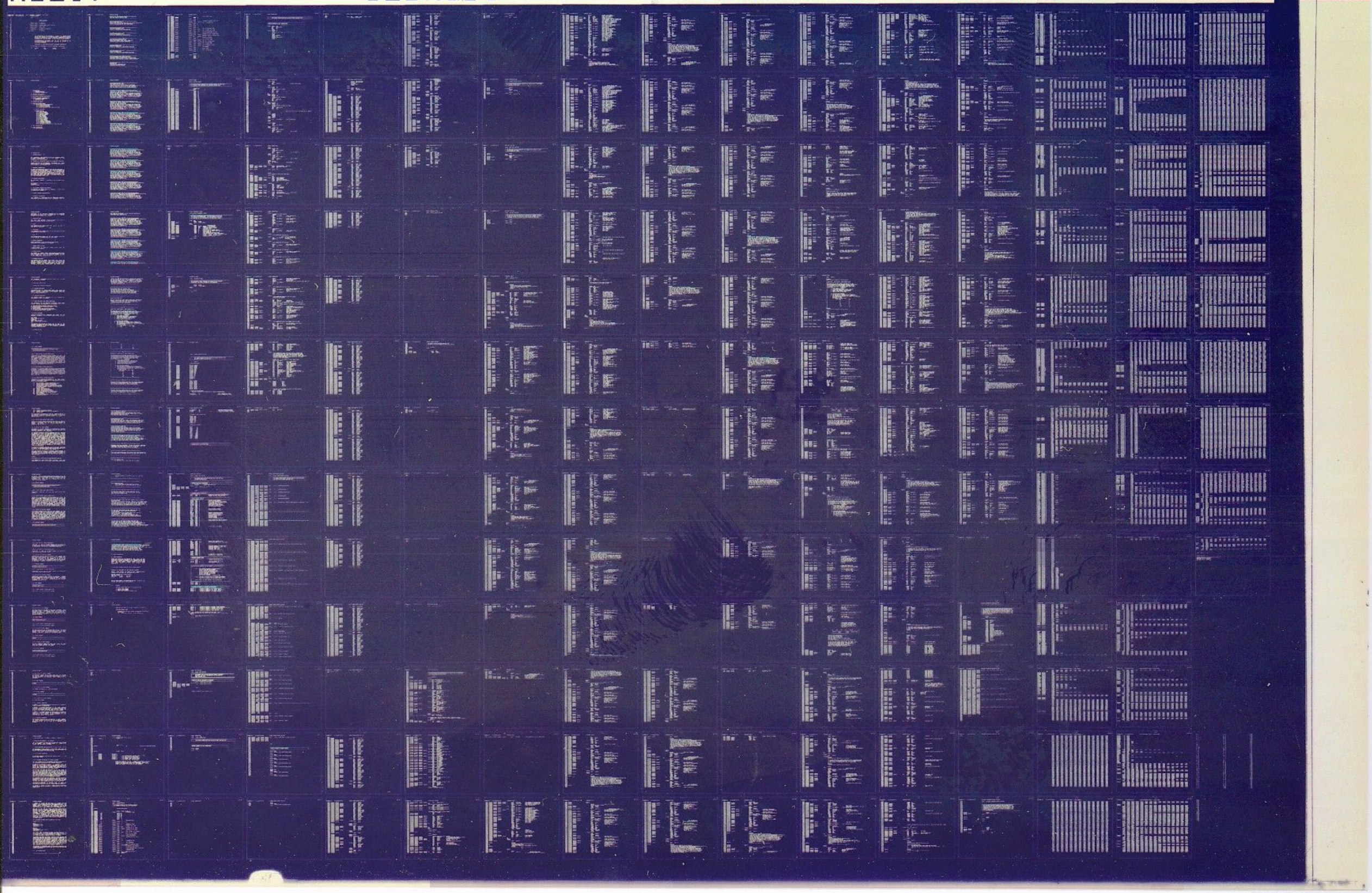
DMP-11,DMR-11, M8207 STATIC DIAG#2 AH-E229D-MC JUL 1982
M8207 CZDMQDO FICHE 1 OF 1



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                        IDENTIFICATION
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PRODUCT CODE:   AC-E228D-MC

PRODUCT NAME:   CZDMQDO M8207 STATIC DIAG #2

PRODUCT DATE:   APRIL 1982

MAINTAINER:     DIAGNOSTICS NERRIMACK

AUTHOR:         ED BADGER
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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PROGRAM ABSTRACT

THIS DIAGNOSTIC WAS DESIGNED TO TEST OUT THE M8200, M8204, OR M8207 MICROPROCESSOR. IT IS THE SECOND OF TWO DIAGNOSTICS FOR THESE OPTIONS.

THE PROGRAM WAS IMPLEMENTED USING THE DIAGNOSTIC SUPERVISOR.

THROUGH DIALOGUE WITH THE OPERATOR, THE PROGRAM WILL ALLOW MODIFICATION OF DEVICE PARAMETERS, SUCH AS UNIBUS ADDRESS, VECTOR ADDRESS, AND PROCESSOR TYPE.

1.2 HARDWARE INTRODUCTION

THE M820X MICROPROCESSOR USES AN EIGHT BIT DATA PATH WITH A SIXTEEN BIT INSTRUCTION MEMORY. THE INSTRUCTION MEMORY AND DATA MEMORY ARE TWO SEPARATE MEMORIES. THE MICROPROCESSOR IS DESIGNED FOR MOVING DATA AT HIGH RATES TO WORK AS A HIGH SPEED LINK BETWEEN PROCESSORS WHEN USED WITH A LINE UNIT. THE M8200 AND M8207 HAVE PROM INSTRUCTION MEMORIES. THE M8204 HAS WRITEABLE CONTROL STORE. THE MEMORY SIZES BETWEEN ALL THREE PROCESSORS VARY ALSO.

2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE M8207 LOGIC TESTS:

PDP-11/04,05.10.20,30,34,35,40,45,50,60, OR 70
16K MEMORY
CONSOLE TERMINAL

3.0 PRELIMINARY PROGRAM REQUIREMENTS

THE PROCESSOR AND MEMORY SHOULD BE THOROUGHLY TESTED PRIOR TO RUNNING THIS DIAGNOSTIC.

4.0 GENERAL PROGRAM CONSIDERATIONS

4.1 DIAGNOSTIC SUPERVISOR

THIS PROGRAM IS COMPATIBLE WITH THE STANDALONE DIAGNOSTIC SUPERVISOR, AND MUST BE LOADED TO BE CO-RESIDENT WITH THE

SUPERVISOR, OR BE PREVIOUSLY COMBINED WITH THE SUPERVISOR AND LOADED AS A SINGLE FILE. IN EITHER CASE, THE COMBINED PROGRAM WILL NOT EXCEED 16K OF MEMORY.

4.2 EXECUTION TIME

THE TOTAL TIME REQUIRED TO RUN THE M8207 STATIC TESTS IS ABOUT 120 SECONDS PER PASS FOR EACH UNIT.

4.3 XXDP+

THIS PROGRAM MAY BE LOADED UNDER XXDP+, AND MAY BE RUN IN DUMP MODE OR CHAIN MODE.

4.4 ACT/SLIDE

THIS PROGRAM MAY BE LOADED UNDER ACT OR SLIDE AND MAY BE RUN IN DUMP MODE OR CHAIN MODE.

4.5 APT

THIS PROGRAM MAY BE LOADED BY THE APT SYSTEM (INCLUDING APT-RD) AND RUN IN PROGRAM MODE OR SCRIPT MODE.

4.6 MEMORY MANAGEMENT

MEMORY MANAGEMENT IS NOT UTILIZED IN THIS PROGRAM. IF IT IS INSTALLED, IT IS DISABLED BY THE PROGRAM.

4.7 MEMORY PARITY OPTION

IF PARITY MEMORY IS INSTALLED, MEMORY PARITY TRAPS ARE DISABLED BY THE PROGRAM.

4.8 ERROR LOGGING

THE NUMBER OF ERRORS WHICH HAVE OCCURRED ON EACH DEVICE UNDER TEST SINCE THE LAST START OR RESTART COMMAND IS KEPT IN AN ERROR LOG. THIS LOG MAY BE PRINTED BY USING THE "PRINT" COMMAND (SEE SECTION 6.3.8).

5.0 PROGRAM LOAD MEDIA

THIS PROGRAM CAN BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER OR FROM ACT, SLIDE, OR APT SYSTEMS, OR FROM ANY MEDIA SUPPORTED BY XXDP+. WHEN USING THE PAPER TAPE ABSOLUTE LOADER, THE PROGRAM SHOULD BE LOADED FIRST, FOLLOWED BY THE DIAGNOSTIC SUPERVISOR. WHEN USING XXDP+,

THE DIAGNOSTIC SUPERVISOR SHOULD BE LOADED FIRST, FOLLOWED BY THE DIAGNOSTIC PROGRAM.

6.0 OPERATING INSTRUCTIONS

6.1 LOADING AND STARTING PROCEDURES

6.1.1 LOADING PROCEDURES

THIS PROGRAM MAY BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER. IT MAY ALSO BE LOADED FROM ANY XXDP+ LOAD MEDIA. WHEN LOADED UNDER XXDP+, THE DIAGNOSTIC SUPERVISOR WILL BE LOADED AUTOMATICALLY.

6.1.2 STARTING PROCEDURES

THE PROGRAM STARTS AT LOCATION 200. USE STANDARD DEC PROCEDURES TO START THE PROGRAM.

6.1.3 STEPS FOR QUICK AND SIMPLE EXECUTION

THE DIAGNOSTIC CAN BE EXECUTED STANDALONE UNDER XXDP+ WITHOUT READING THE REMAINDER OF THIS DOCUMENT, AS FOLLOWS:

A) LOAD AND START DIAGNOSTIC USING RUN COMMAND
B) RECEIVE DIAGNOSTIC SUPERVISOR PROMPT (DR>)
C) ENTER STA<CR>
D) ANSWER HARDWARE AND SOFTWARE QUESTIONS
E) GET END OF PASS MESSAGES OR ERROR MESSAGES
F) TO END EXECUTION, ENTER CONTROL/C

6.2 INITIAL DIALOGUE

AFTER THE PROGRAM AND THE SUPERVISOR ARE LOADED AND THE PROGRAM IS STARTED , THE FOLLOWING IDENTIFICATION IS TYPED:

```
DRS LOADED
DIAG.  RUN-TIME SERVICES
CZDMQ-D-0
M8207 DIAG.  #2 OF 2
UNIT IS M8200,M8204,OR M8207
DR>
```

THE OPERATOR THEN PROCEEDS BY TYPING ONE OR MORE OF THE COMMANDS DESCRIBED IN THE FOLLOWING SECTION 6.3.(FOR MORE DETAILED INFORMATION, REFER TO THE DIAGNOSTIC SUPERVISOR FUNCTIONAL SPECIFICATION).

6.3 PROGRAM OPTIONS

6.3.1 START COMMAND

```
*****************************************************************
STA(RT)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
   <FLAG-LIST>/EOP:<INCR>
*****************************************************************
```

6.3.1.1 TESTS SWITCH (/TESTS:<TEST-LIST>)

<TEST-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT SPECIFY THE TESTS TO BE EXECUTED. THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER IN THE DIAGNOSTIC. THEY MAY BE SPECIFIED IN ANY ORDER. TESTS WILL BE EXECUTED IN NUMERICAL ORDER REGARDLESS OF THE ORDER OF SPECIFICATION. THE DEFAULT IS TO EXECUTE ALL TESTS. ON THIS AND ALL SWITCHES, THE ANGLE BRACKETS <> ARE PUNCTUATION USED IN THE DEFINITION ONLY, AND ARE NOT TO BE TYPED BY THE OPERATOR. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.2 PASS SWITCH (/PASS:<PASS-CNT>)

<PASS-CNT> IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER OF PASSES. A PASS IS DEFINED AS THE EXECUTION OF THE FULL DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUBMITTED. THE DEFAULT IS NON-ENDING EXECUTION. IN THIS CASE EXIT FROM THE PROGRAM IS ACCOMPLISHED EITHER BY TYPING A CONTROL/C OR BY OCCURANCE OF AN ERROR WITH THE HALT ON ERROR FLAG BEING SET. THE EXIT IS A RETURN TO COMMAND MODE. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.3 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS A SEQUENCE OF ELEMENTS OF THE FORM <FLAG>, <FLAG=1>, OR <FLAG=0>, SEPARATED BY COLONS, WHERE <FLAG> HAS ONE OF THE FOLLOWING VALUES:

HOE	HALT ON ERROR, CAUSING COMMAND MODE TO BE ENTERED WHEN AN ERROR IS ENCOUNTERED
LOE	LOOP ON ERROR, CAUSING THE DIAGNOSTIC TO LOOP CONTINUOUSLY WITHIN THE SMALLEST DEFINED BLOCK OF CODING (SEGMENT, SUBTEST, OR TEST) CONTAINING THE ERROR
IER	INHIBIT ERROR REPORTING
IBE	INHIBIT BASIC ERROR REPORTS
IXE	INHIBIT EXTENDED ERROR REPORTS
PRI	DIRECT ALL MESSAGES TO A LINE PRINTER
PNT	PRINT NUMBER OF TEST BEING EXECUTED
BOE	BELL ON ERROR
UAM	RUN IN UNATTENDED MODE, BYPASSING MANUAL INTERVENTION TESTS

ISR INHIBIT STATISTICAL REPORTS
IDU INHIBIT DROPPING OF UNITS BY DIAGNOSTIC
LOT LOOP ON TEST

THE FLAGS NAMED OR EQUATED TO 1 ARE SET, THOSE EQUATED TO 0 ARE CLEARED. A FLAG NOT SPECIFIED IS CLEARED. IF THE FLAGS SWITCH IS NOT GIVEN ALL FLAGS ARE CLEARED. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.4 END OF PASS SWITCH (/EOP:<INCR>)

<INCR> IS A DECIMAL NUMBER INDICATING HOW OFTEN (IN TERMS OF PASSES) IT IS DESIRED THAT THE END OF PASS MESSAGE BE PRINTED. THE DEFAULT IS AT THE END OF EVERY PASS. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.5 EFFECT OF START COMMAND

THE EFFECT OF THE START COMMAND IS TO INITIATE THE HARDWARE PARAMETER DIALOGUE, THE SOFTWARE PARAMETER DIALOGUE, AND THEN THE DIAGNOSTIC TESTS THEMSELVES.

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "# UNITS?" TO WHICH THE OPERATOR REPLIES WITH A DECIMAL NUMBER N FROM 1 TO 16. THE TERM "UNIT" REFERS TO THE DEVICE TO WHICH THIS SERIES OF DIAGNOSTICS IS DEDICATED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE P-TABLES THEMSELVES WILL BE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE CONTAINING ALL THE HARDWARE INFORMATION FOR ONE UNIT. THE OPERATOR MUST SUPPLY N (NUMBER OF UNITS) VALUES FOR EACH QUESTION. HE MAY DO THIS BY GIVING ONE ANSWER TO EACH QUESTION (IN WHICH CASE THE SERIES OF QUESTIONS WILL BE POSED N TIMES) OR BY GIVING N VALUES, SEPARATED BY COMMAS, TO EACH QUESTION (SERIES WILL BE POSED ONCE). EACH QUESTION IS FOLLOWED BY THE RESPONSE RADIX (D FOR DECIMAL, B FOR BINARY, O FOR OCTAL, L FOR YES/NO) IN PARENTHESES AND THE DEFAULT VALUE AFTER THE PARENTHESES.

