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IDENTIFICATION

PRODUCT CODE:	AC-8544D-MC
PRODUCT NAME:	CZDMCDO DMC11 BSC W/R UPROC
DATE:	17-JUN-1985
MAINTAINER:	MK NAC SOFTWARE ENGINEERING
AUTHOR:	BRUCE LUHRS

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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.

CZDMC TESTS THE DMC11 MICRO-PROCESSOR (M8200-YA OR M8200-YB). IT PERFORMS WRITE/READ TESTS ON THE DMC UNIBUS REGISTERS, CHECKS THE MICRO-PROCESSOR OPERATION, CHECKS OUT MAIN MEMORY, SCRATCH PAD MEMORY, THE ALU FUNCTIONS AS WELL AS INTERRUPTS AND NPR OPERATION. CZDMC PERFORMS NO TESTS ON THE LINE UNIT OR ANY CROM DEPENDENT TESTS. IT DOES NOT REQUIRE A LINE UNIT TO RUN. NOTE: THIS DIAGNOSTIC WILL RUN ON A KMC11 (M8204), HOWEVER IT IS NOT ADVISED THAT THIS DIAGNOSTIC BE USED TO CHECK A KMC11, RATHER YOU SHOULD CHECK A KMC11 WITH THE KMC11 DIAGNOSTIC PACKAGE.

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

NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE FIVE DIAGNOSTICS ARE:

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

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (EXCEPT AN LSI-11) WITH MINIMUM 8K MEMORY ASR 33 (OR EQUIVALENT)
DMC11-AR (M8200 YA) OR A DMC11-AL (M8200-YB)

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2.2 STORAGE

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

3. LOADING PROCEDURE

3.1 METHOD

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

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY * SIZE

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

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

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

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

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4. STARTING PROCEDURE

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

MAP OF DMC11 STATUS

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-----
PC      CSR      STAT1  STAT2  STAT3
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001500 160010 145310 177777 000000
001510 160020 145320 177777 000000
  
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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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01
CSR ADDRESS?160010
VECTOR ADDRESS?310
BR PRIORITY LEVEL? (4,5,6,7)?5
DOES MICRO-PROCESSOR HAVE CRAM? (Y OR N)N
WHICH LINE UNIT? IF NONE TYPE "N". IF M8201 TYPE "1", IF
M8202 TYPE "2"?1
IS THE LOOP BACK CONNECTOR ON?Y
SWITCH PAC#1 (DDCMP LINE#)?377
SWITCH PAC#2 (BM873 BOOT ADD)?377
  
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FOLLOWING THE QUESTIONS THE STATUS MAP IS PRINTED OUT AS DESCRIBED ABOVE, THE INFORMATION IN THE MAP REFLECTS THE ANSWERS TO THE QUESTIONS. IF THE DIAGNOSTIC WAS STARTED WITH SW00=0 AND SW07=0 (AUTO-SIZING) THEN NO QUESTIONS ARE ASKED AND ONLY THE STATUS-MAP IS PRINTED OUT. IF AUTO-SIZING IS USED THE STATUS INFORMATION MUST BE VERIFIED TO BE CORRECT (MATCH THE HARDWARE). IF IT DOES NOT MATCH THE HARDWARE THE DIAGNOSTIC MUST BE RESTARTED WITH SW00=1 AND THE QUESTIONS ANSWERED.

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

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

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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 CARRIE 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 ENABELED; AND THERE IS A HARD ERROR (CONSTANT); SW08 IS BEST. (SW14=1,0, SW10=0, SW09=0, SW08=1). FOR INTERMITTEMT ERRORS; SW14=1 WILL LOOP ON TEST REGARDLESS OF ERROR OR NOT ERROR. (SW14=1, SW10=0, SW09=0, SW08=1,0)
3. SW11 INHIBIT INTERATIONS.
4. SW14 LOOP ON CURRENT TEST.

4.2 STARTING ADDRESS

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

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

5. OPERATING PROCEDURE

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

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5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VTA 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.

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 CZDMC CSR: 175000 VEC: 0300 PASSES: 000001
ERRORS: 000000

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

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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.

DMCRO0-DMCR17
DMST00-DMST17
(1500)-(1640)

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

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

DMCSR (1404) 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 CRAM
BIT15=0 MICRO-PROCESSOR HAS CROM
BIT14=1 TURNAROUND CONNECTOR IS ON
BIT14=0 NO TURNAROUND CONNECTOR
BIT13=0 LINE UNIT IS AN M8201
BIT13=1 LINE UNIT IS AN M8202
BIT12=1 NO LINE UNIT
BITS 09-11 IS DMC11 BR PRIORITY LEVEL

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

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

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8.5 METHOD OF AUTO SIZING

8.5.1 FINDING THE CONTROL STATUS REGISTER.

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

8.5.2 FINDING THE VECTOR AND BR LEVEL

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '.+2' (NEXT ADDRESS). THE PROCESSOR STATUS IS STARTED AT 7 AND THE DMC IS PROGRAMMED TO INTERRUPT. THE PS IS LOWERED BY 1 UNTIL THE DMC INTERRUPTS, A DELAY IS MADE AND IF NO INTERRUPT OCCURS 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:

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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.

1683

;*AC-8544C-MC CZDMC DO BASIC DMC11 CONTROLLER TEST
;*COPYRIGHT 1976,1978, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;-----

;STARTING PROCEDURE
;LOAD PROGRAM
;LOAD ADDRESS 000200
;SWR=0 AUTOSIZE DMC11
;SW07=1 USE CURRENT DMC11 PARAMETERS
;SW00=1 INPUT NEW DMC11 PARAMETERS
;PRESS START
;PROGRAM WILL TYPE "AC-8544C-MC CZDMC-DO BASIC DMC11 CONTROLLER TEST"
;PROGRAM WILL TYPE STATUS MAP
;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
;AND THEN RESUME TESTING
;SUBSEQUENT RESTARTS WILL NOT TYPE PROGRAM TITLE

;SWITCH REGISTER OPTIONS
;-----

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

0

;REGISTER DEFINITIONS

;- - - - -

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

;LOCATION EQUIVALENCIES

;- - - - -

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

;INSTRUCTION DEFINITIONS

;- - - - -

005746	PUSH1SP=5746	;DECREMENT PROCESSOR STACK 1 WORD
005726	POP1SP=5726	;INCREMENT PROCESSOR STACK 1 WORD
010046	PUSHRO=10046	;SAVE R0 ON STACK
012600	POPPO=12600	;RESTORE R0 FROM STACK
024646	PUSH2SP=24646	;DECREMENT STACK TWICE
022626	POP2SP=22626	;INCREMENT STACK TWICE

;BIT DEFINITIONS

;- - - - -

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

```

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

```

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

000024      . = 24
000024 005336      .PFAIL      ;POWER FAIL HANDLER
000026 000340      340          ;SERVICE AT LEVEL 7
000030 004750      .MLT        ;ERROR HANDLER
000032 000340      340          ;SERVICE AT LEVEL 7
000034 004716      .TRPSRV     ;GENERAL HANDLER DISPATCH SERVICE
000036 000340      340          ;SERVICE AT LEVEL 7

000040      . = 40
000040 000000      0            ;SAVE FOR ACT-11 OR XXDP
000042 000000      0            ;RETURN ADDRESS IF UNDER ACT 11 OR XXDP
000044 000000      0            ;SAVE FOR ACT-11 OR XXDP
000046 003522      $ENDAD      ;FOR USE WITH ACT-11 OR XXDP
000052 000000      . = 52      0            ;ACT-11 PROGRAM CHARACTERISTICS

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

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

001000      . = 1000
001000      377      012      101      MTITLE: .ASCII <377><12>/AC-8544C-MC/<377>
001016      103      132      104      .ASCIZ /CZDMC-DO BASIC DMC11 CONTROLLER TEST/<377>

001200      . = 1200
;INDIRECT POINTERS TO SWITCH REGISTER AND LIGHT DISPLAY
;-----

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


;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS

```

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

```

;PROGRAM CONTROL PARAMETERS

```

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

```

;PROGRAM VARIABLES

```

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

```

;PROGRAM CONTROL FLAGS

001324 000
 001325 000
 001326 000
 001327 000

INIFLG: .BYTE 0
 ERRFLG: .BYTE 0
 LOKFLG: .BYTE 0
 QV.FLG: .BYTE 0

;PROGRAM INITIALIZATION FLAG
 ;ERROR OCCURED FLAG
 ;LOCK ON CURRENT TEST FLAG
 ;QUICK VERIFY FLAG.
 ;ON FIRST PASS OF EACH DMC11 ITERATIONS WILL BE SUPPRESSED.

.EVEN

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

;;*****

001330 104400
 001330 003576
 104401
 001332 003736
 104402
 001334 003766
 104403
 001336 004050
 104404
 001340 004154
 104405
 001342 004174
 104406
 001344 004374
 104407
 001346 004434
 104410
 001350 004466
 104411
 001352 004472
 104412
 001354 005466
 104413
 001356 005436
 104414
 001360 005504
 104415
 001362 005552
 104416
 001364 005616

 .TRPTAB:
 SCOPE=TRAP+0 ;CALL TO SCOPE LOOP AND ITERATION HANDLER
 .SCOPE
 SCOPE1=TRAP+1 ;CALL TO LOOP ON CURRENT DATA HANDLER
 .SCOPE1
 TYPE=TRAP+2 ;CALL TO TELETYPE OUTPUT ROUTINE
 .TYPE
 INSTR=TRAP+3 ;CALL TO ASCII STRING INPUT ROUTINE
 .INSTR
 INSTRER=TRAP+4 ;CALL TO INPUT ERROR HANDLER
 .INSTRER
 PARAM=TRAP+5 ;CALL TO NUMERICAL DATA INPUT ROUTINE
 .PARAM
 SAVOS=TRAP+6 ;CALL TO REGISTER SAVE ROUTINE
 .SAVOS
 RESOS=TRAP+7 ;CALL TO REGISTER RESTORE ROUTINE
 .RESOS
 CONVRT=TRAP+10 ;CALL TO DATA OUTPUT ROUTINE
 .CONVRT
 CNVRT=TRAP+11 ;CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF.
 .CNVRT
 MSTCLR=TRAP+12 ;CALL TO ISUE A MASTER CLEAR
 .MSTCLR
 DELAY=TRAP+13 ;CALL TO DELAY
 .DELAY
 ROMCLK=TRAP+14 ;CALL TO CLOCK ROM ONCE
 .ROMCLK
 DATACLK=TRAP+15 ;CALL TO CLK DATA
 .DATACLK
 TIMER=TRAP+16 ;CALL TO DELAY A CLOCK TICK
 .TIMER

 ;;*****

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

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

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

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

;TEMP STORAGE
 ;-----

001416 000000 TEMP: 0
 001460 . = . +40

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

001500 . = 1500
 001500 DM.MAP:
 001500 DMC00: .BLKW 1 ; CONTROL STATUS REGISTER FOR DMC11 NUMBER 00
 001502 DMS100: .BLKW 1 ; VECTOR FOR DMC11 NUMBER 00
 001504 DMS200: .BLKW 1 ; DDCMP LINE# FOR DMC11 NUMBER 00
 001506 DMS300: .BLKW 1 ; 3RD STATUS WORD

 001510 DMC01: .BLKW 1 ; CONTROL STATUS REGISTER FOR DMC11 NUMBER 01
 001512 DMS101: .BLKW 1 ; VECTOR FOR DMC11 NUMBER 01
 001514 DMS201: .BLKW 1 ; DDCMP LINE# FOR DMC11 NUMBER 01
 001516 DMS301: .BLKW 1 ; 3RD STATUS WORD

 001520 DMC02: .BLKW 1 ; CONTROL STATUS REGISTER FOR DMC11 NUMBER 02
 001522 DMS102: .BLKW 1 ; VECTOR FOR DMC11 NUMBER 02
 001524 DMS202: .BLKW 1 ; DDCMP LINE# FOR DMC11 NUMBER 02
 001526 DMS302: .BLKW 1 ; 3RD STATUS WORD

 001530 DMC03: .BLKW 1 ; CONTROL STATUS REGISTER FOR DMC11 NUMBER 03
 001532 DMS103: .BLKW 1 ; VECTOR FOR DMC11 NUMBER 03
 001534 DMS203: .BLKW 1 ; DDCMP LINE# FOR DMC11 NUMBER 03
 001536 DMS303: .BLKW 1 ; 3RD STATUS WORD

 001540 DMC04: .BLKW 1 ; CONTROL STATUS REGISTER FOR DMC11 NUMBER 04
 001542 DMS104: .BLKW 1 ; VECTOR FOR DMC11 NUMBER 04
 001544 DMS204: .BLKW 1 ; DDCMP LINE# FOR DMC11 NUMBER 04
 001546 DMS304: .BLKW 1 ; 3RD STATUS WORD

 001550 DMC05: .BLKW 1 ; CONTROL STATUS REGISTER FOR DMC11 NUMBER 05

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 PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

001552	DMS105: .BLKW	1	;VECTOR FOR DMC11 NUMBER 05
001554	DMS205: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 05
001556	DMS305: .BLKW	1	;3RD STATUS WORD
001560	DMCR06: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 06
001562	DMS106: .BLKW	1	;VECTOR FOR DMC11 NUMBER 06
001564	DMS206: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 06
001566	DMS306: .BLKW	1	;3RD STATUS WORD
001570	DMCR07: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 07
001572	DMS107: .BLKW	1	;VECTOR FOR DMC11 NUMBER 07
001574	DMS207: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 07
001576	DMS307: .BLKW	1	;3RD STATUS WORD
001600	DMCR10: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 10
001602	DMS110: .BLKW	1	;VECTOR FOR DMC11 NUMBER 10
001604	DMS210: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 10
001606	DMS310: .BLKW	1	;3RD STATUS WORD
001610	DMCR11: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 11
001612	DMS111: .BLKW	1	;VECTOR FOR DMC11 NUMBER 11
001614	DMS211: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 11
001616	DMS311: .BLKW	1	;3RD STATUS WORD
001620	DMCR12: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 12
001622	DMS112: .BLKW	1	;VECTOR FOR DMC11 NUMBER 12
001624	DMS212: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 12
001626	DMS312: .BLKW	1	;3RD STATUS WORD
001630	DMCR13: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 13
001632	DMS113: .BLKW	1	;VECTOR FOR DMC11 NUMBER 13
001634	DMS213: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 13
001636	DMS313: .BLKW	1	;3RD STATUS WORD
001640	DMCR14: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 14
001642	DMS114: .BLKW	1	;VECTOR FOR DMC11 NUMBER 14
001644	DMS214: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 14
001646	DMS314: .BLKW	1	;3RD STATUS WORD
001650	DMCR15: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 15
001652	DMS115: .BLKW	1	;VECTOR FOR DMC11 NUMBER 15
001654	DMS215: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 15
001656	DMS315: .BLKW	1	;3RD STATUS WORD
001660	DMCR16: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 16
001662	DMS116: .BLKW	1	;VECTOR FOR DMC11 NUMBER 16
001664	DMS216: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 16
001666	DMS316: .BLKW	1	;3RD STATUS WORD
001670	DMCR17: .BLKW	1	;CONTROL STATUS REGISTER FOR DMC11 NUMBER 17
001672	DMS117: .BLKW	1	;VECTOR FOR DMC11 NUMBER 17
001674	DMS217: .BLKW	1	;DDCMP LINE# FOR DMC11 NUMBER 17
001676	DMS317: .BLKW	1	;3RD STATUS WORD
001700	000000	DM.END: 000000	

;DMC11 PASS COUNT AND ERROR COUNT TABLE

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

001706 000000 PACT01: 0 ;PASS COUNT FOR DMC11 NUMBER 01
001710 000000 ERCT01: 0 ;ERROR COUNT FOR DMC11 NUMBER 01

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

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

001722 000000 PACT04: 0 ;PASS COUNT FOR DMC11 NUMBER 04
001724 000000 ERCT04: 0 ;ERROR COUNT FOR DMC11 NUMBER 04

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

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

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

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

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

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

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

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

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

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

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

.REM 1

FORMAT OF STATUS TABLE

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
CSR	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
STAT2	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	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

;PROGRAM INITIALIZATION
 ;LOCK OUT INTERRUPTS
 ;SET UP PROCESSOR STACK
 ;SET UP POWER FAIL VECTOR
 ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
 ;TYPE TITLE MESSAGE

```

002002 012737 000340 177776 .START: MOV #340,PS ;LOCK OUT INTERRUPTS
002010 012706 001200 MOV #STACK,SP ;SET UP STACK
002014 012737 005336 000024 MOV #.PFAIL,#024 ;SET UP POWER FAIL VECTOR
002022 013737 001310 001314 MOV DMNUM,SAVNUM ;SAVE NUMBER OF DEVICES IN SYSTEM.
002030 005037 010016 CLR SWFLG ;CLEAR SOFT TYPEOUT FLAG
002034 105037 001325 CLR# ERRFLG ;CLEAR ERROR FLAG
002040 105037 001327 CLR# QV.FLG ;ZERO QUICK VERIFY FLAG
002044 012737 001470 001320 MOV #DM.MAP-10,CREAM;GET MAP POINTER.
002052 012737 001676 001322 MOV #CNT.MAP-4,MILK ;GET PASS COUNT MAP POINTER
002060 012737 100000 001316 MOV #BIT15,RUN ;POINT POINTER TO FIRST DEVICE.
002066 012700 001702 MOV #CNT.MAP,RO ;PASS COUNT POINTER TO RO
002072 005020 23#: CLR (RO)+ ;CLEAR TABLE
002074 022700 002002 CMP #CNT.MAP+100,RO ;DONE YET?
002100 001374 BNE 23# ;KEEP GOING
002102 005037 001234 CLR LSTERR ;CLEAR LAST ERROR POINTER
002106 012737 000001 001226 MOV #1,TSTND ;SET UP FOR TEST 1
002114 012737 002002 001214 MOV #.START,RETURN ;SET UP FOR POWER FAIL BEFORE
;TESTING STARTS
;SAVE CURRENT VECTORS
002122 013746 000006 MOV #06,-(SP)
002126 013746 000004 MOV #04,-(SP)
;
002132 012737 002166 000004 MOV #6#,#04 ;SET UP FOR TIMEOUT
002140 012737 177570 001202 MOV #177570,SWR ;SET SWR TO HARD SWR ADDRESS
002146 012737 177570 001200 MOV #177570,DISPLAY ;SET DISPLAY TO HARD SWR ADDRESS
002150 022777 177777 177020 CMP #-1,#SWR ;REFERENCE HARDWARE SWITCH REGISTER
002162 001402 BEQ 6#+2 ;IF = -1 USE SOFT SWR ANYWAY
002164 000407 BR 7# ;IF IT EXISTS AND NOT = -1 USE HARD SWR
002166 022626 6#: CMP (SP)+,(SP)+ ;ADJUST STACK
002170 012737 000176 001202 MOV #SWREG,SWR ;POINTER TO SOFT SWR
002176 012737 000174 001200 MOV #DISPREG,DISPLAY ;POINTER TO SOFT DISPLAY REG
002204 012637 000004 7#: MOV (SP)+,#04 ;RESTORE VECTORS
002210 012637 000006 MOV (SP)+,#06
;
002214 105737 001324 TSTB INIFLG ;HAS INITIALIZATION BEEN PERFORMED
002220 001006 BNE 20# ;BR IF YES
002222 022737 003522 000042 CMP #ENDAD,#042 ;IF ACT-11 AUTOMATIC MODE, DON'T TYPE ID
002230 001402 BEQ 20#
002232 104402 001000 TYPE ,MTITLE ;TYPE TITLE MESSAGE
002236 004737 007606 20#: JSR PC,CKSWR ;CHECK FOR SOFT SWR
002242 017737 176734 001236 MOV #SWR,STRTSW ;STORE STARTING SWITCHES
002250 005737 000042 TST #042 ;IS IT RUNNING IN AUTO MODE?
002254 001402 BEQ .+6 ;BR IF NO
002256 005037 001236 CLR STRTSW ;IF YES, CLEAR SWITCHES
002262 032737 000001 001236 BIT #SW00,STRTSW ;IF SW00=1, QUESTIONS ARE ASKED.
002270 001012 BNE 17# ;BR IF SW00=1
002272 105737 001236 TSTB STRTSW ;BIT7=1??
002276 100007 BPL 17# ;BR IF SW07=0
002300 005737 001306 TST DMACTV ;ARE ANY DEVICES SELECTED?
002304 001006 BNE 16# ;BR IF YES
002306 104402 007154 TYPE, NOACT ;NO DEVICES SELECTED.
002312 000000 HALT ;STOP THE SHOW

```

```

002314 000776          BR      .-2          ;DISQUALIFY CONTINUE SWITCH
002316 004737 010512   17$: JSR      PC,AUTO.SIZE ;GO DO THE AUTO SIZE
002322 105737 001324   16$: TSTB   INIFLG          ;FIRST TIME?
002326 001410          BEQ      21$          ;BR IF YES
002330 105737 001236   TSTB   STRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
002334 100431          BMI      1$
002336 032737 000006 001236 BIT      @BIT1!BIT2,STRTSW;IS TEST NO. OR LOCK SELECTED
002344 001403          BEQ      24$          ;IF NO THEN TYPE STATUS
002346 000424          BR      1$          ;IF YES DO NOT TYPE STATUS
002350 005137 001324   21$: COM      INIFLG          ;SET FLAG
002354 104402 006224   24$: TYPE   ,XHEAD          ;TYPE HEADER
002360 012704 001500          MOV      @DM.MAP,R4        ;SET POINTER
002364 010437 001246   5$:  MOV      R4,TEMP1        ;SET ADDRESS
002370 012437 001250          MOV      (R4)+,TEMP2       ;SET CSR
002374 001411          BEQ      1$          ;ALL DONE IF ZERO
002376 012437 001252          MOV      (R4)+,TEMP3       ;SET STAT1
002402 012437 001254          MOV      (R4)+,TEMP4       ;SET STAT2
002406 012437 001256          MOV      (R4)+,TEMP5       ;SET STAT3
002412 104410          CONVRT  ;TYPE OUT STATUS MAP
002414 007454          XSTATQ  ;
002416 000762          BR      5$
002420 012700 001500   1$:  MOV      @DM.MAP,RO        ;RO POINTS TO STATUS TABLE
  
```

```

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

```

002424 013746 000004          MOV      @4,-(SP)          ;SAVE LOC 4
002430 013746 000006          MOV      @6,-(SP)          ;SAVE LOC 6
002434 005037 000006          CLR      @6              ;CLEAR VEC+2
002440 005037 001252          CLR      TEMP3          ;CLEAR FLAG
002444 005005          CLR      R5              ;R5=0=DMC, R5=-1=KMC
002446 011037 001404   AUSTRT: MOV      (RO),DMCSR        ;GET NEXT DMC CSR
002452 001564          BEQ      AUDONE          ;BR IF DONE
002454 005705          TST      R5              ;DMC OR KMC?
002456 001005          BNE      1$              ;BR IF KMC
002460 032760 100000 000002 BIT      @BIT15,2(RO)      ;CHECK FOR DMC CSR
002466 001061          BNE      SKIP            ;SKIP IF NOT DMC
002470 000404          BR      2$              ;ITS A DMC SO CONTINUE
002472 032760 100000 000002 1$: BIT      @BIT15,2(RO)      ;CHECK FOR KMC CSR
002500 001454          BEQ      SKIP            ;SKIP IF NOT KMC
002502 012737 002674 000004 2$: MOV      @NODEV,@4          ;SET UP FOR TIMEOUT
002510 005705          TST      R5              ;DMC OR KMC?
002512 001003          BNE      3$              ;BR IF KMC
002514 012703 000006          MOV      @6,R3           ;R3 IS COUNT OF DEVICES BEFORE DMC
002520 000402          BR      4$              ;GO ON
  
```


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PROGRAM INITIALIZATION AND START UP.

```

002522 012703 000010 3#: MOV #10,R3 ;R3 IS COUNT OF DEVICES BEFORE KMC
002526 012702 003010 4#: MOV #DEV'TAB,R2 ;R2 IS DEVICE TABLE POINTER
002532 012701 160010 MOV #160010,R1 ;START WITH ADDRESS 160010
002536 005711 FLOAT: TST (R1) ;CHECK ADDRESS IN R1
002540 111204 MOV#B (R2),R4 ;IF NO TIMEOUT, GET NEXT ADDRESS
002542 060401 ADD R4,R1 ;IN R1
002544 005201 INC R1 ;
002546 040401 BIC R4,R1 ;
002550 005703 TST R3 ;ANY MORE DEVICES TO CHECK FOR?
002552 001371 BNE FLOAT ;BR IF YES
002554 012737 002700 000004 MOV #ERR,#4 ;OK ONLY DMC'S ARE LEFT, SET UP FOR TIMEOUT
002562 010137 003022 MOV R1,XLOC ;SAVE FIRST DMC/KMC ADDRESS
002566 005705 FY: TST R5 ;DMC OR KMC?
002570 001005 BNE 1# ;BR IF KMC
002572 032760 100000 000002 BIT #BIT15,2(R0) ;CHECK FOR DMC CSR
002600 001014 BNE SKIP ;SKIP IF NOT DMC
002602 000404 BR 2# ;ITS A DMC SO CONTINUE
002604 032760 100000 000002 1#: BIT #BIT15,2(R0) ;CHECK FOR KMC CSR
002612 001407 BEQ SKIP ;SKIP IF NOT KMC
002614 005711 2#: TST (R1) ;CHECK DMC ADDRESS
002616 020137 001404 CMP R1,DMCSR ;DOES IT MATCH
002622 001411 BEQ OK ;BR IF YES
002624 062701 000010 ADD #10,R1 ;GET NEXT DMC ADDRESS
002630 000756 BR FY ;DO IT AGAIN
002632 062700 000010 SKIP: ADD #10,R0 ;SKIP TO NEXT CSR IN TABLE
002636 011037 001404 MOV (R0),DMCSR ;GET NEXT CSR
002642 001470 BEQ AUDONE ;BR IF DONE
002644 000750 BR FY ;ELSE CONTINUE
002646 062700 000010 OK: ADD #10,R0 ;SKIP TO NEXT DMC CSR
002652 062737 000010 003022 ADD #10,XLOC ;UPDATE EXPECTED DMC/KMC ADDRESS
002660 011037 001404 MOV (R0),DMCSR ;GET NEXT DMC/KMC CSR
002664 001457 BEQ AUDONE ;BR IF DONE
002666 013701 003022 MOV XLOC,R1 ;GET EXPECTED DMC/KMC ADDRESS
002672 000735 BR FY ;CONTINUE
002674 122243 NODEV: CMP#B (R2)+,(R3) ;ON TIMEOUT, INC R2, DEC R3
002676 000002 RTI ;RETURN
002700 005737 001252 ERR: TST TEMP3 ;CHECK FLAG IF = 0 TYPE HEADER
002704 001014 BNE 1# ;SKIP HEADER
002706 104402 TYPE ;TYPEOUT HEADER MESSAGE
002710 007223 CONERR ;CONFIGURATION ERROR!!!
002712 012737 002700 001276 MOV #ERR,SAVPC ;SAVE PC FOR TYPEOUT
002720 104411 CNVRT ;TYPE OUT ERROR PC
002722 002770 ERRPC ;
002724 104402 TYPE ;TYPE REST OF HEADER
002726 007277 CNERR ;
002730 012737 177777 001252 MOV #-1,TEMP3 ;SET FLAG SO IT ONLY GETS TYPED ONCE
002736 010137 001262 1#: MOV R1,SAVR1 ;SAVE R1 FOR TYPEOUT
002742 104410 CNVRT ;
002744 002776 CONTAB ;TYPE CSR VALUES
002746 005705 TST R5 ;DMC OR KMC ?
002750 001003 BNE 3# ;BR IF KMC
002752 104402 TYPE ;
002754 007320 DMCM ;
002756 000402 BR 4# ;CONTINUE
002760 104402 3#: TYPE ;
002762 007330 KMCM ;
002764 022626 4#: CMP (SP)+,(SP)+ ;ADJUST STACK

```

```

002766 000727          BR      OK          ;BR TO GET OUT
002770 000001          ERRPC: 1
002772      006      002          .BYTE 6,2
002774 001276          SAVPC
002776 000002          CONTAB: 2
003000      006      004          .BYTE 6,4
003002 003022          XLOC
003004      006      002          .BYTE 6,2
003006 001404          DMCSR
003010      007          DEVTAB: .BYTE 7          ;DJ
003011      017          .BYTE 17         ;DH
003012      007          .BYTE 7          ;DQ
003013      007          .BYTE 7          ;DU
003014      007          .BYTE 7          ;DUP
003015      007          .BYTE 7          ;LK
003016      007          .BYTE 7          ;DMC
003017      007          .BYTE 7          ;DZ
003020      007          .BYTE 7          ;KMC

          .EVEN
003022 000000          XLOC: 0
003024 005705          AUDONE: TST      R5          ;DMC?
003026 001005          BNE      1$          ;BR IF KMC AND ALL DONE
003030 012705 177777          MOV      #-1,R5          ;SET R5 TO -1 (KMC)
003034 012700 001500          MOV      #DM.MAP,RO          ;RESET RO TO START OF TABLE
003040 000602          BR      AUSTRT          ;GO DO KMC'S
003042 012637 000006          1$: MOV      (SP)+,006          ;RESTORE LOC 6
003046 012637 000004          MOV      (SP)+,004          ;RESTORE LOC 4
003052 032737 000010 001236          BIT      #SW03,STRTSM          ;SELECT SPECIFIC DEVICES??
003060 001422          BEQ      3$          ;BR IF NO.
003062 104402 006144          TYPE    ,MNEW          ;TYPE THE MESSAGE.
003066 005000          CLR      RC          ;ZERO DATA LIGHTS
003070 000000          HALT          ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
003072 027737 176104 001312          CMP      #SWR,SAVACT          ;IS THE NUMBER VALID?
003100 010104          BLOS    2$          ;BR IF NUMBER IS OK.
003102 104402 006005          TYPE    ,MEXR3          ;TELL USER OF INVALID NUMBER.
003106 000000          HALT          ;STOP EVERY THING.
003110 000776          BR      .-2          ;RESTART THE PROGRAM AGAIN.
003112 017737 176064 001306          2$: MOV      #SWR,DMACTV          ;GET NEW DEVICE PATTERN
003120 013700 001306          MOV      DMACTV,RO          ;SHOW THE USER WHAT HE SELECTED.
003124 000000          HALT          ;CONTINUE DYNAMIC SWITCHES.
003126 012700 000300          3$: MOV      #300,RC          ;PREPARE TO CLEAR THE FLOATING
003132 012701 000302          MOV      #302,R1          ;VECTOR AREA. 300-776
003136 010120          4$: MOV      R1,(RO)+          ;START PUTTING "PC+2 - HALT"
003140 005021          CLR      (R1)+          ;IN VECTOR AREA.
003142 022021          CMP      (RO)+,(R1)+          ;POP POINTERS
003144 022700 001000          CMP      #1000,RO          ;ALL DONE??
003150 001372          BNE      4$          ;BR IF NO.

          ;TEST START AND RESTART
          ;-----

003152 012706 001200          .BEGIN: MOV      #STACK,SP          ;SET UP STACK
003156 013746 000006          MOV      006,-(SP)          ;SAVE LOC 6
003162 013746 000004          MOV      004,-(SP)          ;SAVE LOC 4
003166 005000          CLR      RO          ;START AT 0
003170 012737 003234 000004          MOV      #2,004          ;SET UP FOR TIME OUT
003176 005037 000006          CLR      006          ;TO AUTOSIZE MEMORY

```

003202	005720			6:	TST	(R0)-		;CHECK ADDRESS IN R0
003204	022700	157776			CMP	#157776,R0		;IS IT AT LEAST 28K
003210	001374				BNE	6:		;BR IF NO
003212	162700	007776			SUB	#7776,R0		;SAVE 2K FOR MONITORS
003216	010037	001304		7:	MOV	R0,MEMLIM		;STORE MEMORY LIMIT
003222	012637	000004			MOV	(SP)+,#4		;RESTORE LOC 4
003226	012637	000006			MOV	(SP)+,#6		;RESTORE LOC 6
003232	000413				BR	10:		;CONTINUE
003234	022626			2:	CMP	(SP)+,(SP)-		;ADJUST STACK
003236	162700	000004			SUB	#4,R0		;GET LAST GOOD ADDRESS
003242	162700	007776			SUB	#7776,R0		;SAVE 2K FOR MONITORS
003246	022700	030000			CMP	#30000,R0		;IS IT 8K?
003252	001361				BNE	7:		;BR IF NO
003254	012700	037400			MOV	#37400,R0		;IF 8K DON'T SAVE 2K
003260	000756				BR	7:		
003262	012737	000340	177776	10:	MOV	#340,PS		;LOCK OUT INTERRUPTS
003270	032737	000004	001236		BIT	#BIT2,STRTSW		;CHECK FOR LOCK ON TEST
003276	001411				BEQ	1:		;BR IF NO LOCK DESIRED.
003300	104402	006043			TYPE	,MLOCK		;TYPE LOCK SELECTED.
003304	012737	000240	003612		MOV	#NOP,TTST		;ADJUST SCOPE ROUTINE.
003312	012737	000240	003614		MOV	#NOP,TTST+2		;SET UP TO LOCK
003320	000406				BR	3:		;CONTINUE ALONG.
003322	013737	003730	003612	1:	MOV	BRW,TTST		;PREPARE NORMAL SCOPE ROUTINE
003330	013737	003732	003614		MOV	BRX,TTST+2		;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
003336	012737	010060	001214	3:	MOV	#CYCLE,RETURN		;START AT "CYCLE" FIND WHICH DEVICE TO TEST
003344	032737	000002	001236	4:	BIT	#SW01,STRTSW		;IS TEST NO. SELECTED?
003352	001002				BNE	5:		;BR IF YES
003354	104402	005755			TYPE	,MR		;TYPE R
003360	000177	175630		5:	JMP	@RETURN		;START TESTING

```

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

003364 000005          .EOP:  RESET          ;MAKE THE WORLD CLEAN AGAIN.
003366 005037 001234   CLR          LSTERR          ;CLEAR LAST ERROR PC
003372 105037 001325   CLRB         ERRFLG          ;CLEAR ERROR FLAG
003376 005237 001230   INC          PASCNT          ;UPDATE PASS COUNT
003402 013777 001230 175570  MOV         PASCNT,@DISPLAY ;DISPLAY PASS COUNT
003410 104402 005733   TYPE        .MEPASS          ;TYPE END PASS
003414 104402 006072   TYPE        .MCSR           ;TYPE CSR
003420 104411 003546   CNVRT       .XCSR           ;SHOW IT
003424 104402 006100   TYPE        .MVEC           ;TYPE VECTOR
003430 104411 003554   CNVRT       .XVEC           ;SHOW IT
003434 104402 006106   TYPE        .MPASSX          ;TYPE PASSES
003440 104411 003562   CNVRT       .XPASS          ;SHOW IT
003444 104402 006117   TYPE        .MERRX          ;TYPE ERRORS
003450 104411 003570   CNVRT       .XERR           ;SHOW IT
003454 013700 001322   MOV         MILK,RO          ;GET POINTER TO PASS COUNT
003460 013720 001230   MOV         PASCNT,(RO)+     ;STORE PASS COUNT FOR THIS DMC11
003464 013720 001232   MOV         ERRCNT,(RO)+     ;STORE ERROR COUNT FOR THIS DMC11
003470 005337 001314   DEC         SAVNUM          ;ARE ALL DEVICES TESTED?
003474 001017          BNE         RESTR           ;BR IF NO.
003476 112737 000377 001327  MOVVB      @377,QV.FLG       ;SET THE QUICK VERIFY FLAG.
003504 013737 001310 001314  MOV         DMNUM,SAVNUM     ;RESTORE THE COUNT
003512 013701 000042          MOV         @42,R1          ;CHECK FOR ACT-11 OR DDP
003516 001406          BEQ         RESTR           ;IF NOT, CONTINUE TESTING
003520 000005          RESET          ;STOP THE SHOW--CLEAR THE WORLD
003522          $ENDAD:
003522 004711          JSR         PC,(R1)
003524 000240          NOP
003526 000240          NOP
003530 000240          NOP
003532 000240          NOP
003534 012737 010060 001214  RESTR:  MOV         @CYCLE,RETURN ;CYCLE,RETURN
003542 000137 010060          JMP         CYCLE
003546 000001          XCSR:      1
003550          .BYTE      6,2
003552 001404          DMCSR
003554 000001          XVEC:      1
003556          .BYTE      4,2
003560 001374          DMRVEC
003562 000001          XPASS:    1
003564          .BYTE      6,2
003566 001230          PASCNT
003570 000001          XERR:      1
003572          .BYTE      6,2
003574 001232          ERRCNT

;SCOPE LOOP AND INTERATION HANDLER
;-----
003576 004737 007606          .SCOPE:  JSR         PC,CKSWR      ;CHECK FOR SOFT SWR
003602 010016          MOV         RO,(SP)         ;SAVE RO ON THE STACK
003604 032777 040000 175370  BIT         @BIT14,@SWR      ;'LOOP ON THIS TEST'?

```

```

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

;CHECK FOR FREEZE ON CURRENT DATA
 ;-----

```

003736 004737 007606 .SCOPI: JSR     PC,CKSWR    ;CHECK FOR SOFT SWR
003742 032777 001000 175232 BIT     @SW09,@SWR    ;IS SW09=1(SET)?
003750 001405          BEQ     1$          ;BR IF NOT SET.
003752 005737 001220   TST    LOCK         ;
003756 001402          BEQ     1$          ;
003760 013716 001220   MOV    LOCK,(SP)    ;GOTO THE ADDRESS IN LOCK.
003764 000002          1$: RTI          ;GO BACK.
  
