

DMC11

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

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IDENTIFICATION

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

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1. ABSTRACT

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

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

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

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

NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE FIVE DIAGNOSTICS ARE:

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

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

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (EXCEPT AN LSI-11) WITH MINIMUM 8K MEMORY
ASR 33 (OR EQUIILVALENT)
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 PROCEEDURE

3.1 METHOD

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

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY * SIZE

4k	17
8k	37
12k	57
16k	77
20k	117
24k	137
28k	157

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

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

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

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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:

HOW MANY DMC11'S TO BE TESTED?1
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 CSR ADDRESS?160010
 VECTOR ADDRESS?310
 BR PRIORITY LEVEL? (4,5,6,7)?5
 DOES MICRO-PROCESSOR HAVE CRAM? (Y OR N)N
 WHICH LINE UNIT? IF NONE TYPE 'N', IF M8201 TYPE '1', IF M8202 TYPE '2'?1
 IS THE LOOP BACK CONNECTOR ON?Y
 (THE NEXT QUESTION WILL BE ASKED ONLY IF M8201 AND LOOP BACK CONNECTOR)
 WHICH MODEM TYPE, TYPE 'D' FOR DMC11-DA (RS232C), OR TYPE 'F' FOR DMC11-FA (V.35)? D
 SWITCH PAC#1 (DDCMP LINE#)?377
 SWITCH PAC#2 (BM873 BOOT ADD)?377
 FOLLOWING THE QUESTIONS THE STATUS MAP IS PRINTED OUT AS DESCRIBED ABOVE, THE INFORMATION IN THE MAP REFLECTS THE ANSWERS TO THE QUESTIONS. IF THE DIAGNOSTIC WAS STARTED WITH SW00=0 AND SW07=0 (AUTO-SIZING) THEN NO QUESTIONS ARE ASKED AND ONLY THE STATUS-MAP IS PRINTED OUT. IF AUTO-SIZING IS USED THE STATUS INFORMATION MUST BE VERIFIED TO BE CORRECT (MATCH THE HARDWARE). IF IT DOES NOT MATCH THE HARDWARE THE DIAGNOSTIC MUST BE RESTARTED WITH SW00=1 AND THE QUESTIONS ANSWERED.

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4.1 CONTROL SWITCH SETTINGS

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

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

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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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4.1.3 DYNAMIC SWITCHES

ERROR SWITCHES

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

SCOPE SWITCHES

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

4.2 STARTING ADDRESS

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

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

5. OPERATING PROCEDURE

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

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5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VIA SW 15=1) WHEN EVER AN ERROR OCCURS.
2. CLEAR SW 15.
3. SET SW 14: (LOOP ON THIS TEST)
4. SET SW 13: (INHIBIT ERROR PRINT OUT)

THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBLY AN ERROR MESSAGE (THIS DEPENDS ON THE TEST) TO GIVE THE OPERATOR AN IDEA AS TO THE SOURCE OF THE PROBLEM. IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT; LOOK IN THE LISTING FOR THAT TEST NUMBER WHICH WAS TYPED OUT AND THEN NOTE THE PC OF THE ERROR REPORT THIS WAY THE EXACT FUNCTION OF THE TEST CAN BE DETERMINED.

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL INFORMATION WILL BE SUPPLIED IN THE THE ERROR MESSAGE TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.2 ERROR RECOVERY

IF FOR SOME REASON THE DMC11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR TO REGAIN CONTROL OF CPU. IF THIS SHOULD HAPPEN; LOOK IN LOCATION 'TSTNO' (ADDRESS 1226) FOR THE NUMBER OF THE TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC ERROR. IN THIS WAY THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DMC11 WAS DOING AT THE TIME OF THE ERROR.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4. (PLEASE)
STATUS TABLE SHOULD BE VERIFIED REGARDLESS OF HOW PROGRAM WAS STARTED. ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH THE INFORMATION PRINTED ON THE TTY TO COMPLETELY ISOLATE PROBLEMS.

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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.

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

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

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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 PERFORMED.

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

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.

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

THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 16 (DECIMAL) DMC11S SEQUENTIALLY. 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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EACH MAP ENTRY CONTAINS 4 WORDS WHICH CONTAIN THE STATUS INFORMATION FOR 1 DMC11. THE PC SHOWS WHERE IN CORE MEMORY THE FIRST OF THE 4 WORDS IS. IN THE EXAMPLE ABOVE THE FIRST DMC'S STATUS IS IN LOCATIONS, 1500, 1502, 1504, AND 1506. THE SECOND DMC STATUS IS LOCATED AT 1510, 1512, 1514, AND 1516. THE INFORMATION CONTAINED IN EACH 4 WORD ENTRY IS DEFINED AS FOLLOWS:

CSR: CONTAINS DMC11 CSR ADDRESS

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

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

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

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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 A 16520 A DMC11 HAS BEEN FOUND, IF NOT, THE ADDRESS IS UPDATED BY 10 AND THE SEARCH CONTINUES. A -1 INDICATES A DMC11 WITH NO CROM OR CRAM, A 125252 INDICATES A KMC11 WITH CRAM, A 626 INDICATES A DMC11-AL AND A 16520 INDICATES DMC11-AR. FURTHER TESTS ARE PERFORMED AT THIS POINT TO DETERMINE WHICH LINE UNIT, IF ANY, IS INSTALLED, IF A LOOP-BACK CONNECTOR IS INSTALLED AND VARIOUS SWITCH SETTINGS ON THE LINE UNIT. THIS IS WHY THE STATUS TABLE MUST BE VERIFIED BY THE USER AND IF ANY OF THE INFORMATION DOES NOT AGREE WITH THE HARDWARE THE DIAGNOSTIC MUST BE RESTARTED AND THE QUESTIONS MUST BE ANSWERED. ALL DMC11'S IN THE SYSTEM WILL BE FOUND BY THE AUTO-SIZER. IF IT DOES NOT FIND A DMC11 THE DIAGNOSTIC MUST BE RESTARTED AND THE QUESTIONS ANSWERED.

8.5.2 FINDING THE VECTOR AND BR LEVEL

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '+2' (NEXT ADDRESS). THE PROCESSOR STATUS IS STARTED AT 7 AND THE DMC IS PROGRAMMED TO INTERRUPT. THE PS IS LOWERED BY 1 UNTIL THE DMC INTERRUPTS, A DELAY IS MADE AND IF NO INTERRUPT 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 INTERRUPT OCCURED; THE ADDRESS TO WHICH THE DMC11 INTERRUPTED TO IS PICKED UP AND REPORTED AS THE VECTOR. NOTE: IF THE VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU; THERE IS A PROBLEM AND AUTO SIZING SHOULD NOT BE DONE.

8.6 SOFTWARE SWITCH REGISTER

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

CONTROL:

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

558
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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.

9.0 HISTORY

THIS DIAGNOSTIC WAS UPDATED TO DETECT FOR THE CONDITION OF V.35 AND M8201. IN THIS CONFIGURATION, RING WILL NOT BE LOOPED BACK AND SHOULD NOT BE TESTED FOR.

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000'

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B 2

SEQ 0014

599
600

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601          :      .NLIST
602
603
604
605
606
607          : *CZDMFCO BTSTUF MD LN UNT TSTS   DMC11 DDCMP LINE UNIT TESTS
608          : *COPYRIGHT 1976, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
609          : -----
610
611          : STARTING PROCEDURE
612          : OAD PROGRAM
613          : LOAD ADDRESS 000200
614          : SWR=0  AUTOSIZE DMC11
615          : SW07=1  USE CURRENT DMC11 PARAMETERS
616          : SW00=1  INPUT NEW DMC11 PARAMETERS
617          : PRESS START
618          : PROGRAM WILL TYPE 'CZDMFCO BTSTUF MD LN UNT TSTS   DMC11 DDCMP LINE UNIT TESTS'
619          : PROGRAM WILL TYPE STATUS MAP
620          : PROGRAM WILL TYPE 'R' TO INDICATE THAT TESTING HAS STARTED
621          : AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
622          : AND THEN RESUME TESTING
623          : SUBSEQUENT RESTARTS WILL NOT TYPE PROGRAM TITLE
624
625
626
627
628          : SWITCH REGISTER OPTIONS
629          : -----
630
631          : 100000      SW15=100000      :=1, HALT ON ERROR
632          : 040000      SW14=40000       :=1, LOOP ON CURRENT TEST
633          : 020000      SW13=20000        :=1, INHIBIT ERROR TIMEOUT
634          : 010000      SW12=10000        :=1, INHIBIT ERROR TYPEOUT
635          : 004000      SW11=4000         :=1, INHIBIT ERROR TYPEOUT/BELL ON ERROR.
636          : 002000      SW10=2000         :=1, INHIBIT ITERATIONS
637          : 001000      SW09=1000         :=1, ESCAPE TO NEXT TEST ON ERROR
638          : 000400      SW08=400          :=1, LOOP WITH CURRENT DATA
639          : 000200      SW07=200          :=1, LOOP ON ERROR
640          : 000100      SW06=100         :=1, USE CURRENT DMC11 PARAMETERS, =0, AUTOSIZE DMC11
641          : 000040      SW05=40          :=1, HALT BEFORE CLOCKING MICRO-PROCESSOR INSTRUCTION
642          : 000020      SW04=20
643          : 000010      SW03=10
644          : 000004      SW02=4
645          : 000002      SW01=2
646          : 000001      SW00=1
          : RESELECT DMC11'S TO BE TESTED (ACTIVE)
          : LOCK ON TEST SELECT
          : RESTART PROGRAM AT SELECTED TEST
          : INPUT DMC11 PARAMETERS

```

```

647
648
649      ;REGISTER DEFINITIONS
650      ;-----
651
652      000000      R0=%0      ;GENERAL REGISTER
653      000001      R1=%1      ;GENERAL REGISTER
654      000002      R2=%2      ;GENERAL REGISTER
655      000003      R3=%3      ;GENERAL REGISTER
656      000004      R4=%4      ;GENERAL REGISTER
657      000005      R5=%5      ;GENERAL REGISTER
658      000006      SP=%6      ;PROCESSOR STACK POINTER
659      000007      PC=%7      ;PROGRAM COUNTER
660
661      ;LOCATION EQUIVALENCIES
662      ;-----
663
664      177776      PS=177776    ;PROCESSOR STATUS WORD
665      001200      STACK=1200   ;START OF PROCESSOR STACK
666
667      ;INSTRUCTION DEFINITIONS
668      ;-----
669
670      005746      PUSH1SP=5746  ;DECREMENT PROCESSOR STACK 1 WORD
671      005726      POP1SP=5726   ;INCREMENT PROCESSOR STACK 1 WORD
672      010046      PUSHRO=10046   ;SAVE R0 ON STACK
673      012600      POPRO=12600    ;RESTORE R0 FROM STACK
674      024646      PUSH2SP=24646 ;DECREMENT STACK TWICE
675      022626      POP2SP=22626   ;INCREMENT STACK TWICE
676      .EQUIV EMT,HLT ;BASIC DEFINITION OF ERROR CALL
677
678      ;BIT DEFINITIONS
679      ;-----
680
681      100000      BIT15=100000
682      040000      BIT14=40000
683      020000      BIT13=20000
684      010000      BIT12=10000
685      004000      BIT11=4000
686      002000      BIT10=2000
687      001000      BIT9=1000
688      000400      BIT8=400
689      000200      BIT7=200
690      000100      BIT6=100
691      000040      BIT5=40
692      000020      BIT4=20
693      000010      BIT3=10
694      000004      BIT2=4
695      000002      BIT1=2
696      000001      BIT0=1
697
698

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699
700
701
702
703
704
705
706
707
708
709      000000
710
711
712
713
714      000024      000024
715      000024      005336
716      000030      000340
717      000030      004750
718      000032      000340
719      000032      004716
720      000034      000340
721      000036      000040
722      000040      000000
723      000042      000000
724      000044      000000
725      000046      003522
726      000052      000052
727      000052      000000
728
729      000174      000174
730      000174      000000
731      000176      000000
732
733      000200      000200      002002
734
735
736      001000      001000
737      001000      005377      055103      046504
738      (2)      001040      046504      030503      020061
739      (2)
740      001200      001200
741
742
743      001200      177570
744      001202      177570

```

```

*****
-----
;TRAPCATCAER FOR ILLEGAL INTERRUPTS
;THE STANDARD "TRAP CATCHER" IS PLACED
;BETWEEN ADDRESS 0 TO ADDRESS 776.
;IT LOOKS LIKE "PC+2 HALT".
-----
*****
-----
;STANDARD INTERRUPT VECTORS
-----
.-24
      .PFAIL      ;POWER FAIL HANDLER
      340          ;SERVICE AT LEVEL 7
      .HLT        ;ERROR HANDLER
      340          ;SERVICE AT LEVEL 7
      .TRPSRV     ;GENERAL HANDLER DISPATCH SERVICE
      340          ;SERVICE AT LEVEL 7
.=40
      0            ;SAVE FOR ACT-11 OR XXDP
      0            ;RETURN ADDRESS IF UNDER ACT-11 OR XXDP
      0            ;SAVE FOR ACT-11 OR XXDP
      $ENDAD      ;FOR USE WITH ACT-11 OR XXDP
.=52
      0            ;ACT-11 PROGRAM CHARACTERISTICS
.=174
DISPREG:0          ;SOFTWARE DISPLAY REGISTER
SWREG: 0           ;SOFTWARE SWITCH REGISTER
.=200
      JMP      .START      ;GO TO START OF PROGRAM
.=1000
MTITLE: .ASCII <377><12>/CZDMFCO BTSTUF MD LN UNT TSTS/<377>
        .ASCII /DMC11 DDCMP LINE UNIT TESTS/<377>
.=1200
;INDIRECT POINTERS TO SWITCH REGISTER AND LIGHT DISPLAY
-----
DISPLAY:177570
SWR: 177570

```

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F 2

PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

SEQ 0018

```

745
746      ;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
747      ;-----
748
749      001204 177560      TKCSR: 177560      ;TELETYPE KEYBOARD CONTROL REGISTER
750      001206 177562      TKDBR: 177562      ;TELETYPE KEYBOARD DATA BUFFER
751      001210 177564      TPCSR: 177564      ;TELEPRINTER CONTROL REGISTER
752      001212 177566      TPDBR: 177566      ;TELEPRINTER DATA BUFFER
753
754      ;PROGRAM CONTROL PARAMETERS
755      ;-----
756
757      001214 000000      RETURN: 0      ;SCOPE ADDRESS FOR LOOP ON TEST
758      001216 000000      NEXT: 0      ;ADDRESS OF NEXT TEST TO BE EXECUTED
759      001220 000000      LOCK: 0      ;ADDRESS FOR LOCK ON CURRENT DATA
760      001222 000003      ICOUNT: 3      ;NUMBER OF ITERATIONS THAT CUPRENT TEST WILL BE EXECUTED
761      001224 000000      LPCNT: 0      ;NUMBER OF ITERATIONS COMPLETED
762      001226 000000      TSTNO: 0      ;NUMBER OF TEST IN PROGRESS
763      001230 000000      PASCNT: 0      ;NUMBER OF PASSES COMPLETED
764      001232 000000      ERRCNT: 0      ;TOTAL NUMBER OF ERRORS
765      001234 000000      LSTERR: 0      ;PC OF LAST ERROR CALL
766
767      ;PROGRAM VARIABLES
768      ;-----
769
770      001236 000000      STRTSW: 0      ;SWITCHES AT START OF PROGRAM
771      001240 000000      STAT: 0      ;DM STATUS WORD STORAGE
772      001242 000000      CLKX: 0
773      001244 000000      MASKX: 0
774      001246 000000      TEMP1: 0      ;TEMPORARY STORAGE
775      001250 000000      TEMP2: 0      ;TEMPORARY STORAGE
776      001252 000000      TEMP3: 0      ;TEMPORARY STORAGE
777      001254 000000      TEMP4: 0      ;TEMPORARY STORAGE
778      001256 000000      TEMP5: 0      ;TEMPORARY STORAGE
779      001260 000000      SAVR0: 0      ;R0 STORAGE
780      001262 000000      SAVR1: 0      ;R1 STORAGE
781      001264 000000      SAVR2: 0      ;R2 STORAGE
782      001266 000000      SAVR3: 0      ;R3 STORAGE
783      001270 000000      SAVR4: 0      ;R4 STORAGE
784      001272 000000      SAVR5: 0      ;R5 STORAGE
785      001274 000000      SAVSP: 0      ;STACK POINTER STORAGE
786      001276 000000      SAVPC: 0      ;PROGRAM COUNTER STORAGE
787      001300 000000      ZERO: 0
788      001302 000001      ONE: 1
789      001304 000000      MEMLIM: 0      ;HIGHEST LOCATION FOR NPR'S
790      001306 000001      DMACTV: .BLKW 1      ;DMC11'S SELECTED ACTIVE.
791      001310 000001      DMNUM: .BLKW 1      ;OCTAL NUMBER OF DMC11'S.
792      001312 000001      SAVACT: .BLKW 1      ;ORIGINAL ACTV DEVICES
793      001314 000001      SAVNUM: .BLKW 1      ;WORKABLE NUMBER
794      001316 000000      RUN: 0      ;POINTER TO RUNNING DEVICE.
795      .EVEN
796      001320 001472      CREAM: DM.MAP-6      ;TABLE POINTER.
797      001322 001676      MILK: CNT.MAP-4      ;TABLE POINTER

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PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

SEQ 0019

```

798
799 ;PROGRAM CONTROL FLAGS
800 ;-----
801
802 001324 000 INIFLG: .BYTE 0 ;PROGRAM INITIALIZATION FLAG
803 001325 000 ERRFLG: .BYTE 0 ;ERROR OCCURED FLAG
804 001326 000 LOKFLG: .BYTE 0 ;LOCK ON CURRENT TEST FLAG
805 001327 000 QV.FLG: .BYTE 0 ;QUICK VERIFY FLAG.
806 ;ON FIRST PASS OF EACH DMC11 ITERATIONS WILL BE SUPPRESS
807 .EVEN
808
809 ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
810 ;POINTERS TO SUBROUTINES CAN BE FOUND
811 ;IN THE TABLE IMMEDIATLY FOLLOWING THE DEFINITIONS
812
813 ;*****
814 ;-----
815 001330 .TRPTAB:
816 104400 SCOPE=TRAP+0 ;CALL TO SCOPE LOOP AND ITERATION HANDLER
817 001330 003576 .SCOPE
818 104401 SCOP1=TRAP+1 ;CALL TO LOOP ON CURRENT DATA HANDLER
819 001332 003736 .SCOP1
820 104402 TYPE=TRAP+2 ;CALL TO TELETYPE OUTPUT ROUTINE
821 001334 003766 .TYPE
822 104403 INSTR=TRAP+3 ;CALL TO ASCII STRING INPUT ROUTINE
823 001336 004050 .INSTR
824 104404 INSTER=TRAP+4 ;CALL TO INPUT ERROR HANDLER
825 001340 004154 .INSTER
826 104405 PARAM=TRAP+5 ;CALL TO NUMERICAL DATA INPUT ROUTINE
827 001342 004174 .PARAM
828 104406 SAV05=TRAP+6 ;CALL TO REGISTER SAVE ROUTINE
829 001344 004374 .SAV05
830 104407 RES05=TRAP+7 ;CALL TO REGISTER RESTORE ROUTINE
831 001346 004434 .RES05
832 104410 CONVRT=TRAP+10 ;CALL TO DATA OUTPUT ROUTINE
833 001350 004466 .CONVRT
834 104411 CNVRT=TRAP+11 ;CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF.
835 001352 004472 .CNVRT
836 104412 MSTCLR=TRAP+12 ;CALL TO ISSUE A MASTER CLEAR
837 001354 005466 .MSTCLR
838 104413 DELAY=TRAP+13 ;CALL TO DELAY
839 001356 005436 .DELAY
840 104414 ROMCLK=TRAP+14 ;CALL TO CLOCK ROM ONCE
841 001360 005504 .ROMCLK
842 104415 DATACLK=TRAP+15 ;CALL TO CLK DATA
843 001362 005552 .DATACLK
844 104416 TIMER=TRAP+16 ;CALL TO DELAY A CLOCK TICK
845 001364 005616 .TIMER
846
847 ;-----
848 ;*****

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PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

SEG 0020

```

849      ;DMC11 CONTROL INDICATORS FOR CURRENT DMC11 UNDER TEST
850      ;-----
851
852      001366 000000      STAT1: 0
853      001370 000000      STAT2: 0
854      001372 000000      STAT3: 0
855
856      ;DMC11 VECTOR AND REGISTER INDIRECT POINTERS
857      ;-----
858
859      001374 000000      DMRVEC: 0      ;POINTER TO DMC11 RECEIVER INTERRUPT VECTOR
860      001376 000000      DMRLVL: 0     ;POINTER TO DMC11 RECEIVER INTERRUPT SERVICE PS
861      001400 000000      DMTVEC: 0     ;POINTER TO DMC11 TRANSMITTER INTERRUPT VECTOR
862      001402 000000      DMTLVL: 0     ;POINTER TO DMC11 TRANSMITTER INTERRUPT SERVICE PS
863      001404 000000      DMCSR: 0      ;POINTER TO DMC11 CONTROL STATUS REGISTER
864      001406 000000      DMCSRH: 0     ;POINTER TO DMC11 CONTROL STATUS REGISTER HIGH BYTE.
865      001410 000000      DMCTL: 0      ;POINTER TO DMC11 CONTROL OUT REGISTER
866      001412 000000      DMP04: 0      ;POINTER TO DMC11 PORT REGISTER(SEL 4)
867      001414 000000      DMP06: 0      ;POINTER TO DMC11 PORT REGISTER(SEL 6)
868
869      ;TEMP STORAGE
870      ;-----
871
872      001416 000000      TEMP: 0
873      001460      . = .+40
874
875      ;DMC11 STATUS TABLE AND ADDRESS ASSIGNMENTS
876      ;-----
877
878      001500      . = 1500
879      001500      DM.MAP:
880      001500 000001      DMC00: .BLKW 1      ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 00
881      001502 000001      DMS100: .BLKW 1     ;VECTOR FOR DMC11 NUMBER 00
882      001504 000001      DMS200: .BLKW 1     ;DDCMP LINE# FOR DMC11 NUMBER 00
883      001506 000001      DMS300: .BLKW 1     ;3RD STATUS WORD
884
885      001510 000001      DMC01: .BLKW 1      ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 01
886      001512 000001      DMS101: .BLKW 1     ;VECTOR FOR DMC11 NUMBER 01
887      001514 000001      DMS201: .BLKW 1     ;DDCMP LINE# FOR DMC11 NUMBER 01
888      001516 000001      DMS301: .BLKW 1     ;3RD STATUS WORD
889
890      001520 000001      DMC02: .BLKW 1      ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 02
891      001522 000001      DMS102: .BLKW 1     ;VECTOR FOR DMC11 NUMBER 02
892      001524 000001      DMS202: .BLKW 1     ;DDCMP LINE# FOR DMC11 NUMBER 02
893      001526 000001      DMS302: .BLKW 1     ;3RD STATUS WORD
894
895      001530 000001      DMC03: .BLKW 1      ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 03
896      001532 000001      DMS103: .BLKW 1     ;VECTOR FOR DMC11 NUMBER 03
897      001534 000001      DMS203: .BLKW 1     ;DDCMP LINE# FOR DMC11 NUMBER 03
898      001536 000001      DMS303: .BLKW 1     ;3RD STATUS WORD
899
900      001540 000001      DMC04: .BLKW 1      ;CONTROL STATUS REGISTER FOR DMC11 NUMBER 04
901      001542 000001      DMS104: .BLKW 1     ;VECTOR FOR DMC11 NUMBER 04
902      001544 000001      DMS204: .BLKW 1     ;DDCMP LINE# FOR DMC11 NUMBER 04
903      001546 000001      DMS304: .BLKW 1     ;3RD STATUS WORD
904

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PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

SEQ 0021

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

961				
962				
963				
964				
965	001702		CNT.MAP:	
966	001702	000000	PACT00: 0	;PASS COUNT FOR DMC11 NUMBER 00
967	001704	000000	ERCT00: 0	;ERROR COUNT FOR DMC11 NUMBER 00
968				
969	001706	000000	PACT01: 0	;PASS COUNT FOR DMC11 NUMBER 01
970	001710	000000	EPCT01: 0	;ERROR COUNT FOR DMC11 NUMBER 01
971				
972	001712	000000	PACT02: 0	;PASS COUNT FOR DMC11 NUMBER 02
973	001714	000000	ERCT02: 0	;ERROR COUNT FOR DMC11 NUMBER 02
974				
975	001716	000000	PACT03: 0	;PASS COUNT FOR DMC11 NUMBER 03
976	001720	000000	ERCT03: 0	;ERROR COUNT FOR DMC11 NUMBER 03
977				
978	001722	000000	PACT04: 0	;PASS COUNT FOR DMC11 NUMBER 04
979	001724	000000	FRCT04: 0	;ERROR COUNT FOR DMC11 NUMBER 04
980				
981	001726	000000	PACT05: 0	;PASS COUNT FOR DMC11 NUMBER 05
982	001730	000000	ERCT05: 0	;ERROR COUNT FOR DMC11 NUMBER 05
983				
984	001732	000000	PACT06: 0	;PASS COUNT FOR DMC11 NUMBER 06
985	001734	000000	ERCT06: 0	;ERROR COUNT FOR DMC11 NUMBER 06
986				
987	001736	000000	PACT07: 0	;PASS COUNT FOR DMC11 NUMBER 07
988	001740	000000	ERCT07: 0	;ERROR COUNT FOR DMC11 NUMBER 07
989				
990	001742	000000	PACT10: 0	;PASS COUNT FOR DMC11 NUMBER 10
991	001744	000000	ERCT10: 0	;ERROR COUNT FOR DMC11 NUMBER 10
992				
993	001746	000000	PACT11: 0	;PASS COUNT FOR DMC11 NUMBER 11
994	001750	000000	ERCT11: 0	;ERROR COUNT FOR DMC11 NUMBER 11
995				
996	001752	000000	PACT12: 0	;PASS COUNT FOR DMC11 NUMBER 12
997	001754	000000	ERCT12: 0	;ERROR COUNT FOR DMC11 NUMBER 12
998				
999	001756	000000	PACT13: 0	;PASS COUNT FOR DMC11 NUMBER 13
1000	001760	000000	ERCT13: 0	;ERROR COUNT FOR DMC11 NUMBER 13
1001				
1002	001762	000000	PACT14: 0	;PASS COUNT FOR DMC11 NUMBER 14
1003	001764	000000	ERCT14: 0	;ERROR COUNT FOR DMC11 NUMBER 14
1004				
1005	001766	000000	PACT15: 0	;PASS COUNT FOR DMC11 NUMBER 15
1006	001770	000000	ERCT15: 0	;ERROR COUNT FOR DMC11 NUMBER 15
1007				
1008	001772	000000	PACT16: 0	;PASS COUNT FOR DMC11 NUMBER 16
1009	001774	000000	ERCT16: 0	;ERROR COUNT FOR DMC11 NUMBER 16
1010				
1011	001776	000000	PACT17: 0	;PASS COUNT FOR DMC11 NUMBER 17
1012	002000	000000	ERCT17: 0	;ERROR COUNT FOR DMC11 NUMBER 17
1013				

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FORMAT OF STATUS TABLE

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	CSR
I	C	O	N	T	R	O	L			R	E	G	I	S	T	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	STAT1
I	*	I	*	I	*	I	*	I	*	I	*	I	*	I	*	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	STAT2
I	*	I	B	I	M			A	D	D	*	I	*	L	I	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	STAT3
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	

DEFINITION OF FORMAT

- CSR: CONTAINS DMC11 CSR ADDRESS
- STAT1: BITS 00-08 IS DMC11 VECTOR ADDRESS
 BIT15=1 MICRO-PROCESSOR HAS CRAM
 BIT15=0 MICRO-PROCESSOR HAS CROM
 BIT14=1 ??? TURNAROUND CONNECTOR IS ON
 BIT14=0 NO TURNAROUND CONNECTOR
 BIT13=0 LINE UNIT IS AN M8201
 BIT13=1 LINE UNIT IS AN M8202
 BIT12=1 NO LINE UNIT
 BITS 09-11 IS DMC11 BR PRIORITY LEVEL
- STAT2: LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
 HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)
- STAT3: BIT0=1 DO FREE RUNNING TESTS ON KMC
 (MUST BE SET TO A ONE MANUALLY [PROGRAM DZDMI ONLY])
 KMC MUST HAVE MICRO-CODE WRITTEN FROM RUNNING
 DZDMG TEST 2 FIRST
 BIT1=1 DMC11-AL LOCAL HIGH SPEED MICRO-CODE
 BIT1=0 DMC11-AR REMOTE LOW SPEED MICRO-CODE
 BIT2=0 DMC11-DA (RS232C)
 BIT2=1 DMC11-FA (V.35)

0011

L 2

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SEQ 0024

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

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SEQ 0026

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1127 002312 000000          HALT          ;STOP THE SHOW
1128 002314 000776          BR            ;DISQUALIFY CONTINUE SWITCH
1129 002316 004737 010640    17$: JSR      PC,AUTO.SIZE ;GO DO THE AUTO SIZE
1130 002322 105737 001324    16$: TSTB    INIFLG      ;FIRST TIME?
1131 002324 001410          BEQ          21$          ;BR IF YES
1132 002330 105737 001236    TSTB    SRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
1133 002334 100431          BMI          1$
1134 002336 032737 000006 001236 BIT      #BIT1:BIT2,SRTSW ;IS TEST NO. OR LOCK SELECTED
1135 002344 001403          BEQ          24$          ;IF NO THEN TYPE STATUS
1136 002346 000424          BR            1$          ;IF YES DO NOT TYPE STATUS
1137 002350 005137 001324    21$: COM      INIFLG      ;SET FLAG
1138 002354 104402 006225    24$: TYPE    ,XHEAD      ;TYPE HEADER
1139 002360 012704 001500    MOV      #DM.MAP,R4      ;SET POINTER
1140 002364 010437 001246    5$:  MOV      R4,TEMP1      ;SET ADDRESS
1141 002370 012437 001250    MOV      (R4)+,TEMP2      ;SET CSR
1142 002374 001411          BEQ          1$          ;ALL DONE IF ZERO
1143 002376 012437 001252    MOV      (R4)+,TEMP3      ;SET STAT1
1144 002402 012437 001254    MOV      (R4)+,TEMP4      ;SET STAT2
1145 002406 012437 001256    MOV      (R4)+,TEMP5      ;SET STAT3
1146 002412 104410          CONVRT          ;TYPE OUT STATUS MAP
1147 002414 007602          XSTATQ          ;
1148 002416 000762          BR            5$
1149 002420 012700 001500    1$:  MOV      #DM.MAP,R0      ;R0 POINTS TO STATUS TABLE
1150
1151      ;*****
1152      ;*AUTO SIZE TEST
1153      ;*THIS TEST VERIFYS THAT THE DMC11S AND/OR KMC11S ARE AT THE CORRECT FLOATING
1154      ;*ADDRESSES FOR YOUR SYSTEM. IF THIS TEST FAILS, IT IS NOT A HARDWARE ERROR.
1155      ;*CHECK THE ADDRESSES OF ALL FLOATING DEVICES (DJ,DH,DQ,DU,DUP,LK,DMC,DZ,KMC).
1156      ;*IF THERE ARE NO OTHER FLOATING DEVICES BEFORE THE DMC11, THE FIRST
1157      ;*DMC11 ADDRESS IS 760070, KMC11 IS 760110. NO DEVICE SHOULD EVER BE AT
1158      ;*ADDRESS 760000. THIS TEST MAY REQUIRE 2 OR MORE ATTEMPTS TO GET THE
1159      ;*RIGHT ADDRESSES. AFTER YOU HAVE CHANGED THE ADDRESS TO WHAT IT TOLD
1160      ;*YOU THE FIRST TIME, IT MAY COME BACK AND TELL YOU A DIFFERENT ADDRESS
1161      ;*THE NEXT TIME YOU RUN IT. PLEASE HAVE PATIENCE, THE FINAL ADDRESS
1162      ;*WILL BE CORRECT (AS LONG AS ALL DEVICES IN FRONT OF THE DMC'S ARE
1163      ;*CORRECT).
1164      ;*****
1165
1166 002424 013746 000004          MOV      @#4,-(SP)      ;SAVE LOC 4
1167 002430 013746 000006          MOV      @#6,-(SP)      ;SAVE LOC 6
1168 002434 005037 000006          CLR      @#6          ;CLEAR VEC+2
1169 002440 005037 001252          CLR      TEMP3          ;CLEAR FLAG
1170 002444 005005          CLR      R5          ;R5=0=DMC, R5=-1=KMC
1171 002446 011037 001404    AUSTRT: MOV      (R0),DMCSR      ;GET NEXT DMC CSR
1172 002452 001564          BEQ      AUDONE          ;BR IF DONE
1173 002454 005705          TST      R5          ;DMC OR KMC?
1174 002456 001005          BNE      1$          ;BR IF KMC
1175 002460 032760 100000 000002 BIT      #BIT15,2(R0)      ;CHECK FOR DMC CSR
1176 002466 001061          BNE      SKIP          ;SKIP IF NOT DMC
1177 002470 000404          BR            2$          ;ITS A DMC SO CONTINUE
1178 002472 032760 100000 000002 1$ BIT      #BIT15,2(R0)      ;CHECK FOR KMC CSR
1179 002500 001454          BEQ      SKIP          ;SKIP IF NOT KMC
1180 002502 012737 002674 000004 2$ MOV      #NODEV,@#4      ;SET UP FOR TIMEOUT
1181 002510 005705          TST      R5          ;DMC OR KMC?
1182 002512 001003          BNE      3$          ;BR IF KMC

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1183 002514 012703 000006      MOV    #6,R3      ;R3 IS COUNT OF DEVICES BEFORE DMC
1184 002520 000402      BR      4$      ;GO ON
1185 002522 012703 000010      3$: MOV    #10,R3     ;R3 IS COUNT OF DEVICES BEFORE KMC
1186 002526 012702 003010      4$: MOV    #DEV TAB,R2   ;R2 IS DEVICE TABLE POINTER
1187 002532 012701 160010      MOV    #160010,R1  ;START WITH ADDRESS 160010
1188 002536 005711      FLOAT: TST    (R1)      ;CHECK ADDRESS IN R1
1189 002540 111204      MOV B    (R2),R4     ;IF NO TIMEOUT, GET NEXT ADDRESS
1190 002542 060401      ADD     R4,R1      ;IN R1
1191 002544 005201      INC     R1
1192 002546 040401      BIC     R4,R1
1193 002550 005703      TST     R3
1194 002552 001371      BNE     FLOAT      ;ANY MORE DEVICES TO CHECK FOR?
1195 002554 012737 002700 000004  MOV    #ERR,2#4     ;BR IF YES
1196 002562 010137 003022      MOV    R1,XLOC     ;OK ONLY DMC'S ARE LEFT, SET UP FOR TIMEOUT
1197 002566 005705      FY:   TST     R5      ;SAVE FIRST DMC/KMC ADDRESS
1198 002570 001005      BNE     1$      ;DMC OR KMC?
1199 002572 032760 100000 000002  BIT     #BIT15,2(R0) ;BR IF KMC
1200 002600 001014      BNE     SKIP      ;CHECK FOR DMC CSR
1201 002602 000404      BR      2$      ;SKIP IF NOT DMC
1202 002604 032760 100000 000002  1$: BIT     #BIT15,2(R0) ;ITS A DMC SO CONTINUE
1203 002612 001407      2$:   BEQ     SKIP      ;CHECK FOR KMC CSR
1204 002614 005711      TST     (R1)      ;SKIP IF NOT KMC
1205 002616 020137 001404      CMP     R1,DMCSR    ;CHECK DMC ADDRESS
1206 002622 001411      BEQ     OK      ;DOES IT MATCH
1207 002624 062701 000010      ADD     #10,R1     ;BR IF YES
1208 002630 000756      BR      FY      ;GET NEXT DMC ADDRESS
1209 002632 062700 000010      SKIP: ADD    #10,R0     ;DO IT AGAIN
1210 002636 011037 001404      MOV     (R0),DMCSR  ;SKIP TO NEXT CSR IN TABLE
1211 002642 001470      BEQ     AUDONE    ;GET NEXT CSR
1212 002644 000750      BR      FY      ;BR IF DONE
1213 002646 062700 000010      OK:   ADD    #10,R0     ;ELSE CONTINUE
1214 002652 062737 000010 003022  ADD    #10,XLOC     ;SKIP TO NEXT DMC CSR
1215 002660 011037 001404      MOV     (R0),DMCSR  ;UPDATE EXPECTED DMC/KMC ADDRESS
1216 002664 001457      BEQ     AUDONE    ;GET NEXT DMC/KMC CSR
1217 002666 013701 003022      MOV     XL7C,R1    ;BR IF DONE
1218 002672 000735      BR      FY      ;GET EXPECTED DMC/KMC ADDRESS
1219 002674 122243      NODEV: CMP B   (R2)+,-(R3) ;CONTINUE
1220 002676 000002      RTI      ;ON TIMEOUT, INC R2, DEC R3
1221 002700 005737 001252      ERR:  TST     TEMP3     ;RETURN
1222 002704 001014      BNE     1$      ;CHECK FLAG IF = 0 TYPE HEADER
1223 002706 104402      TYPE    CONERR    ;SKIP HEADER
1224 002710 007224      MOV     #ERR,SAVPC ;TYPEOUT HEADER MESSAGE
1225 002712 012737 002700 001276  CNVRT   ERRPC      ;CONFIGURATION ERROR!!!
1226 002720 104411      TYPE    CNERR     ;SAVE PC FOR TYPEOUT
1227 002722 002770      CNVRT   CONTAB    ;TYPE OUT ERROR PC
1228 002724 104402      TYPE    CNERR     ;
1229 002726 007300      MOV     #-1,TEMP3 ;TYPE REST OF HEADER
1230 002730 012737 177777 001252  1$: MOV     R1,SAVR1    ;SET FLAG SO IT ONLY GETS TYPED ONCE
1231 002736 010137 001262      CNVRT   CONTAB    ;SAVE R1 FOR TYPEOUT
1232 002742 104410      TST     R5      ;TYPE CSR VALUES
1233 002744 002776      BNE     3$      ;DMC OR KMC ?
1234 002746 005705      TYPE    DMCM      ;BR IF KMC
1235 002750 001003      BR      4$      ;CONTINUE
1236 002752 104402
1237 002754 007321
1238 002756 000402