FOLLOWING THE HARDWARE QUESTIONS ARE THE SOFTWARE QUESTIONS TO BUILD THE SOFTWARE TABLES, WHICH DEFINE THE MODE (QUICK VERIFY ETC.) THAT THE DIAGNOSTIC WILL EXECUTE IN.

WHEN THE QUESTION "# UNITS?" IS ANSWERED, MEMORY STORAGE IS ALLOCATED FOR THE P-TABLES, AND IF THERE IS NOT ENOUGH TO ACCOMMODATE THEM THE MESSAGE "TOO MANY UNITS" IS ISSUED. IN THIS CASE THE DIAGNOSTIC MUST BE EXECUTED MORE THAN ONCE TO TEST ALL UNITS.

EXAMPLE:

```
STA/TESTS:1:2-4:6:8-10/PASS:3/FLAGS:IER:HOE=1:UAM:LOE
```

THIS COMMAND WILL CAUSE THREE PASSES TO BE MADE, EACH PASS CONSISTING OF TESTS 1,2,3,4,6,8,9, AND 10 EXECUTED AGAINST

ALL UNITS. THERE IS NO DIFFERENCE BETWEEN SAYING <FLAG> AND SAYING <FLAG=1>. THE NOTATION <FLAG=0> IS MEANINGFUL ONLY ON A COMMAND OTHER THAN START TO CLEAR A FLAG THAT WAS PREVIOUSLY SET. NOTE THAT ON ALL COMMANDS ONLY THE FIRST THREE LETTERS ARE SCANNED.

6.3.2 RESTART COMMAND

```
**********************************************************************
RES(TART)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
   <FLAG-LIST>/UNITS:<UNIT-LIST>
**********************************************************************
```

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

<TEST-LIST>, <PASS-CNT>, AND <FLAG-LIST> ARE AS IN THE START COMMAND.

6.3.2.2 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (0,1 ETC.) OR RANGES OF DECIMAL NUMBERS (0-5, 8-10 ETC.) THAT SPECIFY THE UNITS TO BE TESTED. THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS MAY RANGE FROM 0 THRU N-1 (N IS THE NUMBER OF UNITS SPECIFIED IN THE PREVIOUS START COMMAND). THE NUMBER INDICATES THE POSITION OF THE P-TABLE AS THE DATA WAS ENTERED DURING THE HARDWARE DIAGLOGUE. THE UNITS WHICH ARE SELECTED MUST NOT HAVE BEEN DROPPED BY THE DROP COMMAND. SEE THE DISCUSSION OF ADD AND DROP COMMANDS BELOW. DEFAULT IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY A DROP COMMAND.

6.3.2.3 EFFECT OF RESTART COMMAND

THE RESTART COMMAND DIFFERS FROM THE START COMMAND IN THAT THE P-TABLES FROM THE PREVIOUS START COMMAND (THERE MUST HAVE BEEN ONE) ARE USED, INSTEAD OF NEW ONES BEING BUILT. THE UNITS SWITCH GIVES THE ABILITY TO SELECT A SUBSET OF THESE. THE SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED (OPERATOR WILL BE ASKED). THE COMMAND CAN BE USED AFTER COMMAND MODE HAS BEEN REENTERED IN ANY OF THE THREE NORMAL WAYS: A) THE REQUESTED NUMBER OF PASSES HAVE BEEN MADE B) AN ERROR WAS ENCOUNTERED WITH THE HALT ON ERROR FLAG SET C) A CONTROL/C WAS ENTERED BY THE OPERATOR.

6.3.3 CONTINUE COMMAND

```
**********************************************************************
CON(TINUE)/PASS:<PASS-CNT/FLAGS:<FLAG-LIST>
**********************************************************************
```

6.3.3.1 PASS SWITCH (/PASS:<PASS-CNT>)

<PASS-CNT> IS SAME AS IN START COMMAND, BUT THE DEFAULT IS THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART. IF NONE REMAINS, THE DEFAULT IS NON-ENDING EXECUTION.

6.3.3.2 FLAG SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS SAME AS IN START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

6.3.3.3 EFFECT OF CONTINUE COMMAND

CONTINUE MUST FOLLOW A START OR RESTART, AND COMMAND MODE MUST HAVE BEEN ENTERED DUE TO A HALT ON ERROR OR A CONTROL/C. THE EFFECT OF THE COMMAND IS TO GO TO THE BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE HALT OR CONTROL/C TOOK PLACE. SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED. HARDWARE PARAMETERS MAY NOT BE CHANGED.

6.3.4 PROCEED COMMAND

****
PRO(CEED)/FLAGS:<FLAG-LIST>
****

6.3.4.1 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS AS IN THE START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

6.3.4.2 EFFECT OF PROCEED COMMAND

PROCEED MUST FOLLOW A START, RESTART, OR CONTINUE. COMMAND MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR. THE EFFECT OF THE COMMAND IS TO BEGIN EXECUTION AT THE LOCATION FOLLOWING THE ERROR CALL. NEITHER HARDWARE NOR SOFTWARE PARAMETERS MAY BE ALTERED.

6.3.5 ADD COMMAND

****
ADD/UNITS:<UNIT-LIST>
****

6.3.5.1 UNITS SWITCH (/UNITS:<UNIT-LIST>

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.5.2 EFFECT OF ADD COMMAND

THE UNITS SPECIFIED ARE ADDED TO THE TEST SEQUENCE. EACH UNIT MUST HAVE A P-TABLE IN MEMORY DUE TO AN EARLIER HARDWARE DIALOGUE. THIS COMMAND MUST BE FOLLOWED BY A RESTART OR CONTINUE. THE UNITS SWITCH MUST BE SPECIFIED. THE ADD COMMAND IS MEANINGFUL ONLY FOR UNITS THAT WERE PREVIOUSLY DROPPED.

6.3.6 DROP COMMAND

****
DRO(P)/UNITS:<UNIT-LIST>
****

6.3.6.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.6.2 EFFECT OF DROP COMMAND

THE UNITS SPECIFIED WILL BE DROPPED FROM TESTING. THE UNITS WILL BE RESELECTED ONLY BY THE EXECUTION OF AN ADD OR START COMMAND. THE UNITS SWITCH MUST BE ENTERED. THIS COMMAND MUST BE FOLLOWED BY A RESTART OR A CONTINUE COMMAND.

6.3.7 PRINT COMMAND

****
PRI(NT)
****

6.3.7.1 EFFECT OF PRINT COMMAND

THE TOTAL NUMBER OF ERRORS FOR EACH UNIT SINCE THE LAST START OR RESTART COMMAND ARE PRINTED. THE ISR (INHIBIT STATISTICAL REPORTING) FLAG IS CLEARED.

6.3.8 DISPLAY COMMAND

****
DIS(PLAY)/UNITS:<UNIT-LIST>
****

6.3.8.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.8.2 EFFECT OF DISPLAY COMMAND

THE HARDWARE P-TABLES FOR ALL UNITS UNDER TEST ARE PRINTED OUT IN THE FORMAT IN WHICH THEY WERE ENTERED. ANY UNITS THAT WERE DROPPED BY THE OPERATOR 'DROP' COMMAND ARE SO DESIGNATED.

6.3.9 FLAGS COMMAND

****
FLA(GS)
****

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

6.3.10 ZFLAGS COMMAND

****
ZFL(AGS)
****

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

A CONTROL C (C) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES A RETURN TO COMMAND MODE.

A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR DIALOGUES- INITIAL DIALOGUE (SEE 6.2),HARDWARE DIALOGUE (SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

A CONTROL O (O) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES ALL TELETYPE OUTPUT TO BE SURPRESSED FOR THE REMAINDER OF THE DIAGNOSTIC OR UNTIL ANOTHER O IS TYPED, WHICH RESTORES NORMAL TELETYPE OUTPUT.

6.3.12 HARDWARE PARAMETERS

THE FOLLOWING QUESTIONS WILL BE ASKED ON A START COMMAND. THE VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN RESPONSE.

1. WHICH MICRO-CPU? (0= M8200, 4= M8204, 7= M8207) (0) 7?

2. MICRO-CPU CSR ADDRESS: (0) 160170?

THIS IS THE ADDRESS AT WHICH THE CSR REGISTERS (SEL0) RESIDE ON THE UNIBUS. THE ALLOWABLE RANGE IS 160000-177776 (OCTAL), AND THE DEFAULT IS 160170.

3. MICRO-PROCESSOR RUN SWITCH-TYPE 1 IF ON, IF OFF: (0) 0?

THE RUN SWITCH IS E28, SWITCH 7 ON THE M8207. MORE TESTS CAN BE PERFORMED IF THE RUN SWITCH IS OFF. YOU MAY GENERATE AN ERROR IF YOU ANSWER THIS QUESTION WRONG.

6.3.13 SOFTWARE PARAMETERS

NO SOFTWARE PARAMETER QUESTIONS ARE ASKED BY PART 2 OF THE STATIC LOGIC TESTS.

6.3.14 EXTENDED DISCUSSION OF P-TABLE DIALOGUE

THE FULL CAPABILITY OF THE HARDWARE DIALOGUE IS REVEALED BY THE FOLLOWING DISCUSSION OF WHAT HAPPENS INTERNALLY.

AS SOON AS THE QUESTION "# UNITS?" IS ANSWERED (WITH THE NUMBER N, SAY) SPACE IN CORE IS ALLOCATED FOR N P-TABLES. ALL OF THE P-TABLES ARE OF THE SAME FORMAT, AND THERE IS A ONE-TO ONE CORRESPONDENCE BETWEEN THE HARDWARE PARAMETER QUESTIONS AND THE SLOTS IN THE P-TABLE FORMAT.

ON THE FIRST TRIP THRU THE QUESTIONS, ALL OF THE SLOTS IN ALL OF THE P-TABLES ARE FILLED. IF THE OPERATOR TYPES IN LESS THAN N EXPLICIT VALUES IN RESPONSE TO A PARTICULAR QUESTION, THESE VALUES ARE PLACED IN THE P-TABLES (ONE VALUE GOING INTO THE PROPER SLOT OF EACH P-TABLE BEGINNING WITH THE FIRST P-TABLE) UNTIL THE STRING OF VALUES IS EXHAUSTED. THE LAST VALUE IN THE STRING BECOMES THE NEW DEFAULT AND IS USED TO FILL THAT SLOT IN THE REMAINING P-TABLES.

ON SUBSEQUENT TRIPS THRU THE QUESTIONS, THE SAME PROCESS IS CARRIED OUT, EXCEPT THAT THE EARLIEST P-TABLE NOT TO HAVE RECEIVED AN EXPLICIT VALUE IN ANY OF ITS SLOTS NOW ASSUMES THE ROLE THAT TABLE NUMBER ONE PLAYED IN THE FIRST TRIP.

THE SERIES OF QUESTIONS IS REISSUED UNTIL AT LEAST ONE QUESTION HAS RECEIVED N EXPLICIT VALUES FROM THE OPERATOR.

IN GIVING A STRING OF VALUES, COMMAS WITHOUT INTERVENING VALUES MAY BE USED TO INDICATE A REPETITION OF THE LAST NAMED VALUE.

A STRING OF VALUES MAY BE GIVEN AS A RANGE (6-10 FOR EXAMPLE). IF THE VALUES REPRESENT PURE NUMERICAL DATA, THIS SAMPLE RANGE TRANSLATES TO THE STRING 6,7,8,9,10 (AN INCREMENT OF 1). IF THE VALUES ARE ADDRESSES, THE SAMPLE RANGE TRANSLATES TO THE STRING 6,8,10 (AN INCREMENT OF 2).

NOW LET US SEE HOW WE COULD USE THESE CAPABILITIES TO CONSTRUCT A SET OF P-TABLES. ASSUME THAT WE HAVE 16 UNITS, AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE SLOTS IN THE P-TABLE, THREE HARDWARE QUESTIONS IN THE DIALOGUE). LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE THE NUMBER 75 FOR ALL 16 TABLES. LET THE DESIRED VALUE FOR THE SECOND PARAMETER BE EQUAL TO THE UNIT NUMBER (0,1,2,...,15) EXCEPT FOR UNIT 12, WHICH SHOULD RECEIVE THE VALUE 11. LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE THE NUMBER 76 FOR THE FIRST 7 UNITS AND THE NUMBER 77 FOR THE LAST 9 UNITS.

THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:

```
# UNITS (D) ? 16

UNIT 1
<QUESTION 1> ? 75
<QUESTION 2> ? 0-6
<QUESTION 3> ? 76

UNIT 21
<QUESTION 1> ?
<QUESTION 2> ? 7-11,,13-15
<QUESTION 3> ? 77
```

THE FIRST TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75 IN ALL 16 TABLES. SLOT TWO RECEIVES THE VALUES 0,1,2,...,6 IN TABLES 0 THRU 6 AND A CONSTANT 6 IN TABLES 7 THRU 15. SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.

THE SECOND TIME THRU THE SERIES, TABLES 16 THRU THE END ARE GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS PRINTED OUT FOR THE THE OPERATOR IN THE FORM 'UNIT XX" AT THE BEGINNING OF EACH SERIES). QUESTION 1 IS RESPONDED TO BY A <CR>, SO SLOT ONE STAYS AT CONSTANT 75 IN TABLES 7 THRU 15, SINCE NO NEW EXLICIT VALUES ARE TYPED IN. SLOT TWO GETS THE VALUES 7,8,9,10,11 IN TABLES 7 THRU 11, AND GETS A 11 IN SLOT 12, AND GETS THE VALUES 13,14,15 IN TABLES 13 THRU 15. SLOT THREE GETS THE VALUE 77 IN TABLES 7 THRU 15.

THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT 16 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ONE QUESTION (NAMELY QUESTION 2).