```

;TELETYPE OUTPUT ROUTINE
 ;-----

```

003766 010546          .TYPE: MOV     R5,-(SP)    ;SAVE R5 ON THE STACK.
003770 017605          MOV     @2(SP),R5    ;GET ADDRESS OF MESSAGE.
003774 062766 000002 000002  ADD     @2,2(SP)     ;POP OVER ADDRESS.
004002 005737 010016   4$: TST    SWFLG      ;SOFT SWR MESSAGE?
004006 001004          BNE     1$          ;IF YES TYPE IT OUT REGARDLESS OF SW12
004010 032777 010000 175164  BIT     @SW12,@SWR    ;INHIBIT ALL PRINT OUT??
004016 001012          BNE     3$          ;BR IF NO PRINT OUT WANTED (SW12=1)
004020 105715          1$: TSTB   (R5)       ;IS NUMBER MINUS? (MSB=1(BIT7))
004022 100002          BPL     2$          ;BR IF NUMBER IS PLUS
004024 104402 005672   TYPE   ,MCRLF       ;TYPE A CR/LF!
004030 105777 175154   2$: TSTB   @TPCSR     ;TTY READY?
004034 100375          BPL     2$          ;BR IF NO.
004036 112577 175150   MOVB   (R5)+,@TPDBR ;PRINT CURRENT CHAR.
004042 001357          BNE     4$          ;IF NOT ZERO KEEP PRINTING!
004044 012605          3$: MOV     (SP)+,R5   ;END OF OUTPUT, RESTORE R5
004046 000002          RTI          ;GO HOME
  
```

```

004050 010346      .INSTR: MOV    R3,-(SP)      ;SAVE R3 ON STACK
004052 010446      MOV    R4,(SP)      ;SAVE R4 ON STACK
004054 017637 000004 004072      MOV    @4(SP),.MSG
004062 062766 000002 000004      ADD    #2,4(SP)
004070 104402      .INST1: TYPE
004072 000000      .MSG: 0
004074 012704 007502      MOV    #INBUF,R4
004100 012703 000007      MOV    #7,R3
004104 105777 175074      1$:   TSTB  @TKCSR
004110 100375      BPL    1$
004112 117714 175070      MOVB  @TKDBR,(R4)
004116 142714 000200      BICB  #200,(R4)
004122 122427 000015      CMPB  (R4)+,#15
004126 001417      BEQ   INSTR2
004130 105777 175054      2$:   TSTB  @TPCSR
004134 100375      BPL    2$
004136 017777 175044 175046      MOV    @TKDBR,@TPDBR
004144 005303      DEC   R3
004146 001356      BNE   1$
004150 012604      MOV   (SP)+,R4
004152 012603      MOV   (SP)+,R3
004154 104402 005666      .INSTE: TYPE ,MQM
004160 010346      MOV   R3,-(SP)
004162 010446      MOV   R4,-(SP)
004164 000741      BR    .INST1
004166 012604      INSTR2: MOV  (SP)+,R4      ;RESTORE R4
004170 012603      MOV  (SP)+,R3      ;RESTORE R3
004172 000002      RTI
    
```

;CONVERT ASCII STRING TO OCTAL

```

004174 010546      .PARAM: MOV    R5,-(SP)
004176 010446      MOV    R4,-(SP)
004200 016605 000004      MOV    4(SP),R5
004204 012537 004364      MOV    (R5)+,LOLIM
004210 012537 004366      MOV    (R5)+,HILIM
004214 012537 004370      MOV    (R5)+,DEVADR
004220 112537 004372      MOVB  (R5)+,LOBITS
004224 112537 004373      MOVB  (R5)+,ADRCNT
004230 010566 000004      MOV    R5,4(SP)
004234 005005      PARAM1: CLR   R5
004236 012704 007502      MOV    #INBUF,R4
004242 122714 000015      CMPB  #15,(R4)
004246 001420      BEQ   PARERR
004250 121427 000060      1$:   CMPB  (R4),#60
004254 002415      BLT   PARERR
004256 121427 000067      CMPB  (R4),#67
004262 003012      BGT   PARERR
004264 142714 000060      BICB  #60,(R4)
004270 152405      BISB  (R4)+,R5
004272 122714 000015      CMPB  #15,(R4)
004276 001406      BEQ   LIMITS
004300 006305      ASL   R5
004302 006305      ASL   R5
004304 006305      ASL   R5
    
```

```

004306 000760          BR      1$
004310 104404          PAREPR: INSTER
004312 000750          BR      PARAM1

;TEST TO SEE IF NUMBER IS WITHIN LIMITS
;-----

004314 020537 004366          LIMITS: CMP      R5,HILIM
004320 101373          BHI      PARERR
004322 020537 004364          CMP      R5,LOLIM
004326 103770          BLO      PARERR
004330 133705 004372          BITB    LOBITS,R5
004334 001365          BNE      PARERR

;STORE NUMBER AT SPECIFIED ADDRESS

004336 013704 004370          1$:   MOV      DEVADR,R4
004342 010524          MOV      R5,(R4)+
004344 062705 000002          ADD      #2,R5
004350 105337 004373          DECB    ADCRNT
004354 001372          BNE      1$
004356 012604          MOV      (SP)+,R4
004360 012605          MOV      (SP)+,R5
004362 000002          RTI
004364 000000          LOLIM:  0
004366 000000          HILIM:  0
004370 000000          DEVADR: 0
004372 000000          LOBITS: 0
004373 004373          ADCRNT=LOBITS+1

;SAVE PC OF TEST THAT FAILED AND R0-R5
;-----

004374 016637 000004 001276 .SAV05: MOV      4(SP),SAVPC      ;SAVE R7 (PC)

;SAVE R0-R5

004402 010537 001272          SV05:  MOV      R5,SAVR5      ;SAVE R5
004406 010437 001270          MOV      R4,SAVR4      ;SAVE R4
004412 010337 001266          MOV      R3,SAVR3      ;SAVE R3
004416 010237 001264          MOV      R2,SAVR2      ;SAVE R2
004422 010137 001262          MOV      R1,SAVR1      ;SAVE R1
004426 010037 001260          MOV      R0,SAVR0      ;SAVE R0
004432 000002          RTI                    ;LEAVE.

;RESTORE R0-R5

004434 013700 001260          .RES05: MOV      SAVR0,R0      ;RESTORE R0
004440 013701 001262          MOV      SAVR1,R1      ;RESTORE R1
004444 013702 001264          MOV      SAVR2,R2      ;RESTORE R2
004450 013703 001266          MOV      SAVR3,R3      ;RESTORE R3
004454 013704 001270          MOV      SAVR4,R4      ;RESTORE R4
004460 013705 001272          MOV      SAVR5,R5      ;RESTORE R5
004464 000002          RTI                    ;LEAVE

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

```

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

;TRAP DISPATCH SERVICE

;ARGUMENT OF TRAP IS EXTRACTED
 ;AND USED AS OFFSET TO OBTAIN POINTER
 ;TO SELECTED SUBROUTINE

```

004716 011646 .TRPSR: MOV (SP),-(SP) ;GET PC OF RETURN
004720 162716 000002 SUB #2,(SP) ;=PC OF TRAP
004724 017616 000000 MOV @SP),(SP) ;GET TRP
004730 006316 TRPOK: ASL (SP) ;MULTIPLY TRAP ARG BY 2
004732 042716 177001 BIC #177001,(SP) ;CLEAR UNWANTED BITS
004736 062716 001330 ADD #.TRPTAB,(SP) ;POINTER TO SUBROUTINE ADDRESS
004742 017616 000000 MOV @SP),(SP) ;SUBROUTINE ADDRESS
004746 000136 JMP @SP)+ ;GO TO SUBROUTINE
    
```

;ERROR HANDLER

```

004750 004737 007606 .HLT: JSR PC,CKSWR ;CHECK FOR SOFT SWR
004754 032777 010000 174220 BIT #SW12,@SWR ;BELL ON ERROR?
004762 001406 BEQ XBX ;BR IF NO BELL
004764 105777 174220 TSTB @TPCSR ;TTY READY.
004770 100003 BPL XBX ;DON'T WAIT IF TTY NOT READY.
004772 112777 000207 174212 MOVB #207,@TPDBR ;PUSH A BELL AT THE TTY.
005000 032777 020000 174174 XBX: BIT #SW13,@SWR ;DELETE ERROR PRINT OUT?
005006 001105 BNE HALTS ;BR IF NO PRINT OUT WANTED.
005010 021637 001234 CMP (SP),LSTERR ;WAS THIS ERROR FOUND LAST TIME?
005014 001404 BEQ 1# ;BR IF YES
005016 011637 001234 MOV (SP),LSTERR ;RECORD BEING HERE
005022 105037 001325 CLRB ERRFLG ;PREPARE HEADER
005026 104406 1#: SAVO5 ;SAVE ALL PROC REGISTERS
005030 011605 MOV (SP),R5 ;GET THE PC OF ERROR
005032 162705 000002 SUB #2,R5 ;GET ADDRESS OF TRAP CALL
005036 011504 MOV (R5),R4 ;GET HLT INSTRUCTION
005040 006304 ASL R4 ;MULT BY TWO
005042 061504 ADD (R5),R4 ;DOUBLE IT
005044 006304 ASL R4 ;MULT AGAIN
005046 042704 177001 BIC #177001,R4 ;CLEAR JUNK
005052 062704 036362 ADD #.ERRTAB,R4 ;GET POINTER
005056 012437 005172 MOV (R4)+,ERRMSG ;GET ERROR MESSAGE
005062 012437 005204 MOV (R4)+,DATAHD ;GET DATA HEADRER
005066 011437 005216 MOV (R4),DATABP ;GET DATA TABLE
005072 105737 001325 TSTB ERRFLG ;TYPE HEADREER
005076 001403 BEQ TYPMSG ;BR IF YES
005100 005737 005216 TST DATABP ;DOES DATA TABLE EXIST?
005104 001040 BNE TYPDAT ;BR IF YES.
005106 104402 005672 TYPMSG: TYPE ,MCRLF
005112 104402 005672 TYPE ,MCRLF
005116 005737 001220 TST LOCK
005122 001402 BEQ 1#
005124 104402 006142 TYPE ,MASTEK
005130 104402 006130 1#: TYPE ,MTSTN
005134 104411 005330 CNVRT ,XTSTN ;SHOW IT
005140 104402 006217 TYPE ,MERRPC ;TYPE PC.
005144 104411 005322 CNVRT ,ERTABO ;SHOW IT
005150 104402 005672 TYPE ,MCRLF ;GIVE A CR/LF
005154 112737 177777 001325 MOVB #1,ERRFLG ;NO MORE HEADER UNLESS NO DATA TABLE.
005162 005737 005172 TST ERRMSG ;IS THERE AN ERROR MESSAGE?
005166 001402 BEQ WRKO.FM ;BR IF NO.
    
```

```

005170 104402                TYPE                ;TYPE
005172 000000                ERRMSG: 0          ; ERROR MESSAGE
005174                        WRKO.FM:          ;
005174 005737 005204          TST      DATAHD    ;DATA HEADER?
005200 001402                BEQ      TYPDAT      ;BR IF NO
005202 104402                TYPE                ;TYPE
005204 000000                DATAHD: 0          ; DATA HEADER
005206 005737 005216          TYPDAT: TST      DATABP    ;DATA TABLE?
005212 001402                BEQ      RESREG      ;BR IF NO.
005214 104410                CONVRT          ;SHOW
005216 000000                DATABP: 0          ; DATA TABLE
005220 104407                RESREG: RES05      ;RESTORE PROC REGISTERS
005222 022737 003522 000042 HALTS:  CMP      @#ENDAD,@#42 ;IF ACT-11 AUTOMATIC MODE, HALT!!
005230 001403                BEQ      1#          ;
005232 005777 173744          TST      @SWR          ;HALT ON ERROR?
005236 100005                BPL      EXITER      ;BR IF NO HALT ON ERROR
005240 010046                1#:  PUSHRO      ;SAVE RO
005242 016600 000002          MOV      2(SP),RO    ;SHOW ERROR PC IN DATA LIGHTS
005246 000000                HALT          ;HALT
005250 012600                POPRO          ;GET RO
005252 005237 001232          EXITER: INC      ERRCNT    ;UPDATE ERROR COUNT
005256 032777 000400 173716 BIT      @SW08,@SWR    ;GOTO TOP OF TEST?
005264 001007                BNE      1#          ;BR IF YES
005266 032777 002000 173706 BIT      @SW10,@SWR    ;GOTO NEXT TEST?
005274 001411                BEQ      2#          ;BR IF NO
005276 013737 001216 001214 MOV      NEXT,RETURN ;SET FOR NEXT TEST
005304 012706 001200          1#:  MOV      @STACK,SP ;RESET SP
005310 013701 001404          MOV      DMCSR,R1   ;SET UP R1
005314 000177 173674          JMP      @RETURN    ;GOTO SPECIFIED TEST
005320 000002                2#:  RTI          ;RETURN
005322 000001                ERTAB0: 1          ;
005324      006      002          .BYTE      6,2
005326 001276                SAVPC
005330 000001                XTSTN: 1          ;
005332      003      002          .BYTE      3,2
005334 001226                TSTNO
;ENTER HERE ON POWER FAILURE
;-----

005336                        .PFAIL:
005336 012737 005350 000024 MOV      @RESTART,24 ;SET UP FOR POWER UP TRAP
005344 000000                HALT          ;HALT ON POWER DOWN NORMAL
005346 000777                BR      .

;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

005350                        RESTAR:
005350 012737 005336 000024 MOV      @.PFAIL,24  ;SET UP FOR POWER FAILURE
005356 012706 001200          MOV      @STACK,SP ;RESET THE STACK POINTER
005362 013701 001404          MOV      DMCSR,R1   ;RESTORE R1
005366 005037 001416          CLR      TEMP       ;READY FOR TIMMER
005372 005237 001416          INC      TEMP       ;PLUS ONE TO THE TIMER!
005376 001375                BNE      .-4         ;BR IF MORE TO GO
005400 104402                TYPE      ,MPFAIL    ;TYPE THE MESSAGE
005404 104411 005430          CNVRT   ,PFTAB      ;TELL WHAT TEST TO RETURN TO.
005410 105037 001325          CLRB    ERRFLG     ;START CLEAN
    
```

```

005414 005037 001234          CLR      LSTERR      ;*****
005420 005011          CLR      (R1)       ;CLEAR MAINT BITS
005422 104412          MSTCLR          ;START CLEAN UP OF DEVICE
005424 000177 173564          JMP      @RETURN    ;START DOING THAT TEST AGAIN.
005430 000001          PFTAB: 1
005432 003          .BYTE 3,2
005434 001226          TSTNO

005436          .DELAY:
005436 012777 000020 173746    MOV      @20,@DMP04
005444 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
005446 121111          121111          ;POKE CLOCK DELAY BIT
005450          1#:
005450 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
005452 121224          121224          ;PORT4_IBUS*11
005454 032777 000020 173730    BIT      @BIT4,@DMP04 ;IS CLOCK BIT SET?
005462 001772          BEQ      1#        ;BR IF NO
005464 000002          RTI

005466          .MSTCLR:
005466 152777 000100 173712    BISB    @BIT6,@DMCSRH ;SET MASTER CLEAR
005474 142777 000300 173704    BICB    @BIT6!BIT7,@DMCSRH ;CLEAR MASTER CLEAR AND RUN
005502 000002          RTI          ;RETURN

005504          .ROMCLK:
005504 152777 000002 173674    BISB    @BIT1,@DMCSRH ;SET ROMI
005512 013677 173676          MOV      @ (SP)+,@DMP06 ;LOAD INSTRUCTION IN SEL6
005516 062746 000002          ADD     @2,-(SP)      ;ADJUST STACK
005522 032777 000100 173452    BIT      @SW06,@SWR   ;HALT IF SW06 =1
005530 001401          BEQ     1#          ;BR IF SW06 =0
005532 000000          HALT          ;HALT BEFORE CLOCKING INSTRUCTION
005534 152777 000003 173644    1#: BISB    @BIT1!BIT0,@DMCSRH ;CLOCK INSTRUCTION
005542 142777 000007 173636    BICB    @BIT2!BIT1!BIT0,@DMCSRH ;CLEAR ROM0, ROM1, STEP
005550 000002          RTI

005552          .DATACLK:
005552 013637 001416          MOV      @ (SP)+,TEMP ;PUT TICK COUNT IN TEMP
005556 062746 000002          ADD     @2,-(SP)      ;ADJUST STACK
005562 152777 000020 173616    1#: BISB    @BIT4,@DMCSRH ;SET STEP LU
005570 027777 173610 173606    CMP     @DMCSR,@DMCSR ;WASTE TIME
005576 142777 000020 173602    BICB    @BIT4,@DMCSRH ;CLEAR STEP LU
005604 005337 001416          DEC     TEMP          ;DEC TICK COUNT
005610 001364          BNE     1#          ;BR IF NOT DONE
005612 000002          RTI          ;RETURN
005614          3#: .BLKW 1

005616          .TIMER:
005616 013637 001416          MOV      @ (SP)+,TEMP ;MOVE COUNT TO TEMP
005622 062746 000002          ADD     @2,-(SP)      ;ADJUST STACK
005626          1#:
005626 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
005630 021364          021364          ;PORT4_IBUS* REG11
005632 032777 000002 173552    BIT      @2,@DMP04    ;IS PGM CLOCK BIT CLEAR?
005640 001772          BEQ     1#        ;BR IF YES
005642          2#:
005642 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
005644 021364          021364          ;PORT4_IBUS* REG11
    
```

005646	032777	000002	173536	BIT	#2,@DMP04	:IS PGM CLOCK BIT SET?
005654	001372			BNE	2\$:BR IF YES
005656	005337	001416		DEC	TEMP	:DEC COUNT
005662	001361			BNE	1\$:BR IF NOT DONE
005664	000002			RTI		:RETURN

005666	040	040	077	MQM:	.ASCIZ	/ ?/
005672	015	012	000	MCRLF:	.ASCIZ	<15><12>
005675	377	120	127	MPFAIL:	.ASCIZ	<377>/PWR FAILED. RESTART AT TEST /
005733	377	105	116	MEPASS:	.ASCIZ	<377>/END PASS CZDMC /
005755	377	122	000	MR:	.ASCIZ	<377>/R/
005760	377	116	117	MERR2:	.ASCIZ	<377>/NO DEVICES PRESENT./
006005	377	111	116	MERR3:	.ASCIZ	<377>/INSUFFICIENT DATA! /
006031	377	124	105	MTSTPC:	.ASCIZ	<377>/TEST PC-/
006043	377	114	117	MLOCK:	.ASCIZ	<377>/LOCK ON SELECTED TEST/
006072	103	123	122	MCSRX:	.ASCIZ	/CSR: /
006100	126	105	103	MVECX:	.ASCIZ	/VEC: /
006106	120	101	123	MPASSX:	.ASCIZ	/PASSES: /
006117	105	122	122	MERRX:	.ASCIZ	/ERRORS: /
006130	124	105	123	MTSTN:	.ASCIZ	/TEST NO: /
006142	052	000		MASTEK:	.ASCIZ	/* /
006144	377	123	105	MNEW:	.ASCIZ	<377>/SET SWITCH REG TO DMC11'S DESIRED ACTIVE./
006217	120	103	072	MERRPC:	.ASCIZ	/PC: /
006224	212	040	040	XHEAD:	.ASCIZ	<212>/
006263	377	040	040		.ASCII	<377>/
006322	212	040	040		.ASCII	<212>/ PC CSR STAT1 STAT2 STAT3/
006374	377	055	055		.ASCIZ	<377>/-----
006450	377	110	117	NUM:	.ASCIZ	<377>/HOW MANY DMC11'S TO BE TESTED? /
006510	377	103	123	CSR:	.ASCIZ	<377>/CSR ADDRESS? /
006526	377	126	105	VEC:	.ASCIZ	<377>/VECTOR ADDRESS? /
006547	377	102	122	PRI0:	.ASCIZ	<377>/BR PRIORITY LEVEL? (4,5,6,7)? /
006606	377	111	106	CRAM:	.ASCIZ	<377>/IF DMC HAS CRAM (M8204) TYPE "Y", IF CROM (M8200) TYPE "N" ? /
006704	377	127	110	MODU:	.ASCIZ	<377>/WHICH LINE UNIT? IF NONE TYPE "N", IF M8201 TYPE "1", IF M8202 TYPE "2

"? /

007016	377	123	127	LINE:	.ASCIZ	<377>/SWITCH PAC#1 (DDCMP LINE #)? /
007054	377	123	127	BM:	.ASCIZ	<377>/SWITCH: PAC#2 (BM873 BOOT ADD)? /
007114	377	111	123	CONN:	.ASCIZ	<377>/IS THE LOOP BACK CONNECTOR ON? /
007154	377	116	117	NOACT:	.ASCIZ	<377>/NO DEVICES ARE SELECTED /
007205	377	012	123	SWMES:	.ASCIZ	<377><12>/SWR= /
007215	116	105	127	SWMES1:	.ASCIZ	/NEW? /
007223	377	377	104	CONERR:	.ASCIZ	<377><377>/DMC11 FOUND AT NON-STANDARD ADDRESS PC: /
007277	377	105	130	CNERR:	.ASCIZ	<377>/EXPECTED FOUND /
007320	040	050	104	DMCM:	.ASCIZ	/ (DMC) /
007330	040	050	113	KMCM:	.ASCIZ	/ (KMC) /
007340	377	104	115	SPEED:	.ASCIZ	<377>/DMC11-AR(REMOTE,LOW SPEED) OR DMC11-AL(LOCAL,HIGH SPEED) TYPE "R" OR "

L" ? /

				.EVEN		
007454	000005			XSTATQ:	5	
007456	006	003		.BYTE	6.3	
007460	001246			TEMP1		
007462	006	003		.BYTE	6.3	
007464	001250			TEMP2		
007466	006	003		.BYTE	6.3	
007470	001252			TEMP3		
007472	006	003		.BYTE	6.3	
007474	001254			TEMP4		
007476	006	002		.BYTE	6.2	
007500	001256			TEMP5		
				.EVEN		

;BUFFERS FOR INPUT OUTPUT

```
007502 000000 INBUF: 0
007544 007544 . = . + 40
007544 000000 MDATA: 0
007606 007606 . = . + 40
```

;ROUTINE USED TO CHANGE SOFTWARE SWITCH
 ;REGISTER USING THE CONSOLE TERMINAL
 ;-----

```
007606 022737 000176 001202 CKSWR: CMP #SWREG,SWR ;IS THE SOFT SWR BEING USED?
007614 001077 BNE CKSWR5 ;BR IF NO
007616 105777 171362 TSTB @TKCSR ;IS DONE SET?
007622 100003 BPL 2$ ;GO ON IF NOT SET
007624 012737 177777 003734 MOV #-1,DONE ;IF DONE SET, SET FLAG
007632 022777 000007 171346 2$: CMP #7,@TKD8R ;WAS CTRL G TYPED? (7 BIT ASCII)
007640 001404 BEQ 1$ ;BR IF YES
007642 022777 000207 171336 CMP #207,@TKD8R ;WAS CTRL G TYPED? (8 BIT ASCII)
007650 001061 BNE CKSWR5 ;BR IF NO
007652 010246 1$: MOV R2,-(SP) ;STORE R2
007654 010346 MOV R3,-(SP) ;STORE R3
007656 010446 MOV R4,-(SP) ;STORE R4
007660 012737 177777 010016 MOV #-1,SWFLG ;SET SOFT TYPE OUT FLAG
007666 005002 CKSWR1: CLR R2 ;CLEAR NEW SWR CONTENTS
007670 012704 177777 MOV #-1,R4 ;SET FLAG TO ALL ONES
007674 104402 007205 TYPE ,SWMES ;TYPE "SWR= "
007700 104411 CKSWR2: CNVRT ;TYPE OUT PRESENT CONTENTS
007702 010052 SOFTSW ;OF SOFT SWITCH REGISTER
007704 104402 007215 CKSWR3: TYPE ,SWMES1 ;TYPE "NEW? "
007710 004737 010020 CKSWR4: JSR PC,INCHAR ;GET RESPONSE
007714 022703 000015 CMP #15,R3 ;WAS IT A CR?
007720 001424 BEQ 5$ ;BR IF YES
007722 022703 000012 CMP #12,R3 ;WAS IT A LF?
007726 001416 BEQ 4$ ;BR IF YES
007730 022703 000025 CMP #25,R3 ;WAS IT CTRL U?
007734 001754 BEQ CKSWR1 ;BR IF YES(START OVER)
007736 022703 000007 CMP #7,R3 ;IF CNTL G GET NEXT CHAR
007742 001762 BEQ CKSWR4
007744 005004 CLR R4 ;IT MUST BE A DIGIT SO CLR FLAG
007746 042703 177770 BIC #177770,R3 ;ONLY 0-7 ARE LEGAL SO MASK OFF BITS
007752 006302 ASL R2 ;SHIFT R2 3 TIMES
007754 006302 ASL R2
007756 006302 ASL R2
007760 050302 BIS R3,R2 ;ADD LAST DIGIT
007762 000752 BR CKSWR4 ;GET NEXT CHARACTER
007764 012766 002002 000006 4$: MOV #.START,6(SP) ;LF WAS TYPED SO GO TO START
007772 005704 5$: TST R4 ;IS FLAG CLEAR?
007774 001002 BNE 6$ ;IF NOT DON'T CHANGE SOFT SWR
007776 010277 171200 MOV R2,@SWR ;IF YES THEN WRITE NEW CONTENTS TO SOFT SWR
010002 005037 010016 6$: CLR SWFLG ;CLEAR TYPEOUT FLAG
010006 012604 MOV (SP)+,R4 ;RESTORE R4
010010 012603 MOV (SP)+,R3 ;RESTORE R3
010012 012602 MOV (SP)+,R2 ;RESTORE R2
010014 000207 CKSWR5: RTS PC ;RETURN
```

010016	000000		SWFLG:	0	
010020	105777	171160	INCHAR:	TSTB	@TKCSR
010024	100375			BPL	.-4
010026	017703	171154		MOV	@TKDBR,R3
010032	105777	171152		TSTB	@TPCSR
010036	100375			BPL	.-4
010040	010377	171146		MOV	R3,@TPDBR
010044	042703	000200		BIC	@BIT7,R3
010050	000207			RTS	PC
010052	000001		SOFTSW:	1	
010054	006	002		.BYTE	6.2
010056	000176			SWREG	

```

;
;ROUTINE USED TO "CYCLE" THROUGH UP TO 16 DMC11'S
;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
;AND RUNS THE SPECIFIED DMC11'S. THIS ROUTINE *MUST*
;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
;SETUP NECESSARY.
;
    
```

```

010060 005737 001306          CYCLE: TST      DMACTV      ;ARE ANY DMC11'S TO BE TESTED?
010064 001004                BNE      1#        ;BR IF OK.
010066 104402 007154          TYPE     ,NOACT    ;NO DMC11'S SELECTED!!
010072 000000                HALT                    ;STOP THE SHOW.
010074 000776                BR       -2        ;DISQUALIFY CONT. SW.
010076 000241                1#:    CLC                    ;CLEAR PROC. CARRY BIT.
010100 006137 001316          ROL      RUN        ;UPDATE POINTER
010104 005537 001316          ADC      RUN        ;CATCH CARRY FROM RUN
010110 062737 000004 001322  ADD     #4,MILK    ;UPDATE POINTER
010116 062737 000010 001320  ADD     #10,CREAM  ;UPDATE ADDRESS POINTER.
010124 022737 001700 001320  CMP     #DM.MAP*200,CREAM
010132 001006                BNE     2#        ;KEEP GOING; NOT ALL TESTED FOR.
010134 012737 001500 001320  MOV     #DM.MAP,CREAM ;RESET ADDRESS POINTER.
010142 012737 001702 001322  MOV     #CNT.MAP,MILK ;RESET PASS COUNT POINTER
010150 033737 001316 001306  2#:    BIT     RUN,DMACTV ;IS THIS ONE ACTIVE?
010156 001747                BEQ     1#        ;BR IF NO
010160 013700 001320          MOV     CREAM,R0   ;GET ADDRESS POINTER
010164 013702 001322          MOV     MILK,R2    ;GET PASS COUNT POINTER
010170 012037 001404          MOV     (R0)+,DMCSR ;LOAD SYSTEM CTRL. REG
010174 011037 001374          MOV     (R0),DMRVEC ;LOAD VECTOR
010200 042737 177000 001374  BIC     #177000,DMRVEC ;CLEAR UNWANTED BITS
010206 012037 001366          MOV     (R0)+,STAT1 ;LOAD STAT1
010212 012037 001370          MOV     (R0)+,STAT2 ;LOAD STAT2
010216 012037 001372          MOV     (R0)+,STAT3 ;LOAD STAT3
010222 012237 001230          MOV     (R2)+,PASCNT ;LOAD PASS COUNT
010226 012237 001232          MOV     (R2)+,ERRCNT ;LOAD ERROR COUNT
010232 012700 000002          MOV     #2,R0     ;SAVE CORE THIS WAY!
010236 013737 001404 001406  MOV     DMCSR,DMCSRH
010244 005237 001406          INC     DMCSRH
010250 013737 001406 001410  MOV     DMCSRH,DMCTL
010256 005237 001410          INC     DMCTL
010262 013737 001410 001412  MOV     DMCTL,DMP04
010270 060037 001412          ADD     R0,DMP04
010274 013737 001412 001414  MOV     DMP04,DMP06
010302 060037 001414          ADD     R0,DMP06

010306 013737 001374 001376  MOV     DMRVEC,DMRLVL ;PTY LVL
010314 060037 001376          ADD     R0,DMRLVL   ;
010320 013737 001376 001400  MOV     DMRLVL,DMTVEC ;TX VEC
010326 060037 001400          ADD     R0,DMTVEC   ;
010332 013737 001400 001402  MOV     DMTVEC,DMTLVL ;TX LVL
010340 060037 001402          ADD     R0,DMTLVL

010344 032737 000002 001236  BIT     #SW01,STRTSM ;IS TEST NO. SELECTED
010352 001450                BEQ     7#        ;BR IF NO
010354                4#:
010354 005737 000042          TST     #42        ;RUNNING IN AUTO MODE?
010360 001045                BNE     7#        ;BR IF YES
    
```

```

010362 104402 005672          TYPE      ,MCRLF
010366 104403          INSTR
010370 006130          MTSTN
010372 104405          PARAM
010374 000001          1
010376 001000          1000
010400 001226          TSTNO
010402      000          .BYTE 0
010403      001          .BYTE 1
010404 012700 012320          MOV      @TST1,R0
010410 022710          5$:      CMP      (PC)+,(R0)      ;CMP FIRST WORD TO 12737
010412 012737          MOV      (PC)+,@(PC)+
010414 001020          BNE      6$
010416 023760 001226 000002    CMP      TSTNO,2(R0)      ;BR IF NOT SAME
010424 001014          BNE      6$      ;DOES TSTNO MATCH?
010426 022760 001226 000004    CMP      @TSTNO,4(R0)      ;BR IF NO
010434 001010          BNE      6$      ;IS LAST WORD OK?
010436 010037 001214          MOV      R0,RETURN      ;BR IF NO
010442 104402 005755          TYPE      ,MR      ;IT IS A LEGAL TEST SO DO IT
010446 042737 000002 001236    BIC      @SW01,STRTSW
010454 000412          BR
010456 005720          6$:      TST      (R0)+
010460 020027 033776          CMP      R0,@TLAST+10      ;POP R0
010464 001351          BNE      5$      ;AT END YET?
010466 104402 005666          TYPE      ,MQM      ;BR IF NO
010472 000730          BR      4$      ;YES ILLEGAL TEST NO.
                                ;TRY AGAIN

010474 012737 012320 001214 7$:      MOV      @TST1,RETURN      ;PREPARE RETURN ADDRESS
010502 013701 001404          8$:      MOV      DMCSR,R1      ;R1 = BASE DMC11 ADDRESS
010506 000177 170502          JMP      @RETURN      ;GO START TESTING.
  
```

```

;ROUTINE USED TO "AUTO SIZE" THE DMC11
;CSR AND VECTOR.
;NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
;      ADDRESS RANGE (160000:164000)
;      AND THE VECTOR MAY BE ANY WHERE IN THE
;      FLOATING VECTOR RANGE (300:770)
;
;
  
```

```

010512          AUTO.SIZE:
010512 000005          RESET
010514 012702 001500          CSRMAP: MOV      @DM.MAP,R2      ;INSURE A BUS INIT.
010520 005022          1$:      CLR      (R2)+      ;LOAD MAP POINTER.
010522 022702 001700          CMP      @DM.END,R2      ;ZERO ENTIRE MAP
010526 001374          BNE      1$      ;ALL DONE?
010530 005037 001310          CLR      DMNUM      ;BR IF NO
010534 012702 001500          MOV      @DM.MAP,R2      ;SET OCTAL NUMBER OF DMC11'S TO 0
010540 005037 001306          CLR      DMACTV      ;R2 POINTS TO DMC MAP
010544 032737 000001 001236    BIT      @SW00,STRTSW      ;CLEAR ACTIVE
010552 001002          BNE      .+6      ;QUESTIONS?
010554 000137 011252          JMP      7$      ;BR IF YES
010560 012737 000001 001256    MOV      @1,TEMP5      ;IF NO SKIP QUESTIONS
010566 104403          INSTR      ;START WITH 1
010570 006450          NUM
010572 104405          PARAM
010574 000001          1
  
```


010576	000020			16.		
010600	001252			TEMP3		
010602	000			.BYTE	0	
010603	001			.BYTE	1	
010604	013737	001252	001310	MOV	TEMP3,DMNUM	;DMNUM = HOW MANY
010612	104402	005672	12%:	TYPE	.MCRLF	
010616	104410			CONVRT		;TYPE WHICH DMC IS BEING DONE
010620	012002			WHICH		;TEMP5 IS WHICH DMC
010622	005237	001256		INC	TEMP5	
010626	104403			INSTR		
010630	006510			CSR		
010632	104405			PARAM		
010634	160000				160000	
010636	164000				164000	
010640	001254			TEMP4		
010642	000			.BYTE	0	
010643	001			.BYTE	1	
010644	013722	001254		MOV	TEMP4,(R2)	;STORE CSR IN MAP
010650	104403			INSTR		
010652	006526			VEC		
010654	104405			PARAM		
010656	000000				0	
010660	000776				776	
010662	001254			TEMP4		
010664	000			.BYTE	0	
010665	001			.BYTE	1	
010666	013712	001254		MOV	TEMP4,(R2)	;STORE VECTOR IN MAP
010672	104402		10%:	TYPE		
010674	006547			PRIO		;ASK WHAT BR LEVEL
010676	004737	012266		JSR	PC,INTTY	;GET RESPONSE
010702	022703	000024		CMP	#24,R3	
010706	101014			BHI	50%	;BR IF LESS THAN 4
010710	022703	000027		CMP	#27,R3	
010714	103411			BLO	50%	;BR IF GREATER THAN 7
010716	012704	000011		MOV	#11,R4	;R4 = NUMBER OF SHIFTS
010722	006303			ASL	R3	;SHIFT R3 LEFT
010724	005304			DEC	R4	;DEC SHIFT COUNT
010726	001375			BNE	--4	;BR IF NOT DONE
010730	042703	170777		BIC	#170777,R3	;BIC UNWANTED BITS
010734	050312			BIS	R3,(R2)	;PUT BR LEVEL IN STATUS MAP
010736	000403			BR	8%	;CONTINUE
010740	104402		50%:	TYPE		
010742	005666			MQM		;RESPONSE IS OUT OF LIMITS
010744	000752			BR	10%	;TRY AGAIN
010746	104402		8%:	TYPE		
010750	006606			CRAM		;DOES DMC HAVE CRAM?
010752	004737	012266		JSR	PC,INTTY	;GET REPLY
010756	022703	000131		CMP	#131,R3	
010762	001427			BEQ	9%	;YES
010764	022703	000116		CMP	#116,R3	;NO
010770	001403			BEQ	40%	;NOT A Y OR N
010772	104402			TYPE		
010774	005666			MQM		;TYPE "?"
010776	000763			BR	8%	;ASK AGAIN
011000	104402		40%:	TYPE		
011002	007340			SPEED		;DMC11-AR OR DMC11-AL?
011004	004737	012266		JSR	PC,INTTY	;GET RESPONSE

011010	022703	000122		CMP	#122,R3	;IS IT R
011014	001414			BEQ	16#	;BR IF REMOTE
011016	022703	000114		CMP	#114,R3	;IS IT L
011022	001403			BEQ	41#	;BR IF LOCAL
011024	104402			TYPE		
011026	005666			MQM		
011030	000763			BR	40#	;TRY AGAIN
011032	052762	000002	000004	BIS	#BIT1,4(R2)	;SET BIT1 IN STAT3
011040	000402			BR	16#	;CONTINUE
011042	052712	100000		BIS	#BIT15,(R2)	;SET BIT 15 IF CRAM
011046	104402		16#:	TYPE		
011050	006704			MODU		;ASK WHICH LINE UNIT
011052	004737	012266		JSR	PC,INTTY	;GET REPLY
011056	022703	000021		CMP	#21,R3	; "1"
011062	001417			BEQ	30#	
011064	022703	000022		CMP	#22,R3	; "2"
011070	001412			BEQ	31#	
011072	022703	000116		CMP	#116,R3	; "N"
011076	001403			BEQ	32#	
011100	104402			TYPE		
011102	005666			MQM		;IF NOT A 1,2 OR N TYPE "?"
011104	000760			BR	16#	;TRY AGIAN
011106	052722	010000	32#:	BIS	#BIT12,(R2)+	;SET BIT 12 IN STAT2 IF NO LU
011112	022222			CMP	(R2)+,(R2)+	;POP OVER STAT2 AND STAT3
011114	000447			BR	33#	
011116	052712	020000	31#:	BIS	#BIT13,(R2)	;SET BIT 13 IN STAT2 IF M8202
011122	104402		30#:	TYPE		
011124	007114			CONN		;ASK IF LOOP-BACK IS ON
011126	004737	012266		JSR	PC,INTTY	;GET REPLY
011132	022703	000131		CMP	#131,R3	;Y
011136	001406			BEQ	17#	
011140	022703	000116		CMP	#116,R3	;N
011144	001406			BEQ	18#	
011146	104402			TYPE		
011150	005666			MQM		;IF NOT Y OR N TYPE "?"
011152	000763			BR	30#	;TRY AGAIN
011154	052722	040000	17#:	BIS	#BIT14,(R2)+	;TURNAROUND IS CONNECTED
011160	000402			BR	19#	
011162	042722	040000	18#:	BIC	#BIT14,(R2)+	;NO TURNAROUND
011166			19#:			
011166	104403			INSTR		
011170	007016			LINE		
011172	104405			PARAM		
011174	000000			0		
011176	000377			377		
011200	001254			TEMP4		
011202	000			.BYTE	0	
011203	001			.BYTE	1	
011204	113722	001254		MOVB	TEMP4,(R2)+	;STORE SWITCH PAC IN MAP
011210	104403			INSTR		
011212	007054			BM		
011214	104405			PARAM		
011216	000000			0		
011220	000377			377		
011222	001254			TEMP4		
011224	000			.BYTE	0	
011225	001			.BYTE	1	

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011226 113722 001254          MOVB  TEMP4,(R2)+  ;STORE SWITCH PAC IN MAP
011232 005722          TST   (R2)+      ;POP OVER STAT3
011234 005337 001252      33$:  DEC   TEMP3      ;DEC DMC COUNT
011240 001402          BEQ   34$        ;BR IF DONE
011242 000137 010612          JMP   12$        ;JUMP IF NOT
011246 000137 011702          JMP   13$        ;CONTINUE
011252 012701 160000          MOV   #160000,R1 ;SET FOR FIRST ADDRESS TO BE TESTED
011256 012737 011774 000004  MOV   #6$,#04    ;SET FOR NON-EXISTANT DEVICE TIME OUT
011264 005011          2$:  CLR   (R1)       ;CLEAR SEL0
011266 005711          TST   (R1)       ;IF DMC11 DMCSR S/B 0
011270 001172          BNE   3$        ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DMC11
011272 005061 000006          CLR   6(R1)     ;CLEAR SEL6
011276 005761 000006          TST   6(R1)     ;IF DMC11 THEN DMRIC S/B =0!
011302 001165          BNE   3$        ;BR IF NOT DMC11
011304 012711 002000          MOV   #BIT10,(R1) ;SET ROMO
011310 005061 000004          CLR   4(R1)     ;CLEAR SEL4
011314 012761 125252 000006  MOV   #125252,6(R1) ;WRITE THIS TO SEL6
011322 052711 020000          BIS   #BIT13,(R1) ;WRITE IT!
011326 022761 125252 000004  CMP   #125252,4(R1) ;WAS IT WRITTEN?
011334 001004          BNE   21$       ;IF NO IT IS NOT CRAM
011336 052762 100000 000002  BIS   #BIT15,2(R2) ;SET BIT15 IF CRAM
011344 000431          BR    22$       ;
011346 012711 001000          21$: MOV   #BIT9,(R1) ;SET ROMI
011352 012761 100430 000006  MOV   #100430,6(R1) ;PUT INSTRUCTION IN SEL6
011360 012711 001400          MOV   #BIT9!BIT8,(R1) ;CLOCK INSTRUCTION (MICRO PROC PC TO 0)
011364 012711 002000          MOV   #BIT10,(R1) ;SET ROMO
011370 022761 016472 000006  CMP   #016472,6(R1) ;IS IT LOCAL CROM?
011376 001411          BEQ   23$       ;BR IF YES
011400 022761 016461 000006  CMP   #016461,6(R1) ;IS IT REMOTE CROM?
011406 001410          BEQ   22$       ;BR IF YES
011410 022761 177777 000006  CMP   #-1,6(R1)  ;NO CROM?
011416 001404          BEQ   22$       ;BR IF YES
011420 000516          BR    3$        ;NOT A DMC
011422 052762 000002 000006  23$: BIS   #BIT1,6(R2) ;SET BIT 1 IN STAT3
;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DMC11 CSR ADDRESS.
011430 010122          22$: MOV   R1,(R2)+ ;STORE CSR IN CORE TABLE.
011432 012711 001000          15$: MOV   #BIT9,(R1) ;CLEAR LINE UNIT LOOP
011436 005061 000004          CLR   4(R1)     ;CLEAR PORT4
011442 012761 122113 000006  MOV   #122113,6(R1) ;LOAD INSTRUCTION (CLR DTR)
011450 052711 000400          BIS   #BIT8,(R1) ;CLOCK INSTRUCTION
011454 012761 021264 000006  MOV   #021264,6(R1) ;LOAD INSTRUCTION
011462 052711 000400          BIS   #BIT8,(R1) ;CLOCK INSTRUCTION
011466 122761 000377 000004  CMPB  #377,4(R1) ;IS IT ALL ONES?
011474 001003          BNE   .+10      ;BR IF NO
011476 052712 010000          BIS   #BIT12,(R2) ;IF YES, NO LINE UNIT, SET STATUS BIT
011502 000436          BR    20$       ;
011504 032761 000002 000004  BIT   #BIT1,4(R1) ;IS SWITCH A ONE?
011512 001403          BEQ   .+10      ;BR IF M8201
011514 052712 060000          BIS   #BIT13!BIT14,(R2) ;M8202 ASSUME CONNECTOR
011520 000427          BR    20$       ;CONNECTOR ON)
011522 032761 000010 000004  BIT   #BIT3,4(R1) ;IS MRDY SET
011530 001023          BNE   20$       ;BR IF M8201 NO CONNECTOR (ON LINE)
011532 012761 000100 000004  MOV   #BIT6,4(R1) ;LOAD PORT4
011540 012761 122113 000006  MOV   #122113,6(R1) ;LOAD INSTRUCTION
011546 052711 000400          BIS   #BIT8,(R1) ;CLOCK INSTRUCTION(SET DTR)
011552 012761 021264 000006  MOV   #021264,6(R1) ;LOAD INSTRUCTION
011560 052711 000400          BIS   #BIT8,(R1) ;CLOCK INSTRUCTION(READ MODEM REG)
    