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SEQ 0028

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

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SEQ 0029

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

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 CZDMF.P11 08-JUL-80 08:25 END OF PASS ROUTINE

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SEQ 0030

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1328 ;END OF PASS
1329 ;TYPE NAME OF TEST
1330 ;UPDATE PASS COUNT
1331 ;CHECK FOR EXIT TO ACT-11
1332 ;RESTART TEST
1333
1334 003364 000005 .EOP: RESET ;MAKE THE WORLD CLEAN AGAIN.
1335 003366 005037 001234 CLR LSTERR ;CLEAR LAST ERROR PC
1336 003372 105037 001325 CLRB ERRFLG ;CLEAR ERROR FLAG
1337 003376 005237 001230 INC PASCNT ;UPDATE PASS COUNT
1338 003402 013777 001230 175570 MOV PASCNT,@DISPLAY ;DISPLAY PASS COUNT
1339 003410 104402 005733 TYPE ,MEPASS ;TYPE END PASS
1340 003414 104402 006073 TYPE ,MCSRX ;TYPE CSR
1341 003420 104411 003546 CNVRT ,XCSR ;SHOW IT
1342 003424 104402 006101 TYPE ,MVECX ;TYPE VECTOR
1343 003430 104411 003554 CNVRT ,XVEC ;SHOW IT
1344 003434 104402 006107 TYPE ,MPASSX ;TYPE PASSES
1345 003440 104411 003562 CNVRT ,XPASS ;SHOW IT
1346 003444 104402 006120 TYPE ,MERRX ;TYPE ERRORS
1347 003450 104411 003570 CNVRT ,XERR ;SHOW IT
1348 003454 013700 001322 MOV MILK,R0 ;GET POINTER TO PASS COUNT
1349 003460 013720 001230 MOV PASCNT,(R0)+ ;STORE PASS COUNT FOR THIS DMC11
1350 003464 013720 001232 MOV ERRCNT,(R0)+ ;STORE ERROR COUNT FOR THIS DMC11
1351 003470 005337 001314 DEC SAVNUM ;ARE ALL DEVICES TESTED?
1352 003474 001017 BNE RESTR ;BR IF NO.
1353 003476 112737 000377 001327 MOVB #377,QV.FLG ;SET THE QUICK VERIFY FLAG.
1354 003504 013737 001310 001314 MOV DMNUM,SAVNUM ;RESTORE THE COUNT
1355 003512 013701 000042 MOV @#42,R1 ;CHECK FOR ACT-11 OR DDP
1356 003516 001406 BEQ RESTR ;IF NOT, CONTINUE TESTING
1357 003520 000005 RESET ;STOP THE SHOW--CLEAR THE WORLD
1358 003522 SENDAD: JSR PC,(R1)
1359 003522 004711 NOP
1360 003524 000240 NOP
1361 003526 000240 NOP
1362 003530 000240 NOP
1363 003532 000240 NOP
1364 003534 012737 010206 001214 RESTR: MOV #CYCLE,RETURN
1365 003542 000137 010206 JMP CYCLE
1366 003546 000001 XCSR: 1
1367 003550 006 002 .BYTE 6,2
1368 003552 001404 DMCSR
1369 003554 000001 XVEC: 1
1370 003556 004 002 .BYTE 4,2
1371 003560 001374 DMRVEC
1372 003562 000001 XPASS: 1
1373 003564 006 002 .BYTE 6,2
1374 003566 001230 PASCNT
1375 003570 000001 XERR: 1
1376 003572 006 002 .BYTE 6,2
1377 003574 001232 ERRCNT
1378
1379 ;SCOPE LOOP AND INTERATION HANDLER
1380 ;-----
1381
1382 003576 004737 007734 .SCOPE: JSR PC,CKSWR ;CHECK FOR SOFT SWR
1383 003602 010016 MOV R0,(SP) ;SAVE R0 ON THE STACK

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0031

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1384 003604 032777 040000 175370      BIT      #BIT14,@SWR      ;'LOOP ON THIS TEST'?
1385 003612 001407      TTST:  BEQ      1$      ;BR IF NO. (IF LOCK SW01=1; THIS LOC =240)
1386 003614 000437      BR      3$      ;GOTO 3$ (IF LOCK SW01=1; THIS LOC =240)
1387 003616 005737 003734      TST      DONE      ;WAS TKCSR DONE SET?
1388 003622 001434      BEQ      3$      ;BR IF NO (LOCKED ON TEST)
1389 003624 005037 003734      CLR      DONE      ;YES, CLEAR FLAG
1390 003630 000415      BR      2$      ;GO TO NEXT TEST
1391 003632 032777 004000 175342 1$:  BIT      #SW11,@SWR      ;DELETE ITERATION? (QUICK PASS)
1392 003640 001011      BNE      2$      ;BR IF YES
1393 003642 105737 001327      TSTB     QV.FLG      ;HAVE PASSES BEECOMPLETED?
1394 003646 001406      BEQ      2$      ;BR IF QUICK PASS.
1395 003650 005237 001224      INC      LPCNT      ;UPDATE ITERATION COUNTER
1396 003654 023737 001224 001222      CMP      LPCNT,ICOUNT ;ARE ALL ITERATIONS DONE??
1397 003662 101414      BLOS     3$      ;BR IF NOT YET
1398 003664 105037 001325      CLRB     ERRFLG      ;PREPARE FOR NEW TEST
1399 003670 005037 001224      CLR      LPCNT      ;START ICOUNTER AT 0
1400 003674 005037 001220      CLR      LOCK
1401 003700 012737 000020 001222      MOV      #20,ICOUNT      ;RESET ITERATIONS
1402 003706 013737 001216 001214      MOV      NEXT,RETURN      ;GET NEXT TEST
1403 003714 011600      3$:  MOV      (SP),R0      ;POP R0 OFF OF THE STACK
1404 003716 022626      POP2SP      ;FAKE AN 'RTI'
1405 003720 013701 001404      MOV      DMCSR,R1      ;R1 CONTAINS BASE DMC ADDRESS
1406 003724 000177 175264      JMP      @RETURN      ;GO DO THE TEST
1407 003730 001407      BRW:    1407
1408 003732 000437      BRX:    437
1409 003734 000000      DONE:   0

;CHECK FOR FREEZE ON CURRENT DATA
;-----
1414 003736 004737 007734      .SCOPI: JSR      PC,CKSWR      ;CHECK FOR SOFT SWR
1415 003742 032777 001000 175232      BIT      #SW09,@SWR      ;IS SW09=1(SET)?
1416 003750 001405      BEQ      1$      ;BR IF NOT SET.
1417 003752 005737 001220      TST      LOCK
1418 003756 001402      BEQ      1$
1419 003760 013716 001220      MOV      LOCK,(SP)      ;GOTO THE ADDRESS IN LOCK.
1420 003764 000002      1$:  RTI      ;GO BACK.

;TELETYPE OUTPUT ROUTINE
;-----
1425 003766 010546      .TYPE:  MOV      R5,-(SP)      ;SAVE R5 ON THE STACK.
1426 003770 017605 000002      MOV      @2(SP),R5      ;GET ADDRESS OF MESSAGE.
1427 003774 062766 000002 000002      ADD      #2,2(SP)      ;POP OVER ADDRESS.
1428 004002 005737 010144      4$:  TST      SWFLG      ;SOFT SWR MESSAGE?
1429 004006 001004      BNE      1$      ;IF YES TYPE IT OUT REGARDLESS OF SW12
1430 004010 032777 010000 175164      BIT      #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
1431 004016 001012      BNE      3$      ;BR IF NO PRINT OUT WANTED (SW12=1)
1432 004020 105715      1$:  TSTB     (R5)      ;IS NUMBER MINUS? (MSB=1(BIT7))
1433 004022 100002      BPL      2$      ;BR IF NUMBER IS PLUS
1434 004024 104402 005672      TYPE     ,MCRLF      ;TYPE A CR/LF!
1435 004030 105777 175154      2$:  TSTB     @TPCSR      ;TTY READY?
1436 004034 100375      BPL      2$      ;BR IF NO.
1437 004036 112577 175150      MOVB     (R5)+,@TPDBR      ;PRINT CURRENT CHAR.
1438 004042 001357      BNE      4$      ;IF NOT ZERO KEEP PRINTING
1439 004044 012605      3$:  MOV      (SP)+,R5      ;END OF OUTPUT. RESTORE R5

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0032

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

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0033

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

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0034

```

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

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SEQ 0035

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1608          004713      SPACNT=CHRCNT+1
1609 004714 000000      BINWRD: 0
1610
1611
1612          ;TRAP DISPATCH SERVICE
1613          ;ARGUMENT OF TRAP IS EXTRACTED
1614          ;AND USED AS OFFSET TO OBTAIN POINTER
1615          ;TO SELECTED SUBROUTINE
1616
1617 004716 011646      .TRPSR: MOV      (SP),-(SP)      ;GET PC OF RETURN
1618 004720 162716 000002      SUB      #2,(SP)      ;=PC OF TRAP
1619 004724 017616 000000      MOV      @ (SP),(SP)      ;GET TRP
1620 004730 006316      TRPOK: ASL      (SP)      ;MULTIPLY TRAP ARG BY 2
1621 004732 042716 177001      BIC      #177001,(SP)      ;CLEAR UNWANTED BITS
1622 004736 062716 001330      ADD      #.TRPTAB,(SP)      ;POINTER TO SUBROUTINE ADDRESS
1623 004742 017616 000000      MOV      @ (SP),(SP)      ;SUBROUTINE ADDRESS
1624 004746 000136      JMP      @ (SP)+      ;GO TO SUBROUTINE
1625
1626          ;ERROR HANDLER
1627          ;-----
1628
1629 004750 004737 007734      .HLT: JSR      PC,CKSWR      ;CHECK FOR SOFT SWR
1630 004754 032777 010000 174220      BIT      #SW12,@SWR      ;BELL ON ERROR?
1631 004762 001406      BEQ      XBK      ;BR IF NO BELL
1632 004764 105777 174220      TSTB      @TPCSR      ;TTY READY.
1633 004770 100003      BPL      XBK      ;DON'T WAIT IF TTY NOT READY.
1634 004772 112777 000207 174212      MOVB      #207,@TPDBR      ;PUSH A BELL AT THE TTY.
1635 005000 032777 020000 174174      XBK: BIT      #SW13,@SWR      ;DELETE ERROR PRINT OUT?
1636 005006 001105      BNE      HALTS      ;BR IF NO PRINT OUT WANTED.
1637 005010 021637 001234      CMP      (SP),LSTERR      ;WAS THIS ERROR FOUND LAST TIME?
1638 005014 001404      BEQ      1$      ;BR IF YES
1639 005016 011637 001234      MOV      (SP),LSTERR      ;RECORD BEING HERE
1640 005022 105037 001325      CLRB      ERRFLG      ;PREPARE HEADER
1641 005026 104406      1$: SAVO5      ;SAVE ALL PROC REGISTERS
1642 005030 011605      MOV      (SP),R5      ;GET THE PC OF ERROR
1643 005032 162705 000002      SUB      #2,R5      ;GET ADDRESS OF TRAP CALL
1644 005036 011504      MOV      (R5),R4      ;GET HLT INSTRUCTION
1645 005040 006304      ASL      R4      ;MULT BY TWO
1646 005042 061504      ADD      (R5),R4      ;DOUBLE IT
1647 005044 006304      ASL      R4      ;MULT AGAIN
1648 005046 042704 177001      BIC      #177001,R4      ;CLEAR JUNK
1649 005052 062704 036070      ADD      #.ERRTAB,R4      ;GET POINTER
1650 005056 012437 005172      MOV      (R4)+,ERRMSG      ;GET ERROR MESSAGE
1651 005062 012437 005204      MOV      (R4)+,DATAHD      ;GET DATA HEADRER
1652 005066 011437 005216      MOV      (R4),DATABP      ;GET DATA TABLE
1653 005072 105737 001325      TSTB      ERRFLG      ;TYPE HEADREER
1654 005076 001403      BEQ      TYPMSG      ;BR IF YES
1655 005100 005737 005216      TST      DATABP      ;DOES DATA TABLE EXIST?
1656 005104 001040      BNE      TYPDAT      ;BR IF YES.
1657 005106 104402 005672      TYPMSG: TYPE      ,MCRLF
1658 005112 104402 005672      TYPE      ,MCRLF
1659 005116 005737 001220      TST      LOCK
1660 005122 001402      BEQ      1$
1661 005124 104402 006143      TYPE      ,MASTK
1662 005130 104402 006131      1$: TYPE      ,MTSTN
1663 005134 104411 005330      CNVRT      ,XTSTN      ;SHOW IT

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0036

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

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0037

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

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0038

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1776 005626 1777 005626 104414 1778 005630 021364 1779 005632 032777 000002 173552
1780 005640 001772 1781 005642 1782 005642 104414 1783 005644 021364 1784 005646 032777 000002 173536
1785 005654 001372 1786 005656 005337 001416 1787 005662 001361 1788 005664 000002 1789
1790 005666 020040 000077 (2) 005672 005015 000 (2) 005675 377 053520 020122 (2) 005733 377 047105 020104
(2) 005756 051377 000 (2) 005761 377 047516 042040 (2) 006006 044777 051516 043125 (2) 006032 052377 051505 020124
(2) 006044 046377 041517 020113 (2) 006073 103 051123 020072 (2) 006101 126 041505 020072
(2) 006107 120 051501 042523 (2) 006120 051105 047522 051522 (2) 006131 124 051505 020124
(2) 006143 052 000 (2) 006145 377 042523 020124 (2) 006220 041520 020072 000
(2) 006225 212 020040 020040 (2) 006264 020377 020040 020040 (2) 006323 212 020040 041520
(2) 006375 377 026455 026455 (2) 006451 377 047510 020127 (2) 006511 377 051503 020122
(2) 006527 377 042526 052103 (2) 006550 041377 020122 051120 (2) 006607 377 043111 042040
(2) 006705 377 044127 041511 (2) 007017 377 053523 052111 (2) 007055 377 053523 052111
(2) 007115 377 051511 052040 (2) 007155 377 047516 042040 (2) 007206 005377 053523 036522
(2) 007216 042516 037527 000040 (2) 007224 177777 046504 030503 (2) 007300 042777 050130 041505
(2) 007321 040 042050 041515 (2) 007331 040 045450 041515 (2) 007341 377 046504 030503
(2) 007455 200 044127 041511 (2) 007541 200 054524 042520 (2)
(2)
(2)

```

1\$: ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021364 ;PORT4 IBUS* REG11
BIT #2,ADMP04 ;IS PGM CLOCK BIT CLEAR?
REQ 1\$;BR IF YES

2\$: ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021364 ;PORT4 IBUS* REG11
BIT #2,ADMP04 ;IS PGM CLOCK BIT SET?
BNE 2\$;BR IF YES
DEC TEMP ;DEC COUNT
BNE 1\$;BR IF NOT DONE
RTI ;RETURN

MQM: .ASCII / ?/
MCRLF: .ASCII <15><12>
MPFAIL: .ASCII <377>/PWR FAILED. RESTART AT TEST /
MEPASS: .ASCII <377>/END PASS CZDMFC /
MR: .ASCII <377>/R/
MERR2: .ASCII <377>/NO DEVICES PRESENT./
MERR3: .ASCII <377>/INSUFFICIENT DATA!/
MTSTPC: .ASCII <377>/TEST PC-/
MLOCK: .ASCII <377>/LOCK ON SELECTED TEST/
MCSR: .ASCII /CSR: /
MVEC: .ASCII /VEC: /
MPASSX: .ASCII /PASSES: /
MERRX: .ASCII /ERRORS: /
MTSTN: .ASCII /TEST NO: /
MASTEK: .ASCII /*/
MNEW: .ASCII <377>/SET SWITCH REG TO DMC11'S DESIRED ACTIVE./
MERRPC: .ASCII /PC: /
XHEAD: .ASCII <212>/ MAP OF DMC11 STATUS/
. ASCII <377>/-----/
. ASCII <212>/ PC CSR STAT1 STAT2 STAT3/
. ASCII <377>/-----/

NUM: .ASCII <377>/HOW MANY DMC11'S TO BE TESTED?/
CSR: .ASCII <377>/CSR ADDRESS?/
VEC: .ASCII <377>/VECTOR ADDRESS?/
PRIO: .ASCII <377>/BR PRIORITY LEVEL? (4,5,6,7)?/
CRAM: .ASCII <377>/IF DMC HAS CRAM (M8204) TYPE 'Y', IF CROM (M8200) TYPE 'N' ?/
MODU: .ASCII <377>/WHICH LINE UNIT? IF NONE TYPE 'N', IF M8201 TYPE '1', IF M8202 TYP
LINE: .ASCII <377>/SWITCH PAC#1 (DDCMP LINE #)?/
BM: .ASCII <377>/SWITCH PAC#2 (BM873 BOOT ADD)?/
CONN: .ASCII <377>/IS THE LOOP BACK CONNECTOR ON?/
NOACT: .ASCII <377>/NO DEVICES ARE SELECTED/
SWMES: .ASCII <377><12>/SWR= /
SWMES1: .ASCII /NEW? /
CONERR: .ASCII <377><377>/DMC11 FOUND AT NON-STANDARD ADDRESS PC: /
CNERR: .ASCII <377>/EXPECTED FOUND/
DMCM: .ASCII / (DMC) /
KMCM: .ASCII / (KMC) /
SPEED: .ASCII <377>/DMC11-AR(REMOTE,LOW SPEED) OR DMC11-AL(LOCAL,HIGH SPEED) TYPE 'R'
MV35: .ASCII <200>/WHICH MODEM TYPE, TYPE 'D' FOR DMC11-DA (RS232C),OR/
. ASCII <200>/TYPE 'F' FOR DMC11-FA (V.35) ? /

.EVEN

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0039

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

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B 4

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0040

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

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1874
1875
1876
1877
1878
1879
1880
1881
1882
1883 010206 005737 001306      CYCLE: TST      DMACTV      ;ARE ANY DMC11'S TO BE TESTED?
1884 010212 001004              BNE      1$      ;BR IF OK.
1885 010214 104402 007155      TYPE      ,NOACT      ;NO DMC11'S SELECTED.
1886 010220 000000              HALT      ;STOP THE SHOW.
1887 010222 000776              BR        -2      ;DISQUALIFY CONT. SW.
1888 010224 000241              1$: CLC      ;CLEAR PROC. CARRY BIT.
1889 010226 006137 001316      ROL      RUN      ;UPDATE POINTER
1890 010232 005537 001316      ADC      RUN      ;CATCH CARRY FROM RUN
1891 010236 062737 000004 001322  ADD      #4,MILK      ;UPDATE POINTER
1892 010244 062737 000010 001320  ADD      #10,CREAM      ;UPDATE ADDRESS POINTER.
1893 010252 022737 001700 001320  CMP      #DM.MAP+200,CREAM
1894 010260 001006              BNE      2$      ;KEEP GOING; NOT ALL TESTED FOR.
1895 010262 012737 001500 001320  MOV      #DM.MAP,CREAM      ;RESET ADDRESS POINTER.
1896 010270 012737 001702 001322  MOV      #CNT.MAP,MILK      ;RESET PASS COUNT POINTER
1897 010276 033737 001316 001306  2$: BIT      RUN,DMACTV      ;IS THIS ONE ACTIVE?
1898 010304 001747              BEQ      1$      ;BR IF NO
1899 010306 013700 001320      MOV      CREAM,R0      ;GET ADDRESS POINTER
1900 010312 013702 001322      MOV      MILK,R2      ;GET PASS COUNT POINTER
1901 010316 012037 001404      MOV      (R0)+,DMCSR      ;LOAD SYSTEM CTRL. REG
1902 010322 011037 001374      MOV      (R0),DMRVEC      ;LOAD VECTOR
1903 010326 042737 177000 001374  BIC      #177000,DMRVEC      ;CLEAR UNWANTED BITS
1904 010334 012037 001366      MOV      (R0)+,STAT1      ;LOAD STAT1
1905 010340 012037 001370      MOV      (R0)+,STAT2      ;LOAD STAT2
1906 010344 012037 001372      MOV      (R0)+,STAT3      ;LOAD STAT3
1907 010350 012237 001230      MOV      (R2)+,PASCNT      ;LOAD PASS COUNT
1908 010354 012237 001232      MOV      (R2)+,ERRCNT      ;LOAD ERROR COUNT
1909 010360 012700 000002      MOV      #2,R0      ;SAVE CORE THIS WAY.
1910 010364 013737 001404 001406  MOV      DMCSR,DMCSRH
1911 010372 005237 001406      INC      DMCSRH
1912 010376 013737 001406 001410  MOV      DMCSRH,DMCTL
1913 010404 005237 001410      INC      DMCTL
1914 010410 013737 001410 001412  MOV      DMCTL,DMP04
1915 010416 060037 001412      ADD      R0,DMP04
1916 010422 013737 001412 001414  MOV      DMP04,DMP06
1917 010430 060037 001414      ADD      R0,DMP06
1918
1919 010434 013737 001374 001376  MOV      DMRVEC,DMRLVL      ;PTY LVL
1920 010442 060037 001376      ADD      R0,DMRLVL
1921 010446 013737 001376 001400  MOV      DMRLVL,DMTVEC      ;TX VEC
1922 010454 060037 001400      ADD      R0,DMTVEC
1923 010460 013737 001400 001402  MOV      DMTVEC,DMTLVL      ;TX LVL
1924 010466 060037 001402      ADD      R0,DMTLVL
1925
1926 010472 032737 000002 001236  BIT      #SW01,STRISW      ;IS TEST NO. SELECTED
1927 010500 001450              BEQ      7$      ;BR IF NO
1928 010502
1929 010502 005737 000042      4$: TST      @#42      ;RUNNING IN AUTO MODE?

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GENERAL UTILITIES (TYPEOUT, ERROR, SCOPE, ETC)

SEQ 0042

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1930 010506 001045      BNE      7$      ;BR IF YES
1931 010510 104402 005672 TYPE      ,MCKLF
1932 010514 104403      INSTR
1933 010516 006131      MTSTN
1934 010520 104405      PARAM
1935 010522 000001      1
1936 010524 001000      1000
1937 010526 001226      TSTNO
1938 010530      000      .BYTE 0
1939 010531      001      .BYTE 1
1940 010532 012700 012526 MOV      #TST1,R0
1941 010536 022710      5$: CMP      (PC)+,(R0)      ;CMP FIRST WORD TO 12737
1942 010540 012737      MOV      (PC)+,@(PC)+
1943 010542 001020      BNE      6$      ;BR IF NOT SAME
1944 010544 023760 001226 000002 CMP      TSTNO,2(R0)      ;DOES TSTNO MATCH?
1945 010552 001014      BNE      6$      ;BR IF NO
1946 010554 022760 001226 000004 CMP      #TSTNO,4(R0)      ;IS LAST WORD OK?
1947 010562 001010      BNE      6$      ;BR IF NO
1948 010564 010037 001214 MOV      R0,RETURN      ;IT IS A LEGAL TEST SO DO IT
1949 010570 104402 005756 TYPE      ,MR
1950 010574 042737 000002 001236 BIC      #SW01,STRTSW
1951 010602 000412      BR      8$
1952 010604 005720      6$: TST      (R0)+      ;POP R0
1953 010606 020027 031762 CMP      R0,#TLAST+10      ;AT END YET?
1954 010612 001351      BNE      5$      ;BR IF NO
1955 010614 104402 005666 TYPE      ,MQM      ;YES ILLEGAL TEST NO.
1956 010620 000730      BR      4$      ;TRY AGAIN
1957
1958 010622 012737 012526 001214 7$: MOV      #TST1,RETURN      ;PREPARE RETURN ADDRESS
1959 010630 013701 001404      8$: MOV      DMCSR,R1      ;R1 = BASE DMC11 ADDRESS
1960 010634 000177 *70354 JMP      @RETURN      ;GO START TESTING.
1961
1962
1963      ;ROUTINE USED TO "AUTO SIZE" THE DMC11
1964      ;CSR AND VECTOR.
1965      ;NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
1966      ;      ADDRESS RANGE (160000:164000)
1967      ;      AND THE VECTOR MAY BE ANY WHERE IN THE
1968      ;      FLOATING VECTOR RANGE (300:770)
1969      ;
1970
1971      AUTO.SIZE:
1972 010640 000005      RESET
1973 010642 012702 001500 CSRMAP: MOV      #DM.MAP,R2      ;INSURE A BUS INIT.
1974 010646 005022      1$: CLR      (R2)+      ;LOAD MAP POINTER.
1975 010650 022702 001700 CMP      #DM.END,R2      ;ZERO ENTIRE MAP
1976 010654 001374      BNE      1$      ;ALL DONE?
1977 010656 005037 001310 CLR      DMNUM      ;BR IF NO
1978 010662 012702 001500 MOV      #DM.MAP,R2      ;SET OCTAL NUMBER OF DMC11'S TO 0
1979 010666 005037 001306 CLR      DMACTV      ;R2 POINTS TO DMC MAP
1980 010672 032737 000001 001236 BIT      #SW00,STRTSW      ;CLEAR ACTIVE
1981 010700 001002      BNE      ,+6      ;QUESTIONS?
1982 010702 000137 011460 JMP      7$      ;BR IF YES
1983 010706 012737 000001 001256 MOV      #1,TEMP5      ;IF NO SKIP QUESTIONS
1984 010714 104403      INSTR
1985 010716 006451      NUM

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SEQ 0043

1986	010720	104405		PARAM		
1987	010722	000001		1		
1988	010724	000020		16.		
1989	010726	001252		TEMP3		
1990	010730	000		.BYTE	0	
1991	010731	001		.BYTE	1	
1992	010732	013737	001252 001310	MOV	TEMP3,DMNUM	;DMNUM = HOW MANY
1993	010740	104402	005672 12\$:	TYPE	.MCRLF	
1994	010744	104410		CONVRT		;TYPE WHICH DMC IS BEING DONE
1995	010746	012210		WHICH		;TEMP5 IS WHICH DMC
1996	010750	005237	001256	INC	TEMP5	
1997	010754	104403		INSTR		
1998	010756	006511		CSR		
1999	010760	104405		PARAM		
2000	010762	160000		160000		
2001	010764	164000		164000		
2002	010766	001254		TEMP4		
2003	010770	000		.BYTE	0	
2004	010771	001		.BYTE	1	
2005	010772	013722	001254	MOV	TEMP4,(R2)+	;STORE CSR IN MAP
2006	010776	104403		INSTR		
2007	011000	006527		VEC		
2008	011002	104405		PARAM		
2009	011004	000000		0		
2010	011006	000776		776		
2011	011010	001254		TEMP4		
2012	011012	000		.BYTE	0	
2013	011013	001		.BYTE	1	
2014	011014	013712	001254	MOV	TEMP4,(R2)	;STORE VECTOR IN MAP
2015	011020	104402		TYPE		
2016	011022	006550		PRI0		;ASK WHAT BR LEVEL
2017	011024	004737	012474	JSR	PC,INTTY	;GET RESPONSE
2018	011030	022703	000024	CMP	#24,R3	
2019	011034	101014		BHI	50\$	;BR IF LESS THAN 4
2020	011036	022703	000027	CMP	#27,R3	
2021	011042	103411		BLO	50\$	;BR IF GREATER THAN 7
2022	011044	012704	000011	MOV	#11,R4	;R4 = NUMBER OF SHIFTS
2023	011050	006303		ASL	R3	;SHIFT R3 LEFT
2024	011052	005304		DEC	R4	;DEC SHIFT COUNT
2025	011054	001375		BNE	.-4	;BR IF NOT DONE
2026	011056	042703	170777	BIC	#170777,R3	;BIC UNWANTED BITS
2027	011062	050312		BIS	R3,(R2)	;PUT BR LEVEL IN STATUS MAP
2028	011064	000403		BR	8\$	;CONTINUE
2029	011066	104402		TYPE		
2030	011070	005666		MQM		;RESPONSE IS OUT OF LIMITS
2031	011072	000752		BR	10\$	;TRY AGAIN
2032	011074	104402		TYPE		
2033	011076	006607		CRAM		;DOES DMC HAVE CRAM?
2034	011100	004737	012474	JSR	PC,INTTY	;GET REPLY
2035	011104	022703	000131	CMP	#131,R3	
2036	011110	001427		BEQ	9\$	;YES
2037	011112	022703	000116	CMP	#116,R3	;NO
2038	011116	001403		BEQ	40\$	;NOT A Y OR N
2039	011120	104402		TYPE		
2040	011122	005666		MQM		;TYPE ""
2041	011124	000763		BR	8\$	;ASK AGAIN

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SEQ 0044

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2042 011126 104402          40$: TYPE
2043 011130 007341          SPEED
2044 011132 004737 012474   JSR    PC,INTTY      ;DMC11-AR OR DMC11-AL?
2045 011136 022703 000122   CMP    #122,R3      ;GET RESPONSE
2046 011142 001414          BEQ    16$          ;IS IT R
2047 011144 022703 000114   CMP    #114,R3      ;BR IF REMOTE
2048 011150 001403          BEQ    41$          ;IS IT L
2049 011152 104402          TYPE
2050 011154 005666          MQM
2051 011156 000763          BR     40$          ;TRY AGAIN
2052 011160 052762 000002 000004 41$: BIS    #BIT1,4(R2)    ;SET BIT1 IN STAT3
2053 011166 000402          BR     16$          ;CONTINUE
2054 011170 052712 100000   9$:  BIS    #BIT15,(R2)    ;SET BIT 15 IF CRAM
2055 011174          16$:
2056
2057 011174 104402          TYPE
2058 011176 006705          MODU
2059 011200 004737 012474   JSR    PC,INTTY      ;ASK WHICH LINE UNIT
2060 011204 022703 000021   CMP    #21,R3      ;GET REPLY
2061 011210 001417          BEQ    30$          ;'1'
2062 011212 022703 000022   CMP    #22,R3      ;'2'
2063 011216 001412          BEQ    31$          ;'N'
2064 011220 022703 000116   CMP    #116,R3
2065 011224 001403          BEQ    32$
2066 011226 104402          TYPE
2067 011230 005666          MQM
2068 011232 000760          BR     16$          ;IF NOT A 1,2 OR N TYPE '?'
2069 011234 052722 010000   32$: BIS    #BIT12,(R2)+    ;TRY AGAIN
2070 011240 022222          CMP    (R2)+,(R2)+    ;SET BIT 12 IN STAT2 IF NO LU
2071 011242 000477          BR     33$          ;POP OVER STAT2 AND STAT3
2072 011244 052712 020000   31$: BIS    #BIT13,(R2)    ;SET BIT 13 IN STAT2 IF M8202
2073 011250 104402          30$: TYPE
2074 011252 007115          CONN
2075 011254 004737 012474   JSR    PC,INTTY      ;ASK IF LOOP-BACK IS ON
2076 011260 022703 000131   CMP    #131,R3      ;GET REPLY
2077 011264 001406          BEQ    17$          ;Y
2078 011266 022703 000116   CMP    #116,R3      ;N
2079 011272 001436          BEQ    18$
2080 011274 104402          TYPE
2081 011276 005666          MQM
2082 011300 000763          BR     30$          ;IF NOT Y OR N TYPE '?'
2083 011302 052722 040000 17$: BIS    #BIT14,(R2)+    ;TRY AGAIN
2084 011306 032762 020000 177776 BIT    #BIT13,-2(R2)    ;TURNAROUND IS CONNECTED
2085 011314 001027          BNE    19$          ;M8202?
2086 011316          440$:
2087
2088 011316 104402          TYPE
2089 011320 007455          MV35
2090 011322 004737 012474   JSR    PC,INTTY      ;ASK QUESTION
2091 011326 122703 000104   CMPB   #'D,R3      ;ABOUT MODEM TTYPE
2092 011332 001004          BNE    442$          ;GET ANSWER.
2093
2094 011334 042762 000004 000002 BIC    #BIT2,2(R2)    ;IS IT DMC11-DA?
2095 011342 000411          BR     441$          ;NO.
2096
2097 011344 122703 000106   442$: CMPB   #'F,R3      ;YES INDICATE IT IN STAT3

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SEQ 0045

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2098 011350 001403      BEQ      443$      ; YES-TAKE CARE OF IT.
2099
2100 011352 104402      TYPE      ; NO ASK OPERATER WHATS GOING ON.
2101 011354 005666      MQM
2102 011356 000757      BR      440$      ; REASK QUESTION
2103
2104 011360 052762 000004 000002 443$: BIS      #BIT2,2(R2)      ; YES V.35, RECORD IN STAT3
2105
2106 011366      441$:      ; END DECISION POINT.
2107 011366 000402      BR      19$
2108 011370 042722 040000 18$: BIC      #BIT14,(R2)+      ;NO TURNAROUND
2109 011374      19$:
2110 011374 104403      INSTR
2111 011376 007017      LINE
2112 011400 104405      PARAM
2113 011402 000000      0
2114 011404 000377      377
2115 011406 001254      TEMP4
2116 011410      000      .BYTE      0
2117 011411      001      .BYTE      1
2118 011412 113722 001254      MOVB      TEMP4,(R2)+      ;STORE SWITCH PAC IN MAP
2119 011416 104403      INSTR
2120 011420 007055      BM
2121 011422 104405      PARAM
2122 011424 000000      0
2123 011426 000377      377
2124 011430 001254      TEMP4
2125 011432      000      .BYTE      0
2126 011433      001      .BYTE      1
2127 011434 113722 001254      MOVB      TEMP4,(R2)+      ;STORE SWITCH PAC IN MAP
2128 011440 005722      TST      (R2)+      ;POP OVER STAT3
2129 011442 005337 001252 33$: DEC      TEMP3      ;DEC DMC COUNT
2130 011446 001402      BEQ      34$      ;BR IF DONE
2131 011450 000137 010740      JMP      12$      ;JUMP IF NOT
2132 011454 000137 012110 34$: JMP      13$      ;CONTINUE
2133 011460 012701 160000 7$: MOV      #160000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
2134 011464 012737 012202 000004      MOV      #6$,R4      ;SET FOR NON-EXISTANT DEVICE TIME OUT
2135 011472 005011      2$: CLR      (R1)      ;CLEAR SEL0
2136 011474 005711      TST      (R1)      ;IF DMC11 DMC SR S/B 0
2137 011476 001172      BNE      3$      ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DMC11
2138 011500 005061 000006      CLR      5(R1)      ;CLEAR SEL6
2139 011504 005761 000006      TST      6(R1)      ;IF DMC11 THEN DMRIC S/B =0.
2140 011510 001165      BNE      3$      ;BR IF NOT DMC11
2141 011512 012711 002000      MOV      #BIT10,(R1)      ;SET ROM0
2142 011516 005061 000004      CLR      4(R1)      ;CLEAR SEL4
2143 011522 012761 125252 000006      MOV      #125252,6(R1)      ;WRITE THIS TO SEL6
2144 011530 052711 020000      BIS      #BIT13,(R1)      ;WRITE IT!
2145 011534 022761 125252 000004      CMP      #125252,4(R1)      ;WAS IT WRITTEN?
2146 011542 001004      BNE      21$      ;IF NO IT IS NOT CRAM
2147 011544 052762 100000 000002      BIS      #BIT15,2(R2)      ;SET BIT15 IF CRAM
2148 011552 000431      BR      22$
2149 011554 012711 001000 21$: MOV      #BIT9,(R1)      ;SET ROM1
2150 011560 012761 100430 000006      MOV      #100430,6(R1)      ;PUT INSTRUCTION IN SEL6
2151 011566 012711 001400      MOV      #BIT9:BIT8,(R1)      ;CLOCK INSTRUCTION (MICRO PROC PC TO 0)
2152 011572 012711 002000      MOV      #BIT10,(R1)      ;SET ROM0
2153 011576 022761 016472 000006      CMP      #016472,6(R1)      ;IS IT LOCAL CROM?