7.0 TEST DESCRIPTIONS

********** TEST 1 **********

```
                        *VERIFY THAT REFERENCING UNIBUS DEVICE REGISTERS
                        *DOES NOT CAUSE A TIME OUT TRAP
                        ************************************************


                        ********************** TEST 2 **********************
                        *TEST OF BR RIGHT SHIFT
                        *VERIFY THAT A DEST OF BR RSH (011) OF A MICRO-INSTRUCTION
                        *SHIFTS THE RESULTING BR  DATA RIGHT ONCE.
                        ************************************************


                        ********************** TEST 3 **********************
                        *IOP CRAM WRITE/READ TEST
                        *FLOAT A 1 THROUGH EACH CRAM LOCATION
                        ************************************************


                        ********************** TEST 4 **********************
                        *IOP CRAM WRITE/READ TEST
                        *FLOAT A 0 THROUGH EACH CRAM LOCATION
                        ************************************************


                        ********************** TEST 5 **********************
                        *IOP CRAM DUAL ADDRESSING TEST
                        *WRITE EACH ADDRESS INTO ITSELF, READ EACH
                        *ADDRESS TO VERIFY CORRECT ADDRESSING
                        ************************************************


                        ********************** TEST 6 **********************
                        *IOP MAIN MEMORY TEST
                        *FLOAT A 1 THROUGH ALL MAIN MEMORY LOCATIONS
                        ************************************************


                        ********************** TEST 7 **********************
                        *IOP MAIN MEMORY TEST
                        *FLOAT A 0 THROUGH ALL MAIN MEMORY LOCATIONS
                        ************************************************


                        ********************** TEST 8 **********************
                        *IOP MAIN MEMORY DUAL ADDRESSING TEST
                        *LOAD EACH MEMORY LOCATION WITH ITS OWN ADDRESS
                        *READ BACK EACH LOCATION TO VERIFY CORRECT ADDRESSING
                        ************************************************


                        ********************** TEST 9 **********************
                        *IOP MAR TEST
                        *PERFORM DUAL ADDRESSING TEST
                        *USING MAR AUTO-INC FEATURE
                        ************************************************
```

```
761
762                     ********** TEST 10 **********
763                     *IOP (CRAM) ODT BITS TEST
764                     *LOAD MAR WITH A 0 INC MAR UNTIL IT OVERFLOWS
765                     *VERIFY THAT IBUS* 10 BITS IS SET ONLY WHEN MAR BIT 8 IS A ONE
766                     *AND THAT IBUS* 10 BIT6 IS SET ON MAR OVERFLOW
767                     ************************************************
768
769
770                     ********** TEST 11 **********
771                     *CRAM TEST OF JUMP(I) NEVER MICRO-PROCESSOR INSTRUCTION.
772                     *PERFORM THE JUMP INSTRUCTION
773                     *VERIFY THE JUMP DID NOT OCCUR BY CLOCKING THE INSTRUCTION
774                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
775                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
776                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
777                     *THE CRAM PC IS CORRECT.  IF THE CRAM PC IN NOT RIGHT,
778                     *THEN PORT4 CONTAINS A 37
779                     ************************************************
780
781
782                     ********** TEST 12 **********
783                     *CRAM TEST OF JUMP(I) ALWAYS MICRO-PROCESSOR INSTRUCTION.
784                     *PERFORM THE JUMP INSTRUCTION
785                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
786                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
787                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
788                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
789                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
790                     *THEN PORT4 WILL CONTAIN A 37
791                     ************************************************
792
793
794                     ********** TEST 13 **********
795                     *CRAM TEST OF JUMP(I) ON C BIT SET MICRO-PROCESSOR INSTRUCTION.
796                     *SET THE C BIT, PERFORM THE JUMP INSTRUCTION.
797                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
798                     *IN THE LOCATION IT IS AT.  THIS INSTRUCITON LOADS THE
799                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
800                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
801                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
802                     *THEN PORT4 WILL CONTAIN A 37.
803                     ************************************************
804
805
806                     ********** TEST 14 **********
807                     *CRAM TEST OF JUMP(I) ON Z BIT SET MICRO-PROCESSOR INSTRUCTION.
808                     *SET THE Z BIT, PERFORM THE JUMP INSTRUCTION.
809                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
810                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
811                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
812                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
813                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
814                     *THEN PORT4 WILL CONTAIN A 37
815                     ************************************************
816
```

```
817
818                     ********** TEST 15 **********
819                     *CRAM TEST OF JUMP(I) ON BR0 SET MICRO-PROCESSOR INSTRUCTION.
820                     *SET THE BR0 BIT, PERFORM THE JUMP INSTRUCTION.
821                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
822                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
823                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
824                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
825                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
826                     *THEN THE PORT4 WILL CONTAIN A 37
827                     **************************************************
828
829
830                     ********** TEST 16 **********
831                     *CRAM TEST OF JUMP(I) ON BR1 SET MICRO-PROCESSOR INSTRUCTION.
832                     *SET THE BR1 BIT, PERFORM THE JUMP INSTRUCTION.
833                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
834                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
835                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
836                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
837                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
838                     *THEN PORT4 WILL CONTAIN A 37
839                     **************************************************
840
841
842                     ********** TEST 17 **********
843                     *CRAM TEST OF JUMP(I) ON BR4 SET MICRO-PROCESSOR INSTRUCTION.
844                     *SET THE BR4 BIT, PERFORM THE JUMP INSTRUCTION.
845                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
846                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
847                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
848                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
849                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
850                     *THEN PORT4 WILL CONTAIN A 37
851                     **************************************************
852
853
854                     ********** TEST 18 **********
855                     *CRAM TEST OF JUMP(I) ON BR7 SET MICRO-PROCESSOR INSTRUCTION.
856                     *SET THE BR7 BIT, PERFORM THE JUMP INSTRUCTION
857                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
858                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
859                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
860                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
861                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
862                     *THEN PORT4 WILL CONTAIN A 37
863                     **************************************************
864
865
866                     ********** TEST 19 **********
867                     *CRAM TEST OF JUMP(I) ON C BIT CLEAR MICRO-PROCESSOR INSTRUCTION.
868                     *SET THE C BIT, PERFORM THE JUMP INSTRUCTION.
869                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
870                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
871                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
872                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
```

```
873                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
874                     *THEN PORT4 WILL CONTAIN A 37
875                     ************************************************************
876
877
878                     ********************* TEST 20 *************************
879                     *CRAM TEST OF JUMP(I) ON Z BIT CLEAR MICRO-PROCESSOR INSTRUCTION.
880                     *CLEAR THE Z BIT, PERFORM THE JUMP INSTRUCTION.
881                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
882                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
883                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
884                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
885                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
886                     *THEN PORT4 WILL CONTAIN A 37
887                     ************************************************************
888
889
890                     ********************* TEST 21 *************************
891                     *CRAM TEST OF JUMP(I) ON BRO CLEAR MICRO-PROCESSOR INSTRUCTION.
892                     *CLEAR THE BRO BIT, PERFORM THE JUMP INSTRUCTION.
893                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
894                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
895                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  A THIS POINT
896                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
897                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
898                     *THEN PORT4 WILL CONTAIN A 37
899                     ************************************************************
900
901
902                     ********************* TEST 22 *************************
903                     *CRAM TEST OF JUMP(I) ON BR1 CLEAR MICRO-PROCESSOR INSTRUCTION.
904                     *CLEAR THE BR1 BIT, PERFORM THE JUMP INSTRUCTION.
905                     *VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
906                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
907                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
908                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
909                     *THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
910                     *THEN PORT4 WILL CONTAIN A 37
911                     ************************************************************
912
913
914                     ********************* TEST 23 *************************
915                     *CRAM TEST OF JUMP(I) ON BR4 CLEAR MICRO-PROCESSOR INSTRUCTION.
916                     *CLEAR THE BR4 BIT, PERFORM THE JUMP INSTRUCTION.
917                     *VERIFY THE JUMP DID NOT OCCUR BY CLOCKING THE INSTRUCTION
918                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
919                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
920                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
921                     *THE CRAM PC IS CORRECT, IF THE CRAM PC IS NOT RIGHT
922                     *THEN PORT4 CONTAINS A 37
923                     ************************************************************
924
925
926                     ********************* TEST 24 *************************
927                     *CRAM TEST OF JUMP(I) ON BR7 CLEAR MICRO-PROCESSOR INSTRUCTION.
928                     *CLEAR THE BR7 BIT, PERFORM THE JUMP INSTRUCTION.
```

CZDMQD.P11 12-JAN-82 09:50 PROGRAM DOCUMENT

```
929                     *VERIFY THE JUMP DID NOT OCCUR BY CLOCKING THE INSTRUCTION
930                     *IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
931                     *BR WITH THE LOWEST 8 BITS OF THE CRAM PC.  AT THIS POINT
932                     *THE BR DATA IS MOVED TO PORT4.  IF THIS DATA IS CORRECT
933                     *THE CRAM PC IS CORRECT, IF THE CRAM PC IS NOT RIGHT
934                     *THEN PORT4 CONTAINS A 37
935                     ************************************************************
936
937
938                     ******************** TEST 25 ***************************
939                     *
940                     *MAIN MEMORY PAGE DUAL ADDRESS TEST.
941                     *IN THIS TEST WE WILL VERIFY THAT PAGES DO
942                     *NOT DUAL ADDRESS.  THIS TEST IS DIFFERENT FROM THE
943                     *PREVIOUS DUAL ADDRESS TESTS IN THAT THE OTHER
944                     *TEST REALLY DIDN'T CHECK PAGE DUAL ADDRESSING
945                     ************************************************************
946
947
948                     ******************** TEST 26 ***************************
949                     *
950                     *JUMP FIELD,PAGE TEST
951                     *
952                     *IN THIS TEST WE WILL MAKE SURE A JUMP FIELD INSTRUCTION
953                     *WORKS.  TO DO THIS, WE'LL PUT THE DESIRED PAGE, FIELD
954                     *INFORMATION IN IBUS*<13> THEN ISSUE A JUMP FIELD
955                     *THEN WE'LL READ PC REG. AND VERIFY.
956                     *
957                     ************************************************************
958
959
960                     ******************** TEST 27 ***************************
961                     *
962                     *JUMP TEST, JUMP ALWAYS, JUMP CHANGE FIELD
963                     *
964                     *IN THIS TEST, WE WILL CHECK THE ABILITY OF THE
965                     *MICRO-PROCESSOR TO JUMP (BRANCH AND ALWAYS INSTRUCTION)
966                     *TO LOCATIONS, FIELDS FROM OTHER LOCATIONS FIELDS.
967                     *WE ALREADY KNOW THAT THE BRANCH INSTR WORKS FROM
968                     *OTHER TEST.              PROCEDURE:
969                     *       1.  START ADDR 0, FIELD 0
970                     *       2.  **CALCULATE NEW ADDRS, FIELD VIA INC,
971                     *       3.  CAUSE JUMP (BRANCH) TO NEW ADDRESS
972                     *       4.  READ PC FROM IBUS*12 AND IBUS*13
973                     *       5.  REPEAT STEP 2-4 256.TIMES
974                     *
975                     *       TO CALCULATE NEW ADDRESS:
976                     *       1.  INC LOW BYTE OF ADDRESS FOR PC ADDRESS 0-7
977                     *       2.  INC LOW BYTE OF N ADDRESS FOR PC ADDRESS 8-11
978                     *           BITS REPRESENTED AS BITS 0-3.  WHEN 0-3 OVERFLOWS,
979                     *           RESTARTS AT ZERO.
980                     *                   NET RESULT IS JUMPS FROM:
981                     *           FIELD,PAGE                      LOC
982                     *                   0                       0
983                     *                   1                       1
984                     *                   2                       2
```