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011564 032761 000010 000004 BIT #BIT3,4(R1) ;IS MRDY SET NOW?
011572 001402 BEQ 20$ ;BR IF NO CONNECTOR
011574 052712 040000 BIS #BIT14,(R2) ;SET STATUS BIT FOR CONNECTOR
011600 005722 20$: TST (R2)+ ;POP POINTER
011602 012761 021324 000006 MOV #021324,6(R1) ;PUT INSTRUCTION IN PORT6
011610 012711 001400 MOV #BIT9:BIT8,(R1) ;PORT4_LU 15
011614 156122 000004 BISB 4(R1),(R2)+ ;STORE DDCMP LINE # IN TABLE
011620 012761 021344 000006 MOV #021344,6(R1) ;PORT6_INSTRUCTION
011626 012711 001400 MOV #BIT8:BIT9,(R1) ;CLOCK INSTR.
011632 156122 000004 BISB 4(R1),(R2)+ ;STORE BM873 ADD IN TABLE
011636 005722 TST (R2)+ ;POP OVER STAT3
011640 005011 CLR (R1) ;CLEAR ROMI
011642 005237 001310 INC DMNUM ;UPDATE DEVICE COUNTER
011646 022737 000020 001310 CMP #20,DMNUM ;ARE MAX. NO. OF DEV FOUND?
011654 001412 BEQ 13$ ;YES DON'T LOOK FOR ANY MORE.
011656 005011 3$: CLR (R1) ;CLEAR BIT 10
011660 005061 000006 CLR 6(R1) ;CLEAR SEL 6
011664 062701 000010 14$: ADD #10,R1 ;UPDATE CSR POINTER ADDRESS
011670 022701 164000 CMP #164000,R1
011674 001402 BEQ 13$ ;BR IF DONE
011676 000137 011264 JMP 2$ ;JUMP IF NOT
011702 005037 001306 13$: CLR DMACTV
011706 005737 001310 TST DMNUM ;WERE ANY DMC11'S FOUND AT ALL?
011712 001423 BEQ 5$ ;ERROR AUTO SIZER FOUND NO DMC11'S IN THIS SYS.
011714 013701 001310 MOV DMNUM,R1
011720 010137 001314 MOV R1,SAVNUM ;SAVE NUMBER OF DEVICES
011724 000241 4$: CLC
011726 006137 001306 ROL DMACTV ;GENERATE ACTIVE REGISTER OF DEVICES.
011732 005237 001306 INC DMACTV ;SET THE BIT
011736 005301 DEC R1
011740 001371 BNE 4$ ;BR IF MORE TO GENERATE
011742 012737 000006 000004 MOV #6,0#4 ;RESTORE TRAP VECTOR
011750 013737 001306 001312 MOV DMACTV,SAVACT ;SAVE ACTIVE REGISTER
011756 000137 012010 JMP VECMAP ;GO FIND THE VECTOR NOW.
011762 104402 005760 5$: TYPE ,MERR2 ;NOTIFY OPR THAT NO DMC11'S FOUND.
011766 005000 CLR RO ;MAKE DATA LIGHTS ZERO
011770 000000 HALT ;STOP THE SHOW
011772 000776 BR -.2 ;DISABLE CONT. SW.
011774 012716 011664 6$: MOV #14$,(SP) ;ENTERED BY NON-EXISTANT TIME-OUT.
012000 000002 RTI ;RETURN TO MAINSTREAM

012002 000001 WHICH: 1
012004 002 002 .BYTE 2,2
012006 001256 TEMP5

012010 032737 000001 001236 VECMAP: BIT #SW00,STRTSW
012016 001114 BNE 5$
012020 012737 000340 000022 MOV #340,0#22 ;SET IOT TRAP PRIO TO 7
012026 012737 012202 000020 MOV #4$,0#20 ;SET IOT TRAP VECTOR
012034 012702 001500 MOV #DM.MAP,R2 ;SET SOFTWARE POINTER
012040 012700 000300 MOV #300,RO ;FLOATING VECTORS START HERE.
012044 012701 000302 MOV #302,R1 ;PC OF IOT INSTR.
012050 010120 1$: MOV R1,(RO)+ ;START FILLING VECTOR AREA
012052 012721 000004 MOV #4,(R1)+ ;WITH .+2; IOT
012056 022021 CMP (RO)+,(R1)+ ;ADD 2 TO RO +R1
012060 020127 001000 CMP R1,#1000
012064 101771 BLOS 1$ ;BR IF MORE TO FILL
    
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012066 013737 001306 001246      MGV  DMACTV,TEMP1  ;STORE TEMPORALLY
012074 006037 001246      2$:  ROR  TEMP1      ;BRING OUT A BIT
012100 103063                BCC  5$          ;BR IF ALL DONE
012102 012704 000012                MOV  #12,R4      ;R4 IS INDEX REGISTER
012106 016437 012252 177776      MOV  BRLVL(R4),PS ;SET PS TO 7
012114 011201                MOV  (R2),R1
012116 012761 000200 000004      MOV  #200,4(R1)
012124 012711 001000                MOV  #BIT9,(R1)  ;SET ROMI
012130 012761 121111 000006      MOV  #121111,6(R1);PUT INSTRUCTION IN PORT6
012136 012711 001400                MOV  #BIT9!BIT8,(R1);FORCE AN INTERRUPT
012142 105200                7$:  INCB  R0      ;STALL
012144 001376                BNE  -2         ;FOR TIME TO INTERUPT
012146 162704 000002                SUB  #2,R4      ;GET NEXT LOWEST PS LEVEL
012152 001404                BEQ  6$          ;BR IF R4 = 0
012154 016437 012252 177776      MOV  BRLVL(R4),PS ;MOVE NEXT LOWER LEVEL IN PS
012162 000767                BR   7$          ;BR TO DELAY
012164 052762 005300 000002 6$:  BIS  #5300,2(R2) ;NO INTERRUPT ASSUME 300 AT LEVEL 5 AND FIX DMC11 LATER
012172 005011                3$:  CLR  (R1)     ;CLEAR ROMI
012174 062702 000010                ADD  #10,R2     ;POP SOFTWARE POINTER
012200 000735                BR   2$          ;KEEP GOING
012202 051662 000002 4$:  BIS  (SP),2(R2)  ;GET VECTOR ADDRESS
012206 042762 000007 000002      BIC  #7,2(R2)   ;CLEAR JUNK
012214 016405 012254                MOV  BRLVL+2(R4),R5 ;GET BR LEVEL OF DMC11
012220 006305                ASL  R5         ;SHIFT LEVEL 4 PLACES
012222 006305                ASL  R5         ;TO THE LEFT FOR THE
012224 006305                ASL  R5         ;STATUS TABLE
012226 006305                ASL  R5
012230 042705 170777                BIC  #170777,R5 ;CLEAR UNWANTED BITS
012234 050562 000002                BIS  R5,2(R2)  ;PUT BR LEVEL IN STATUS TABLE
012240 022626                CMP  (SP)+,(SP)+ ;POP IOT JUNK OFF STACK
012242 012716 012172                MOV  #3$,(SP)  ;SET FOR RETURN
012246 000002                RTI
012250 000207                5$:  RTS  PC     ;ALL DONE WITH "AUTO SIZING"

012252 000000                BRLVL: 0        ;LEVEL 0
012254 000000                0      ;LEVEL 0
012256 000200                200    ;LEVEL 4
012260 000240                240    ;LEVEL 5
012262 000300                300    ;LEVEL 6
012264 000340                340    ;LEVEL 7

012266 105777 166712                INTTY: TSTB  #TKCSR ;WAIT FOR DONE
012272 100375                BPL  -4
012274 017703 166706                MOV  #TKDBR,R3 ;PUT CHAR IN R3
012300 105777 166704                TSTB #TPCSR    ;WAIT UNTIL PRINTER IS READY
012304 100375                BPL  -4
012306 010377 166700                MOV  R3,#TPDBR ;ECHO CHAR
012312 042703 000240                BIC  #BIT7!BIT5,R3 ;MASK OFF LOWER CASE
012316 000207                RTS  PC        ;RETURN
    
```

7

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***** TEST 1 *****
;*VERIFY THAT REFERENCING UNIBUS DEVICE REGISTERS
;*DOES NOT CAUSE A TIME OUT TRAP
*****
    
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```
      ; TEST 1
      ;-----
012320 012737 000001 001226 TST1: MOV    #1,TSTNO
012326 012737 012426 001216      MOV    #TST2,NEXT
012334 012737 012366 001220      MOV    #1$,LOCK
                                     ;R1 CONTAINS BASE DMC11 ADDRESS
012342 013701 001404          MOV    DMCSR,R1      ;R1 CONTAINS BASE DMC11 ADDRESS
012346 012700 000004          MOV    #4,RO        ;4 REGISTERS TO BE TESTED
012352 012737 012420 000004      MOV    #2$,4        ;SET UP TIMEOUT TRAP
012360 012737 000340 000006      MOV    #340,6       ;LEVEL 7
012366 005711          1$:    TST    (R1)      ;REFERENCE DEVICE REGISTER
012370 000240          NOP
012372 104401          SCOPE1
012374 062701 000002          ADD    #2,R1        ;SW09=1?
012400 005300          DEC    RO          ;NEXT REGISTER
012402 001371          BNE    1$         ;DEC REGISTER COUNT
012404 012737 000006 000004      MOV    #6,4        ;BR IF NOT LAST REGISTER
012412 005037 000006          CLR    6           ;RESTORE LOC 4
012416 104400          SCOPE          ;RESTORE LOC 6
012420 011602          2$:    MOV    (SP),R2      ;SCOPE THIS TEST
012422 104001          EMT    1          ;GET PC OF TRAP
012424 000002          RTI          ;TIME-OUT ERROR
```

8

```
***** TEST 2 *****
*VERIFY THAT RUN CAN BE CLEARED
*****
```

```
      ; TEST 2
      ;-----
012426 012737 000002 001226 TST2: MOV    #2,TSTNO
012434 012737 012456 001216      MOV    #TST3,NEXT
                                     ;R1 CONTAINS BASE DMC11 ADDRESS
012442 005011          CLR    (R1)        ;CLEAR DMCSR
012444 005005          CLR    R5         ;CLEAR "EXPECTED"
012446 011104          MOV    (R1),R4     ;PUT DMCSR IN "FOUND"
012450 001401          BEQ    1$         ;BR IF CLEARED
012452 104002          EMT    2          ;ERROR DMCSR NOT CLEARED
012454 104400          1$:    SCOPE          ;SCOPE THIS TEST
```

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```
***** TEST 3 *****
*UNIBUS REGISTER WORD DUAL ADDRESSING TEST
*LOAD ALL REGISTERS WITH INCREMENTING PATTERN
*READ BACK ALL REGISTERS TO VERIFY CORRECT ADDRESSING
*****
```

```
      ; TEST 3
      ;-----
012456 012737 000003 001226 TST3: MOV    #3,TSTNO
012464 012737 012606 001216      MOV    #TST4,NEXT
012472 012737 012506 001220      MOV    #1$,LOCK
                                     ;R1 CONTAINS BASE DMC11 ADDRESS
012500 104412          MSTCLR          ;MASTER CLEAR DMC11
012502 012700 000001          MOV    #1,RO        ;START PATTERN AT 1
012506 005011          1$:    CLR    (R1)        ;CLEAR REGISTER
```

```

012510 010005      MOV      R0,R5      ;PUT DATA IN "EXPECTED"
012512 010011      MOV      R0,(R1)    ;WRITE DMC REGISTER WITH PATTERN
012514 011104      MOV      (R1),R4    ;READ DMC REGISTER INTO "FOUND"
012516 020504      CMP      R5,R4      ;IS DATA CORRECT
012520 001401      BEQ     2$          ;BR IF YES
012522 104002      EMT     2           ;DATA ERROR
012524 104401      2$:      SCOP1     ;SW09=1?
012526 005721      TST     (R1)+       ;NEXT REGISTER
012530 005200      INC     R0          ;INCREMENT DATA PATTERN
012532 022700 000005  CMP     #5,R0        ;LAST REGISTER?
012536 001363      BNE     1$          ;BR IF NO
012540 013701 001404  MOV     DMCSR,R1     ;BASE DMC11 ADDRESS TO R1
012544 012700 000001  MOV     #1,R0        ;RESTART PATTERN AT 1
012550 012737 012556 001220  MOV     #3$,LOCK    ;NEW SCOP1
012556 010005      3$:      MOV     R0,R5      ;PUT DATA IN "EXPECTED"
012560 011104      MOV     (R1),R4    ;READ DMC REGISTER INTO "FOUND"
012562 020504      CMP     R5,R4      ;IS DATA CORRECT
012564 001401      BEQ     4$          ;BR IF YES
012566 104002      EMT     2           ;DUAL ADDRESSING ERROR
012570 104401      4$:      SCOP1     ;SW09=1?
012572 005721      TST     (R1)+       ;NEXT REGISTER
012574 005200      INC     R0          ;INCREMENT PATTERN
012576 022700 000005  CMP     #5,R0        ;LAST REGISTER?
012602 001365      BNE     3$          ;BR IF NO
012604 104400      SCOPE    ;SCOPE THIS TEST
  
```

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```

;***** TEST 4 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT0, VERIFY BIT0 WAS SET
;*CLEAR BIT0, VERIFY BIT0 WAS CLEARED
;:*****
  
```

; TEST 4

```

012606 012737 000004 001226  TST4:  MOV     #4,TSTNO
012614 012737 012704 001216  MOV     #TST5,NEXT
012622 012737 012632 001220  MOV     #1$,LOCK
012630 104412      MSTCLR    ;MASTER CLEAR DMC11
012632 013701 001404      1$:      MOV     DMCSR,R1    ;PUT REGISTER ADDRESS IN R1
012636 012705 000001      MOV     #BIT0,R5    ;PUT DATA IN "EXPECTED"
012642 010511      MOV     R5,(R1)     ;WRITE BIT 0
012644 011104      MOV     (R1),R4    ;READ CONTROL STATUS REGISTER
012646 020504      CMP     R5,R4      ;IS DATA CORRECT
012650 001401      BEQ     2$          ;BR IF YES
012652 104002      EMT     2           ;DATA ERROR
012654 104401      2$:      SCOP1     ;SW09 UP?
012656 012737 012664 001220  MOV     #3$,LOCK    ;NEW SCOP1
012664 042711 000001      3$:      BIC     #BIT0,(R1)  ;CLEAR BIT 0
012670 005005      CLR     R5          ;CLEAR "EXPECTED"
012672 011104      MOV     (R1),R4    ;READ CONTROL STATUS REGISTER
012674 001402      BEQ     4$          ;BR IF ZERO
012676 104002      EMT     2           ;DATA ERROR BIT0 NOT CLEARED
012700 104401      SCOPE    ;SW09 UP?
012702 104400      4$:      SCOPE    ;SCOPE THIS TEST
  
```

```

;***** TEST 5 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT1, VERIFY BIT1 WAS SET
;*CLEAR BIT1, VERIFY BIT1 WAS CLEARED
;:*****
  
```

; TEST 5

```

;-----
012704 012737 000005 001226 TST5: MOV #5,TSTNO
012712 012737 013002 001216 MOV #TST6,NEXT
012720 012737 012730 001220 MOV #1$,LOCK
012726 104412 MSTCLR ;MASTER CLEAR DMC11
012730 013701 001404 1$: MOV DMCSR,R1 ;PUT REGISTER ADDRESS IN R1
012734 012705 000002 MOV #BIT1,R5 ;PUT DATA IN "EXPECTED"
012740 010511 MOV R5,(R1) ;WRITE BIT 1
012742 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
012744 020504 CMF R5,R4 ;IS DATA CORRECT
012746 001401 BEQ 2$ ;BR IF YES
012750 104002 EMT 2 ;DATA ERROR
012752 104401 SCOP1 ;SW09 UP?
012754 012737 012762 001220 2$: MOV #3$,LOCK ;NEW SCOP1
012762 042711 000002 3$: BIC #BIT1,(R1) ;CLEAR BIT 1
012766 005005 CLR R5 ;CLEAR "EXPECTED"
012770 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
012772 001402 BEQ 4$ ;BR IF ZERO
012774 104002 EMT 2 ;DATA ERROR BIT1 NOT CLEARED
012776 104401 SCOP1 ;SW09 UP?
013000 104400 4$: SCOPE ;SCOPE THIS TEST
  
```

```

;***** TEST 6 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT2, VERIFY BIT2 WAS SET
;*CLEAR BIT2, VERIFY BIT2 WAS CLEARED
;:*****
  
```

; TEST 6

```

;-----
013002 012737 000006 001226 TST6: MOV #6,TSTNO
013010 012737 013100 001216 MOV #TST7,NEXT
013016 012737 013026 001220 MOV #1$,LOCK
013024 104412 MSTCLR ;MASTER CLEAR DMC11
013026 013701 001404 1$: MOV DMCSR,R1 ;PUT REGISTER ADDRESS IN R1
013032 012705 000004 MOV #BIT2,R5 ;PUT DATA IN "EXPECTED"
013036 010511 MOV R5,(R1) ;WRITE BIT 2
013040 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
013042 020504 CMP R5,R4 ;IS DATA CORRECT
013044 001401 BEQ 2$ ;BR IF YES
013046 104002 EMT 2 ;DATA ERROR
013050 104401 SCOP1 ;SW09 UP?
013052 012737 013060 001220 2$: MOV #3$,LOCK ;NEW SCOP1
013060 042711 000004 3$: BIC #BIT2,(R1) ;CLEAR BIT 2
013064 005005 CLR R5 ;CLEAR "EXPECTED"
013066 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
013070 001402 BEQ 4$ ;BR IF ZERO
013072 104002 EMT 2 ;DATA ERROR BIT2 NOT CLEARED
013074 104401 SCOP1 ;SW09 UP?
  
```



```

013264 001402 BEQ 4$ ;BR IF ZERO
013266 104002 EMT 2 ;DATA ERROR BIT6 NOT CLEARED
013270 104401 SCOP1 ;SWO9 UP?
013272 104400 4$: SCOPE ;SCOPE THIS TEST
  
```

```

;***** TEST 11 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT7, VERIFY BIT7 WAS SET
;*CLEAR BIT7, VERIFY BIT7 WAS CLEARED
;:*****
  
```

; TEST 11

```

;-----
013274 012737 000011 001226 TST11: MOV #11,TSTNO
013302 012737 013372 001216 MOV #TST12,NEXT
013310 012737 013320 001220 MOV #1$,LOCK
013316 104412 MSTCLR ;MASTER CLEAR DMC11
013320 013701 001404 1$: MOV DMC1R,R1 ;PUT REGISTER ADDRESS IN R1
013324 012705 000200 MOV #BIT7,R5 ;PUT DATA IN "EXPECTED"
013330 010511 MOV R5,(R1) ;WRITE BIT 7
013332 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
013334 020504 CMP R5,R4 ;IS DATA CORRECT
013336 001401 BEQ 2$ ;BR IF YES
013340 104002 EMT 2 ;DATA ERROR
013342 104401 2$: SCOP1 ;SWO9 UP?
013344 012737 013352 001220 MOV #3$,LOCK ;NEW SCOP1
013352 042711 000200 3$: BIC #BIT7,(R1) ;CLEAR BIT 7
013356 005005 CLR R5 ;CLEAR "EXPECTED"
013360 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
013362 001402 BEQ 4$ ;BR IF ZERO
013364 104002 EMT 2 ;DATA ERROR BIT7 NOT CLEARED
013366 104401 SCOP1 ;SWO9 UP?
013370 104400 4$: SCOPE ;SCOPE THIS TEST
  
```

```

;***** TEST 12 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT9, VERIFY BIT9 WAS SET
;*CLEAR BIT9, VERIFY BIT9 WAS CLEARED
;:*****
  
```

; TEST 12

```

;-----
013372 012737 000012 001226 TST12: MOV #12,TSTNO
013400 012737 013470 001216 MOV #TST13,NEXT
013406 012737 013416 001220 MOV #1$,LOCK
013414 104412 MSTCLR ;MASTER CLEAR DMC11
013416 013701 001404 1$: MOV DMC1R,R1 ;PUT REGISTER ADDRESS IN R1
013422 012705 001000 MOV #BIT9,R5 ;PUT DATA IN "EXPECTED"
013426 010511 MOV R5,(R1) ;WRITE BIT 9
013430 011104 MOV (R1),R4 ;READ CONTROL STATUS REGISTER
013432 020504 CMP R5,R4 ;IS DATA CORRECT
013434 001401 BEQ 2$ ;BR IF YES
013436 104002 EMT 2 ;DATA ERROR
013440 104401 2$: SCOP1 ;SWO9 UP?
013442 012737 013450 001220 MOV #3$,LOCK ;NEW SCOP1
  
```

```

013450 042711 001000      3$:  BIC    #BIT9,(R1)    ;CLEAR BIT 9
013454 005005                CLR    R5              ;CLEAR "EXPECTED"
013456 011104                MOV    (R1),R4         ;READ CONTROL STATUS REGISTER
013460 001402                BEQ    4$              ;BR IF ZERO
013462 104002                EMT    2               ;DATA ERROR BIT9 NOT CLEARED
013464 104401                SCOPI                ;SW09 UP?
013466 104400      4$:  SCOPE                ;SCOPE THIS TEST
    
```

```

;***** TEST 13 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT11, VERIFY BIT11 WAS SET
;*CLEAR BIT11, VERIFY BIT11 WAS CLEARED
;:*****
    
```

; TEST 13

```

013470 012737 000013 001226 TST13: MOV    #13,TSTNO
013476 012737 013566 001216      MOV    #TST14,NEXT
013504 012737 013514 001220      MOV    #1$,LOCK
013512 104412                MSTCLR                ;MASTER CLEAR DMC11
013514 013701 001404      1$:  MOV    DMCSR,R1      ;PUT REGISTER ADDRESS IN R1
013520 012705 004000      MOV    #BIT11,R5     ;PUT DATA IN "EXPECTED"
013524 010511                MOV    R5,(R1)       ;WRITE BIT 11
013526 011104                MOV    (R1),R4       ;READ CONTROL STATUS REGISTER
013530 020504                CMP    R5,R4         ;IS DATA CORRECT
013532 001401                BEQ    2$              ;BR IF YES
013534 104002                EMT    2               ;DATA ERROR
013536 104401                SCOPI                ;SW09 UP?
013540 012737 013546 001220      MOV    #3$,LOCK     ;NEW SCOPI
013546 042711 004000      3$:  BIC    #BIT11,(R1)  ;CLEAR BIT 11
013552 005005                CLR    R5              ;CLEAR "EXPECTED"
013554 011104                MOV    (R1),R4       ;READ CONTROL STATUS REGISTER
013556 001402                BEQ    4$              ;BR IF ZERO
013560 104002                EMT    2               ;DATA ERROR BIT11 NOT CLEARED
013562 104401                SCOPI                ;SW09 UP?
013564 104400      4$:  SCOPE                ;SCOPE THIS TEST
    
```

```

;***** TEST 14 *****
;*CONTROL STATUS REGISTER WRITE/READ TEST
;*SET BIT12, VERIFY BIT12 WAS SET
;*CLEAR BIT12, VERIFY BIT12 WAS CLEARED
;:*****
    
```

; TEST 14

```

013566 012737 000014 001226 TST14: MOV    #14,TSTNO
013574 012737 013664 001216      MOV    #TST15,NEXT
013602 012737 013612 001220      MOV    #1$,LOCK
013610 104412                MSTCLR                ;MASTER CLEAR DMC11
013612 013701 001404      1$:  MOV    DMCSR,R1      ;PUT REGISTER ADDRESS IN R1
013616 012705 010000      MOV    #BIT12,R5     ;PUT DATA IN "EXPECTED"
013622 010511                MOV    R5,(R1)       ;WRITE BIT 12
013624 011104                MOV    (R1),R4       ;READ CONTROL STATUS REGISTER
013626 020504                CMP    R5,R4         ;IS DATA CORRECT
013630 001401                BEQ    2$              ;BR IF YES
    
```

```

013632 104002          EMT      2          ;DATA ERROR
013634 104401          SCOPE1         ;SW09 UP?
013636 012737 013644 001220 2#: MOV     #3$,LOCK ;NEW SCOPE1
013644 042711 010000          3#: BIC     #BIT12,(R1) ;CLEAR BIT 12
013650 005005          CLR      R5          ;CLEAR "EXPECTED"
013652 011104          MOV     (R1),R4      ;READ CONTROL STATUS REGISTER
013654 001402          BEQ     4#          ;BR IF ZERO
013656 104002          EMT      2          ;DATA ERROR BIT12 NOT CLEARED
013660 104401          SCOPE1         ;SW09 UP?
013662 104400          4#: SCOPE          ;SCOPE THIS TEST
  
```

15

```

;***** TEST 15 *****
;CONTROL OUT REGISTER WRITE/READ TEST
;SET BIT0, VERIFY BIT0 WAS SET
;CLEAR BIT0, VERIFY BIT0 WAS CLEARED
;*****
  
```

; TEST 15

```

013664 012737 000015 001226 TST15: MOV     #15,TSTNO
013672 012737 013762 001216      MOV     #TST16,NEXT
013700 012737 013710 001220      MOV     #1$,LOCK
013706 104412          MSTCLR          ;MASTER CLEAR DMC11
013710 013701 001410          1#: MOV     DMCTL,R1 ;PUT REGISTER ADDRESS IN R1
013714 012705 000001          MOV     #BIT0,R5 ;PUT DATA IN "EXPECTED"
013720 010511          MOV     R5,(R1) ;WRITE BIT 0
013722 011104          MOV     (R1),R4 ;READ CONTROL OUT REGISTER
013724 020504          CMP     R5,R4    ;IS DATA CORRECT
013726 001401          BEQ     2#          ;BR IF YES
013730 104002          EMT      2          ;DATA ERROR
013732 104401          2#: SCOPE1         ;SW09 UP?
013734 012737 013742 001220      MOV     #3$,LOCK ;NEW SCOPE1
013742 042711 000001          3#: BIC     #BIT0,(R1) ;CLEAR BIT 0
013746 005005          CLR      R5          ;CLEAR "EXPECTED"
013750 011104          MOV     (R1),R4      ;READ CONTROL OUT REGISTER
013752 001402          BEQ     4#          ;BR IF ZERO
013754 104002          EMT      2          ;DATA ERROR BIT0 NOT CLEARED
013756 104401          SCOPE1         ;SW09 UP?
013760 104400          4#: SCOPE          ;SCOPE THIS TEST
  
```

```

;***** TEST 16 *****
;CONTROL OUT REGISTER WRITE/READ TEST
;SET BIT1, VERIFY BIT1 WAS SET
;CLEAR BIT1, VERIFY BIT1 WAS CLEARED
;*****
  
```

; TEST 16

```

013762 012737 000016 001226 TST16: MOV     #16,TSTNO
013770 012737 014060 001216      MOV     #TST17,NEXT
013776 012737 014006 001220      MOV     #1$,LOCK
014004 104412          MSTCLR          ;MASTER CLEAR DMC11
014006 013701 001410          1#: MOV     DMCTL,R1 ;PUT REGISTER ADDRESS IN R1
014012 012705 000002          MOV     #BIT1,R5 ;PUT DATA IN "EXPECTED"
014016 010511          MOV     R5,(R1) ;WRITE BIT 1
  
```

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```

014020 011104      MOV      (R1),R4      ;READ CONTROL OUT REGISTER
014022 020504      CMP      R5,R4       ;IS DATA CORRECT
014024 001401      BEQ     2$          ;BR IF YES
014026 104002      EMT     2           ;DATA ERROR
014030 104401      SCOPE1          ;SW09 UP?
014032 012737 014040 001220 2$:  MOV      #3$,LOCK    ;NEW SCOPE1
014040 042711 000002      3$:  BIC     #BIT1,(R1)  ;CLEAR BIT 1
014044 005005      CLR     R5          ;CLEAR "EXPECTED"
014046 011104      MOV      (R1),R4     ;READ CONTROL OUT REGISTER
014050 001402      BEQ     4$          ;BR IF ZERO
014052 104002      EMT     2           ;DATA ERROR BIT1 NOT CLEARED
014054 104401      SCOPE1          ;SW09 UP?
014056 104400      4$:  SCOPE      ;SCOPE THIS TEST

```

```

;***** TEST 17 *****
;*CONTROL OUT REGISTER WRITE/READ TEST
;*SET BIT2, VERIFY BIT2 WAS SET
;*CLEAR BIT2, VERIFY BIT2 WAS CLEARED
;*****

```

```

; TEST 17
;-----

```

```

014060 012737 000017 001226 TST17: MOV      #17,TSTNO
014066 012737 014156 001216      MOV      #TST20,NEXT
014074 012737 014104 001220      MOV      #1$,LOCK
014102 104412      MSTCLR          ;MASTER CLEAR DMC11
014104 013701 001410 1$:  MOV      DMCTL,R1   ;PUT REGISTER ADDRESS IN R1
014110 012705 000004      MOV      #BIT2,R5   ;PUT DATA IN "EXPECTED"
014114 010511      MOV      R5,(R1)    ;WRITE BIT 2
014116 011104      MOV      (R1),R4    ;READ CONTROL OUT REGISTER
014120 020504      CMP      R5,R4     ;IS DATA CORRECT
014122 001401      BEQ     2$          ;BR IF YES
014124 104002      EMT     2           ;DATA ERROR
014126 104401      SCOPE1          ;SW09 UP?
014130 012737 014136 001220 2$:  MOV      #3$,LOCK    ;NEW SCOPE1
014136 042711 000004      3$:  BIC     #BIT2,(R1)  ;CLEAR BIT 2
014142 005005      CLR     R5          ;CLEAR "EXPECTED"
014144 011104      MOV      (R1),R4    ;READ CONTROL OUT REGISTER
014146 001402      BEQ     4$          ;BR IF ZERO
014150 104002      EMT     2           ;DATA ERROR BIT2 NOT CLEARED
014152 104401      SCOPE1          ;SW09 UP?
014154 104400      4$:  SCOPE      ;SCOPE THIS TEST

```

```

;***** TEST 20 *****
;*CONTROL OUT REGISTER WRITE/READ TEST
;*SET BIT6, VERIFY BIT6 WAS SET
;*CLEAR BIT6, VERIFY BIT6 WAS CLEARED
;*****

```

```

; TEST 20
;-----

```

```

014156 012737 000020 001226 TST20: MOV      #20,TSTNO
014164 012737 014254 001216      MOV      #TST21,NEXT
014172 012737 014202 001220      MOV      #1$,LOCK
014200 104412      MSTCLR          ;MASTER CLEAR DMC11

```

```

014202 013701 001410      1$:  MOV    DMCTL,R1      ;PUT REGISTER ADDRESS IN R1
014206 012705 000100      MOV    @BIT6,R5      ;PUT DATA IN "EXPECTED"
014212 010511              MOV    R5,(R1)       ;WRITE BIT 6
014214 011104              MOV    (R1),R4       ;READ CONTROL OUT REGISTER
014216 020504              CMP    R5,R4         ;IS DATA CORRECT
014220 001401              BEQ    2$            ;BR IF YES
014222 104002              EMT    2             ;DATA ERROR
014224 104401              SCOPI              ;SW09 UP?
014226 012737 014234 001220 2$:  MOV    @3$,LOCK      ;NEW SCOPI
014234 042711 000100      3$:  BIC    @BIT6,(R1)    ;CLEAR BIT 6
014240 005005              CLR    R5            ;CLEAR "EXPECTED"
014242 011104              MOV    (R1),R4       ;READ CONTROL OUT REGISTER
014244 001402              BEQ    4$            ;BR IF ZERO
014246 104002              EMT    2             ;DATA ERROR BIT6 NOT CLEARED
014250 104401              SCOPI              ;SW09 UP?
014252 104400      4$:  SCOPE              ;SCOPE THIS TEST
  
```

```

;***** TEST 21 *****
;CONTROL OUT REGISTER WRITE/READ TEST
;SET BIT7, VERIFY BIT7 WAS SET
;CLEAR BIT7, VERIFY BIT7 WAS CLEARED
;*****
  
```

; TEST 21

```

014254 012737 000021 001226 TST21: MOV    @21,TSTNO
014262 012737 014352 001216      MOV    @TST22,NEXT
014270 012737 014300 001220      MOV    @1$,LOCK
014276 104412              MSTCLR              ;MASTER CLEAR DMC11
014300 013701 001410      1$:  MOV    DMCTL,R1      ;PUT REGISTER ADDRESS IN R1
014304 012705 000200      MOV    @BIT7,R5      ;PUT DATA IN "EXPECTED"
014310 010511              MOV    R5,(R1)       ;WRITE BIT 7
014312 011104              MOV    (R1),R4       ;READ CONTROL OUT REGISTER
014314 020504              CMP    R5,R4         ;IS DATA CORRECT
014316 001401              BEQ    2$            ;BR IF YES
014320 104002              EMT    2             ;DATA ERROR
014322 104401              SCOPI              ;SW09 UP?
014324 012737 014332 001220 2$:  MOV    @3$,LOCK      ;NEW SCOPI
014332 042711 000200      3$:  BIC    @BIT7,(R1)    ;CLEAR BIT 7
014336 005005              CLR    R5            ;CLEAR "EXPECTED"
014340 011104              MOV    (R1),R4       ;READ CONTROL OUT REGISTER
014342 001402              BEQ    4$            ;BR IF ZERO
014344 104002              EMT    2             ;DATA ERROR BIT7 NOT CLEARED
014346 104401              SCOPI              ;SW09 UP?
014350 104400      4$:  SCOPE              ;SCOPE THIS TEST
  
```

```

;***** TEST 22 *****
;CONTROL OUT REGISTER WRITE/READ TEST
;SET BIT12, VERIFY BIT12 WAS SET
;CLEAR BIT12, VERIFY BIT12 WAS CLEARED
;*****
  
```

; TEST 22

```

014352 012737 000022 001226 TST22: MOV    @22,TSTNO
  
```

```
014360 012737 014450 001216      MOV    #TST23,NEXT
014366 012737 014376 001220      MOV    #1$,LOCK
014374 104412                    MSTCLR                    ;MASTER CLEAR DMC11
014376 013701 001410            1$:  MOV    DMCTL,R1          ;PUT REGISTER ADDRESS IN R1
014402 012705 010000            MOV    #BIT12,R5        ;PUT DATA IN "EXPECTED"
014406 010511                    MOV    R5,(R1)          ;WRITE BIT 12
014410 011104                    MOV    (R1),R4          ;READ CONTROL OUT REGISTER
014412 020504                    CMP    R5,R4            ;IS DATA CORRECT
014414 001401                    BEQ    2$                ;BR IF YES
014416 104002                    EMT    2                 ;DATA ERROR
014420 104401                    SCOPE1                   ;SW09 UP?
014422 012737 014430 001220      2$:  MOV    #3$,LOCK        ;NEW SCOPE1
014430 042711 010000            3$:  BIC    #BIT12,(R1)     ;CLEAR BIT 12
014434 005005                    CLR    R5                ;CLEAR "EXPECTED"
014436 011104                    MOV    (R1),R4          ;READ CONTROL OUT REGISTER
014440 001402                    BEQ    4$                ;BR IF ZERO
014442 104002                    EMT    2                 ;DATA ERROR BIT12 NOT CLEARED
014444 104401                    SCOPE1                   ;SW09 UP?
014446 104400                    4$:  SCOPE                    ;SCOPE THIS TEST
```

```
***** TEST 23 *****
;*CONTROL OUT REGISTER WRITE/READ TEST
;*SET BIT13, VERIFY BIT13 WAS SET
;*CLEAR BIT13, VERIFY BIT13 WAS CLEARED
:*****
```

; TEST 23

```
-----
014450 012737 000023 001226 TST23: MOV    #23,TSTNO
014456 012737 014546 001216      MOV    #TST24,NEXT
014464 012737 014474 001220      MOV    #1$,LOCK
014472 104412                    MSTCLR                    ;MASTER CLEAR DMC11
014474 013701 001410            1$:  MOV    DMCTL,R1          ;PUT REGISTER ADDRESS IN R1
014500 012705 020000            MOV    #BIT13,R5        ;PUT DATA IN "EXPECTED"
014504 010511                    MOV    R5,(R1)          ;WRITE BIT 13
014506 011104                    MOV    (R1),R4          ;READ CONTROL OUT REGISTER
014510 020504                    CMP    R5,R4            ;IS DATA CORRECT
014512 001401                    BEQ    2$                ;BR IF YES
014514 104002                    EMT    2                 ;DATA ERROR
014516 104401                    SCOPE1                   ;SW09 UP?
014520 012737 014526 001220      2$:  MOV    #3$,LOCK        ;NEW SCOPE1
014526 042711 020000            3$:  BIC    #BIT13,(R1)     ;CLEAR BIT 13
014532 005005                    CLR    R5                ;CLEAR "EXPECTED"
014534 011104                    MOV    (R1),R4          ;READ CONTROL OUT REGISTER
014536 001402                    BEQ    4$                ;BR IF ZERO
014540 104002                    EMT    2                 ;DATA ERROR BIT13 NOT CLEARED
014542 104401                    SCOPE1                   ;SW09 UP?
014544 104400                    4$:  SCOPE                    ;SCOPE THIS TEST
```

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```
***** TEST 24 *****
;*PORT4 REGISTER WRITE/READ TEST
;*FLOAT A ONE THROUGH PORT4 REGISTER
;*FLOAT A ZERO THROUGH PORT4 REGISTER
:*****
```

```

; TEST 24
;---
014546 012737 000024 001226 TST24: MOV #24,TSTNO
014554 012737 014672 001216 MOV #TST25,NEXT
014562 012737 014602 001220 MOV #64$,LOCK
014570 104412 MSTCLR ;MASTER CLEAR DMC11
014572 013701 001412 MOV DMP04,R1 ;PUT REGISTER ADDRESS IN R1
014576 012700 000001 MOV #1,R0 ;START WITH BIT0
014602 64$: MOV R0,R5 ;PUT "EXPECTED" IN R5
014604 010005 MOV R5,(R1) ;WRITE PORT4 REGISTER
014606 011104 MOV (R1),R4 ;READ PORT4 REGISTER
014610 020504 CMP R5,R4 ;COMPARE EXPECTED AND FOUND
014612 001401 BEQ 65$ ;BR IF OK
014614 104002 EMT 2 ;WRITE/READ ERROR
014616 104401 65$: SCOP1 ;LOOP TO 64$ IF SW09=1
014620 000241 CLC ;CLEAR CARRY
014622 006100 ROL R0 ;SHIFT TO NEXT BIT
014624 001366 BNE 64$ ;BR IF NOT DONE YET?
014626 012737 014640 001220 MOV #66$,LOCK ;NEW SCOP1
014634 012700 000001 MOV #1,R0 ;START WITH BIT0
014640 66$: COM R0 ;CHANGE TO A FLOATING ZERO
014642 010005 MOV R0,R5 ;PUT "EXPECTED" IN R5
014644 010511 MOV R5,(R1) ;WRITE PORT4 REGISTER
014646 011104 MOV (R1),R4 ;READ PORT4 REGISTER
014650 020504 CMP R5,R4 ;COMPARE EXPECTED AND FOUND
014652 001401 BEQ 67$ ;BR IF OK
014654 104002 EMT 2 ;WRITE/READ ERROR
014656 104401 67$: SCOP1 ;LOOP TO 66$ IF SW09=1
014660 005100 COM R0 ;CHANGE BACK TO A FLOATING ONE
014662 000241 CLC ;CLEAR CARRY
014664 006100 ROL R0 ;SHIFT TO NEXT BIT
014666 001364 BNE 66$ ;BR IF NOT DONE YET?
014670 104400 SCOPE ;SCOPE THIS TEST
  