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SEQ 0046

2154	011604	001411			BEQ	23\$	:BR IF YES
2155	011606	022761	016461	000006	CMP	#016461,6(R1)	:IS IT REMOTE CROM?
2156	011614	001410			BEQ	22\$	:BR IF YES
2157	011616	022761	177777	000006	CMP	#-1,6(R1)	:NO CROM?
2158	011624	001404			BEQ	22\$	:BR IF YES
2159	011626	000516			BR	3\$	:NOT A DMC
2160	011630	052762	000002	000006	23\$: BIS	#BIT1,6(R2)	:SET BIT 1 IN STAT3
2161					:AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DMC11 CSR ADDRESS.		
2162	011636	010122			22\$: MOV	R1,(R2)+	:STORE CSR IN CORE TABLE.
2163	011640	012711	001000		15\$: MOV	#BIT9,(R1)	:CLEAR LINE UNIT LOOP
2164	011644	005061	000004		CLR	4(R1)	:CLEAR PORT4
2165	011650	012761	122113	000006	MOV	#122113,6(R1)	:LOAD INSTRUCTION (CLR DTR)
2166	011656	052711	000400		BIS	#BIT8,(R1)	:CLOCK INSTRUCTION
2167	011662	012761	021264	000006	MOV	#021264,6(R1)	:LOAD INSTRUCTION
2168	011670	052711	000400		BIS	#BIT8,(R1)	:CLOCK INSTRUCTION
2169	011674	122761	000377	000004	CMPB	#377,4(R1)	:IS IT ALL ONES?
2170	011702	001003			BNE	.+10	:BR IF NO
2171	011704	052712	010000		BIS	#BIT12,(R2)	:IF YES, NO LINE UNIT, SET STATUS BIT
2172	011710	000436			BR	20\$	
2173	011712	032761	000002	000004	BIT	#BIT1,4(R1)	:IS SWITCH A ONE?
2174	011720	001403			BEQ	.+10	:BR IF M8201
2175	011722	052712	060000		BIS	#BIT13!BIT14,(R2)	:M8202 ASSUME CONNECTOR
2176	011726	000427			BR	20\$	:CONNECTOR ON)
2177	011730	032761	000010	000004	BIT	#BIT3,4(R1)	:IS MRDY SET
2178	011736	001023			BNE	20\$	:BR IF M8201 NO CONNECTOR (ON LINE)
2179	011740	012761	000100	000004	MOV	#BIT6,4(R1)	:LOAD PORT4
2180	011746	012761	122113	000006	MOV	#122113,6(R1)	:LOAD INSTRUCTION
2181	011754	052711	000400		BIS	#BIT8,(R1)	:CLOCK INSTRUCTION(SET DTR)
2182	011760	012761	021264	000006	MOV	#021264,6(R1)	:LOAD INSTRUCTION
2183	011766	052711	000400		BIS	#BIT8,(R1)	:CLOCK INSTRUCTION(READ MODEM REG)
2184	011772	032761	000010	000004	BIT	#BIT3,4(R1)	:IS MRDY SET NOW?
2185	012000	001402			BEQ	20\$	:BR IF NO CONNECTOR
2186	012002	052712	040000		BIS	#BIT14,(R2)	:SET STATUS BIT FOR CONNECTOR
2187	012006	005722			20\$: TST	(R2)+	:POP POINTER
2188	012010	012761	021324	000006	MOV	#021324,6(R1)	:PUT INSTRUCTION IN PORT6
2189	012016	012711	001400		MOV	#BIT9!BIT8,(R1)	:PORT4_LU 15
2190	012022	156122	000004		BISB	4(R1),(R2)+	:STORE-DDCMP LINE # IN TABLE
2191	012026	012761	021344	000006	MOV	#021344,6(R1)	:PORT6-INSTRUCTION
2192	012034	012711	001400		MOV	#BIT8!BIT9,(R1)	:CLOCK-INSTR.
2193	012040	156122	000004		BISB	4(R1),(R2)+	:STORE BM873 ADD IN TABLE
2194	012044	075722			TST	(R2)+	:POP OVER STAT3
2195	012046	005011			CLR	(R1)	:CLEAR ROM1
2196	012050	005237	001310		INC	DMNUM	:UPDATE DEVICE COUNTER
2197	012054	022737	000020	001310	CMP	#20,DMNUM	:ARE MAX. NO. OF DEV FOUND?
2198	012062	001412			BEQ	13\$	:YES DON'T LOOK FOR ANY MORE.
2199	012064	005011			3\$: CLR	(R1)	:CLEAR BIT 10
2200	012066	005061	000006		CLR	6(R1)	:CLEAR SEL 6
2201	012072	062701	000010		14\$: ADD	#10,R1	:UPDATE CSR POINTER ADDRESS
2202	012076	022701	164000		CMP	#164000,R1	
2203	012102	001402			BEQ	13\$	:BR IF DONE
2204	012104	000137	011472		JMP	2\$	:JUMP IF NOT
2205	012110	005037	001306		13\$: CLR	DMACTV	
2206	012114	005737	001310		DMNUM		:WERE ANY DMC11'S FOUND AT ALL?
2207	012120	001423			BEQ	5\$	:ERROR AUTO SIZER FOUND NO DMC11'S IN THIS SYS.
2208	012122	013701	001310		MOV	DMNUM,R1	
2209	012126	010137	001314		MOV	R1,SAVNUM	:SAVE NUMBER OF DEVICES

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2210 012132 000241          4$: CLC
2211 012134 006137 001306    ROL    DMACTV      ;GENERATE ACTIVE REGISTER OF DEVICES.
2212 012140 005237 001306    INC    DMACTV      ;SET THE BIT
2213 012144 005301          DEC    R1
2214 012146 001371          BNE    4$           ;BR IF MORE TO GENERATE
2215 012150 012737 000006 000004 MOV    #6,2#4      ;RESTORE TRAP VECTOR
2216 012156 013737 001306 001312 MOV    DMACTV,SAVACT ;SAVE ACTIVE REGISTER
2217 012164 000137 012216    JMP    VECMAP      ;GO FIND THE VECTOR NOW.
2218 012170 104402 005761    5$: TYPE    ,MERR2    ;NOTIFY OPR THAT NO DMC11'S FOUND.
2219 012174 005000          CLR    R0           ;MAKE DATA LIGHTS ZERO
2220 012176 000000          HALT
2221 012200 000776          BR    -2           ;STOP THE SHOW
2222 012202 012716 012072    6$: MOV    #14$, (SP) ;DISABLE CONT. SW.
2223 012206 000002          RTI                ;ENTERED BY NON-EXISTANT TIME-OUT.
2224                                     ;RETURN TO MAINSTREAM
2225 012210 000001          WHICH: 1
2226 012212      002      002      .BYTE 2,2
2227 012214 001256          TEMPS
2228
2229 012216 032737 000001 001236 VECMAP: BIT    #SW00,STRISW
2230 012224 001114          BNE    5$
2231 012226 012737 000340 000022 MOV    #340,2#22    ;SET IOT TRAP PRIO TO 7
2232 012234 012737 012410 000020 MOV    #4$,2#20      ;SET IOT TRAP VECTOR
2233 012242 012702 001500    MOV    #DM.MAP,R2    ;SET SOFTWARE POINTER
2234 012246 012700 000300    MOV    #300,R0       ;FLOATING VECTORS START HERE.
2235 012252 012701 000302    MOV    #302,R1       ;PC OF IOT INSTR.
2236 012256 010120    1$: MOV    R1,(R0)+        ;START FILLING VECTOR AREA
2237 012260 012721 000004    MOV    #4,(R1)+      ;WITH .+2; IOT
2238 012264 022021    CMP    (R0)+,(R1)+          ;ADD 2 TO R0 +R1
2239 012266 020127 001000    CMP    R1,#1000
2240 012272 101771          BLOS    1$           ;BR IF MORE TO FILL
2241 012274 013737 001306 001246 MOV    DMACTV,TEMP1    ;STORE TEMPORALLY
2242 012302 006037 001246    2$: ROR    TEMP1      ;BRING OUT A BIT
2243 012306 103063          BCC    5$           ;BR IF ALL DONE
2244 012310 012704 000012    MOV    #12,R4        ;R4 IS INDEX REGISTER
2245 012314 016437 012460 177776 MOV    BRLVL(R4),PS    ;SET PS TO 7
2246 012322 011201    MOV    (R2),R1
2247 012324 012761 000200 000004 MOV    #200,4(R1)
2248 012332 012711 001000    MOV    #BIT9,(R1)    ;SET ROMI
2249 012336 012761 121111 000006 MOV    #121111,6(R1) ;PUT INSTRUCTION IN PORT6
2250 012344 012711 001400    MOV    #BIT9!BIT8,(R1) ;FORCE AN INTERRUPT
2251 012350 105200    7$: INCB    R0           ;STALL
2252 012352 001376          BNE    -2           ;FOR TIME TO INTERRUPT
2253 012354 162704 000002    SUB    #2,R4        ;GET NEXT LOWEST PS LEVEL
2254 012360 001404          BEQ    6$           ;BR IF R4 = 0
2255 012362 016437 012460 177776 MOV    BRLVL(R4),PS    ;MOVE NEXT LOWER LEVEL IN PS
2256 012370 000767          BR    7$           ;BR TO DELAY
2257 012372 052762 005300 000002 6$: BIS    #5300,2(R2) ;NO INTERRUPT ASSUME 300 AT LEVEL 5 AND FIX DMC11 LATER
2258 012400 005011    3$: CLR    (R1)          ;CLEAR ROMI
2259 012402 062702 000010    ADD    #10,R2       ;POP SOFTWARE POINTER
2260 012406 000735          BR    2$           ;KEEP GOING
2261 012410 051662 000002    4$: BIS    (SP),2(R2)    ;GET VECTOR ADDRESS
2262 012414 042762 000007 000002 BIC    #7,2(R2)    ;CLEAR JUNK
2263 012422 016405 012462    MOV    BRLVL+2(R4),R5 ;GET BR LEVEL OF DMC11
2264 012426 006305          ASL    R5           ;SHIFT LEVEL 4 PLACES
2265 012430 006305          ASL    R5           ;TO THE LEFT FOR THE

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SEQ 0048

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2266 012432 006305      ASL      R5          ;STATUS TABLE
2267 012434 006305      ASL      R5
2268 012436 042705 170777 BIC      #170777,R5      ;CLEAR UNWANTED BITS
2269 012442 050562 000002 BIS      R5,2(R2)      ;PUT BR LEVEL IN STATUS TABLE
2270 012446 022626      (MP      (SP)+,(SP)+    ;POP JOT JUNK OFF STACK
2271 012450 012716 012400 MOV      #3$, (SP)      ;SET FOR RETURN
2272 012454 000002      RTI
2273 012456 000207      RTS      PC          ;ALL DONE WITH 'AUTO SIZING'
2274
2275 012460 000000      BPLVL: 0          ;LEVEL 0
2276 012462 000000      0          ;LEVEL 0
2277 012464 000200      200          ;LEVEL 4
2278 012466 000240      240          ;LEVEL 5
2279 012470 000300      300          ;LEVEL 6
2280 012472 000340      340          ;LEVEL 7
2281
2282
2283 012474 105777 166504 INTTY: TSTB    @TKCSR      ;WAIT FOR DONE
2284 012500 100375      BPL      .-4
2285 012502 217703 166500 MOV      @TKDBR,R3      ;PUT CHAR IN R3
2286 012506 105777 166476 TSTB    @TPCSR      ;WAIT UNTIL PRINTER IS READY
2287 012512 100375      BPL      .-4
2288 012514 010377 166472 MOV      R3,@TPDBR      ;ECHO CHAR
2289 012520 042703 000240 BIC      #BIT7!BIT5,R3 ;MASK OFF LOWER CASE
2290 012524 000207      RTS      PC          ;RETURN
2291
2292
2293
2294
2295
2296
2297
2298
2299
2300
2301
2302
2303 012526 012737 000001 001226 TST1: MOV      #1,TSTNO
2304 012534 012737 012602 001216 MOV      #TST2,NEXT
2305
2306 012542 005077 166636 CLR      @DMCSR      ;R1 CONTAINS BASE DMC11 ADDRESS
2307 012546 012702 000011 MOV      #11,R2      ;CLEAR SEL0
2308 012552 104414 ROMCLK      ;SAVE R2 FOR TYPEOUT
2309 012554 021224 021004!<20*11> ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
2310 012556 016104 000004 MOV      4(R1),R4      ;PORT4 LINE UNIT REG 11
2311 012562 042704 000054 BIC      #54,R4      ;PUT 'FOUND' IN R4
2312 012566 012705 000020 MOV      #20,R5      ;CLEAR UNKNOWN BITS
2313 012572 120504 CMPB     R5,R4      ;PUT 'EXPECTED' IN R5
2314 012574 001401 BEQ      1$          ;IS OUT READY SET?
2315 012576 104002 HLT      2          ;BR IF YES
2316 012600 104400      1$: SCOPE      ;ERROR IN LU 11
2317
2318
2319
2320
2321

```

***** 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

***** TEST 2 *****

*IN CONTROL REGISTER READ/ONLY TEST

*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY

```

2322 ;*BITS ARE IN THE CORRECT STATE
2323 ;*****
2324
2325 ; TEST 2
2326 ;-----
2327 012602 012737 000002 001226 TST2: MOV #2,TSTNO
2328 012610 012737 012650 001216 MOV #TST3,NEXT
2329 ;R1 CONTAINS BASE DMC11 ADDRESS
2330 012616 012702 000012 MOV #12,R2 ;SAVE R2 FOR TYPEOUT
2331 012622 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2332 012624 021244 021004.<20*12> ;PORT4 LINE UNIT REG 12
2333 012626 016104 000004 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
2334 012632 042704 000017 BIC #17,R4 ;CLEAR UNKNOWN BITS
2335 012636 005005 CLR R5 ;PUT 'EXPECTED' IN R5
2336 012640 120504 CMPB R5,R4 ;ARE ALL BITS CLEARED?
2337 012642 001401 BEQ 1$ ;BR IF YES
2338 012644 104002 HLT 2 ;ERROR IN LU 12
2339 012646 104400 1$: SCOPE ;SCOPE THIS TEST
2340
2341 ;***** TEST 3 *****
2342 ;*MODEM CONTROL REGISTER READ/ONLY TEST
2343 ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
2344 ;*BITS ARE IN THE CORRECT STATE
2345 ;*****
2346
2347 ; TEST 3
2348 ;-----
2349 012650 012737 000003 001226 TST3: MOV #3,TSTNO
2350 012656 012737 012722 001216 MOV #TST4,NEXT
2351 ;R1 CONTAINS BASE DMC11 ADDRESS
2352 012664 104412 MSTCLR ;MASTER CLEAR DMC11
2353 012666 012702 000013 MOV #13,R2 ;SAVE R2 FOR TYPEOUT
2354 012672 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2355 012674 021264 021004!<20*13> ;PORT4 LINE UNIT REG 13
2356 012676 016104 000004 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
2357 012702 042704 000213 BIC #213,R4 ;CLEAR UNKNOWN BITS
2358 012706 012705 000100 MOV #100,R5 ;PUT 'EXPECTED' IN R5
2359 012712 120504 CMPB R5,R4 ;ARE RING, DTR, AND MODEM READY SET?
2360 012714 001401 BEQ 1$ ;BR IF YES
2361 012716 104002 HLT 2 ;ERROR IN LU 13
2362 012720 104400 1$: SCOPE ;SCOPE THIS TEST
2363
2364 ;***** TEST 4 *****
2365 ;*MAINTENANCE REGISTER READ/ONLY TEST
2366 ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
2367 ;*BITS ARE IN THE CORRECT STATE
2368 ;*****
2369
2370 ; TEST 4
2371 ;-----
2372 012722 012737 000004 001226 TST4: MOV #4,TSTNO
2373 012730 012737 013024 001216 MOV #TST5,NEXT
2374 ;R1 CONTAINS BASE DMC11 ADDRESS
2375 012736 104412 MSTCLR ;MASTER CLEAR DMC11
2376
2377

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2378 012740 012702 000017      MOV    #17,R2      ;SAVE R2 FOR TYPEOUT
2379 012744 104414      ROMCLK    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2380 012746 021364      021004!<20*17> ;PORT4 LINE UNIT REG 17
2381 012750 016104 000004      MOV    4(R1),R4    ;PUT 'FOUND' IN R4
2382 012754 042704 000206      BIC    #206,R4    ;CLEAR UNKNOWN BITS
2383 012760 012705 000051      MOV    #51,R5    ;PUT 'EXPECTED' IN R5
2384 012764 032737 020000 001366 BIT    #BIT13,STAT1 ;IS LU AN M8202 OR M8201?
2385 012772 001004      BNE     2$      ;BR IF M8202
2386 012774 032737 040000 001366 BIT    #BIT14,STAT1 ;CONNECTOR???
2387 013002 001004      BNE     3$      ;BR IF M8201 WITH CONNECTOR
2388 013004 042704 000040      BIC    #40,R4    ;MASK OFF SI BIT IF M8202 OR M8201, NO CONNECTOR
2389 013010 042705 000040      BIC    #BIT5,R5    ;SI BIT IS UNKNOWN
2390 013014      3$:
2391 013014 120504      CMPB    R5,R4    ;ARE SI AND ICIR SET?
2392 013016 001401      BEQ     1$      ;BR IF YES
2393 013020 104002      HLT     2      ;ERROR IN LU 17
2394 013022 104400      1$:      SCOPE    ;SCOPE THIS TEST
2395
2396
2397
2398
2399
2400
2401
2402
2403
2404
2405 013024 012737 000005 001226 TST5:  MOV    #5,TSTNO
2406 013032 012737 013164 001216      MOV    #TST6,NEXT
2407 013040 012737 013054 001220      MOV    #1$,LOCK
2408
2409 013046 104412      MSTCLR
2410 013050 012702 000012      MOV    #12,R2    ;R1 CONTAINS BASE DMC11 ADDRESS
2411 013054 012761 000040 000004 1$:  MOV    #40,4(R1) ;MASTER CLEAR DMC11
2412 013062 104414      ROMCLK    ;SAVE REGISTER ADDRESS FOR TYPEOUT
2413 013064 122112      122112    ;LOAD PORT4
2414 013066 104414      ROMCLK    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2415 013070 021245      021245    ;SET BITS IN LU-12
2416 013072 012705 000040      MOV    #40,R5    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2417 013076 116104 000005      MOVB   5(R1),R4  ;READ LU-12
2418 013102 042704 000337      BIC    #337,R4  ;PUT 'EXPECTED' IN R5
2419 013106 120504      CMPB    R5,R4  ;PUT 'FOUND' IN R4
2420 013110 001401      BEQ     2$      ;CLEAR UNWANTED BITS
2421 013112 104003      HLT     3      ;IS BITS SET?
2422 013114 104401      2$:      SCOP1    ;BR IF YES
2423 013116 012737 013124 001220      MOV    #3$,LOCK ;ERROR, BIT 5 IS NOT SET
2424 013124 005061 000004      CLR     4(R1)  ;SCOPE SUBTEST (SW09-1)
2425 013130 104414      ROMCLK    ;NEW SCOP1
2426 013132 122112      122112    ;LOAD PORT4
2427 013134 104414      ROMCLK    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2428 013136 021245      021245    ;CLEAR BIT 5 IN LU-12
2429 013140 005005      CLR     R5    ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
2430 013142 116104 000005      MOVB   5(R1),R4  ;READ LU-12
2431 013146 042704 000337      BIC    #337,R4  ;PUT 'EXPECTED' IN R5
2432 013152 120504      CMPB    R5,R4  ;PUT 'FOUND' IN R4
2433 013154 001401      BEQ     4$      ;CLEAR UNWANTED BITS

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M 4

SEQ 0051

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2434 013156 104003          HLT      3          ;ERROR, BIT5 IS NOT CLEAR
2435 013160 104401          4$: SCOPE1        ;SCOPE SUBTEST (SW09=1)
2436 013162 104400          SCOPE          ;SCOPE THIS TEST
2437
2438
2439          ;***** TEST 6 *****
2440          ;*LINE UNIT REGISTER WRITE/READ TEST
2441          ;*SET BIT1 IN LU REGISTER 17, VERIFY IT IS SET
2442          ;*CLEAR BIT1 IN LU REGISTER 17, VERIFY IT IS CLEAR
2443          ;*****
2444
2445          ; TEST 6
2446          ;-----
2447 013164 012737 000006 001226 TST6: MOV      #6,TSTNO
2448 013172 012737 013324 001216      MOV      #TST7,NEXT
2449 013200 012737 013214 001220      MOV      #1$,LOCK
2450
2451 013206 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
2452 013210 012702 000017          MOV      #17,R2      ;MASTER CLEAR DMC11
2453 013214 012761 000001 000004 1$: MOV      #1,4(R1)    ;SAVE REGISTER ADDRESS FOR TYPEOUT
2454 013222 104414          ROMCLK          ;LOAD PORT4
2455 013224 122117          122117          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2456 013226 104414          ROMCLK          ;SET BIT1 IN LU-17
2457 013230 021365          021365          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2458 013232 012705 000001          MOV      #1,R5      ;READ LU-17
2459 013236 116104 000005          MOV      5(R1),R4    ;PUT 'EXPECTED' IN R5
2460 013242 042704 000376          BIC      #376,R4     ;PUT 'FOUND' IN R4
2461 013246 120504          CMPB      R5,R4      ;CLEAR UNWANTED BITS
2462 013250 001401          BEQ      2$          ;IS BIT1 SET?
2463 013252 104003          HLT      3          ;BR IF YES
2464 013254 104401          2$: SCOPE1        ;ERROR, BIT 1 IS NOT SET
2465 013256 012737 013264 001220      MOV      #3$,LOCK  ;SCOPE SUBTEST (SW09=1)
2466 013264 005061 000004 3$: CLR      4(R1)      ;NEW SCOPE
2467 013270 104414          ROMCLK          ;LOAD PORT4
2468 013272 122117          122117          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2469 013274 104414          ROMCLK          ;CLEAR BIT 1 IN LU-17
2470 013276 021365          021365          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2471 013300 005005          CLR      R5          ;READ LU-17
2472 013302 116104 000005          MOV      5(R1),R4    ;PUT 'EXPECTED' IN R5
2473 013306 042704 000376          BIC      #376,R4     ;PUT 'FOUND' IN R4
2474 013312 120504          CMPB      R5,R4      ;CLEAR UNWANTED BITS
2475 013314 001401          BEQ      4$          ;IS BIT1 CLEAR?
2476 013316 104003          HLT      3          ;BR IF YES
2477 013320 104401          4$: SCOPE1        ;ERROR, BIT1 IS NOT CLEAR
2478 013322 104400          SCOPE          ;SCOPE SUBTEST (SW09=1)
2479
2480
2481          ;***** TEST 7 *****
2482          ;*LINE UNIT REGISTER WRITE/READ TEST
2483          ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 13
2484          ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 13
2485          ;*****
2486
2487          ; TEST 7
2488          ;-----
2489 013324 012737 000007 001226 TST7: MOV      #7,TSTNO

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N 4

SEQ 0052

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

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

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;R1 CONTAINS BASE DMC11 ADDRESS

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2602 013724 104412
2603 013726 104414
2604 013730 021324
2605 013732 016104 000004
2606 013736 113705 001370
2607 013742 120504
2608 013744 001401
2609 013746 104031
2610 013750 104400
2611
2612
2613
2614
2615
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2620
2621 013752 012737 000012 001226 TST12:
2622 013760 012737 014014 001216
2623
2624 013766 104412
2625 013770 104414
2626 013772 021344
2627 013774 016104 000004
2628 014000 113705 001371
2629 014004 120504
2630 014006 001401
2631 014010 104031
2632 014012 104400
2633
2634
2635
2636
2637
2638
2639
2640
2641
2642
2643 014014 012737 000013 001226 TST13:
2644 014022 012737 014114 001216
2645
2646 014030 104412
2647 014032 005037 001416
2648 014036
2649 014036 104414
2650 014040 021364
2651 014042 032761 000002 000004
2652 014050 001004
2653 014052 005237 001416
2654 014056 001367
2655 014060 104004
2656 014062 005037 001416
2657 014066

MSTCLR
ROMCLK
021324
MOV 4(R1),R4
MOVB STAT2,R5
CMPB R5,R4
BEQ 1$
HLT 31
1$: SCOPE

;MASTER CLEAR DMC11
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;PORT4 LU15
;PUT 'FOUND' IN R4
;PUT 'EXPECTED' IN R5
;SW OK?
;BR IF YES
;ERROR, SWITCH PAC READ ERROR
;SCOPE THIS TEST

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

; TEST 12
;-----
MOV #12,TSTNO
MOV #TST13,NEXT
MSTCLR
ROMCLK
021344
MOV 4(R1),R4
MOVB STAT2+1,R5
CMPB R5,R4
BEQ 1$
HLT 31
1$: SCOPE

;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;PORT4 LU16
;PUT 'FOUND' IN R4
;PUT 'EXPECTED' IN R5
;SW OK?
;BR IF YES
;ERROR, SWITCH PAC READ ERROR
;SCOPE THIS TEST

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

; TEST 13
;-----
MOV #13,TSTNO
MOV #TST14,NEXT
MSTCLR
ROMCLK
CLR TEMP
1$:
ROMCLK
021364
BIT #2,4(R1)
BNE 2$
INC TEMP
BNE 1$
HLT 4
2$: CLR TEMP
3$:

;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11
;PREPARE FOR DELAY
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;PORT4 LU-17
;IS CLOCK BIT SET?
;BR IF YES
;DELAY
;DELAY FINISHED?
;ERROR BIT IS STUCK CLEAR
;PREPARE FOR DELAY

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2658 014066 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2659 014070 021364 ;PORT4 LU-17
2660 014072 032761 000002 000004 BIT #2,4(R1) ;IS CLOCK BIT CLEAR?
2661 014100 001404 BEQ 4$ ;BR IF YES
2662 014102 005237 001416 INC TEMP ;DELAY
2663 014106 001367 BNE 3$ ;BR IF DELAY NOT DONE
2664 014110 104004 HLT 4 ;ERROR BIT IS STUCK SET
2665 014112 104400 4$: SCOPE
2666
2667
2668 ;***** TEST 14 *****
2669 ;*OUT DATA SILO TEST
2670 ;*SET SOM AND LOAD OUT DATA SILO
2671 ;*VERIFY THAT OCOR SET, INDICATING THAT THE
2672 ;*CHARACTER IS AT THE BOTTOM OF THE OUT SILO
2673 ;*****
2674
2675 ; TEST 14
2676 ;-----
2677 014114 012737 000014 001226 TST14: MOV #14,TSTNO
2678 014122 012737 014230 001216 MOV #TST15,NEXT
2679
2680 014130 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
2681 014132 005061 000004 CLR 4(R1) ;MASTER CLEAR DMC11
2682 014136 104414 ROMCLK ;CLEAR PORT4
2683 014140 122117 122117 ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
2684 014142 004737 033676 JSR PC,CLRIO ;PUT LINE UNIT IN BITSTUFF MODE
2685 014146 012711 004000 MOV #BIT11,(R1) ;DO THIS AFTER MODE IS SET
2686 014152 012761 000001 000004 MOV #1,4(R1) ;SET LINE UNIT LOOP
2687 014160 104414 ROMCLK ;LOAD PORT4 WITH BIT0
2688 014162 122111 122111 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2689 014164 104414 ROMCLK ;SET SOM
2690 014166 122110 122110 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2691 014170 104416 000002 ;LOAD OUT DATA SILO
2692 014174 012702 000017 TIMER, 2 ;WAIT FOR OCOR
2693 014200 104414 MOV #17,R2 ;SAVE ADDRESS FOR TYPEOUT
2694 014202 021364 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2695 014204 016104 000004 MOV 4(R1),R4 ;PORT4 LU 17
2696 014210 042704 000357 BIC #357,R4 ;PUT 'FOUND' IN R4
2697 014214 012705 000020 MOV #20,R5 ;CLEAR UNWANTED BITS
2698 014220 120504 CMPB R5,R4 ;PUT 'EXPECTED' IN R5
2699 014222 001401 BEQ 1$ ;IS OCOR SET?
2700 014224 104005 HLT 5 ;BR IF YES
2701 014226 1$:
2702 014226 104400 SCOPE ;SCOPE THIS TEST
2703
2704
2705 ;***** TEST 15 *****
2706 ;*BITSTUFF TEST OF RTS AND OUT ACTIVE
2707 ;*SET SOM AND LOAD OUT DATA SILO
2708 ;*SINGLE STEP 2 DATA CLOCKS, VERIFY
2709 ;*THAT RTS AND ACTIVE ARE SET
2710 ;*****
2711
2712 ; TEST 15
2713 ;-----

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2714 014230 012737 000015 001226 TST15: MOV #15,TSTNO
2715 014236 012737 014402 001216 MOV #TST16,NEXT
2716                                     ;R1 CONTAINS BASE DMC11 ADDRESS
2717 014244 104412 MSTCLR ;MASTER CLEAR DMC11
2718 014246 005061 000004 CLR 4(R1) ;CLEAR PORT4
2719 014252 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2720 014254 122117 122117 ;PUT LINE UNIT IN BITSTUFF MODE
2721 014256 004737 033676 JSR PC,CLR10 ;DO THIS AFTER MODE IS SET
2722 014262 012711 004000 MOV #BIT11,(R1) ;SET LINE UNIT LOOP
2723 014266 012761 000001 000004 MOV #1,4(R1) ;LOAD PORT4 WITH BIT0
2724 014274 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2725 014276 122111 122111 ;SET SOM
2726 014300 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2727 014302 122110 122110 ;LOAD OUT DATA SILO
2728 014304 004737 032346 JSR PC,OCOR ;WAIT FOR OCOR
2729 014310 104415 000002 DATACLK, 2 ;CLOCK DATA FOUR TIMES
2730 014314 012702 000011 MOV #11,R2 ;SAVE ADDRESS FOR TYPEOUT
2731 014320 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2732 014322 021224 021224 ;PORT4 LU 11
2733 014324 016104 000004 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
2734 014330 042704 000257 BIC #257,R4 ;CLEAR UNWANTED BITS
2735 014334 012705 000120 MOV #120,R5 ;PUT 'EXPECTED' IN R5
2736 014340 120504 CMPB R5,R4 ;IS ACTIVE SET?
2737 014342 001401 BEQ 1$ ;BR IF YES
2738 014344 104005 HLT 5
2739 014346 1$
2740 014346 012702 000013 MOV #13,R2 ;SAVE ADDRESS FOR TYPEOUT
2741 014352 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2742 014354 021264 021264 ;PORT4 LU 13
2743 014356 016104 000004 MOV 4(R1),R4 ;PUT EXPECTED IN R4
2744 014362 042704 000337 BIC #337,R4 ;CLEAR UNWANTED BITS
2745 014366 012705 000040 MOV #BIT5,R5 ;PUT 'EXPECTED' IN R5, RTS SHOULD BE SET
2746 014372 120504 CMPB R5,R4 ;IS RTS OK?
2747 014374 001401 BEQ 2$ ;BR IF YES
2748 014376 104005 HLT 5 ;RTS ERROR
2749 014400 2$
2750 014400 104400 SCOPE ;SCOPE THIS TEST
2751
2752
2753 ;***** TEST 16 *****
2754 ;*TEST OF OUT CLEAR
2755 ;*SET SOM AND LOAD OUT DATA SILO
2756 ;*SINGLE STEP DATA CLOCK, SET OUT CLEAR
2757 ;*VERIFY THAT OCOR,RTS, AND ACTIVE ARE CLEARED
2758 ;*****
2759
2760 ; TEST 16
2761 ;-----
2762 014402 012737 000016 001226 TST16: MOV #16,TSTNO
2763 014410 012737 014614 001216 MOV #TST17,NEXT
2764                                     ;R1 CONTAINS BASE DMC11 ADDRESS
2765 014416 104412 MSTCLR ;MASTER CLEAR DMC11
2766 014420 005061 000004 CLR 4(R1) ;CLEAR PORT4
2767 014424 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2768 014426 122117 122117 ;PUT LINE UNIT IN BITSTUFF MODE
2769 014430 004737 033676 JSR PC,CLR10 ;DO THIS AFTER MODE IS SET

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

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2826 014614 012737 000017 001226 TST17:
2827 014622 012737 015076 001216
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2829 014630 104412
2830 014632 005061 000004
2831 014636 104414
2832 014640 122117
2833 014642 004737 033676
2834 014646 005037 034114
2835 014652 012711 004000
2836 014656 004737 032500
2837 014662 012761 000001 000004
2838 014670 104414
2839 014672 122111
2840 014674 104414
2841 014676 122110
2842 014700 012705 000000
2843 014704 004737 032500
2844 014710 010561 000004
2845 014714 104414
2846 014716 122110
2847 014720 004737 032346
2848 014724 005003
2849 014726 010502
2850 014730 104415 000002
2851 014734 012737 000176 001252
2852 014742 104415 000001
2853 014746 106037 001252
2854 014752 103405
2855 014754 004737 032314
2856 014760 103006
2857 014762 104026
2858 014764 000404
2859 014766 004737 032314
2860 014772 103401
2861 014774 104026
2862 014776 005203
2863 015000 022703 000010
2864 015004 001356
2865 015006 005003
2866 015010 104415 000001
2867 015014 106002

;***** TEST 17 *****
;*BITSTUFF TRANSMITTER TEST
;*SINGLE CLOCK THE CHARACTER 0
;*CHECK FLAG AND DATA IN THE BIT WINDOW
;*VERIFY EACH BIT POSITION AS IT
;*PASSES THE BIT WINDOW (SI BIT)
;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
;*****

: TEST 17
:-----
MOV #17,TSTNO
MOV #TST20,NEXT
MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
CLR 4(R1) ;MASTER CLEAR DMC11
ROMCLK ;CLEAR PORT4
122117 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
JSR PC,CLR10 ;PUT LINE UNIT IN BITSTUFF MODE
CLR BITCON ;DO THIS AFTER MODE IS SET
MOV #BIT11,(R1) ;CONSECUTIVE 1'S COUNTER INIT TO 0
JSR PC,OUTRDY ;SET LINE UNIT LOOP
MOV #1,4(R1) ;WAIT FOR OUT-READY
ROMCLK ;SET BIT0 IN PORT4
122111 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
ROMCLK ;SET SOM!
122110 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
MOV #0,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
JSR PC,OUTRDY ;WAIT FOR OUT-READY
MOV R5,4(R1) ;LOAD PORT4 WITH CHARACTER
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122110 ;LOAD OUT DATA
JSR PC,OCOR ;WAIT FOR OCOR TO SET
CLR R3 ;CLEAR BIT COUNTER
MOV R5,R2 ;LOAD CHARACTER IN R2
DATACLK, 2 ;2 TICKS TO SET UP TRANSMITTER
MOV #B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
64$: DATACLK, 1 ;CLOCK FLAG ONCE
RORB TEMP3 ;SHIFT SOFT FLAG
BCS 65$ ;BR IF BIT IS MARK
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 66$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
BR 66$
65$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 66$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
66$: INC R3 ;INC BIT COUNT
CMP #10,R3 ;FLAG DONE YET?
BNE 64$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNT
1$: DATACLK, 1 ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
RORB R2 ;SHIFT NEXT SOFTWARE BIT IN TO CARRY