CZDMQD.P11 12-JAN-82 09:50 PROGRAM DOCUMENT

```
*                    3                    3
*                   10                    7
*                   11                   11
*                   :TO                  :
*                   17                   377
*****************************************************


******************** TEST 28 ************************
*
*JUMP TEST, JUMP ALWAYS, JUMP CHANGE FIELD
*
*IN THIS TEST, WE WILL CHECK THE ABILITY OF THE
*MICRO-PROCESSOR TO JUMP (BRANCH AND ALWAYS INSTRUCTION)
*TO LOCATIONS, FIELDS FROM OTHER LOCATIONS FIELDS.
*WE ALREADY KNOW THAT THE BRANCH INSTR WORKS FROM
*OTHER TESTS.                PROCEDURE:
*       1.  START ADDR 0, FIELD 0
*       2.  **CALCULATE NEW ADDRS, FIELD VIA DEC,
*       3.  CAUSE JUMP (BRANCH) TO NEW ADDRESS
*       4.  READ PC FROM IBUS*12 AND IBUS*13
*       5.  REPEAT STEP 2-4 256.TIMES
*
*       TO CALCULATE NEW ADDRESS:
*       1.  DEC LOW BYTE OF ADDRESS FOR PC ADDRESS 0-7
*       2.  DEC LOW BYTE OF N ADDRESS FOR PC ADDRESS 8-11
*           BITS REPRESENTED AS BITS 0-3.  WHEN 0-3 OVERFLOWS,
*           RESTARTS AT ZERO
*               NET RESULT IS JUMPS FROM:
*             FIELD,PAGE              LOC:
*                  0                  0
*                 17                  377
*                 16                  376
*                 15                  375
*                 :TO                 :
*                 00                  000
*****************************************************


******************** TEST 29 ************************
*
*IN THIS TEST WE'LL VERIFY THAT THE Z BIT CAN BE READ FROM
*IBUS*<13>. WE ALREADY KNOW THAT THE Z BIT WORKS PROPERLY,
*ALL WE WANT TO KNOW HERE IS THAT IT CAN BE READ.
*****************************************************


******************** TEST 30 ************************
*
*IN THIS TEST WE'LL VERIFY THAT THE C BIT CAN BE READ FROM
*IBUS*<13>. WE ALREADY KNOW THAT THE C BIT WORKS PROPERLY
*ALL WE WANT TO KNOW HERE IS THAT IT BE READ.
*
*****************************************************
```

```
1041
1042                    ********** TEST 31 **********
1043                    *TEST OF PROGRAM CLOCK BIT
1044                    *DO A MASTER CLEAR, VERIFY THAT PROGRAM CLOCK IS SET
1045                    *WRITE PROGRAM CLOCK BIT TO A ONE, VERIFY THAT IT CLEARS,
1046                    *AND THEN SETS SOME TIME LATER
1047                    ************************************************
1048
1049
1050                    ********** TEST 32 **********
1051                    *FORCE POWER FAIL TEST
1052                    *SET FORCE POWER FAIL BIT VERIFY THAT PROCESSOR TRAPS TO 24
1053                    *GOING DOWN AND COMING UP.  VERIFY ALSO THAT BUS INIT WAS
1054                    *BLOCKED FROM GETTING TO THE M8200,4,7 DURING THE POWER FAIL
1055                    ************************************************
1056
1057
1058                    ********** TEST 33 **********
1059                    *MICRO-PROCESSOR NOISE TEST
1060                    *WRITE ALL ZERO'S THEN ALL ONE'S THEN A DATA PATTERN
1061                    *TO THE IBUS* AND IBUS REGISTERS AND TO THE SP AND MAIN MEM
1062                    *THEN GO BACK AND READ THE DATA PATTERNS TO VERIFY THAT
1063                    *READING AND WRITING OF OTHER LOCATIONS AND REGISTERS
1064                    *DID NOT CHANGE THE DATA.
1065                    ************************************************
1066
1067
1068                    ********** TEST 34 **********
1069                    *THIS TEST IS DESIGNED TO MAKE SURE THAT A NODST INSTRUCTION
1070                    *DOES NOT WRITE INTO PORT B OF THE MULTIPORT RAM.
1071                    *TO DO THIS, WE'LL PUT A 125 INTO INDAT2, THEN WE'LL PUT A
1072                    *125 INTO BOTH SP1 AND BR. LAST WE'LL DO A NODST BR, SUBOC, SP1
1073                    *IF THERE IS A WRITE INTO PORTB, INADT2 WILL CONTAIN A 377
1074                    ************************************************
1075
1076
1077                    ********** TEST 35 **********
1078                    *
1079                    *EXTENDED CRAM TEST FOR M8206.  IN THIS TEST WE WILL LOAD DATA
1080                    *THROUGHOUT THE CRAM (TEST DATA IS JUST 4K OF DIAG. CODE) AND
1081                    *THEN READ IT BACK AND VERIFY THAT IT IS CORRECT
1082                    ************************************************
1083
1084
1085                    ********** TEST 36 **********
1086                    *
1087                    *THIS TEST LOADS MICRO-CODE INTO A M8206 MCPU THEN EXECUTES IT.
1088                    *THE MICRO-CODE IS DESIGNED TO WRITE ALL ONES INTO THE SEL REGS.
1089                    *
1090                    ************************************************
1091
1092
1093                    ********** TEST 37 **********
1094                    *
1095                    *NEGATIVE ADDRESS TEST.
1096                    *       IN THIS TEST, WE'LL MAKE SURE THAT THE M8207
```

```
1097                    *       DOES NOT RESPOND TO AN ADDRESS THAT ISN'T ASSIGNED
1098                    *        TO IT
1099                    *
1100                    ************************************************************
1101
1102
1103                    ******************** TEST 38 ****************************
1104                    *
1105                    *BYTE ADDRESSING TEST
1106                    *       HERE, WE'RE GOING TO MAKE SURE THAT WE CAN
1107                    *        WRITE INTO ONLY A HIGH OR LOW BYTE OF THE MCPU.
1108                    *
1109                    ************************************************************
1110
1111
1112                    ******************** TEST 39 ****************************
1113                    *
1114                    *IN THIS TEST WE'RE GOING TO MAKE SURE THAT THE PC
1115                    *REG COUNTS UP PROPERLY.  THE PC REG SHOULD INCREMENT
1116                    *ONCE AFTER EACH INSTRUCTION.
1117                    *
1118                    ************************************************************
1119
1120
1121                    ******************** TEST 40 ****************************
1122                    *
1123                    *IN THIS TEST WE'LL MAKE SURE THAT 'BRANCH FIELD H'' DOESN'T
1124                    *GET STUCK HIGH.
1125                    *FIRST WE'LL CLEAR THE PC HIGH REG. THEN WE'LL DO A BRANCH INSTR
1126                    *WITH BAB BITS 11+12 SET.  IF PCR  BITS 8+9 SET THEN WE'LL KNOW
1127                    *WE WERE SUCCESSFUL IF PCR BITS 8+9 FAIL TO SET, WE,LL KNOW
1128                    *THAT THE MAX SELECTED THE WRONG INPUT TO BE CLOCKED INTO THE PCR.
1129                    ************************************************************
1130
1131
1132                    ******************** TEST 41 ****************************
1133                    *
1134                    *IN THIS TEST WE'RE GOING TO MAKE SURE THAT ONLY SPO
1135                    *IS SELECTED FOR SOURCE WHEN THE DESTINATION
1136                    *IS THE OUTBUS
1137                    *FIRST WE'LL WRITE EACH SP ADDRS INTO ITSELF THEN WE'LL
1138                    *MOV SP TO OBUS4.  THAT SHOULD SELECT
1139                    *SP ADDRESS 0.  IF ANY OTHER DATA SHOWS UP, WE'LL
1140                    *BLAME IT ON THE SELECTION OF A DIFFERENT SCRATCH PAD.
1141                    ************************************************************
1142
1143
1144                    ******************** TEST 42 ****************************
1145                    *
1146                    *IN THIS TEST WE ARE GOING TO MAKE SURE THAT THE
1147                    *SIGNAL 'MOV INST H'' (AND ITS ASSOC. TRIBS) DOESN'T GET
1148                    *STUCK HIGH.  IN ORDER TO DO THIS WE'LL CLEAR THE PC HIGH REG
1149                    *PUT KNOWN DATA IN THE BREG AND SP1 THEN WE'LL BRANCH
1150                    *WITH CROM BITS 0-3 SET AS WELL AS CROM BIT 7 WITH CROM BITS 8 AND 11 CLEAR.
1151                    *IF 'MOV INST H'' GETS STUCK HIGH, THE PC REG HIGH WILL GET LOADED
1152                    *WITH THE CONTENTS OF THE ALU
```

```
1153                    **********************************************************
1154
1155
1156                    ******************** TEST 43 *****************************
1157                    *TEST THAT MASTER CLEAR, CLEARS BIT$ IN THE NPR CONTROL REGISTER AND
1158                    *MICROPROCESSOR MISCELLANEOUS REGISTER-FIRST WE'LL SET THE
1159                    *PRIORITY UP SO THAT WHEN WE SET THE BUS REQUEST BIT THAT IT WON'T BUG US
1160                    *THEN WE'LL SET ALL THE BITS IN BOTH REGS EXCEPT THE
1161                    *NPR REQUEST. WE'LL LOOK TO SEE THAT ALL GOT SET, NEXT
1162                    *WE'LL DO A MASTER CLEAR AND BE SURE THAT THEY ALL CLEAR.
1163                    **********************************************************
1164
1165
1166
1167                    8.0 ERROR INFORMATION
1168
1169
1170                    8.1 ERROR REPORTING
1171
1172                    ERRORS ARE REPORTED BY THE PROGRAM AS  THEY  OCCUR  (IF  NOT
1173                    INHIBITED). THE REPORT CONFORMS TO THE DIAGNOSTIC SUPERVISOR
1174                    ERROR REPORT FORMAT, AND CONSISTS OF A  DESCRIPTION  OF  THE
1175                    ERROR,  THE  TEST  NUMBER,  SUBTEST  NUMBER, PC OF THE ERROR
1176                    CALL,  DEVICE  ADDRESS,  AND  BASIC   AND   EXTENDED   ERROR
1177                    INFORMATION.
1178
1179
1180
1181                    THE FOLLOWING EXAMPLES PROVIDE TYPICAL ERROR REPORTS:
1182
1183
1184                    CZDMQ DVC FTL ERR 00045 TST 027 SUB 000 PC:022572
1185
1186                    MASTER   CLEAR  FAILED  TO  CLEAR  PC  REG,  CONTENTS=000624
1187                    CZDMQ DVC FTL ERR 00015 TST 042 SUB 000 PC:027234
1188
1189                    UNIT=00, FAILING UNIT ADDRESS=160170
1190                    JUMP TEST ERROR
1191                    FROM ADDR      TO ADDR       BAD ADDR
1192                    000402         000000        000114
1193
1194
1195
1196                    FOR ALL OTHER ERRORS, THE REPORT MAY BE MORE  EXTENSIVE  AND
1197                    REQUIRE ADDITIONAL DATA TO BE REPORTED.
1198
1199
1200
1201                    9.0     HISTORY
1202
1203                       -    MODIFIED AUGUST 1980 FOR THE FOLLOWING REASONS:
1204
1205                            1) CANCELL DEPO CZDMQA1
1206                            2) CANCELL DEPO CZDMQA2
1207                            3) DETECT BAD TIMING ON INTERNAL CLOCK.
1208
```

CZDMQD.P11 12-JAN-82 09:50 PROGRAM DOCUMENT

```
1209
1210                    -   MODIFIED JULY 1981 TO FIX TEST 43 MAR BITS IN IBUS* 10.
1211
1212                    -   MODIFIED JANUARY 1982
1213
1214                        1) ERRONEOUS DATA WAS NOT CLEARED IN HIGH BYTE OF REGISTER 5
1215                           IN TEST 40.
1216                           FIX:  CHANGE BIC  #374,R5   TO BIC #177774,R5.
1217
1218                    @
```

```
1219
1220
1221
1222
1223
```

CZDMQD.P11 12-JAN-82 09:50 PROGRAM DOCUMENT

```
1224                                    .TITLE CZDMQD0 M8207 STATIC DIAG #2
1225            002000                          .=2000
1226
1227
1228
1229
1230
1231
1232                                            .MCALL  SVC
1233    002000                                  SVC                                     ; INITIALIZE SUPERVISOR MACROS
1234
1235
1236
1237
1238
1239    002000                                  BGNMOD  CZDMQ
1240
1241
1242            000000                  $LSTIN= 0
1243            000000                  $LSTTAG= 0
1244            000000                  SVCINS= 0       ; LIST INSTRUCTIONS, SHIFTED RIGHT
1245            000000                  SVCTST= 0       ; LIST TEST TAGS, SHIFTED RIGHT
1246            000000                  SVCSUB= 0       ; LIST SUBTEST TAGS, SHIFTED RIGHT
1247            000000                  SVCGBL= 0       ; LIST GLOBAL TAGS, SHIFTED RIGHT
1248            000000                  SVCTAG= 0       ; LIST OTHER TAGS, SHIFTED RIGHT
1249
1250                                    ;       CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
1251                                    ;       TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS.  CHANGE THE
1252                                    ;       SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS.  YOU MAY
1253                                    ;       CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
1254
1255
```

```
                                .SBTTL  PROGRAM HEADER
                                ;++
                                ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                                ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                                ;--

002000                                  POINTER BGNAU,BGNDU


                                        HEADER  CZDMQ,D,0,240.,0
002000                  L$NAME::                ;DIAGNOSTIC NAME
002000  103                             .ASCII /C/
002001  132                             .ASCII /Z/
002002  104                             .ASCII /D/
002003  115                             .ASCII /M/
002004  121                             .ASCII /Q/
002005  000                             .BYTE   0
002006  000                             .BYTE   0
002007  000                             .BYTE   0
002010                  L$REV::                 ;REVISION LEVEL
002010  104                             .ASCII  /D/
002011                  L$DEPO::                ;0
002011  060                             .ASCII  /0/
002012                  L$UNIT::                ;NUMBER OF UNITS
002012  000000                          .WORD   0
002014                  L$TIML::                ;LONGEST TEST TIME
002014  000360                          .WORD   240.
002016                  L$HPCP::                ;POINTER TO H.W. QUES.
002016  027344                          .WORD   L$HARD
002020                  L$SPCP::                ;POINTER TO S.W. QUES.
002020  000000                          .WORD   0
002022                  L$HPTP::                ;PTR. TO DEF. H.W. PTABLE
002022  002262                          .WORD   L$HW
002024                  L$SPTP::                ;PTR. TO S.W. PTABLE
002024  000000                          .WORD   0
002026                  L$LADP::                ;DIAG. END ADDRESS
002026  030144                          .WORD   L$LAST
002030                  L$STA::                 ;RESERVED FOR APT STATS
002030  000000                          .WORD   0
002032                  L$CO::
002032  000000                          .WORD   0
002034                  L$DTYP::                ;DIAGNOSTIC TYPE
002034  000000                          .WORD   0
002036                  L$APT::                 ;APT EXPANSION
002036  000000                          .WORD   0
002040                  L$DTP::                 ;PTR. TO DISPATCH TABLE
002040  002132                          .WORD   L$DISPATCH
002042                  L$PRIO::                ;DIAGNOSTIC RUN PRIORITY
002042  000000                          .WORD   0
002044                  L$ENVI::                ;FLAGS DESCRIBE HOW IT WAS SETUP
002044  000000                          .WORD   0
002046                  L$EXP1::                ;EXPANSION WORD
002046  000000                          .WORD   0
002050                  L$MREV::                ;SVC REV AND EDIT #
002050  003                             .BYTE   CSREVISION
002051  003                             .BYTE   CSEDIT
```

CZDMQD.P11 12-JAN-82 09:50 PROGRAM HEADER

```
1312  002052
1313  002052  000000          LSEF::          ;DIAG. EVENT FLAGS
1314  002054  000000                  .WORD   0
1315  002056                  .WORD   0
1316  002056  000000  LSSPC::
1317  002060                  .WORD   0
1318  002060  002730  LSDEVP::         ; POINTER TO DEVICE TYPE LIST
1319  002062                  .WORD   LSDVTYP
1320  002062  000000  LSREPP::         ;PTR. TO REPORT CODE
1321  002064                  .WORD   0
1322  002064  000000  LSEXP4::
1323  002066                  .WORD   0
1324  002066  000000  LSEXP5::
1325  002070                  .WORD   0
1326  002070  012144  LSAUT::          ;PTR. TO ADD UNIT CODE
1327  002072                  .WORD   LSAU
1328  002072  012140  LSDUT::          ;PTR. TO DROP UNIT CODE
1329  002074                  .WORD   LSDU
1330  002074  000000  LSLUN::          ;LUN FOR EXERCISERS TO FILL
1331  002076                  .WORD   0
1332  002076  002312  LSDESP::         ;POINTER TO DIAG. DESCRIPTION
1333  002100                  .WORD   LSDESC
1334  002100  104035  LSLOAD::         ;GENERATE SPECIAL AUTOLOAD EMT
1335  002102                  EMT     ESLOAD
1336  002102  000000  LSETP::          ;POINTER TO ERRTBL
1337  002104                  .WORD   0
1338  002104  011340  LSICP::          ;PTR. TO INIT CODE
1339  002106                  .WORD   LSINIT
1340  002106  012134  LSCCP::          ;PTR. TO CLEAN-UP CODE
1341  002110                  .WORD   LSCLEAN
1342  002110  012042  LSACP::          ;PTR. TO AUTO CODE
1343  002112                  .WORD   LSAUTO
1344  002112  002122  LSPRT::          ;PTR. TO PROTECT TABLE
1345  002114                  .WORD   LSPROT
1346  002114  000000  LSTEST::         ;TEST NUMBER
1347  002116                  .WORD   0
1348  002116  000000  LSDLY::          ;DELAY COUNT
1349  002120                  .WORD   0
1350  002120  000000  LSHIME::         ;PTR. TO HIGH MEM
1351                          .WORD   0
1352
1353  002122                  BGNPROT
1354  002122          LSPROT::
1355  002122  177777          .WORD   -1
1356  002124  177777          .WORD   -1
1357  002126  177777          .WORD   -1
1358  002130                  ENDPROT
1359
```

CZDMQD.P11 12-JAN-82 09:50 DISPATCH TABLE

```
1360
1361                                    .SBTTL  DISPATCH TABLE
1362
1363                                    ;////////////////////////////////////////////////////////////////////////
1364                                    ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
1365                                    ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
1366                                    ;////////////////////////////////////////////////////////////////////////
1367   002130                                   DISPATCH 43
1368   002130  000053                           .WORD   43
1369   002132                           L$DISPATCH::
1370   002132  012146                           .WORD   T1
1371   002134  012256                           .WORD   T2
1372   002136  012422                           .WORD   T3
1373   002140  012552                           .WORD   T4
1374   002142  012712                           .WORD   T5
1375   002144  013154                           .WORD   T6
1376   002146  013356                           .WORD   T7
1377   002150  013570                           .WORD   T8
1378   002152  014112                           .WORD   T9
1379   002154  014470                           .WORD   T10
1380   002156  014736                           .WORD   T11
1381   002160  015202                           .WORD   T12
1382   002162  015432                           .WORD   T13
1383   002164  015676                           .WORD   T14
1384   002166  016142                           .WORD   T15
1385   002170  016406                           .WORD   T16
1386   002172  016652                           .WORD   T17
1387   002174  017116                           .WORD   T18
1388   002176  017362                           .WORD   T19
1389   002200  017642                           .WORD   T20
1390   002202  020122                           .WORD   T21
1391   002204  020376                           .WORD   T22
1392   002206  020654                           .WORD   T23
1393   002210  021130                           .WORD   T24
1394   002212  021404                           .WORD   T25
1395   002214  021576                           .WORD   T26
1396   002216  021744                           .WORD   T27
1397   002220  022322                           .WORD   T28
1398   002222  022560                           .WORD   T29
1399   002224  022774                           .WORD   T30
1400   002226  023210                           .WORD   T31
1401   002230  023452                           .WORD   T32
1402   002232  024044                           .WORD   T33
1403   002234  025116                           .WORD   T34
1404   002236  025216                           .WORD   T35
1405   002240  025364                           .WORD   T36
1406   002242  026042                           .WORD   T37
1407   002244  026202                           .WORD   T38
1408   002246  026310                           .WORD   T39
1409   002250  026446                           .WORD   T40
1410   002252  026544                           .WORD   T41
1411   002254  026644                           .WORD   T42
1412   002256  026770                           .WORD   T43
1413
1414
1415
```