```

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```

;***** TEST 25 *****
;*PORT6 REGISTER WRITE/READ TEST
;*FLOAT A ONE THROUGH PORT6 REGISTER
;*FLOAT A ZERO THROUGH PORT6 REGISTER
;:*****
  
```

```

; TEST 25
;---
014672 012737 000025 001226 TST25: MOV #25,TSTNO
014700 012737 015016 001216 MOV #TST26,NEXT
014706 012737 014726 001220 MOV #64$,LOCK
014714 104412 MSTCLR ;MASTER CLEAR DMC11
014716 013701 001414 MOV DMP06,R1 ;PUT REGISTER ADDRESS IN R1
014722 012700 000001 MOV #1,R0 ;START WITH BIT0
014726 64$: MOV R0,R5 ;PUT "EXPECTED" IN R5
014726 010005 MOV R5,(R1) ;WRITE PORT6 REGISTER
014730 010511 MOV (R1),R4 ;READ PORT6 REGISTER
014732 011104 MOV (R1),R4 ;READ PORT6 REGISTER
014734 020504 CMP R5,R4 ;COMPARE EXPECTED AND FOUND
014736 001401 BEQ 65$ ;BR IF OK
  
```



```

014740 104002          EMT      2          ;WRITE/READ ERROR
014742 104401      65$: SCOP1          ;LOOP TO 64$ IF SW09=1
014744 000241          CLC              ;CLEAR CARRY
014746 006100          ROL      R0          ;SHIFT TO NEXT BIT
014750 001366          BNE      64$         ;BR IF NOT DONE YET?
014752 012737 014764 001220 MOV      $66$,LOCK    ;NEW SCOPE1
014760 012700 000001  MOV      $1,R0        ;START WITH BIT0
014764          66$:          COM      R0          ;CHANGE TO A FLOATING ZERO
014766 005100          MOV      R0,R5        ;PUT "EXPECTED" IN R5
014770 010511          MOV      R5,(R1)       ;WRITE PORT6 REGISTER
014772 011104          MOV      (R1),R4       ;READ PORT6 REGISTER
014774 020504          CMP      R5,R4        ;COMPARE EXPECTED AND FOUND
014776 001401          BEQ      67$         ;BR IF OK
015000 104002          EMT      2          ;WRITE/READ ERROR
015002 104401      67$: SCOP1          ;LOOP TO 66$ IF SW09=1
015004 005100          COM      R0          ;CHANGE BACK TO A FLOATING ONE
015006 000241          CLC              ;CLEAR CARRY
015010 006100          ROL      R0          ;SHIFT TO NEXT BIT
015012 001364          BNE      66$         ;BR IF NOT DONE YET?
015014 104400          SCOPE          ;SCOPE THIS TEST
  
```

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```

;***** TEST 26 *****
;*UNIBUS REGISTER BYTE DUAL ADDRESSING TEST
;*LOAD ALL REGISTERS WITH INCREMENTING PATTERN
;*READ BACK ALL REGISTERS TO VERIFY CORRECT ADDRESSING
;*****
  
```

; TEST 26

```

015016 012737 000026 001226 TST26: MOV      $26,TSTNO
015024 012737 015146 001216      MOV      $TST27,NEXT
015032 012737 015046 001220      MOV      $1$,LOCK

015040 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
015042 012700 000001  MOV      $1,R0        ;MASTER CLEAR DMC11
015046 105011      1$: CLRB      (R1)       ;START PATTERN AT 1
015050 110005          MOVB     R0,R5        ;CLEAR REGISTER
015052 110011          MOVB     R0,(R1)     ;PUT DATA IN "EXPECTED"
015054 111104          MOVB     (R1),R4     ;WRITE DMC REGISTER WITH PATTERN
015056 020504          CMP      $5,R4      ;READ DMC REGISTER INTO "FOUND"
015060 001401          BEQ      2$         ;IS DATA CORRECT
015062 104002          EMT      2          ;BR IF YES
015064 104401      2$: SCOP1          ;DATA ERROR
015066 105721          TSTB     (R1)+      ;SW09=1?
015070 005200          INC      R0          ;NEXT REGISTER
015072 022700 000011  CMP      $11,R0     ;INCREMENT DATA PATTERN
015076 001363          BNE      1$         ;LAST REGISTER?
015100 013701 001404  MOV      DMC1R,R1    ;BR IF NO
015104 012700 000001  MOV      $1,R0      ;BASE DMC11 ADDRESS TO R1
015110 012737 015116 001220 MOV      $3$,LOCK    ;RESTART PATTERN AT 1
015116 110005      3$: MOVB     R0,R5        ;NEW SCOPE1
015120 111104          MOVB     (R1),R4     ;PUT DATA IN "EXPECTED"
015122 020504          CMP      R5,R4      ;READ DMC REGISTER INTO "FOUND"
015124 001401          BEQ      4$         ;IS DATA CORRECT
015126 104002          EMT      2          ;BR IF YES
                          ;DUAL ADDRESSING ERROR
  
```

```

015130 104401          4$: SCOP1          ;SW09=1?
015132 105721          TSTB (R1)+ ;NEXT REGISTER
015134 005200          INC RO ;INCREMENT PATTERN
015136 022700 000011  CMP #11,RO ;LAST REGISTER?
015142 001365          BNE 3$ ;BR IF NO
015144 104400          SCOPE ;SCOPE THIS TEST
    
```

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```

;***** TEST 27 *****
;MAINTENANCE INSTRUCTION REGISTER TEST
;VERIFY THAT THE MAINT IR CAN BE WRITTEN TO ALL ZEROS'
;AND ALL ONES'. VERIFY THAT IT IS CLEARED ON A BUS RESET.
;*****
    
```

; TEST 27

```

015146 012737 000027 001226 TST27: MOV #27,TSTNO ;R1 CONTAINS BASE DMC11 ADDRESS
015154 012737 015306 001216 MOV #TST30,NEXT ;MASTER CLEAR DMC11
015162 012737 015200 001220 MOV #1$,LOCK ;SEL6 IS NOW THE IR

015170 104412          MSTCLR ;PUT "EXPECTED" IN R5
015172 012711 003000  MOV #BIT9:BIT10,(R1) ;CLEAR THE IR
015176 005005          CLR R5 ;READ THE IR
015200 010561 000006 1$: MOV R5,6(R1) ;IS IT CLEARED?
015204 016104 000006  MOV 6(R1),R4 ;BR IF YES
015210 020504          CMP R5,R4 ;ERROR IR IS NOT CLEAR
015212 001401          BEQ 2$ ;LOOP TO 1$ IF SW09=1
015214 104023          EMT 23 ;NEW SCOPE1
015216 104401          2$: SCOP1 ;PUT "EXPECTED" IN R5
015220 012737 015232 001220 MOV #3$,LOCK ;WRITE ALL ONES TO THE IR
015226 012705 177777  MOV #-1,R5 ;READ THE IR
015232 010561 000006 3$: MOV R5,6(R1) ;IS IT ALL ONES?
015236 016104 000006  MOV 6(R1),R4 ;BR IF YES
015242 020504          CMP R5,R4 ;ERROR IR IS NOT = ALL ONES
015244 001401          BEQ 4$ ;LOOP TO 3$ IF SW09=1
015246 104023          EMT 23 ;NEW SCOPE1
015250 104401          4$: SCOP1 ;PUT "EXPECTED" IN R5
015252 012737 015262 001220 MOV #5$,LOCK ;BUS RESET
015260 005005          CLR R5 ;SEL6 IS IR
015262 000005          5$: RESET ;READ THE IR
015264 012711 003000  MOV #BIT9:BIT10,(R1) ;IS IT CLEARED?
015270 016104 000006  MOV 6(R1),R4 ;BR IF YES
015274 020504          CMP R5,R4 ;ERROR IR IS NOT CLEARED
015276 001401          BEQ 6$ ;LOOP TO 5$ IF SW09=1
015300 104023          EMT 23 ;SCOPE THIS TEST
015302 104401          6$: SCOP1
015304 104400          SCOPE
    
```

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```

;***** TEST 30 *****
;MAINTENANCE INSTRUCTION REGISTER TEST
;VERIFY THAT THE MAINT IR CAN BE WRITTEN TO ALL ZEROS'
;AND ALL ONES'. VERIFY THAT IT IS CLEARED ON A MASTER RESET.
;*****
    
```

; TEST 30

;-----

```

015306 012737 000030 001226 TST30: MOV #30,TSTNO
015314 012737 015450 001216 MOV #TST31,NEXT
015322 012737 015340 001220 MOV #1$,LOCK

                                ;R1 CONTAINS BASE DMC11 ADDRESS
015330 104412 MSTCLR ;MASTER CLEAR DMC11
015332 012711 003000 MOV #BIT9:BIT10,(R1) ;SEL6 IS NOW THE IR
015336 005005 CLR R5 ;PUT "EXPECTED" IN R5
015340 010561 000006 1$: MOV R5,6(R1) ;CLEAR THE IR
015344 016104 000006 MOV 6(R1),R4 ;READ THE IR
015350 020504 CMP R5,R4 ;IS IT CLEARED?
015352 001401 BEQ 2$ ;BR IF YES
015354 104023 EMT 23 ;ERROR IR IS NOT CLEAR
015356 104401 2$: SCOPI ;LOOP TO 1$ IF SW09=1
015360 012737 015372 001220 MOV #3$,LOCK ;NEW SCOPI
015366 012705 177777 MOV #-1,R5 ;PUT "EXPECTED" IN R5
015372 010561 000006 3$: MOV R5,6(R1) ;WRITE ALL ONES TO THE IR
015376 016104 000006 MOV 6(R1),R4 ;READ THE IR
015402 020504 CMP R5,R4 ;IS IT ALL ONES?
015404 001401 BEQ 4$ ;BR IF YES
015406 104023 EMT 23 ;ERROR IR IS NOT = ALL ONES
015410 104401 4$: SCOPI ;LOOP TO 3$ IF SW09=1
015412 012737 015422 001220 MOV #5$,LOCK ;NEW SCOPI
015420 005005 CLR R5 ;PUT "EXPECTED" IN R5
015422 052711 040000 5$: BIS #BIT14,(R1) ;MASTER CLEAR
015426 012711 003000 MOV #BIT9:BIT10,(R1) ;SEL6 IS IR
015432 016104 000006 MOV 6(R1),R4 ;READ THE IR
015436 020504 CMP R5,R4 ;IS IT CLEARED?
015440 001401 BEQ 6$ ;BR IF YES
015442 104023 EMT 23 ;ERROR, IR IS NOT CLEARED
015444 104401 6$: SCOPI ;LOOP TO 5$ IF SW09=1
015446 104400 SCOPE ;SCOPE THIS TEST
    
```

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```

;***** TEST 31 *****
;MICRO PROCESSOR TEST
;LOAD DMP06 WITH A MICRO-PROCESSOR INSTRUCTION, CLOCK IT
;VERIFY INSTRUCTION EXECUTED PROPERLY
;INSTRUCTION SHOULD MOVE IBUS*4 TO IBUS*5. IBUS*4 IS ALL 1'S
;AND IBUS*5 IS ALL 0'S. RESULT SHOULD BE ALL 1'S IN SEL4
;*****
    
```

; TEST 31

```

;-----
015450 012737 000031 001226 TST31: MOV #31,TSTNO
015456 012737 015534 001216 MOV #TST32,NEXT

                                ;R1 CONTAINS BASE DMC11 ADDRESS
015464 104412 MSTCLR ;MASTER CLEAR DMC11
015466 012761 000377 000004 MOV #377,4(R1) ;PORT4 HI-BYTE=0'S LO-BYTE=1'S
015474 012711 001000 MOV #BIT9,(R1) ;SET ROMI
015500 012761 121105 000006 MOV #121105,6(R1) ;INSTRUCTION TO PORT6
015506 052711 001400 BIS #BIT8:BIT9,(R1) ;CLK INSTRUCTION, MOVE IBUS*4 TO IBUS*5
015512 000240 NOP ;
015514 012705 177777 MOV #-1,R5 ;PUT "EXPECTED" IN R5
015520 016104 000004 MOV 4(R1),R4 ;PUT "FOUND" INTO R4
015524 020504 CMP R5,R4 ;IS DATA CORRECT
015526 001401 BEQ 1$ ;BR IF YES
015530 104003 EMT 3 ;ERROR
    
```

25 015532 104400

1\$: SCOPE ;SCOPE THIS TEST

***** TEST 32 *****
 ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
 ;*FLOAT A 1 THROUGH IBUS* REGISTER 0
 ;*FLOAT A 0 THROUGH IBUS* REGISTER 0
 ;*****

; TEST 32

```

015534 012737 000032 001226 TST32: MOV #32,TSTNO
015542 012737 015734 001216 MOV #TST33,NEXT
015550 012737 015570 001220 MOV #64$,LOCK

015556 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
015560 012702 000000 MOV #0,R2 ;MASTER CLEAR DMC11
015564 012700 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
;START WITH BIT 0

015570 010061 000004 64$: MOV R0,4(R1) ;PUT PATTERN INTO PORT4
015574 042761 000030 000004 BIC #30,4(R1) ;CLEAR UNWANTED BITS
015602 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015604 121100 121100:0 ;MOV DATA TO IBUS* REGISTER 0
015606 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015610 121005 121005!<0*20> ;READ FROM IBUS* REGISTER 0
015612 010005 MOV R0,R5 ;PUT EXPECTED IN R5
015614 042705 000030 BIC #30,R5 ;CLEAR UNWANTED BITS
015620 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
015624 120504 CMPB R5,R4 ;DATA CORRECT?
015626 001401 BEQ 65$ ;BR IF YES
015630 104004 EMT 4 ;ERROR
015632 104401 65$: SCOP1 ;SW09=1?
015634 000241 CLC ;CLEAR CARRY
015636 106100 ROLB R0 ;SHIFT BIT IN R0
015640 001353 BNE 64$ ;IF R0=0 THEN DONE
015642 012737 015656 001220 MOV #67$,LOCK ;NEW SCOP1
015650 012700 000001 MOV #1,R0 ;START WITH BIT 0
015654 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
015656 67$: MOV R0,4(R1) ;PUT PATTERN INTO PORT4
015662 042761 000030 000004 BIC #30,4(R1) ;CLEAR UNWANTED BITS
015670 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015672 121100 121100:0 ;MOV DATA TO IBUS* REGISTER 0
015674 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
015676 121005 121005!<0*20> ;READ FROM IBUS* REGISTER 0
015700 010005 MOV R0,R5 ;PUT EXPECTED IN R5
015702 042705 000030 BIC #30,R5 ;CLEAR UNWANTED BITS
015706 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
015712 120504 CMPB R5,R4 ;DATA CORRECT?
015714 001401 BEQ 68$ ;BR IF YES
015716 104004 EMT 4 ;ERROR
015720 104401 68$: SCOP1 ;SW09=1?
015722 005100 COM R0 ;CHANGE TO FLOATING 1
015724 000241 CLC ;CLEAR CARRY
015726 106100 ROLB R0 ;SHIFT BIT IN R0
015730 001351 BNE 69$ ;IF R0=0 THEN DONE
015732 104400 SCOPE ;SCOPE THIS TEST
  
```

```

;***** TEST 33 *****
;MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
;FLOAT A 1 THROUGH IBUS* REGISTER 2
;FLOAT A 0 THROUGH IBUS* REGISTER 2
;*****

```

; TEST 33

```

015734 012737 000033 001226 TST33: MOV #33,TSTNO
015742 012737 016134 001216 MOV #TST34,NEXT
015750 012737 015770 001220 MOV #64$,LOCK

015756 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
015760 012702 000002 MOV #2,R2 ;MASTER CLEAR DMC11
015764 012700 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
;START WITH BIT 0

015770 64$: MOV R0,4(R1) ;PUT PATTERN INTO PORT4
015774 010061 000004 BIC #70,4(R1) ;CLEAR UNWANTED BITS
016002 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016004 121102 121100!2 ;MOV DATA TO IBUS* REGISTER 2
016006 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016010 121045 121005!<2*20> ;READ FROM IBUS* REGISTER 2
016012 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016014 042705 000070 BIC #70,R5 ;CLEAR UNWANTED BITS
016020 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016024 120504 CMPB R5,R4 ;DATA CORRECT?
016026 001401 BEQ 65$ ;BR IF YES
016030 104004 EMT 4 ;ERROR
016032 104401 65$: SCOP1 ;SW09=1?
016034 000241 CLC ;CLEAR CARRY
016036 106100 ROLB R0 ;SHIFT BIT IN R0
016040 001353 BNE 64$ ;IF R0=0 THEN DONE
016042 012737 016056 001220 MOV #67$,LOCK ;NEW SCOP1
016050 012700 000001 MOV #1,R0 ;START WITH BIT 0
016054 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
016056 67$:

016056 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016062 042761 000070 000004 BIC #70,4(R1) ;CLEAR UNWANTED BITS
016070 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016072 121102 121100!2 ;MOV DATA TO IBUS* REGISTER 2
016074 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016076 121045 121005!<2*20> ;READ FROM IBUS* REGISTER 2
016100 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016102 042705 000070 BIC #70,R5 ;CLEAR UNWANTED BITS
016106 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016112 120504 CMPB R5,R4 ;DATA CORRECT?
016114 001401 BEQ 68$ ;BR IF YES
016116 104004 EMT 4 ;ERROR
016120 104401 68$: SCOP1 ;SW09=1?
016122 005100 COM R0 ;CHANGE TO FLOATING 1
016124 000241 CLC ;CLEAR CARRY
016126 106100 ROLB R0 ;SHIFT BIT IN R0
016130 001351 BNE 69$ ;IF R0=0 THEN DONE
016132 104400 SCOPE ;SCOPE THIS TEST

```

***** TEST 34 *****
 ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
 ;*FLOAT A 1 THROUGH IBUS* REGISTER 4
 ;*FLOAT A 0 THROUGH IBUS* REGISTER 4
 ;*****

; TEST 34

```

016134 012737 000034 001226 TST34: MOV #34,TSTNO
016142 012737 016310 001216 MOV #TST35,NEXT
016150 012737 016170 001220 MOV #64$,LOCK

016156 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
016160 012702 000004 MOV #4,R2 ;MASTER CLEAR DMC11
016164 012700 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
016170 64$: ;START WITH BIT 0
016170 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016174 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016176 121104 121100!4 ;MOV DATA TO IBUS* REGISTER 4
016200 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016202 121105 121005!<4*20> ;READ FROM IBUS* REGISTER 4
016204 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016206 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016212 120504 CMPB R5,R4 ;DATA CORRECT?
016214 001401 BEQ 65$ ;BR IF YES
016216 104004 EMT 4 ;ERROR
016220 104401 65$: SCOP1 ;SW09=1?
016222 000241 CLC ;CLEAR CARRY
016224 106100 ROLB R0 ;SHIFT BIT IN R0
016226 001360 BNE 64$ ;IF R0=0 THEN DONE
016230 012737 016244 001220 MOV #67$,LOCK ;NEW SCOP1
016236 012700 000001 MOV #1,R0 ;START WITH BIT 0
016242 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
016244 67$:
016244 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016250 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016252 121104 121100!4 ;MOV DATA TO IBUS* REGISTER 4
016254 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016256 121105 121005!<4*20> ;READ FROM IBUS* REGISTER 4
016260 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016262 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016266 120504 CMPB R5,R4 ;DATA CORRECT?
016270 001401 BEQ 68$ ;BR IF YES
016272 104004 EMT 4 ;ERROR
016274 104401 68$: SCOP1 ;SW09=1?
016276 005100 COM R0 ;CHANGE TO FLOATING 1
016300 000241 CLC ;CLEAR CARRY
016302 106100 ROLB R0 ;SHIFT BIT IN R0
016304 001356 BNE 69$ ;IF R0=0 THEN DONE
016306 104400 SCOPE ;SCOPE THIS TEST
    
```

***** TEST 35 *****
 ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
 ;*FLOAT A 1 THROUGH IBUS* REGISTER 5
 ;*FLOAT A 0 THROUGH IBUS* REGISTER 5

```

;*****
; TEST 35
;-----
016310 012737 000035 001226 TST35: MOV #35,TSTNO
016316 012737 016464 001216 MOV #TST36,NEXT
016324 012737 016344 001220 MOV #64$,LOCK

016332 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
016334 012702 000005 MOV #5,R2 ;MASTER CLEAR DMC11
016340 012700 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
016344 64$: ;START WITH BIT 0
016344 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016350 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016352 121105 121100!5 ;MOV DATA TO IBUS* REGISTER 5
016354 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016356 121125 121005!<5*20> ;READ FROM IBUS* REGISTER 5
016360 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016362 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016366 120504 CMPB R5,R4 ;DATA CORRECT?
016370 001401 BEQ 65$ ;BR IF YES
016372 104004 EMT 4 ;ERROR
016374 104401 65$: SCOP1 ;SW09=1?
016376 000241 CLC ;CLEAR CARRY
016400 106100 ROLB R0 ;SHIFT BIT IN R0
016402 001360 BNE 64$ ;IF R0=0 THEN DONE
016404 012737 016420 001220 MOV #67$,LOCK ;NEW SCOP1
016412 012700 000001 MOV #1,R0 ;START WITH BIT 0
016416 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
016420 67$:
016420 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016424 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016426 121105 121100!5 ;MOV DATA TO IBUS* REGISTER 5
016430 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016432 121125 121005!<5*20> ;READ FROM IBUS* REGISTER 5
016434 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016436 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016442 120504 CMPB R5,R4 ;DATA CORRECT?
016444 001401 BEQ 68$ ;BR IF YES
016446 104004 EMT 4 ;ERROR
016450 104401 68$: SCOP1 ;SW09=1?
016452 005100 COM R0 ;CHANGE TO FLOATING 1
016454 000241 CLC ;CLEAR CARRY
016456 106100 ROLB R0 ;SHIFT BIT IN R0
016460 001356 BNE 69$ ;IF R0=0 THEN DONE
016462 104400 SCOPE ;SCOPE THIS TEST
  
```

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```

;***** TEST 36 *****
;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
;*FLOAT A 1 THROUGH IBUS* REGISTER 10
;*FLOAT A 0 THROUGH IBUS* REGISTER 10
;*THE NPR RQ BIT (BIT 0) IS MASKED DURING THIS TEST
;*****
  
```

```

; TEST 36
;-----
  
```

```

016464 012737 000036 001226 TST36: MOV #36,TSTNO
016472 012737 016664 001216 MOV #TST37,NEXT
016500 012737 016520 001220 MOV #64$,LOCK

016506 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
016510 012702 000010 MOV #10,R2 ;MASTER CLEAR DMC11
016514 012700 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
016520 64$: ;START WITH BIT 0
016520 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016524 042761 000141 000004 BIC #141,4(R1) ;CLEAR UNWANTED BITS
016532 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016534 121110 121100!10 ;MOV DATA TO IBUS* REGISTER 10
016536 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016540 121205 121005!<10*20> ;READ FROM IBUS* REGISTER 10
016542 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016544 042705 000141 BIC #141,R5 ;CLEAR UNWANTED BITS
016550 116104 000005 MOV# 5(R1),R4 ;PUT "FOUND" INTO R4
016554 120504 CMPB R5,R4 ;DATA CORRECT?
016556 001401 BEQ 65$ ;BR IF YES
016560 104004 EMT 4 ;ERROR
016562 104401 65$: SCOP1 ;SW09=1?
016564 000241 CLC ;CLEAR CARRY
016566 106100 ROLB R0 ;SHIFT BIT IN R0
016570 001353 BNE 64$ ;IF R0=0 THEN DONE
016572 012737 016606 001220 MOV #67$,LOCK ;NEW SCOP1
016600 012700 000001 MOV #1,R0 ;START WITH BIT 0
016604 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
016606 67$:
016606 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016612 042761 000141 000004 BIC #141,4(R1) ;CLEAR UNWANTED BITS
016620 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016622 121110 121100!10 ;MOV DATA TO IBUS* REGISTER 10
016624 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016626 121205 121005!<10*20> ;READ FROM IBUS* REGISTER 10
016630 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016632 042705 000141 BIC #141,R5 ;CLEAR UNWANTED BITS
016636 116104 000005 MOV# 5(R1),R4 ;PUT "FOUND" INTO R4
016642 120504 CMPB R5,R4 ;DATA CORRECT?
016644 001401 BEQ 68$ ;BR IF YES
016646 104004 EMT 4 ;ERROR
016650 104401 68$: SCOP1 ;SW09=1?
016652 005100 COM R0 ;CHANGE TO FLOATING 1
016654 000241 CLC ;CLEAR CARRY
016656 106100 ROLB R0 ;SHIFT BIT IN R0
016660 001351 BNE 69$ ;IF R0=0 THEN DONE
016662 104400 SCOPE ;SCOPE THIS TEST
    
```

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```

;***** TEST 37 *****
;MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
;FLOAT A 1 THROUGH IBUS* REGISTER 11
;FLOAT A 0 THROUGH IBUS* REGISTER 11
;THE BR RQ BIT, PGM CLOCK BIT, FORCE POWER FAIL BIT
;(BITS 7,4,1) ARE ALL MASKED DURING THIS TEST
;*****
    
```

; TEST 37


```

016664 012737 000037 001226 TST37: MOV #37,TSTNO
016672 012737 017104 001216 MOV #TST40,NEXT
016700 012737 016720 001220 MOV #64$,LOCK

016706 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
016710 012702 000011 MOV #11,R2 ;MASTER CLEAR DMC11
016714 012700 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
016720 64$: ;START WITH BIT 0
016720 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
016724 042761 000262 000004 BIC #262,4(R1) ;CLEAR UNWANTED BITS
016732 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016734 121111 121100!11 ;MOV DATA TO IBUS* REGISTER 11
016736 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016740 121225 121005!<11*20> ;READ FROM IBUS* REGISTER 11
016742 010005 MOV R0,R5 ;PUT EXPECTED IN R5
016744 042705 000262 BIC #262,R5 ;CLEAR UNWANTED BITS
016750 052705 000020 BIS #20,R5 ;ADD THESE BITS
016754 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
016760 052704 000020 BIS #20,R4 ;ADD THIS BIT
016764 120504 CMPB R5,R4 ;DATA CORRECT?
016766 001401 BEQ 65$ ;BR IF YES
016770 104004 EMT 4 ;ERROR
016772 104401 65$: SCOP1 ;SW09=1?
016774 000241 CLC ;CLEAR CARRY
016776 106100 ROLB R0 ;SHIFT BIT IN R0
017000 001347 BNE 64$ ;IF R0=0 THEN DONE
017002 012737 017016 001220 MOV #67$,LOCK ;NEW SCOP1
017010 012700 000001 MOV #1,R0 ;START WITH BIT 0
017014 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
017016 67$:
017016 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
017022 042761 000262 000004 BIC #262,4(R1) ;CLEAR UNWANTED BITS
017030 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017032 121111 121100!11 ;MOV DATA TO IBUS* REGISTER 11
017034 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017036 121225 121005!<11*20> ;READ FROM IBUS* REGISTER 11
017040 010005 MOV R0,R5 ;PUT EXPECTED IN R5
017042 042705 000262 BIC #262,R5 ;CLEAR UNWANTED BITS
017046 052705 000020 BIS #20,R5 ;ADD THESE BITS
017052 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
017056 052704 000020 BIS #20,R4 ;ADD THIS BIT
017062 120504 CMPB R5,R4 ;DATA CORRECT?
017064 001401 BEQ 68$ ;BR IF YES
017066 104004 EMT 4 ;ERROR
017070 104401 68$: SCOP1 ;SW09=1?
017072 005100 COM R0 ;CHANGE TO FLOATING 1
017074 000241 CLC ;CLEAR CARRY
017076 106100 ROLB R0 ;SHIFT BIT IN R0
017100 001345 BNE 69$ ;IF R0=0 THEN DONE
017102 104400 SCOPE ;SCOPE THIS TEST
    
```

```

;***** TEST 40 *****
;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
;*FLOAT A 1 THROUGH IBUS REGISTER 0
;*FLOAT A 0 THROUGH IBUS REGISTER 0
    
```

```

;*****
; TEST 40
;-----
017104 012737 000040 001226 TST40: MOV #40,TSTNO
017112 012737 017260 001216 MOV #TST41,NEXT
017120 012737 017140 001220 MOV #64$,LOCK

017126 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
017130 012702 000000 MOV #0,R2 ;MASTER CLEAR DMC11
017134 012706 000001 MOV #1,R0 ;SAVE REGISTER ADDRESS FOR TYPEOUT
017140 64 : ;START WITH BIT 0
017140 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
017144 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017146 122100!0 ;MOV DATA TO IBUS REGISTER 0
017150 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017152 021005 21005!<0*20> ;READ FROM IBUS REGISTER 0
017154 010005 MOV R0,R5 ;PUT EXPECTED IN R5
017156 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
017162 120504 CMPB R5,R4 ;DATA CORRECT?
017164 001401 BEQ 65$ ;BR IF YES
017166 104005 EMT 5 ;ERROR
017170 104401 65$: SCOP1 ;SW09=1?
017172 000241 CLC ;CLEAR CARRY
017174 106100 ROLB R0 ;SHIFT BIT IN R0
017176 001360 BNE 64$ ;IF R0=0 THEN DONE
017200 012737 017214 001220 MOV #67$,LOCK ;NEW SCOP1
017206 012700 000001 MOV #1,R0 ;START WITH BIT 0
017212 005100 69$: COM R0 ;CHANGE TO FLOATING ZERO
017214 67$:
017214 010061 000004 MOV R0,4(R1) ;PUT PATTERN INTO PORT4
017220 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017222 122100!0 ;MOV DATA TO IBUS REGISTER 0
017224 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017226 021005 21005!<0*20> ;READ FROM IBUS REGISTER 0
017230 010005 MOV R0,R5 ;PUT EXPECTED IN R5
017232 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
017236 120504 CMPB R5,R4 ;DATA CORRECT?
017240 001401 BEQ 68$ ;BR IF YES
017242 104005 EMT 5 ;ERROR
017244 104401 68$: SCOP1 ;SW09=1?
017246 005100 COM R0 ;CHANGE TO FLOATING 1
017250 000241 CLC ;CLEAR CARRY
017252 106100 ROLB R0 ;SHIFT BIT IN R0
017254 001356 BNE 69$ ;IF R0=0 THEN DONE
017256 104400 SCOPE ;SCOPE THIS TEST

```

```

;***** TEST 41 *****
;MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
;FLOAT A 1 THROUGH IBUS REGISTER 1
;FLOAT A 0 THROUGH IBUS REGISTER 1
;*****

```

```

; TEST 41
;-----
017260 012737 000041 001226 TST41: MOV #41,TSTNO

```



```

017464 012700 000001      MOV    #1,R0          ;START WITH BIT 0
017470      64$:      MOV    RO,4(R1)        ;PUT PATTERN INTO PORT4
017474 010061 000004      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017476 104414          122100!2        ;MOV DATA TO IBUS REGISTER 2
017500 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017502 021045          21005!<2*20>    ;READ FROM IBUS REGISTER 2
017504 010005          MOV    RO,R5      ;PUT EXPECTED IN R5
017506 116104 000005      MOVB   5(R1),R4   ;PUT "FOUND" INTO R4
017512 120504          CMPB   R5,R4     ;DATA CORRECT?
017514 001401          BEQ    65$       ;BR IF YES
017516 104005          EMT    5         ;ERROR
017520 104401          65$:      SCOP1          ;SW09=1?
017522 000241          CLC                    ;CLEAR CARRY
017524 106100          ROLB   RO        ;SHIFT BIT IN RO
017526 001360          BNE    64$       ;IF RO=0 THEN DONE
017530 012737 017544 001220      MOV    #67$,LOCK  ;NEW SCOP1
017536 012700 000001          MOV    #1,R0     ;START WITH BIT 0
017542 005100          69$:      COM    RO        ;CHANGE TO FLOATING ZERO
017544          67$:      MOV    RO,4(R1)        ;PUT PATTERN INTO PORT4
017544 010061 000004      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017550 104414          122100!2        ;MOV DATA TO IBUS REGISTER 2
017552 122102          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017554 104414          21005!<2*20>    ;READ FROM IBUS REGISTER 2
017556 021045          MOV    RO,R5      ;PUT EXPECTED IN R5
017560 010005          MOVB   5(R1),R4   ;PUT "FOUND" INTO R4
017562 116104 000005      CMPB   R5,R4     ;DATA CORRECT?
017566 120504          BEQ    68$       ;BR IF YES
017570 001401          EMT    5         ;ERROR
017572 104005          68$:      SCOP1          ;SW09=1?
017574 104401          COM    RO        ;CHANGE TO FLOATING 1
017576 005100          CLC                    ;CLEAR CARRY
017600 000241          ROLB   RO        ;SHIFT BIT IN RO
017602 106100          BNE    69$       ;IF RO=0 THEN DONE
017604 001356          SCOPE          ;SCOPE THIS TEST
017606 104400

```

```

;***** TEST 43 *****
;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
;*FLOAT A 1 THROUGH IBUS REGISTER 3
;*FLOAT A 0 THROUGH IBUS REGISTER 3
;:*****

```

; TEST 43

```

017610 012737 000043 001226  TST43:  MOV    #43,TSTNO
017616 012737 017764 001216      MOV    #TST44,NEXT
017624 012737 017644 001220      MOV    #64$,LOCK
                                ;R1 CONTAINS BASE DMC11 ADDRESS
017632 104412          MSTCLR          ;MASTER CLEAR DMC11
017634 012702 000003          MOV    #3,R2    ;SAVE REGISTER ADDRESS FOR TYPEOUT
017640 012700 000001          MOV    #1,R0    ;START WITH BIT 0
017644          64$:      MOV    RO,4(R1)        ;PUT PATTERN INTO PORT4
017644 010061 000004      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017650 104414          122100!3        ;MOV DATA TO IBUS REGISTER 3
017652 122103

```

```

017654 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017656 021065 21005!<3*20> ;READ FROM IBUS REGISTER 3
017660 010005 MOV RO,R5 ;PUT EXPECTED IN R5
017662 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
017666 120504 CMPB R5,R4 ;DATA CORRECT?
017670 001401 BEQ 65$ ;BR IF YES
017672 104005 EMT 5 ;ERRCR
017674 104401 65$: SCOP1 ;SW09=1?
017676 000241 CLC ;CLEAR CARRY
017700 106100 ROLB RO ;SHIFT BIT IN RO
017702 001360 BNE 64$ ;IF RO=0 THEN DONE
017704 012737 017720 001220 MOV #67$,LOCK ;NEW SCOP1
017712 012700 000001 MOV #1,RO ;START WITH BIT 0
017716 005100 69$: COM RO ;CHANGE TO FLOATING ZERO
017720 67$:
017720 01C061 000004 MOV RO,4(R1) ;PUT PATTERN INTO PORT4
017724 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017726 122103 122100!3 ;MOV DATA TO IBUS REGISTER 3
017730 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017732 021065 21005!<3*20> ;READ FROM IBUS REGISTER 3
017734 010005 MOV RO,R5 ;PUT EXPECTED IN R5
017736 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
017742 120504 CMPB R5,R4 ;DATA CORRECT?
017744 001401 BEQ 68$ ;BR IF YES
017746 104005 EMT 5 ;ERROR
017750 104401 68$: SCOP1 ;SW09=1?
017752 005100 COM RO ;CHANGE TO FLOATING 1
017754 000241 CLC ;CLEAR CARRY
017756 106100 ROLB RO ;SHIFT BIT IN RO
017760 001356 BNE 69$ ;IF RO=0 THEN DONE
017762 104400 SCOPE ;SCOPE THIS TEST
  
```

***** TEST 44 *****
 ;MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
 ;*FLOAT A 1 THROUGH IBUS REGISTER 4
 ;*FLOAT A 0 THROUGH IBUS REGISTER 4
 ;*****

; TEST 44

```

017764 012737 000044 001226 TST44: MOV #44,TSTNO
017772 012737 020140 001216 MOV #TST45,NEXT
020000 012737 020020 001220 MOV #64$,LOCK

020006 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
020010 012702 000004 MOV #4,R2 ;MASTER CLEAR DMC11
020014 012700 000001 MOV #1,RO ;SAVE REGISTER ADDRESS FOR TYPEOUT
020020 64$: ;START WITH BIT 0
020020 010061 000004 MOV RO,4(R1) ;PUT PATTERN INTO PORT4
020024 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020026 122104 122100!4 ;MOV DATA TO IBUS REGISTER 4
020030 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020032 021105 21005!<4*20> ;READ FROM IBUS REGISTER 4
020034 010005 MOV RO,R5 ;PUT EXPECTED IN R5
020036 116104 000005 MOVB 5(R1),R4 ;PUT "FOUND" INTO R4
020042 120504 CMPB R5,R4 ;DATA CORRECT?
  
```

```

020044 001401      BEQ    65$      ;BR IF YES
020046 104005      EMT    5          ;ERROR
020050 104401      65$: SCOP1      ;SW09=1?
020052 000241      CLC                    ;CLEAR CARRY
020054 106100      ROLB   RO        ;SHIFT BIT IN RO
020056 001360      BNE    64$      ;IF RO=0 THEN DONE
020060 012737 020074 001220  MOV    #67$,LOCK ;NEW SCOP1
020066 012700 000001  MOV    #1,RO     ;START WITH BIT 0
020072 005100      69$: COM    RO     ;CHANGE TO FLOATING ZERO
020074 000004      67$: MOV    RO,4(R1) ;PUT PATTERN INTO PORT4
020100 104414      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020102 122104      122100!4 ;MOV DATA TO IBUS REGISTER 4
020104 104414      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020106 021105      21005!<4*20> ;READ FROM IBUS REGISTER 4
020110 010005      MOV    RO,R5     ;PUT EXPECTED IN R5
020112 116104 000005  MOVB   5(R1),R4  ;PUT "FOUND" INTO R4
020116 120504      CMPB   R5,R4     ;DATA CORRECT?
020120 001401      BEQ    68$      ;BR IF YES
020122 104005      EMT    5          ;ERROR
020124 104401      68$: SCOP1      ;SW09=1?
020126 005100      COM    RO        ;CHANGE TO FLOATING 1
020130 000241      CLC                    ;CLEAR CARRY
020132 106100      ROLB   RO        ;SHIFT BIT IN RO
020134 001356      BNE    69$      ;IF RO=0 THEN DONE
020136 104400      SCOPE ;SCOPE THIS TEST
  
```

```

;***** TEST 45 *****
;MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
;FLOAT A 1 THROUGH IBUS REGISTER 5
;FLOAT A 0 THROUGH IBUS REGISTER 5
;*****
  
```

; TEST 45

```

020140 012737 000045 001226 TST45: MOV    #45,TSTNO
020146 012737 020314 001216  MOV    #TST46,NEXT
020154 012737 020174 001220  MOV    #64$,LOCK

020162 104412      MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
020164 012702 000005  MOV    #5,R2     ;MASTER CLEAR DMC11
020170 012700 000001  MOV    #1,RO     ;SAVE REGISTER ADDRESS FOR TYPEOUT
020174 000004      64$: ;START WITH BIT 0
020174 010061 000004  MOV    RO,4(R1) ;PUT PATTERN INTO PORT4
020200 104414      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020202 122105      122100!5 ;MOV DATA TO IBUS REGISTER 5
020204 104414      ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020206 021125      21005!<5*20> ;READ FROM IBUS REGISTER 5
020210 010005      MOV    RO,R5     ;PUT EXPECTED IN R5
020212 116104 000005  MOVB   5(R1),R4  ;PUT "FOUND" INTO R4
020216 120504      CMPB   R5,R4     ;DATA CORRECT?
020220 001401      BEQ    65$      ;BR IF YES
020222 104005      EMT    5          ;ERROR
020224 104401      65$: SCOP1      ;SW09=1?
020226 000241      CLC                    ;CLEAR CARRY
020230 106100      ROLB   RO        ;SHIFT BIT IN RO
  
```

