SOFTC          595#    1801
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$VARIA          595#     728
$WINDO          595#    2766    2817    2868    2919
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                2774    2817    2825    2868    2876    2919    2927    2970    2979    3031    3037    3059    3065    3087    3093
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                3859    3865    3925    3931    3991    3999    4092    4101    4160    4171    4406    4418    4684    4692    4749
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$ZEROS          595#

. ABS.  032226     000

 ERRORS DETECTED:  0

 CZDMEC/I,CZDMEC.SEQ/CRF/SOL=CZDMEC
 RUN-TIME: 14 19 1 SECONDS
 RUN-TIME RATIO: 55/35=1.5
 CORE USED:  32K  (63 PAGES)
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