CZDMQD.P11 12-JAN-82 09:50 DISPATCH TABLE

```
1416
1417
1418
```

```
CZDMQD.P11    12-JAN-82 09:50          DEFAULT HARDWARE P-TABLE

                                       .SBTTL DEFAULT HARDWARE P-TABLE

                                       ;////////////////////////////////////////////////////////////////////////
                                       ;/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                       ;/ THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                                       ;/ IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
                                       ;////////////////////////////////////////////////////////////////////////

                                       .ENABL  AMA
002260                                         BGNHW   DFPTBL
002260  000013                                 .WORD   L10001-L$HW/2
002262                                 L$HW::
002262                                 DFPTBL::
002262  000007                               .WORD   7                       ;MICRO-CPU TYPE.
002264  160170                               .WORD   160170  ;M8200,4,7 CRS ADDRESS
002266  000300                               .WORD   300     ;M8200,4,7 VECTOR ADDRESS
002270  005000                               .WORD   5000    ;INTERRUPT PRIORITY LEVEL
002272  000003                               .WORD   3       ;LINE UNIT TYPE
002274  000056                               .WORD   56      ;SWITCH PACK #1 (DDCMP LINE #)
002276  000000                               .WORD   0       ;SWITCH PACK #2 (BM873 BOOT ADDRESS)
002300  000000                               .WORD   0       ;SWITCH PACK #3
002302  000000                               .WORD   0       ;TEST CONNECTOR INSTALLED FLAG
002304  000004                               .WORD   4       ;CONTAINS BAUD RATE 4=56K BAUD DEFAULT
                                                             ;0=2.4K , 1=4.8K , 2=9.6K , 3=19.2K , 4=56K
                                                             ;5=250K , 6=500K , 7=1 MEG BAUD
002306  000000                               .WORD   0       ;0=RUN SW OFF, 1=SW ON

002310                                         ENDHW
002310                                 L10001:
```

```
CZDMQD.P11    12-JAN-82 09:50          SOFTWARE P-TABLE

  1448                                 .SBTTL  SOFTWARE P-TABLE
  1449
  1450                                 ;////////////////////////////////////////////////////////////////////////
  1451                                 ;/ THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
  1452                                 ;/ PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
  1453                                 ;////////////////////////////////////////////////////////////////////////
  1454
  1455  002310                                 BGNSW   SFPTBL
  1456  002310  000000                         .WORD   L10002-L$SW/2
  1457  002312                         L$SW::
  1458  002312                         SFPTBL::
  1459
  1460
  1461  002312                                 ENDSW
  1462  002312                         L10002:
  1463
  1464
  1465
  1466
  1467
  1468
```

```
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480                                    .SBTTL  GLOBAL EQUATES SECTION
1481
1482
1483                                    ;////////////////////////////////////////////////////////////////////////////
1484                                    ;/      THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
1485                                    ;/      ARE USED IN MORE THAN ONE TEST.
1486                                    ;////////////////////////////////////////////////////////////////////////////
1487
1488  002312                                    EQUALS
1489                                    ;
1490                                    ; BIT DIFINITIONS
1491                                    ;
1492            100000                  BIT15== 100000
1493            040000                  BIT14== 40000
1494            020000                  BIT13== 20000
1495            010000                  BIT12== 10000
1496            004000                  BIT11== 4000
1497            002000                  BIT10== 2000
1498            001000                  BIT09== 1000
1499            000400                  BIT08== 400
1500            000200                  BIT07== 200
1501            000100                  BIT06== 100
1502            000040                  BIT05== 40
1503            000020                  BIT04== 20
1504            000010                  BIT03== 10
1505            000004                  BIT02== 4
1506            000002                  BIT01== 2
1507            000001                  BIT00== 1
1508                                    ;
1509            001000                  BIT9==  BIT09
1510            000400                  BIT8==  BIT08
1511            000200                  BIT7==  BIT07
1512            000100                  BIT6==  BIT06
1513            000040                  BIT5==  BIT05
1514            000020                  BIT4==  BIT04
1515            000010                  BIT3==  BIT03
1516            000004                  BIT2==  BIT02
1517            000002                  BIT1==  BIT01
1518            000001                  BIT0==  BIT00
1519                                    ;
1520                                    ; EVENT FLAG DEFINITIONS
1521                                    ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
1522                                    ;
1523            000040                  EF.START==      32.                     ; START COMMAND WAS ISSUED
1524            000037                  EF.RESTART==    31.                     ; RESTART COMMAND WAS ISSUED
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL EQUATES SECTION

```
1525    000036          EF.CONTINUE==   30.             ; CONTINUE COMMAND WAS ISSUED
1526    000035          EF.NEW==        29.             ; A NEW PASS HAS BEEN STARTED
1527    000034          EF.PWR==        28.             ; A POWER-FAIL/POWER-UP OCCURRED
1528                    ;
1529                    ;
1530                    ; PRIORITY LEVEL DEFINITIONS
1531                    ;
1532    000340          PRI07== 340
1533    000300          PRI06== 300
1534    000240          PRI05== 240
1535    000200          PRI04== 200
1536    000140          PRI03== 140
1537    000100          PRI02== 100
1538    000040          PRI01== 40
1539    000000          PRI00== 0
1540                    ;
1541                    ;OPERATOR FLAG BITS
1542                    ;
1543    000004          EVL==       4
1544    000010          LOT==      10
1545    000020          ADR==      20
1546    000040          IDU==      40
1547    000100          ISR==     100
1548    000200          UAM==     200
1549    000400          BOE==     400
1550    001000          PNT==    1000
1551    002000          PRI==    2000
1552    004000          IXE==    4000
1553    010000          IBE==   10000
1554    020000          IER==   20000
1555    040000          LOE==   40000
1556    100000          HOE==  100000
1557
1558
1559
1560
1561                    ;;*****************************************************************************
1562                    ;* PROGRAM EVENT FLAG DEFINITIONS
1563                    ;;*****************************************************************************
1564
1565
1566
```

```
CZDMQD.P11    12-JAN-82 09:50          GLOBAL DATA SECTION

                                       .SBTTL  GLOBAL DATA SECTION

                                       ;////////////////////////////////////////////////////////////////////////////
                                       ;/      THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
                                       ;/      IN MORE THAN ONE TEST.
                                       ;////////////////////////////////////////////////////////////////////////////

                                       ;;**************************************************************************
                                       ;* STORAGE FOR DEVICE REGISTERS
                                       ;;**************************************************************************
002312                                 L$DESC::        DESCRIPT        <M8207 DIAG. #2 OF 2>
002312                                 L$DESC::
002312  034115  030062  020067                 .ASCIZ  /M8207 DIAG. #2 OF 2/
002320  044504  043501  020056
002326  031043  047440  020106
002334  000062
                                               .EVEN

                                       ;**************************************************************************
                                       ;* PROGRAM CONTROL PARAMETERS
                                       ;**************************************************************************
002336  000000                         NEXT:   .WORD   0               ;ADDRESS OF NEXT TEST TO BE EXECUTED
002340  000000                         LOCK:   .WORD   0               ;ADDRESS FOR LOCK CURRENT DATA

                                       ;**************************************************************************
                                       ;* MISCELLANEOUS STORAGE
                                       ;**************************************************************************
002342  000000                         LOGDEV: .WORD   0               ;LOGICAL DEVICE NUMBER
002344  000000                         PSTACK: .WORD   0               ;BASE LEVEL PROGRAM STACK POINTER
002346  000000                         SUBRPC: .WORD   0               ;PC OF SUBR CALL FOR ERROR REPORTS
002350  000000                         ERRFLG: .WORD   0               ;SUBROUTINE ERROR FLAG
002352  000000                         RETADR: .WORD   0               ;SUBR ERROR RETURN ADDRESS
002354  000000                         STRTSW: .WORD   0               ;SWITCHES AT START OF PROGRAM
002356  000000                         STAT:   .WORD   0               ;KM STATUS WORD STORAGE
002360  000000                         CLKX:   .WORD   0               ;
002362  000000                         MASKX:  .WORD   0               ;
002364  000000                         SAVSP:  .WORD   0               ;STACK POINTER STORAGE
002366  000000                         SAVPC:  .WORD   0               ;PROGRAM COUNTER STORAGE
002370  000000                         ZERO:   .WORD   0               ;
002372  000001                         ONE:    .WORD   1               ;
002374  000000                         MEMLIM: .WORD   0               ;HIGHEST LOCATION FOR NPR'S
002376  000001                         KMACTV: .BLKW   1               ;M8200,4,7 SELECTED ACTIVE
002400  000001                         KMNUM:  .BLKW   1               ;OCTAL NUMBER OF M8200,4,7'S
002402  000001                         SAVACT: .BLKW   1               ;ORIGINAL ACTIVE DEVICES
002404  000001                         SAVNUM: .BLKW   1               ;WORKABLE NUMBER
002406  000000                         FLAG:   .WORD   0               ;SCRATCH STORAGE
002410  000000                         RUN:    .WORD   0               ;POINTER TO RUNNING DEVICES
002412  000000                         FADR:   .WORD   0
002414  000000                         MTYPE:  .WORD   0               ;M82XX NUMBER FOR TYPE OF MICO-CPU
002416  000000                         $REG5:  .WORD   0               ;STORAGE USED FOR ERROR MSG DATA
002420  000000                         $REG4:  .WORD   0
002422  000000                         $REG3:  .WORD   0
002424  000000                         $REG2:  .WORD   0
002426  000000                         $REG1:  .WORD   0
002430  000000                         $REG0:  .WORD   0
002432  000000                         TYPE:   .WORD   0               ;=0 FOR DMP,=1 FOR M8206
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL DATA SECTION

```
1623  002434  000000  MRO:    .WORD   0               ;MEMLOC USED INSTEAD OF R0.
1624  002436  003777  MEMSZ:  .WORD   3777            ;INDICATES MEMORIE SIZE, LAST ADDR.
1625  002440  000000  TEMP:   .WORD   0
1626  002442  000000  $TEMP0: .WORD   0
1627  002444  000000  $TMP0:  .WORD   0
1628  002446  000000  $GDADR: .WORD   0               ;CONTAINS ADDRESS OF 'GOOD' DATA
1629  002450  000000  $BDADR: .WORD   0               ;CONTAINS ADDRESS OF 'BAD' DATA
1630  002452  000000  $GDDAT: .WORD   0               ;CONTAINS 'GOOD' DATA
1631  002454  000000  $BDDAT: .WORD   0               ;CONTAINS 'BAD' DATA
1632  002456  000000          .WORD   0               ;RESERVED--NOT TO BE USED
1633  002460  000000          .WORD   0
1634  002462  000000  FTIME:  .WORD   0
1635  002464  000000  SAVE4:  .WORD   0
1636  002466  000000  SAVE6:  .WORD   0
1637  002470  000000  RUNB:   .WORD   0               ;0= RUN OFF, 1= RUN SW ON
1638  002472  000000  RUNINH: .WORD   0               ;0=RUN SW OFF, 1=RUN SW ON
1639
1640                  ;*****************************************************************************
1641                  ;* PROGRAM CONTROL FLAGS
1642                  ;*****************************************************************************
1643  002474     000  INIFLG: .BYTE   0               ;PROGRAM INITIALIZING FLAG
1644        002476            .EVEN
1645  002476     000  LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG
1646  002477     000  QV.FLG: .BYTE   0               ;QUICK VERIFY FLAG
1647                          .EVEN
1648
1649                  ;*****************************************************************************
1650                  ;* DEFINITION OF M8200,4,7 STATUS WORDS - STAT1,STAT2,STAT3
1651                  ;*
1652                  ;*
1653                  ;*      STAT1 - BITS 00-08 IS M8200,4,7 VECTOR ADDRESS
1654                  ;*              BIT15=1 LINE UNIT IS AN M8203
1655                  ;*              BIT14=0 NO TEST CONNECTOR(S) USED
1656                  ;*              BIT14=1 H-XXX TEST CONNECTOR WILL BE USED
1657                  ;*              BIT13=0 LINE UNIT IS AN M8201
1658                  ;*              BIT13=1 LINE UNIT IS AN M8202
1659                  ;*              BIT12=1 NO LINE UNIT
1660                  ;*              BITS 09-11 IS M8200,4,7 PRIORITY LEVEL
1661                  ;*
1662                  ;*      STAT2 - LOW BYTE IS SWITCH PACK #1 (DDCMP LINE NUMBER)
1663                  ;*              HIGH BYTE IS SWITCH PACK #2 (BM873 BOOT ADDRESS)
1664                  ;*
1665                  ;*      STAT3 - BIT0=1 DO FREE RUNNING TESTS ON M8200,4,7
1666                  ;*
1667                  ;*****************************************************************************
1668  002500  000000  STAT1:  .WORD   0
1669  002502  000000  STAT2:  .WORD   0
1670  002504  000000  STAT3:  .WORD   0
1671
1672                  ;*****************************************************************************
1673                  ;* POINTERS TO M8200,4,7 VECTORS AND REGISTERS
1674                  ;*****************************************************************************
1675  002506  000000  KMRVEC: 0       ;POINTER TO M8200,4,7 RCV INTRPT VECTOR
1676  002510  000000  KMRLVL: 0       ;POINTER TO M8200,4,7 RCV INTRPT SERVICE PS
1677  002512  000000  KMTVEC: 0       ;POINTER TO M8200,4,7 TX INTRPT VECTOR
1678  002514  000000  KMTLVL: 0       ;POINTER TO M8200,4,7 TX INTRPT SERVICE PS
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL DATA SECTION

```
 1679  002516  000000          KMCSR:  0       ;POINTER TO M8200.4.7 CONTROL STATUS REGISTER
 1680  002520  000000          KMCSRH: 0       ;POINTER TO M8200.4.7 CONTROL STATUS REGISTER HIGH BYTE
 1681  002522  000000          KMCTL:  0       ;POINTER TO M8200.4.7 CONTROL OUT REGISTER
 1682  002524  000000          KMP04:  0       ;POINTER TO M8200.4.7 PORT REGISTER - SEL4
 1683  002526  000000          KMP06:  0       ;POINTER TO M8200.4.7 PORT REGISTER - SEL6
 1684
 1685                          ;;****  PRIMARY REG ADRS STORAGE FOR THIS UNIT  ******
 1686                          ;THESE LOCATIONS WILL BE LOADED FOR THE CURRENT UNIT, IN INIT CODE
 1687  002530                  REGADR:
 1688
 1689                          ;;****  STACK USED FOR SUBROUTINE LINKAGE  *****
 1690  002530  000100                  .BLKW   100
 1691  002730                  SSTACK:
 1692
 1693
 1694
 1695
 1696
 1697
 1698
```

```
CZDMQD.P11    12-JAN-82 09:50          GLOBAL TEXT SECTION

                                       .SBTTL  GLOBAL TEXT SECTION

                                       ;%%%
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL SUBROUTINES

```
1728                    .SBTTL  GLOBAL SUBROUTINES
1729
1730                    ;////////////////////////////////////////////////////////////////////////
1731                    ;/      THE GLOBAL SUBROUTINES ARE CALLED BY MORE THAN ONE TEST
1732                    ;////////////////////////////////////////////////////////////////////////
1733
1734
1735
1736                    ;-------------------------------------------------------------------
1737                    ; MACRO'S NEEDED TO CALL SUBROUTINES
1738                    ;-------------------------------------------------------------------
1739
1740                    .MACRO  POPSP2
1741                            22626
1742                    .ENDM
```

```
1743
1744
1745
1746
1747
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL SUBROUTINES