```

020232 001360          BNE      64$          ;IF R0=0 THEN DONE
020234 012737 020250 001220      MOV      #67$,LOCK      ;NEW SCOPI
020242 012700 000001          MOV      #1,'0          ;START WITH BIT 0
020246 005100          69$:      COM      R0          ;CHANGE TO FLOATING ZERO
020250          67$:
020250 010061 000004          MOV      R0,4(R1)       ;PUT PATTERN INTO PORT4
020254 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020256 122105          122100!5      ;MOV DATA TO IBUS REGISTER 5
020260 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020262 021125          21005!<5*20>    ;READ FROM IBUS REGISTER 5
020264 010005          MOV      R0,R5          ;PUT EXPECTED IN R5
020266 116104 000005          MOVB     5(R1),R4       ;PUT "FOUND" INTO R4
020272 120504          CMPB     R5,R4          ;DATA CORRECT?
020274 001401          BEQ      68$          ;BR IF YES
020276 104005          EMT      5            ;ERROR
020300 104401          68$:      SCOP1          ;SW09=1?
020302 005100          COM      R0          ;CHANGE TO FLOATING 1
020304 000241          CLC          ;CLEAR CARRY
020306 106100          ROLB     R0          ;SHIFT BIT IN R0
020310 001356          BNE      69$          ;IF R0=0 THEN DONE
020312 104400          SCOPE          ;SCOPE THIS TEST
  
```

```

;***** TEST 46 *****
;MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
;FLOAT A 1 THROUGH IBUS REGISTER 6
;FLOAT A 0 THROUGH IBUS REGISTER 6
;*****
  
```

; TEST 46

```

020314 012737 000046 001226 TST46:  MOV      #46,TSTNO
020322 012737 020470 001216      MOV      #TST47,NEXT
020330 012737 020350 001220      MOV      #64$,LOCK
                                ;R1 CONTAINS BASE DMC11 ADDRESS
020336 104412          MSTCLR          ;MASTER CLEAR DMC11
020340 012702 000006          MOV      #6,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
020344 012700 000001          MOV      #1,R0          ;START WITH BIT 0
020350          64$:
020350 010061 000004          MOV      R0,4(R1)       ;PUT PATTERN INTO PORT4
020354 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020356 122106          122100!6      ;MOV DATA TO IBUS REGISTER 6
020360 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020362 021145          21005!<6*20>    ;READ FROM IBUS REGISTER 6
020364 010005          MOV      R0,R5          ;PUT EXPECTED IN R5
020366 116104 000005          MOVB     5(R1),R4       ;PUT "FOUND" INTO R4
020372 120504          CMPB     R5,R4          ;DATA CORRECT?
020374 001401          BEQ      65$          ;BR IF YES
020376 104005          EMT      5            ;ERROR
020400 104401          65$:      SCOP1          ;SW09=1?
020402 000241          CLC          ;CLEAR CARRY
020404 106100          ROLB     R0          ;SHIFT BIT IN R0
020406 001360          BNE      64$          ;IF R0=0 THEN DONE
020410 012737 020424 001220      MOV      #67$,LOCK      ;NEW SCOPI
020416 012700 000001          MOV      #1,R0          ;START WITH BIT 0
020422 005100          69$:      COM      R0          ;CHANGE TO FLOATING ZERO
020424          67$:
  
```

```

020424 010061 000004      MOV      R0,4(R1)      ;PUT PATTERN INTO PORT4
020430 104414             ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020432 122106             122100!6          ;MOV DATA TO IBUS REGISTER 6
020434 104414             ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020436 021145             21005!<6*20>     ;READ FROM IBUS REGISTER 6
020440 010005             MOV      R0,R5      ;PUT EXPECTED IN R5
020442 116104 000005     MOVVB   5(R1),R4    ;PUT "FOUND" INTO R4
020446 120504             CMPB    R5,R4      ;DATA CORRECT?
020450 001401             BEQ     68$        ;BR IF YES
020452 104005             EMT     5          ;ERROR
020454 104401 68$:     SCOP1              ;SW09=1?
020456 005100             COM     R0         ;CHANGE TO FLOATING 1
020460 000241             CLC                    ;CLEAR CARRY
020462 106100             ROLB   R0         ;SHIFT BIT IN R0
020464 001356             BNE    69$        ;IF R0=0 THEN DONE
020466 104400             SCOPE              ;SCOPE THIS TEST

```

```

;***** TEST 47 *****
;MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
;FLOAT A 1 THROUGH IBUS REGISTER 7
;FLOAT A 0 THROUGH IBUS REGISTER 7
;:*****

```

```

; TEST 47
;-----

```

```

020470 012737 000047 001226 TST47: MOV      #47,TSTNO
020476 012737 020644 001216      MOV      #TST50,NEXT
020504 012737 020524 001220      MOV      #64$,LOCK

020512 104412             MSTCLR              ;R1 CONTAINS BASE DMC11 ADDRESS
020514 012702 000007     MOV      #7,R2      ;MASTER CLEAR DMC11
020520 012700 000001     MOV      #1,R0      ;SAVE REGISTER ADDRESS FOR TYPEOUT
020524 104414             64$:              ;START WITH BIT 0
020524 010061 000004     MOV      R0,4(R1)   ;PUT PATTERN INTO PORT4
020530 104414             ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020532 122107             122100!7          ;MOV DATA TO IBUS REGISTER 7
020534 104414             ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020536 021165             21005!<7*20>     ;READ FROM IBUS REGISTER 7
020540 010005             MOV      R0,R5      ;PUT EXPECTED IN R5
020542 116104 000005     MOVVB   5(R1),R4    ;PUT "FOUND" INTO R4
020546 120504             CMPB    R5,R4      ;DATA CORRECT?
020550 001401             BEQ     65$        ;BR IF YES
020552 104005             EMT     5          ;ERROR
020554 104401 65$:     SCOP1              ;SW09=1?
020556 000241             CLC                    ;CLEAR CARRY
020560 106100             ROLB   R0         ;SHIFT BIT IN R0
020562 001360             BNE    64$        ;IF R0=0 THEN DONE
020564 012737 020600 001220     MOV      #67$,LOCK ;NEW SCOP1
020572 012700 000001     MOV      #1,R0      ;START WITH BIT 0
020576 005100 69$:     COM     R0         ;CHANGE TO FLOATING ZERO
020600 104414             67$:              ;PUT PATTERN INTO PORT4
020604 104414             ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020606 122107             122100!7          ;MOV DATA TO IBUS REGISTER 7
020610 104414             ROMCLK              ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020612 021165             21005!<7*20>     ;READ FROM IBUS REGISTER 7

```



```

021024 050337 021032      BIS      R3,7$      ;ADD ADDRESS TO INSTRUCTION
021030 104414              ROMCLK           ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021032 021005      7$:    21005              ;READ FROM IBUS REGISTER
021034 010005              MOV      RO,R5      ;PUT "EXPECTED" IN R5
021036 116104 000005      MOVB     5(R1),R4    ;PUT "FOUND" IN R5
021042 120504              CMPB     R5,R4      ;DATA CORRECT?
021044 001401              BEQ      4$          ;BR IF YES
021046 104005              EMT      5          ;DUAL ADDRESSING ERROR
021050 104401      4$:    SCOP1           ;SW09=1?
021052 005200              INC      RO          ;INCREMENT PATTERN
021054 005202              INC      R2          ;NEXT ADDRESS
021056 062703 000020      ADD      #20,R3     ;ADD 1 TO ADDRESS IN R3(SHIFTED 4 TIMES)
021062 022702 000010      CMP      #7*1,R2   ;LAST ADDRESS DONE?
021066 001353              BNE     3$          ;BR IF NO
021070 104400              SCOPE           ;SCOPE THIS TEST
  
```

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```

;***** TEST 51 *****
;MICRO PROCESSOR BR REGISTER TEST
;FLOAT A 1 THROUGH THE BR
;FLOAT A 0 THROUGH THE BR
;*****
  
```

; TEST 51

```

021072 012737 000051 001226 TST51: MOV      #51,TSTNO
021100 012737 021242 001216      MOV      #TST52,NEXT
021106 012737 021122 001220      MOV      #64$,LOCK

021114 104412              MSTCLR           ;R1 CONTAINS BASE DMC11 ADDRESS
021116 012700 000001      MOV      #1,RO    ;MASTER CLEAR DMC11
021122 021122      64$:    MOV      RO,4(R1)   ;START PATTERN WITH BITO
021122 010061 000004      ROMCLK           ;WRITE PATTERN IN PORT4
021126 104414              120500          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021130 120500              ROMCLK           ;MOVE DATA TO THE BR REGISTER
021132 104414              061225          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021134 061225              MOV      RO,R5    ;MOVE BR TO PORT 5
021136 010005              MOVB     5(R1),R4 ;PUT "EXPECTED" IN R5
021140 116104 000005      CMPB     R5,R4    ;PUT "FOUND" IN R4
021144 120504              BEQ      65$      ;DATA CORRECT?
021146 001401              EMT      6          ;BR IF YES
021150 104006              SCOP1           ;DATA ERROR
021152 104401      65$:    CLC              ;CLEAR CARRY
021154 000241              ROLB      RO      ;SHIFT BIT IN RO
021156 106100              BNE     64$      ;DONE IF RO=0
021160 001360              MOV      #67$,LOCK ;NEW SCOP1
021162 012737 021176 001220      MOV      #1,RO    ;START PATTERN WITH BITO
021170 012700 000001      COM      RO       ;CHANGE TO FLOATING ZERO
021174 005100      69$:
021176 021176      67$:    MOV      RO,4(R1)   ;WRITE PATTERN IN PORT4
021202 104414              ROMCLK           ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021204 120500              120500          ;MOVE DATA TO THE BR REGISTER
021206 104414              ROMCLK           ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021210 061225              MOV      RO,R5    ;MOVE BR TO PORT 5
021212 010005              MOVB     5(R1),R4 ;PUT "EXPECTED" IN R5
021214 116104 000005      MOV      5(R1),R4 ;PUT "FOUND" IN R4
  
```

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021220	120504			CMPB	R5,R4		;DATA CORRECT?
021222	001401			BEQ	68\$;BR IF YES
021224	104006			EMT	6		;DATA ERROR
021226	104401	68\$:		SCOP1			
021230	005100			COM	RO		;CHANGE BACK TO A ONE
021232	000241			CLC			;CLEAR CARRY
021234	106100			ROLB	RO		;SHIFT BIT IN RO
021236	001356			BNE	69\$;DONE IF RO=0
021240	104400			SCOPE			;SCOPE THIS TEST

***** TEST 52 *****
 ;*SCRATCH PAD TEST
 ;*FLOAT A 1 THROUGH EACH SCRATCH PAD LOCATION
 ;*FLOAT A 0 THROUGH EACH SCRATCH PAD LOCATION
 ;*****

; TEST 52

021242	012737	000052	001226	TST52:	MOV	#52,TSTNO	
021250	012737	021510	001216		MOV	#TST53,NEXT	
021256	012737	021274	001220		MOV	#64\$,LOCK	
021264	104412				MSTCLR		;R1 CONTAINS BASE DMC11 ADDRESS
021266	005002				CLR	R2	;MASTER CLEAR DMC11
021270	012700	000001			MOV	#1,RO	;START AT ADDRESS ZERO
021274	042737	000017	021314	64\$:	BIC	#17,65\$;START WITH BIT0
021302	050237	021314			BIS	R2,65\$;CLEAR ADDRESS FIELD OF INSTRUCTION
021306	010061	000004			MOV	RO,4(R1)	;ADD ADDRESS TO INSTRUCTION
021312	104414				ROMCLK		;WRITE PATTERN TO PORT4
021314	123100			65\$:	ROMCLK	123100	;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021316	042737	000017	021332		BIC	#17,66\$;WRITE SCRATCH PAD(ADDRESS IN R2)
021324	050237	021332			BIS	R2,66\$;CLEAR ADDRESS FIELD OF INSTRUCTION
021330	104414				ROMCLK		;ADD ADDRESS TO INSTRUCTION
021332	040600			66\$:	ROMCLK	040600	;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021334	104414				ROMCLK	061225	;MOV SP TO BR
021336	061225				MOV	RO,R5	;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021340	010005				MOV	5(R1),R4	;MOVE BR TO PORT5
021342	116104	000005			MOV	R5,R4	;PUT "EXPECTED" IN R5
021346	120504				CMPB	R5,R4	;PUT "FOUND" IN R4
021350	001401				BEQ	57\$;DATA CORRECT
021352	104007				EMT	7	;BR IF YES
021354	104401			67\$:	SCOP1		;DATA ERROR
021356	000241				CLC		;SW09=1?
021360	106100				ROLB	RO	;CLEAR CARRY
021362	001344				BNE	64\$;SHIFT BIT IN RO
021364	012737	021400	001220		MOV	#69\$,LOCK	;DONE IF RO=0
021372	012700	000001			MOV	#1,RO	;NEW SCOPE
021376	005100			73\$:	COM	RO	;START WITH BIT0
021400	042737	000017	021420	69\$:	BIC	#17,70\$;CHANGE TO FLOATING ZERO
021406	050237	021420			BIS	R2,70\$;CLEAR ADDRESS FIELD OF INSTRUCTION
021412	010061	000004			MOV	RO,4(R1)	;ADD ADDRESS TO INSTRUCTION
021416	104414				ROMCLK		;WRITE PATTERN TO PORT4
021420	123100			70\$:	ROMCLK	123100	;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021422	042737	000017	021436		BIC	#17,71\$;WRITE SCRATCH PAD(ADDRESS IN R2)
021430	050237	021436			BIS	R2,71\$;CLEAR ADDRESS FIELD OF INSTRUCTION
021434	104414				ROMCLK		;ADD ADDRESS TO INSTRUCTION
							;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304

```

021436 040600          71$: 040600          ;MOV SP TO BR
021440 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021442 061225          061225          ;MOVE BR TO PORT5
021444 010005          MOV R0,R5          ;PUT "EXPECTED" IN R5
021446 116104 000005  MOVB 5(R1),R4      ;PUT "FOUND" IN R4
021452 120504          CMPB R5,R4        ;DATA CORRECT
021454 001401          BEQ 72$          ;BR IF YES
021456 104007          EMT 7            ;DATA ERROR
021460 104401          72$: SCOP1      ;SW09=1?
021462 005100          COM R0           ;CHANGE BACK TO A ONE
021464 000241          CLC             ;CLEAR CARRY
021466 106100          ROLB R0         ;SHIFT BIT IN R0
021470 001342          BNE 73$        ;DONE IF R0=0
021472 012700 000001  MOV #1,R0        ;RESTART AT BIT 0
021476 005202          INC R2          ;NEXT SP ADDRESS
021500 022702 000020  CMP #20,R2      ;LAST ADDRESS?
021504 001273          BNE 64$        ;BR IF NO
021506 104400          SCOPE          ;SCOPE THIS TEST
  
```

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```

;***** TEST 53 *****
;SCRATCH PAD DUAL ADDRESSING TEST
;WRITE AN INCREMENTING PATTERN IN ALL SP LOCATIONS
;READ ALL SP LOCATIONS TO VERIFY CORRECT ADDRESSING
;*****
  
```

; TEST 53

```

021510 012737 000053 001226 TST53: MOV #53,TSTNO
021516 012737 021732 001216 MOV #TST54,NEXT
021524 012737 021542 001220 MOV #1$,LOCK

021532 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
021534 012700 000001  MOV #1,R0        ;MASTER CLEAR DMC11
021540 005003          CLR R3         ;START WITH A 1
021542 010302          1$: MOV R3,R2    ;ADDRESS 0
021544 042737 000017 021564  BIC #17,2$      ;MOVE ADDRESS TO R2
021552 050237 021564  BIS R2,2$       ;CLEAR ADDRESS FIELD
021556 010061 000004  MOV R0,4(R1)    ;ADD ADDRESS TO INSTRUCTION
021562 104414          ROMCLK          ;WRITE PATTERN TO PORT4
021564 123100          2$: 123100    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021566 042737 000017 021602  BIC #17,3$      ;WRITE SP(ADDRESS IN R2)
021574 050237 021602  BIS R2,3$       ;CLEAR ADDRESS FIELD OF INSTRUCTION
021600 104414          ROMCLK          ;ADD ADDRESS TO INSTRUCTION
021602 060600          3$: 60600     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021604 104414          ROMCLK          ;MOV SP TO BR
021606 061225          61225         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021610 010005          MOV R0,R5        ;MOVE BR TO PORT5
021612 116104 000005  MOVB 5(R1),R4    ;PUT "EXPECTED" IN R5
021616 120504          CMPB R5,R4        ;PUT "FOUND" IN R4
021620 001401          BEQ 4$          ;DATA CORRECT?
021622 104007          EMT 7            ;BR IF YES
021624 104401          4$: SCOP1      ;DATA ERROR
021626 005200          INC R0           ;SW09=0
021630 005203          INC R3          ;INCREMENT PATTERN
021632 022703 000020  CMP #20,R3      ;NEXT ADDRESS
021636 001341          BNE 1$          ;LAST ADDRESS DONE?
  
```

```

021640 012737 021654 001220      MOV    #5$,LOCK      ;NEW SCOPE1
021646 012700 000001      MOV    #1,R0        ;RESTART PATTERN AT 1
021652 005003      CLR    R3           ;RESTART AT ADDRESS ZERO
021654 010302      5$:  MOV    R3,R2     ;PUT ADDRESS IN R2
021656 042737 000017 021672      BIC    #17,6$      ;CLEAR ADDRESS FIELD OF INSTRUCTION
021664 050237 021672      BIS    R2,6$      ;ADD ADDRESS TO INSTRUCTION
021670 104414      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021672 060600      6$:  60600        ;MOV SP TO BR
021674 104414      ROMCLK          ;NEXT WORD JS INSTRUCTION, ROMCLK PC=5304
021676 061225      61225        ;MOV BR TO PORTS
021700 010005      MOV    R0,R5       ;PUT "EXPECTED" IN R5
021702 116104 000005      MOVB   5(R1),R4    ;PUT "FOUND" IN R4
021706 120504      CMPB   R5,R4       ;DATA CORRECT?
021710 001401      BEQ    7$         ;BR IF YES
021712 104007      EMT    7          ;SP ADDRESSING ERROR
021714 104401      7$:  SCOPE1       ;SW09=1?
021716 005200      INC    R0         ;INCREMENT PATTERN
021720 005203      INC    R3         ;NEXT ADDRESS
021722 022703 000020      CMP    #20,R3     ;LAST ADDRESS DONE?
021726 001352      BNE    5$         ;BR IF NO
021730 104400      SCOPE          ;SCOPE THIS TEST

```

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```

;***** TEST 54 *****
;*INTERRUPT TEST
;*TEST THAT DEVICE CAN INTERRUPT TO VECTOR A
;:*****

```

; TEST 54

```

021732 012737 000054 001226 TST54: MOV    #54,TSTNO
021740 012737 022026 001216      MOV    #TST55,NEXT
;R1 CONTAINS BASE DMC11 ADDRESS
021746 000005      RESET          ;BUS RESET
021750 005011      CLR    (R1)    ;CLEAR RUN
021752 004537 034642      JSR    R5,SETVEC ;SET UP VECTORS
021756 022020      3$          ;XX0
021760 022016      2$          ;XX4
021762 340 340      .BYTE 340,340  ;LEVEL 7
021764 012737 000340 177776 1$:  MOV    #340,PS  ;PS = LEVEL 7
021772 012761 000200 000004      MOV    #200,4(R1) ;WRITE PORT4
022000 104414      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022002 121111      121111        ;SET BR RQ IN IBUS* REG 11
022004 005037 177776      CLR    PS       ;ALLOW INTERRUPT
022010 000240      NOP           ;
022012 104010      EMT    10      ;NO INTERRUPT
022014 000403      BR     4$      ;
022016 104011      2$:  EMT    11      ;WRONG VECTOR
022020 012706 001200      3$:  MOV    #STACK,SP ;RESET STACK
022024 104400      4$:  SCOPE          ;SCOPE THIS TEST

```

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```

;***** TEST 55 *****
;*INTERRUPT TEST
;*TEST THAT DEVICE CAN INTERRUPT TO VECTOR B
;:*****

```

```

; TEST 55
;-----
022026 012737 000055 001226 TST55: MOV #55,TSTNO
022034 012737 022120 001216 MOV #TST56,NEXT
;R1 CONTAINS BASE DMC11 ADDRESS
022042 104412 MSTCLR ;MASTER CLEAR DMC11
022044 004537 034642 JSR R5,SETVEC ;SET UP VECTORS
022050 022110 2# ;XX0
022052 022112 3# ;XX4
022054 340 340 .BYTE 340,340 ;LEVEL 7
022056 012737 000340 177776 1#: MOV #340,PS ;PS = LEVEL 7
022064 012761 000300 000004 MOV #300,4(R1) ;WRITE PORT4
022072 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022074 121111 121111 ;SET BR RQ IN IBUS* REG 11
022076 005037 177776 CLR PS ;ALLOW INTERRUPT
022102 000240 NOP
022104 104010 EMT 10 ;NO INTERRUPT
022106 000403 BR 4#
022110 104011 2#: EMT 11 ;WRONG VECTOR
022112 012706 001200 3#: MOV #STACK,SP ;RESET STACK
022116 104400 4#: SCOPE ;SCOPE THIS TEST

```

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```

;***** TEST 56 *****
;PRIORITY INTERRUPT TESTS
;SET PS TO ALL BR LEVELS EQUAL OR GREATER THAN
;THE DMC11 LEVEL,VERIFY THAT DMC11 DOES NOT INTERRUPT
;*****

```

```

; TEST 56
;-----
022120 012737 000056 001226 TST56: MOV #56,TSTNO
022126 012737 022240 001216 MOV #TST57,NEXT
;R1 CONTAINS BASE DMC11 ADDRESS
022134 104412 MSTCLR ;MASTER CLEAR DMC11
022136 012702 000340 MOV #340,R2 ;PUT LEVEL 7 IN R2
022142 010237 177776 MOV R2,PS ;SET PRIORITY TO 7
022146 013700 001366 MOV STAT1,R0 ;GET BR LEVEL OF DMC11
022152 006200 ASR R0 ;SHIFT R0 4 TIMES
022154 006200 ASR R0 ;TO GET PROPER LEVEL
022156 006200 ASR R0
022160 006200 ASR R0
022162 042700 177437 BIC #177437,R0 ;CLEAR UNWANTED BITS
022166 004537 034642 JSR R5,SETVEC ;SET UP VECTORS
022172 022234 2# ;A VECTOR
022174 022234 2# ;B VECTOR
022176 340 340 .BYTE 340,340 ;PRIORITY 7
022200 012761 000200 000004 4#: MOV #200,4(R1) ;LOAD PORT4
022206 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022210 121111 121111 ;SET BR REQUEST
022212 010237 177776 5#: MOV R2,PS ;PUT LEVEL IN R2 IN PS
022216 000240 NOP
022220 020002 CMP R0,R2 ;IS PRESENT PS LEVEL = TO DMC LEVEL
022222 001403 BEQ 1# ;BR IF YES
022224 162702 000040 SUB #40,R2 ;NO GET NEXT LOWER LEVEL IN R2
022230 000770 BR 5# ;AND CONTINUE WITH TEST
022232 104400 1#: SCOPE ;SCOPE THIS TEST

```

022234 104020 2#: EMT 20 ;ERROR UNEXPECTED INTERRUPT
 022236 000002 RTI

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***** TEST 57 *****
 ;*PRIORITY INTERRUPT TESTS
 ;*SET PS TO ALL BR LEVELS LESS THAN THE DMC11 LEVEL
 ;*VERIFY THAT THE DMC11 WILL INTERRUPT
 ;*****

; TEST 57

```

022240 012737 000057 001226 TST57: MOV #57,TSTNO
022246 012737 022404 001216 MOV #TST60,NEXT

022254 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
022256 012702 000340 MOV #340,R2 ;MASTER CLEAR DMC11
022262 010237 177776 MOV R2,PS ;PUT LEVEL 7 IN R2
022266 013700 001366 MOV STAT1,R0 ;SET PRIORITY TO 7
022272 006200 ASR R0 ;GET BR LEVEL OF DMC11
022274 006200 ASR R0 ;SHIFT R0 4 TIMES
022276 006200 ASR R0 ;TO GET PROPER LEVEL
022300 006200 ASR R0
022302 042700 177437 BIC #177437,R0 ;CLEAR UNWANTED BITS
022306 010002 MOV R0,R2 ;PUT DMC LEVEL IN R2
022310 162702 000040 SUB #40,R2 ;GET NEXT LOWER LEVEL IN R2
022314 004537 034642 JSR R5,SETVEC ;SET UP VECTORS
022320 022366 2# ;A VECTOR
022322 022374 3# ;B VECTOR
022324 340 340 .BYTE 340,340 ;PRIORITY 7
022326 012761 000200 000004 4#: MOV #200,4(R1) ;LOAD PORT4
022334 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022336 121111 121111 ;SET BR REQUEST
022340 010237 177776 5#: MOV R2,PS ;PUT LEVEL IN R2 IN PS
022344 000240 NOP
022346 104010 EMT 10 ;ERROR, NO INTERRUPT
022350 022702 000140 6#: CMP #140,R2 ;IS IT DOWN TO LEVEL 3 YET?
022354 001403 DEQ 1# ;YES,DMC DID NOT INTERUPT, ERROR
022356 162702 000040 SUB #40,R2 ;PUT NEXT LOWER LEVEL IN R2
022362 000761 BR 4# ;CONTINUE TEST
022364 104400 1# : SCOPE
022366 012716 022350 2#: MOV #6,(SP) ;SCOPE THIS TEST
022372 000002 RTI ;SET UP FOR RTI
022374 104011 3#: EMT 11 ;ERROR, WRONG VECTOR
022376 012716 022350 MOV #6,(SP) ;SET UP FOR RTI
022402 000002 RTI
  
```

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***** TEST 60 *****
 ;*NPR TEST
 ;*TEST OF DATO, 1 WORD FROM UPROC TO 11 MEMORY
 ;*****

; TEST 60

```

022404 012737 000060 001226 TST60: MOV #60,TSTNO
022412 012737 022510 001216 MOV #TST61,NEXT
  
```

```

022420 000005          RESET          ;R1 CONTAINS BASE DMC11 ADDRESS
022422 005011          CLR          (R1)          ;BUS RESET
022424 005061 000004   CLR          4(R1)          ;CLEAR RUN
022430 004537 034664   JSR          R5,NPRSET       ;CLR PORT4
022434 000000          0          ;SET UP IBUS REG 0 7
022436 177777          1          ;IN DATA
022440 022506          3$         ;OUT DATA
022442 022504          2$         ;IN BA
022444 005037 022504   CLR          2$         ;OUT BA
022450 012761 000021 000004   MOV          @21,4(R1)       ;CLEAR 2$
022456 104414          ROMCLK         ;WRITE PORT4
022460 121110          121110      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022462 000240          NOP          ;SET NPR BITS IN IBUS* REG 11
022464 012705 177777   MOV          @-1,R5         ;PUT "EXPECTED" IN R5
022470 013704 022504   MOV          2$,R4         ;PUT "FOUND" IN R4
022474 020504          CMP          R5,R4         ;DATA CORRECT?
022476 001401          BEQ          4$         ;BR IF YES
022500 104012          EMT          12        ;ERROR NPR FAILED
022502 104400          4$:        SCOPE         ;SCOPE THIS TEST
022504 000000          2$:        0          ;OUT BA
022506 000000          3$:        0          ;IN BA
  
```

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```

;***** TEST 61 *****
; *NPR TEST
; *TEST OF DATI, 1 WORD FROM 11 MEMORY TO UPROC
; *****
  
```

; TEST 61

```

022510 012737 000061 001226 TST61: MOV          @61,TSTNO
022516 012737 022624 001216 MOV          @TST62,NEXT
022524 104412          MSTCLR         ;R1 CONTAINS BASE DMC11 ADDRESS
022526 005061 000004   CLR          4(R1)          ;MASTER CLEAR DMC11
022532 004537 034664   JSR          R5,NPRSET       ;CLR PORT4
022536 000000          0          ;SET UP IBUS REG 0 7
022540 177777          -1         ;IN DATA
022542 022622          3$         ;OUT DATA
022544 022620          2$         ;IN BA
022546 012737 177777 022622   MOV          @-1,3$        ;OUT BA
022554 012761 000001 000004   MOV          @1,4(R1)       ;PUT DATA IN 3$
022562 104414          ROMCLK         ;WRITE PORT4
022564 121110          121110      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022566 000240          NOP          ;SET NPR BITS IN IBUS* REG 11
022570 012705 177777   MOV          @-1,R5         ;PUT "EXPECTED" IN R5
022574 104414          ROMCLK         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022576 021004          021004      ;MOVE IN DATA LOW BYTE TO PORT4
022600 104414          ROMCLK         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022602 021025          021025      ;MOVE IN DATA HIGH BYTE TO PORT5
022604 016104 000004   MOV          4(R1),R4       ;PUT "FOUND" IN R4
022610 020504          CMP          R5,R4         ;DATA CORRECT?
022612 001401          BEQ          4$         ;BR IF YES
022614 104012          EMT          12        ;ERROR NPR FAILED
022616 104400          4$:        SCOPE         ;SCOPE THIS TEST
022620 000000          2$:        0          ;OUT BA
  
```


56 022622 000000 3#: 0 ;IN BA

***** TEST 62 *****
 ;*NPR TEST
 ;*TEST OF DATOB. 1 BYTE FROM UPROC TO 11 MEMORY
 ;*****

; TEST 62

```

022624 012737 000062 001226 TST62: MOV #62,TSTNO
022632 012737 022726 001216 MOV #TST63,NEXT

022640 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
022642 005061 000004 CLR 4(R1) ;MASTER CLEAR DMC11
022646 004537 034664 JSR R5,NPRSET ;CLR PORT4
022652 000000 0 ;SET UP IBUS REG 0 7
022654 177777 0 ;IN DATA
022656 022724 -1 ;OUT DATA
022660 022723 3# ;IN BA
022662 005037 022722 2#+1 ;OUT BA
022666 012761 000221 000004 CLR 2# ;CLEAR 2#
022674 104414 MOV #221,4(R1) ;WRITE PORT4
022676 121110 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022700 000240 121110 ;SET NPR BITS IN IBUS* REG 11
022702 012705 177400 NOP
022706 013704 022722 MOV #177400,R5 ;PUT "EXPECTED" IN R5
022712 020504 MOV 2#,R4 ;PUT "FOUND" IN R4
022714 001401 CMP R5,R4 ;DATA CORRECT?
022716 104012 BEQ 4# ;BR IF YES
022720 104400 EMT 12 ;ERROR NPR FAILED
022722 000000 4#: SCOPE ;SCOPE THIS TEST
022724 000000 2#: 0 ;OUT BA
3#: 0 ;IN BA
  
```

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***** TEST 63 *****
 ;*TEST OF EA BITS 16 AND 17
 ;*DO A DATO TO AN ADDRESS USING OUT BA BITS 16 AND 17
 ;*VERIFY CORRECT RESULTS
 ;*****

; TEST 63

```

022726 012737 000063 001226 TST63: MOV #63,TSTNO
022734 012737 023064 001216 MOV #TST64,NEXT

022742 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
022744 013737 001412 022772 MOV DMP04,1# ;MASTER CLEAR DMC11
022752 013737 001412 022770 MOV DMP04,2# ;USE SEL4 FOR ADDRESS
022760 004537 034664 JSR R5,NPRSET ;USE SEL4 FOR ADDRESS
022764 000000 0 ;LOAD BA AND DATA
022766 125252 125252 ;IN DATA
022770 000000 0 ;OUT DATA
022772 000000 2#: 0 ;IN BA
022774 012761 000014 000004 1#: 0 ;OUT BA
023002 104414 MOV #14,4(R1) ;LOAD SEL 4 WITH OUT BA16 AND 17
023004 121111 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
121111 ;SET OUTBA 16 AND 17
  
```

```

023006 012761 000021 000004      MOV      #21,4(R1)      ;LOAD SEL4
023014 012761 121110 000006      MOV      #121110,6(R1) ;PUT INSTRUCTION IN SEL6
023022 012711 003000              MOV      #BIT9!BIT10,(R1);SET CROMI AND CROMO!!
023026 052711 000400              BIS      #BIT8,(R1)    ;CLOCK IT!
023032 000240              NOP                      ;WAIT FOR NPR
023034 012705 121110              MOV      #121110,R5    ;PUT "EXPECTED" IN R5
023040 104414              ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023042 021044              021044                   ;MOVE OUT DATA LB TO SEL4
023044 104414              ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023046 021065              021065                   ;MOVE OUT DATA HB TO SEL5
023050 016104 000004              MOV      4(R1),R4       ;PUT "FOUND" IN R4
023054 020504              CMP      R5,R4          ;CORRECT RESULTS ?
023056 001401              BEQ      3$             ;BR IF YES
023060 104012              EMT      12             ;ERROR BA 16 AND 17 FAILED
023062 104400              3$: SCOPE                ;SCOPE THIS TEST
  
```

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```

;***** TEST 64 *****
;*TEST OF EA BITS 16 AND 17
;*DO A DATI USING IN BA BITS 16 AND 17
;*VERIFY CORRECT RESULTS
;*****
  
```

; TEST 64

```

023064 012737 000064 001226 TST64: MOV      #64,TSTNO
023072 012737 023210 001216      MOV      #TST65,NEXT

023100 104412              MSTCLR                   ;R1 CONTAINS BASE DMC11 ADDRESS
023102 013737 001412 023130      MOV      DMP04,1$       ;MASTER CLEAR DMC11
023110 013737 001412 023126      MOV      DMP04,2$       ;USE SEL4 FOR ADDRESS
023116 004537 034664              JSR      R5,NPRSET      ;USE SEL4 FOR ADDRESS
023122 000000              0                        ;LOAD BA AND DATA
023124 125252              125252                   ;IN DATA
023126 000000              0                        ;OUT DATA
023130 000000              0                        ;IN BA
023132 012761 000015 000004      MOV      #15,4(R1)      ;OUT BA
023140 012761 121110 000006      MOV      #121110,6(R1) ;LOAD SEL4
023146 012711 003000              MOV      #BIT9!BIT10,(R1);PUT INSTRUCTION IN SEL6
023152 052711 000400              BIS      #BIT8,(R1)    ;SET CROMI AND CROMO!!
023156 000240              NOP                      ;CLOCK IT!
023160 012705 121110              MOV      #121110,R5    ;WAIT FOR NPR
023164 104414              ROMCLK                   ;PUT "EXPECTED" IN R5
023166 021004              021004                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023170 104414              ROMCLK                   ;MOVE IN DATA LB TO SEL4
023172 021025              021025                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023174 016104 000004              MOV      4(R1),R4       ;MOVE IN DATA HB TO SEL5
023200 020504              CMP      R5,R4          ;PUT "FOUND" IN R4
023202 001401              BEQ      3$             ;CORRECT RESULTS ?
023204 104012              EMT      12             ;BR IF YES
023206 104400              3$: SCOPE                ;ERROR BA 16 AND 17 FAILED
                                ;SCOPE THIS TEST
  
```

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```

;***** TEST 65 *****
;*NPR NON-EXISTENT MEMORY TEST
;*DO A DATO TO A NON-EXISTENT ADDRESS
;*VERIFY THAT THE NON-EXISTENT BIT SET IN IBUS REG 11
  
```

; TEST 65

```

023210 012737 000065 001226 TST65: MOV #65,TSTNO
023216 012737 023320 001216 MOV #TST66,NEXT

023224 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
023226 004537 034664 JSR R5,NPRSET ;MASTER CLEAR DMC11
023232 000000 0 ;LOAD IBUS REGISTERS 0-7
023234 000000 0 ;IN DATA
023236 177320 0 ;OUT DATA
023240 177320 177320 ;IN BA
023242 012761 000014 000004 MOV #14,(R1) ;OUT BA
023250 104414 ROMCLK ;SET OUT BA BITS 16+17 IN PORT4
023252 121111 121111 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023254 012761 000021 000004 MOV #21,(R1) ;SET OUTBA 16 AND 17
023262 104414 ROMCLK ;SET NPR REQUEST BITS IN PORT4
023264 121110 121110 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023266 000240 NOP ;MOV IBUS* 4 TO IBUS* 10
023270 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023272 121225 121225 ROMCLK ;MOV IBUS*11 TO IBUS*5
023274 012705 000001 MOV #1,R5 ;PUT "EXPECTED" IN R5
023300 116104 000005 MOV# 5(R1),R4 ;PUT "FOUND" IN R4
023304 042704 177776 BIC #177776,R4 ;CLEAR UNWANTED BITS
023310 020504 CMP R5,R4 ;DATA CORRECT?
023312 001401 BEQ 1# ;BR IF YES
023314 104012 EMT 12 ;ERROR NON-EXISTENT MEM BIT FAILED TO SET
023316 104400 1# SCOPE ;SCOPE THIS TEST
  
```

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***** TEST 66 *****
 ;*NPR NON-EXISTENT MEMORY TEST
 ;*DO A DATI FROM A NON-EXISTENT ADDRESS
 ;*VERIFY THAT THE NON-EXISTENT BIT SET IN IBUS REG 11
 ;*****

; TEST 66

```

023320 012737 000066 001226 TST66: MOV #66,TSTNO
023326 012737 023426 001216 MOV #TST67,NEXT

023334 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
023336 004537 034664 JSR R5,NPRSET ;MASTER CLEAR DMC11
023342 000000 0 ;LOAD IBUS REGISTERS 0-7
023344 000000 0 ;IN DATA
023346 177320 0 ;OUT DATA
023350 177320 177320 ;IN BA
023352 005061 000004 CLR 4(R1) ;OUT BA
023356 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023360 121111 121111 ROMCLK ;CLEAR NON-EXISTENT BIT
023362 012761 000015 000004 MOV #15,(R1) ;SET NPR REQUEST BITS IN PORT4
023370 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023372 121110 121110 ROMCLK ;MOV IBUS* 4 TO IBUS* 10
023374 000240 NOP
023376 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023400 121225 121225 ROMCLK ;MOV IBUS*11 TO IBUS*5
  
```

```

023402 012705 000001      MOV      #1,R5      ;PUT "EXPECTED" IN R5
023406 116104 000005      MOV      5(R1),R4   ;PUT "FOUND" IN R4
023412 042704 177776      BIC      #177776,R4 ;CLEAR UNWANTED BITS
023416 020504              CMP      R5,R4      ;DATA CORRECT?
023420 001401              BEQ      1$         ;BR IF YES
023422 104012              EMT      12         ;ERROR NON-EXISTENT MEM BIT FAILED TO SET
023424 104400              SCOPE                    ;SCOPE THIS TEST
  
```

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```

;***** TEST 67 *****
;*NPR TEST
;*USING DATO, NPR A BINARY COUNT (0-377 )
;*FROM MICRO-PROCESSOR TO ALL AVAILABLE MEMORY
;*****
  
```

: TEST 67

```

023426 012737 000067 001226 TST67: MOV      #67,TSTNO
023434 012737 000003 001222      MOV      #3,ICOUNT
023442 012737 023624 001216      MOV      #TST70,NEXT
                                     ;R1 CONTAINS BASE DMC11 ADDRESS
023450 104412              MSTCLR                    ;MASTER CLEAR DMC11
023452 005037 023622      CLR      5$           ;START FLAG AT 0
023456 005000              CLR      R0           ;DATA
023460 012702 036566      MOV      #CORMAX,R2   ;ADDRESS
023464                                1$:
023464 010037 023514      MOV      R0,2$        ;LOAD DATA
023470 010237 023520      MOV      R2,4$        ;LOAD BA
023474 032702 000001      BIT      #BIT0,R2     ;IS BA ODD?
023500 001402              BEQ      .+6          ;BR IF NO
023502 000337 023514      SWAB     2$          ;IF ODD PUT DATA IN HI-BYTE
023506 004537 034664      JSR      R5,NPRSET   ;LOAD NPR REGISTERS
023512 000000              0           ;IN DATA
023514 000000              2$: 0           ;OUT DATA
023516 000000              0           ;IN BA
023520 000000              4$: 0           ;OUT BA
023522 105012              CLR      (R2)         ;CLEAR MEMORY LOCATION
023524 012761 000221 000004      MOV      #221,4(R1)  ;LOAD PORT4
023532 104414              ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023534 121110              121110              ;DO THE NPR
023536 000240              NOP
023540 010005              MOV      R0,R5       ;PUT "EXPECTED" IN R5
023542 111204              MOV      (R2),R4     ;PUT "FOUND" IN R4
023544 120504              CMP      R5,R4       ;IS DATA CORRECT?
023546 001401              BEQ      3$          ;BR IF YES
023550 104021              EMT      21         ;ERROR, DATA INCORRECT
023552 104401              3$: SCOP1
023554 005200              INC      R0           ;NEXT CHARACTER
023556 042700 177400      BIC      #177400,R0  ;USE ONLY LOW BYTE
023562 005737 023622      TST      5$          ;HAS MAX MEMORY BEEN REACHED YET?
023566 001402              BEQ      6$          ;BR IF NO
023570 005700              TST      R0           ;DONE PATTERN?
023572 001412              BEQ      7$          ;BR IF YES
023574 005202              6$: INC      R2           ;INC BA
023576 023702 001304      CMP      MEMLIM,R2   ;REACHED MEMORY LIMIT YET?
023602 001330              BNE      1$          ;BR IF NOT
023604 012702 036566      MOV      #CORMAX,R2 ;RESTART BA AT FIRST ADDRESS
  