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Address	Hex	Dec	Label	Op	Op2	Op3	Op4	Op5	Op6	Op7	Op8	Op9	Op10	Op11	Op12	Op13	Op14	Op15	Op16	Op17	Op18	Op19	Op20	Op21	Op22	Op23	Op24	Op25	Op26	Op27	Op28	Op29	Op30	Op31	Op32	Op33	Op34	Op35	Op36	Op37	Op38	Op39	Op40	Op41	Op42	Op43	Op44	Op45	Op46	Op47	Op48	Op49	Op50	Op51	Op52	Op53	Op54	Op55	Op56	Op57	Op58	Op59	Op60	Op61	Op62	Op63	Op64	Op65	Op66	Op67	Op68	Op69	Op70	Op71	Op72	Op73	Op74	Op75	Op76	Op77	Op78	Op79	Op80	Op81	Op82	Op83	Op84	Op85	Op86	Op87	Op88	Op89	Op90	Op91	Op92	Op93	Op94	Op95	Op96	Op97	Op98	Op99	Op100	Op101	Op102	Op103	Op104	Op105	Op106	Op107	Op108	Op109	Op110	Op111	Op112	Op113	Op114	Op115	Op116	Op117	Op118	Op119	Op120	Op121	Op122	Op123	Op124	Op125	Op126	Op127	Op128	Op129	Op130	Op131	Op132	Op133	Op134	Op135	Op136	Op137	Op138	Op139	Op140	Op141	Op142	Op143	Op144	Op145	Op146	Op147	Op148	Op149	Op150	Op151	Op152	Op153	Op154	Op155	Op156	Op157	Op158	Op159	Op160	Op161	Op162	Op163	Op164	Op165	Op166	Op167	Op168	Op169	Op170	Op171	Op172	Op173	Op174	Op175	Op176	Op177	Op178	Op179	Op180	Op181	Op182	Op183	Op184	Op185	Op186	Op187	Op188	Op189	Op190	Op191	Op192	Op193	Op194	Op195	Op196	Op197	Op198	Op199	Op200	Op201	Op202	Op203	Op204	Op205	Op206	Op207	Op208	Op209	Op210	Op211	Op212	Op213	Op214	Op215	Op216	Op217	Op218	Op219	Op220	Op221	Op222	Op223	Op224	Op225	Op226	Op227	Op228	Op229	Op230	Op231	Op232	Op233	Op234	Op235	Op236	Op237	Op238	Op239	Op240	Op241	Op242	Op243	Op244	Op245	Op246	Op247	Op248	Op249	Op250	Op251	Op252	Op253	Op254	Op255	Op256	Op257	Op258	Op259	Op260	Op261	Op262	Op263	Op264	Op265	Op266	Op267	Op268	Op269	Op270	Op271	Op272	Op273	Op274	Op275	Op276	Op277	Op278	Op279	Op280	Op281	Op282	Op283	Op284	Op285	Op286	Op287	Op288	Op289	Op290	Op291	Op292	Op293	Op294	Op295	Op296	Op297	Op298	Op299	Op300	Op301	Op302	Op303	Op304	Op305	Op306	Op307	Op308	Op309	Op310	Op311	Op312	Op313	Op314	Op315	Op316	Op317	Op318	Op319	Op320	Op321	Op322	Op323	Op324	Op325	Op326	Op327	Op328	Op329	Op330	Op331	Op332	Op333	Op334	Op335	Op336	Op337	Op338	Op339	Op340	Op341	Op342	Op343	Op344	Op345	Op346	Op347	Op348	Op349	Op350	Op351	Op352	Op353	Op354	Op355	Op356	Op357	Op358	Op359	Op360	Op361	Op362	Op363	Op364	Op365	Op366	Op367	Op368	Op369	Op370	Op371	Op372	Op373	Op374	Op375	Op376	Op377	Op378	Op379	Op380	Op381	Op382	Op383	Op384	Op385	Op386	Op387	Op388	Op389	Op390	Op391	Op392	Op393	Op394	Op395	Op396	Op397	Op398	Op399	Op400	Op401	Op402	Op403	Op404	Op405	Op406	Op407	Op408	Op409	Op410	Op411	Op412	Op413	Op414	Op415	Op416	Op41
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2924 015210 010502      MOV    R5,R2      ;LOAD CHARACTER IN R2
2925 015212 104415 000002  DATACLK, 2      ;2 TICKS TO SET UP TRANSMITTER
2926 015216 012737 000176 001252  MOV    #*B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
2927 015224 104415 000001      DATACLK, 1      ;CLOCK FLAG ONCE
2928 015230 106037 001252      RORB    TEMP3      ;SHIFT SOFT FLAG
2929 015234 103405      BCS     65$      ;BR IF BIT IS MARK
2930 015236 004737 032314      JSR     PC,GETSI    ;LOOK AT BIT WINDOW
2931 015242 103006      BCC     66$      ;BR IF OK
2932 015244 104026      HLT     26      ;ERROR IN FLAG CHAR
2933 015246 000404      BR      66$
2934 015250 004737 032314 65$: JSR     PC,GETSI    ;LOOK AT BIT WINDOW
2935 015254 103401      BCS     66$      ;BR IF OK
2936 015256 104026      HLT     26      ;ERROR IN FLAG CHAR
2937 015260 005203 66$: INC     R3      ;INC BIT COUNT
2938 015262 022703 000010      CMP     #10,R3    ;FLAG DONE YET?
2939 015266 001356      BNE     64$      ;BR IF NO
2940 015270 005003      CLR     R3      ;CLEAR BIT COUNT
2941 015272 104415 000001 1$: DATACLK, 1      ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
2942 015276 106002      RORB    R2      ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
2943 015300 103005      BCC     2$      ;BR IF CARRY CLEAR
2944 015302 004737 032314      JSR     PC,GETSI    ;GET THE WINDOW
2945 015306 103406      BCS     3$      ;BR IF BIT IS A MARK
2946 015310 104006      HLT     6      ;ERROR BIT WAS A SPACE
2947 015312 000404      BR      3$      ;CONTINUE WITH TEST
2948 015314 004737 032314 2$: JSR     PC,GETSI    ;GET THE WINDOW
2949 015320 103001      BCC     3$      ;BR IF BIT IS A SPACE
2950 015322 104006      HLT     6      ;ERROR BIT WAS A MARK
2951 015324      3$:
2952 015324 005203      INC     R3      ;NEXT BIT
2953 015326 022703 000010      CMP     #10,R3    ;DONE YET?
2954 015332 001357      BNE     1$      ;BR IF NO
2955 015334 104415 000014      DATACLK, 14     ;CLOCK TRANSMITTER 14 MORE TICKS
2956 015340 104414      ROMCLK    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2957 015342 021264      021264    ;PORT4 LU-13
2958 015344 032761 000040 000004 BIT     #BIT5,4(R1) ;RTS SHOULD BE CLEAR NOW
2959 015352 001401      BEQ     4$      ;BR IF YES
2960 015354 104034      HLT     34     ;ERROR, RTS NOT CLEAR
2961 015356 104400 4$: SCOPE      ;SCOPE THIS TEST
2962
2963
2964
2965 ***** TEST 21 *****
2966 *BITSTUFF TRANSMITTER TEST
2967 *SINGLE CLOCK THE CHARACTER 252
2968 *CHECK FLAG AND DATA IN THE BIT WINDOW
2969 *VERIFY EACH BIT POSITION AS IT
2970 *PASSES THE BIT WINDOW (SI BIT)
2971 *ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
2972 *****
2973
2974 : TEST 21
2975 :-----
2976 015360 012737 000021 001226 TST21: MOV     #21,TSTNO
2977 015366 012737 015642 001216      MOV     #TST22,NEXT
2978
2979 015374 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11

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2980	015376	005061	000004		CLR	4(R1)	:CLEAR PORT4
2981	015402	104414			ROMCLK		:NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2982	015404	122117			122117		:PUT LINE UNIT IN BITSTUFF MODE
2983	015406	004737	033676		JSR	PC,CLR10	:DO THIS AFTER MODE IS SET
2984	015412	005037	034114		CLR	BITCON	:CONSECUTIVE 1'S COUNTER INIT TO C
2985	015416	012711	004000		MOV	#BIT11,(R1)	:SET LINE UNIT LOOP
2986	015422	004737	032500		JSR	PC,OUTRDY	:WAIT FOR OUT-READY
2987	015426	012761	000001	000004	MOV	#1,4(R1)	:SET BIT0 IN PORT4
2988	015434	104414			ROMCLK		:NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2989	015436	122111			122111		:SET SOM!
2990	015440	104414			ROMCLK		:NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2991	015442	122110			122110		:LOAD GARBAGE CHAR
2992	015444	012705	000252		MOV	#252,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT	
2993	015450	004737	032500		JSR	PC,OUTRDY	:WAIT FOR OUT-READY
2994	015454	010561	000004		MOV	R5,4(R1)	:LOAD PORT4 WITH CHARACTER
2995	015460	104414			ROMCLK		:NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2996	015462	122110			122110		:LOAD OUT DATA
2997	015464	004737	032346		JSR	PC,OCOR	:WAIT FOR OCOR TO SET
2998	015470	005003			CLR	R3	:CLEAR BIT COUNTER
2999	015472	010502			MOV	R5,R2	:LOAD CHARACTER IN R2
3000	015474	104415	000002		DATACLK,	2	:2 TICKS TO SET UP TRANSMITTER
3001	015500	012737	000176	001252	MOV	#*B<01111110>,TEMP3	:PUT FLAG CHARACTER IN TEMP3
3002	015506	104415	000001		DATACLK,	1	:CLOCK FLAG ONCE
3003	015512	106037	001252	64\$:	RORB	TEMP3	:SHIFT SOFT FLAG
3004	015516	103405			BCS	65\$	:BR IF BIT IS MARK
3005	015520	004737	032314		JSR	PC,GETSI	:LOOK AT BIT WINDOW
3006	015524	103006			BCC	66\$	:BR IF OK
3007	015526	104026			HLT	26	:ERROR IN FLAG CHAR
3008	015530	000404			BR	66\$	
3009	015532	004737	032314	65\$:	JSR	PC,GETSI	:LOOK AT BIT WINDOW
3010	015536	103401			BCS	66\$	:BR IF OK
3011	015540	104026			HLT	26	:ERROR IN FLAG CHAR
3012	015542	005203		66\$:	INC	R3	:INC BIT COUNT
3013	015544	022703	000010		CMP	#10,R3	:FLAG DONE YET?
3014	015550	001356			BNE	64\$	:BR IF NO
3015	015552	005003			CLR	R3	:CLEAR BIT COUNT
3016	015554	104415	000001	1\$:	DATACLK,	1	:SHIFT NEXT BIT IN THE WINDOW (>1 BIT)
3017	015560	106002			RORB	R2	:SHIFT NEXT SOFTWARE BIT IN TO CARRY
3018	015562	103005			BCC	2\$	:BR IF CARRY CLEAR
3019	015564	004737	032314		JSR	PC,GETSI	:GET THE WINDOW
3020	015570	103406			BCS	3\$	:BR IF BIT IS A MARK
3021	015572	104006			HLT	6	:ERROR BIT WAS A SPACE
3022	015574	000404			BR	3\$	:CONTINUE WITH TEST
3023	015576	004737	032314	2\$:	JSR	PC,GETSI	:GET THE WINDOW
3024	015602	103001			BCC	3\$	:BR IF BIT IS A SPACE
3025	015604	104006			HLT	6	:ERROR BIT WAS A MARK
3026	015606			3\$:			
3027	015606	005203			INC	R3	:NEXT BIT
3028	015610	022703	000010		CMP	#10,R3	:DONE YET?
3029	015614	001357			BNE	1\$	:BR IF NO
3030	015616	104415	000014		DATACLK,	14	:CLOCK TRANSMITTER 14 MORE TICKS
3031	015622	104414			ROMCLK		:NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3032	015624	021264			021264		:PORT4 LU-13
3033	015626	032761	000040	000004	BIT	#BIT5,4(R1)	:RTS SHOULD BE CLEAR NOW
3034	015634	001401			BEQ	4\$	:BR IF YES
3035	015636	104034			HLT	34	:ERROR, RTS NOT CLEAR

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K 5

SF0 0062

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3036 015640 104400          4$: SCOPE          ;SCOPE THIS TEST
3037
3038
3039          ;***** TEST 22 *****
3040          ;*BIT STUFF TEST
3041          ;*THIS TEST CHECKS ZERO BIT STUFFING OF
3042          ;* THE TRANSMITTER IN THE BIT WINDOW
3043          ;*****
3044
3045          ; TEST 22
3046          ;-----
3047 015642 012737 000022 001226 TST22: MOV #22,TSTNO
3048 015650 012737 016152 001216 MOV #TST23,NEXT
3049
3050 015656 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
3051 015660 005061 000004          CLR 4(R1) ;MASTER CLEAR DMC11
3052 015664 104414          ROMCLK          ;CLEAR PORT4
3053 015666 122117          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3054 015670 004737 033676          JSR PC,CLRIO ;PUT LINE UNIT IN BITSTUFF MODE
3055 015674 012711 004000          MOV #BIT11,(R1) ;DO THIS AFTER MODE IS SET
3056 015700 004737 032500          JSR PC,OUTRDY ;SET LU LOOP
3057 015704 012761 000001 000004          MOV #1,4(R1) ;WAIT FOR OUT-READY
3058 015712 104414          ROMCLK          ;SET BIT0 IN PORT4
3059 015714 122111          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3060 015716 104414          ROMCLK          ;SET SOM!
3061 015720 122110          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3062 015722 004537 033634          .SR R5,MESLD ;LOAD GARBAGE CHAR
3063 015726 034142          STUFDT          ;LOAD OUT SILO DATA
3064 015730 000024          20. ;MESSAGE ADDRESS
3065 015732 012704 034142          MOV #STUFDT,R4 ;NUMBER OF CHARACTERS
3066 015736 005003          CLR R3 ;R4=CHARACTER POINTER
3067 015740 012700 000006          MOV #6,R0 ;R3= BIT COUNTER
3068 015744 104415 000002          DATACLK, 2 ;BIT COUNTER FOR FLAG CHARACTER
3069 015750 012737 000176 001252          MOV #B<01111110>,TEMP3 ;SET UP TRANSMITTER
3070 015756 104415 000001 64$: DATACLK, 1 ;PUT FLAG CHARACTER IN TEMP3
3071 015762 106037 001252          RORB TEMP3 ;CLOCK FLAG ONCE
3072 015766 103405          BCS 65$ ;SHIFT SOFT FLAG
3073 015770 004737 032314          JSR PC,GETSI ;BR IF BIT IS MARK
3074 015774 103006          BCC 66$ ;LOOK AT BIT WINDOW
3075 015776 104026          HLT 26 ;BR IF OK
3076 016000 000404          BR 66$ ;ERROR IN FLAG CHAR
3077 016002 004737 032314 65$: JSR PC,GETSI ;LOOK AT BIT WINDOW
3078 016006 103401          BCS 66$ ;BR IF OK
3079 016010 104026          HLT 26 ;ERROR IN FLAG CHAR
3080 016012 005203 66$: INC R3 ;INC BIT COUNT
3081 016014 022703 000010          CMP #10,R3 ;FLAG DONE YET?
3082 016020 001356          BNE 64$ ;BR IF NO
3083 016022 005003          CLR R3 ;CLEAR BIT COUNT
3084 016024 012700 000024          MOV #20.,R0 ;RO=CHARACTER COUNTER
3085 016030 005037 034114          CLR BITCON ;CLEAR BIT STUFF COUNTER
3086 016034 112405          3$: MOVB (R4)+,R5 ;LOAD CHARACTER IN R5
3087 016036 010502          MOV R5,R2 ;LOAD CHARACTER IN R2
3088 016040 104415 000001 4$: DATACLK, 1 ;SHIFT DTAT ONCE
3089 016044 106002          RORB R2 ;SHIFT SOFT DATA
3090 016046 103407          BCS 5$ ;BR IF CARRY SET
3091 016050 005037 034114          CLR BITCON ;CLEAR BIT STUFF COUNTER

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3092 016054 004737 032314      JSR    PC,GETSI      ;LOOK AT WINDOW
3093 016060 103010      BCC     6$           ;BR IF SPACE
3094 016062 104006      HLT     6           ;ERROR, WINDOW WAS A MARK
3095 016064 000406      BR      6$           ;CONTINUE
3096 016066 005237 034114      5$: INC     BITCON      ;ADD 1 TO BIT STUFF COUNTER
3097 016072 004737 032314      JSR     PC,GETSI      ;LOOK AT WINDOW
3098 016076 103401      BCS     6$           ;BR IF MARK
3099 016100 104006      HLT     6           ;ERROR, WINDOW WAS A SPACE
3100 016102 022737 000005 034114 6$: CMP     #5,BITCON    ;HAVE THERE BEEN 5 1'S IN A ROW
3101 016110 001010      BNE     7$           ;BR IF NO
3102 016112 005037 034114      CLR     BITCON      ;IF YES CLR BIT STUFF COUNTER
3103 016116 104415 000001      DATACLK, 1      ;AND CLOCK TRANSMITTER ONCE
3104 016122 004737 032314      JSR     PC,GETSI      ;CHECK WINDOW FOR A ZER STUFF!!
3105 016126 103001      BCC     7$           ;BR IF WINDOW IS A SPACE
3106 016130 104030      HLT     30          ;ERROR, TRANSMITTER DID NOT STUFF A ZERO
3107 016132 005203      7$: INC     R3           ;BUMP BIT COUNTER
3108 016134 022703 000010      CMP     #10,R3      ;DONE THIS CHARACTER YET?
3109 016140 001337      BNE     4$           ;BR IF NO
3110 016142 005003      CLR     R3           ;RESTART BIT COUNTER AT ZERO
3111 016144 005300      DEC     R0           ;DEC CHARACTER COUNTER
3112 016146 001332      BNE     3$           ;BR IF NOT DONE YET
3113 016150 104400      8$: SCOPE      ;SCOPE THIS TEST
3114
3115
3116
3117
3118
3119
3120
3121
3122
3123
3124
3125
3126

```

```

:***** TEST 23 *****
: *BITSTUFF TRANSMITTER TEST
: *SINGLE CLOCK THE CHARACTER 377
: *CHECK FLAG AND DATA IN THE BIT WINDOW
: *VERIFY EACH BIT POSITION AS IT
: *PASSES THE BIT WINDOW (SI BIT)
: *ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
:*****

```

: TEST 23

```

3127 016152 012737 000023 001226 TST23: MOV     #23,TSTNO
3128 016160 012737 016460 001216      MOV     #TST24,NEXT
3129
3130 016166 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
3131 016170 005061 000004      CLR     4(R1)      ;MASTER CLEAR DMC11
3132 016174 104414      ROMCLK     ;CLEAR PORT4
3133 016176 122117      122117      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3134 016200 004737 033676      JSR     PC,CLRIO     ;PUT LINE UNIT IN BITSTUFF MODE
3135 016204 005037 034114      CLR     BITCON      ;DO THIS AFTER MODE IS SET
3136 016210 012711 004000      MOV     #BIT11,(R1) ;CONSECUTIVE 1'S COUNTER INIT TO 0
3137 016214 004737 032500      JSR     PC,OUTRDY    ;SET LINE UNIT LOOP
3138 016220 012761 000001 000004      MOV     #1,4(R1)    ;WAIT FOR OUT-READY
3139 016226 104414      ROMCLK     ;SET BIT0 IN PORT4
3140 016230 122111      122111      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3141 016232 104414      ROMCLK     ;SET SOM!
3142 016234 122110      122110      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3143 016236 012705 000377      MOV     #377,R5      ;LOAD GARBAGE CHAR
3144 016242 010537 016414      MOV     R5,5$      ;LOAD CHARACTER IN R5 FOR TYPEOUT
3145 016246 004737 032500      JSR     PC,OUTRDY    ;LOAD CHAR FOR STUFF CHECK
3146 016252 010561 000004      MOV     R5,4(R1)    ;WAIT FOR OUT-READY
3147 016256 104414      ROMCLK     ;LOAD PORT4 WITH CHARACTER
                                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304

```

```

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

```

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3204
3205
3206      : TEST 24
3207      :-----
3207 016460 012737 000024 001226 TST24: MOV #24,TSTNO
3208 016466 012737 017012 001216 MOV #TST25,NEXT
3209
3210 016474 104412 MSTCLR
3211 016476 005061 000004 CLR 4(R1)
3212 016502 104414 ROMCLK
3213 016504 122117 122117
3214 016506 004737 733676 JSR PC,CLR'D
3215 016512 005037 034114 CLR BITCON
3216 016516 012711 004000 MOV #BIT11,(R1)
3217 016522 005003 CLR R3
3218 016524 005004 CLR R4
3219 016526 005005 CLR R5
3220 016530 004737 032500 JSR PC,OUTRDY
3221 016534 012761 000001 000004 MOV #1,4(R1)
3222 016542 104414 ROMCLK
3223 016544 122111 122111
3224 016546 104414 ROMCLK
3225 016550 122110 122110
3226 016552 004737 032500 JSR PC,OUTRDY
3227 016556 010461 000004 MOV R4,4(R1)
3228 016562 104414 ROMCLK
3229 016564 122110 122110
3230 016566 005204 INC R4
3231 016570 004737 032500 JSR PC,OUTRDY
3232 016574 010461 000004 MOV R4,4(R1)
3233 016600 104414 ROMCLK
3234 016602 122110 122110
3235 016604 004737 032346 JSR PC,OCOR
3236 016610 104415 000002 DATACLK, 2
3237 016614 012737 000176 001252 MOV #*B<01111110>,TEMP3
3238 016622 104415 000001 64$: DATACLK, 1
3239 016626 106037 001252 RORB TEMP3
3240 016632 103405 BCS 65$
3241 016634 004737 032314 JSR PC,GETSI
3242 016640 103006 BCC 66$
3243 016642 104026 HLT 26
3244 016644 000404 BR 66$
3245 016646 004737 032314 65$: JSR PC,GETSI
3246 016652 103401 BCS 66$
3247 016654 104026 HLT 26
3248 016656 005203 66$: INC R3
3249 016660 022703 000010 CMP #10,R3
3250 016664 001356 BNE 64$
3251 016666 005003 CLR R3
3252 016670 005037 034114 CLR BITCON
3253 016674 005003 4$: CLR R3
3254 016676 010502 MOV R5,R2
3255 016700 010237 016742 MOV R2,6$
3256 016704 104415 000001 1$: DATACLK, 1
3257 016710 106002 RORB R2
3258 016712 103005 BCC 2$
3259 016714 004737 032314 JSR PC,GETSI

```

;R1 CONTAINS BASE DMC11 ADDRESS
 ;MASTER CLEAR DMC11
 ;CLEAR PORT4
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;PUT LINE UNIT IN BITSTUFF MODE
 ;DO THIS AFTER MODE IS SET
 ;CONSECUTIVE 1'S COUNTER INIT TO 0
 ;SET LINE UNIT LOOP
 ;R3 CONTAINS BIT COUNT
 ;R4 CONTAINS CHAR TO BE LOADED IN SILO
 ;R5 CONTAINS CHARACTER CURRENTLY BEING SHIFTED OUT
 ;WAIT FOR OUT-READY
 ;SET BIT0 IN PORT4
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;SET SOM!
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;LOAD GARBAGE CHAR
 ;WAIT FOR OUT-READY
 ;LOAD PORT4 WITH CHARACTER
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;LOAD OUT DATA
 ;INCREMENT TO NEXT CHARACTER
 ;WAIT FOR OUT-READY
 ;LOAD PORT4 WITH CHARACTER
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;LOAD OUT DATA
 ;WAIT FOR OCOR TO SET
 ;2 TICKS TO SET UP TRANSMITTER
 ;PUT FLAG CHARACTER IN TEMP3
 ;CLOCK FLAG ONCE
 ;SHIFT SOFT FLAG
 ;BR IF BIT IS MARK
 ;LOOK AT BIT WINDOW
 ;BR IF OK
 ;ERROR IN FLAG CHAR
 ;LOOK AT BIT WINDOW
 ;BR IF OK
 ;ERROR IN FLAG CHAR
 ;INC BIT COUNT
 ;FLAG DONE YET?
 ;BR IF NO
 ;CLEAR BIT COUNT
 ;CLEAR BIT STUFF COUNTER
 ;CLEAR BIT COUNTER
 ;LOAD CHARACTER IN R2
 ;LOAD CHAR FOR STUFF CHECK
 ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
 ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
 ;BR IF CARRY CLEAR
 ;GET THE WINDOW

```

3260 016720 103406      BCS      3$      ;BR IF BIT IS A MARK
3261 016722 104006      HLT       6      ;ERROR BIT WAS A SPACE
3262 016724 000404      BR        3$      ;CONTINUE WITH TEST
3263 016726 004737 032314 2$:      JSR      PC,GETSI  ;GET THE WINDOW
3264 016732 103001      BCC       3$      ;BR IF BIT IS A SPACE
3265 016734 104006      HLT       6      ;ERROR BIT WAS A MARK
3266 016736      3$:      ;
3267 016736 004537 033776      JSR      R5,STFFCK ;CHECK FOR BIT STUFF
3268 016742 000000      6$:      0      ;DATA CHARACTER
3269 016744 000001      1      ;SHIFT COUNT
3270 016746 010237 016742      MOV      R2,6$      ;LOAD CHAR FOR STUFF CHECK
3271 016752 005203      INC       R3      ;NEXT BIT
3272 016754 022703 000010      CMP      #10,R3     ;DONE YET?
3273 016760 001351      BNE       1$      ;BR IF NO
3274 016762 005204      INC       R4      ;NEXT CHARACTER
3275 016764 004737 032500      JSR      PC,OUTRDY  ;WAIT FOR OUT-READY
3276 016770 010461 000004      MOV      R4,4(R1)   ;LOAD PORT4 WITH CHARACTER
3277 016774 104414      ROMCLK    122110 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3278 016776 122110      ;LOAD OUT DATA
3279 017000 005205      INC       R5      ;NEXT CHARACTER
3280 017002 022705 000400      CMP      #400,R5    ;DONE YET?
3281 017006 001332      BNE       4$      ;BR IF NO
3282 017010 104400      5$:      SCOPE      ;SCOPE THIS TEST
3283
3284
3285
3286
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3290
3291
3292
3293
3294

```

```

;***** TEST 25 *****
; *MULTIPLE FLAG AND TRANSMITTER ABORT TEST
; *LOAD SILO WITH 5 FLAGS AND A CHAR (000)
; *VERIFY IN THE BIT WINDOW THAT THE FLAGS
; *AND DATA ARE CORRECT AND FOLLOWED BY AN ABORT
; *SEQUENCE (8 CONTIGUOUS 1'S)
;*****

```

; TEST 25

```

3295 017012 012737 000025 001226 TST25: MOV      #25,TSTNO
3296 017020 012737 017300 001216      MOV      #TST26,NEXT
3297
3298 017026 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
3299 017030 005061 000004      CLR      4(R1) ;MASTER CLEAR DMC11
3300 017034 104414      ROMCLK    122117 ;CLEAR PORT4
3301 017036 122117      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3302 017040 004737 033676      JSR      PC,CLRIO  ;PUT LINE UNIT IN BITSTUFF MODE
3303 017044 012711 004000      MOV      #BIT11,(R1) ;DO THIS AFTER MODE IS SET
3304 017050 012700 000005      MOV      #5,R0      ;SET LU LOOP
3305 017054 005003      CLR       R3      ;FLAG COUNT
3306 017056 004737 032500      1$:      JSR      PC,OUTRDY ;CLEAR BIT COUNTER
3307 017062 012761 000001 000004      MOV      #1,4(R1) ;WAIT FOR OUT-READY
3308 017070 104414      ROMCLK    122111 ;SET BIT0 IN PORT4
3309 017072 122111      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3310 017074 104414      ROMCLK    122110 ;SET SOM!
3311 017076 122110      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3312 017100 005300      DEC       R0      ;LOAD GARBAGE CHAR
3313 017102 001365      BNF       1$      ;DEC COUNT
3314 017104 004737 032500      JSR      PC,OUTRDY  ;LOAD ANOTHER
3315 017110 005061 000004      CLR      4(R1)   ;WAIT FOR OUTRDY
;CLEAR PORT4

```

```

3316 017114 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3317 017116 122110 ;LOAD A ZERO
3318 017120 001737 032346 JSR PC,OCOR ;WAIT
3319 017124 012700 000005 MOV #5,R0 ;RO = FLAG COUNT
3320 017130 104415 000002 DATACLK, 2 ;SET UP TRANSMITTER
3321 017134
3322 017134 012737 000176 001252 2$: MOV #B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
3323 017142 104415 000001 64$: DATACLK, 1 ;CLOCK FLAG ONCE
3324 017146 106037 001252 RORB TEMP3 ;SHIFT SOFT FLAG
3325 017152 103405 BCS 65$ ;BR IF BIT IS MARK
3326 017154 004737 032314 JSR PC,GETSI ;LOOK AT BIT WINDOW
3327 017160 103006 BCC 66$ ;BR IF OK
3328 017162 104026 HLT 26 ;ERROR IN FLAG CHAR
3329 017164 000404 BR 66$
3330 017166 004737 032314 65$: JSR PC,GETSI ;LOOK AT BIT WINDOW
3331 017172 103401 BCS 66$ ;BR IF OK
3332 017174 104026 HLT 26 ;ERROR IN FLAG CHAR
3333 017176 005203 66$: INC R3 ;INC BIT COUNT
3334 017200 022703 000010 CMP #10,R3 ;FLAG DONE YET?
3335 017204 001356 BNE 64$ ;BR IF NO
3336 017206 005003 CLR R3 ;CLEAR BIT COUNT
3337 017210 005300 DEC R0 ;DEC COUNT
3338 017212 001350 BNE 2$ ;BR IF NOT DONE
3339 017214 005003 CLR R3 ;R3 = BIT COUNT
3340 017216 005005 CLR R5 ;R5 = 'EXPECTED'
3341 017220 104415 000001 3$: DATACLK, 1 ;CLOCK ONCE
3342 017224 004737 032314 JSR PC,GETSI ;GO LOOK AT WINDOW
3343 017230 103001 BCC 4$ ;BR IF A SPACE
3344 017232 104006 HLT 6 ;ERROR, A MARK WAS SEEN
3345 017234 005203 4$: INC R3 ;INC BIT COUNT
3346 017236 022703 000010 CMP #10,R3 ;DONE YET?
3347 017242 001366 BNE 3$ ;BR IF NO
3348 017244 005003 CLR R3 ;CLEAR BIT COUNT
3349 017246 012705 000377 MOV #377,R5 ;R5 = 'EXPECTED'
3350 017252 104415 000001 5$: DATACLK, 1 ;CLOCK ONCE
3351 017256 004737 032314 JSR PC,GETSI ;LOOK AT WINDOW
3352 017262 103401 BCS 6$ ;BR IF A MARK
3353 017264 104033 HLT 33 ;ERROR, A SPACE WAS SEEN
3354 017266 005203 6$: INC R3 ;INC BIT COUNT
3355 017270 022703 000010 CMP #10,R3 ;DONE YET?
3356 017274 001366 BNE 5$ ;BR IF NO
3357 017276 104400 SCOPE ;SCOPE THIS TEST
3358
3359
3360 ;***** TEST 26 *****
3361 ;*LEADING ZEROS TEST
3362 ;*VERIFY THAT THE SETTING OF SOM AND EOM TOGETHER
3363 ;*AND THEN SOM ALONE WILL GENERATE 16 LEADING ZEROS
3364 ;*AND A FLAG,THE CHECK IS MADE USING THE BIT WINDOW
3365 ;*****
3366
3367 : TEST 26
3368 :-----
3369 017300 012737 000026 001226 TST26: MOV #26,TSTNO
3370 017306 012737 017520 001216 MOV #TST27,NEXT
3371

```

;R1 CONTAINS BASE DMC11 ADDRESS

```

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

```

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3428 017520 012737 000027 001226 TST27: MOV #27,TSTNO
3429 017526 012737 017622 001216 MOV #TST30,NEXT
3430
3431 017534 104412 MSTCLR
3432 017536 005061 000004 CLR 4(R1)
3433 017542 104414 ROMCLK
3434 017544 122117 122117
3435 017546 004737 033676 JSR PC,CLR10
3436 017552 012711 004000 MOV #BIT11,(R1)
3437 017556 012702 000012 MOV #12,R2
3438 017562 004737 032364 JSR PC,SYNC
3439 017566 000005 5
3440 017570 104415 000054 DATACLK, 54
3441 017574 104414 ROMCLK
3442 017576 021244 021244
3443 017600 016104 000004 MOV 4(R1),R4
3444 017604 042704 000277 BIC #277,R4
3445 017610 005005 CLR R5
3446 017612 120504 CMPB R5,R4
3447 017614 001401 BEQ 1$
3448 017616 104040 HLT 40
3449 017620 104400 1$: SCOPE
3450
3451
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3459
3460 017622 012737 000030 001226 TST30: MOV #30,TSTNO
3461 017630 012737 017726 001216 MOV #TST31,NEXT
3462
3463 017636 104412 MSTCLR
3464 017640 005061 000004 CLR 4(R1)
3465 017644 104414 ROMCLK
3466 017646 122117 122117
3467 017650 004737 033676 JSR PC,CLR10
3468 017654 012711 004000 MOV #BIT11,(R1)
3469 017660 012702 000012 MOV #12,R2
3470 017664 004737 032364 JSR PC,SYNC
3471 017670 000005 5
3472 017672 104415 000064 DATACLK, 64
3473 017676 104414 ROMCLK
3474 017700 021244 021244
3475 017702 016104 000004 MOV 4(R1),R4
3476 017706 042704 000277 BIC #277,R4
3477 017712 012705 000100 MOV #BIT16,R5
3478 017716 120504 CMPB R5,R4
3479 017720 001401 BEQ 1$
3480 017722 104040 HLT 40
3481 017724 104400 1$: SCOPE
3482
3483

```

;R1 CONTAINS BASE DMC11 ADDRESS
 ;MASTER CLEAR DMC11
 ;CLEAR PORT4
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;PUT LINE UNIT IN BITSTUFF MODE
 ;DO THIS AFTER MODE IS SET
 ;SET LU LOOP
 ;SAVE LU REG FOR TYPEOUT
 ;SINGLE CLOCK 5 SYNC CHARACTERS

 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;PORT4 LU12
 ;PUT 'FOUND' IN R4
 ;CLEAR UNWANTED BITS
 ;PUT 'EXPECTED' IN R5
 ;IS ACTIVE CLEAR?
 ;BR IF YES
 ;ERROR ACTIVE IS NOT CLEAR
 ;SCOPE THIS TEST

***** TEST 30 *****
 ;*BITSTUFF IN ACTIVE TEST
 ;*SET LU LOOP, SINGLE STEP 5 FLAGS AND A NON-FLAG (301)
 ;*VERIFY THAT IN ACTIVE IS SET
 ;*****

: TEST 30
 :-----

;R1 CONTAINS BASE DMC11 ADDRESS
 ;MASTER CLEAR DMC11
 ;CLEAR PORT4
 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;PUT LINE UNIT IN BITSTUFF MODE
 ;DO THIS AFTER MODE IS SET
 ;SET LU LOOP
 ;SAVE LU REG FOR TYPEOUT
 ;SINGLE CLOCK 5 SYNC CHARACTERS

 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;PORT4 LU12
 ;PUT 'FOUND' IN R4
 ;CLEAR UNWANTED BITS
 ;PUT 'EXPECTED' IN R5
 ;IS ACTIVE SET?
 ;BR IF YES
 ;ERROR ACTIVE IS NOT SET
 ;SCOPE THIS TEST

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3484
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3491
3492 017726 012737 000031 001226 TST31:
3493 017734 012737 020064 001216
3494
3495 017742 104412
3496 017744 005061 000004
3497 017750 104414
3498 017752 122117
3499 017754 004737 033676
3500 017760 012711 004000
3501 017764 012702 000012
3502 017770 004737 032500
3503 017774 012761 000001 000004
3504 020002 104414
3505 020004 122111
3506 020006 104414
3507 020010 122110
3508 020012 012761 000301 000004
3509 020020 104414
3510 020022 122110
3511 020024 004737 032346
3512 020030 104415 000023
3513 020034 104414
3514 020036 021244
3515 020040 016104 000004
3516 020044 042704 000277
3517 020050 012705 000100
3518 020054 120504
3519 020056 001401
3520 020060 104040
3521 020062 104400
3522
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3532 020064 012737 000032 001226 TST32:
3533 020072 012737 020170 001216
3534
3535 020100 104412
3536 020102 005061 000004
3537 020106 104414
3538 020110 122117
3539 020112 004737 033676
    
```

***** TEST 31 *****
 ;*BITSTUFF IN ACTIVE TEST
 ;*SET LINE UNIT LOOP, SINGLE STEP ONE FLAG AND A CHAR (301)
 ;*VERIFY THAT IN ACTIVE IS SET
 ;*****
 ; TEST 31
 ;-----
 MOV #31, TSTNO
 MOV #TST32, NEXT
 ;R1 CONTAINS BASE DMC11 ADDRESS
 MSTCLR ;MASTER CLEAR DMC11
 CLR 4(R1) ;CLEAR PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122117 ;PUT LINE UNIT IN BITSTUFF MODE
 JSR PC, CLRIO ;MUST DO THIS AFTER MODE IS SET
 MOV #BIT11, (R1)
 MOV #12, R2 ;SAVE REG ADDRESS FOR TYPEOUT
 JSR PC, OUTRDY ;WAIT FOR OUTRDY
 MOV #1, 4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122111 ;SET SOM
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD GARBAGE CHAR
 MOV #301, 4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD OUT DATA
 JSR PC, OCOR ;WAIT FOR OCOR
 DATACLK, 23 ;SINGLE CLOCK THE DATA
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021244 ;PORT4, LU-12
 MOV 4(R1), R4 ;PUT 'FOUND' IN R4
 BIC #277, R4 ;CLEAR UNWANTED BITS
 MOV #BIT6, R5 ;PUT 'EXPECTED' IN R5
 CMPB R5, R4 ;IS IN ACTIVE SET?
 BEQ 1\$
 HLT 40 ;ERROR, IN ACTIVE NOT SET
 1\$: SCOPE ;SCOPE THIS TEST