```
1748
1749                    ;////////////////////////////////////////////////////////////////////////////
1750                    ;/      THE GLOBAL SUBROUTINES ARE CALLED BY MORE THAN ONE TEST
1751                    ;////////////////////////////////////////////////////////////////////////////
1752
1753
1754
1755                    ;-------------------------------------------------------------------
1756                    ; MACRO'S NEEDED TO CALL SUBROUTINES
1757                    ;-------------------------------------------------------------------
1758
1759                    .MACRO  K4ONLY  ?N2
1760                            CMP     MEMSZ,#2000
1761                            BNE     N2
1762                            EXIT    TST
1763                            .ENDM
1764                    .MACRO  EDSCALL XY
1765                            .LIST
1766                            ;*************** TEST 'XY' ***************
1767                            .NLIST
1768                            .ENDM
1769                            .MACRO  BADHEAD
1770                            .RADIX  10
1771                            EDSCALL \T$TESTNUM+1
1772                            .RADIX  8
1773                            .ENDM
```

```
1774                    .MACRO  MYINT
1775                            .LIST
1776                            MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
1777                            .NLIST
1778                    .ENDM
1779
1780                    .MACRO  MACEX   ?N2
1781                            .LIST
1782                            ;DO NOT DO TEST IF M8200
1783                            .NLIST
1784                            TST     TYPE
1785                            BNE     N2
1786                            EXIT    TST
1787                    N2:
1788                    .ENDM   MACEX
1789                    .MACRO  MACEX2  ?N2
1790                            .LIST
1791                            ;DO NOT DO TEST IF M8200
1792                            .NLIST
1793                            CMP     WTYPE,#0
1794                            BNE     N2
1795                            EXIT TST
1796                    N2:
1797                    .ENDM   MACEX2
1798                    .MACRO  K4ONLY  ?N2
1799                            .LIST
1800                            ;DO NOT DO TEST IF M8200, OR M8204
1801                            .NLIST
1802                            CMP     MEMSZ,#2000
1803                            BNE     N2
1804                            EXIT    TST
1805                    N2:
1806                                                    ;NOTE THIS TEST IS ONLY DESIGNED FOR 4K MODULE.
1807                    .ENDM
1808
1809                    .MACRO  CLRMAR
1810                            ROMCLK
1811                            004000
1812                    .ENDM   CLRMAR
1813                    .MACRO  ROMCLK
1814                    .LIST
1815                            JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
1816                    .NLIST
1817                    .ENDM
1818
1819                    .MACRO  SROMCLK
1820                            .LIST
1821                            JSR     R5,..SROMCLK
1822                            .NLIST
1823                    .ENDM
1824                    .MACRO  SKIP06  NNN
1825                            .LIST
1826                            ;GOTO 'NNN' IF M8206
1827                            .NLIST
1828                            CMP     WTYPE,#6                ;SEE IF M8206
1829                            BEQ     NNN
```