```

```

023610 012737 177777 023622      MOV    #-1.5#      ;SET FLAG TO END TEST AT END OF DATA PATTERN
023616 000722                      BR 1#             ;CONTINUE
023620 104400                      7#:            SCOPE  ;SCOPE THIS TEST
023622 000000                      5#:            0        ;THIS LOCATION IS A FLAG, IT STARTS AT 0,
                                ;AND IS SET TO -1 WHEN LAST MEMORY ADDRESS
                                ;IS USED, TEST IS THEN ENDED WHEN PATTERN IS FINISHED
  
```

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```

;***** TEST 70 *****
;MAIN MEMORY TEST
;FLOAT A 1 THROUGH ALL MAIN MEMORY LOCATIONS
;*****
  
```

```

; TEST 70
;-----
023624 012737 000070 001226 TST70: MOV    #70,TSTNO
023632 012737 023752 001216      MOV    #TST71,NEXT
023640 012737 023656 001220      MOV    #65#,LOCK

023646 104412                      MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
023650 005002                      CLR    R2       ;MASTER CLEAR DMC11
023652 012700                      MOV    #1,R0    ;START WITH ADDRESS 0
023656 042737 000377 023672 65# : BIC    #377,66# ;START WITH BIT 0
                                ;CLEAR ADDRESS FIELD OF INSTRUCTION
023664 050237 023672                      BIS    R2,66#  ;ADD ADDRESS TO INSTRUCTION
023670 104414                      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023672 010000                      MOV    R0,4(R1) ;LOAD MAR WITH ADDRESS IN R2
023674 010061 000004                      MOV    R0,4(R1) ;WRITE PATTERN IN PORT4
023700 104414                      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023702 122500                      122500         ;MOVE PORT4 TO MEMORY
023704 104414                      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023706 040620                      040620         ;MOVE MEMORY TO BR
023710 104414                      ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023712 061225                      61225          ;MOVE BR TO PORT5
023714 010005                      MOV    R0,R5    ;PUT "EXPECTED" IN R5
023716 116104 000005                      MOV    5(R1),R4 ;PUT "FOUND" IN R4
023722 120504                      CMPB   R5,R4    ;DATA CORRECT?
023724 001401                      BEQ    67#      ;BR IF YES
023726 104013                      EMT    13       ;DATA ERROR
023730 104401                      67# : SCOP1     ;SW09=1?
023732 000241                      CLC                    ;CLEAR CARRY
023734 106100                      ROLB   R0       ;SHIFT BIT IN R0
023736 001347                      BNE   65#       ;DONE IF R0=0
023740 005202                      INC    R2       ;NEXT ADDRESS
023742 022702 000400                      CMP    #400,R2  ;LAST ADDRESS
023746 001341                      BNE   1#        ;BR IF NO
023750 104400                      SCOPE          ;SCOPE THIS TEST
  
```

66

```

;***** TEST 71 *****
;MAIN MEMORY TEST
;FLOAT A 0 THROUGH ALL MAIN MEMORY LOCATIONS
;*****
  
```

```

; TEST 71
;-----
023752 012737 000071 001226 TST71: MOV    #71,TSTNO
023760 012737 024104 001216      MOV    #TST72,NEXT
  
```

```

023766 012737 024006 001220      MOV      #65$,LOCK
023774 104412                      MSTCLR
023776 005002                      CLR      R2
024000 012700 000001              1$:     MOV      #1,R0
024004 005100                      64$:     COM      R0
024006 042737 000377 024022      65$:     BIC      #377,66$
024014 050237 024022              BIS      R2,66$
024020 104414                      ROMCLK
024022 010000                      66$:     010000
024024 010061 000004              MOV      R0,4(R1)
024030 104414                      ROMCLK
024032 122500                      122500
024034 104414                      ROMCLK
024036 040620                      040620
024040 104414                      ROMCLK
024042 061225                      61225
024044 010005                      MOV      R0,R5
024046 116104 000005              MOVB    5(R1),R4
024052 120504                      CMPB    R5,R4
024054 001401                      BEQ     67$
024056 104013                      EMT     13
024060 104401                      67$:     SCOP1
024062 005100                      COM      R0
024064 000241                      CLC
024066 106100                      ROLB    R0
024070 001345                      BNE     64$
024072 005202                      INC     R2
024074 022702 000400              CMP     #400,R2
024100 001337                      BNE     1$
024102 104400                      SCOPE

```

```

;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11
;START WITH ADDRESS 0
;START WITH BIT 0
;CHANGE TO FLOATING 0
;CLEAR ADDRESS FIELD OF INSTRUCTION
;ADD ADDRESS TO INSTRUCTION
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;LOAD MAR WITH ADDRESS IN R2
;WRITE PATTERN IN PORT4
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;MOVE PORT4 TO MEMORY
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;MOVE MEMORY TO BR
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;MOVE BR TO PORT5
;PUT "EXPECTED" IN R5
;PUT "FOUND" IN R4
;DATA CORRECT?
;BR IF YES
;DATA ERROR
;SW09=1?
;CHANGE TO FLOATING 1
;CLEAR CARRY
;SHIFT BIT IN R0
;DONE IF R0=0
;NEXT ADDRESS
;LAST ADDRESS
;BR IF NO
;SCOPE THIS TEST

```

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```

;***** TEST 72 *****
;MAIN MEMORY DUAL ADDRESSING TEST
;LOAD EACH MEMORY LOCATION WITH ITS OWN ADDRESS
;READ BACK EACH LOCATION TO VERIFY CORRECT ADDRESSING
;*****

```

; TEST 72

```

024104 012737 000072 001226 TST72: MOV      #72,TSTNO
024112 012737 024304 001216      MOV      #TST73,NEXT
024120 012737 024132 001220      MOV      #1$,LOCK
024126 104412                      MSTCLR
024130 005002                      CLR      R2
024132 042737 000377 024146      1$:     BIC      #377,2$
024140 050237 024146              BIS      R2,2$
024144 104414                      ROMCLK
024146 010000                      2$:     010000
024150 010261 000004              MOV      R2,4(R1)
024154 104414                      ROMCLK
024156 122500                      122500
024160 104414                      ROMCLK
024162 040620                      040620
024164 104414                      ROMCLK

```

```

;R1 CONTAINS BASE DMC11 ADDRESS
;MASTER CLEAR DMC11
;START AT ADDRESS 0
;CLEAR ADDRESS FIELD OF INSTRUCTION
;ADD ADDRESS TO INSTRUCTION
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;LOAD MAR
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;MOVE PORT4 TO MEMORY
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
;MOVE MEMORY TO THE BR
;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304

```



```

024364 005002 CLR R2 ;RESTART WITH A ZERO
024366 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024370 010000 010000 ;LOAD MAR
024372 032737 100000 001366 BIT #BIT15,STAT1 ;DMC?
024400 001402 BEQ .+6 ;BR IF YES
024402 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024404 004000 4000 ;MAR HI _ 0 (KMC ONLY)
024406 2$: ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024406 104414 055224 ;MOVE MEM TO PORT4
024410 055224 MOV R2,R5 ;PUT "EXPECTED" IN R5
024412 010205 MOV 4(R1),R4 ;PUT "FOUND" IN R4
024414 016104 000004 CMPB R5,R4 ;DATA CORRECT?
024420 120504 BEQ 3$ ;BR IF YES
024422 001401 EMT 14 ;MAR ERROR
024424 104014 3$: INC R2 ;NEXT ADDRESS
024426 005202 CMP #400,R2 ;DONE YET?
024430 022702 000400 BNE 2$ ;BR IF NO
024434 001364 SCOPE ;SCOPE THIS TEST
024436 104400

```

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```

;***** TEST 74 *****
;*ALU C BIT TEST
;*TEST THAT AN ADD OF 377 AND 377 WILL SET THE C BIT
;:*****

```

; TEST 74

```

024440 012737 000074 001226 TST74: MOV #74,TSTNO
024446 012737 024552 001216 MOV #TST75,NEXT
024454 012737 024500 001220 MOV #1$,LOCK

024462 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
024464 004737 034726 JSR PC,MEMLD ;MASTER CLEAR DMC11
024470 024542 TDATA ;LOAD MAINMEM DATA
024472 004737 034762 JSR PC,SPLD ;POINTER TO DATA
024476 024542 TDATA ;LOAD SP DATA
024500 1$: TDATA ;POINTER TO DATA
024500 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024502 010000 010000 ;MAR_0
024504 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024506 054400 054400!<0*20> ;ADD 377 AND 377, TO SET C BIT
024510 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024512 040421 040401!<1*20> ;ADD 0 AND 0 AND THE C BIT
024514 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024516 061224 61224 ;PUT RESULTS IN PORT4
024520 012705 000001 MOV #1,R5 ;PUT "EXPECTED" IN R5
024524 016104 000004 MOV 4(R1),R4 ;PUT "FOUND" IN R4
024530 120504 CMPB R5,R4 ;DATA CORRECT?
024532 001401 9CQ 2$ ;BR IF YES
024534 104015 EMT 15 ;ERROR C BIT NOT SET
024536 104401 2$: SCOPE1 ;SW09=1?
024540 104400 SCOPE ;SCOPE THIS TEST
024542 377 000 000 TDATA: .BYTE -1.0.0.0.0.0.0.0
024545 000 000 000
024550 000 000

```

.EVEN

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```

***** TEST 75 *****
;*ALU TEST
;*TEST OF ALU FUNCTION SEL B WITH C BIT CLEARED
;*ALU FUNCTION (B) CODE=11
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
:*****
  
```

; TEST 75

```

024552 012737 000075 001226 TST75: MOV #75,TSTNO
024560 012737 024726 001216 MOV #TST76,NEXT
024566 012737 024620 001220 MOV #1$,LOCK

024574 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
024576 005000 CLR RO ;MASTER CLEAR DMC11
024600 012702 024716 MOV #5$,R2 ;MEM + SP ADDRESS
024604 004737 034726 JSR PC,MEMLD ;POINTER TO CORRECT DATA
024610 035052 MEMDAT ;LOAD 8 WORDS OF MAIN MEMORY
024612 004737 034762 JSR PC,SPLD ;POINTER TO DATA
024616 035062 SPDAT ;LOAD 8 WORDS OF SP
024620 004737 035026 1$: JSR PC,CLRC ;POINTER TO DATA
024624 042737 000017 024640 BIC #17,2$ ;CLEAR C BIT!
024632 050037 024640 BIS RO,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
024636 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
024640 010000 2$: 010000 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024642 042737 000017 024656 BIC #17,3$ ;LOAD MAR
024650 050037 024656 BIS RO,3$ ;CLEAR ADDRESS OF INSTRUCTION
024654 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
024656 040620 3$: 040400!<11*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024660 104414 ROMCLK ;BR SEL B
024662 061224 61224 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024664 111205 MOVB (R2),R5 ;MOVE BR TO PORT4
024666 116104 000004 MOVB 4(R1),R4 ;PUT "EXPECTED" IN R5
024672 120504 CMPB R5,R4 ;PUT "FOUND" IN R4
024674 001401 BEQ 4$ ;DATA CORRECT?
024676 104015 EMT 15 ;BR IF YES
024700 104401 4$: SCOP1 ;ALU ERROR
024702 005202 INC R2 ;SW09=1?
024704 005200 INC RO ;NEXT DATA
024706 022700 000010 CMP #10,RO ;NEXT ADDRESS
024712 001342 BNE 1$ ;DONE YET?
024714 104400 SCOPE 1$ ;BR IF NO
024716 000 377 000 5$: .BYTE 0,-1,0,-1,125,252,125,252
024721 377 125 252
024724 125 252

.EVEN
  
```

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```

***** TEST 76 *****
;*ALU TEST
;*TEST OF ALU FUNCTION SEL A WITH C BIT CLEARED
;*ALU FUNCTION (A) CODE=10
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
  
```

; TEST 76

```

024726 012737 000076 001226 TST76: MOV    #76,TSTNO
024734 012737 025102 001216 MOV    #TST77,NEXT
024742 012737 024774 001220 MOV    #1$,LOCK

024750 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
024752 005000 CLR    R0 ;MASTER CLEAR DMC11
024754 012702 025072 MOV    #5$,R2 ;MEM + SP ADDRESS
024760 004737 034726 JSR    PC,MEMLD ;POINTER TO CORRECT DATA
024764 035052 MEMDAT ;LOAD 8 WORDS OF MAIN MEMORY
024766 004737 034762 JSR    PC,SPLD ;POINTER TO DATA
024772 035062 SPDAT ;LOAD 8 WORDS OF SP
024774 004737 035026 1$: JSR    PC,CLRC ;POINTER TO DATA
025000 042737 000017 025014 BIC    #17,2$ ;CLEAR C BIT!
025006 050037 025014 BIS    R0,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
025012 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
025014 010000 010000 2$: ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025016 042737 000017 025032 BIC    #17,3$ ;LOAD MAR
025024 050037 025032 BIS    R0,3$ ;CLEAR ADDRESS OF INSTRUCTION
025030 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
025032 040600 040600 3$: ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025034 104414 ROMCLK ;BR SEL A
025036 061224 61224 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025040 111205 MOVB   (R2),R5 ;MOVE BR TO PORT4
025042 116104 000004 MOVB   4(R1),R4 ;PUT "EXPECTED" IN R5
025046 120504 CMPB   R5,R4 ;PUT "FOUND" IN R4
025050 001401 BEQ    4$ ;DATA CORRECT?
025052 104015 EMT    15 ;BR IF YES
025054 104401 4$: SCOP1 ;ALU ERROR
025056 005202 INC    R2 ;SW09=1?
025060 005200 INC    R0 ;NEXT DATA
025062 022700 000010 CMP    #10,R0 ;NEXT ADDRESS
025066 001342 BNE    1$ ;DONE YET?
025070 104400 SCOPE 1$ ;BR IF NO
025072 000 000 377 5$: .BYTE 0,0,-1,-1,125,125,252,252 ;SCOPE THIS TEST
025075 377 125 125
025100 252 252

.EVEN
  
```

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***** TEST 77 *****
 ;*ALU TEST
 ;*TEST OF ALU FUNCTION A OR NOTB WITH C BIT CLEARED
 ;*ALU FUNCTION (A OR NOTB) CODE=12
 ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;*****

; TEST 77

```

025102 012737 000077 001226 TST77: MOV    #77,TSTNO
025110 012737 025256 001216 MOV    #TST100,NEXT
025116 012737 025150 001220 MOV    #1$,LOCK

;R1 CONTAINS BASE DMC11 ADDRESS
  
```

025124	104412			MSTCLR		;MASTER CLEAR DMC11
025126	005000			CLR	R0	;MEM + SP ADDRESS
025130	012702	025246		MOV	#5,R2	;POINTER TO CORRECT DATA
025134	004737	034726		JSR	PC,MEMLD	;LOAD 8 WORDS OF MAIN MEMORY
025140	035052			MEMDAT		;POINTER TO DATA
025142	004737	034762		JSR	PC,SPLD	;LOAD 8 WORDS OF SP
025146	035062			SPDAT		;POINTER TO DATA
025150	004737	035026	025170	1#:	JSR	PC,CLRC
025154	042737	000017		BIC	#17,2#	;CLEAR C BIT!
025162	050037	025170		BIS	R0,2#	;CLEAR ADDRESS FIELD OF INSTRUCTION
025166	104414			ROMCLK		;ADD ADDRESS TO INSTRUCTION
025170	010000			010000		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025172	042737	000017	025206	2#:	BIC	#17,3#
025200	050037	025206		BIS	R0,3#	;LOAD MAR
025204	104414			ROMCLK		;CLEAR ADDRESS OF INSTRUCTION
025206	040640			040400!<12*20>		;ADD ADDRESS TO INSTRUCTION
025210	104414			ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025212	061224			61224		;BR A OR NOTB
025214	111205			MOVB	(R2),R5	;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025216	116104	000004		MOVB	4(R1),R4	;MOVE BR TO PORT4
025222	120504			CMPB	R5,R4	;PUT "EXPECTED" IN R5
025224	001401			BEQ	4#	;PUT "FOUND" IN R4
025226	104015			EHT	15	;DATA CORRECT?
025230	104401			4#:	SCOPE	;BR IF YES
025232	005202			INC	R2	;ALU ERROR
025234	005200			INC	R0	;SW09=1?
025236	022700	000010		CMP	#10,R0	;NEXT DATA
025242	001342			BNE	1#	;NEXT ADDRESS
025244	104400			SCOPE		;DONE YET?
025246	377	000	377	5#:	.BYTE	;BR IF NO
025251	377	377	125			;SCOPE THIS TEST
025254	252	377				-1,0,-1,-1,-1,125,252,-1

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```

;***** TEST 100 *****
;ALU TEST
;TFST OF ALU FUNCTION A AND B WITH C BIT CLEARED
;ALU FUNCTION (A AND B) CODE=13
;LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****

```

; TEST 100

025256	012737	000100	001226	TST100:	MOV	#100,TSTNO	
025264	012737	025432	001216		MOV	#TST101,NEXT	
025272	012737	025324	001220		MOV	#1#,LOCK	
025300	104412						;R1 CONTAINS BASE DMC11 ADDRESS
025302	005000			MSTCLR			;MASTER CLEAR DMC11
025304	012702	025422		CLR	R0		;MEM + SP ADDRESS
025310	004737	034726		MOV	#5#,R2		;POINTER TO CORRECT DATA
025314	035052			JSR	PC,MEMLD		;LOAD 8 WORDS OF MAIN MEMORY
025316	004737	034762		MEMDAT			;POINTER TO DATA
025322	035062			JSR	PC,SPLD		;LOAD 8 WORDS OF SP
025324	004737	035026	1#:	SPDAT			;POINTER TO DATA
				JSR	PC,CLRC		;CLEAR C BIT!


```

025540 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025542 061224 61224 ;MOVE BR TO PORT4
025544 111205 MOVB (R2),R5 ;PUT "EXPECTED" IN R5
025546 116104 000004 MOVB 4(R1),R4 ;PUT "FOUND" IN R4
025552 120504 CMPB R5,R4 ;DATA CORRECT?
025554 001401 BEQ 4$ ;BR IF YES
025556 104015 EMT 15 ;ALU ERROR
025560 104401 4$: SCOP1 ;SW09=1?
025562 005202 INC R2 ;NEXT DATA
025564 005200 INC R0 ;NEXT ADDRESS
025566 022700 000010 CMP #10,R0 ;DONE YET?
025572 001342 BNE 1$ ;BR IF NO
025574 104400 SCOPE ;SCOPE THIS TEST
025576 000 377 377 5$: .BYTE 0, 1,-1,-1,125,-1, 1,252
025601 377 125 377
025604 377 252

```

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.EVEN

```

;***** TEST 102 *****
;*ALU TEST
;*TEST OF ALU FUNCTION A XOR B WITH C BIT CLEARED
;*ALU FUNCTION (A XOR B) CODE=15
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;:*****

```

; TEST 102

```

025606 012737 000102 001226 TST102: MOV #102,TSTNO
025614 012737 025762 001216 MOV #TST103,NEXT
025622 012737 025654 001220 MOV #1$,LOCK

025630 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
025632 005000 CLR R0 ;MASTER CLEAR DMC11
025634 012702 025752 CLR R0 ;MEM + SP ADDRESS
025640 004737 034726 MOV #5$,R2 ;POINTER TO CORRECT DATA
025644 035052 JSR PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY
025646 004737 034762 MEMDAT ;POINTER TO DATA
025652 035062 JSR PC,SPLD ;LOAD 8 WORDS OF SP
025654 004737 035026 SPDAT ;POINTER TO DATA
025660 042737 000017 025674 1$: JSR PC,CLRC ;CLEAR C BIT!
025666 050037 025674 BIC #17,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
025672 104414 BIS R0,2$ ;ADD ADDRESS TO INSTRUCTION
025674 010000 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025676 042737 000017 025712 2$: BIC #17,3$ ;LOAD MAR
025704 050037 025712 BIS R0,3$ ;CLEAR ADDRESS OF INSTRUCTION
025710 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
025712 040720 3$: ROMCLK 040400!<15*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025714 104414 ROMCLK ;BR A XOR B
025716 061224 61224 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025720 111205 MOVB (R2),R5 ;MOVE BR TO PORT4
025722 116104 000004 MOVB 4(R1),R4 ;PUT "EXPECTED" IN R5
025726 120504 CMPB R5,R4 ;PUT "FOUND" IN R4
025730 001401 BEQ 4$ ;DATA CORRECT?
025732 104015 EMT 15 ;BR IF YES
025734 104401 4$: SCOP1 ;ALU ERROR
;SW09=1?

```

```

025736 005202      INC      R2      ;NEXT DATA
025740 005200      INC      R0      ;NEXT ADDRESS
025742 022700      CMP      #10,R0  ;DONE YET?
025746 001342      BNE     1$      ;BR IF NO
025750 104400      SCOPE   ;SCOPE THIS TEST
025752      000      377      377      5$: .BYTE 0, 1,-1.0.0, 1,-1.0
025755      000      000      377
025760      377      000
  
```

.EVEN

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```

;***** TEST 103 *****
;*ALU TEST
;*TEST OF ALU FUNCTION ADD WITH C BIT CLEARED
;*ALU FUNCTION (A PLUS B) CODE=00
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****
  
```

; TEST 103

```

025762 012737 000103 001226 TST103: MOV      #103,TSTND
025770 012737 026136 001216 MOV      #TST104,NEXT
025776 012737 026030 001220 MOV      #1$,LOCK

                                ;R1 CONTAINS BASE DMC11 ADDRESS
026004 104412      MSTCLR  ;MASTER CLEAR DMC11
026006 005000      CLR     R0      ;MEM + SP ADDRESS
026010 012702 026126  MOV     #5$,R2  ;POINTER TO CORRECT DATA
026014 004737 034726  JSR    PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY
026020 035052      MEMDAT  ;POINTER TO DATA
026022 004737 034762  JSR    PC,SPLD  ;LOAD 8 WORDS OF SP
026026 035062      SPDAT  ;POINTER TO DATA
026030 004737 035026  1$: JSR    PC,CLRC  -CLEAR C BIT!
026034 042737 000017 026050  BIC    #17,2$   ;CLEAR ADDRESS FIELD OF INSTRUCTION
026042 050037 026050  BIS    R0,2$   ;ADD ADDRESS TO INSTRUCTION
026046 104414      ROMCLK  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026050 010000      010000  2$: ;LOAD MAR
026052 042737 000017 026066  BIC    #17,3$   ;CLEAR ADDRESS OF INSTRUCT 1
026060 050037 026066  BIS    R0,3$   ;ADD ADDRESS TO INSTRUCTIC
026064 104414      ROMCLK  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026066 040400      040400  3$: ;BR ADD
026070 104414      ROMCLK  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026072 061224      61224  ;MOVE BR TO PORT4
026074 111205      MOVB   (R2),R5  ;PUT "EXPECTED" IN R5
026076 116104 000004  MOVB   4(R1),R4 ;PUT "FOUND" IN R4
026102 120504      CMPB   R5,R4    ;DATA CORRECT?
026104 001401      BEQ    4$      ;BR IF YES
026106 104015      EMT    15     ;ALU ERROR
026110 104401      4$: SCOP1  ;SW09=1?
026112 005202      INC     R2      ;NEXT DATA
026114 005200      INC     R0      ;NEXT ADDRESS
026116 022700 000010  CMP     #10,R0  ;DONE YET?
026122 001342      BNE    1$      ;BR IF NO
026124 104400      SCOPE  ;SCOPE THIS TEST
026126      000      377      377      5$: .BYTE 0, -1, -1, 376, 252, -1, -1, 124
026131      376      252      377
026134      377      124
  
```

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.EVEN

```
***** TEST 104 *****
;*ALU TEST
;*TEST OF ALU FUNCTION 2A W/C WITH C BIT CLEARED
;*ALU FUNCTION (A PLUS A PLUS C) CODE=6
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
:*****
```

; TEST 104

```
026136 012737 000104 001226 TST104: MOV #104,TSTNO
026144 012737 026312 001216 MOV #TST105,NEXT
026152 012737 026204 001220 MOV #1$,LOCK

026160 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
026162 005000 CLR R0 ;MASTER CLEAR DMC11
026164 012702 026302 MOV #5$,R2 ;MEM + SP ADDRESS
026170 004737 034726 JSR PC,MEMLD ;POINTER TO CORRECT DATA
026174 035052 MEMDAT ;LOAD 8 WORDS OF MAIN MEMORY
026176 004737 034762 JSR PC,SPLD ;POINTER TO DATA
026202 035062 SPDAT ;LOAD 8 WORDS OF SP
026204 004737 035026 1$: JSR PC,CLRC ;POINTER TO DATA
026210 042737 000017 026224 BIC #17,2$ ;CLEAR C BIT!
026216 050037 026224 BIS R0,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
026222 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026224 010000 010000 2$: ;LOAD MAR
026226 042737 000017 026242 BIC #17,3$ ;CLEAR ADDRESS OF INSTRUCTION
026234 050037 026242 BIS R0,3$ ;ADD ADDRESS TO INSTRUCTION
026240 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026242 040540 3$: 040400!<6*20> ;BR 2A W/C
026244 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, RL CLK PC=5304
026246 061224 61224 ;MOVE BR TO PORT4
026250 111205 MOVB (R2),R5 ;PUT "EXPECTED" IN R5
026252 116104 000004 MOVB 4(R1),R4 ;PUT "FOUND" IN R4
026256 120504 CMPB R5,R4 ;DATA CORRECT?
026260 001401 BEQ 4$ ;BR IF YES
026262 104015 EMT 15 ;ALU ERROR
026264 104401 4$: SCOP1 ;SW09=1?
026266 005202 INC R2 ;NEXT DATA
026270 005200 INC R0 ;NEXT ADDRESS
026272 022700 000010 CMP #10,R0 ;DONE YET?
026276 001342 BNE 1$ ;BR IF NO
026300 104400 SCOPE ;SCOPE THIS TEST
026302 000 000 376 5$: .BYTE 0,0,376,376,252,252,124,124
026305 376 252 252
026310 124 124
```

.EVEN

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```
***** TEST 105 *****
;*ALU TEST
;*TEST OF ALU FUNCTION SUB WITH C BIT CLEARED
;*ALU FUNCTION (A-B) CODE=16
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
```

;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;:*****

; TEST 105

```

026312 012737 000105 001226 TST105: MOV    #105,TSTNO
026320 012737 026466 001216 MOV    #TST106,NEXT
026326 012737 026360 001220 MOV    #1$,LOCK

026334 104412 MSTCLR                ;R1 CONTAINS BASE DMC11 ADDRESS
026336 005000 CLR    R0              ;MASTER CLEAR DMC11
026340 012702 026456 MOV    #5$,R2          ;MEM + SP ADDRESS
026344 004737 034726 JSR    PC,MEMLD        ;POINTER TO CORRECT DATA
026350 035052 MEMDAT                ;LOAD 8 WORDS OF MAIN MEMORY
026352 004737 034762 JSR    PC,SPLD         ;POINTER TO DATA
026356 035062 SPDAT                ;LOAD 8 WORDS OF SP
026360 004737 035026 1$: JSR    PC,CLRC        ;POINTER TO DATA
026364 042737 000017 026400 BIC    #17,2$         ;CLEAR C BIT!
026372 050037 026400 BIS    R0,2$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
026376 104414 ROMCLK                ;ADD ADDRESS TO INSTRUCTION
026400 010000 010000 2$: ROMCLK    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026402 042737 000017 026416 BIC    #17,3$         ;LOAD MAR
026410 050037 026416 BIS    R0,3$         ;CLEAR ADDRESS OF INSTRUCTION
026414 104414 ROMCLK                ;ADD ADDRESS TO INSTRUCTION
026416 040740 040400!<16*20> 3$: ROMCLK    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026420 104414 ROMCLK                ;BR SUB
026422 061224 61224 ROMCLK                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026424 111205 MOVB   (R2),R5         ;MOVE BR TO PORT4
026426 116104 000004 MOVB   4(R1),R4        ;PUT "EXPECTED" IN R5
026432 120504 CMPB   R5,R4           ;PUT "FOUND" IN R4
026434 001401 BEQ    4$              ;DATA CORRECT?
026436 104015 EMT    15             ;BR IF YES
026440 104401 4$: SCOP1                ;ALU ERROR
026442 005202 INC    R2              ;SW09=1?
026444 005200 INC    R0              ;NEXT DATA
026446 022700 000010 CMP    #10,R0         ;NEXT ADDRESS
026452 001342 BNE    1$              ;DONE YET?
026454 104400 SCOPE                ;BR IF NO
026456 000 001 377 5$: .BYTE 0,1,-1,0,0,253,125,0 ;SCOPE THIS TEST
026461 000 000 253
026464 125 000
    
```

.EVEN

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***** TEST 106 *****
 ;*ALU TEST
 ;*TEST OF ALU FUNCTION ADD W/C WITH C BIT CLEARED
 ;*ALU FUNCTION (A PLUS B PLUS C) CODE=01
 ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;:*****

; TEST 106

```

026466 012737 000106 001226 TST106: MOV    #106,TSTNO
026474 012737 026642 001216 MOV    #TST107,NEXT
026502 012737 026534 001220 MOV    #1$,LOCK
    
```



```

026710 004737 035026      1$: JSR   PC,CLRC      ;CLEAR C BIT!
026714 042737 000017 026730 BIC   #17,2$      ;CLEAR ADDRESS FIELD OF INSTRUCTION
026722 050037 026730      BIC   RO,2$      ;ADD ADDRESS TO INSTRUCTION
026726 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026730 010000      2$: O10000      ;LOAD MAR
026732 042737 000017 026746 BIC   #17,3$      ;CLEAR ADDRESS OF INSTRUCTION
026740 050037 026746      BIC   RO,3$      ;ADD ADDRESS TO INSTRUCTION
026744 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026746 040440      3$: 040400!<2*20> ;BR - SUB W/C
026750 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026752 061224      61224      ;MOVE BR TO PORT4
026754 111205      MOVB   (R2),R5    ;PUT "EXPECTED" IN R5
026756 116104 000004      MOVB   4(R1),R4  ;PUT "FOUND" IN R4
026762 120504      CMPB   R5,R4     ;DATA CORRECT?
026764 001401      BEQ   4$         ;BR IF YES
026766 104015      EMT   15        ;ALU ERROR
026770 104401      4$: SCOP1      ;SW09=1?
026772 005202      INC   R2        ;NEXT DATA
026774 005200      INC   RO        ;NEXT ADDRESS
026776 022700 000010      CMP   #10,RO    ;DONE YET?
027002 001342      BNE   1$        ;BR IF NO
027004 104400      SCOPE      ;SCOPE THIS TEST
027006      377      000      376 5$: .BYTE  -1,0.376,-1,-1,252,124,-1
027011      377      377      252
027014      124      377

```

.EVEN

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```

;***** TEST 110 *****
;*ALU TEST
;*TEST OF ALU FUNCTION INC A WITH C BIT CLEARED
;*ALU FUNCTION (A PLUS 1) CODE=3
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****

```

; TEST 110

```

027016 012737 000110 001226 TST110: MOV   #110,TSTNO
027024 012737 027172 001216      MOV   #TST111,NEXT
027032 012737 027064 001220      MOV   #1$,LOCK

027040 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
027042 005000      CLR   RO      ;MASTER CLEAR DMC11
027044 012702 027162      MOV   #5$,R2  ;MEM + SP ADDRESS
027050 004737 034726      JSR   PC,MEMLD ;POINTER TO CORRECT DATA
027054 035052      MEMDAT      ;LOAD 8 WORDS OF MAIN MEMORY
027056 004737 034762      JSR   PC,SPLD ;POINTER TO DATA
027062 035062      SPDAT      ;LOAD 8 WORDS OF SP
027064 004737 035026      1$: JSR   PC,CLRC  ;POINTER TO DATA
027070 042737 000017 027104 BIC   #17,2$    ;CLEAR C BIT!
027076 050037 027104      BIC   RO,2$    ;CLEAR ADDRESS FIELD OF INSTRUCTION
027102 104414      ROMCLK      ;ADD ADDRESS TO INSTRUCTION
027104 010000      2$: O10000      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027106 042737 000017 027122 BIC   #17,3$    ;LOAD MAR
027114 050037 027122      BIC   RO,3$    ;CLEAR ADDRESS OF INSTRUCTION
027120 104414      ROMCLK      ;ADD ADDRESS TO INSTRUCTION
                                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304

```

```

027122 040460      3$: 040400!<3*20>      ;BR _ INC A
027124 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027126 061224      61224      ;MOVE BR TO PORT4
027130 111205      MOVB      (R2),R5      ;PUT "EXPECTED" IN R5
027132 116104 000004 MOVB      4(R1),R4      ;PUT "FOUND" IN R4
027136 120504      CMPB      R5,R4      ;DATA CORRECT?
027140 001401      BEQ      4$      ;BR IF YES
027142 104015      EMT      15      ;ALU ERROR
027144 104401      4$: SCOP1      ;SW09=1?
027146 005202      INC      R2      ;NEXT DATA
027150 005200      INC      R0      ;NEXT ADDRESS
027152 022700 000010 CMP      #10,R0      ;DONE YET?
027156 001342      BNE      1$      ;BR IF NO
027160 104400      SCOPE      ;SCOPE THIS TEST
027162 001 001 000 5$: .BYTE 1,1,0,0,126,126,253,253
027165 000 126 126
027170 253 253

.EVEN
  
```

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```

;***** TEST 111 *****
;*ALU TEST
;*TEST OF ALU FUNCTION 2A WITH C BIT CLEARED
;*ALU FUNCTION (A PLUS A) CODE=5
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;:*****
  
```

; TEST 111

```

027172 012737 000111 001226 TST111: MOV      #111,TSTNO
027200 012737 027346 001216      MOV      #TST112,NEXT
027206 012737 027240 001220      MOV      #1$,LOCK

027214 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
027216 005000      CLR      R0      ;MASTER CLEAR DMC11
027220 012702 027336      MOV      #5$,R2      ;MEM + SP ADDRESS
027224 004737 034726      JSR      PC,MEMLD      ;POINTER TO CORRECT DATA
027230 035052      MEMDAT      ;LOAD 8 WORDS OF MAIN MEMORY
027232 004737 034762      JSR      PC,SPLD      ;POINTER TO DATA
027236 035062      SPDAT      ;LOAD 8 WORDS OF SP
027240 004737 035026 1$: JSR      PC,CLRC      ;POINTER TO DATA
027244 042737 000017 027260 BIC      #17,2$      ;CLEAR C BIT!
027252 050037 027260      BIS      R0,2$      ;CLEAR ADDRESS FIELD OF INSTRUCTION
027256 104414      ROMCLK      ;ADD ADDRESS TO INSTRUCTION
027260 010000      2$: 010000      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027262 042737 000017 027276 BIC      #17,3$      ;LOAD MAR
027270 050037 027276      BIS      R0,3$      ;CLEAR ADDRESS OF INSTRUCTION
027274 104414      ROMCLK      ;ADD ADDRESS TO INSTRUCTION
027276 040520 3$: 040400!<5*20>      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027300 104414      ROMCLK      ;BR _ 2A
027302 061224      61224      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027304 111205      MOVB      (R2),R5      ;MOVE BR TO PORT4
027306 116104 000004 MOVB      4(R1),R4      ;PUT "EXPECTED" IN R5
027312 120504      CMPB      R5,R4      ;PUT "FOUND" IN R4
027314 001401      BEQ      4$      ;DATA CORRECT?
027316 104015      EMT      15      ;BR IF YES
                                ;ALU ERROR
  
```

```

027320 104401          4$: SCOP1          ;SW09=1?
027322 005202          INC      R2          ;NEXT DATA
027324 005200          INC      R0          ;NEXT ADDRESS
027326 022700 000010  CMP      #10,R0       ;DONE YET?
027332 001342          BNE     1$          ;BR IF NO
027334 104400          SCOPE         ;SCOPE THIS TEST
027336      000      000  376 5$: .BYTE  0,0,376,376,252,252,124,124
027341      376      252  252
027344      124      124

```

.EVEN

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```

;***** TEST 112 *****
;*ALU TEST
;*TEST OF ALU FUNCTION A PLUS C WITH C BIT CLEARED
;*ALU FUNCTION (A PLUS C) CODE=4
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****

```

; TEST 112

```

027346 012737 000112 001226 TST112: MOV      #112,TSTNO
027354 012737 027522 001216 MOV      #TST113,NEXT
027362 012737 027414 001220 MOV      #1$,LOCK

027370 104412          MSTCLR         ;R1 CONTAINS BASE DMC11 ADDRESS
027372 005000          CLR      R0          ;MASTER CLEAR DMC11
027374 012702 027512  MOV      #5$,R2       ;MEM + SP ADDRESS
027400 004737 034726  JSR      PC,MEMLD     ;POINTER TO CORRECT DATA
027404 035052          MEMDAT         ;LOAD 8 WORDS OF MAIN MEMORY
027406 004737 034762  JSR      PC,SPLD     ;POINTER TO DATA
027412 035062          SPDAT         ;LOAD 8 WORDS OF SP
027414 004737 035026  1$: JSR      PC,CLRC     ;POINTER TO DATA
027420 042737 000017 027434 BIC      #17,2$      ;CLEAR C BIT!
027426 050037 027434 BIC      R0,2$      ;CLEAR ADDRESS FIELD OF INSTRUCTION
027432 104414          ROMCLK         ;ADD ADDRESS TO INSTRUCTION
027434 010000          010000     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027436 042737 000017 027452 BIC      #17,3$      ;LOAD MAR
027444 050037 027452 BIC      R0,3$      ;CLEAR ADDRESS OF INSTRUCTION
027450 104414          ROMCLK         ;ADD ADDRESS TO INSTRUCTION
027452 040500          040400!<4*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027454 104414          ROMCLK         ;BR - A PLUS C
027456 061224          61224         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027460 111205          MOVB     (R2),R5      ;MOVE BR TO PORT4
027462 116104 000004  MOVB     4(R1),R4     ;PUT "EXPECTED" IN R5
027466 120504          CMPB     R5,R4       ;PUT "FOUND" IN R4
027470 001401          BEQ     4$          ;DATA CORRECT?
027472 104015          EMT      15        ;BR IF YES
027474 104401          4$: SCOP1         ;ALU ERROR
027476 005202          INC      R2          ;SW09=1?
027500 005200          INC      R0          ;NEXT DATA
027502 022700 000010  CMP      #10,R0       ;NEXT ADDRESS
027506 001342          BNE     1$          ;DONE YET?
027510 104400          SCOPE         ;BR IF NO
027512      000      000  377 5$: .BYTE  0,0,-1,-1,125,125,252,252
027515      377      125  125

```

027520 252 252
 87 .EVEN

```
***** TEST 113 *****
;*ALU TEST
;*TEST OF ALU FUNCTION 2'S COMP SUB WITH C BIT CLEARED
;*ALU FUNCTION (A-B 1) CODE=17
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****
```

; TEST 113

```
-----
027522 012737 000113 001226 TST113: MOV #113,TSTNO
027530 012737 027676 001216 MOV #TST114,NEXT
027536 012737 027570 001220 MOV #1$,LOCK

027544 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
027546 005000 CLR R0 ;MASTER CLEAR DMC11
027550 012702 027666 MOV #5$,R2 ;MEM + SP ADDRESS
027554 004737 034726 JSR PC,MEMLD ;POINTER TO CORRECT DATA
027560 035052 MEMDAT ;LOAD 8 WORDS OF MAIN MEMORY
027562 004737 034762 JSR PC,SPLD ;POINTER TO DATA
027566 035062 SPDAT ;LOAD 8 WORDS OF SP
027570 004737 035026 1$: JSR PC,CLRC ;POINTER TO DATA
027574 042737 000017 027610 BIC #17,2$ ;CLEAR C BIT!
027602 050037 027610 BIS R0,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
027606 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
027610 010000 2$: 010000 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027612 042737 000017 027626 BIC #17,3$ ;LOAD MAR
027620 050037 027626 BIS R0,3$ ;CLEAR ADDRESS OF INSTRUCTION
027624 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
027626 040760 3$: 040400!<17*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027630 104414 ROMCLK ;BR 2'S COMP SUB
027632 061224 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027634 111205 MOVB (R2),R5 ;MOVE BR TO PORT4
027636 116104 000004 MOVB 4(R1),R4 ;PUT "EXPECTED" IN R5
027642 120504 CMPB R5,R4 ;PUT "FOUND" IN R4
027644 001401 BEQ 4$ ;DATA CORRECT?
027646 104015 EMT 15 ;BR IF YES
027650 104401 4$: SCOP1 ;ALU ERROR
027652 005202 INC R2 ;SW09=1?
027654 005200 INC R0 ;NEXT DATA
027656 022700 000010 CMP #10,R0 ;NEXT ADDRESS
027662 001342 BNE 1$ ;DONE YET?
027664 104400 SCOPE ;BR IF NO
027666 377 000 376 5$: .BYTE -1,0.376,-1,-1,252,124,-1
027671 377 377 252
027674 124 377
```

88 .EVEN