***** TEST 32 *****
 ;*BITSTUFF IN ACTIVE TEST
 ;*SET LU LOOP, SINGLE STEP 2 FLAGS AND A NON-FLAG (301)
 ;*VERIFY THAT IN ACTIVE IS SET
 ;*****
 ; TEST 32
 ;-----
 MOV #32, TSTNO
 MOV #TST33, NEXT
 ;R1 CONTAINS BASE DMC11 ADDRESS
 MSTCLR ;MASTER CLEAR DMC11
 CLR 4(R1) ;CLEAR PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
 122117 ;PUT LINE UNIT IN BITSTUFF MODE
 JSR PC, CLRIO ;DO THIS AFTER MODE IS SET

```

3540 020116 012711 004000      MOV    #BIT11,(R1)      ;SET LU LOOP
3541 020122 012702 000012      MOV    #12,R2        ;SAVE LU REG FOR TYPEOUT
3542 020126 004737 032364      JSR     PC,SYNC        ;SINGLE CLOCK 2 SYNC CHARACTERS
3543 020132 000002 2          DATACLK,      33
3544 020134 104415 000033      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3545 020140 104414 021244      PORT4,LU12
3546 020142 021244 000004      MOV    4(R1),R4      ;PUT 'FOUND' IN R4
3547 020144 016104 000004      BIC     #277,R4      ;CLEAR UNWANTED BITS
3548 020150 042704 000277      MOV    #BIT6,P5      ;PUT 'EXPECTED' IN P5
3549 020154 012705 000100      CMPB   R5,R4        ;IS ACTIVE SET?
3550 020160 120504 000004      BEQ     1$          ;BR IF YES
3551 020162 001401 000004      HLT     40          ;ERROR ACTIVE IS NOT SET
3552 020164 104040 000004      SCOPE   ;SCOPE THIS TEST
3553 020166 104400 000004
3554
3555
3556 ***** TEST 33 *****
3557 ;*IN CLEAR TEST
3558 ;*SYNC UP RECEIVER AND TRANSMIT A CHARACTER
3559 ;*WAIT FOR IN RDY, THEN SET IN CLEAR
3560 ;*VERIFY THAT IN ACTIVE AND IN RDY ARE CLEARED
3561 ;*****
3562
3563 ; TEST 33
3564 ;-----
3565 020170 012737 000033 001226 TST33: MOV    #33,TSTNO
3566 020176 012737 020374 001216      MOV    #TST34,NEXT
3567
3568 020204 104412 000004      MSTCLR   ;R1 CONTAINS BASE DMC11 ADDRESS
3569 020206 005061 000004      CLR     4(R1)      ;MASTER CLEAR DMC11
3570 020212 104414 000004      ROMCLK   ;CLEAR PORT4
3571 020214 122117 000004      122117  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3572 020216 004737 033676      JSR     PC,CLR10    ;PUT LINE UNIT IN BITSTUFF MODE
3573 020222 012702 000012      MOV    #12,R2      ;DO THIS AFTER MODE IS SET
3574 020226 012711 004000      MOV    #BIT11,(R1) ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3575 020232 012761 000001 000004 MOV    #1,4(R1)      ;SET LINE UNIT LOOP
3576 020240 104414 000004      ROMCLK   ;SET BIT0 IN PORT4
3577 020242 122111 000004      122111  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3578 020244 104414 000004      ROMCLK   ;SET SOM!
3579 020246 122110 000004      122110  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3580 020250 004737 032644      JSR     PC,CHARSD   ;LOAD GARBAGE CHAR
3581 020254 000026 000004      26          ;LOAD SILO WITH CHARACTER
3582 020256 104415 000033      DATACLK, 33      ;CHARACTER
3583 020262 104416 000002      TIMER, 2         ;SINGLE CLOCK THE DATA
3584 020266 104414 000004      ROMCLK   ;WAIT FOR INRDY
3585 020270 021244 000004      021244  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3586 020272 016 04 000004      MOV    4(R1),R4    ;PORT4,LU 12
3587 020276 042704 000357      BIC     #357,R4     ;PUT 'FOUND' IN R4
3588 020302 012705 000020      MOV    #BIT4,R5    ;CLEAR UNWANTED BITS
3589 020306 120504 000020      CMPB   R5,R4      ;PUT 'EXPECTED' IN R5
3590 020310 001401 000020      BEQ     1$          ;IS INRDY SET?
3591 020312 104040 000020      HLT     40          ;ERROR, INRDY IS NOT SET
3592 020314 000020 000004
3593 020314 012761 000200 000004 1$: MOV    #BIT7,4(R1) ;LOAD PORT4
3594 020322 104414 000004      ROMCLK   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3595 020324 122112 000004      122112  ;SET IN CLEAR

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3596 020326 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3597 020330 021244 021244 ;PORT4 LU 12
3598 020332 016104 000004 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
3599 020336 042704 000277 BIC #277,R4 ;CLEAR UNWANTED BITS
3600 020342 005005 CLR R5 ;PUT 'EXPECTED' IN R5
3601 020344 120504 CMPB R5,R4 ;IS IN ACTIVE CLEAR?
3602 020346 001401 BEQ 2$ ;ERROR, IN ACTIVE IS NOT CLEAR
3603 020350 104040 HLT 40
3604 020352 2$:
3605 020352 016104 000004 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
3606 020356 042704 000357 BIC #357,R4 ;CLEAR UNWANTED BITS
3607 020362 005005 CLR R5 ;PUT 'EXPECTED' IN R5
3608 020364 120504 CMPB R5,R4 ;IS INRDY CLEARED?
3609 020366 001401 BEQ 3$ ;ERROR, INRDY IS NOT CLEARED
3610 020370 104040 HLT 40 ;SCOPE THIS TEST
3611 020372 104400 3$: SCOPE
3612
3613
3614 ;***** TEST 34 *****
3615 ;*BITSTUFF BASIC RECEICER TEST
3616 ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 0
3617 ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3618 ;*****
3619
3620 ; TEST 34
3621 ;-----
3622 020374 012737 000034 001226 1ST34: MOV #34,ISTNO
3623 020402 012737 020542 001216 MOV #1ST35,NEXT
3624
3625 020410 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
3626 020412 005061 000004 CLR 4(R1) ;MASTER CLEAR DMC11
3627 020416 104414 ROMCLK ;CLEAR PORT4
3628 020420 122117 122117 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3629 020422 004737 033676 JSR PC,CLR10 ;PUT LINE UNIT IN BITSTUFF MODE
3630 020426 012702 000012 MOV #12,R2 ;DO THIS AFTER MODE IS SET
3631 020432 012711 004000 MOV #BIT11,(R1) ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3632 020436 012761 000001 000004 MOV #1,4(R1) ;SET LINE UNIT LOOP
3633 020444 104414 ROMCLK ;SET BIT0 IN PORT4
3634 020446 122111 122111 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3635 020450 104414 ROMCLK ;SET SOM
3636 020452 122110 122110 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3637 020454 004737 032644 JSR PC,CHARSD ;LOAD GARBAGE CHAR
3638 020460 000000 0 CHARACT ;LOAD SILO WITH CHARACTER
3639 020462 104415 000033 DATACLK, 33 ;CHARACTER
3640 020466 104416 000002 TIMER, 2 ;SINGLE CLOCK THE DATA
3641 020472 104414 ROMCLK ;WAIT FOR INRDY
3642 020474 021244 021244 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3643 020476 016104 000004 MOV 4(R1),R4 ;PORT4 LU 12
3644 020502 042704 000357 BIC #357,R4 ;PUT 'FOUND' IN R4
3645 020506 012705 000020 MOV #BIT4,R5 ;CLEAR UNWANTED BITS
3646 020512 120504 CMPB R5,R4 ;PUT 'EXPECTED' IN R5
3647 020514 001401 BEQ 1$ ;IS INRDY SET?
3648 020516 104040 HLT 40 ;ERROR, INRDY IS NOT SET
3649 020520 1$:
3650 020520 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
3651 020522 021204 021204 ROMCLK ;PORT4 IN DATA

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3652 020524 016104 000004      MOV     4(R1),R4      ;PUT 'FOUND' IN R4
3653 020530 005005              CLR     R5              ;PUT 'EXPECTED' IN R5
3654 020532 120504              CMPB   R5,R4            ;WAS A 0 RECEIVED?
3655 020534 001401              BEQ     2$
3656 020536 104010              HLT     10              ;ERROR, RECEIVED DATA IS WRONG
3657 020540 104400              SCOPE              ;SCOPE THIS TEST
3658
3659
3660
3661
3662
3663
3664
3665
3666
3667
3668 020542 012737 000035 001226 TST35: MOV     #35,TSTNO
3669 020550 012737 020712 001216      MOV     #TST36,NEXT
3670
3671 020556 104412              MSTCLR
3672 020560 005061 000004      CLR     4(R1)
3673 020564 104414              ROMCLK
3674 020566 122117 122117      JSR     PC,CLR10
3675 020570 004737 033676      MOV     #12,R2
3676 020574 012702 000012      MOV     #BIT11,(R1)
3677 020600 012711 004000      MOV     #1,4(R1)
3678 020604 012761 000001 000004      ROMCLK
3679 020612 104414 122111      ROMCLK
3680 020614 122111 122110      JSR     PC,CHARSD
3681 020616 104414 125
3682 020620 122110 032644      DATACLK, 33
3683 020622 004737 000125      TIMER, 2
3684 020626 000125 000002      ROMCLK
3685 020630 104415 000033      021244
3686 020634 104416 000002      MOV     4(R1),R4
3687 020640 104414 000004      BIC     #357,R4
3688 020642 021244 000357      MOV     #BIT4,R5
3689 020644 016104 000020      CMPB   R5,R4
3690 020650 042704 000020      BEQ     1$
3691 020654 012705 000020      HLT     40
3692 020660 120504
3693 020662 001401
3694 020664 104040
3695 020666
3696 020666 104414
3697 020670 021204
3698 020672 016104 000004
3699 020676 012705 000125
3700 020702 120504
3701 020704 001401
3702 020706 104010
3703 020710 104400
3704
3705
3706
3707

;***** TEST 35 *****
;BITSTUFF BASIC RECEICER TEST
;SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 125
;VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
;*****

; TEST 35
;-----
;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11
;CLEAR PORT4
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;PUT LINE UNIT IN BITSTUFF MODE
;DO THIS AFTER MODE IS SET
;SAVE REG ADDRESS IN R2 FOR TYPEOUT
;SET LINE UNIT LOOP
;SET BIT0 IN PORT4
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;SET SOM!
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;LOAD GARBAGE CHAR
;LOAD SILO WITH CHARACTER
;CHARACTER
;SINGLE CLOCK THE DATA
;WAIT FOR INRDY
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;PORT4 LU 12
;PUT 'FOUND' IN R4
;CLEAR UNWANTED BITS
;PUT 'EXPECTED' IN R5
;IS INRDY SET?
;ERROR, INRDY IS NOT SET
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;PORT4 IN DATA
;PUT 'FOUND' IN R4
;PUT 'EXPECTED' IN R5
;WAS A 125 RECEIVED?
;ERROR, RECEIVED DATA IS WRONG
;SCOPE THIS TEST

;***** TEST 36 *****
;BITSTUFF BASIC RECEICER TEST

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3708 ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 252
3709 ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3710 ;*****
3711
3712 ; TEST 36
3713 ;-----
3714 020712 012737 000036 001226 TST36: MOV #36,TSTNO
3715 020720 012737 021062 001216 MOV #TST37,NEXT
3716
3717 020726 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
3718 020730 005061 000004 CLR 4(R1) ;MASTER CLEAR DMC11
3719 020734 104414 ROMCLK ;CLEAR PORT4
3720 020736 122117 122117 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3721 020740 004737 033676 JSR PC,CLR10 ;PUT LINE UNIT IN BITSTUFF MODE
3722 020744 012702 000012 MOV #12,R2 ;DO THIS AFTER MODE IS SET
3723 020750 012711 004000 MOV #BIT11,(R1) ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3724 020754 012761 000001 000004 MOV #1,4(R1) ;SET LINE UNIT LOOP
3725 020762 104414 ROMCLK ;SET BIT0 IN PORT4
3726 020764 122111 122111 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3727 020766 104414 ROMCLK ;SET SOM!
3728 020770 122110 122110 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3729 020772 004737 032644 JSR PC,CHARSD ;LOAD GARBAGE CHAR
3730 020776 000252 252 ;LOAD SILO WITH CHARACTER
3731 021000 104415 000033 DATACLK, 33 ;CHARACTER
3732 021004 104416 000002 TIMER, 2 ;SINGLE CLOCK THE DATA
3733 021010 104414 ROMCLK ;WAIT FOR INRDY
3734 021012 021244 021244 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3735 021014 016104 000004 MOV 4(R1),R4 ;PORT4 LU 12
3736 021020 042704 000357 BIC #357,R4 ;PUT 'FOUND' IN R4
3737 021024 012705 000020 MOV #BIT4,R5 ;CLEAR UNWANTED BITS
3738 021030 120504 CMPB R5,R4 ;PUT 'EXPECTED' IN R5
3739 021032 001401 BEQ 1$ ;IS INRDY SET?
3740 021034 104040 HLT 40 ;ERROR, INRDY IS NOT SET
3741 021036 1$:
3742 021036 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3743 021040 021204 021204 ;PORT4 IN DATA
3744 021042 016104 000004 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
3745 021046 012705 000252 MOV #252,R5 ;PUT 'EXPECTED' IN R5
3746 021052 120504 CMPB R5,R4 ;WAS A 252 RECEIVED?
3747 021054 001401 BEQ 2$
3748 021056 104010 HLT 10 ;ERROR, RECEIVED DATA IS WRONG
3749 021060 104400 2$: SCOPE ;SCOPE THIS TEST
3750
3751
3752 ;***** TEST 37 *****
3753 ;*BITSTUFF BASIC RECEICER TEST
3754 ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 377
3755 ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3756 ;*****
3757
3758 ; TEST 37
3759 ;-----
3760 021062 012737 000037 001226 TST37: MOV #37,TSTNO
3761 021070 012737 021232 001216 MOV #TST40,NEXT
3762
3763 021076 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11

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3820 021312 012711 004000      MOV    #BIT11,(R1)      ;SET LINE UNIT LOOP
3821 021316 004737 032710      JSR     PC,SILOLD      ;LOAD SILO WITH COUNT PATTERN
3822 021322 104415 000023      DATACLK, 23      ;SYNC RECEIVER AND GET IT ACTIVE
3823 021326 104415 000730      1$:    DATACLK, 730      ;CLOCK IN 73 CHARACTERS
3824 021332 004737 033154      4$:    JSR     PC,INRDY      ;WAIT FOR INRDY
3825 021336 104414              ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3826 021340 021204 021204      021204      ;PORT4 IN DATA
3827 021342 016104 000004      MOV     4(R1),R4      ;PUT 'FOUND' IN R4
3828 021346 010205              MOV     R2,R5      ;PUT 'EXPECTED' IN R5
3829 021350 120504              CMPB    R5,R4      ;IS DATA CORRECT?
3830 021352 001401              BEQ     2$      ;BR IF YES
3831 021354 104010              HLT     10      ;DATA ERROR
3832 021356 005202              2$:    INC     R2      ;NEXT CHARACTER
3833 021360 022702 000400      CMP     #400,R2      ;ALL DONE?
3834 021364 001407              BEQ     3$      ;BR IF YES
3835 021366 005303              DEC     R3      ;DECREMENT CHARACTER COUNT
3836 021370 001360              BNE     4$      ;BR IF SILO NOT EMPTY
3837 021372 004737 032710      JSR     PC,SILOLD      ;LOAD SILO WITH MORE OF COUNT PATTERN
3838 021376 012703 000073      MOV     #73,R3      ;RELOAD CHARACTER COUNT
3839 021402 000751              BR      1$      ;CONTINUE
3840 021404 104400              3$:    SCOPE      ;SCOPE THIS TEST
3841
3842
3843      ;***** TEST 41 *****
3844      ;*BITSTUFF DATA TEST
3845      ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
3846      ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
3847      ;*THIS TEST IS EXACTLY THE SAME AS THE LAST TEST,
3848      ;*EXCEPT LINE UNIT LOOP IS SET IN LU REGISTER 12
3849      ;*****
3850
3851      ; TEST 41
3852      ;-----
3853 021406 012737 000041 001226 TST41: MOV     #41,TSTNO
3854 021414 012737 021572 001216      MOV     #TST42,NEXT
3855
3856 021422 104412              MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
3857 021424 005061 000004      CLR     4(R1)      ;MASTER CLEAR DMC11
3858 021430 104414              ROMCLK      ;CLEAR PORT4
3859 021432 122117 122117      122117      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3860 021434 004737 033676      JSR     PC,CLRIO      ;PUT LINE UNIT IN BITSTUFF MODE
3861 021440 005037 033150      CLR     SCHAR      ;DO THIS AFTER MODE IS SET
3862 021444 005137 033150      COM     SCHAR      ;START BINARY COUNT AT ZERO
3863 021450 005037 034114      CLR     BITCON      ;IF BITSTUFF SCHAR IS MINUS NUMBER
3864 021454 005037 033152      CLR     STUFLG      ;START 1'S COUNT AT 0
3865 021460 005002              CLR     R2      ;CLEAR BITSTUFF FLAG
3866 021462 012703 000073      MOV     #73,R3      ;R2 IS 'EXPECTED' DATA
3867 021466 005011              CLR     (R1)      ;R3 IS CHARACTER COUNT
3868 021470 012761 000040 000004      MOV     #BIT5,4(R1) ;CLEAR LU LOOP IN MAINT REG
3869 021476 104414              ROMCLK      ;LOAD PORT4
3870 021500 122112 122112      122112      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3871 021502 004737 032710      JSR     PC,SILOLD      ;SET LU LOOP IN LU REG 12
3872 021506 104415 000023      DATACLK, 23      ;LOAD SILO WITH COUNT PATTERN
3873 021512 104415 000730      1$:    DATACLK, 730      ;SYNC RECEIVER AND GET IT ACTIVE
3874 021516 004737 033154      4$:    JSR     PC,INRDY      ;CLOCK IN 73 CHARACTERS
3875 021522 104414              ROMCLK      ;WAIT FOR INRDY
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304

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3876	021524	021204		021204		:PORT4 IN DATA
3877	021526	016104	000004	MOV	4(R1),R4	:PUT 'FOUND' IN R4
3878	021532	010205		MOV	R2,R5	:PUT 'EXPECTED' IN R5
3879	021534	120504		CMPB	R5,R4	:IS DATA CORRECT?
3880	021536	001401		BEQ	2\$	:BR IF YES
3881	021540	104010		HLT	10	:DATA ERROR
3882	021542	005202		2\$: INC	R2	:NEXT CHARACTER
3883	021544	022702	000400	CMP	#400,R2	:ALL DONE?
3884	021550	001407		BEQ	3\$	:BR IF YES
3885	021552	005303		DEC	R3	:DECREMENT CHARACTER COUNT
3886	021554	001360		BNE	4\$	:BR IF SILO NOT EMPTY
3887	021556	004737	032710	JSR	PC,SILOLD	:LOAD SILO WITH MORE OF COUNT PATTERN
3888	021562	012703	000073	MOV	#73,R3	:RELOAD CHARACTER COUNT
3889	021566	000751		BR	1\$	:CONTINUE
3890	021570	104400		3\$: SCOPE		:SCOPE THIS TEST

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021572 012737 000042 001226

021600 012737 021734 001216

021606 104412

021610 005061 000004

021614 104414

021616 122117

021620 004737 033676

021624 012711 004000

021630 004737 032532

021634 000301

021636 004737 032500

021642 104414

021644 122110

021646 104415 000073

021652 004737 033154

021656 104414

021660 021204

021662 016104 000004

021666 012705 000301

021672 120504

021674 001401

021676 104010

021700 004737 033154

021704 104414

021706 021244

021710 016104 000004

021714 042704 000375

021720 012705 000002

2\$:

3\$:

: TEST 42

TST42:

1\$:

***** TEST 42 *****
 :*RECEIVER ABORT TEST
 :*SINGLE CLOCK 3 FLAGS, A 301, ANOTHER 301 AND 10 EXTRA
 :*CLOCK TICKS, VERIFY THAT A 301 AND A BLOCK END
 :*WERE RECEIVED INDICATING THAT THE RECEIVER RECOGNIZED
 :*THE ABORT SEQUENCE (8 CONTIGUOUS 1'S)
 :*****

: TEST 42
 :-----
 :MOV #42,TSTNO
 :MOV #TST43,NEXT

MSTCLR
 CLR 4(R1)
 ROMCLK
 122117
 JSR PC,CLRIO
 MOV #BIT11,(R1)
 JSR PC,CHAR
 301
 JSR PC,OUTRDY
 ROMCLK
 122110
 DATACLK, 73
 JSR PC,INRDY
 ROMCLK
 021204
 MOV 4(R1),R4
 MOV #301,R5
 CMPB R5,R4
 BEQ 1\$
 HLT 10
 JSR PC,INRDY
 ROMCLK
 021244
 MOV 4(R1),R4
 BIC #375,R4
 MOV #2,R5

:R1 CONTAINS BASE DMC11 ADDRESS
 :MASTER CLEAR DMC11
 :NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 :PUT LINE UNIT IN BITSTUFF MODE
 :DO THIS AFTER MODE IS SET
 :SET LINE UNIT LOOP
 :LOAD SILO WITH 3 FLAGS
 :AND A 301
 :WAIT FOR OUTRDY
 :NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 :LOAD 2ND 301 CHARACTER
 :CLOCK THE 301 IN AND 10 EXTRA TICKS
 :WAIT FOR INRDY
 :NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 :PORT4 IN DATA
 :PUT 'FOUND' IN R4
 :PUT 'EXPECTED' IN R5
 :WAS A 301 RECEIVED?
 :ERROR FIRST CHARACTER INCORRECT
 :WAIT FOR INRDY
 :NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 :READ LU-12
 :PUT 'FOUND' IN R4
 :CLEAR UNWANTED BITS
 :PUT 'EXPECTED' IN R5

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3932 021724 120504      CMPB    R5,R4      ;IS BLOCK END SET?
3933 021726 001401      BEQ      3$      ;BR IF YES
3934 021730 104032      HLT      32      ;ERROR, BLOCK END NOT SET
3935 021732 104400      3$:      SCOPE    ;SCOPE THIS TEST
3936
3937
3938      ;***** TEST 43 *****
3939      ;*CABLE TURNAROUND TEST
3940      ;*CLEAR LINE UNIT LOOP, SET DTR
3941      ;*VERIFY THAT RING AND MODEM READY ARE SET
3942      ;*CLEAR DTR, VERIFY THAT MRDY IS CLEARED
3943      ;*****
3944
3945      ; TEST 43
3946      ;-----
3947 021734 012737 000043 001226 TST43: MOV     #43,TSTNO
3948 021742 012737 022162 001216      MOV     #TST44,NEXT
3949
3950      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
3951 021752 032737 020000 001366      BIT      #BIT13,STAT1 ;IS LINE UNIT M8202?
3952 021760 001004      BNE      .+12      ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
3953 021762 032737 040000 001366      BIT      #BIT14,STAT1 ;IS TURNAROUND CONNECTOR ON?
3954 021770 001473      BEQ      2$      ;SKIP TEST IF NO
3955 021772 005011      CLR      (R1)      ;CLEAR LINE UNIT LOOP
3956 021774 012761 000100 000004      MOV     #100,4(R1) ;LOAD PORT4
3957 022002 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3958 022004 122113      122113      ;SET DTR
3959 022006 104416 000002      TIMER, 2 ;WAIT
3960 022012 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3961 022014 021264      021264      ;PORT4_LU13
3962 022016 016104 000004      MOV     4(R1),R4 ; PUT FOUND IN R4      +++NEW
3963 022022 042704 000023      BIC      #23,R4 ; CLEAR JUNK
3964 022026 012705 000310      MOV     #310,R5 ; GET EXPECTED.
3965 022032 032737 020000 001366      BIT      #BIT13,STAT1 ; IS LINE UNIT M8202?
3966 022040 001402      BEQ      .+6      ;
3967 022042 042705 000200      BIC      #BIT7,R5 ; NO RING ON M8202
3968
3969 022046 032737 000004 001372      BIT      #BIT2,STAT3 ; IS THIS V.35 MODEM?
3970 022054 001402      BEQ      3$      ; NO THEN GO AHEAD.
3971
3972 022056 042705 000200      BIC      #BIT7,R5 ; YES-NO RING ON V.35 MODEM
3973 022062      3$:
3974 022062 020504      CMP      R5,R4 ; ARE RING AND MODEM READY SET?
3975 022064 001401      BEQ      1$      ; WARNING! IF V.35 AND AUTO STARTED,
3976      ; YOU WILL GET THIS ERROR. YOU MUST
3977      ; MANUALL NASWER THE QUESTIONS FOR V.35.
3978 022066 104011      HLT      11      ;ERROR, MRDY NOT SET
3979 022070 005061 000004      1$:      CLR      4(R1) ;CLEAR PORT4
3980 022074 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3981 022076 122113      122113      ;CLEAR DTR
3982 022100 104416 000002      TIMER, 2
3983 022104 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3984 022106 021264      021264      ;PORT4_LU13
3985 022110 016104 000004      MOV     4(R1),R4 ; PUT FOUND IN R4      +++NEW
3986 022114 042704 000023      BIC      #23,R4 ; STRIP JUNK
3987 022120 005005      CLR      R5 ; SET EXPECTED.

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3988	022122	032737	020000	001366		BIT	#BIT13,STAT1	: IS THIS A M8202?
3989	022130	001402				BEQ	.+6	
3990	022132	052705	000010			BIS	#BIT3,R5	: YES THEN EXPECT MRDY SET.
3991	022136	032737	000004	001372		BIT	#BIT2,STAT3	: IS THIS V.35?
3992	022144	001402				BEQ	4\$	
3993	022146	042704	000200			BIC	#BIT7,R4	
3994	022152				4\$:			
3995	022152	120405				CMPB	R4,R5	: ARE RING AND MRDY CLEAR?
3996	022154	001401				BEQ	2\$	
3997								: WARNING! YOU MAY GET THIS ERROR IF V.35
3998								: AND AUTOSTART. YOU MUST MANNUALLY ANSWER
3999								: ALL QUESTIONS IF V.35.
4000	022156	104011				HIT	11	:ERROR, MRDY NOT CLEAR
4001	022160	104400			2\$:	SCOPE		:SCOPE THIS TEST
4002								
4003								
4004								:***** TEST 44 *****
4005								:*CABLE TURNAROUND TEST
4006								:*CLEAR LINE UNIT LOOP, LOAD OUT DATA SILO
4007								:*VERIFY THAT ALL MODEM SIGNALS ARE SET
4008								:*****
4009								
4010								: TEST 44
4011								:-----
4012	022162	012737	000044	001226	TST44:	MOV	#44,TSTNO	
4013	022170	012737	022356	001216		MOV	#TST45,NEXT	
4014								
4015	022176	104412				MSTCLR		;R1 CONTAINS BASE DMC11 ADDRESS
4016	022200	032737	020000	001366				;MASTER CLEAR DMC11
4017	022206	001004				BIT	#BIT13,STAT1	:IS LINE UNIT M8202?
4018	022210	032737	040000	001366		BNE	.+12	:BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
4019	022216	001456				BIT	#BIT14,STAT1	:IS TURNAROUND CONNECTOR ON?
4020	022220	012711	004000			BEQ	1\$	:SKIP TEST IF NO
4021	022224	012761	000100	000004		MOV	#BIT11,(R1)	:SET LINE UNIT LOOP
4022	022232	104414				MOV	#100, 4(R1)	:LOAD PORT4
4023	022234	122113			ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4024	022236	104416	000002			122113		:CLEAR ALL MODEM SIGNALS,EXCEPT DTR
4025	022242	012761	000001	000004		TIMER,	2	:WAIT
4026	022250	104414				MOV	#1,4(R1)	:LOAD PORT4
4027	022252	122111			ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4028	022254	004537	033634			122111		:SET SOM
4029	022260	034116				JSP	R5,MESLD	:FILL OUT DATA SILO
4030	022262	000100				MESDAT	64.	:WITH 64 CHARACTERS
4031	022264	012700	000050			MOV	#50,R0	:PREPARE FOR DELAY
4032	022270	005011				CLR	(R1)	:CLEAR LINE UNIT LOOP
4033	022272				2\$:			
4034	022272	104414			ROMCLK			:NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4035	022274	021264				021264		:PORT4,LU13
4036	022276	016104	000004			MOV	4(R1),R4	:PUT "FOUND" IN R4
4037	022302	042704	000023			BIC	#23,R4	:CLEAR UNWANTED BITS
4038	022306	012705	000354			MOV	#354,R5	:PUT "EXPECTED" IN R5
4039								
4040	022312	032737	000004	001372		BIT	#BIT2,STAT3	: SEE IF V.35
4041	022320	001402				BEQ	40\$	
4042	022322	042705	000200			BIC	#BIT7,R5	: IF SO, NO RING.
4043	022326	032737	020000	001366	40\$:	BIT	#BIT13,STAT1	: IS THIS M8202?

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4044 022334 001402      BEQ      4$      ; NO,SKIP
4045 022336 042705 000200      BIC      #BIT7,R5
4046 022342      4$:      CMPB      R5,R4      ;COMPARE EXPECTED AND FOUND
4047 022342 120504      BEQ      1$      ;BR IF OK
4048 022344 001403      DEC      R0      ;DEC DELAY COUNT
4049 022346 005300      BNE      2$      ;BR IF NOT ZERO
4050 022350 001350      HLT      11      ;ERROR, ALL SIGNALS ARE NOT SET
4051 022352 104011      ; YOU MUST ANSWER ALL QUESTIONS
4052      ; MAUNALLY IF V.35 .
4053      ; SCOPE THIS TEST
4054 022354 104400      1$:      SCOPE
4055
4056
4057      ;***** TEST 45 *****
4058      ;*TEST OF CRC OPERATION
4059
4060      ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4061      ;*0, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4062
4063      ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4064      ;*****
4065
4066      ; TEST 45
4067      ;-----
4068 022356 012737 000045 001226 TST45: MOV      #45,TSTNO
4069 022364 012737 022722 001216      MOV      #TST46,NEXT
4070 022372 012737 022426 001220      MOV      #64$,LOCK
4071
4072 022400 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
4073 022402 005061 000004      CLR      4(R1)      ;MASTER CLEAR DMC11
4074 022406 104414      ROMCLK      ;CLEAR PORT4
4075 022410 122117      122117      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4076      ;PUT LINE UNIT IN BITSTUFF MODE
4077 022412 004737 033676      JSR      PC,CLRIO      ;DO THIS AFTER MODE IS SET
4078 022416 005037 034114      CLR      BITCON      ;CONSECUTIVE 1'S COUNTER INIT TO 0
4079 022422 012711 004000      MOV      #BIT11,(R1)      ;SET LU LOOP
4080 022426 004737 033676      64$: JSR      PC,CLRIO      ;CLEAR BCC REGISTERS
4081 022432 005000      CLR      R0      ;START SHIFT COUNTER AT ZERO
4082 022434 012737 102010 033332      MOV      #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL FOR SOFTWARE BCC
4083 022442 012737 000000 022506      MOV      #0,66$      ;LOAD CHAR FOR SOFTWARE BCC
4084 022450 005037 022510      CLR      67$      ;CLEAR OLD SOFTWARE BCC
4085 022454 005137 022510      COM      67$      ;START AT -1
4086 022460 004737 033336      JSR      PC,BCCLD      ;LOAD OUT SILO WITH 2 SYNCs
4087 022464 000000      0      ;AND THE CHARACTER 0
4088 022466 104415 000021      DATACLK, 21      ;GET TRANSMITTER ACTIVE
4089 022472 104415 000001      65$: DATACLK, 1      ;SHIFT BCC ONCE
4090
4091 022476 005200      INC      R0      ;BUMP SHIFT COUNT
4092
4093 022500 004537 033210      JSR      R5,SIMBCC      ;CALCULATE SOFTWARE BCC LSB
4094 022504 000001      1      ;ONE SHIFT
4095 022506 000000      66$: 0      ;DATA CHARACTER
4096 022510 000000      67$: 0      ;OLD BCC
4097 022512 103405      BCS      68$      ;BR IF SOFT BCC LSB IS SET
4098 022514 004737 033450      JSR      PC,GE'00      ;GET HARDWARE TRANSMITTER BCC LSB
4099 022520 103006      BCC      69$      ;BR IF HARD BCC LSB IS CLEAR

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4100 022522 104012
4101 022524 000404
4102 022526 004737 033450
4103 022532 103401
4104 022534 104016
4105 022536
4106 022536 006037 022506
4107 022542 013737 033334 022510
4108 022550 022700 000010
4109 022554 001346
4110 022556 104401
4111 022560 012737 022566 001220
4112 022566 004737 033676
4113 022572 005000
4114 022574 012737 102010 033332
4115 022602 012737 000000 022646
4116 022610 005037 022650
4117 022614 005137 022650
4118 022620 004737 033336
4119 022624 000000
4120 022626 104415 000032
4121 022632 104415 000001
4122
4123 022636 005200
4124
4125 022640 004537 033210
4126 022644 000001
4127 022646 000000
4128 022650 000000
4129 022652 103405
4130 022654 004737 033462
4131 022660 103006
4132 022662 104013
4133 022664 000404
4134 022666 004737 033462
4135 022672 103401
4136 022674 104017
4137 022676
4138 022676 006037 022646
4139 022702 013737 033334 022650
4140 022710 022700 000010
4141 022714 001346
4142 022716 104401
4143 022720 104400
4144
4145
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4151
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4153
4154
4155

      68$:
      69$:
      71$:
      72$:
      73$:
      74$:
      75$:
      76$:
      77$:

      HLT 12 ;ERROR, BCC LSB IS SET
      BR 69$ ;CONTINUE
      JSR PC,GETQO ;GET HARDWARE TRANSMITTER BCC LSB
      BCS 69$ ;BR IF HARD BCC LSB IS SET
      HLT 16 ;ERROR, HARD BCC LSB IS CLEAR

      ROR 66$ ;SHIFT SOFT DATA
      MOV CALBCC,67$ ;LOAD OLD SOFT BCC
      CMP #10,RO ;DONE YET?
      BNE 65$ ;BR IF NOT DONE
      SCOP1 ;SCOPE SUBTEST (SW09=1)

      MOV #71$,LOCK ;NEW SCOPE1
      JSR PC,CLR10 ;CLEAR BCC REGISTERS
      CLR RO ;START SHIFT COUNTER AT ZERO
      MOV #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL FOR SOFTWARE BCC
      MOV #0,73$ ;LOAD CHAR FOR SOFTWARE BCC
      CLR 74$ ;CLEAR OLD SOFTWARE BCC
      COM 74$ ;START AT -1
      JSR PC,BCCLD ;LOAD OUT SILO WITH 2 SYNCs
      0 ;AND THE CHARACTER 0
      DATACLK, 32 ;GET RECEIVER ACTIVE
      DATACLK, 1 ;SHIFT BCC ONCE

      INC RO ;BUMP SHIFT COUNT

      JSR R5,SIMBCC ;CALCULATE SOFTWARE BCC LSB
      1 ;ONE SHIFT
      0 ;DATA CHARACTER
      0 ;OLD BCC
      BCS 75$ ;BR IF SOFT BCC LSB IS SET
      JSR PC,GETQI ;GET HARDWARE RECEIVER BCC LSB
      BCC 76$ ;BR IF HARD BCC LSB IS CLEAR
      HLT 13 ;ERROR, BCC LSB IS SET
      BR 76$ ;CONTINUE
      JSR PC,GETQI ;GET HARDWARE RECEIVER BCC LSB
      BCS 76$ ;BR IF HARD BCC LSB IS SET
      HLT 17 ;ERROR, BCC LSB IS CLEAR

      ROR 73$ ;SHIFT SOFT DATA
      MOV CALBCC,74$ ;LOAD OLD SOFT BCC
      CMP #10,RO ;DONE YET?
      BNE 72$ ;BR IF NOT DONE
      SCOP1 ;SCOPE SUBTEST (SW09=1)

      ;***** TEST 46 *****
      ;*TEST OF CRC OPERATION
      ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
      ;*377, VERIFY THE LSB OF THE BCC ON EACH SHIFT
      ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
      ;*****
      ; TEST 46

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SF0 0082

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

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4212 023206 005137 023242      COM      74$      ;START AT -1
4213 023212 004737 033336      JSR      PC,BCCLD ;LOAD OUT SILO WITH 2 SYNCs
4214 023216 000377              377          ;AND THE CHARACTER 377
4215 023220 104415 000033      DATACLK, 33      ;GET RECEIVER ACTIVE
4216 023224 104415 000001      DATACLK, 1        ;SHIFT BCC ONCE
4217
4218 023230 005200              INC      RO        ;BUMP SHIFT COUNT
4219
4220 023232 004537 033210      JSR      R5,SIMBCC ;CALCULATE SOFTWARE BCC LSB
4221 023236 000001              1            ;ONE SHIFT
4222 023240 000000      73$: 0            ;DATA CHARACTER
4223 023242 000000      74$: 0            ;OLD BCC
4224 023244 103405              BCS      75$      ;BR IF SOFT BCC LSB IS SET
4225 023246 004737 033462      JSR      PC,GETQI ;GET HARDWARE RECEIVER BCC LSB
4226 023252 103006              BCC      76$      ;BR IF HARD BCC LSB IS CLEAR
4227 023254 104013              HLT      13        ;ERROR, BCC LSB IS SET
4228 023256 000404              BR       76$      ;CONTINUE
4229 023260 004737 033462      75$: JSR      PC,GETQI ;GET HARDWARE RECEIVER BCC LSB
4230 023264 103401              BCS      76$      ;BR IF HARD BCC LSB IS SET
4231 023266 104017              HLT      17        ;ERROR, BCC LSB IS CLEAR
4232
4233 023270 006037 023240      76$: ROR      73$      ;SHIFT SOFT DATA
4234 023274 013737 033334 023242 MOV      CALBCC,74$ ;LOAD OLD SOFT BCC
4235 023302 022700 000010      CMP      #10,R0 ;DONE YET?
4236 023306 001346              BNE      72$      ;BR IF NOT DONE
4237 023310 104401              SCOPE1 ;SCOPE SUBTEST (SW09=1)
4238 023312 104400      77$: SCOPE ;SCOPE THIS TEST
4239
4240
4241 ;***** TEST 47 *****
4242 ;*TEST OF CRC OPERATION
4243
4244 ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4245 ;*125, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4246
4247 ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4248 ;*****
4249
4250 ; TEST 47
4251 ;-----
4252 023314 012737 000047 001226 TST47: MOV      #47,TSTNO
4253 023322 012737 023660 001216 MOV      #TST50,NEXT
4254 023330 012737 023364 001220 MOV      #64$,LOCK
4255
4256 023336 104412              MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
4257 023340 005061 000004              CLR      4(R1) ;MASTER CLEAR DMC11
4258 023344 104414              ROMCLK ;CLEAR PORT4
4259 023346 122117              122117 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4260 ;PUT LINE UNIT IN BITSTUFF MODE
4261 023350 004737 033676              JSR      PC,CLRIO ;DO THIS AFTER MODE IS SET
4262 023354 005037 034114              CLR      BITCON ;CONSECUTIVE 1'S COUNTER INIT TO 0
4263 023360 012711 004000              MOV      #BIT11,(R1) ;SET LU LOOP
4264 023364 004737 033676      64$: JSR      PC,CLRIO ;CLEAR BCC REGISTERS
4265 023370 005000              CLR      RO        ;START SHIFT COUNTER AT ZERO
4266 023372 012737 102010 033332 MOV      #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL FOR SOFTWARE BCC
4267 023400 012737 000125 023444 MOV      #125,66$ ;LOAD CHAR FOR SOFTWARE BCC

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4268	023406	005037	023446		CLR	67\$		;CLEAR OLD SOFTWARE BCC
4269	023412	005137	023446		COM	67\$		;START AT -1
4270	023416	004737	033336		JSR	PC,BCCLD		;LOAD OUT SILO WITH 2 SYNCs
4271	023422	000125			125			;AND THE CHARACTER 125
4272	023424	104415	000021		DATACLK,	21		;GET TRANSMITTER ACTIVE
4273	023430	104415	000001	65\$:	DATACLK,	1		;SHIFT BCC ONCE
4274								
4275	023434	005200			INC	R0		;BUMP SHIFT COUNT
4276								
4277	023436	004537	033210		JSR	R5,SIMBCC		;CALCULATE SOFTWARE BCC LSB
4278	023442	000001			1			;ONE SHIFT
4279	023444	000000		66\$:	0			;DATA CHARACTER
4280	023446	000000		67\$:	0			;OLD BCC
4281	023450	103405			BCS	68\$		;BR IF SOFT BCC LSB IS SET
4282	023452	004737	033450		JSR	PC,GETQ0		;GET HARDWARE TRANSMITTER BCC LSB
4283	023456	103006			BCC	69\$		;BR IF HARD BCC LSB IS CLEAR
4284	023460	104012			HLT	12		;ERROR, BCC LSB IS SET
4285	023462	000404			BR	69\$		;CONTINUE
4286	023464	004737	033450	68\$:	JSR	PC,GETQ0		;GET HARDWARE TRANSMITTER BCC LSB
4287	023470	103401			BCS	69\$		;BR IF HARD BCC LSB IS SET
4288	023472	104016			HLT	16		;ERROR, HARD BCC LSB IS CLEAR
4289	023474			69\$:				
4290	023474	006037	023444		ROR	66\$		;SHIFT SOFT DATA
4291	023500	013737	033334	023446	MOV	CALBCC,67\$		;LOAD OLD SOFT BCC
4292	023506	022700	000010		CMP	#10,R0		;DONE YET?
4293	023512	001346			BNE	65\$		;BR IF NOT DONE
4294	023514	104401			SCOPE1			;SCOPE SUBTEST (SW09-1)
4295	023516	012737	023524	001220	MOV	#71\$,LOCK		;NEW SCOPE1
4296	023524	004737	033676		JSR	PC,CLR10		;CLEAR BCC REGISTERS
4297	023530	005000			CLR	R0		;START SHIFT COUNTER AT ZERO
4298	023532	012737	102010	033332	MOV	#CRC.CCITT,XPOLY		;LOAD POLYNOMIAL FOR SOFTWARE BCC
4299	023540	012737	000125	023604	MOV	#125,73\$;		;LOAD CHAR FOR SOFTWARE BCC
4300	023546	005037	023606		CLR	74\$		;CLEAR OLD SOFTWARE BCC
4301	023552	005137	023606		COM	74\$		;START AT -1
4302	023556	004737	033336		JSR	PC,BCCLD		;LOAD OUT SILO WITH 2 SYNCs
4303	023562	000125			125			;AND THE CHARACTER 125
4304	023564	104415	000032		DATACLK,	32		;GET RECEIVER ACTIVE
4305	023570	104415	000001	72\$:	DATACLK,	1		;SHIFT BCC ONCE
4306								
4307	023574	005200			INC	R0		;BUMP SHIFT COUNT
4308								
4309	023576	004537	033210		JSR	R5,SIMBCC		;CALCULATE SOFTWARE BCC LSB
4310	023602	000001			1			;ONE SHIFT
4311	023604	000000		73\$:	0			;DATA CHARACTER
4312	023606	000000		74\$:	0			;OLD BCC
4313	023610	103405			BCS	75\$		;BR IF SOFT BCC LSB IS SET
4314	023612	004737	033462		JSR	PC,GETQ1		;GET HARDWARE RECEIVER BCC LSB
4315	023616	103006			BCC	76\$		;BR IF HARD BCC LSB IS CLEAR
4316	023620	104013			HLT	13		;ERROR, BCC LSB IS SET
4317	023622	000404			BR	76\$		;CONTINUE
4318	023624	004737	033462	75\$:	JSR	PC,GETQ1		;GET HARDWARE RECEIVER BCC LSB
4319	023630	103401			BCS	76\$		;BR IF HARD BCC LSB IS SET
4320	023632	104017			HLT	17		;ERROR, BCC LSB IS CLEAR
4321	023634			76\$:				
4322	023634	006037	023604		ROR	73\$		;SHIFT SOFT DATA
4323	023640	013737	033334	023606	MOV	CALBCC,74\$		;LOAD OLD SOFT BCC

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4324 023646 022700 000010      CMP    #0,R0      ;DONE YET?
4325 023652 001346      BNE     72$      ;BR IF NOT DONE
4326 023654 104401      SCOPE1      ;SCOPE SUBTEST (SW09=1)
4327 023656 104400      77$: SCOPE      ;SCOPE THIS TEST
4328
4329
4330      ;***** TEST 50 *****
4331      ;*TEST OF CRC OPERATION
4332
4333      ;*USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4334      ;*252, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4335
4336      ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4337      ;*****
4338
4339      ; TEST 50
4340      ;-----
4341 023660 012737 000050 001226 TST50: MOV    #50,TSTNO
4342 023666 012737 024224 001216      MOV    #TST51,NEXT
4343 023674 012737 023730 001220      MOV    #64$,LOCK
4344
4345 023702 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
4346 023704 005061 000004      CLR     4(R1)      ;MASTER CLEAR DMC11
4347 023710 104414      ROMCLK      ;CLEAR PORT4
4348 023712 122117      122117      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4349      ;PUT LINE UNIT IN BITSTUFF MODE
4350 023714 004737 033676      JSR     PC,CLRIO      ;DO THIS AFTER MODE IS SET
4351 023720 005037 034114      CLR     BITCON      ;CONSECUTIVE 1'S COUNTER INIT TO 0
4352 023724 012711 004000      MOV    #BIT11,(R1)      ;SET LU LOOP
4353 023730 004737 033676      64$: JSR     PC,CLRIO      ;CLEAR BCC REGISTERS
4354 023734 005000      CLR     R0      ;START SHIFT COUNTER AT ZERO
4355 023736 012737 102010 033332      MOV    #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL FOR SOFTWARE BCC
4356 023744 012737 000252 024010      MOV    #252,66$      ;LOAD CHAR FOR SOFTWARE BCC
4357 023752 005037 024012      CLR     67$      ;CLEAR OLD SOFTWARE BCC
4358 023756 005137 024012      COM     67$      ;START AT -1
4359 023762 004737 033336      JSR     PC,BCCLD      ;LOAD OUT SILO WITH 2 SYNCs
4360 023766 000252      252      ;AND THE CHARACTER 252
4361 023770 104415 000021      DATACLK, 21      ;GET TRANSMITTER ACTIVE
4362 023774 104415 000001      65$: DATACLK, 1      ;SHIFT BCC ONCE
4363
4364 024000 005200      INC     R0      ;BUMP SHIFT COUNT
4365
4366 024002 004537 033210      JSR     R5,SIMBCC      ;CALCULATE SOFTWARE BCC LSB
4367 024006 000001      1      ;ONE SHIFT
4368 024010 000000      66$: 0      ;DATA CHARACTER
4369 024012 000000      67$: 0      ;OLD BCC
4370 024014 103405      BCS     68$      ;BR IF SOFT BCC LSB IS SET
4371 024016 004737 033450      JSR     PC,GETQO      ;GET HARDWARE TRANSMITTER BCC LSB
4372 024022 103006      BCC     69$      ;BR IF HARD BCC LSB IS CLEAR
4373 024024 104012      HLT     12      ;ERROR, BCC LSB IS SET
4374 024026 000404      BR     69$      ;CONTINUE
4375 024030 004737 033450      68$: JSR     PC,GETQO      ;GET HARDWARE TRANSMITTER BCC LSB
4376 024034 103401      BCS     69$      ;BR IF HARD BCC LSB IS SET
4377 024036 104016      HLT     16      ;ERROR, HARD BCC LSB IS CLEAR
4378 024040
4379 024040 006037 024010      69$: ROR     66$      ;SHIFT SOFT DATA

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4380	024044	013737	033334	024012		MOV	CALBCC,67\$	;LOAD OLD SOFT BCC
4381	024052	022700	000010			CMP	#10,R0	;DONE YET?
4382	024056	001346				BNE	65\$	;BR IF NOT DONE
4383	024060	104401				SCOPE1		;SCOPE SUBTEST (SW09=1)
4384	024062	012737	024070	001220		MOV	#71\$,LOCK	;NEW SCOPE!
4385	024070	004737	033676		71\$:	JSR	PC,CLRIO	;CLEAR BCC REGISTERS
4386	024074	005000				CLR	R0	;START SHIFT COUNTER AT ZERO
4387	024076	012737	102010	033332		MOV	#CRC.CCITT,XPOLY	;LOAD POLYNOMIAL FOR SOFTWARE BCC
4388	024104	012737	000252	024150		MOV	#252,73\$;	;LOAD CHAR FOR SOFTWARE BCC
4389	024112	005037	024152			CLR	74\$	;CLEAR OLD SOFTWARE BCC
4390	024116	005137	024152			COM	74\$	;START AT -1
4391	024122	004737	033336			JSR	PC,BCCLD	;LOAD OUT SILO WITH 2 SYNC'S
4392	024126	000252				252		;AND THE CHARACTER 252
4393	024130	104415	000032			DATACLK,	32	;GET RECEIVER ACTIVE
4394	024134	104415	000001		72\$:	DATACLK,	1	;SHIFT BCC ONCE
4395								
4396	024140	005200				INC	R0	;BUMP SHIFT COUNT
4397								
4398	024142	004537	033210			JSR	R5,SIMBCC	;CALCULATE SOFTWARE BCC LSB
4399	024146	000001				1		;ONE SHIFT
4400	024150	000000			73\$:	0		;DATA CHARACTER
4401	024152	000000			74\$:	0		;OLD BCC
4402	024154	103405				BCS	75\$	;BR IF SOFT BCC LSB IS SET
4403	024156	004737	033462			JSR	PC,GETOI	;GET HARDWARE RECEIVER BCC LSB
4404	024162	103006				BCC	76\$	;BR IF HARD BCC LSB IS CLEAR
4405	024164	104013				HLT	13	;ERROR, BCC LSB IS SET
4406	024166	000404				BR	76\$	;CONTINUE
4407	024170	004737	033462		75\$:	JSR	PC,GETOI	;GET HARDWARE RECEIVER BCC LSB
4408	024174	103401				BCS	76\$	;BR IF HARD BCC LSB IS SET
4409	024176	104017				HLT	17	;ERROR, BCC LSB IS CLEAR
4410	024200				76\$:			
4411	024200	006037	024150			ROR	73\$	;SHIFT SOFT DATA
4412	024204	013737	033334	024152		MOV	CALBCC,74\$	;LOAD OLD SOFT BCC
4413	024212	022700	000010			CMP	#10,R0	;DONE YET?
4414	024216	001346				BNE	72\$	;BR IF NOT DONE
4415	024220	104401				SCOPE1		;SCOPE SUBTEST (SW09=1)
4416	024222	104400			77\$:	SCOPE		;SCOPE THIS TEST

[illegible]

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

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4492 024522 003404
4493 024524 010461 000004
4494 024530 104414
4495 024532 122110
4496 024534 005205
4497 024536 022705 000400
4498 024542 001313
4499 024544 104400
4500
4501
4502
4503
4504
4505
4506
4507
4508
4509
4510 024546 012737 000052 001226 TST52:
4511 024554 012737 025104 001216
4512
4513 024562 104412
4514 024564 005061 000004
4515 024570 104414
4516 024572 122117
4517 024574 004737 033676
4518 024600 005037 034114
4519 024604 012711 004000
4520 024610 005003
4521 024612 005004
4522 024614 005005
4523 024616 005037 024750
4524 024622 005137 024750
4525 024626 012737 102010 033332
4526 024634 004737 033500
4527 024640 010461 000004
4528 024644 104414
4529 024646 122110
4530 024650 005204
4531 024652 010461 000004
4532 024656 104414
4533 024660 122110
4534 024662 005204
4535 024664 010461 000004
4536 024670 104414
4537 024672 122110
4538 024674 004737 032346
4539 024700 104415 000032
4540 024704 010537 024734
4541 024710 005237 024734
4542 024714 012700 000010
4543 024720 010537 024746
4544 024724 104415 000001
4545 024730 004537 033776
4546 024734 000000
4547 024736 000001

      BLE 9$ ;BR IF YES
      MOV R4,4(R1) ;PORT4 DATA
      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
      122110 ;LOAD OUT DATA
9$: INC R5 ;INCREMENT DATA
      CMP #400,R5 ;DONE BINARY PATTERN YET?
      BNE 1$ ;BR IF NO
7$: SCOPE ;SCOPE THIS TEST

;***** TEST 52 *****
; *RECEIVER CRC TEST
; *USING THE CRC.CCITT POLYNOMIAL, SINGLE CLOCK A BINARY
; *COUNT PATTERN, VERIFY THE LSB OF THE RECEIVER BCC ON EACH SHIFT
;*****

; TEST 52
;-----
MOV #52,TSTNO
MOV #TST53,NEXT
;R1 CONTAINS BASE DMC11 ADDRESS
MSTCLR ;MASTER CLEAR DMC11
CLR 4(R1) ;CLEAR PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
      122117 ;PUT LINE UNIT IN BITSTUFF MODE
      JSR PC,CLR10 ;DO THIS AFTER MODE IS SET
      CLR BITCON ;CONSECUTIVE 1'S COUNTER INIT TO 0
      MOV #BIT11,(R1) ;SET LINE UNIT LOOP
      CLR R3 ;ZERO BIT COUNT
      CLR R4 ;R4 CONTAINS CHAR TO BE LOADED IN SILO
      CLR R5 ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
      CLR 4$ ;CLEAR SOFT BCC
      COM 4$ ;START AT -1
      MOV #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL
      JSR PC,SYNLD ;LOAD SILO WITH 2 SYNCs, SOM SET
      MOV R4,4(R1) ;PORT4 CHAR
      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
      122110 ;LOAD OUT DATA
      INC R4 ;INCREMENT TO NEXT CHARACTER
      MOV R4,4(R1) ;PORT4 CHAR
      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
      122110 ;LOAD OUT DATA
      INC R4 ;INCREMENT TO NEXT CHARACTER
      MOV R4,4(R1) ;PORT4 CHAR
      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
      122110 ;LOAD OUT DATA
      JSR PC,OCOR ;WAIT FOR OCOR
      DATACLK,32 ;CLOCK DATA
      MOV R5,10$ ;START WITH ZERO
      INC 10$ ;TRANSMITTER IS ONE CHAR AHEAD
      MOV #10,R0 ;R0 = CHAR COUNT
      1$: MOV R5,3$ ;LOAD CHAR FOR SOFT LRC
      2$: DATACLK,1 ;SHIFT BCC ONCE
      JSR R5,STFFCK ;CHECK BIT STUFFING
      10$: 0 ;CHARACTER
      1 ;SHIFT COUNT