```
1830                                    .ENDM
1831                                    .MACRO  SKIP07  NNN
1832                                            .LIST
1833                                            ;GOTO 'NNN' IF M8207
1834                                            .NLIST
1835                                            CMP     WTYPE,#7                ;SEE IF M8200,4,7
1836                                            BEQ     NNN
1837                                    .ENDM
1838                                    .MACRO  SKIP04  NNN
1839                                            .LIST
1840                                            ;GOTO 'NNN' IF M8204
1841                                            .NLIST
1842                                            CMP     WTYPE,#4                ;SEE IF M8204
1843                                            BEQ     NNN
1844                                    .ENDM
1845                                    .MACRO  MSTCLR
1846                                    JSR     R5,.MSTCLR              ;CLEAR M8200,4,7
1847                                    .ENDM
1848
1849  002756                            .MSTCLR:
1850  002756  112777  000100  177534            MOVB    #BIT6,@KMCSRH   ;SET INST.
1851  002764  142777  000300  177526            BICB    #BIT6!BIT7,@KMCSRH
1852  002772  000205                            RTS     R5
1853
1854  002774  000024                    PATCH:  .BLKW   20.             ;PATCH AREA.
1855
1856
1857
1858  003044                            ENDBUG:
1859                                    ;       UNSAFE TO PATCH ANY OTHER AREA.
1860  003044                            .ROMCLK:
1861  003044  000240                            NOP
1862  003046  000240                            NOP
1863  003050  152777  000002  177442    .REGT:  BISB    #BIT1,@KMCSRH
1864  003056  012577  177444                    MOV     (R5)+,@KMP06
1865  003062  152777  000003  177430            BISB    #BIT1!BIT0,@KMCSRH
1866  003070  142777  000007  177422            BICB    #BIT2!BIT1!BIT0,@KMCSRH
1867  003076  000205                            RTS     R5
1868
1869  003100                            .SROMCLK:
1870  003100  000240                            NOP
1871  003102  022737  000006  002414            CMP     #6,WTYPE
1872  003110  001357                            BNE     .REGT
1873  003112  152777  000002  177400            BISB    #BIT1,@KMCSRH
1874  003120  012577  177402                    MOV     (R5)+,@KMP06
1875  003124  000240                            NOP
1876  003126  000240                            NOP
1877  003130  142777  000007  177362            BICB    #7,@KMCSRH
1878  003136                            1$:
1879  003136  152777  000001  177354            BISB    #BIT0,@KMCSRH           ;STEP INSTR.
1880  003144  142777  000007  177346            BICB    #BIT2!BIT1!BIT0,@KMCSRH
1881  003152  000240                            NOP
1882  003154  000240                            NOP
1883  003156  152777  000002  177334            BISB    #2,@KMCSRH
1884  003164                            2$:
1885  003164  000205                            RTS     R5
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL SUBROUTINES

```
1886  003166                          CLRALL:
1887                                          ;CLEARS C & Z BITS AND BR
1888  003166                                  ROMCLK
1889  003166  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1890  003172  000400                         400                       ;0 TO BR
1891  003174                                  ROMCLK
1892  003174  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1893  003200  063220                         63220                     ;SP(0) TO BR
1894  003202                                  ROMCLK
1895  003202  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1896  003206  060400                         60400                     ;BR,SP(0) + BR
1897  003210                                  SROMCLK
1898  003210  004537  003100                 JSR     R5,..SROMCLK
1899  003214  000000                         0
1900  003216  000207                         RTS     PC
1901
1902  003220                          SETBR0:
1903                                          ;SETS BR0 BIT
1904  003220                                  ROMCLK
1905  003220  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1906  003224  000401                         401                       ;1 TO BR
1907  003226  000207                         RTS     PC
1908
1909  003230                          SETBR1:
1910                                          ;THIS SUBROUTINE SETS BR1 BIT
1911
1912  003230                                  ROMCLK                    ;NEXT WORD IS INSTRUCTION
1913  003230  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1914  003234  000402                         000402                    ;BR_002
1915  003236  000207                         RTS     PC
1916
1917  003240                          SETBR4:
1918                                          ;THIS SUBROUTINE SETS BR4 BIT
1919
1920  003240                                  ROMCLK                    ;NEXT WORD IS INSTRUCTION
1921  003240  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1922  003244  000420                         420
1923  003246  000207                         RTS     PC
1924
1925  003250                          SETBR7:
1926                                          ;THIS SUBROUTINE SETS BR7 BIT
1927
1928  003250                                  ROMCLK                    ;NEXT WORD IS INSTRUCTION
1929  003250  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1930  003254  000600                         600
1931  003256  000207                         RTS     PC
1932
1933  003260                          SETC:
1934                                          ;THIS SUBROUTINE SETS THE C BIT
1935
1936  003260                                  ROMCLK                    ;NEXT WORD IS INSTRUCTION
1937  003260  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1938  003264  000777                         000777                    ;BR_377
1939  003266                                  ROMCLK                    ;NEXT WORD IS INSTRUCTION
1940  003266  004537  003044                 JSR     R5,..ROMCLK       ;CLOCK INSTRUCTION
1941  003272  063220                         063220                    ;SP(0)_BR
```

```
1942  003274                                ROMCLK                  ;NEXT WORD IS INSTRUCTION
1943  003274  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
1944  003300  060400                        060400                  ;BR SP(0)+BR
1945  003302                                SROMCLK                 ;NOW WE MUST CLOCK THE BITS INTO IBUS <13>
1946  003302  004537  003100                JSR     R5,..SROMCLK
1947  003306  000000                        0
1948  003310  000207                        RTS     PC
1949
1950  003312                        SETZ:
1951                                        ;THIS SUBROUTINE SETS THE Z BIT
1952
1953  003312                                ROMCLK                  ;NEXT WORD IS INSTRUCTION
1954  003312  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
1955  003316  000777                        000777                  ;BR 377
1956  003320                                SROMCLK                 ;NOW CLOCK THE BITS INTO IBUS<13>
1957  003320  004537  003100                JSR     R5,..SROMCLK
1958  003324  000777                        0777
1959  003326  000207                        RTS     PC
1960
1961  003330                        RAMDAT:
1962                                        ;THIS SUBROUTINE LOADS R4 WITH THE LOWEST
1963                                        ;8 BITS OF THE CRAM PC.
1964
1965  003330  005004                        CLR     R4
1966  003332  017605  000000                MOV     @(SP),R5        ;GOOD DATA
1967  003336  062716  000002                ADD     #2,(SP)         ;ADJUST STACK
1968  003342                                SKIP06  1$      ;IF M8206,WE'LL GET PC A DIFFERENT WAY.
1969                                        ;GOTO 1$ IF M8206
1970  003352                                SKIP07  1$      ;IF M8200,4,7 WE'LL GET PC A DIFFERENT WAY.
1971                                        ;GOTO 1$ IF M8207
1972  003362  005011                        CLR     (R1)            ;CLEAR BIT10
1973  003364  052711  000400                BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION IN CRAM THAT
1974                                                                ;JUMPED TO, IT LOADS BR WITH IT
1975  003370  005011                        CLR     (R1)            ;CLR BIT8
1976  003372                                ROMCLK                  ;NEXT WORD IS INSTRUCTION
1977  003372  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
1978  003376  061225                        061225                  ;MOV BR TO PORT 5
1979  003400  116104  000005                MOVB    5(R1),R4        ;PUT "FOUND" IN R4
1980  003404  000207                        RTS     PC              ;RETURN
1981
1982  003406                        1$:     ROMCLK                  ;READ PC LOW REG DIRECTLY.
1983  003406  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
1984  003412  121244                        121244                  ;IBUS*<12> TO PORT 4
1985  003414  116104  000004                MOVB    4(R1),R4        ;PUT INTO R4
1986  003420  000207                        RTS PC                  ;EXIT
1987
1988  003422                        WROM:
1989                                        ;THIS SUBROUTINE WRITES THE ROMMAP INTO THE CRAM
1990
1991                                ;       BIT     #BIT15,STAT1    ;BE SURE M8200,4,7 HAS CRAM
1992                                ;       BEQ     2$              ;SKIP IF NO CRAM
1993  003422                                SKIP07  2$
1994                                        ;GOTO 2$ IF M8207
1995  003432  005000                        CLR     R0              ;R0=CRAM ADDRESS
1996  003434  012702  012146                MOV     #ROMMAP,R2      ;R2 POINTS TO ROMMAP
1997  003440  012711  002000        1$:     MOV     #BIT10,(R1)     ;SET ROM0
```

```
CZDMQD.P11    12-JAN-82 09:50          GLOBAL SUBROUTINES

 1998  003444  010061  000004                MOV     R0,4(R1)        ;LOAD CRAM ADDRESS
 1999  003450  012261  000006                MOV     (R2)+,6(R1)     ;LOAD WORD TO BE WRITTEN
 2000  003454  052711  020000                BIS     #BIT13,(R1)     ;WRITE IT!
 2001  003460  005200                        INC     R0              ;NEXT ADDRESS
 2002  003462  023700  002436                CMP     MEMSZ,R0        ;DONE YET?
 2003  003466  001364                        BNE     1$              ;BR IF NO
 2004  003470  005011                        CLR     (R1)            ;CLEAR SEL0
 2005  003472  000207              2$:       RTS     PC              ;RETURN
 2006
 2007  003474                    MEMSET:
 2008                                        ;THIS SUBROUTINE LOADS CRAM WITH SPECIAL INSTRUCTIONS
 2009                                        ;FOR THE CRAM JUMP TEST. ALL CRAM LOCATIONS ARE LOADED
 2010                                        ;WITH INSTRUCTIONS THAT MOVE A 37 TO THE BR, EXCEPT THE
 2011                                        ;FOLLOWING CRAM ADDRESSES: 0,1,4,7,525,1777. THESE LOCATIONS
 2012                                        ;CONTAIN INSTRUCTIONS WHICH LOAD THE BR WITH THE LOWEST
 2013                                        ;8 BITS OF THAT CRAM ADDRESS.
 2014
 2015  003474                                SKIP07  3$      ;IF M8200,4,7 CAN'T WRITE CRAM!
 2016                                        ;GOTO 3$ IF M8207
 2017  003504  005000                        CLR     R0              ;R0 = CRAM ADDRESS
 2018  003506  012711  002000        1$:     MOV     #BIT10,(R1)     ;SET ROMO
 2019  003512  010061  000004                MOV     R0,4(R1)        ;LOAD CRAM ADDRESS
 2020  003516  012761  000437  000006        MOV     #437,6(R1)      ;LOAD INSTRUCTION
 2021  003524  052711  020000                BIS     #BIT13,(R1)     ;WRITE INSTRUCTION IN CRAM
 2022  003530  005200                        INC     R0              ;NEXT ADDRESS
 2023  003532  023700  002436                CMP     MEMSZ,R0        ;DONE YET?
 2024  003536  001363                        BNE     1$              ;BR IF NO
 2025  003540  005000                        CLR     R0              ;INDEX REGISTER
 2026  003542  012711  002000        2$:     MOV     #BIT10,(R1)     ;SET ROMO
 2027  003546  016061  003602  000004        MOV     CRAMA(R0),4(R1) ;LOAD CRAM ADDRESS IN SEL4
 2028  003554  016061  003616  000006        MOV     INSTU(R0),6(R1) ;LOAD INSTRUCTION TO BE WRITTEN
 2029  003562  052711  020000                BIS     #BIT13,(R1)     ;WRITE CRAM!
 2030  003566  005720                        TST     (R0)+           ;NEXT
 2031  003570  022700  000014                CMP     #14,R0          ;DONE YET?
 2032  003574  001362                        BNE     2$              ;BR IF NO
 2033  003576  005011                        CLR     (R1)            ;CLEAR ALL BITS
 2034  003600  000207              3$:       RTS     PC              ;RETURN
 2035
 2036  003602  000000  000001  000004  CRAMA:  .WORD   0,1,4,7,1777,525
 2037  003610  000007  001777  000525
 2038
 2039  003616  000400                  INSTU:  000400          ;BR_0
 2040  003620  000401                          000401          ;BR_1
 2041  003622  000404                          000404          ;BR_4
 2042  003624  000407                          000407          ;BR_7
 2043  003626  000777                          000777          ;BR_377
 2044  003630  000525                          000525          ;BR_125
 2045
 2046
 2047                                        ;ROUTINE TO SAVE GENERAL REGISTERS FOR ERROR ROUTINE.
 2048                                        ; CALL = JSR    PC,SV05
 2049  003632  010537  002416        SV05:   MOV     R5,$REG5
 2050  003636  010437  002420                MOV     R4,$REG4
 2051  003642  010337  002422                MOV     R3,$REG3
 2052  003646  010237  002424                MOV     R2,$REG2
 2053  003652  010137  002426                MOV     R1,$REG1
```

```
  2054  003656  013737  002434  002430          MOV     MR0,$REG0
  2055  003664  000207                          RTS     PC
  2056
  2057
```

```
                                .SBTTL  GLOBAL ERROR REPORT SECTION

                                ;//////////////////////////////////////////////////////////////////
                                ;/      THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
                                ;/      THAT ARE USED IN MORE THAN ONE TEST.
                                ;//////////////////////////////////////////////////////////////////

003666  047045  047445  022466  TFM1:   .ASCIZ  /%N%O6%S4%O6%S4%O4%N/
003674  032123  047445  022466
003702  032123  047445  022464
003710  000116
003712  047045  047445  022463  TFM2:   .ASCIZ  /%N%O3%S7%O3%N/
003720  033523  047445  022463
003726  000116
003730  047045  047445  022463  TFM3:   .ASCIZ  /%N%O3%S10%O3%S4%O4%N/
003736  030523  022460  031517
003744  051445  022464  032117
003752  047045     000
003755     045  022516  031517  TFM4:   .ASCIZ  /%N%O3%S7%O3%N/
003762  051445  022467  031517
003770  047045     000
003773     045  022516  033117  TFM5:   .ASCIZ  /%N%O6%S5%O6%S3%O6%N/
004000  051445  022465  033117
004006  051445  022463  033117
004014  047045     000
004017     045  022516  051101  TFM36:  .ASCIZ  /%N%AREGISTER ADDRESS ERROR,ADDRESS = %O6%A,UNIT = %O2/
004024  043505  051511  042524
004032  020122  042101  051104
004040  051505  020123  051105
004046  047522  026122  042101
004054  051104  051505  020123
004062  020075  047445  022466
004070  026101  047125  052111
004076  036440  022440  031117
004104     000
004105     045  022516  020101  TFM41:  .ASCIZ  /%N%A CSR HIGH BYTE GOT WRITTEN INTO ON A LOW BYTE XFER/
004112  051503  020122  044510
004120  044107  041040  052131
004126  020105  047507  020124
004134  051127  052111  042524
004142  020116  047111  047524
004150  047440  020116  020101
004156  047514  020127  054502
004164  042524  054040  042506
004172  000122
004174  047045  040445  041440  TFM42:  .ASCIZ  /%N%A CSR LOW BYTE GOT WRITTEN INTO ON A HIGH BYTE XFER/
004202  051123  046040  053517
004210  041040  052131  020105
004216  047507  020124  051127
004224  052111  042524  020116
004232  047111  047524  047440
004240  020116  020101  044510
```

```
2114  004246  044107  041040  052131
2115  004254  020105  043130  051105
2116  004262     000
2117  004263     045  022516  047101  TFM40:  .ASCIZ  /%N%ANEG ADDR TEST DUAL ADDR ERROR-BAD ADDR = %06/
2118  004270  043505  040440  042104
2119  004276  020122  042524  052123
2120  004304  042040  040525  020114
2121  004312  042101  051104  042440
2122  004320  051122  051117  041055
2123  004326  042101  040440  042104
2124  004334  020122  020075  047445
2125  004342  000066
2126  004344  040445  051440  051103  TFM43:  .ASCIZ  /%A SCRATCH PAD %03%A DUAL ADDRESS ERROR WITH SP%02/
2127  004352  052101  044103  050040
2128  004360  042101  022440  031517
2129  004366  040445  042040  040525
2130  004374  020114  042101  051104
2131  004402  051505  020123  051105
2132  004410  047522  020122  044527
2133  004416  044124  051440  022520
2134  004424  031117     000
2135  004427     045  022524  052101  TFM44:  .ASCIZ  /%T%ATHE MAR REG, CONTENTS= %06/
2136  004434  042510  046440  051101
2137  004442  051040  043505  020054
2138  004450  047503  052116  047105
2139  004456  051524  020075  047445
2140  004464  000066
2141  004466  052045  040445  044124  TFM45:  .ASCIZ  /%T%ATHE PC REG, CONTENTS= %06/
2142  004474  020105  041520  051040
2143  004502  043505  020054  047503
2144  004510  052116  047105  051524
2145  004516  020075  047445  000066
2146  004524  047045  040445  047516  TFM45A: .ASCII  /%N%ANOTE: THIS ERROR MAY BE FALSELY GENERATED IF THE/
2147  004532  042524  020072  044124
2148  004540  051511  042440  051122
2149  004546  051117  046440  054501
2150  004554  041040  020105  040506
2151  004562  051514  046105  020131
2152  004570  042507  042516  040522
2153  004576  042524  020104  043111
2154  004604  052040  042510
2155  004610  047045  040445  052522          .ASCIZ  /%N%ARUN BIT (SW7 OF E28) IS ON/
2156  004616  020116  044502  020124
2157  004624  051450  033527  047440
2158  004632  020106  031105  024470
2159  004640  044440  020123  047117
2160  004646     000
2161  004647     045  047101  051120  TFM46:  .ASCIZ  '%ANPR/MISC REGS DATA FAILURE, GOOD =%06%A, BAD =%06''
2162  004654  046457  051511  020103
2163  004662  042522  051507  042040
2164  004670  052101  020101  040506
2165  004676  046111  051125  026105
2166  004704  043440  047517  020104
2167  004712  022475  033117  040445
2168  004720  020054  040502  020104
2169  004726  022475  033117     000
```

```
2170  004733    045  050101  020103  TFM47:  .ASCIZ  '%APC INCR. INCORRECT: S/B= %06%A ; WAS = %06''
2171  004740 047111  051103  020056
2172  004746 047111  047503  051122
2173  004754 041505  035124  051440
2174  004762 041057  020075  047445
2175  004770 022466  020101  020073
2176  004776 040527  020123  020075
2177  005004 047445  000066
2178  005010 040515  052123  051105  TMMC:   .ASCIZ  /MASTER CLEAR FAILED TO CLEAR /
2179  005016 041440  042514  051101
2180  005024 043040  044501  042514
2181  005032 020104  047524  041440
2182  005040 042514  051101  000040
2183  005046 047045  052045  047045  FM1:    .ASCIZ  /%N%T%N/
2184  005054    000
2185
2186
2187
2188  005055    000                   EM0:    .ASCIZ  //
2189  005056 051103  046501  042040  EM1:    .ASCIZ  /CRAM DATA ERROR/
2190  005064 052101  020101  051105
2191  005072 047522  000122
2192  005076 051103  046501  042040  EM2:    .ASCIZ  /CRAM DUAL ADDRESSING ERROR/
2193  005104 040525  020114  042101
2194  005112 051104  051505  044523
2195  005120 043516  042440  051122
2196  005126 051117     000
2197  005131    112  046525  020120  EM3:    .ASCIZ  /JUMP ERROR/
2198  005136 051105  047522  000122
2199  005144 051103  046501  045040  EM4:    .ASCIZ  /CRAM JUMP TEST FAULT/
2200  005152 046525  020120  042524
2201  005160 052123  043040  052501
2202  005166 052114     000
2203  005171    111  050117  046440  EM5:    .ASCIZ  /IOP MAIN MEMORY TEST/
2204  005176 044501  020116  042515
2205  005204 047515  054522  052040
2206  005212 051505  000124
2207  005216 047511  020120  040515  EM6:    .ASCIZ  /IOP MAR TEST/
2208  005224 020122  042524  052123
2209  005232    000
2210  005233    102  020122  044522  EM7:    .ASCIZ  /BR RIGHT SHIFT ERROR/
2211  005240 044107  020124  044123
2212  005246 043111  020124  051105
2213  005254 047522  000122
2214  005260 040515  020122  052504  EM10:   .ASCIZ  /MAR DUAL ADDRESSING ERROR/
2215  005266 046101  040440  042104
2216  005274 042522  051523  047111
2217  005302 020107  051105  047522
2218  005310 000122
2219  005312 052512  050115  043040  EM11:   .ASCIZ  /JUMP FIELD ERROR/
2220  005320 042511  042114  042440
2221  005326 051122  051117     000
2222  005333    112  046525  020120  EM12:   .ASCIZ  /JUMP TEST ERROR/
2223  005340 042524  052123  042440
2224  005346 051122  051117     000
2225  005353    103  047117  044504  EM16:   .ASCIZ  /CONDITION CODE TESTING,Z & C/
```

```
2224  005360  044524  047117  041440
2227  005366  042117  020105  042524
2228  005374  052123  047111  026107
2229  005402  020132  020046  000103
2230  005410  046103  041517  020113  EMB1:   .ASCIZ  /CLOCK TIME TOO FAST/
2231  005416  044524  042515  052040
2232  005424  047517  043040  051501
2233  005432  000124
2234  005434                          EM35:
2235  005434  047506  041522  020105  EM17:   .ASCIZ  /FORCE POWER FAIL ERROR/
2236  005442  047520  042527  020122
2237  005450  040506  046111  042440
2238  005456  051122  051117     000
2239  005463     111  052502  025123  EM27:   .ASCIZ  "IBUS* WRITE/READ ERROR"
2240  005470  053440  044522  042524
2241  005476  051057  040505  020104
2242  005504  051105  047522  000122
2243
2244  005512  041111  051525  047457  EM29:   .ASCIZ  'IBUS/OBUS WRITE/READ ERROR'
2245  005520  052502  020123  051127
2246  005526  052111  027505  042522
2247  005534  042101  042440  051122
2248  005542  051117     000
2249
2250  005545     120  046507  041440  EMB50:  .ASCIZ  'PGM CLOCK WOULD NOT CLEAR'
2251  005552  047514  045503  053440
2252  005560  052517  042114  047040
2253  005566  052117  041440  042514
2254  005574  051101     000
2255  005577     120  046507  041440  EMB51:  .ASCIZ  'PGM CLOCK WOULD NOT SET'
2256  005604  047514  045503  053440
2257  005612  052517  042114  047040
2258  005620  052117  051440  052105
2259  005626     000
2260  005627     045  022516  025101  STM:    .ASCIZ  '%N%A************************************************************'
2261  005634  025052  025052  025052
2262  005642  025052  025052  025052
2263  005650  025052  025052  025052
2264  005656  025052  025052  025052
2265  005664  025052  025052  025052
2266  005672  025052  025052  025052
2267  005700  025052  025052  025052
2268  005706  025052  025052  025052
2269  005714  025052  025052  025052
2270  005722     000
2271  005723     000                  DH0:    .ASCIZ  //
2272
2273
2274  005724  054105  042520  052103  DH1:    .ASCIZ  /EXPECTED  FOUND  ADDRESS/
2275  005732  042105  020040  047506
2276  005740  047125  020104  040440
2277  005746  042104  042522  051523
2278  005754     000
2279  005755     105  050130  041505  DH2:    .ASCIZ  /EXPECTED  FOUND/
2280  005762  042524  020104  043040
2281  005770  052517  042116     000
```

```
2282  005775  000106  047522  020115  DH3:    .ASCIZ  /FROM ADDR  TO ADDR  BAD ADDR/
2283  006002  042101  051104  020040
2284  006010  047524  040440  042104
2285  006016  020122  04104C  042101
2286  006024  040440  042104  000122
2287
2288
2289                                  .EVEN
2290
2291
2292
2293                                  ;-----------------------------------------------------------------
2294                                  ; MACRO'S NEEDED TO REPORT ERRORS
2295                                  ;-----------------------------------------------------------------
2296
2297                                  .MACRO  MDT1
2298                                          PRINTB  #TFM1,$REG2,$REG4,$REG0
2299                                  .ENDM
2300
2301                                  .MACRO  MDT2
2302                                          PRINTB  #TFM1,$REG5,$REG4,$REG2
2303                                  .ENDM
2304
2305                                  .MACRO  MDT3
2306                                          PRINTB  #TFM2,$REG5,$REG4
2307                                  .ENDM
2308
2309                                  .MACRO  MDT4
2310                                          PRINTB  #TFM3,$REG5,$REG4,FLAG
2311                                  .ENDM
2312
2313                                  .MACRO  MDT5
2314                                          PRINTB  #TFM3,$REG5,$REG4,$REG2
2315                                  .ENDM
2316
2317                                  .MACRO  MDT0
2318                                  .ENDM
2319                                  .MACRO  MDT6
2320                                          PRINTB  #TFM4,$REG2,$REG4
2321                                  .ENDM
2322
2323                                  .MACRO  MDT7
2324                                          PRINTB  #TFM4,$REG5,$REG4
```

```
2325                            .ENDM
2326                            .MACRO  MDT8
2327                                    PRINTB #TFM5,FADR,$REG5,$REG4
2328                            .ENDM
```

```
2329
2330                    .MACRO  $MD     ERRNN   ERNB    ERHM    ERFM
2331                            BGNMSG  ERR'ERRNN
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL ERROR REPORT SECTION

```
2332                                            PRINTB  #FM1,#EM'ERNB
2333                                            PRINTB  #FM1,#DH'ERHM
2334                                            MDT'ERFM
2335                                            PRINTB  #STM
2336                                            ENDMSG
2337                                    .ENDM
2338
2339                                    .MACRO  ERROR   ECB
2340                                            JSR     PC,SV05
2341                                            ERRDF   'ECB',EM0,ERR'ECB'
2342                                    .ENDM
2343
2344
2345
2346  006032                                    SMD     1,1,1,1
2347  006032                            ERR1::
2348  006032  012746  005056                    MOV     #EM1,-(SP)
2349  006036  012746  005046                    MOV     #FM1,-(SP)
2350  006042  012746  000002                    MOV     #2,-(SP)
2351  006046  010600                            MOV     SP,R0
2352  006050  104414                            TRAP    C$PNTB
2353  006052  062706  000006                    ADD     #6,SP
2354  006056  012746  005724                    MOV     #DH1,-(SP)
2355  006062  012746  005046                    MOV     #FM1,-(SP)
2356  006066  012746  000002                    MOV     #2,-(SP)
2357  006072  010600                            MOV     SP,R0
2358  006074  104414                            TRAP    C$PNTB
2359  006076  062706  000006                    ADD     #6,SP
2360  006102  013746  002430                    MOV     $REG0,-(SP)
2361  006106  013746  002420                    MOV     $REG4,-(SP)
2362  006112  013746  002424                    MOV     $REG2,-(SP)
2363  006116  012746  003666                    MOV     #TFM1,-(SP)
2364  006122  012746  000004                    MOV     #4,-(SP)
2365  006126  010600                            MOV     SP,R0
2366  006130  104414                            TRAP    C$PNTB
2367  006132  062706  000012                    ADD     #12,SP
2368  006136  012746  005627                    MOV     #STM,-(SP)
2369  006142  012746  000001                    MOV     #1,-(SP)
2370  006146  010600                            MOV     SP,R0
2371  006150  104414                            TRAP    C$PNTB
2372  006152  062706  000004                    ADD     #4,SP
2373  006156                            L10003:
2374  006156  104423                            TRAP    C$MSG
2375  006160                                    $MD     2,2,1,1
2376  006160                            ERR2::
2377  006160  012746  005076                    MOV     #EM2,-(SP)
2378  006164  012746  005046                    MOV     #FM1,-(SP)
2379  006170  012746  000002                    MOV     #2,-(SP)
2380  006174  010600                            MOV     SP,R0
2381  006176  104414                            TRAP    C$PNTB
2382  006200  062706  000006                    ADD     #6,SP
2383  006204  012746  005724                    MOV     #DH1,-(SP)
2384  006210  012746  005046                    MOV     #FM1,-(SP)
2385  006214  012746  000002                    MOV     #2,-(SP)
2386  006220  010600                            MOV     SP,R0
2387  006222  104414                            TRAP    C$PNTB
```