```
***** TEST 114 *****
;*ALU TEST
;*TEST OF ALU FUNCTION DEC A WITH C BIT CLEARED
;*ALU FUNCTION (A-1) CODE=7
```

;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;:*****

; TEST 114

```

027676 012737 000114 001226 TST114: MOV    #114,TSTNO
027704 012737 030052 001216 MOV    #TST115,NEXT
027712 012737 027744 001220 MOV    #1$,LOCK

027720 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
027722 005000          CLR     R0        ;MASTER CLEAR DMC11
027724 012702 030042  MOV    #5$,R2    ;MEM + SP ADDRESS
027730 004737 034726  JSR    PC,MEMLD  ;POINTER TO CORRECT DATA
027734 035052          MEMDAT          ;LOAD 8 WORDS OF MAIN MEMORY
027736 004737 034762  JSR    PC,SPLD   ;POINTER TO DATA
027742 035062          SPDAT          ;LOAD 8 WORDS OF SP
027744 004737 035026  JSR    PC,CLRC  ;POINTER TO DATA
027750 042737 000017 027764 1$:  BIC    #17,2$   ;CLEAR C BIT!
027756 050037 027764  BIS    R0,2$    ;CLEAR ADDRESS FIELD OF INSTRUCTION
027762 104414          ROMCLK          ;ADD ADDRESS TO INSTRUCTION
027764 010000          010000        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027766 042737 000017 030002 2$:  BIC    #17,3$   ;LOAD MAR
027774 050037 030002  BIS    R0,3$    ;CLEAR ADDRESS OF INSTRUCTION
030000 104414          ROMCLK          ;ADD ADDRESS TO INSTRUCTION
030002 040560          040400!<7*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030004 104414          ROMCLK          ;BR - DEC A
030006 061224          61224          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030010 111205          MOVB   (R2),R5   ;MOVE BR TO PORT4
030012 116104 000004  MOVB   4(R1),R4 ;PUT "EXPECTED" IN R5
030016 120504          CMPB   R5,R4     ;PUT "FOUND" IN R4
030020 001401          BEQ    4$        ;DATA CORRECT?
030022 104015          EMT    15       ;BR IF YES
030024 104401          4$:  SCOP1          ;ALU ERROR
030026 005202          INC    R2        ;SW09=1?
030030 005200          INC    R0        ;NEXT DATA
030032 022700 000010  CMP    #10,R0   ;NEXT ADDRESS
030036 001342          BNE    1$        ;DONE YET?
030040 104400          SCOPE          ;BR IF NO
030042    377          377          ;SCOPE THIS TEST
030045    376          124          .BYTE   -1,-1,376,376,124,124,251,251
030050    251          251
    
```

.EVEN

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***** TEST 115 *****
 ;*ALU TEST
 ;*TEST OF ALU FUNCTION SEL B WITH C BIT SET
 ;*ALU FUNCTION (B) CODE=11
 ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;:*****

; TEST 115

```

030052 012737 000115 001226 TST115: MOV    #115,TSTNO
030060 012737 030226 001216 MOV    #TST116,NEXT
    
```

```

030066 012737 030120 001220      MOV      #1$,LOCK
                                ;R1 CONTAINS BASE DMC11 ADDRESS
030074 104412                      MSTCLR
                                ;MASTER CLEAR DMC11
030076 005000                      CLR      R0
                                ;MEM + SP ADDRESS
030100 012702 030216              MOV      #5$,R2
                                ;POINTER TO CORRECT DATA
030104 004737 034726              JSR      PC,MEMLD
                                ;LOAD 8 WORDS OF MAIN MEMORY
030110 035052                      MEMDAT
                                ;POINTER TO DATA
030112 004737 034762              JSR      PC,SPLD
                                ;LOAD 8 WORDS OF SP
030116 035062                      SPDAT
                                ;POINTER TO DATA
030120 004737 035040 1$:         JSR      PC,SETC
                                ;SET C BIT!
030124 042737 000017 030140      BIC      #17,2$
                                ;CLEAR ADDRESS FIELD OF INSTRUCTION
030132 050037 030140              BIS      R0,2$
                                ;ADD ADDRESS TO INSTRUCTION
030136 104414                      ROMCLK
                                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030140 010000                      010000
                                ;LOAD MAR
030142 042737 000017 030156      BIC      #17,3$
                                ;CLEAR ADDRESS OF INSTRUCTION
030150 050037 030156              BIS      R0,3$
                                ;ADD ADDRESS TO INSTRUCTION
030154 104414                      ROMCLK
                                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030156 040620 3$:                 040400! <11*20>
                                ;BR - SEL B
030160 104414                      ROMCLK
                                ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030162 061224                      61224
                                ;MOVE BR TO PORT4
030164 111205                      MOV      (R2),R5
                                ;PUT "EXPECTED" IN R5
030166 116104 000004              MOV      4(R1),R4
                                ;PUT "FOUND" IN R4
030172 120504                      CMP      R5,R4
                                ;DATA CORRECT?
030174 001401                      BEQ      4$
                                ;BR IF YES
030176 104015                      EMT      15
                                ;ALU ERROR
030200 104401 4$:                 SCOP1
                                ;SW09=1?
030202 005202                      INC      R2
                                ;NEXT DATA
030204 005200                      INC      R0
                                ;NEXT ADDRESS
030206 022700 000010              CMP      #10,R0
                                ;DONE YET?
030212 001342                      BNE      1$
                                ;BR IF NO
030214 104400                      SCOPE
                                ;SCOPE THIS TEST
030216 000 377 000 5$:            .BYTE 0,-1,0,-1,125,252,125,252
030221 377 125 252
030224 125 252

```

.EVEN

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```

;***** TEST 116 *****
;*ALU TEST
;*TEST OF ALU FUNCTION SEL A WITH C BIT SET
;*ALU FUNCTION (A) CODE=10
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;:*****

```

; TEST 116

```

030226 012737 000116 001226 TST116: MOV      #116,TSTNO
030234 012737 030402 001216      MOV      #TST117,NEXT
030242 012737 030274 001220      MOV      #1$,LOCK
                                ;R1 CONTAINS BASE DMC11 ADDRESS
030250 104412                      MSTCLR
                                ;MASTER CLEAR DMC11
030252 005000                      CLR      R0
                                ;MEM + SP ADDRESS
030254 012702 030372              MOV      #5$,R2
                                ;POINTER TO CORRECT DATA
030260 004737 034726              JSR      PC,MEMLD
                                ;LOAD 8 WORDS OF MAIN MEMORY
030264 035052                      MEMDAT
                                ;POINTER TO DATA
030266 004737 034762              JSR      PC,SPLD
                                ;LOAD 8 WORDS OF SP

```



```

030504 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030506 040640          040400!<12*20> ;BR A OR NOTB
030510 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030512 061224          61224           ;MOVE BR TO PORT4
030514 111205          MOVB (R2),R5 ;PUT "EXPECTED" IN R5
030516 116104 000004  MOVB 4(R1),R4 ;PUT "FOUND" IN R4
030522 120504          CMPB R5,R4 ;DATA CORRECT?
030524 001401          BEQ 4$ ;BR IF YES
030526 104015          EMT 15 ;ALU ERROR
030530 104401          4$: SCOP1 ;SW09-1?
030532 005202          INC R2 ;NEXT DATA
030534 005200          INC R0 ;NEXT ADDRESS
030536 022700 000010  CMP #10,R0 ;DONE YET?
030542 001342          BNE 1$ ;BR IF NO
030544 104400          SCOPE ;SCOPE THIS TEST
030546 377 000 377 5$: .BYTE -1,0,-1, 1,-1,125,252,-1
030551 377 377 125
030554 252 377

```

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.EVEN

```

;***** TEST 120 *****
;*ALU TEST
;*TEST OF ALU FUNCTION A AND B WITH C BIT SET
;*ALU FUNCTION (A AND B) CODE=13
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****

```

; TEST 120

```

030556 012737 000120 001226 TST120: MOV #120,TSTNO
030564 012737 030732 001216 MOV #TST121,NEXT
030572 012737 030624 001220 MOV #1$,LOCK

030600 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
030602 005000          CLR R0 ;MASTER CLEAR DMC11
030604 012702 030722  MOV #5$,R2 ;MEM + SP ADDRESS
030610 004737 034726  JSR PC,MEMLD ;POINTER TO CORRECT DATA
030614 035052          MEMDAT ;LOAD 8 WORDS OF MAIN MEMORY
030616 004737 034762  JSR PC,SPLD ;POINTER TO DATA
030622 035062          SPDAT ;LOAD 8 WORDS OF SP
030624 004737 035040  1$: JSR PC,SETC ;POINTER TO DATA
030630 042737 000017 030644  BIC #17,2$ ;SET C BIT!
030636 050037 030644  BIS R0,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
030642 104414          ROMCLK          ;ADD ADDRESS TO INSTRUCTION
030644 010000          010000 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030646 042737 000017 030662  BIC #17,3$ ;LOAD MAR
030654 050037 030662  BIS R0,3$ ;CLEAR ADDRESS OF INSTRUCTION
030660 104414          ROMCLK          ;ADD ADDRESS TO INSTRUCTION
030662 040660          3$: 040400!<13*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030664 104414          ROMCLK          ;BR A AND B
030666 061224          61224 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030670 111205          MOVB (R2),R5 ;MOVE BR TO PORT4
030672 116104 000004  MOVB 4(R1),R4 ;PUT "EXPECTED" IN R5
030676 120504          CMPB R5,R4 ;PUT "FOUND" IN R4
030700 001401          BEQ 4$ ;DATA CORRECT?
;BR IF YES

```

```

030702 104015          EMT      15          ;ALU ERROR
030704 104401          SCOPE1         ;SW09=1?
030706 005202          INC       R2          ;NEXT DATA
030710 005200          INC       R0          ;NEXT ADDRESS
030712 022700 000010  CMP      #10,R0       ;DONE YET?
030716 001342          BNE      1$          ;BR IF NO
030720 104400          SCOPE         ;SCOPE THIS TEST
030722      000      000      000 5$: .BYTE  0,0,0, 1,125,0,0,252
030725      377      125      000
030730      000      252
  
```

.EVEN

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```

;***** TEST 121 *****
;*ALU TEST
;*TEST OF ALU FUNCTION A OR B WITH C BIT SET
;*ALU FUNCTION (A OR B) CODE=14
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;:*****
  
```

; TEST 121

```

030732 012737 000121 001226 TST121: MOV     #121,TSTNO
030740 012737 031106 001216      MOV     #TST122,NEXT
030746 012737 031000 001220      MOV     #1$,LOCK

030754 104412          MSTCLR         ;R1 CONTAINS BASE DMC11 ADDRESS
030756 005000          CLR       R0          ;MASTER CLEAR DMC11
030760 012702 031076  MOV     #5$,R2       ;MEM + SP ADDRESS
030764 004737 034726  JSR     PC,MEMLD     ;POINTER TO CORRECT DATA
030770 035052          MEMDAT        ;LOAD 8 WORDS OF MAIN MEMORY
030772 004737 034762  JSR     PC,SPLD     ;PCINTER TO DATA
030776 035062          SPDAT        ;LOAD 8 WORDS OF SP
031000 004737 035040  JSR     PC,SETC     ;POINTER TO DATA
031004 042737 000017 031020 1$: BIC     #17,2$      ;SET C BIT!
031012 050037 031020  BIC     #17,2$      ;CLEAR ADDRESS FIELD OF INSTRUCTION
031016 104414          ROMCLK        ;ADD ADDRESS TO INSTRUCTION
031020 010000          ROMCLK        ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
031022 042737 000017 031036 2$: BIC     #17,3$      ;LOAD MAR
031030 050037 031036  BIC     #17,3$      ;CLEAR ADDRESS OF INSTRUCTION
031034 104414          ROMCLK        ;ADD ADDRESS TO INSTRUCTION
031036 040700          ROMCLK        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031040 104414          ROMCLK        ;BR = A OR B
031042 061224          ROMCLK        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031044 111205          MOVB      (R2),R5    ;MOVE BR TO PORT4
031046 116104 000004  MOVB      4(R1),R4   ;PUT "EXPECTED" IN R5
031052 120504          CMPB      R5,R4     ;PUT "FOUND" IN R4
031054 001401          CMPB      R5,R4     ;DATA CORRECT?
031056 104015          BEC       4$          ;BR IF YES
031060 104401          EMT       15        ;ALU ERROR
031062 005202          SCOPE1         ;SW09=1?
031064 005200          INC       R2          ;NEXT DATA
031066 022700 000010  INC       R0          ;NEXT ADDRESS
031072 001342          CMP      #10,R0     ;DONE YET?
031074 104400          BNE      1$          ;BR IF NO
031076      000      377      377 5$: SCOPE         ;SCOPE THIS TEST
      .BYTE  0,-1, 1, 1,125, 1, 1,252
  
```

031101 377 125 377
 031104 377 252

.EVEN

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```
***** TEST 122 *****
;*ALU TEST
;*TEST OF ALU FUNCTION A XOR B WITH C BIT SET
;*ALU FUNCTION (A XOR B) CODE=15
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****
```

; TEST 122

```
031106 012737 000122 001226 TST122: MOV #122,TSTNO
031114 012737 031262 001216 MOV #TST123,NEXT
031122 012737 031154 001220 MOV #1$,LOCK

031130 104412 MSTCLR ;R1 CONTAINS BASE DMC11 ADDRESS
031132 005000 CLR R0 ;MASTER CLEAR DMC11
031134 012702 031252 MOV #5$,R2 ;MEM + SP ADDRESS
031140 004737 034726 JSR PC,MEMLD ;POINTER TO CORRECT DATA
031144 035052 MEMDAT ;LOAD 8 WORDS OF MAIN MEMORY
031146 004737 034762 JSR PC,SPLD ;POINTER TO DATA
031152 035062 SPDAT ;LOAD 8 WORDS OF SP
031154 004737 035040 1$: JSR PC,SETC ;POINTER TO DATA
031160 042737 000017 031174 BIC #17,2$ ;SET C BIT!
031166 050037 031174 BIS R0,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
031172 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
031174 010000 2$: 010000 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031176 042737 000017 031212 BIC #17,3$ ;LOAD MAR
031204 050037 031212 BIS R0,3$ ;CLEAR ADDRESS OF INSTRUCTION
031210 104414 ROMCLK ;ADD ADDRESS TO INSTRUCTION
031212 040720 3$: 040400!<15*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031214 104414 ROMCLK ;BR A XOR B
031216 061224 61224 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031220 111205 MOVB (R2),R5 ;MOVE BR TO PORT4
031222 116104 000004 MOVB 4(R1),R4 ;PUT "EXPECTED" IN R5
031226 120504 CMPB R5,R4 ;PUT "FOUND" IN R4
031230 001401 BEQ 4$ ;DATA CORRECT?
031232 104015 EMT 15 ;BR IF YES
031234 104401 4$: SCOP1 ;ALU ERROR
031236 005202 INC R2 ;SW09=1?
031240 005200 INC R0 ;NEXT DATA
031242 022700 000010 CMP #10,R0 ;NEXT ADDRESS
031246 001342 BNE 1$ ;DONE YET?
031250 104400 SCOPE ;BR IF NO
031252 000 377 377 5$: .BYTE 0,-1,-1,0,0,-1,-1,0 ;SCOPE THIS TEST
031255 000 000 377
031260 377 000
```

.EVEN

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```
***** TEST 123 *****
;*ALU TEST
;*TEST OF ALU FUNCTION ADD WITH C BIT SET
```

```

; *ALU FUNCTION (A PLUS B) CODE=00
; *LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
; *PERFORM THE FUNCTION, VERIFY THE RESULTS
; :*****

```

; TEST 123

```

-----
031262 012737 000123 001226 TST123: MOV     #123,TSTNO
031270 012737 031436 001216 MOV     #TST124,NEXT
031276 012737 031330 001220 MOV     #1$,LOCK

031304 104412 MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
031306 005000 CLR     R0       ;MASTER CLEAR DMC11
031310 012702 031426 MOV     #5$,R2   ;MEM + SP ADDRESS
031314 004737 034726 JSR     PC,MEMLD ;POINTER TO CORRECT DATA
031320 035052 MEMDAT          ;LOAD 8 WORDS OF MAIN MEMORY
031322 004737 034762 JSR     PC,SPLD  ;POINTER TO DATA
031326 035062 SPDAT          ;LOAD 8 WORDS OF SP
031330 004737 035040 1$: JSR     PC,SETC ;POINTER TO DATA
031334 042737 000017 031350 BIC     #17,2$  ;SET C BIT!
031342 050037 031350 BIS     R0,2$  ;CLEAR ADDRESS FIELD OF INSTRUCTION
031346 104414 ROMCLK          ;ADD ADDRESS TO INSTRUCTION
031350 010000 010000 2$: ROMCLK  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031352 042737 000017 031366 BIC     #17,3$ ;LOAD MAP
031360 050037 031366 BIS     R0,3$  ;CLEAR ADDRESS OF INSTRUCTION
031364 104414 ROMCLK          ;ADD ADDRESS TO INSTRUCTION
031366 040400 040400!<00*20> 3$: ROMCLK  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031370 104414 ROMCLK          ;BR ADD
031372 061224 61224          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031374 111205 MOVB    (R2),R5  ;MOVE BR TO PORT4
031376 116104 000004 MOVB    4(R1),R4 ;PUT "EXPECTED" IN R5
031402 120504 CMPB    R5,R4    ;PUT "FOUND" IN R4
031404 001401 BEQ     4$       ;DATA CORRECT?
031406 104015 EMT     15      ;BR IF YES
031410 104401 4$: SCOP1          ;ALU ERROR
031412 005202 INC     R2       ;SW09=1?
031414 005200 INC     R0       ;NEXT DATA
031416 022700 000010 CMP     #10,R0  ;NEXT ADDRESS
031422 001342 BNE     1$       ;DONE YET?
031424 104400 SCOPE          ;BR IF NO
031426 000 377 377 5$: .BYTE 0,-1,-1,376,252,-1,-1,124 ;SCOPE THIS TEST
031431 376 252 377
031434 377 124

.EVEN

```

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```

;***** TEST 124 *****
; *ALU TEST
; *TEST OF ALU FUNCTION 2A W/C WITH C BIT SET
; *ALU FUNCTION (A PLUS A PLUS C) CODE=6
; *LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
; *PERFORM THE FUNCTION, VERIFY THE RESULTS
; :*****

```

; TEST 124

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-----
031436 012737 000124 001226 TST124: MOV     #124,TSTNO

```

```

031444 012737 031612 001216 MOV    #TST125,NEXT
031452 012737 031504 001220 MOV    #1$,LOCK
                                ;R1 CONTAINS BASE DMC11 ADDRESS
031460 104412 MSTCLR ;MASTER CLEAR DMC11
031462 005000 CLR    RO ;MEM + SP ADDRESS
031464 012702 031602 MOV    #5$,R2 ;POINTER TO CORRECT DATA
031470 004737 034726 JSR    PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY
031474 035052 MEMDAT ;POINTER TO DATA
031476 004737 034762 JSR    PC,SPLD ;LOAD 8 WORDS OF SP
031502 035062 SPCAT ;POINTER TO DATA
031504 004737 035040 1$: JSR    PC,SETC ;SET C BIT!
031510 042737 000017 031524 BIC    #17,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
031516 050037 031524 BIS    RO,2$ ;ADD ADDRESS TO INSTRUCTION
031522 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031524 010000 2$: O10000 ;LOAD MAR
031526 042737 000017 031542 BIC    #17,3$ ;CLEAR ADDRESS OF INSTRUCTION
031534 050037 031542 BIS    RO,3$ ;ADD ADDRESS TO INSTRUCTION
031540 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031542 040540 3$: ROMCLK 040400!<6*20> ;BR - 2A W/C
031544 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031546 061224 61224 ;MOVE BR TO PORT4
031550 111205 MOVB   (R2),R5 ;PUT "EXPECTED" IN R5
031552 116104 000004 MOVB   4(R1),R4 ;PUT "FOUND" IN R4
031556 120504 CMPB   R5,R4 ;DATA CORRECT?
031560 001401 BEQ    4$ ;BR IF YES
031562 104015 EMT    15 ;ALU ERROR
031564 104401 4$: SCOP1 ;SW09=1?
031566 005202 INC    R2 ;NEXT DATA
031570 005200 INC    RO ;NEXT ADDRESS
031572 022700 000010 CMP    #10,RO ;DONE YET?
031576 001342 BNE    1$ ;BR IF NO
031600 104400 SCOPE ;SCOPE THIS TEST
031602 001 001 377 5$: .BYTE 1,1,-1,-1,253,253,125,125
031605 377 253 253
031610 125 125
                                .EVEN
  
```

97

```

;***** TEST 125 *****
;*ALU TEST
;*TEST OF ALU FUNCTION SUB WITH C BIT SET
;*ALU FUNCTION (A-B) CODE=16
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;:*****
  
```

; TEST 125

```

031612 012737 000125 001226 TST125: MOV    #125,TSTNO
031620 012737 031766 001216 MOV    #TST126,NEXT
031626 012737 031660 001220 MOV    #1$,LOCK
                                ;R1 CONTAINS BASE DMC11 ADDRESS
031634 104412 MSTCLR ;MASTER CLEAR DMC11
031636 005000 CLR    RO ;MEM + SP ADDRESS
031640 012702 031756 MOV    #5$,R2 ;POINTER TO CORRECT DATA
031644 004737 034726 JSR    PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY
031650 035052 MEMDAT ;POINTER TO DATA
  
```

031652	004737	034762			JSR	PC,SPLD		;LOAD 8 WORDS OF SP
031656	035062				SPDAT			;POINTER TO DATA
031660	004737	035040		1#:	JSR	PC,SETC		;SET C BIT!
031664	042737	000017	031700		BIC	#17,2#		;CLEAR ADDRESS FIELD OF INSTRUCTION
031672	050037	031700			BIS	RO,2#		;ADD ADDRESS TO INSTRUCTION
031676	104414				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031700	010000			2#:	010000			;LOAD MAR
031702	042737	000017	031716		BIC	#17,3#		;CLEAR ADDRESS OF INSTRUCTION
031710	050037	031716			BIS	RO,3#		;ADD ADDRESS TO INSTRUCTION
031714	104414				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031716	040740			3#:	040400!	<16*20>		;BR SUB
031720	104414				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031722	061224				61224			;MOVE BR TO PORT4
031724	111205				MOVB	(R2),R5		;PUT "EXPECTED" IN R5
031726	116104	000004			MOVB	4(R1),R4		;PUT "FOUND" IN R4
031732	120504				CMPB	R5,R4		;DATA CORRECT?
031734	001401				BEQ	4#		;BR IF YES
031736	104015				EMT	15		;ALU ERROR
031740	104401			4#:	SCOPE			;SW09=1?
031742	005202				INC	R2		;NEXT DATA
031744	005200				INC	RO		;NEXT ADDRESS
031746	022700	000010			CMP	#10,RO		;DONE YET?
031752	001342				BNE	1#		;BR IF NO
031754	104400				SCOPE			;SCOPE THIS TEST
031756	000	001	377	5#:	.BYTE	0,1,-1,0,0,253,125,0		
031761	000	000	253					
031764	125	000						

.EVEN

98

***** TEST 126 *****
 ;*ALU TEST
 ;*TEST OF ALU FUNCTION ADD W/C WITH C BIT SET
 ;*ALU FUNCTION (A PLUS B PLUS C) CODE=01
 ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;:*****

; TEST 126

031766	012737	000126	001226	TST126:	MOV	#126,TSTNO		
031774	012737	032142	001216		MOV	#TST127,NEXT		
032002	012737	032034	001220		MOV	#1#,LOCK		
032010	104412				MSTCLR			;R1 CONTAINS BASE DMC11 ADDRESS
032012	005000				CLR	RO		;MASTER CLEAR DMC11
032014	012702	032132			MOV	#5#,R2		;MEM + SP ADDRESS
032020	004737	034726			JSR	PC,MEMLD		;POINTER TO CORRECT DATA
032024	035052				MEMDAT			;LOAD 8 WORDS OF MAIN MEMORY
032026	004737	034762			JSR	PC,SPLD		;POINTER TO DATA
032032	035062				SPDAT			;LOAD 8 WORDS OF SP
032034	004737	035040		1#:	JSR	PC,SETC		;POINTER TO DATA
032040	042737	000017	032054		BIC	#17,2#		;SET C BIT!
032046	050037	032054			BIS	RO,2#		;CLEAR ADDRESS FIELD OF INSTRUCTION
032052	104414				ROMCLK			;ADD ADDRESS TO INSTRUCTION
032054	010000			2#:	010000			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032056	042737	000017	032072		BIC	#17,3#		;LOAD MAR
								;CLEAR ADDRESS OF INSTRUCTION

032064	050037	032072			BIS	RO,3#		;ADD ADDRESS TO INSTRUCTION
032070	104414				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032072	040420			3#:	040400!	<01*20>		;BR ADD W/C
032074	104414				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032076	061224				61224			;MOVE BR TO PORT4
032100	111205				MOVB	(R2),R5		;PUT "EXPECTED" IN R5
032102	116104	000004			MOVB	4(R1),R4		;PUT "FOJND" IN R4
032106	120504				CMPB	R5,R4		;DATA CORRECT?
032110	001401				BEQ	4#		;BR IF YES
032112	104015				EMT	15		;ALU ERROR
032114	104401			4#:	SCOP1			;SW09=1?
032116	005202				INC	R2		;NEXT DATA
032120	005200				INC	RO		;NEXT ADDRESS
032122	022700	000010			CMP	#10,RO		;DONE YET?
032126	001342				BNE	1#		;BR IF NO
032130	104400				SCOPE			;SCOPE THIS TEST
032132	001	000	000	5#:	.BYTE	1,0,0, 1,253,0,0,125		
032135	377	253	000					
032140	000	125						

.EVEN

99

***** TEST 127 *****
 ;*ALU TEST
 ;*TEST OF ALU FUNCTION SUB W/C WITH C BIT SET
 ;*ALU FUNCTION (A-B-C) CODE=2
 ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;:*****

; TEST 127

032142	012737	000127	001226	TST127:	MOV	#127,TSTNO		
032150	012737	032316	001216		MOV	#TST130,NEXT		
032156	012737	032210	001220		MOV	#1#,LOCK		
032164	104412				MSTCLR			;R1 CONTAINS BASE DMC11 ADDRESS
032166	005000				CLR	RO		;MASTER CLEAR DMC11
032170	012702	032306			MOV	#5#,R2		;MEM + SP ADDRESS
032174	004737	034726			JSR	PC,MEMLD		;POINTER TO CORRECT DATA
032200	035052				MEMDAT			;LOAD 8 WORDS OF MAIN MEMORY
032202	004737	034762			JSR	PC,SPLD		;POINTER TO DATA
032206	035062				SPDAT			;LOAD 8 WORDS OF SP
032210	004737	035040			JSR	PC,SETC		;POINTER TO DATA
032214	042737	000017	032230	1#:	JSR	PC,SETC		;SET C BIT!
032222	050037	032230			BIC	#17,2#		;CLEAR ADDRESS FIELD OF INSTRUCTION
032226	104414				BIS	RO,2#		;ADD ADDRESS TO INSTRUCTION
032230	010000				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032232	042737	000017	032246	2#:	010000			;LOAD MAR
032240	050037	032246			BIC	#17,3#		;CLEAR ADDRESS OF INSTRUCTION
032244	104414				BIS	RO,3#		;ADD ADDRESS TO INSTRUCTION
032246	040440				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032250	104414			3#:	040400!	<2*20>		;BR SUB W/C
032252	061224				ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032254	111205				61224			;MOVE BR TO PORT4
032256	116104	000004			MOVB	(R2),R5		;PUT "EXPECTED" IN R5
032262	120504				MOVB	4(R1),R4		;PUT "FOUND" IN R4
					CMPB	R5,R4		;DATA CORRECT?

```

032264 001401      BEQ      4$      ;BR IF YES
032266 104015      EMT      15      ;ALU ERROR
032270 104401      4$:     SCOP1      ;SW09=1?
032272 005202      INC      R2      ;NEXT DATA
032274 005200      INC      R0      ;NEXT ADDRESS
032276 022700 000010  CMP      #10,R0  ;DONE YET?
032302 001342      BNE      1$      ;BR IF NO
032304 104400      SCOPE     ;SCOPE THIS TEST
032306 000 001 377 5$:   .BYTE    0,1, 1,0,0,253,125,0
032311 000 000 253
032314 125 000

```

.EVEN

100

```

;***** TEST 130 *****
;*ALU TEST
;*TEST OF ALU FUNCTION INC A WITH C BIT SET
;*ALU FUNCTION (A PLUS 1) CODE=3
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;*****

```

; TEST 130

```

032316 012737 000130 001226 TST130: MOV      #130,TSTNO
032324 012737 032472 001216      MOV      #TST131,NEXT
032332 012737 032364 001220      MOV      #1$,LOCK

032340 104412      MSTCLR      ;R1 CONTAINS BASE DMC11 ADDRESS
032342 005000      CLR      R0      ;MASTER CLEAR DMC11
032344 012702 032462      MOV      #5$,R2  ;MEM + SP ADDRESS
032350 004737 034726      JSR      PC,MEMLD ;POINTER TO CORRECT DATA
032354 035052      MEMDAT      ;LOAD 8 WORDS OF MAIN MEMORY
032356 004737 034762      JSR      PC,SPLD  ;POINTER TO DATA
032362 035062      SPDAT      ;LOAD 8 WORDS OF SP
032364 004737 035040      JSR      PC,SETC  ;POINTER TO DATA
032370 042737 000017 032404 1$:   BIC      #17,2$  ;SET C BIT!
032376 050037 032404      BIS      R0,2$  ;CLEAR ADDRESS FIELD OF INSTRUCTION
032402 104414      ROMCLK     ;ADD ADDRESS TO INSTRUCTION
032404 010000      010000     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032406 042737 000017 032422 2$:   BIC      #17,3$  ;LOAD MAR
032414 050037 032422      BIS      R0,3$  ;CLEAR ADDRESS OF INSTRUCTION
032420 104414      ROMCLK     ;ADD ADDRESS TO INSTRUCTION
032422 040460      040400!<3*20> ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032424 104414      ROMCLK     ;BR - INC A
032426 061224      61224      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032430 111205      MOVB      (R2),R5 ;MOVE BR TO PORT4
032432 116104 000004      MOVB      4(R1),R4 ;PUT "EXPECTED" IN R5
032436 120504      CMPB      R5,R4  ;PUT "FOUND" IN R4
032440 001401      BEQ      4$      ;DATA CORRECT?
032442 104015      EMT      15      ;BR IF YES
032444 104401      4$:     SCOP1      ;ALU ERROR
032446 005202      INC      R2      ;SW09=1?
032450 005200      INC      R0      ;NEXT DATA
032452 022700 000010  CMP      #10,R0  ;NEXT ADDRESS
032456 001342      BNE      1$      ;DONE YET?
032460 104400      SCOPE     ;BR IF NO
                                ;SCOPE THIS TEST

```


032462 001 001 000 5#: .BYTE 1,1,0,0,126,126,253,253
 032465 000 126 126
 032470 253 253

.EVEN

101

***** TEST 131 *****
 ;*ALU TEST
 ;*TEST OF ALU FUNCTION 2A WITH C BIT SET
 ;*ALU FUNCTION (A PLUS A) CODE=5
 ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
 ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
 ;*****

; TEST 131

032472	012737	000131	001226	TST131:	MOV	#131,TSTNO	
032500	012737	032646	001216		MOV	#TST132,NEXT	
032506	012737	032540	001220		MOV	#1\$,LOCK	
							;R1 CONTAINS BASE DMC11 ADDRESS
032514	104412				MSTCLR		;MASTER CLEAR DMC11
032516	005000				CLR	R0	;MEM + SP ADDRESS
032520	012702	032636			MOV	#5\$,R2	;POINTER TO CORRECT DATA
032524	004737	034726			JSR	PC,MEMLD	;LOAD 8 WORDS OF MAIN MEMORY
032530	035052				MEMDAT		;POINTER TO DATA
032532	004737	034762			JSR	PC,SPLD	;LOAD 8 WORDS OF SP
032536	035062				SPDAT		;POINTER TO DATA
032540	004737	035040		1\$:	JSR	PC,SETC	;SET C BIT!
032544	000737	000017	032560		BIC	#17,2\$;CLEAR ADDRESS FIELD OF INSTRUCTION
032552	000037	032560			BIS	R0,2\$;ADD ADDRESS TO INSTRUCTION
032556	104414				ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032560	010000			2\$:	010000		;LOAD MAR
032562	042737	000017	032576		BIC	#17,3\$;CLEAR ADDRESS OF INSTRUCTION
032570	050037	032576			BIS	R0,3\$;ADD ADDRESS TO INSTRUCTION
032574	104414				ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032576	040520			3\$:	040400!<5*20>		;BR - 2A
032600	104414				ROMCLK		;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032602	061224				61224		;MOVE BR TO PORT4
032604	111205				MOVB	(R2),R5	;PUT "EXPECTED" IN R5
032606	116104	000004			MOVB	4(R1),R4	;PUT "FOUND" IN R4
032612	120504				CMPB	R5,R4	;DATA CORRECT?
032614	001401				BEQ	4\$;BR IF YES
032616	104015				EMT	'5	;ALU ERROR
032620	104401			4\$:	SCOPI		;SW09=1?
032622	005202				INC	R2	;NEXT DATA
032624	005200				INC	R0	;NEXT ADDRESS
032626	022700	000010			CMP	#10,R0	;DONE YET?
032632	001342				BNE	1\$;BR IF NO
032634	104400				SCOPE		;SCOPE THIS TEST
032636	000	000	376	5\$:	.BYTE	0,0,376,376,252,252,124,124	
032641	376	252	252				
032644	124	124					

.EVEN

102

***** TEST 132 *****
 ;*ALU TEST

```

; *TEST OF ALU FUNCTION A PLUS C WITH C BIT SET
; *ALU FUNCTION (A PLUS C) CODE=4
; *LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
; *PERFORM THE FUNCTION, VERIFY THE RESULTS
; :*****

```

; TEST 132

```

032646 012737 000132 001226 TST132: MOV #132,TSTNO
032654 012737 033022 001216 MOV #TST133,NEXT
032662 012737 032714 001220 MOV #1$.LOCK

                                ;R1 CONTAINS BASE DMC11 ADDRESS
032670 104412 MSTCLR ;MASTER CLEAR DMC11
032672 005000 CLR R0 ;MEM + SP ADDRESS
032674 012702 033012 MOV #5$,R2 ;POINTER TO CORRECT DATA
032 00 004737 034726 JSR PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY
032704 035052 MEMDAT ;POINTER TO DATA
032706 004737 034762 JSR PC,SPLD ;LOAD 8 WORDS OF SP
032712 035062 SPDAT ;POINTER TO DATA
032714 004737 035040 1$: JSR PC,SETC ;SET C BIT!
032720 042737 000017 032734 BIC #17,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
032726 050037 032734 BIS R0,2$ ;ADD ADDRESS TO INSTRUCTION
032732 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032734 010000 2$: 010000 ;LOAD MAR
032736 042737 000017 032752 BIC #17,3$ ;CLEAR ADDRESS OF INSTRUCTION
032744 050037 032752 BIS R0,3$ ;ADD ADDRESS TO INSTRUCTION
032750 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032752 040500 3$: 040400!<4*20> ;BR A PLUS C
032754 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032756 061224 61224 ;MOVE BR TO PORT4
032760 111205 MOVB (R2),R5 ;PUT "EXPECTED" IN R5
032762 116104 000004 MOVB 4(R1),R4 ;PUT "FOUND" IN R4
032766 120504 CMPB R5,R4 ;DATA CORRECT?
032770 001401 BEQ 4$ ;BR IF YES
032772 104015 EMT 15 ;ALU ERROR
032774 104401 4$: SCOP1 ;SW09=1?
032776 005202 INC R2 ;NEXT DATA
033000 005200 INC R0 ;NEXT ADDRESS
033002 022700 000010 CMP #10,R0 ;DONE YET?
033006 001342 BNE 1$ ;BR IF NO
033010 104400 SCOPE ;SCOPE THIS TEST
033012 001 001 000 5$: .BYTE 1,1,0,0,126,126,253,253
033015 000 126 126
033020 253 253

```

.EVEN

103

```

;***** TEST 133 *****
; *ALU TEST
; *TEST OF ALU FUNCTION 2'S COMP SUB WITH C BIT SET
; *ALU FUNCTION (A-B-1) CODE=17
; *LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
; *PERFORM THE FUNCTION, VERIFY THE RESULTS
; :*****

```

; TEST 133

```

033022 012737 000133 001226 TST133: MOV #133,TSTNO
033030 012737 033176 001216 MOV #TST134,NEXT
033036 012737 033070 001220 MOV #1$,LOCK

;R1 CONTAINS BASE DMC11 ADDRESS
033044 104412 MSTCLR ;MASTER CLEAR DMC11
033046 005000 CLR R0 ;MEM + SP ADDRESS
033050 012702 033166 MOV #5$,R2 ;POINTER TO CORRECT DATA
033054 004737 034726 JSR PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY
033060 035052 MEMDAT ;POINTER TO DATA
033062 004737 034762 JSR PC,SPLD ;LOAD 8 WORDS OF SP
033066 035062 SPDAT ;POINTER TO DATA
033070 004737 035040 1$: JSR PC,SETC ;SET C BIT!
033074 042737 000017 033110 BIC #17,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
033102 050037 033110 BIS R0,2$ ;ADD ADDRESS TO INSTRUCTION
033106 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033110 010000 010000 2$: ;LOAD MAR
033112 042737 000017 033126 BIC #17,3$ ;CLEAR ADDRESS OF INSTRUCTION
033120 050037 033126 BIS R0,3$ ;ADD ADDRESS TO INSTRUCTION
033124 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033126 040760 3$: 040400!<17*20> ;BR - 2'S COMP SUB
033130 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033132 061224 61224 ;MOVE BR TO PORT4
033134 111205 MOVB (R2),R5 ;PUT "EXPECTED" IN R5
033136 116104 000004 MOVB 4(R1),R4 ;PUT "FOUND" IN R4
033142 120504 CMPB R5,R4 ;DATA CORRECT?
033144 001401 BEQ 4$ ;BR IF YES
033146 104015 EMT 15 ;ALU ERROR
033150 104401 4$: SCOPE1 ;SW09=1?
033152 005202 INC R2 ;NEXT DATA
033154 005200 INC R0 ;NEXT ADDRESS
033156 022700 000010 CMP #10,R0 ;DONE YET?
033162 001342 BNE 1$ ;BR IF NO
033164 104400 SCOPE ;SCOPE THIS TEST
033166 377 000 376 5$: .BYTE -1,0,376,-1,-1,252,124,-1
033171 377 377 252
033174 124 377

.EVEN

```

104

```

;***** TEST 134 *****
;*ALU TEST
;*TEST OF ALU FUNCTION DEC A WITH C BIT SET
;*ALU FUNCTION (A-1) CODE=7
;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
;*PERFORM THE FUNCTION, VERIFY THE RESULTS
;:*****

```

; TEST 134

```

033176 012737 000134 001226 TST134: MOV #134,TSTNO
033204 012737 033352 001216 MOV #TST135,NEXT
033212 012737 033244 001220 MOV #1$,LOCK

;R1 CONTAINS BASE DMC11 ADDRESS
033220 104412 MSTCLR ;MASTER CLEAR DMC11
033222 005000 CLR R0 ;MEM + SP ADDRESS
033224 012702 033342 MOV #5$,R2 ;POINTER TO CORRECT DATA
033230 004737 034726 JSR PC,MEMLD ;LOAD 8 WORDS OF MAIN MEMORY

```