```

```

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

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4604	025130	122117		122117		;PUT LINE UNIT IN BITSTUFF MODE
4605	025132	004737	033676	JSR	PC,CLR10	;DO THIS AFTER MODE IS SET
4606	025136	005037	034114	CLR	BITCON	;CONSECUTIVE 1'S COUNTER INIT TO 0
4607						
4608						
4609						;LOAD OUT DATA SILO
4610	025142	012711	004000	MOV	#BIT11,(R1)	;SET LINE UNIT LOOP
4611	025146	012704	034116	MOV	#MESDAT,R4	;LOAD POINTER TO DATA
4612	025152	005037	025262	CLR	10\$	;CLEAR SOFT BCC
4613	025156	005137	025262	COM	10\$	;START AT -1
4614	025162	012700	000004	MOV	#4,R0	;LOAD CHARACTER COUNT
4615	025166	004737	033500	JSR	PC,SYNLD	;LOAD 2 FLAG CHARACTERS IN OUT SILO
4616	025172	004737	032500	JSR	PC,OUTRDY	;WAIT FOR OUTRDY
4617	025176	004537	033634	JSR	R5,MESLD	;LOAD SILO WITH 4 CHAR MESS
4618	025202	034116		MESDAT		;ADDRESS OF MESSAGE
4619	025204	000004		4		;NUMBER OF CHARACTERS
4620	025206	004737	033610	JSR	PC,EOM	;LOAD GARBAGE CHARACTER, WITH EOM SET
4621	025212	004737	033610	JSR	PC,EOM	
4622	025216	004737	032346	JSR	PC,OCOR	;WAIT FOR OCOR
4623	025222	005003		CLR	R3	;CLEAR BIT COUNTER
4624	025224	104415	000022	DATA CLK,22		;CLOCK DATA
4625	025230	112405		MOVB	(R4)+,R5	;LOAD R5 WITH CHAR
4626	025232	010502		MOV	R5,R2	;LOAD R2 WITH CHAR
4627						
4628						;CHECK FIRST FOUR CHARACTER MESSAGE
4629						;IN THE BIT WINDOW (0,125,252,377)
4630						
4631	025234	010537	025330	MOV	R5,71\$	;LOAD FOR STUFF CHECK
4632	025240	012737	102010	MOV	#CRC.CCITT,XPOLY	;LOAD POLYNOMIAL
4633	025246	010537	025260	MOV	R5,67\$	;LOAD SOFT CHAR FOR BCC
4634	025252	004537	033210	JSR	R5,SIMBCC	;CALCULATE SOFT BCC
4635	025256	000010		10		;SHIFT COUNT
4636	025260	000000		0		;CHARACTER
4637	025262	000000		0		;OLD BCC
4638	025264	013737	033334	MOV	CALBCC,10\$	;LOAD SOFT BCC FOR NEXT SHIFT
4639	025272	104415	000001	DATA CLK,1		;SHIFT DATA IN TO BIT WINDOW
4640	025276	106002		RORB	R2	;SHIFT SOFT DATA
4641	025300	103005		BCC	65\$	;BR IF A SPACE
4642	025302	004737	032314	JSR	PC,GETSI	;LOOK AT BIT WINDOW
4643	025306	103406		BCS	66\$	;BR IF OK (MARK)
4644	025310	104006		HLT	6	;ERROR, BIT WINDOW WAS A SPACE
4645	025312	000404		BR	66\$	;CONTINUE
4646	025314	004737	032314	JSR	PC,GETSI	;LOOK AT BIT WINDOW
4647	025320	103001		BCC	66\$	;BR IF OK (SPACE)
4648	025322	104006		HLT	6	;ERROR, BIT WINDOW WAS A MARK
4649	025324					
4650	025324	004537	033776	JSR	R5,STFFCK	
4651	025330	000000		0		
4652	025332	000001		1		
4653	025334	110237	025330	MOVB	R2,71\$	;SHIFT FOR NEXT STUFF CHECK
4654	025340	005203		INC	R3	;BUMP BIT COUNTER
4655	025342	022703	000010	CMP	#10,R3	;DONE FULL 8 BITS YET
4656	025346	001351		BNE	64\$	;BR IF NO
4657	025350	005003		CLR	R3	;CLEAR BIT COUNTER
4658	025352	005300		DEC	R0	;DEC CHARACTER COUNT
4659	025354	001325		BNE	12\$	;BR IF NOT DONE YET

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4660
4661
4662
4663 025356 005137 033334
4664 025362 013700 033334
4665 025366 010037 025430
4666 025372 104415 000001
4667 025376 006000
4668 025400 103005
4669 025402 004737 032314
4670 025406 103406
4671 025410 104014
4672 025412 000404
4673 025414 004737 032314
4674 025420 103001
4675 025422 104014
4676 025424
4677 025424 004537 033776
4678 025430 000000
4679 025432 000001
4680 025434 010037 025430
4681 025440 005203
4682 025442 022703 000020
4683 025446 001351
4684 025450 005003
4685
4686
4687
4688 025452 012737 000176 001252
4689 025460 104415 000001
4690 025464 106037 001252
4691 025470 103405
4692 025472 004737 032314
4693 025476 103006
4694 025500 104026
4695 025502 000404
4696 025504 004737 032314
4697 025510 103401
4698 025512 104026
4699 025514 005203
4700 025516 022703 000010
4701 025522 001356
4702 025524 005003
4703
4704
4705
4706 025526 104415 000001
4707 025532 004737 032314
4708 025536 103401
4709 025540 104024
4710 025542 005203
4711 025544 022703 000007
4712 025550 001366
4713 025552 104415 000010
4714 025556 005003
4715 025560 104415 000001

;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
COM CALBCC ;ADJUST BCC FOR SDLC
MOV CALBCC,R0 ;PUT BCC IN R0
MOV R0,72$ ;LOAD BCC FOR STUFF CHECK
68$: DATACLK,1 ;SHIFT HARDWARE BCC
ROR R0 ;SHIFT SOFT BCC
BCC 69$ ;BR IF CARRY CLEAR
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 70$ ;BR IF OK (MARK)
HLT 14 ;ERROR, CRC WRONG (SPACE)
BR 70$ ;CONTINUE
69$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 70$ ;BR IF OK (SPACE)
HLT 14 ;ERROR, CRC WRONG (MARK)
70$:
72$: JSR R5,STFFCK ;CHECK BCC CHAR FOR ZERO STUFFS
0 ;CHARACTER
1 ;SHIFT COUNT
MOV R0,72$ ;SHIFT SOFTBCC ONCE
INC R3 ;BUMP BIT COUNTER
CMP #20,R3 ;FINISHED BCC YET?
BNE 68$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNTER

;CHECK FOR FLAG TO FOLLOW BCC
MOV #B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
73$: DATACLK,1 ;CLOCK FLAG ONCE
RORB TEMP3 ;SHIFT SOFT FLAG
BCS 74$ ;BR IF BIT IS MARK
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 75$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
BR 75$
74$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 75$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
75$: INC R3 ;INC BIT COUNT
CMP #10,R3 ;FLAG DONE YET?
BNE 73$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNT

;CHECK TO SEE IF TRANSMITTER IS MARKING
2$: DATACLK,1 ;CLOCK TRANSMITTER
JSR PC,GETSI ;LOOK AT WINDOW
BCS 3$ ;IT SHOULD BE MARKING
HLT 24 ;ERROR, BIT WAS A SPACE
3$: INC R3 ;BUMP BIT COUNTER
CMP #7,R3 ;DONE YET
BNE 2$ ;BR IF NO
DATACLK,10 ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
CLR R3 ;CLEAR BIT COUNTER
4$: DATACLK,1 ;SHIFT OUT NEXT BIT

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

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C 8

SEQ 0093

4772 025762 042737 177400 001252
 4773 025770 004737 033154
 4774 025774 104414
 4775 025776 021244
 4776 026000 016104 000004
 4777 026004 042704 000374
 4778 026010 012705 000003
 4779 026014 120504
 4780 026016 001401
 4781 026020 104042
 4782 026022
 4783 026022 104414
 4784 026024 021204
 4785 026026 104400
 4786
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 4789
 4790
 4791
 4792
 4793
 4794
 4795
 4796
 4797
 4798
 4799
 4800
 4801 026030 012737 000055 001226 TST55:
 4802 026036 012737 027430 001216
 4803
 4804 026044 104412
 4805 026046 005061 000004
 4806 026052 104414
 4807 026054 122117
 4808 026056 004737 033676
 4809 026062 005037 034114
 4810
 4811
 4812
 4813 026066 012711 004000
 4814 026072 012704 034116
 4815 026076 005037 026226
 4816 026102 005137 026226
 4817 026106 012700 000004
 4818 026112 004737 033500
 4819 026116 004737 032500
 4820 026122 004537 033634
 4821 026126 034116
 4822 026130 000004
 4823 026132 004737 033610
 4824 026136 004737 033610
 4825 026142 004537 033634
 4826 026146 034116
 4827 026150 000004

BIC #177400,TEMP3 ;CLEAR HI BYTE
 JSR PC,INRDY ;WAIT FOR INRDY
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021244
 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
 BIC #374,R4 ;CLEAR UNWANTED BITS
 MOV #3,R5 ;PUT 'EXPECTED' IN R5
 CMPB R5,R4 ;ARE IN BCC MATCH AND PLOCK END SET?
 BEQ 25\$
 HLT 42 ;IN BCC MATCH ERROR
 25\$:
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021204 ;GET LAST HALF
 2\$: SCOPE ;SCOPE THIS TEST

***** TEST 55 *****
 ;*BITSTUFF EOM FUNCTION TEST
 ;*THIS TEST LOADS OUT SILO WITH: 2 FLAGS,4 CHAR MESSAGE,EOM
 ;*4 CHARACTER MESS,EOM. THE DATA STREAM IS CHECKED TO BE
 ;*4 CHAR,BCC,FLAG,4 CHAR,BCC,FLAG,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 55

MOV #55,TSTNO
 MOV #TST56,NEXT

MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
 CLR 4(R1) ;MASTER CLEAR DMC11
 ROMCLK ;CLEAR PORT4
 122117 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 JSR PC,CLRIO ;PUT LINE UNIT IN BITSTUFF MODE
 CLR BITCON ;DO THIS AFTER MODE IS SET
 ;CONSECUTIVE 1'S COUNTER INIT TO 0

;LOAD OUT DATA SILO

MOV #BIT11,(R1) ;SET LINE UNIT LOOP
 MOV #MESDAT,R4 ;LOAD POINTER TO DATA
 CLR 10\$;CLEAR SOFT BCC
 COM 10\$;START AT -1
 MOV #4,R0 ;LOAD CHARACTER COUNT
 JSR PC,SYNLD ;LOAD 2 FLAG CHARACTERS IN OUT SILO
 JSR PC,OUTRDY ;WAIT FOR OUTRDY
 JSR R5,MESLD ;LOAD SILO WITH 4 CHAR MESS
 MESDAT ;ADDRESS OF MESSAGE
 4 ;NUMBER OF CHARACTERS
 JSR PC,EOM ;LOAD GARBAGE CHARACTER, WITH EOM SET
 JSR PC,EOM
 JSR R5,MESLD ;LOAD FOUR MORE CHARACTERS
 MESDAT ;ADDRESS OF MESSAGE
 4 ;NUMBER OF CHACTERS

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

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4884 026370
4885 026370 004537 033776
4886 026374 000000
4887 026376 000001
4888 026400 010037 026374
4889 026404 005203
4890 026406 022703 000020
4891 026412 001351
489 026414 005003
489
4894
4895
4896 026416 012737 000176 001252
4897 026424 104415 000001 73$
4898 026430 106037 001252
4899 026434 103405
4900 026436 004737 032314
4901 026442 103006
4902 026444 104026
4903 026446 000404
4904 026450 004737 032314 74$
4905 026454 103401
4906 026456 104026
4907 026460 005203 75$
4908 026462 022703 000010
4909 026466 001356
4910 026470 005003
4911 026472 012700 000004
4912 026476 012704 034116
4913 026502 005037 026544
4914 026506 005137 026544
4915 026512 112405
4916 026514 010502
4917
4918
4919
4920 026516 010537 026612
4921 026522 012737 102010 033332
4922 026530 010537 026542
4923 026534 004537 033210
4924 026540 000010
4925 026542 000000
4926 026544 000000
4927 026546 013737 033334 026544
4928 026554 104415 000001
4929 026560 106002
4930 026562 103005
4931 026564 004737 032314
4932 026570 103406
4933 026572 104006
4934 026574 000404
4935 026576 004737 032314
4936 026602 103001
4937 026604 104006
4938 026606
4939 026606 004537 033776

70$: JSR R5,STFFCK ;CHECK BCC CHAR FOR ZERO STUFFS
72$: 0 ;CHARACTER
1 ;SHIFT COUNT
MOV R0,72$ ;SHIFT SOFTBCC ONCE
INC R3 ;BUMP BIT COUNTER
CMP #20,R3 ;FINISHED BCC YET?
BNE 68$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNTER

;CHECK FOR FLAG TO FOLLOW BCC
MOV #B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
73$: DATACLK, 1 ;CLOCK FLAG ONCE
RORB TEMP3 ;SHIFT SOFT FLAG
BCS 74$ ;BR IF BIT IS MARK
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 75$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
BR 75$
74$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 75$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
75$: INC R3 ;INC BIT COUNT
CMP #10,R3 ;FLAG DONE YET?
BNE 73$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNT
MOV #4,R0 ;RESET CHARACTER COUNTER
MOV #MESDAT,R4 ;LOAD MESSAGE POINTER
CLR 11$ ;CLR SOFT BCC
COM 11$ ;ADJUST TO -1 FOR SDLC
13$: MOVB (R4)+,R5 ;LOAD CHAR IN R5
MOV R5,R2 ;LOAD CHAR IN R2

;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
MOV R5,83$ ;LOAD FOR STUFF CHECK
MOV #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL
MOV R5,79$ ;LOAD SOFT CHAR FOR BCC
JSR R5,SIMBCC ;CALCULATE SOFT BCC
10 ;SHIFT COUNT
79$: 0 ;CHARACTER
11$: 0 ;OLD BCC
MOV CALBCC,11$ ;LOAD SOFT BCC FOR NEXT SHIFT
76$: DATACLK, 1 ;SHIFT DATA IN TO BIT WINDOW
RORB R2 ;SHIFT SOFT DATA
BCC 77$ ;BR IF A SPACE
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 78$ ;BR IF OK (MARK)
HLT 6 ;ERROR, BIT WINDOW WAS A SPACE
BR 78$ ;CONTINUE
77$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 78$ ;BR IF OK (SPACE)
HLT 6 ;ERROR, BIT WINDOW WAS A MARK
78$: JSR R5,STFFCK

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

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

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

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;..... TEST 56 .....
; *BITSTUFF EOM FUNCTION TEST
; *THIS TEST LOADS OUT SILO WITH: 2 FLAGS,4 CHAR MESSAGE,EOM
; *SOM,4 CHAR MESS,EOM. THE DATA STREAM IS CHECKED TO BE
; *4 CHAR,BCC,FLAG,4 CHAR,BCC,FLAG,MARKS. THIS TEST VERIFYS THAT

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5108                                     ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
5109                                     ;*ALSO THAT THE CHAR LOADED WITH SOM IS NOT IN THE BCC
5110                                     ;*ALL DATA AND BCC'S ARE CHECKED IN THE BIT WINDOW
5111                                     ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
5112                                     ;*RECEIVED DATA IS VERIFIED, AND IN BCC MATCH IS CHECKED
5113                                     ;*****
5114                                     ;
5115                                     ; TEST 56
5116                                     ;-----
5117 027430 012737 000056 001226 TST56: MOV #56,TSTNO
5118 027436 012737 031110 001216 MOV #TST57,NEXT
5119                                     ;
5120 027444 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
5121 027446 005061 000004 CLR 4(R1) ;MASTER CLEAR DMC11
5122 027452 104414 ROMCLK ;CLEAR PORT4
5123 027454 122117 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5124 027456 004737 033676 JSR PC,CLRIO ;PUT LINE UNIT IN BITSTUFF MODE
5125 027462 005037 034114 CLR BITCON ;DO THIS AFTER MODE IS SET
5126                                     ;CONSECUTIVE 1'S COUNTER INIT TO 0
5127                                     ;
5128                                     ;LOAD OUT DATA SILO
5129 027466 012711 004000 MOV #BIT11,(R1) ;SET LINE UNIT LOOP
5130 027472 012704 034116 MOV #MESDAT,R4 ;LOAD POINTER TO DATA
5131 027476 005037 027632 CLR 10$ ;CLEAR SOFT BCC
5132 027502 005137 027632 COM 10$ ;START AT -1
5133 027506 012700 000004 MOV #4,R0 ;LOAD CHARACTER COUNT
5134 027512 004737 033500 JSR PC,SYNLD ;LOAD 2 FLAG CHARACTERS IN OUT SILO
5135 027516 004737 032500 JSR PC,OUTRDY ;WAIT FOR OUTRDY
5136 027522 004537 033634 JSR R5,MESLD ;LOAD SILO WITH 4 CHAR MESS
5137 027526 034116 MESDAT ;ADDRESS OF MESSAGE
5138 027530 000004 4 ;NUMBER OF CHARACTERS
5139 027532 004737 033610 JSR PC,EOM ;LOAD GARBAGE CHARACTER, WITH EOM SET
5140 027536 004737 033610 JSR PC,EOM
5141 027542 004737 033560 JSR PC,SOM ;LOAD GARBAGE CHAR WITH SOM SET
5142 027546 004537 033634 JSR R5,MESLD ;LOAD FOUR MORE CHARACTERS
5143 027552 034116 MESDAT ;ADDRESS OF MESSAGE
5144 027554 000004 4 ;NUMBER OF CHACTERS
5145 027556 004737 033610 JSR PC,EOM ;SET EOM
5146 027562 004737 033610 JSR PC,EOM ;SET EOM
5147 027566 004737 032346 JSR PC,OCOR ;WAIT FOR OCOR
5148 027572 005003 CLR R3 ;CLEAR BIT COUNTER
5149 027574 104415 000022 DATACLK,22 ;CLOCK DATA
5150 027600 112405 12$: MOVB (R4)+,R5 ;LOAD R5 WITH CHAR
5151 027602 010502 MOV R5,R2 ;LOAD R2 WITH CHAR
5152                                     ;
5153                                     ;CHECK FIRST FOUR CHARACTER MESSAGE
5154                                     ;IN THE BIT WINDOW (0,125,252,377)
5155                                     ;
5156 027604 010537 027700 MOV R5,71$ ;LOAD FOR STUFF CHECK
5157 027610 012737 102010 033332 MOV #CRC,CCITT,XPOLY ;LOAD POLYNOMIAL
5158 027616 010537 027630 MOV R5,67$ ;LOAD SOFT CHAR FOR BCC
5159 027622 004537 033210 JSR R5,SIMBCC ;CALCULATE SOFT BCC
5160 027626 000010 10 ;SHIFT COUNT
5161 027630 000000 67$: 0 ;CHARACTER
5162 027632 000000 10$: 0 ;OLD BCL
5163 027634 013737 033334 027632 MOV CALBCC,10$ ;LOAD SOFT BCC FOR NEXT SHIFT

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J 8

SEQ 0100

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

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K 8

SEQ 0101

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5220 030052 000404
5221 030054 004737 032314
5222 030060 103401
5223 030062 104026
5224 030064 005203
5225 030066 022703 000010
5226 030072 001356
5227 030074 005003
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5231 030076 012737 000176 001252
5232 030104 104415 000001
5233 030110 106037 001252
5234 030114 103405
5235 030116 004737 032314
5236 030122 103006
5237 030124 104026
5238 030126 000404
5239 030130 004737 032314
5240 030134 103401
5241 030136 104026
5242 030140 005203
5243 030142 022703 000010
5244 030146 001356
5245 030150 005003
5246 030152 012700 000004
5247 030156 012704 034116
5248 030162 005037 030224
5249 030166 005137 030224
5250 030172 112405
5251 030174 010502
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5254
5255 030176 010537 030272
5256 030202 012737 102010 033332
5257 030210 010537 030222
5258 030214 004537 033210
5259 030220 000010
5260 030222 000000
5261 030224 000000
5262 030226 013737 033334 030224
5263 030234 104415 000001
5264 030240 106002
5265 030242 103005
5266 030244 004737 032314
5267 030250 103406
5268 030252 104006
5269 030254 000404
5270 030256 004737 032314
5271 030262 103001
5272 030264 104006
5273 030266
5274 030266 004537 033776
5275 030272 000000

74$: BR 75$
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 75$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
75$: INC R3 ;INC BIT COUNT
CMP #10,R3 ;FLAG DONE YET?
BNE 73$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNT

;CHECK FOR ANOTHER FLAG CAUSED BY THE SOM

76$: MOV #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
DATA CLK, 1 ;CLOCK FLAG ONCE
RORB TEMP3 ;SHIFT SOFT FLAG
BCS 77$ ;BR IF BIT IS MARK
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 78$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
77$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 78$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
78$: INC R3 ;INC BIT COUNT
CMP #10,R3 ;FLAG DONE YET?
BNE 76$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNT

MOV #4,R0 ;RESET CHARACTER COUNTER
MOV #MESDAT,R4 ;LOAD MESSAGE POINTER
CLR 11$ ;CLR SOFT BCC
COM 11$ ;ADJUST TO -1 FOR SDLC
13$: MOVB (R4)+,R5 ;LOAD CHAR IN R5
MOV R5,R2 ;LOAD CHAR IN R2

;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)

MOV R5,86$ ;LOAD FOR STUFF CHECK
MOV #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL
MCV R5,82$ ;LOAD SOFT CHAR FOR BCC
JSR R5,SIMBCC ;CALCULATE SOFT BCC
10 ;SHIFT COUNT
82$: 0 ;CHARACTER
11$: 0 ;OLD BCC
MOV CALBCC,11$ ;LOAD SOFT BCC FOR NEXT SHIFT
79$: DATA CLK, 1 ;SHIFT DATA IN TO BIT WINDOW
RORB R2 ;SHIFT SOFT DATA
BCC 80$ ;BR IF A SPACE
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 81$ ;BR IF OK (MARK)
HLT 6 ;ERROR, BIT WINDOW WAS A SPACE
80$: BR 81$ ;CONTINUE
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 81$ ;BR IF OK (SPACE)
HLT 6 ;ERROR, BIT WINDOW WAS A MARK
81$: JSR R5,STFFCK
86$: 0

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5276 030274 000001
5277 030276 110237 030272
5278 030302 005203
5279 030304 022703 000010
5280 030310 001351
5281 030312 005003
5282 030314 005300
5283 030316 001325
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5287 030320 005137 033334
5288 030324 013700 033334
5289 030330 010037 030372
5290 030334 104415 000001
5291 030340 006000
5292 030342 103005
5293 030344 004737 032314
5294 030350 103406
5295 030352 104014
5296 030354 000404
5297 030356 004737 032314
5298 030362 103001
5299 030364 104014
5300 030366
5301 030366 004537 033776
5302 030372 000000
5303 030374 000001
5304 030376 010037 030372
5305 030402 005203
5306 030404 022703 000020
5307 030410 001351
5308 030412 005003
5309
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5312 030414 012737 000176 001252
5313 030422 104415 000001
5314 030426 106037 001252
5315 030432 103405
5316 030434 004737 032314
5317 030440 103006
5318 030442 104026
5319 030444 000404
5320 030446 004737 032314
5321 030452 103401
5322 030454 104026
5323 030456 005203
5324 030460 022703 000010
5325 030464 001356
5326 030466 005003
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5329
5330 030470 104415 000001
5331 030474 004737 032314

1
MOVB R2,86$ ;SHIFT FOR NEXT STUFF CHECK
INC R3 ;BUMP BIT COUNTER
CMP #10,R3 ;DONE FULL 8 BITS YET
BNE 79$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNTER
DEC R0 ;DEC CHARACTER COUNT
BNE 13$ ;BR IF NOT DONE YET

;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW

COM CALBCC ;ADJUST BCC FOR SDLC
MOV CALBCC,R0 ;PUT BCC IN R0
MOV R0,87$ ;LOAD BCC FOR STUFF CHECK
83$: DATACLK,1 ;SHIFT HARDWARE BCC
ROR R0 ;SHIFT SOFT BCC
BCC 84$ ;BR IF CARRY CLEAR
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 85$ ;BR IF OK (MARK)
HLT 14 ;ERROR, CRC WRONG (SPACE)
BR 85$ ;CONTINUE
84$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 85$ ;BR IF OK (SPACE)
HLT 14 ;ERROR, CRC WRONG (MARK)
85$:
JSR R5,STFFCK ;CHECK BCC CHAR FOR ZERO STUFFS
87$: 0 ;CHARACTER
1 ;SHIFT COUNT
MOV R0,87$ ;SHIFT SOFTBCC ONCE
INC R3 ;BUMP BIT COUNTER
CMP #20,R3 ;FINISHED BCC YET?
BNE 83$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNTER

;CHECK FOR FLAG TO FOLLOW BCC

MOV #^B<01111110>,TEMP3 ;PUT FLAG CHARACTER IN TEMP3
88$: DATACLK,1 ;CLOCK FLAG ONCE
RORB TEMP3 ;SHIFT SOFT FLAG
BCS 89$ ;BR IF BIT IS MARK
JSR PC,GETSI ;LOOK AT BIT WINDOW
BCC 90$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
BR 90$
89$: JSR PC,GETSI ;LOOK AT BIT WINDOW
BCS 90$ ;BR IF OK
HLT 26 ;ERROR IN FLAG CHAR
90$: INC R3 ;INC BIT COUNT
CMP #10,R3 ;FLAG DONE YET?
BNE 88$ ;BR IF NO
CLR R3 ;CLEAR BIT COUNT

;CHECK TO SEE IF TRANSMITTER IS MARKING

2$: DATACLK,1 ;CLOCK TRANSMITTER
JSR PC,GETSI ;LOOK AT WINDOW

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5332	030500	103401			BCS	3\$		; IT SHOULD BE MARKING
5333	030502	104024			HLT	24		; ERROR, BIT WAS A SPACE
5334	030504	005203			3\$: INC	R3		; BUMP BIT COUNTER
5335	030506	^_2703	000007		CMP	#7,R3		; DONE YET
5336	030512	^_1366			BNE	2\$		; BR IF NO
5337	030514	104415	000010		DATACLK,	10		; GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
5338	030520	005003			CLR	R3		; CLEAR BIT COUNTER
5339	030522	104415	000001		4\$: DATACLK,	1		; SHIFT OUT NEXT BIT
5340	030526	004737	032314		JSR	PC,GETSI		; LOOK AT BIT WINDOW
5341	030532	103401			BCS	+4		; BR IF IT IS A MARK
5342	030534	104024			HLT	24		; ERROR, TRANSMITTER IS NOT MARKING
5343	030536	005203			INC	R3		; INC BIT COUNT
5344	030540	022703	000020		CMP	#20,R3		; DONE YET?
5345	030544	001366			BNE	4\$		; BR IF NO
5346								
5347								; CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
5348								; WAS RECEIVED CORRECTLY (0,125,252,377)
5349								
5350	030546	104415	000001		DATACLK,	1		; GET LAST BIT IN RECEIVER
5351	030552	012703	000004		MOV	#4,R3		; R3=CHARACTER COUNT
5352	030556	012702	034116		MOV	#MESDAT,R2		; LOAD MESSAGE POINTER IN R2
5353	030562	004737	033154		40\$: JSR	PC,INRDY		; WAIT FOR INRDY
5354	030566	104414			ROMCLK			; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5355	030570	021204			021204			
5356	030572	016104	000004		MOV	4(R1),R4		; PUT 'FOUND' IN R4
5357	030576	112205			MOVB	(R2)+,R5		; PUT 'EXPECTED' IN R5
5358	030600	120504			CMPB	R5,R4		; IS RECEIVED DATA CORRECT?
5359	030602	001401			BEQ	41\$		; BR IF YES
5360	030604	104010			HLT	10		; RECEIVE DATA ERROR
5361	030606	005303			41\$: DEC	R3		; DEC CHARACTER COUNT
5362	030610	001364			BNE	40\$		; BR IF NOT DONE YET
5363								
5364								
5365								; CHECK TO SEE THAT IN BCC MATCH IS SET
5366								; AND THAT THE BCC WAS RECEIVED CORRECTLY
5367								
5368	030612	004737	033154		JSR	PC,INRDY		; WAIT FOR INRDY
5369	030616	104414			ROMCLK			; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5370	030620	021204			021204			; GET FIRST HALF OF CRC
5371	030622	116137	000004	001252	MOVB	4(R1),TEMP3		; PUT IN TEMP3
5372	030630	042737	177400	001252	BIC	#177400,TEMP3		; CLEAR HI BYTE
5373	030636	004737	033154		JSR	PC,INRDY		; WAIT FOR INRDY
5374	030642	104414			ROMCLK			; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5375	030644	021244			021244			
5376	030646	016104	000004		MOV	4(R1),R4		; PUT 'FOUND' IN R4
5377	030652	042704	000374		BIC	#374,R4		; CLEAR UNWANTED BITS
5378	030656	012705	000003		MOV	#3,R5		; PUT 'EXPECTED' IN R5
5379	030662	120504			CMPB	R5,R4		; ARE IN BCC MATCH AND BLOCK END SET?
5380	030664	001401			BEQ	50\$		
5381	030666	104042			HLT	42		; IN BCC MATCH ERROR
5382	030670				50\$: ROMCLK			; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5383	030670	104414			021204			; GET LAST HALF
5384	030672	021204			MOVB	4(R1),TEMP2+1		; PUT IN TEMP2
5385	030674	116137	000004	001251	BIC	#377,TEMP2		; CLEAR LO BYTE
5386	030702	042737	000377	001250	BIS	TEMP2,TEMP3		; 16 BIT BCC NOW IN TEMP3
5387	030710	053737	001250	001252				

5388 030716 023737 033334 001252
 5389 030724 001401
 5390 030726 104027
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 5395 030730 012703 000004
 5396 030734 012702 034116
 5397 030740 004737 033154
 5398 030744 104414
 5399 030746 021204
 5400 030750 016104 000004
 5401 030754 112205
 5402 030756 120504
 5403 030760 001401
 5404 030762 104010
 5405 030764 005303
 5406 030766 001364
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 5412 030770 004737 033154
 5413 030774 104414
 5414 030776 021204
 5415 031000 116137 000004 001252
 5416 031006 042737 177400 001252
 5417 031014 004737 033154
 5418 031020 104414
 5419 031022 021244
 5420 031024 016104 000004
 5421 031030 042704 000374
 5422 031034 012705 000003
 5423 031040 120504
 5424 031042 001401
 5425 031044 104042
 5426 031046
 5427 031046 104414
 5428 031050 021204
 5429 031052 116137 000004 001251
 5430 031060 042737 000377 001250
 5431 031066 053737 001250 001252
 5432 031074 023737 033334 001252
 5433 031102 001401
 5434 031104 104027
 5435 031106 104400
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CMP CALBCC,TEMP3 ;IS IT CORRECT?
 BEQ 42\$;BR IF OK
 HLT 27

 ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
 ;WAS RECEIVED CORRECTLY (0,125,252,377)
 42\$: MOV #4,R3 ;R3=CHARACTER COUNT
 MOV #MESDAT,R2 ;LOAD MESSAGE POINTER IN R2
 43\$: JSR PC,INRDY ;WAIT FOR INRDY
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021204
 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
 MOV (R2)+,R5 ;PUT 'EXPECTED' IN R5
 CMPB R5,R4 ;IS RECEIVED DATA CORRECT?
 BEQ 44\$;BR IF YES
 HLT 10 ;RECEIVE DATA ERROR
 44\$: DEC R3 ;DEC CHARACTER COUNT
 BNE 43\$;BR IF NOT DONE YET

 ;CHECK TO SEE THAT IN BCC MATCH IS SET
 ;AND THAT THE BCC WAS RECEIVED CORRECTLY
 JSR PC,INRDY ;WAIT FOR INRDY
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021204 ;GET FIRST HALF OF CRC
 MOVB 4(R1),TEMP3 ;PUT IN TEMP3
 BIC #177400,TEMP3 ;CLEAR HI BYTE
 JSR PC,INRDY ;WAIT FOR INRDY
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021244
 MOV 4(R1),R4 ;PUT 'FOUND' IN R4
 BIC #374,R4 ;CLEAR UNWANTED BITS
 MOV #3,R5 ;PUT 'EXPECTED' IN R5
 CMPB R5,R4 ;ARE IN BCC MATCH AND BLOCK END SET?
 BEQ 51\$
 HLT 42 ;IN BCC MATCH ERROR
 51\$: ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 021204 ;GET LAST HALF
 MOVB 4(R1),TEMP2+1 ;PUT IN TEMP2
 BIC #377,TEMP2 ;CLEAR LO BYTE
 BIS TEMP2,TEMP3 ;16 BIT BCC NOW IN TEMP3
 CMP CALBCC,TEMP3 ;IS IT CORRECT?
 BEQ 5\$;BR IF OK
 HLT 27
 5\$: SCOPE ;SCOPE THIS TEST

 ;***** TEST 57 *****
 ;*EMPTY SILO TEST
 ;*LOAD SILO WITH 2 SYNCs, 4 CHAR MESSAGE, SINGLE CLOCK
 ;*UNTIL THE SILO IS EMPTY, LOAD 4 MORE CHARACTERS IN THE
 ;*SILO. GIVE MORE TICKS, AND VERIFY THAT ONLY THE FIRST
 ;*4 CHARACTERS AND A BLOCK END WERE RECEIVED, AND IN ACTIVE IS CLEAR

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

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 5514 031330 012737 000060 001226
 5515 031336 012737 031752 001216
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 5517 031344 104412
 5518 031346 032737 040000 001366
 5519 031354 001575
 5520 031356 005061 000004
 5521 031362 104414
 5522 031364 122117
 5523 031366 004737 033676
 5524 031372 012711 004000
 5525 031376 004737 033500
 5526 031402 012737 102010 033332
 5527 031410 005037 031444
 5528 031414 005137 031444
 5529 031420 012703 000020
 5530 031424 012702 034122
 5531 031430 112237 031442
 5532 031434 004537 033210
 5533 031440 000010
 5534 031442 000000
 5535 031444 000000
 5536 031446 013737 033334 031444
 5537 031454 005303
 5538 031456 001364
 5539 031460 005137 033334
 5540 031464 004537 033634
 5541 031470 034122
 5542 031472 000020
 5543 031474 004737 033610
 5544 031500 004737 033610
 5545 031504 004537 033634
 5546 031510 034122
 5547 031512 000020
 5548 031514 004737 033610
 5549 031520 004737 033610
 5550 031524 004537 033634
 5551 031530 034122
 5552 031532 000020
 5553 031534 004737 033610
 5554 031540 004737 033610
 5555 031544 004737 032346

***** TEST 60 *****
 ;*BITSTUFF CABLE DATA TEST
 ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
 ;*2 FLAGS,16 CHAR,EOM,16 CHAR,EOM,16 CHAR,EOM
 ;*THE 16 CHARACTERS INCLUDE A FLOATING ONE AND ZERO
 ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
 ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
 ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
 ;*****

TEST 60

 TST60: MOV #60,TSTNO
 MOV #TST61,NEXT
 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
 ;MASTER CLEAR DMC11
 BIT #BIT14,STAT1 ;SKIP TEST IF NO
 BEQ 3\$;LOOPBACK CONNECTOR ON
 CLR 4(R1) ;CLEAR PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122117 ;PUT LINE UNIT IN BITSTUFF MODE
 JSR PC,CLR10 ;DO THIS AFTER MODE IS SET
 MOV #BIT11,(R1) ;SET LINE UNIT LOOP
 JSR PC,SYNLD ;LOAD TWO FLAGS
 MOV #CRC.CCITT,XPOLY ;LOAD POLYNOMIAL FOR SOFT CRC CALC
 CLR 6\$;CLEAR OLD BCC
 COM 6\$;ADJUST TO -1 FOR SDLC
 MOV #16.,R3 ;CHARACTER COUNT
 MOV #FLTDAT,R2 ;R2= POINTER
 7\$: MOV B (R2)+,5\$;LOAD CHAR FOR SOFT BCC CALC.
 JSR R5,SIMBCC ;CALC SOFT BCC
 10 ;SHIFT COUNT
 5\$: 0 ;CHARACTER
 6\$: 0 ;OLD BCC
 MOV CALBCC,6\$;LOAD OLD BCC
 DEC R3 ;DEC COUNT
 BNE 7\$;BR IF NOT DONE YET
 COM CALBCC ;ADJUST CALBCC FOR SDLC
 JSR R5,MESLD ;LOAD SILO
 FLTDAT ;MESSAGE ADDRESS
 16. ;CHARACTER COUNT
 JSR PC,EOM ;LOAD AN EOM
 JSR PC,EOM
 JSR R5,MESLD ;LOAD SILO
 FLTDAT ;MESSAGE ADDRESS
 16. ;CHARACTER COUNT
 JSR PC,EOM ;LOAD AN EOM
 JSR PC,EOM
 JSR R5,MESLD ;LOAD SILO
 FLTDAT ;MESSAGE ADDRESS
 16. ;CHARACTER COUNT
 JSR PC,EOM ;LOAD AN EOM
 JSR PC,EOM
 JSR PC,OCOR ;WAIT FOR OCOR

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

***** TEST 61 *****

;*BITSTUFF CABLE DATA TEST

;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:

;*2 FLAGS,59 DATA CHARACTERS,EOM WITH GARBAGE CHARACTER

;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK

;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH

```

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

```

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SEQ 0109

```

5668 032174 004737 033154
5669 032200 104414
5670 032202 021204
5671 032204 116137 000004 001252
5672 032212 042737 177400 001252
5673 032220 004737 033154
5674 032224 104414
5675 032226 021244
5676 032230 016104 000004
5677 032234 042704 000374
5678 032240 012705 000003
5679 032244 120504
5680 032246 001401
5681 032250 104042
5682 032252
5683 032252 104414
5684 032254 021204
5685 032256 116137 000004 001251
5686 032264 042737 000377 001250
5687 032272 053737 001250 001252
5688 032300 023737 033334 001252
5689 032306 001401
5690 032310 104027
5691 032312 104400
5692
5693
5694
5695
5696
5697 032314
5698
5699
5700
5701 032314 104414
5702 032316 021364
5703 032320 017737 147066 032344
5704 032326 106137 032344
5705 032332 106137 032344
5706 032336 106137 032344
5707 032342 000207
5708 032344 000000
5709
5710
5711 032346
5712
5713
5714 032346 104414
5715 032350 021364
5716 032352 032777 000020 147032
5717 032360 001772
5718 032362 000207
5719
5720
5721 032364
5722
5723

ROMCLK JSR PC,INRDY ;WAIT FOR INRDY
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021204 ;GET FIRST HALF OF CRC
MOVB 4(R1),TEMP3 ;PUT IN TEMP3
BIC #177400,TEMP3 ;CLEAR HI BYTE
JSR PC,INRDY ;WAIT FOR INRDY
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021244
MOV 4(R1),R4 ;PUT 'FOUND' IN R4
BIC #374,R4 ;CLEAR-UNWANTED BITS
MOV #3,R5 ;PUT 'EXPECTED' IN R5
CMPB R5,R4 ;ARE IN BCC MATCH AND BLOCK END SET?
BEQ 25$
HLT 42 ;IN BCC MATCH ERROR
25$:
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021204 ;GET LAST HALF
MOVB 4(R1),TEMP2+1 ;PUT IN TEMP2
BIC #377,TEMP2 ;CLEAR LO BYTE
BIS TEMP2,TEMP3 ;16 BIT BCC NOW IN TEMP3
CMP CALBCC,TEMP3 ;IS IT CORRECT?
BEQ 3$ ;BR IF OK
HLT 27
3$: SCOPE ;SCOPE THIS TEST

;SUBROUTINES
;-----
GETSI:
;THIS SUBROUTINE READS LU 17, AND PUTS IT INTO NITCH.
;NITCH IS ROTATED LEFT UNTILL THE SI BIT IS IN CARRY
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021364 ;PORT4_LU 17
MOV @DMP04,NITCH ;STORE LU 17
ROLB NITCH
ROLB NITCH
ROLB NITCH ;PUT SI IN THE CARRY BIT
RTS PC
NITCH: 0

OCOR:
;THIS SUBROUTINE SPINS ON OCOR
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021364 ;PORT4_LU 17
BIT #BIT4,@DMP04 ;IS OCOR SET?
BEQ OCOR ;BR IF NO
RTS PC ;OK OCOR IS SET, GO BACK

SYNC:
;THIS SUBROUTINE LOADS THE SILO WITH THE NUMBER OF SYNC
;CHARACTERS PASSED TO IT IN THE WORD AFTER THE JSR CALL

```

```

5724
5725
5726 032364 013637 001246
5727 032370 062746 000002
5728 032374 012761 000026 000004
5729 032402 104414
5730 032404 122114
5731 032406 004737 032500
5732 032412 012761 000001 000004
5733 032420 104414
5734 032422 122111
5735 032424 012761 000026 000004
5736 032432 104414
5737 032434 122110
5738 032436 005337 001246
5739 032442 001361
5740 032444 004737 032500
5741 032450 005061 000004
5742 032454 104414
5743 032456 122111
5744 032460 012761 000301 000004
5745 032466 104414
5746 032470 122110
5747 032472 004737 032346
5748 032476 000207
5749
5750
5751 032500
5752
5753
5754 032500 005037 001256
5755 032504
5756 032504 104414
5757 032506 021224
5758 032510 032777 000020 146674
5759 032516 001004
5760 032520 005237 001256
5761 032524 001367
5762 032526 104036
5763 032530 000207
5764
5765
5766 032532
5767
5768
5769
5770 032532 013637 001250
5771 032536 062746 000002
5772 032542 012737 000003 001246
5773 032550 012761 000026 000004
5774 032556 104414
5775 032560 122114
5776 032562 004737 032500
5777 032566 012761 000001 000004
5778 032574 104414
5779 032576 122111

```

```

;AND A NON-SYNC CHARACTER (301)
MOV @ (SP)+,TEMP1 ;GET COUNT
ADD #2,-(SP) ;ADJUST STACK
MOV #26,4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
1$: 122114 ;LOAD SYNC REGISTER
JSR PC,OUTRDY ;WAIT FOR OUTRDY
MOV #1,4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122111 ;SET SOM
MOV #26,4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122110 ;LOAD OUT DATA
DEC TEMP1 ;ALL DONE?
BNE 1$ ;BR IF NOT
JSR PC,OUTRDY ;WAIT FOR OUTRDY
CLR 4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122111 ;SET SOM
MOV #301,4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122110 ;LOAD OUT DATA
JSR PC,OCOR ;WAIT FOR OCOR
RTS PC

OUTRDY:
;THIS SUBROUTINE SPINS ON OUT READY
CLR TEMPS ;CLEAR TIMER
1$: ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021224 ;PORT4 LUI1
BIT #BIT4,@DMP04 ;IS OUT RDY SET?
BNE 2$ ;BR IF YES
INC TEMPS ;INC TIMER
BNE 1$ ;KEEP CHECKING IF NOT DONE
HLT 36 ;ERROR, OUT READY NOT SET
2$: RTS PC

CHAR:
;THIS SUBROUTINE LOADS THE SILO WITH 3 SYNCs
;AND THE CHARACTER PASSED TO IT.
MOV @ (SP)+,TEMP2 ;GET CHARACTER
ADD #2,-(SP) ;ADJUST STACK
MOV #3,TEMP1 ;SET FOR 3 SYNCs
MOV #26,4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122114 ;LOAD SYNC REGISTER
1$: JSR PC,OUTRDY ;WAIT FOR OUTRDY
MOV #1,4(R1) ;LOAD PORT4
ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
122111 ;SET SOM

```

5780 032600 012761 000026 000004
 5781 032606 104414
 5782 032610 122110
 5783 032612 005337 001246
 5784 032616 001361
 5785 032620 004737 032500
 5786 032624 013761 001250 000004
 5787 032632 104414
 5788 032634 122110
 5789 032636 004737 032346
 5790 032642 000207
 5791
 5792
 5793 032644
 5794
 5795
 5796 032644 013637 001250
 5797 032650 062746 000002
 5798 032654 004737 032500
 5799 032660 013761 001250 000004
 5800 032666 104414
 5801 032670 122110
 5802 032672 004737 032500
 5803 032676 104414
 5804 032700 122110
 5805 032702 004737 032346
 5806 032706 000207
 5807
 5808
 5809 032710
 5810
 5811
 5812
 5813 032710 012737 000073 001250
 5814 032716 005737 033150
 5815 032722 100470
 5816 032724 001032
 5817 032726 062737 000002 001250
 5818 032734 012737 000003 001246
 5819 032742 012761 000026 000004
 5820 032750 104414
 5821 032752 122114
 5822 032754 004737 032500
 5823 032760 012761 000001 000004
 5824 032766 104414
 5825 032770 122111
 5826 032772 012761 000026 000004
 5827 033000 104414
 5828 033002 122110
 5829 033004 005337 001246
 5830 033010 001361
 5831 033012 004737 032500
 5832 033016 013761 033150 000004
 5833 033024 104414
 5834 033026 122110
 5835 033030 005737 033152

MOV #26,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD OUT DATA
 DEC TEMP1 ;ALL DONE?
 BNE 1\$;BR IF NOT
 JSR PC,OUTRDY ;WAIT FOR OUTRDY
 MOV TEMP2,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD OUT DATA
 JSR PC,OCOR ;WAIT FOR OCOR
 RTS PC
 CHARS: ;THIS SUBROUTINE LOADS THE SILO WITH THE CHARACTER PASSED TO IT.
 MOV @ (SP)+,TEMP2 ;GET CHARACTER
 ADD #2,-(SP) ;ADJUST STACK
 JSR PC,OUTRDY ;WAIT FOR OUTRDY
 MOV TEMP2,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD OUT DATA
 JSR PC,OUTRDY ;WAIT FOR OUTRDY
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD GARBAGE CHAR
 JSR PC,OCOR ;WAIT FOR OCOR
 RTS PC
 SILOD: ;THIS SUBROUTINE FILLS THE OUT SILO
 ; WITH A BINARY COUNT PATTERN
 MOV #73,TEMP2 ;LOAD COUNT
 TST SCHAR ;FIRST TIME HERE?
 BMI 4\$;BR IF BITSTUFF
 BNE 2\$;BR IF NO
 ADD #2,TEMP2 ;ADD 2 TO CHARACTER COUNT
 MOV #3,TEMP1 ;SET FOR 3 SYNCs
 MOV #26,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122114 ;LOAD SYNC REGISTER
 1\$: JSR PC,OUTRDY ;WAIT FOR OUTRDY
 MOV #1,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122111 ;SET SOM
 MOV #26,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD OUT DATA
 DEC TEMP1 ;ALL DONE?
 BNE 1\$;BR IF NOT
 2\$: JSR PC,OUTRDY ;WAIT FOR OUTRDY
 MOV SCHAR,4(R1) ;LOAD PORT4
 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 122110 ;LOAD OUT DATA
 TST STUFFLG ;BITSTUFF???

5836 033034 001407
 5837 033036 013737 033150 033050
 5838 033044 004537 033716
 5839 033050 000000
 5840 033052 000010
 5841 033054 005237 033150
 5842 033060 022737 000400 033150
 5843 033066 001403
 5844 033070 005337 001250
 5845 033074 001346
 5846 033076 004737 032346
 5847 033102 000207
 5848 033104 005037 033150
 5849 033110 012737 177777 033152
 5850 033116 005037 034114
 5851 033122 062737 000002 001250
 5852 033130 012761 000001 000004
 5853 033136 104414
 5854 033140 122111
 5855 033142 104414
 5856 033144 122110
 5857 033146 000721
 5858 033150 000000
 5859 033152 000000
 5860
 5861
 5862 033154
 5863
 5864
 5865
 5866
 5867
 5868
 5869
 5870 033154 012737 000000 001246
 5871 033162
 5872 033162 104414
 5873 033164 021244
 5874 033166 032777 000020 146216
 5875 033174 001004
 5876 033176 005237 001246
 5877 033202 001367
 5878 033204 104037
 5879 033206 000207
 5880
 5881
 5882 033210
 5883
 5884
 5885
 5886
 5887 033210 010046
 5888 033212 012537 001246
 5889 033216 012537 001250
 5890 033222 012537 033334
 5891 033226 013700 033334

BEO 6\$;BR IF NO
 MOV SCHAR,5\$;IT IS SLD SO CHECK BITSTUFFING
 JSR R5,STFFCL ;ADD ANY BIT STUFF CLOCK TICKS
 5\$: 0 ;CHARACTER
 10 ;SHIFT COUNT
 6\$: INC SCHAR ;NEXT CHARACTER
 CMP #400,SCHAR ;ALL DONE?
 BEQ 3\$
 DEC TEMP2 ;DECREMENT COUNT
 BNE 2\$;BR IF NOT DONE
 3\$: JSR PC,OCOR ;WAIT FOR OCOR
 RTS PC
 4\$: CLR SCHAR ;START PATTERN AT ZERO
 MOV #-1,STUFLG ;SET BITSTUFF FLAG
 CLR BITCON ;CLEAR STUFF COUNT
 ADD #2,TEMP2 ;ADD 2 TO CHARACTER COUNT
 MOV #1,4(R1) ;SET BIT0 IN PORT4
 ROMCLK 122111 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;SET SOM!
 ROMCLK 122110 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;LOAD GARBAGE CHAR
 BR 2\$;GO LOAD SILL
 SCHAR: 0
 STUFLG: 0

INRDY:
 ;THIS SUBROUTINE SPINS ON INRDY
 ;IF INRDY FAILS TO SET THE DELAY TIMES OUT AND AN
 ;ERROR IS REPORTED. FOR BETTER SCOPE LOOPS THIS
 ;DELAY CAN BE MADE SHORTER BY ALTERING THE NUMBER
 ;INITIALLY LOADED INTO TEMP1, THE SMALLER THE NUMBER
 ;THE SHORTER THE DELAY. 0 IS THE LONGEST DELAY.

MOV #0,TEMP1 ;SET UP DELAY COUNTER
 1\$: ROMCLK 021244 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 ;PORT4 LUI2
 BIT #BIT4,ADMP04 ;IS INRDY SET?
 BNE 2\$;BR IF YES
 INC TEMP1 ;INC DELAY
 BNE 1\$;TRY AGAIN
 HLT 37 ;ERROR,NO INRDY
 2\$: RTS PC ;RETURN

SIMBCC:

;THIS SUBROUTINE CALCULATES THE CRC USING POLYNOMIAL GIVEN
 ;IN XPOLY. THE CORRECT CRC IS RETURNED IN CALBCC, AND THE
 ;STATE OF THE LSB OF THE BCC IS RETURNED IN THE C BIT.

MOV R0,-(SP) ;SAVE R0 ON STACK
 MOV (R5)+,TEMP1 ;TEMP1 = SHIFT COUNT
 MOV (R5)+,TEMP2 ;TEMP2 = CHARACTER
 MOV (R5)+,CALBCC ;CALBCC = OLD BCC
 1\$: MOV CALBCC,R0 ;PUT OLD BCC IN R0

5892	033232	000241		CLC		
5893	033234	006037	033334	ROR	CALBCC	;SHIFT OLD BCC
5894	033240	006037	001250	ROR	TEMP2	;SHIFT CHARACTER
5895	033244	005500		ADC	RO	;ADD CHAR CARRY TO OLD BCC
5896	033246	006000		ROR	RO	;PUT BITO TO CARRY BIT
5897	033250	103011		BCC	2\$	;CARRY IS FEEDBACK BIT
5898	033252	013700	033332	MOV	XPOLY,RO	;IF FEEDBACK = 1
5899	033256	043700	033334	BIC	CALBCC,RO	;EXCLUSIVLY OR XPOLY TO CALBCC
5900	033262	043737	033332	BIC	XPOLY,CALBCC	
5901	033270	050037	033334	BIS	RO,CALBCC	
5902	033274	005337	001246	DEC	TEMP1	;DEC SHIFT COUNT
5903	033300	001352		BNE	1\$	;BR IF NOT DONE
5904	033302	012737	000001	MOV	#1,TEMP1	;GET SET TO INVERT BITO
5905	033310	013700	033334	MOV	CALBCC,RO	;PUT RESULT IN RO
5906	033314	006000		ROR	RO	;SHIFT BITO TO CARRY
5907	033316	005537	001246	ADC	TEMP1	;INVERT CARRY TO BITO OF TEMP1
5908	033322	006037	001246	ROR	TEMP1	;PUT INVERTED BIT IN CARRY
5909	033326	012600		MOV	(SP)+,RO	;RESTORE RO
5910	033330	000205		RTS	R5	;RETURN
5911	033332	000000				
5912	033334	000000				
5913		000200				
5914		120001				
5915		102010				

XPOLY: 0
CALBCC: 0
LRC8=200
CRC16=120001
CRC.CCITT=102010

5916						
5917						
5918	033336			BCCLD:		
5919						
5920						;THIS SUBROUTINE LOADS THE OUT SILO WITH 2 SYNCs
5921						;WITH SOM SET, AND ONE CHARACTER PASSED TO IT
5922						;WITH THE SOM BIT CLEAR (ENABLE CRC)
5923	033336	013637	001250	MOV	@(SP)+,TEMP2	;GET CHARACTER
5924	033342	062746	000002	ADD	#2,-(SP)	;ADJUST STACK
5925	033346	012737	000002	MOV	#2,TEMP1	;SET FOR 2 SYNCs
5926	033354	012761	000026	MOV	#26,4(R1)	;LOAD PORT4
5927	033362	104414		ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5928	033364	122114			122114	;LOAD SYNC REGISTER
5929	033366	004737	032500	1\$: JSR	PC,OUTRDY	;WAIT FOR OUTRDY
5930	033372	012761	000001	MOV	#1,4(R1)	;LOAD PORT4
5931	033400	104414		ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5932	033402	122111			122111	;SET SOM
5933	033404	012761	000026	MOV	#26,4(R1)	;LOAD PORT4
5934	033412	104414		ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5935	033414	122110			122110	;LOAD OUT DATA
5936	033416	005337	001246	DEC	TEMP1	;ALL DONE?
5937	033422	001361		BNE	1\$	;BR IF NOT
5938	033424	004737	032500	JSR	PC,OUTRDY	;WAIT FOR OUTRDY
5939	033430	013761	001250	MOV	TEMP2,4(R1)	;LOAD PORT4
5940	033436	104414		ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5941	033440	122110			122110	;LOAD OUT DATA
5942	033442	004737	032346	JSR	PC,OCOR	;WAIT FOR OCOR
5943	033446	000207		RTS	PC	
5944						
5945						
5946	033450			GETQO:		
5947						;THIS SUBROUTINE READS THE STATE OF THE TRANSMIT