```
033234 035052 MEMDAT ; POINTER TO DATA
033236 004737 034762 JSR PC,SPLD ; LOAD 8 WORDS OF SP
033242 035062 SPDAT ; POINTER TO DATA
033244 004737 035040 1#: JSR PC,SETC ; SET C BIT!
033250 042737 000017 033264 BIC #17,2# ; CLEAR ADDRESS FIELD OF INSTRUCTION
033256 050037 033264 BIS RO,2# ; ADD ADDRESS TO INSTRUCTION
033262 104414 ROMCLK ; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033264 010000 010000 2#: ; LOAD MAR
033266 042737 000017 033302 BIC #17,3# ; CLEAR ADDRESS OF INSTRUCTION
033274 050037 033302 BIS RO,3# ; ADD ADDRESS TO INSTRUCTION
033300 104414 ROMCLK ; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033302 040560 040400!<7*20> 3#: ; BR - DEC A
033304 104414 RDMCLK ; NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033306 061224 61224 ; MOVE BR TO PORT4
033310 111205 MOV (R2),R5 ; PUT "EXPECTED" IN R5
033312 116104 000004 MOVB 4(R1),R4 ; PUT "FOUND" IN R4
033316 120504 CMPB R5,R4 ; DATA CORRECT?
033320 001401 BEQ 4# ; BR IF YES
033322 104015 EMT 15 ; ALU ERROR
033324 104401 4#: SCOP1 ; SW09=1?
033326 005202 INC R2 ; NEXT DATA
033330 005200 INC RO ; NEXT ADDRESS
033332 022700 000010 CMP #10,RO ; DONE YET?
033336 001342 BNE 1# ; BR IF NO
033340 104400 SCOPE ; SCOPE THIS TEST
033342 377 377 376 5#: .BYTE -1,-1,376,376,124,124,251,251
033345 376 124 124
033350 251 251
```

105

.EVEN

```
***** TEST 135 *****
;*TEST OF PROGRAM CLOCK BIT
;*DO A MASTER CLEAR, WRITE THE PROGRAM CLOCK BIT TO A ONE,
;*VERIFY THAT IT CLEARS, AND THEN SETS SOME TIME LATER
:*****
```

; TEST 135

```
033352 012737 000135 001226 TST135: MOV #135,TSTNO
033360 012737 033544 001216 MOV #TST136,NEXT
033366 104412 MSTCLR ; R1 CONTAINS BASE DMC11 ADDRESS
033370 005037 001416 CLR TEMP ; MASTER CLEAR DMC11
033374 005037 001246 CLR TEMP1 ; PREPARE FOR
033400 012702 000011 MOV #11,R2 ; DELAY
033404 012761 000020 000004 1#: MOV #20,4(R1) ; SAVE FOR TYPEOUT
033412 152761 000002 000001 MOV #121111,6(R1) ; LOAD PORT 4
033420 012761 121111 000006 BISB #BIT1:BIT0,1(R1) ; SET ROMI
033426 152761 000003 000001 MOV #121111,6(R1) ; SEL6 - INSTRUCTION
033434 012761 121224 000006 BISB #BIT1:BIT0,1(R1) ; SET CLOCK BIT
033442 152761 000003 000001 MOV #121224,6(R1) ; LOAD NEXT INSTRUCTION
033450 142761 000003 000001 BISB #BIT1:BIT0,1(R1) ; READ CLOCK BIT
033456 016104 000004 BICB #BIT1:BIT0,1(R1) ; CLEAR MAINT BITS
033462 005005 MOV 4(R1),R4 ; PUT "FOUND" IN R4
033464 120504 CLR R5 ; PUT "EXPECTED" IN R5
033466 001401 CMPB R5,R4 ; IS PGM CLOCK CLEAR?
BEQ 2#
```

```

033470 104016          EMT      16          ;ERROR, PGM CLOCK IS NOT CLEAR
033472                2#:          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033472 104414          121224          ;PORT4_LU11
033474 121224          CMPB     #20,4(R1)        ;IS PGM CLOCK SET?
033476 122761 000020 000004          BEQ      3#          ;BR IF YES
033504 001416          ADD      #1,TEMP          ;INCREMENT DELAY
033506 062737 000001 001416          ADC      TEMP1          ;INCREMENT DELAY
033514 005537 001246          CMP      #6,TEMP1        ;IS DELAY DONE
033520 022737 000006 001246          BNE     2#          ;BR IF NO
033526 001361          MOV      #20,R5          ;PUT "EXPECTED" IN R5
033530 012705 000020          MOV      4(R1),R4        ;PUT "FOUND" IN R4
033534 016104 000004          EMT      16          ;ERROR PGM CLOCK NOT SET
033540 104016          3#:          SCOPE          ;SCOPE THIS TEST
033542 104400

```

106

```

;***** TEST 136 *****
;*FORCE POWER FAIL TEST
;*SET FORCE POWER FAIL BIT VERIFY THAT PROCESSOR TRAPS TO 24
;*GOING DOWN AND COMING UP, VERIFY ALSO THAT BUS INIT WAS
;*BLOCKED FROM GETTING TO THE DMC DURING THE POWER FAIL
;*THIS TEST MAY HANG ON SOME PROCESSORS IF AN M9301 IS PRESENT.
;*TO AVOID HANGING SW02 (POWER ON REBOOT ENABLE) ON THE M9301
;*MUST BE IN THE OFF POSITION. THIS TEST WILL ALSO FAIL IF THE
;*CPU POWER FAIL VECTOR IS SET TO ANY LOCATION OTHER THAN 24.
;*IF THIS TEST HANGS OR FAILS DUE TO EITHER REASON ABOVE THE
;*FOLLOWING PATCH MAY BE INSTALLED TO SKIP THIS TEST:
;*
;*      LOC 33362      WAS 33544      SB 33736
;*****

```

; TEST 136

```

033544 012737 000136 001226 TST136: MOV      #136,TSTNO
033552 012737 033766 001216          MOV      #TST137,NEXT
;R1 CONTAINS BASE DMC11 ADDRESS
033560 104412          MSTCLR          ;MASTER CLEAR DMC11
033562 005037 001416          CLR      TEMP          ;PREPARE FOR DELAY
033566 013746 000024          MOV      #024,-(SP)    ;STORE POWER FAIL ADDRESS
033572 012737 033636 000024          MOV      #1#,#024      ;SET UP FOR FORCE POWER FAIL
033600 012761 000002 000004          MOV      #2,4(R1)      ;LOAD PORT4
033606 012711 001000          MOV      #BIT9,(R1)    ;SET ROMI
033612 012761 121111 000006          MOV      #121111,6(R1) ;LOAD INSTRUCTION
033620 012711 001400          MOV      #BIT9:BIT8,(R1);CLOCK INSTRUCTION
033624 005237 001416          5#:          INC      TEMP          ;WAIT FOR POWER FAIL
033630 001375          BNE     5#          ;BR IF DELAY NOT DONE
033632 104017          EMT      17          ;ERROR, NO POWER FAIL
033634 000426          BR      4#
033636 012747 033654 000024 1#:          MOV      #3#,#024      ;POWER UP ADDRESS
033644 010637 033652          MOV      SP,2#          ;STORE STACK
033650 000000          HALT          ;WAIT FOR POWER UP SEQUENCE
033652 000000          2#:          0
033654 013706 033652          3#:          MOV      2#,SP          ;RESTORE STACK
033660 022626          POP2SP          ;POP STACK TWICE
033662 012637 000024          MOV      (SP)+,#024    ;RESTORE TRUE POWER FAIL ADDRESS
033666 022737 005336 000024          CMP      #.PFAIL,#024 ;IS IT CORRECT?
033674 001406          BEQ     4#          ;BR IF YES

```

```

033676 104017          EMT      17          ;ERROR, STACK IS INCORRECT
033700 012737 005336 000024 MOV      @.PFAIL,@#24 ;RESTORE TRUE POWER FAIL ADDRESS
033706 012706 001200          MOV      @STACK,SP   ;RESTORE STACK
033712 005737 006042          TST      @#42        ; CHECK FOR ACT-11 OR DDP
033716 001407          BEQ      7#          ;
033720 012701 000140          MOV      @140, R1
033724 005000          6# : CLR      R0          ; DELAY TO WAIT FOR RK05 TO BECOME
033726 005300          8# : DEC      R0          ; READY AFTER POWER FAIL
033730 001375          BNE      8#
033732 005301          DEC      R1
033734 001373          BNE      6#
033736 013701 001404          7# : MOV      DMCSR,R1 ;RESTORE ADDRESS. R1 CLOBBERED ON 11/84 PWRFAIL
033742 012711 063000          MOV      @BIT9:BIT10,(R1);SEL6 = MAINT IR
033746 012705 121111          MOV      @121111,R5 ;R5 = EXPECTED
033752 016104 000004          MOV      4(R1),R4   ;R4 = FOUND
033756 020504          CMP      R5,R4      ;MAINT IR SHOULD = 12111
033760 001401          BEQ      .-4        ;BR IF OK
033762 104025          EMT      25        ;IF = 0 THEN BUS INIT WAS
                                ;NOT BLOCKED FROM CLEARING
                                ;THE DMC-11
                                ;SCOPE THIS TEST

```

107 033764 104400

SCOPE ;SCOPE THIS TEST

```

;***** TEST 137 *****
;*MICRO-PROCESSOR NOISE TEST
;*WRITE ALL ZERO'S THEN ALL ONE'S THEN A DATA PATTERN
;*TO THE IBUS* AND IBUS REGISTERS AND TO THE SP AND MAIN MEM
;*THEN GO BACK AND READ THE DATA PATERNS TO VERIFY THAT
;*READING AND WRITING OF OTHER LOCATIONS AND REGISTERS
;*DID NOT CHANGE THE DATA.
;*****

```

; TEST 137

```

033766 012737 000137 001226 TST137: MOV      @137,TSTNO
033774 012737 003364 001216 MOV      @.EOP,NEXT

034002 104412          MSTCLR          ;R1 CONTAINS BASE DMC11 ADDRESS
034004 005002          CLR      R2      ;MASTER CLEAR DMC11
034006 042737 000017 034032 1# : BIC      @17,2#   ;R2 IS INDEX REGISTER
034014 156237 034626 034032 BIC      30#(R2),2# ;CLEAR ADDRESS FIELD
034022 116261 034634 000004 BIC      31#(R2),4(R1) ;ADD IBUS* REG ADDRESS TO INSTRUCTION
034030 104414          ROMCLK          ;LOAD PORT4
034032 121100          2# : ROMCLK 121100 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034034 005202          INC      R2      ;WRITE IBUS* REGISTER
034036 022702 000005          CMP      @5,R2   ;INC INDEX REGISTER
034042 001361          BNE      1#      ;DONE YET?
034044 005002          CLR      R2      ;BR IF NO
034046 042737 000017 034112 3# : BIC      @17,4#   ;R2 IS IBUS REGISTER ADDRESS
034054 042737 000017 034124 BIC      @17,5#   ;CLEAR ADDRESS FIELD OF INSTRUCTIONS
034062 042737 000017 034134 BIC      @17,6#
034070 050237 034112          BIS      R2,4#   ;ADD IBUS REG ADDRESS TO INSTRUCTION
034074 050237 034124          BIS      R2,5#
034100 050237 034134          BIS      R2,6#
034104 105061 000004          CLR      4(R1)   ;CLEAR PORT4
034110 104414          ROMCLK          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034112 122100          4# : ROMCLK 122100 ;WRITE 0 TO IBUS REG

```

```

034114 112761 000377 000004      MOVB    #377,4(R1)      ;LOAD PORT4
034122 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034124 122100      5$:      122100      ;WRITE ALL ONES TO IBUS REG
034126 110261 000004      MOVB    R2,4(R1)      ;LOAD PORT4
034132 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034134 122100      6$:      122100      ;WRITE ITS OWN ADDRESS TO IBUS REG
034136 005202      INC      R2           ;NEXT ADDRESS
034140 022702 000010      CMP     #10,R2        ;DONE YET?
034144 001340      BNE     3$           ;BR IF NO
034146 005002      CLR     R2           ;START AT SP ADDRESS 0
034150 042737 000017 034214 7$:      BIC     #17,8$        ;CLEAR ADDRESS FIELD
034156 042737 000017 034226      BIC     #17,9$
034164 042737 000017 034236      BIC     #17,10$
034172 050237 034214      BIS     R2,8$        ;ADD ADDRESS TO INSTRUCTION
034176 050237 034226      BIS     R2,9$
034202 050237 034236      BIS     R2,10$
034206 105061 000004      CLR    4(R1)         ;CLEAR PORT4
034212 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034214 123100      8$:      123100      ;WRITE ZERO TO SP
034216 112761 000377 000004      MOVB    #377,4(R1)    ;LOAD PORT4
034224 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034226 123100      9$:      123100      ;WRITE ALL ONES TO SP
034230 110261 000004      MOVB    R2,4(R1)    ;LOAD PORT4
034234 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034236 123100      10$:     123100      ;WRITE SP ADDRESS TO ITSELF
034240 005202      INC      R2           ;NEXT SP ADDRESS
034242 022702 000020      CMP     #20,R2        ;DONE YET?
034246 001340      BNE     7$           ;BR IF NO
034250 005002      CLR     R2           ;R2 = MAIN MEM ADDRESS
034252 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034254 010000      010000      ;MAR = 0
034256 105061 000004      11$:     CLR    4(R1)         ;CLEAR PORT4
034262 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034264 122500      122500      ;WRITE ZEROS TO MEM
034266 112761 000377 000004      MOVB    #377,4(R1)    ;LOAD PORT4
034274 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034276 122500      122500      ;WRITE ONES TO MEM
034300 110261 000004      MOVB    R2,4(R1)    ;LOAD PORT4
034304 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034306 136500      136500      ;WRITE TO MEM IT OWN ADDRESS
034310 005202      INC      R2           ;NEXT MEM ADDRESS
034312 022702 000400      CMP     #400,R2      ;DONE YET?
034316 001357      BNE     11$         ;BR IF NO

;NOW GO BACK AND READ EVERYTHING

034320 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034322 010000      010000      ;MAR_0
034324 032737 100000 001366      BIT     #BIT15,STAT1 ;DMC?
034332 001402      BEQ     .+6         ;BR IF YES
034334 104414      ROMCLK      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034336 004000      4000      ;MAR HI = 0 (KMC ONLY)
034340 005000      CLR     R0           ;R0 IS INDEX REGISTER
034342 042737 000360 034400 12$:     BIC     #360,13$      ;CLEAR ADDRESS FIELD
034350 116002 034626      MOVB    30$(R0),R2   ;R2 = IBUS* ADDRESS
034354 010203      MOV     R2,R3        ;PUT IBUS* ADDRESS IN R3
034356 006303      ASL     R3           ;SHIFT ADDRESS TO BITS 4-7
  
```

034360	006303		ASL	R3		
034362	006303		ASL	R3		
034364	006303		ASL	R3		
034366	050337	034400	BIS	R3,13\$;AD, ADDRESS TO INSTRUCTION
034372	116005	034634	MOV#	31\$(R0),R5		;R5 = "EXPECTED"
034376	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034400	121004		121004		13\$:	;PORT4 = IBUS* REGISTER
034402	016104	000004	MOV	4(R1),R4		;R4 = "FOUND"
034406	120504		CMPB	R5,R4		;IBUS* CONTENTS OK?
034410	001401		BEQ	.+4		;BR IF YES
034412	104004		EMT	4		;IBUS* DATA ERROR
034414	005200		INC	R0		;INC COUNTER
034416	022700	000005	CMP	#5,R0		;DONE YET?
034422	001347		BNE	12\$;BR IF NO
034424	005002		CLR	R2		;R2 = IBUS REG ADDRESS
034426	042737	000360 034456	BIC	#360,15\$	14\$:	;CLEAR ADDRESS FIELD OF INSTRUCTION
034434	010203		MOV	R2,R3		;R3 = IBUS ADDRESS
034436	006303		ASL	R3		;SHIFT ADDRESS TO BITS 4-7
034440	006303		ASL	R3		
034442	006303		ASL	R3		
034444	006303		ASL	R3		
034446	050337	034456	BIS	R3,15\$;ADD ADDRESS TO INSTRUCTION
034452	010205		MOV	R2,R5		;R5 = "EXPECTED"
034454	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034456	021004		021004		15\$:	;PORT4 = IBUS REG
034460	016104	000004	MOV	4(R1),R4		;R4 = "FOUND"
034464	120504		CMPB	R5,R4		;IBUS CONTENTS OK?
034466	001401		BEQ	.+4		;BR IF YES
034470	104005		EMT	5		;IBUS DATA ERROR
034472	005202		INC	R2		;NEXT IBUS REGISTER
034474	022702	000010	CMP	#10,R2		;DONE YET?
034500	001352		BNE	14\$;BR IF NO
034502	005002		CLR	R2		;R2 = SP ADDRESS
034504	042737	000017 034520	BIC	#17,17\$	16\$:	;CLEAR ADDRESS FIELD OF INSTRUCTION
034512	050237	034520	BIS	R2,17\$;ADD ADDRESS TO INSTRUCTION
034516	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034520	040600		040600		17\$:	;BR = SP
034522	010205		MOV	R2,R5		;R5 = "EXPECTED"
034524	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034526	061224		061224			;PORT4 = BR
034530	016104	000004	MOV	4(R1),R4		;R4 = "FOUND"
034534	120504		CMPB	R5,R4		;SP CONTENTS OK?
034536	001401		BEQ	.+4		;BR IF YES
034540	104007		EMT	7		;SP DATA ERROR
034542	005202		INC	R2		;NEXT SP LOCATION
034544	022702	000020	CMP	#20,R2		;DONE YET?
034550	001355		BNE	16\$;BR IF NO
034552	005002		CLR	R2		;R2 = MEMORY ADDRESS
034554	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034556	010000		010000			;MAR = 0
034560	032737	100000 001366	BIT	#BIT15,STAT1		;DMC?
034566	001402		BEQ	.+6		;BR IF YES
034570	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034572	004000		4000			;MAR HI = 0 (KMC ONLY)
034574	010205		MOV	R2,R5	18\$:	;R5 = "EXPECTED"
034576	104414		ROMCLK			;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034600	055224		055224			;PORT4 = MAIN MEM


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034602 016104 000004      MOV      4(R1),R4      ;R4 = "FOUND"
034606 120504              CMPB     R5,R4        ;MAIN MEM CONTENTS OK?
034610 001401              BEQ      .+4          ;BR IF YES
034612 1C4013              EMT      13          ;MAIN MEM DATA ERROR
034614 005202              INC      R2          ;NEXT MEM ADDRESS
034616 022702 000400      CMP      #400,R2     ;DONE YET?
034622 001364              BNE      18$         ;BR IF NO
034624 104400              SCOPE    0,2,3,5,10 ;SCOPE THIS TEST
034626      000      002 003 30$: .BYTE 0,2,3,5,10
034631      005      010              .EVEN
034634      001      003 004 31$: .BYTE 1,3,4,6,10
034637      006      010              .EVEN

110
111
112
113
114
115 034642              SETVEC:
116                      ;THIS SUBROUTINE LOADS THE VECTORS AND VECTOR LEVELS
117
118 034642 012577 144526      MOV      (R5)+,@DMRVEC ;LOAD BASE VECTOR
119 034646 012577 144526      MOV      (R5)+,@DMTVEC ;LOAD VECTOR + 2
120 034652 112577 144520      MOVB     (R5)+,@DMRLVL ;LOAD VECTOR + 4
121 034656 112577 144520      MOVB     (R5)+,@DMTLVL ;LOAD VECTOR + 6
122 034662 000205              RTS      R5          ;RETURN
123
124
125 034664              NPRSET:
126                      ;THIS SUBROUTINE LOADS IBUS REGISTERS 0-7
127                      ;WITH NPR INFORMATION (INBA, OUTBA, OUT DATA)
128
129 034664 010246              MOV      R2,-(SP)     ;SAVE R2
130 034666 005002              CLR      R2          ;START AT IBUS REG 0
131 034670 112561 000004 034710 1$: MOVB     (R5)+,4(R1)  ;LOAD PORT4
132 034674 042737 000017 034710 BIC      #17,2$      ;CLEAR ADDRESS FIELD OF INSTRUCTION
133 034702 050237 034710      BIS      R2,2$      ;ADD ADDRESS TO INSTRUCTION
134 034706 104414              ROMCLK   122100     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
135 034710 122100 2$:          ;MOVE PORT4 TO IBUS REG
136 034712 005202              INC      R2          ;NEXT ADDRESS
137 034714 022702 000010      CMP      #10,R2     ;ALL DONE?
138 034720 001363              BNE      1$         ;BR IF NO
139 034722 012602              MOV      (SP)+,R2    ;RESTORE R2
140 034724 000205              RTS      R5          ;RETURN
141
142
143 034726              MEMLD:
144                      ;THIS SUBROUTINE LOADS THE FIRST 8 LOCATIONS OF MAIN
145                      ;MEMORY WITH THIS DATA: 0,-1,.0,-1,125,252,125,252
146
147 034726 013605              MOV      @ (SP)+,R5   ;PUT POINTER TO DATA IN R5
148 034730 062746 000002      ADD      #2,-(SP)    ;ADJUST STACK
149 034734 012704 000010      MOV      #10,R4     ;DO 8 LOADS
150 034740 104414              ROMCLK   010000     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
151 034742 010000              ;MAR < 0
152 034744 112577 144442 1$: MOVB     (R5)+,@DMP04 ;LOAD PORT4

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```

153 034750 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
154 034752 136500 136500 ;MOV DATA TO MEM, AUTO INC MAR
155 034754 005304 DEC R4 ;DECREMENT COUNT
156 034756 001372 BNE 1$ ;BR IF NOT DONE
157 034760 000207 RTS PC ;RETURN
158
159
162 034762 SPLD: ;THIS SUBROUTINE LOADS THE FIRST 8 SCRATCH PAD
163 ;LOCATIONS WITH: 0,0, 1,-1,125,125,252,252
164
165
166 034762 013605 MOV @ (SP)+,R5 ;PUT POINTER TO DATA IN R5
167 034764 062746 000002 ADD #2,-(SP) ;ADJUST STACK
168 034770 005004 CLR R4 ;START AT SP ADDRESS 0
169 034772 112577 144414 1$: MOVB (R5)+,@DMP04 ;LOAD PORT4 WITH DATA
170 034776 042737 000017 035012 BIC #17,2$ ;CLEAR ADDRESS FIELD OF INSTRUCTION
171 035004 050437 035012 BIS R4,2$ ;ADD ADDRESS TO INSTRUCTION
172 035010 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
173 035012 123100 2$: 123100 ;MOVE DATA TO SP
174 035014 005204 INC R4 ;INCREMENT COUNT
175 035016 022704 000010 CMP #10,R4 ;DONE YET?
176 035022 001363 BNE 1$ ;BR IF NO
177 035024 000207 RTS PC ;RETURN
178
179
180 035026 CLRC: ;THIS SUBROUTINE CLEARS THE MICRO PROCESSOR C BIT
181
182
183 035026 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
184 035030 010000 010000 ;MAR_0
185 035032 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
186 035034 040400 040400!<0*20> ;CLEAR C BIT
187 035036 000207 RTS PC ;RETURN
188
189
190 035040 SETC: ;THIS SUBROUTINE SETS THE MICRO PROCESSOR C BIT
191
192
193 035040 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
194 035042 010003 010003 ;MAR_3
195 035044 104414 ROMCLK ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
196 035046 040403 040403!<0*20> ;SET C BIT
197 035050 000207 RTS PC ;RETURN
198
199
200 035052 000 377 000 MEMDAT: .BYTE 0,-1,0,-1,125,252,125,252
035055 377 125 252
035060 125 252
201 035062 000 000 377 SPDAT: .BYTE 0,0,-1,-1,125,125,252,252
035065 377 125 125
035070 252 252
202 .EVEN
207 035072 377 125 116 EM1: .ASCIZ <377>/UNIBUS REGISTER ADDRESSING TIME-OUT/
208 035137 377 125 116 EM2: .ASCIZ <377>/UNIBUS REGISTER WRITE, READ TEST/
209 035201 377 115 111 EM3: .ASCIZ <377>/MICRO PROCESSOR TEST/
210 035227 377 115 111 EM4: .ASCIZ <377>/MICRO PROCESSOR WRITE, READ TEST/
211 035271 377 102 122 EM5: .ASCIZ <377>/BR REGISTER TEST/

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212	035313	377	123	103	EM6:	.ASCIZ	<377>/SCRATCH PAD TEST/		
213	035335	377	104	105	EM7:	.ASCIZ	<377>/DEVICE FAILED TO INTERRUPT/		
214	035371	377	104	105	EM10:	.ASCIZ	<377>/DEVICE INTERRUPTED TO WRONG VECTOR/		
215	035435	377	116	120	EM11:	.ASCIZ	<377>/NPR TEST/		
216	035447	377	115	101	EM12:	.ASCIZ	<377>/MAIN MEMORY TEST/		
217	035471	377	115	101	EM13:	.ASCIZ	<377>/MAR TEST/		
218	035503	377	101	114	EM14:	.ASCIZ	<377>/ALU TEST/		
219	035515	377	120	122	EM15:	.ASCIZ	<377>/PROGRAM CLOCK TEST/		
220	035541	377	106	117	EM16:	.ASCIZ	<377>/FORCE POWER FAIL ERROR/		
221	035571	377	125	116	EM17:	.ASCIZ	<377>/UNEXPECTED INTERRUPT/		
222	035617	377	104	115	EM20:	.ASCIZ	<377>/DMC11 CONFIGURATION ERROR/		
223	035652	377	115	101	EM21:	.ASCIZ	<377>/MAINTENANCE INSTRUCTION REGISTER TEST/		
224	035721	377	120	117	EM22:	.ASCIZ	<377>/POWER FAIL INITIALIZE FAILURE/		
225									
226	035760	377	122	105	DH1:	.ASCIZ	<377>/REGISTER	TRAPPED FROM/	
227	036021	377	105	130	DH2:	.ASCIZ	<377>/EXPECTED FOUND	REGISTER/	
228	036057	377	105	130	DH3:	.ASCIZ	<377>/EXPECTED FOUND/		
229	036100	377	105	130	DH4:	.ASCIZ	<377>/EXPECTED FOUND	IBUS* REGISTER/	
230	036142	377	105	130	DH5:	.ASCIZ	<377>/EXPECTED FOUND	IBUS REGISTER/	
231	036203	377	105	130	DH6:	.ASCIZ	<377>/EXPECTED FOUND	ADDRESS/	
232						.EVEN			
233									
234	036240	000002			DT1:	2			
235	036242	006	015			.BYTE	6.15		
236	036244	001262				SAVR1			
237	036246	006	002			.BYTE	6.2		
238	036250	001264				SAVR2			
239	036252	000003			DT2:	3			
240	036254	006	004			.BYTE	6.4		
241	036256	001272				SAVR5			
242	036260	006	004			.BYTE	6.4		
243	036262	001270				SAVR4			
244	036264	006	002			.BYTE	6.2		
245	036266	001262				SAVR1			
246	036270	000002			DT3:	2			
247	036272	006	004			.BYTE	6.4		
248	036274	001272				SAVR5			
249	036276	006	002			.BYTE	6.2		
250	036300	001270				SAVR4			
251	036302	000003			DT4:	3			
252	036304	003	007			.BYTE	3.7		
253	036306	001272				SAVR5			
254	036310	003	011			.BYTE	3.11		
255	036312	001270				SAVR4			
256	036314	002	002			.BYTE	2.2		
257	036316	001264				SAVR2			
258	036320	000003			DT5:	3			
259	036322	003	007			.BYTE	3.7		
260	036324	001272				SAVR5			
261	036326	003	007			.BYTE	3.7		
262	036330	001270				SAVR4			
263	036332	006	002			.BYTE	6.2		
264	036334	001264				SAVR2			
265	036336	000002			DT6:	2			
266	036340	003	007			.BYTE	3.7		
267	036342	001272				SAVR5			
268	036344	003	002			.BYTE	3.2		

269	036346	001270			SAVR4		
270	036350	000002			DT7:	2	
271	036352	006	004		.BYTE	6.4	
272	036354	001262			SAVR1		
273	036356	006	002		.BYTE	6.2	
274	036360	001404			DMCSR		
275	036362				.ERRTAB:		
276	036362	000000			0		
277	036364	000000			0		
278	036366	000000			0		
279	036370	035072			EM1		
280	036372	035760			DH1	:EMT	1
281	036374	036240			DT1		
282	036376	035137			EM2		
283	036400	036021			DH2	:EMT	2
284	036402	03E252			DT2		
285	036404	035201			EM3		
286	036406	036057			DH3	:EMT	3
287	036410	036270			DT3		
288	036412	035227			EM4		
289	036414	036100			DH4	:EMT	4
290	036416	036302			DT4		
291	036420	035227			EM4		
292	036422	036142			DH5	:EMT	5
293	036424	036302			DT4		
294	036426	035271			EM5		
295	036430	036057			DH3	:EMT	6
296	036432	036336			DT6		
297	036434	035313			EM6		
298	036436	036203			DH6	:EMT	7
299	036440	036320			DT5		
300	036442	035335			EM7		
301	036444	000000			0	:EMT	10
302	036446	000000			0		
303	036450	035371			EM10		
304	036452	000000			0	:EMT	11
305	036454	000000			0		
306	036456	035435			EM11		
307	036460	036057			DH3	:EMT	12
308	036462	036270			DT3		
309	036464	035447			EM12		
310	036466	036203			DH6	:EMT	13
311	036470	036320			DT5		
312	036472	035471			EM13		
313	036474	036203			DH6	:EMT	14
314	036476	036320			DT5		
315	036500	035503			EM14		
316	036502	036057			DH3	:EMT	15
317	036504	036336			DT6		
318	036506	035515			EM15		
319	036510	036100			DH4	:EMT	16
320	036512	036302			DT4		
321	036514	035541			EM16		
322	036516	000000			0	:EMT	17
323	036520	000000			0		
324	036522	035571			EM17		
325	036524	000000			0	:EMT	20

326	036526	000000	0		
327	036530	035435	EM11		
328	036532	036203	DH6	:EMT	21
329	036534	036320	DT5		
330	036536	035617	EM20		
331	036540	036057	DH3	:EMT	22
332	036542	036350	DT7		
333	036544	035652	EM21		
334	036546	036057	DH3	:EMT	23
335	036550	036270	DT3		
336	036552	035617	EM20		
337	036554	000000	0	:EMT	24
338	036556	000000	0		
339	036560	035721	EM22		
340	036562	036057	DH3	:EMT	25
341	036564	036270	DT3		
342					
343					
344	036566		.EVEN		
349		000001	CORMAX:		
			.END		

ADRCNT	004373	DH5	036142	DMS213	001634	ERCT06	001734	MPFAIL	005675
AUDONE	003024	DH6	036203	DMS214	001644	ERCT07	001740	MQM	005666
AUSTRT	002446	DISPLA	001200	DMS215	001654	ERCT10	001744	MR	005755
AUTO.S	010512	DISPRE	000174	DMS216	001664	ERCT11	001750	MRESET	004000
BINWRD	004714	DMACTV	001306	DMS217	001674	ERCT12	001754	MSTCLR	104412
BIT0	000001	DMCM	007320	DMS300	001506	ERCT13	001760	MTITLE	001000
BIT1	000002	DMCR00	001500	DMS301	001516	ERCT14	001764	MTSTN	006130
BIT10	002000	DMCR01	001510	DMS302	001526	ERCT15	001770	MTSTPC	006031
BIT11	004000	DMCR02	001520	DMS303	001536	ERCT16	001774	MVECX	006100
BIT12	010000	DMCR03	001530	DMS304	001546	ERCT17	002000	NEXT	001216
BIT13	020000	DMCR04	001540	DMS305	001556	ERR	002700	NOACT	007154
BIT14	040000	DMCR05	001550	DMS306	001566	ERRCNT	001232	NODEV	002674
BIT15	100000	DMCR06	001560	DMS307	001576	ERRFLG	001325	NPRSET	034664
BIT2	000004	DMCR07	001570	DMS310	001606	ERRMSG	005172	NUM	006450
BIT3	000010	DMCR10	001600	DMS311	001616	ERRPC	002770	OK	002646
BIT4	000020	DMCR11	001610	DMS312	001626	ERTAB0	005322	ONE	001302
BIT5	000040	DMCR12	001620	DMS313	001636	EXIT	000205	PACT00	001702
BIT6	000100	DMCR13	001630	DMS314	001646	EXITER	005252	PACT01	001706
BIT7	000200	DMCR14	001640	DMS315	001656	FLOAT	002536	PACT02	001712
BIT8	000400	DMCR15	001650	DMS316	001666	FY	002566	PACT03	001716
BIT9	001000	DMCR16	001660	DMS317	001676	HALTS	005222	PACT04	001722
BM	007054	DMCR17	001670	DMTLVL	001402	HLLIM	004366	PACT05	001726
BRLVL	012252	DMCSR	001404	DMTVEC	001400	ICOUNT	001222	PACT06	001732
BRW	003730	DMCSRH	001406	DM.END	001700	INBUF	007502	PACT07	001736
BRX	003732	DMCTL	001410	DM.MAP	001500	INCHAR	010020	PACT10	001742
CHRCNT	004712	DMNUM	001310	DONE	003734	INIFLG	001324	PACT11	001746
CKSWR	007606	DMP04	001412	DT1	036240	INSTR	104404	PACT12	001752
CKSWR1	007666	DMP06	001414	DT2	036252	INSTR	104403	PACT13	001756
CKSWR2	007700	DMRLVL	001376	DT3	036270	INSTR2	004166	PACT14	001762
CKSWR3	007704	DMRVEC	001374	DT4	036302	INTY	012266	PACT15	001766
CKSWR4	007710	DMS100	001502	DT5	036320	KMCM	007330	PACT16	001772
CKSWR5	010014	DMS101	001512	DT6	036336	LIMITS	004314	PACT17	001776
CLKX	001242	DMS102	001522	DT7	036350	LINE	007016	PARAM	104405
CLRC	035026	DMS103	001532	EM1	035072	LOBITS	004372	PARAM1	004234
CNERR	007277	DMS104	001542	EM10	035371	LOCK	001220	PARBIT	040000
CNT.MA	001702	DMS105	001552	EM11	035435	LOKFLG	001326	PARERR	004310
CNVRT	104411	DMS106	001562	EM12	035447	LOLIM	004364	PASCNT	001230
CONERR	007223	DMS107	001572	EM13	035471	LPCNT	001224	PERFOR	004537
CONN	007114	DMS110	001602	EM14	035503	LSTERR	001234	PFTAB	005430
CONTAB	002776	DMS111	001612	EM15	035515	MASKX	001244	POPRO	012600
CONVRT	104410	DMS112	001622	EM16	035541	MASTEK	006142	POP1SP	005726
CORMAX	036566	DMS113	001632	EM17	035571	MCRLF	005672	POP2SP	022626
CRAM	006606	DMS114	001642	EM2	035137	MCSRX	006072	PRI0	006547
CREAM	001320	DMS115	001652	EM20	035617	MDATA	007544	PS	177776
CSR	006510	DMS116	001662	EM21	035652	MEMDAT	035052	PUSHRO	010046
CSRMAP	010514	DMS117	001672	EM22	035721	MEMLD	034726	PUSH1S	005746
CYCLE	010060	DMS200	001504	EM3	035201	MEMLIM	001304	PUSH2S	024646
DATABP	005216	DMS201	001514	EM4	035227	MEPASS	005733	QV.FLG	001327
DATAACL	104415	DMS202	001524	EM5	035271	MERRPC	006217	RESREG	005220
DATAHD	005204	DMS203	001534	EM6	035313	MERRX	006117	RESTAR	005350
DELAY	104413	DMS204	001544	EM7	035335	MERR2	005760	RESTRT	003534
DEVADR	004370	DMS205	001554	ERCT00	001704	MERR3	006005	RES05	104407
DEVTAB	003010	DMS206	001564	ERCT01	001710	MILK	001322	RETURN	001214
DH1	035760	DMS207	001574	ERCT02	001714	MLOCK	006043	ROMCLK	104414
DH2	036021	DMS210	001604	ERCT03	001720	MNEW	006144	RUN	001316
DH3	036057	DMS211	001614	ERCT04	001724	MODU	006704	SAVACT	001312
DH4	036100	DMS212	001624	ERCT05	001730	MPASSX	006106	SAVNUM	001314

SAVPC	001276	SW11	= 004000	TST122	031106	TST43	017610	WRKO.F	005174
SAVRO	001260	SW12	= 010000	TST123	031262	TST44	017764	XBX	005000
SAVR1	001262	SW13	= 020000	TST124	031436	TST45	020140	XCSR	003546
SAVR2	001264	SW14	= 040000	TST125	031612	TST46	020314	XERR	003570
SAVR3	001266	SW15	= 100000	TST126	031766	TST47	020470	XHEAD	006224
SAVR4	001270	TDATA	024542	TST127	032142	TST5	012704	XLOC	003022
SAVR5	001272	TEMP	001416	TST13	013470	TST50	020644	XPASS	003562
SAVSP	001274	TEMP1	001246	TST130	032316	TST51	021072	XSTATQ	007454
SAV05	= 104406	TEMP2	001250	TST131	032472	TST52	021242	XTSTN	005330
SCOPE	= 104400	TEMP3	001252	TST132	032646	TST53	021510	XVEC	003554
SCOP1	= 104401	TEMP4	001254	TST133	033022	TST54	021732	ZERO	001300
SETC	035040	TEMP5	001256	TST134	033176	TST55	022026	\$CRAP	= 177777
SETVEC	034642	TIMER	= 104416	TST135	033352	TST56	022120	\$ENDAD	003522
SKIP	002632	TKCSR	001204	TST136	033544	TST57	022240	\$N	= 000137
SOFTSW	010052	TKDBR	001206	TST137	033766	TST6	013002	\$S	= 000141
SPACNT	= 004713	TLAST	= 033766	TST14	013566	TST60	022404	\$Y	= 000017
SPDAT	035062	TPCSR	001210	TST15	013664	TST61	022510	.BEGIN	003152
SPEED	007340	TPDBR	001212	TST16	013762	TST62	022624	.CNVRT	004472
SPLD	034762	TRPOK	004730	TST17	014060	TST63	022726	.CONVR	004466
STACK	= 001200	TSTNO	001226	TST2	012426	TST64	023064	.DATAC	005552
STAT	001240	TST1	012320	TST20	014156	TST65	023210	.DELAY	005436
STAT1	001366	TST10	013176	TST21	014254	TST66	023320	.EOP	003364
STAT2	001370	TST100	025256	TST22	014352	TST67	023426	.ERRTA	036362
STAT3	001372	TST101	025432	TST23	014450	TST7	013100	.HLT	004750
STRTSW	001236	TST102	025606	TST24	014546	TST70	023624	.INSTE	004154
SV05	004402	TST103	025762	TST25	014672	TST71	023752	.INSTR	004050
SWFLG	010016	TST104	026136	TST26	015016	TST72	024104	.INST1	004070
SWMES	007205	TST105	026312	TST27	015146	TST73	024304	.MSG	004072
SWMES1	007215	TST106	026466	TST3	012456	TST74	024440	.MSTCL	005466
SWR	001202	TST107	026642	TST30	015306	TST75	024552	.PARAM	004174
SWREG	000176	TST11	013274	TST31	015450	TST76	024726	.PFAIL	005336
SW00	= 000001	TST110	027016	TST32	015534	TST77	025102	.RES05	004434
SW01	= 000002	TST111	027172	TST33	015734	TTST	003612	.ROMCL	005504
SW02	= 000004	TST112	027346	TST34	016134	TWOSYN	= 010000	.SAV05	004374
SW03	= 000010	TST113	027522	TST35	016310	TYPDAT	005206	.SCOPE	003576
SW04	= 000020	TST114	027676	TST36	016464	TYPE	= 104402	.SCOP1	003736
SW05	= 000040	TST115	030052	TST37	016664	TYPMSG	005106	.START	002002
SW06	= 000100	TST116	030226	TST4	012606	VEC	006526	.TIMER	005616
SW07	= 000200	TST117	030402	TST40	017104	VECMAP	012010	.TRPSR	004716
SW08	= 000400	TST12	013372	TST41	017260	WHICH	012002	.TRPTA	001330
SW09	= 001000	TST120	030556	TST42	017434	WRDCNT	004710	.TYPE	003766
SW10	= 002000	TST121	030732						

. ABS. 036566 000
 000000 001

ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 53760 WORDS (210 PAGES)
 DYNAMIC MEMORY AVAILABLE FOR 71 PAGES
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