```

5948                                     ;BCC LSB AND PUTS IT IN THE CARRY BIT
5949
5950 033450 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5951 033452 021364                                     021364 ;PORT4 LU-17
5952 033454 106177 145732 ROLB @DMP04 ;PUT Q0 IN CARRY
5953 033460 000207 RTS PC ;RETURN
5954
5955
5956 033462 GETQ1: ;THIS SUBROUTINE READS THE STATE OF THE RECEIVE
5957                                     ;BCC LSB AND PUTS IT IN THE CARRY BIT
5958
5959
5960 033462 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5961 033464 021364                                     021364 ;PORT4 LU-17
5962 033466 106177 145720 ROLB @DMP04 ;PUT Q0 IN CARRY
5963 033472 106177 145714 ROLB @DMP04 ;PUT Q1 IN CARRY
5964 033476 000207 RTS PC ;RETURN
5965
5966
5967 033500 SYNLD: ;THIS SUBROUTINE LOADS OUT SILO WITH
5968                                     ;2 SYNC CHARACTERS WITH SOM SET
5969
5970
5971 033500 012737 000002 001246 MOV #2,TEMP1 ;LOAD COUNTER FOR 2 SYNCs
5972 033506 012761 000026 000004 MOV #26,4(R1) ;PORT4 26
5973 033514 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5974 033516 122114 122114 ;LOAD SYNC REG
5975 033520 004737 032500 JSR PC,OUTRDY ;WAIT FOR OUTRDY
5976 033524 012761 000001 000004 MOV #1,4(R1) ;LOAD PORT4
5977 033532 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5978 033534 122111 122111 ;SET SOM
5979 033536 012761 000026 000004 MOV #26,4(R1) ;PORT4 26
5980 033544 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5981 033546 122110 122110 ;LOAD OUT DATA WITH SYNC
5982 033550 005337 001246 DEC TEMP1 ;DECREMENT COUNTER
5983 033554 001361 BNE 1$ ;BR IF NOT DONE
5984 033556 000207 RTS PC ;RETURN
5985
5986
5987 033560 SOM: ;THIS SUBROUTINE LOADS SOM AND OUT DATA WITH A
5988                                     ;GARBAGE CHARACTER (0)
5989
5990
5991 033560 004737 032500 JSR PC,OUTRDY ;WAIT FOR OUTRDY
5992 033564 012761 000001 000004 MOV #1,4(R1) ;PORT4 1
5993 033572 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5994 033574 122111 122111 ;SET SOM
5995 033576 005061 000004 CLR 4(R1) ;CLEAR DATA CHAR
5996 033602 104414 ROMCLK                                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5997 033604 122110 122110 ;LOAD GARBAGE CHARACTER
5998 033606 000207 RTS PC ;RETURN
5999
6000
6001 033610 EOM: ;THIS SUBROUTINE LOADS EOM AND OUT DATA WITH A
6002                                     ;GARBAGE CHARACTER (2) TO ENABLE TRANSMISSION OF BCC
6003

```

6004									
6005	033610	004737	032500			JSR	PC,OUTRDY		;WAIT FOR OUTRDY
6006	033614	012761	000002	000004		MOV	#2,4(R1)		;PORT4 2
6007	033622	104414			ROMCLK				;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6008	033624	122111				122111			;SET EOM
6009	033626	104414			ROMCLK				;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6010	033630	122110				122110			;LOAD GARBAGE CHARACTER
6011	033632	000207				RTS	PC		;RETURN
6012									
6013									
6014	033634								
6015									
6016									
6017									
6018									
6019	033634	010046							
6020	033636	012500							
6021	033640	012537	001246						
6022	033644	004737	032500		1\$:	JSR	PC,OUTRDY		;WAIT FOR OUT RDY
6023	033650	112061	000004			MOVB	(R0)+,4(R1)		;LOAD PORT4 WITH CHARACTER
6024	033654	104414			ROMCLK				;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6025	033656	122110				122110			;LOAD OUT DATA SILO
6026	033660	005337	001246			DEC	TEMP1		;DEC CHAR COUNT
6027	033664	001367				BNE	1\$		;BR IF NOT DONE
6028	033666	004737	032346			JSR	PC,OCOR		;WAIT FOR OCOR
6029	033672	012600				MOV	(SP)+,R0		;RESTORE R0
6030	033674	000205				RTS	R5		;RETURN
6031									
6032									
6033	033676								
6034									
6035									
6036									
6037	033676	012761	000200	000004					
6038	033704	104414			ROMCLK				;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6039	033706	122112				122112			;SET IN CLR!
6040	033710	104414			ROMCLK				;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6041	03 12	122111				122111			;SET OUT CLR!
6042	033714	000207				RTS	PC		;RETURN
6043									
6044									
6045	033716								
6046									
6047									
6048									
6049	033716	010046							
6050	033720	012500							
6051	033722	012537	001252						
6052	033726	106000			1\$:	RORB	R0		;LOOK AT NEXT BIT
6053	033730	103403				BCC	2\$		;BR IF A MARK
6054	033732	005037	034114			CLR	BITCON		;IT WAS A SPACE, CLEAR 1'S COUNTER
6055	033736	000412				BR	3\$		;CONTINUE
6056	033740	005237	034114		2\$:	INC	BITCON		;INC CONSECUTIVE 1'S COUNTER
6057	033744	022737	000005	034114		CMP	#5,BITCON		;IS IT 5 YET?
6058	033752	001004				BNE	3\$		;BR IF NO
6059	033754	005037	034114			CLR	BITCON		;YES! SO START AGAIN

6060	033760	104415	000001				DATACLK,	1	;GIVE EXTRA TICK TO STUFF ZERO
6061	033764	005337	001252				DEC	TEMP3	;DEC SHIFT COUNT
6062	033770	001356					BNE	1\$	;BR IF NOT DONE
6063	033772	012600					MOV	(SP)+,R0	;RESTORE R0
6064	033774	000205					RTS	R5	;RETURN
6065									
6066									
6067	033776						STFFCK:		
6068									;THIS SUBROUTINE CHECKS TO SEE IF TRANSMITTER
6069									;IS STUFFING ZEROS WHEN IT SHOULD. FIRST ARGUMENT
6070									;IS THE CHARACTER, SECOND ARGUMENT IS SHIFT COUNT.
6071									
6072	033776	010046					MOV	R0,-(SP)	;SAVE R0
6073	034000	012500					MOV	(R5)+,R0	;PUT CHAR IN R0
6074	034002	012537	001252				MOV	(R5)+,TEMP3	;PUT SHIFT COUNT IN TEMP3
6075	034006	106000					1\$:	RORB	R0
6076	034010	103403						BCS	2\$
6077	034012	005037	034114					CLR	BITCON
6078	034016	000416						BR	3\$
6079	034020	005237	034114				2\$:	INC	BITCON
6080	034024	022737	000005	034114				CMP	#5,BITCON
6081	034032	001010						BNE	3\$
6082	034034	005037	034114					CLR	BITCON
6083	034040	104415	000001					DATACLK,	1
6084	034044	004737	032314					JSR	PC,GETSI
6085	034050	103001						BCC	3\$
6086	034052	104030						HLT	30
6087	034054	005337	001252				3\$:	DEC	TEMP3
6088	034060	001352						BNE	1\$
6089	034062	012600						MOV	(SP)+,R0
6090	034064	000205						RTS	R5
6091									
6092									
6093	034066						CTSDLY:		
6094									;THIS SUBROUTINE WASTES TIME UNTIL CTS SETS,
6095									;BUT HOPEFULLY NOT SO LONG THAT THE SILO RUNS OUT
6096									
6097	034066	010046					MOV	R0,-(SP)	;SAVE R0
6098	034070	012700	000032				MOV	#32,R0	;LOAD R0 WITH COUNT
6099	034074	027777	145104	145102			1\$:	CMP	@TKCSR,@TKCSR
6100	034102	005300						DEC	R0
6101	034104	001373						BNE	1\$
6102	034106	012600						MOV	(SP)+,R0
6103	034110	000207						RTS	PC
6104									
6105									
6106	034112	000176					FLAG:	^B<01111110>	;FLAG CHARACTER
6107	034114	000000					BITCON:	0	
6108	034116	000	125	252			MESDAT:	.BYTE	0,125,252,377
6109	034121	377							
6110	034122	001	002	004			FLTDAT:	.BYTE	1,2,4,10,20,40,100,200,376,375,373,367,357,337,277,177
6111	034125	010	020	040					
6112	034130	100	200	376					
6113	034133	375	373	367					
6114	034136	357	337	277					
6115	034141	177							

6116	034142	100	140	160
6117	034145	170	003	300
6118	034150	174	176	177
6119	034153	001		
6120	034154	363	347	317
6121	034157	200	000	377
6122	034162	377	377	200
6123	034165	037		
6124				
6125	034166	046377	047111	020105

	034224	046377	047111	020105
	034267	377	044514	042516
	034333	377	044514	042516
	034375	377	051124	047101
	034425	377	042522	042503
	034444	051377	041505	044505
	034471	377	047515	042504
	034514	052377	044510	020123
	034574	040777	052125	051517
	034656	054777	052517	044040
	034710	052377	040522	051516
	034737	377	042522	042503
	034763	377	047111	041040
	035023	377	051124	047101
	035073	377	040503	046102
	035114	043377	040514	020107
	035130	052377	040522	051516
	035174	051777	044527	041524
	035215	377	041101	051117
	035232	052377	040522	051516
	035255	377	040510	043114
	035277	377	052517	020124
	035322	044777	020116	042522

	035344	042777	050130	041505
	035365	377	054105	042520
	035423	377	044103	051101
	035461	377	047503	051122
	035521	377	054105	042520
	035553	377	054105	042520
	035621	377	046102	041517
	035644	051377	051524	042040
		035670		

	035670	000002		
	035672	003	007	
	035674	001272		
	035676	003	002	
	035700	001270		
	035702	000003		
	035704	003	007	
	035706	001272		
	035710	003	010	
	035712	001270		
	035714	003	002	
	035716	001264		

STUFDI: .BYTE '00,140,160,170,3,300,174,176,177,1

.BYTE 363,347,317,200,0,377,377,377,200,37

.EVEN

EM1:	.ASCIZ	<377>/LINE UNIT INITIALIZATION TEST/
EM2:	.ASCIZ	<377>^LINE UNIT REGISTER READ/ONLY TEST^
EM3:	.ASCIZ	<377>^LINE UNIT REGISTER WRITE/READ TEST^
EM4:	.ASCIZ	<377>/LINE UNIT INTERNAL CLOCK FAILURE/
EM5:	.ASCIZ	<377>/TRANSMITTER DATA ERROR/
EM6:	.ASCIZ	<377>/RECEIVER TEST/
EM7:	.ASCIZ	<377>/RECEIVER DATA ERROR/
EM10:	.ASCIZ	<377>/MODEM SIGNAL ERROR/
	.ASCIZ	<377>/THIS ERROR COULD BE CAUSED IF YOU HAVE V.35 AND/
	.ASCIZ	<377>/AUTOSIZED. YOU MUST MANUALLY ANSWER QUESTIONS IF/
	.ASCIZ	<377>/YOU HAVE V.35 (DMC11-FA)/
EM11:	.ASCIZ	<377>/TRANSMITTER CRC ERROR/
EM12:	.ASCIZ	<377>/RECEIVER CRC ERROR/
EM13:	.ASCIZ	<377>/IN BCC MATCH ERROR (LU REG 12)/
EM14:	.ASCIZ	<377>/TRANSMITTER FAILED TO GO TO MARK STATE/
EM15:	.ASCIZ	<377>/CABLE DATA TEST/
EM16:	.ASCIZ	<377>/FLAG ERROR/
EM17:	.ASCIZ	<377>/TRANSMITTER FAILED TO STUFF A ZERO/
EM20:	.ASCIZ	<377>/SWITCH PAC TEST/
EM21:	.ASCIZ	<377>/ABORT ERROR/
EM22:	.ASCIZ	<377>/TRANSMITTER ERROR/
EM23:	.ASCIZ	<377>/HALF DUPLEX TEST/
EM24:	.ASCIZ	<377>/OUT READY NOT SET/
EM25:	.ASCIZ	<377>/IN READY NOT SET/

DH1:	.ASCIZ	<377>/EXPECTED FOUND/
DH2:	.ASCIZ	<377>/EXPECTED FOUND LU-REGISTER/
DH3:	.ASCIZ	<377>/CHARACTER BIT THAT FAILED/
DH4:	.ASCIZ	<377>/CORRECT CRC BIT THAT FAILED/
DH5:	.ASCIZ	<377>/EXPECTED FOUND SHIFT/
DH6:	.ASCIZ	<377>/EXPECTED FOUND CHARACTER SHIFT/
DH7:	.ASCIZ	<377>/BLOCK END NOT SET/
DH10:	.ASCIZ	<377>/RTS DID NOT CLEAR/
	.EVEN	

DT1:	2	
	.BYTE	3,7
	SAVR5	
	.BYTE	3,2
	SAVR4	
DT2:	3	
	.BYTE	3,7
	SAVR5	
	.BYTE	3,10
	SAVR4	
	.BYTE	3,2
	SAVR2	

035720	000002		DT3:	2	
035722	003	017		.BYTE	3,17
035724	001272			SAVR5	
035726	002	002		.BYTE	2,2
035730	001266			SAVR3	
035732	000002		DT4:	2	
035734	006	021		.BYTE	6,21
035736	033334			CALBCC	
035740	002	002		.BYTE	2,2
035742	001266			SAVR3	
035744	000003		DT5:	3	
035746	001	011		.BYTE	1,11
035750	001300			ZERO	
035752	001	011		.BYTE	1,11
035754	001302			ONE	
035756	002	002		.BYTE	2,2
035760	001260			SAVR0	
035762	000003		DT6:	3	
035764	001	011		.BYTE	1,11
035766	001302			ONE	
035770	001	011		.BYTE	1,11
035772	001300			ZERO	
035774	002	002		.BYTE	2,2
035776	001260			SAVR0	
036000	000004		DT7:	4	
036002	001	011		.BYTE	1,11
036004	001300			ZERO	
036006	001	011		.BYTE	1,11
036010	001302			ONE	
036012	003	007		.BYTE	3,7
036014	001272			SAVR5	
036016	002	001		.BYTE	2,1
036020	001266			SAVR3	
036022	000004		DT10:	4	
036024	001	011		.BYTE	1,11
036026	001302			ONE	
036030	001	011		.BYTE	1,11
036032	001300			ZERO	
036034	003	007		.BYTE	3,7
036036	001272			SAVR5	
036040	002	001		.BYTE	2,1
036042	001266			SAVR3	
036044	000002		DT11:	2	
036046	003	007		.BYTE	3,7
036050	034112			FLAG	
036052	002	002		.BYTE	2,2
036054	001266			SAVR3	
036056	000002		DT12:	2	
036060	006	004		.BYTE	6,4
036062	033334			CALBCC	
036064	006	002		.BYTE	6,2
036066	001252			TEMP3	
036070			.ERRTAB:		
036070	000000			0	
036072	000000			0	

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CZDMF.P11 08-JUL-80 08:25 SUBROUTINES

C 10

SEQ 0119

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

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

036412 000001

CORMAX:
 .END

CROSS REFERENCE TABLE -- USER SYMBOLS

ADRCNT=	004373	1482*	1518*	1527#										
AUDONE	003024	1172	1211	1216	1262#									
AUSTRT	002446	1171#	1266											
AUTO.S	010640	1129	1971#											
BCCLD	033336	4086	4118	4175	4213	4270	4302	4359	4391	5918#				
BINWRD	004714	1568*	1571*	1572	1609#									
BITCON	034114	2834*	2909*	2984*	3085*	3091*	3096*	3100	3102*	3135*	3168*	3215*	3252*	3816*
		3863*	4078*	4167*	4178*	4262*	4351*	4435*	4518*	4606*	4809*	5125*	5850*	6054*
		6056*	6057	6059*	6077*	6079*	6080	6082*	6107#					
BIT0 =	000001	696#	1758	1759										
BIT1 =	000002	695#	1134	1752	1758	1759	2052	2160	2173					
BIT10 =	002000	686#	2141	2152										
BIT11 =	004000	685#	2685	2722	2770	2835	2910	2985	3055	3136	3216	3303	3377	3436
		3468	3500	3540	3574	3631	3677	3723	3769	3820	3911	4020	4079	4168
		4263	4352	4436	4519	4610	4742	4813	5129	5456	5524	5627		
BIT12 =	010000	684#	2069	2171										
BIT13 =	020000	683#	2072	2084	2144	2175	2384	3951	3965	3988	4016	4043		
BIT14 =	040000	682#	1384	2083	2108	2175	2186	2386	3953	4018	5518	5621		
BIT15 =	100000	681#	1088	1175	1178	1199	1202	2054	2147					
BIT2 =	000004	694#	1134	1315	1759	2094	2104	3969	3991	4040				
BIT3 =	000010	693#	2177	2184	3990									
BIT4 =	000020	692#	1742	1765	1767	2806	3588	3645	3691	3731	3783	5716	5758	5874
BIT5 =	000040	691#	2289	2389	2745	2883	2958	3033	3190	3868	5473			
BIT6 =	000100	690#	1747	1748	2179	3477	3517	3549						
BIT7 =	000200	689#	1748	1868	2289	2778	3593	3967	3972	3993	4042	4045	6037	
BIT8 =	000400	688#	2151	2166	2168	2181	2183	2189	2192	2250				
BIT9 =	001000	687#	2149	2151	2163	2189	2192	2248	2250					
BM	007055	1790#	2120											
BRLVL	012460	2245	2255	2263	2275#									
BRW	003730	1321	1407#											
BRX	003732	1322	1408#											
CALBCC	033334	4107	4139	4202	4234	4291	4323	4380	4412	4485	4571	4638	4663*	4664
		4846	4871*	4872	4927	4952*	4953	5053	5097	5163	5188*	5189	5262	5287*
		5288	5388	5432	5536	5539*	5597	5639	5642*	5688	5890*	5891	5893*	5899
		5900*	5901*	5905	5912#	6125								
CHAR	032532	3912	5766#											
CHARSD	032644	3580	3637	3683	3729	3775	5793#							
CHRCNT	004712	1566*	1569	1573	1589*	1607#	1608							
CKSWR	007734	1115	1382	1414	1629	1815#								
CKSWR1	010014	1828#	1840											
CKSWR2	010026	1831#												
CKSWR3	010032	1833#												
CKSWR4	010036	1834#	1842	1849										
CKSWR5	010142	1816	1823	1858#										
CLKX	001242	772#												
CLR10	033676	2684	2721	2769	2833	2908	2983	3054	3134	3214	3302	3376	3435	3467
		3499	3539	3572	3629	3675	3721	3767	3813	3860	3910	4077	4080	4112
		4166	4169	4207	4261	4264	4296	4350	4353	4385	4434	4517	4605	4741
		4808	5124	5455	5523	5626	6033#							
CNERR	007300	1229	1790#											
CNT.MA	001702	797	965#	1087	1089	1091	1896							
CNVRT =	104411	834#	1226	1341	1343	1345	1347	1663	1665	1725	1831			
CONERR	007224	1224	1790#											
CONN	007115	1790#	2074											
CONTAB	002776	1233	1246#											
CONVRT=	104410	832#	1146	1232	1679	1994								

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0122

CORMAX	036412	6125#												
CRAM	006607	1790#	2033											
CRC.CC=	102010	4082	4114	4171	4209	4266	4298	4355	4387	4442	4525	4632	4840	4921
		5157	5256	5526	5629	5915#								
CRC16 =	120001	5914#												
CREAM	001320	796#	1086*	1892*	1893	1895*	1899							
CSR	006511	1790#	1998											
CSRMAP	010642	1973#												
CTSDLY	034066	6093#												
CYCLE	010206	1323	1364	1365	1883#									
DATABP	005216	1652*	1655	1677	1680#									
DATAL=	104415	842#	2729	2777	2781	2850	2852	2866	2880	2925	2927	2941	2955	3000
		3002	3016	3030	3068	3070	3088	3103	3152	3154	3169	3187	3236	3238
		3256	3320	3323	3341	3350	3393	3394	3403	3440	3472	3512	3544	3582
		3639	3685	3731	3777	3822	3823	3872	3873	3917	4088	4089	4120	4121
		4177	4180	4215	4216	4272	4273	4304	4305	4361	4362	4393	4394	4456
		4460	4539	4544	4624	4639	4666	4689	4706	4713	4715	4753	4832	4847
		4874	4897	4928	4955	4978	4995	5002	5004	5015	5149	5164	5191	5214
		5232	5263	5290	5313	5330	5337	5339	5350	5465	5470	5476	6060	6083
DATAHD	005204	1651*	1673	1676#										
DELAY =	104413	838#												
DEVADR	004370	1480*	1515	1525#										
DEVTAB	003010	1186	1251#											
DH1	035344	6125#												
DH10	035644	6125#												
DH2	035365	6125#												
DH3	035423	6125#												
DH4	035461	6125#												
DH5	035521	6125#												
DH6	035553	6125#												
DH7	035621	6125#												
DISPLA	001200	743#	1101*	1107*	1338*									
DISPRE	000174	729#	1107											
DMACTV	001306	790#	1124	1279*	1280	1883	1897	1979*	2205*	2211*	2212*	2216	2241	
DMCM	007321	1237	1790#											
DMCRO0	001500	880#												
DMCRO1	001510	885#												
DMCRO2	001520	890#												
DMCRO3	001530	895#												
DMCRO4	001540	900#												
DMCRO5	001550	905#												
DMCRO6	001560	910#												
DMCRO7	001570	915#												
DMCR10	001600	920#												
DMCR11	001610	925#												
DMCR12	001620	930#												
DMCR13	001630	935#												
DMCR14	001640	940#												
DMCR15	001650	945#												
DMCR16	001660	950#												
DMCR17	001670	955#												
DMCSR	001404	863#	1171*	1205	1210*	1215*	1250	1368	1405	1697	1720	1766	1901*	1910
		1959	2306*											
DMCSRH	001406	864#	1747*	1748*	1752*	1758*	1759*	1765*	1767*	1910*	1911*	1912		
DMCTL	001410	865#	1912*	1913*	1914									
DMNUM	001310	791#	1082	1354	1977*	1992*	2196*	2197	2206	2208				

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0123

[illegible]

[illegible]

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SEQ 0126

MLOCK	006044	1317	1790#											
MNEW	006145	1271	1790#											
MODU	006705	1790#	2058											
MPASSX	006107	1344	1790#											
MPFAIL	005675	1724	1790#											
MQM	005666	1464	1790#	1955	2030	2040	2050	2067	2081	2101				
MR	005756	1326	1790#	1949										
MRESET=	004000	697#												
MSTCLR=	104412	836#	1729	2353	2377	2409	2451	2493	2551	2602	2624	2646	2680	2717
		2765	2829	2904	2979	3050	3130	3210	3298	3372	3431	3463	3495	3535
		3568	3625	3671	3717	3763	3809	3856	3906	3950	4015	4072	4161	4256
		4345	4430	4513	4601	4737	4804	5120	5451	5517	5620			
		737#	1114											
MTITLE	001000	1662	1790#	1933										
MTSTN	006131	1790#												
MTSTPC	006032	1342	1790#											
MVECX	006101	1790#	2089											
MV35	007455	758#	1402	1695	2304*	2328*	2351*	2375*	2406*	2448*	2490*	2548*	2600*	2622*
NEXT	001216	2644*	2678*	2715*	2763*	2827*	2902*	2977*	3048*	3128*	3208*	3296*	3370*	3429*
		3461*	3493*	3533*	3566*	3623*	3669*	3715*	3761*	3807*	3854*	3904*	3948*	4013*
		4069*	4158*	4253*	4342*	4428*	4511*	4599*	4735*	4802*	5118*	5449*	5515*	5618*
		5703*	5704*	5705*	5706*	5708#								
NITCH	032344	1126	1790#	1885										
NOACT	007155	1180	1219#											
NODEV	002674	1790#	1985											
NUM	006451	2728	2776	2847	2922	2997	3149	3235	3318	3391	3511	4455	4538	4622
OCOR	032346	4752	4830	5147	5464	5469	5555	5648	5711#	5717	5747	5789	5805	5846
		5942	6028											
		1206	1213#	1242										
OK	002646	788#	6125											
ONE	001302	2836	2843	2911	2918	2986	2993	3056	3137	3145	3220	3226	3231	3275
OUTRDY	032500	3306	3314	3378	3502	3914	4616	4746	4819	5135	5460	5731	5740	5751#
		5776	5785	5798	5802	5822	5831	5929	5938	5975	5991	6005	6022	
PACT00	001702	966#												
PACT01	001706	969#												
PACT02	001712	972#												
PACT03	001716	975#												
PACT04	001722	978#												
PACT05	001726	981#												
PACT06	001732	984#												
PACT07	001736	987#												
PACT10	001742	990#												
PACT11	001746	993#												
PACT12	001752	996#												
PACT13	001756	999#												
PACT14	001762	1002#												
PACT15	001766	1005#												
PACT16	001772	1008#												
PACT17	001776	1011#												
PARAM =	104405	826#	1934	1986	1999	2008	2112	2121						
PARAM1	004234	1484#	1501											
PARBIT=	040000	697#												
PARERR	004310	1487	1489	1491	1500#	1507	1509	1511						
PASCNT	001230	763#	1337*	1338	1349	1374	1907*							
PERFOR=	004537	697#												
PFIAB	005430	1725	1731#											

SEQ 0127

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0130

TST60	031330	5449	5514#											
TST61	031752	5515	5617#	5692										
TST62 =	***** U	5618												
TST7	013324	2448	2489#											
TTST	003612	1318*	1319*	1321*	1322*	1385#								
TWOSYN=	010000	697#												
TYPDAT	005206	1656	1674	1677#										
TYPE =	104402	820#	1114	1126	1138	1223	1228	1236	1239	1271	1276	1317	1326	1339
		1340	1342	1344	1346	1434	1447	1454	1557	1597	1657	1658	1661	1662
		1664	1666	1670	1675	1724	1830	1833	1885	1931	1949	1955	1993	2015
		2029	2032	2039	2042	2049	2057	2066	2073	2080	2088	2100	2218	
TYPMSG	005106	1654	1657#											
VEC	006527	1790#	2007											
VECMAP	012216	2217	2229#											
WHICH	012210	1995	2225#											
WRDCNT	004710	1565*	1598*	1606#										
WRKO.F	005174	1669	1672#											
XBX	005000	1631	1633	1635#										
XCSR	003546	1341	1366#											
XERR	003570	1347	1375#											
XHEAD	006225	1138	1790#											
XLOC	003022	1196*	1214*	1217	1248	1261#								
XPASS	003562	1345	1372#											
XPOLY	033332	4082*	4114*	4171*	4209*	4266*	4298*	4355*	4387*	4442*	4525*	4632*	4840*	4921*
		5157*	5256*	5526*	5629*	5898	5900	5911#						
XSTATQ	007602	1147	1790#											
XTSTN	005330	1663	1703#											
XVEC	003554	1343	1369#											
ZERO	001300	787#	6125											
\$COD =	***** U	602												
\$CRAP =	177777	1#	2293#	2296	2299#	2317#	2320	2323#	2340#	2343	2346#	2364#	2367	2370#
		2395#	2398	2401#	2437#	2440	2443#	2479#	2482	2485#	2537#	2540	2543#	2589#
		2592	2595#	2611#	2614	2617#	2633#	2636	2639#	2666#	2669	2673#	2703#	2706
		2710#	2751#	2754	2758#	2813#	2816	2822#	2888#	2891	2897#	2963#	2966	2972#
		3037#	3040	3043#	3114#	3117	3123#	3194#	3197	3203#	3283#	3286	3291#	3358#
		3361	3365#	3418#	3421	3424#	3450#	3453	3456#	3482#	3485	3488#	3522#	3525
		3528#	3554#	3557	3561#	3612#	3615	3618#	3658#	3661	3664#	3704#	3707	3710#
		3750#	3753	3756#	3796#	3799	3802#	3841#	3844	3849#	3891#	3894	3899#	3936#
		3939	3943#	4002#	4005	4008#	4055#	4058	4064#	4144#	4147	4153#	4239#	4242
		4248#	4328#	4331	4337#	4417#	4420	4423#	4500#	4503	4506#	4586#	4589	4594#
		4723#	4726	4730#	4786#	4789	4797#	5101#	5104	5113#	5436#	5439	5444#	5500#
		5503	5510#	5604#	5607	5613#								
		724	1112	1358#	1682									
SENDAD	003522	1#	2293	2299	2301	2306#	2317	2323	2325	2330#	2340	2346	2348	2353
\$N =	000061	2354#	2364	2370	2372	2377	2378#	2395	2401	2403	2409	2410#	2437	2443
		2445	2451	2452#	2479	2485	2487	2493	2494#	2537	2543	2545	2551	2552#
		2589	2595	2597	2602	2603#	2611	2617	2619	2624	2625#	2633	2639	2641
		2646	2647#	2666	2673	2675	2680	2681#	2703	2710	2712	2717	2718#	2751
		2758	2760	2765	2766#	2813	2822	2824	2829	2830#	2888	2897	2899	2904
		2905#	2963	2972	2974	2979	2980#	3037	3043	3045	3050	3051#	3114	3123
		3125	3130	3131#	3194	3203	3205	3210	3211#	3283	3291	3293	3298	3299#
		3358	3365	3367	3372	3373#	3418	3424	3426	3431	3432#	3450	3456	3458
		3463	3464#	3482	3488	3490	3495	3496#	3522	3528	3530	3535	3536#	3554
		3561	3563	3568	3569#	3612	3618	3620	3625	3626#	3658	3664	3666	3671
		3672#	3704	3710	3712	3717	3718#	3750	3756	3758	3763	3764#	3796	3802
		3804	3809	3810#	3841	3849	3851	3856	3857#	3891	3899	3901	3906	3907#

DMEND	1#	1328													
DMFRNT	1#	602													
HLT	676#	2315	2338	2362	2393	2421	2434	2463	2476	2509	2530	2564	2582	2609	2631
	2655	2664	2700	2738	2748	2790	2800	2809	2857	2861	2871	2875	2885	2932	2936
	2946	2950	2960	3007	3011	3021	3025	3035	3075	3079	3094	3099	3106	3159	3163
	3174	3178	3192	3243	3247	3261	3265	3328	3332	3344	3353	3397	3408	3412	3448
	3480	3520	3552	3591	3603	3610	3648	3656	3694	3702	3740	3748	3786	3794	3831
	3881	3925	3934	3978	4000	4051	4100	4104	4132	4136	4194	4198	4227	4231	4284
	4288	4316	4320	4373	4377	4405	4409	4471	4475	4555	4559	4644	4648	4671	4675
	4694	4698	4709	4718	4761	4781	4852	4856	4879	4883	4902	4906	4933	4937	4960
	4964	4983	4987	4998	5007	5025	5046	5055	5069	5090	5099	5169	5173	5196	5200
	5219	5223	5237	5241	5268	5272	5295	5299	5318	5322	5333	5342	5360	5381	5390
	5404	5425	5434	5475	5484	5495	5567	5590	5599	5659	5681	5690	5762	5878	6086
\$ABORT	599#	3891													
\$AUTO	1#	1150													
\$BCC	601#	4055	4144	4239	4328										
\$BINCR	601#	4417	4500												
\$BINWI	599#	3194													
\$BUFFE	1#	1802													
\$CDATA	602#	5500	5604												
\$CLOCK	601#	2633													
\$COMP	1#	599#	3515	3586	3598	3605	3643	3652	3689	3698	3735	3744	3781	3790	3921
	4776	5041	5085	5376	5420	5585	5676								
\$CRC	601#	4080	4112	4169	4207	4264	4296	4353	4385						
\$CRCSH	601#	4436	4519												
\$CYCLE	1#	1874													
\$EMPTY	602#	5436													
\$EOP	1#	1328													
\$FINI	1#	5692													
\$FLAG	599#	2851	2926	3001	3069	3153	3237	3322	3402	4688	4896	4977	5213	5231	5312
\$FLOAT	599#	2495	2515	2553	2570										
\$GETPA	1#														
\$HALF	602#														
\$HEADE	1#	602													
\$INACT	599#	3418	3450	3522											
\$INIT	599#														
\$LINE1	599#	2479	2537												
\$LU1	599#	2293	2317	2340	2364										
\$LU12	599#	2395													
\$LU17	599#	2437													
\$MARHI	1#														
\$MARK	599#														
\$MATCH	601#	4764	5028	5072	5363	5407	5572	5663							
\$MOCK	1#														
\$MODEM	601#	3936													
\$MSG	1#	1790													
\$MULT	602#	3283													
\$PATTE	599#	3796	3841												
\$PFAIL	1#	1706													
\$QOOI	601#	5946	5956												
\$QUEST	1#	1984	1997	2006	2110	2119									
\$RAMCL	1#	1734													
\$RCLK	1#	1737	1740	1777	1782	2308	2331	2355	2379	2412	2414	2425	2427	2454	2456
	2467	2469	2499	2501	2520	2522	2556	2558	2574	2576	2603	2625	2649	2658	2682
	2687	2689	2693	2719	2724	2726	2731	2741	2767	2772	2774	2779	2783	2793	2803
	2831	2838	2840	2845	2881	2906	2913	2915	2920	2956	2981	2988	2990	2995	3031

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0133

	3052	3058	3060	3132	3139	3141	3147	3188	3212	3222	3224	3228	3233	3277	3300
	3308	3310	3316	3374	3380	3382	3385	3387	3389	3433	3441	3465	3473	3497	3504
	3506	3509	3513	3537	3545	3570	3576	3578	3584	3594	3596	3627	3633	3635	3641
	3650	3673	3679	3681	3687	3696	3719	3725	3727	3733	3742	3765	3771	3773	3779
	3788	3811	3825	3858	3869	3875	3908	3915	3919	3927	3957	3960	3980	3983	4022
	4026	4033	4074	4163	4258	4347	4432	4445	4449	4453	4494	4515	4528	4532	4536
	4580	4603	4739	4755	4769	4774	4783	4806	5019	5034	5039	5048	5063	5078	5083
	5092	5122	5354	5369	5374	5383	5398	5413	5418	5427	5453	5471	5478	5488	5521
	5561	5578	5583	5592	5624	5653	5669	5674	5683	5701	5714	5729	5733	5736	5742
	5745	5756	5774	5778	5781	5787	5800	5803	5820	5824	5827	5833	5853	5855	5872
	5927	5931	5934	5940	5950	5960	5973	5977	5980	5993	5996	6007	6009	6024	6038
	6040														
\$RCRC	602#	4723													
\$REC	599#	3554	3612	3658	3704	3750									
\$SCOPE	1#	1378													
\$SIMBC	1#	5882													
\$SINAC	599#	3482													
\$SOFTC	1#	1810													
\$STUFF	602#	3037													
\$SWPAC	602#	2589	2611												
\$TCHAR	601#	4610	4742	4813	5129										
\$TCRC	601#	4586	4786	5101											
\$TRANW	601#	4631	4839	4920	5156	5255									
\$TRAN1	599#	2666	2703	2751											
\$IRPDE	1#	816	818	820	822	824	826	828	830	832	834	836	838	840	842
	844														
\$TSTN	1#	2301	2325	2348	2372	2403	2445	2487	2545	2597	2619	2641	2675	2712	2760
	2824	2899	2974	3045	3125	3205	3293	3367	3426	3458	3490	3530	3563	3620	3666
	3712	3758	3804	3851	3901	3945	4010	4066	4155	4250	4339	4425	4508	4596	4732
	4799	5115	5446	5512	5615										
\$VARIA	1#	735													
\$WINDO	599#	2813	2888	2963	3114										
\$XZ	1#	2293	2299	2317	2323	2340	2346	2364	2370	2395	2401	2437	2443	2479	2485
	2537	2543	2589	2595	2611	2617	2633	2639	2666	2673	2703	2710	2751	2758	2813
	2822	2888	2897	2963	2972	3037	3043	3114	3123	3194	3203	3283	3291	3358	3365
	3418	3424	3450	3456	3482	3488	3522	3528	3554	3561	3612	3618	3658	3664	3704
	3710	3750	3756	3796	3802	3841	3849	3891	3899	3936	3943	4002	4008	4055	4064
	4144	4153	4239	4248	4328	4337	4417	4423	4500	4506	4586	4594	4723	4730	4786
	4797	5101	5113	5436	5444	5500	5510	5604	5613						
\$ZEROS	602#	3358													

. ABS. 036412 000

ERRORS DETECTED: 0

CZDMF,CZDMF/NL:TOC/SOL/CRF_CZDMF.MAC,CZDMF.P11/EQ:LUTYPE

RUN-TIME: 15 22 1 SECONDS

RUN-TIME RATIO: 48/39=1.2

CORE USED: 33K (65 PAGES)