```
 2388  006224  062706  000006          ADD     #6,SP
 2389  006230  013746  002430          MOV     $REG0,-(SP)
 2390  006234  013746  002420          MOV     $REG4,-(SP)
 2391  006240  013746  002424          MOV     $REG2,-(SP)
 2392  006244  012746  003666          MOV     #TFM1,-(SP)
 2393  006250  012746  000004          MOV     #4,-(SP)
 2394  006254  010600                  MOV     SP,R0
 2395  006256  104414                  TRAP    C$PNTB
 2396  006260  062706  000012          ADD     #12,SP
 2397  006264  012746  005627          MOV     #STM,-(SP)
 2398  006270  012746  000001          MOV     #1,-(SP)
 2399  006274  010600                  MOV     SP,R0
 2400  006276  104414                  TRAP    C$PNTB
 2401  006300  062706  000004          ADD     #4,SP
 2402  006304                  L10004:
 2403  006304  104423                  TRAP    C$MSG
 2404  006306                          $MD     3,1,1,2
 2405  006306                  ERR3::
 2406  006306  012746  005056          MOV     #EM1,-(SP)
 2407  006312  012746  005046          MOV     #FM1,-(SP)
 2408  006316  012746  000002          MOV     #2,-(SP)
 2409  006322  010600                  MOV     SP,R0
 2410  006324  104414                  TRAP    C$PNTB
 2411  006326  062706  000006          ADD     #6,SP
 2412  006332  012746  005724          MOV     #DH1,-(SP)
 2413  006336  012746  005046          MOV     #FM1,-(SP)
 2414  006342  012746  000002          MOV     #2,-(SP)
 2415  006346  010600                  MOV     SP,R0
 2416  006350  104414                  TRAP    C$PNTB
 2417  006352  062706  000006          ADD     #6,SP
 2418  006356  013746  002424          MOV     $REG2,-(SP)
 2419  006362  013746  002420          MOV     $REG4,-(SP)
 2420  006366  013746  002416          MOV     $REG5,-(SP)
 2421  006372  012746  003666          MOV     #TFM1,-(SP)
 2422  006376  012746  000004          MOV     #4,-(SP)
 2423  006402  010600                  MOV     SP,R0
 2424  006404  104414                  TRAP    C$PNTB
 2425  006406  062706  000012          ADD     #12,SP
 2426  006412  012746  005627          MOV     #STM,-(SP)
 2427  006416  012746  000001          MOV     #1,-(SP)
 2428  006422  010600                  MOV     SP,R0
 2429  006424  104414                  TRAP    C$PNTB
 2430  006426  062706  000004          ADD     #4,SP
 2431  006432                  L10005:
 2432  006432  104423                  TRAP    C$MSG
 2433  006434                          $MD     4,3,2,3
 2434  006434                  ERR4::
 2435  006434  012746  005131          MOV     #EM3,-(SP)
 2436  006440  012746  005046          MOV     #FM1,-(SP)
 2437  006444  012746  000002          MOV     #2,-(SP)
 2438  006450  010600                  MOV     SP,R0
 2439  006452  104414                  TRAP    C$PNTB
 2440  006454  062706  000006          ADD     #6,SP
 2441  006460  012746  005755          MOV     #DH2,-(SP)
 2442  006464  012746  005046          MOV     #FM1,-(SP)
 2443  006470  012746  000002          MOV     #2,-(SP)
```

```
 2444  006474  010600                    MOV     SP,R0
 2445  006476  104414                    TRAP    C$PNTB
 2446  006500  062706  000006            ADD     #6,SP
 2447  006504  013746  002420            MOV     $REG4,-(SP)
 2448  006510  013746  002416            MOV     $REG5,-(SP)
 2449  006514  012746  003712            MOV     #TFM2,-(SP)
 2450  006520  012746  000003            MOV     #3,-(SP)
 2451  006524  010600                    MOV     SP,R0
 2452  006526  104414                    TRAP    C$PNTB
 2453  006530  062706  000010            ADD     #10,SP
 2454  006534  012746  005627            MOV     #STM,-(SP)
 2455  006540  012746  000001            MOV     #1,-(SP)
 2456  006544  010600                    MOV     SP,R0
 2457  006546  104414                    TRAP    C$PNTB
 2458  006550  062706  000004            ADD     #4,SP
 2459  006554                    L10006:
 2460  006554  104423                    TRAP    C$MSG
```

```
 2461  006556
 2462  006556
 2463  006556  012746  005144          $MD     5,4,2,3
 2464  006562  012746  005046  ERR5::
 2465  006566  012746  000002          MOV     #EM4,-(SP)
 2466  006572  010600                  MOV     #FM1,-(SP)
 2467  006574  104414                  MOV     #2,-(SP)
 2468  006576  062706  000006          MOV     SP,R0
 2469  006602  012746  005755          TRAP    C$PNTB
 2470  006606  012746  005046          ADD     #6,SP
 2471  006612  012746  000002          MOV     #DH2,-(SP)
 2472  006616  010600                  MOV     #FM1,-(SP)
 2473  006620  104414                  MOV     #2,-(SP)
 2474  006622  062706  000006          MOV     SP,R0
 2475  006626  013746  002420          TRAP    C$PNTB
 2476  006632  013746  002416          ADD     #6,SP
 2477  006636  012746  003712          MOV     $REG4,-(SP)
 2478  006642  012746  000003          MOV     $REG5,-(SP)
 2479  006646  010600                  MOV     #TFM2,-(SP)
 2480  006650  104414                  MOV     #3,-(SP)
 2481  006652  062706  000010          MOV     SP,R0
 2482  006656  012746  005627          TRAP    C$PNTB
 2483  006662  012746  000001          ADD     #10,SP
 2484  006666  010600                  MOV     #STM,-(SP)
 2485  006670  104414                  MOV     #1,-(SP)
 2486  006672  062706  000004          MOV     SP,R0
 2487  006676                          TRAP    C$PNTB
 2488  006676  104423                  ADD     #4,SP
                          L10007:
                                  TRAP    C$MSG
```

```
2489  006700                          $MD     6,5,1,4
2490  006700                  ERR6::
2491  006700  012746  005171          MOV     #EM5,-(SP)
2492  006704  012746  005046          MOV     #FM1,-(SP)
2493  006710  012746  000002          MOV     #2,-(SP)
2494  006714  010600                  MOV     SP,R0
2495  006716  104414                  TRAP    C$PNTB
2496  006720  062706  000006          ADD     #6,SP
2497  006724  012746  005724          MOV     #DH1,-(SP)
2498  006730  012746  005046          MOV     #FM1,-(SP)
2499  006734  012746  000002          MOV     #2,-(SP)
2500  006740  010600                  MOV     SP,R0
2501  006742  104414                  TRAP    C$PNTB
2502  006744  062706  000006          ADD     #6,SP
2503  006750  013746  002406          MOV     FLAG,-(SP)
2504  006754  013746  002420          MOV     $REG4,-(SP)
2505  006760  013746  002416          MOV     $REG5,-(SP)
2506  006764  012746  003730          MOV     #TFM3,-(SP)
2507  006770  012746  000004          MOV     #4,-(SP)
2508  006774  010600                  MOV     SP,R0
2509  006776  104414                  TRAP    C$PNTB
2510  007000  062706  000012          ADD     #12,SP
2511  007004  012746  005627          MOV     #STM,-(SP)
2512  007010  012746  000001          MOV     #1,-(SP)
2513  007014  010600                  MOV     SP,R0
2514  007016  104414                  TRAP    C$PNTB
2515  007020  062706  000004          ADD     #4,SP
2516  007024                  L10010:
2517  007024  104423                  TRAP    C$MSG
2518  007026                          $MD     7,6,1,5
2519  007026                  ERR7::
2520  007026  012746  005216          MOV     #EM6,-(SP)
2521  007032  012746  005046          MOV     #FM1,-(SP)
2522  007036  012746  000002          MOV     #2,-(SP)
2523  007042  010600                  MOV     SP,R0
2524  007044  104414                  TRAP    C$PNTB
2525  007046  062706  000006          ADD     #6,SP
2526  007052  012746  005724          MOV     #DH1,-(SP)
2527  007056  012746  005046          MOV     #FM1,-(SP)
2528  007062  012746  000002          MOV     #2,-(SP)
2529  007066  010600                  MOV     SP,R0
2530  007070  104414                  TRAP    C$PNTB
2531  007072  062706  000006          ADD     #6,SP
2532  007076  013746  002424          MOV     $REG2,-(SP)
2533  007102  013746  002420          MOV     $REG4,-(SP)
2534  007106  013746  002416          MOV     $REG5,-(SP)
2535  007112  012746  003730          MOV     #TFM3,-(SP)
2536  007116  012746  000004          MOV     #4,-(SP)
2537  007122  010600                  MOV     SP,R0
2538  007124  104414                  TRAP    C$PNTB
2539  007126  062706  000012          ADD     #12,SP
2540  007132  012746  005627          MOV     #STM,-(SP)
2541  007136  012746  000001          MOV     #1,-(SP)
2542  007142  010600                  MOV     SP,R0
2543  007144  104414                  TRAP    C$PNTB
2544  007146  062706  000004          ADD     #4,SP
```

CZDMQD.. 1 12-JAN-82 09:50

```
2545  007152
2546  007152  104423
2547  007154
2548  007154
2549  007154  012746  005233
2550  007160  012746  005046
2551  007164  012746  000002
2552  007170  010600
2553  007172  104414
2554  007174  062706  000006
2555  007200  012746  005755
2556  007204  012746  005046
2557  007210  012746  000002
2558  007214  010600
2559  007216  104414
2560  007220  062706  000006
2561  007224  013746  002420
2562  007230  013746  002416
2563  007234  012746  003712
2564  007240  012746  000003
2565  007244  010600
2566  007246  104414
2567  007250  062706  000010
2568  007254  012746  005627
2569  007260  012746  000001
2570  007264  010600
2571  007266  104414
2572  007270  062706  000004
2573  007274
2574  007274  104423
2575  007276
2576  007276
2577  007276  012746  005260
2578  007302  012746  005046
2579  007306  012746  000002
2580  007312  010600
2581  007314  104414
2582  007316  062706  000006
2583  007322  012746  005755
2584  007326  012746  005046
2585  007332  012746  000002
2586  007336  010600
2587  007340  104414
2588  007342  062706  000006
2589  007346  013746  002420
2590  007352  013746  002424
2591  007356  012746  003755
2592  007362  012746  000003
2593  007366  010600
2594  007370  104414
2595  007372  062706  000010
2596  007376  012746  005627
2597  007402  012746  000001
2598  007406  010600
2599  007410  104414
2600  007412  062706  000004
```

GLOBAL ERROR REPORT SECTION

```
L10011:
        TRAP    C$MSG
        $MD     10,7,2,3
ERR10::
        MOV     #EM7,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     #DH2,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     $REG4,-(SP)
        MOV     $REG5,-(SP)
        MOV     #TFM2,-(SP)
        MOV     #3,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #10,SP
        MOV     #STM,-(SP)
        MOV     #1,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #4,SP
L10012:
        TRAP    C$MSG
        $MD     11,10,2,6
ERR11::
        MOV     #EM10,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     #DH2,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     $REG4,-(SP)
        MOV     $REG2,-(SP)
        MOV     #TFM4,-(SP)
        MOV     #3,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #10,SP
        MOV     #STM,-(SP)
        MOV     #1,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #4,SP
```

CZDMGD.P11 12-JAN-82 09:50 GLOBAL ERROR REPORT SECTION

```
2601  007416
2602  007416  104423
2603  007420
2604  007420
2605  007420  012746  005233
2606  007424  012746  005046
2607  007430  012746  000002
2608  007434  010600
2609  007436  104414
2610  007440  062706  000006
2611  007444  012746  005755
2612  007450  012746  005046
2613  007454  012746  000002
2614  007460  010600
2615  007462  104414
2616  007464  062706  000006
2617  007470  013746  002420
2618  007474  013746  002416
2619  007500  012746  003755
2620  007504  012746  000003
2621  007510  010600
2622  007512  104414
2623  007514  062706  000010
2624  007520  012746  005627
2625  007524  012746  000001
2626  007530  010600
2627  007532  104414
2628  007534  062706  000004
2629  007540
2630  007540  104423
2631  007542
2632  007542
2633  007542  012746  005260
2634  007546  012746  005046
2635  007552  012746  000002
2636  007556  010600
2637  007560  104414
2638  007562  062706  000006
2639  007566  012746  005755
2640  007572  012746  005046
2641  007576  012746  000002
2642  007602  010600
2643  007604  104414
2644  007606  062706  000006
2645  007612  013746  002420
2646  007616  013746  002416
2647  007622  012746  003712
2648  007626  012746  000003
2649  007632  010600
2650  007634  104414
2651  007636  062706  000010
2652  007642  012746  005627
2653  007646  012746  000001
2654  007652  010600
2655  007654  104414
2656  007656  062706  000004
```

```
L10013:
        TRAP    C$MSG
        $MD     12,7,2,7
ERR12::
        MOV     #EM7,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     #DH2,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     $REG4,-(SP)
        MOV     $REG5,-(SP)
        MOV     #TFM4,-(SP)
        MOV     #3,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #10,SP
        MOV     #STM,-(SP)
        MOV     #1,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #4,SP
L10014:
        TRAP    C$MSG
        $MD     13,10,2,3
ERR13::
        MOV     #EM10,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     #DH2,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     $REG4,-(SP)
        MOV     $REG5,-(SP)
        MOV     #TFM2,-(SP)
        MOV     #3,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #10,SP
        MOV     #STM,-(SP)
        MOV     #1,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #4,SP
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL ERROR REPORT SECTION

```
2657  007662
2658  007662  104423
2659  007664
2660  007664
2661  007664  012746  005312
2662  007670  012746  005046
2663  007674  012746  000002
2664  007700  010600
2665  007702  104414
2666  007704  062706  000006
2667  007710  012746  005755
2668  007714  012746  005046
2669  007720  012746  000002
2670  007724  010600
2671  007726  104414
2672  007730  062706  000006
2673  007734  013746  002420
2674  007740  013746  002424
2675  007744  012746  003755
2676  007750  012746  000003
2677  007754  010600
2678  007756  104414
2679  007760  062706  000010
2680  007764  012746  005627
2681  007770  012746  000001
2682  007774  010600
2683  007776  104414
2684  010000  062706  000004
2685  010004
2686  010004  104423
```

```
L10015:
        TRAP    C$MSG
        $MD     14,11,2,6
ERR14::
        MOV     #EM11,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     #DH2,-(SP)
        MOV     #FM1,-(SP)
        MOV     #2,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #6,SP
        MOV     $REG4,-(SP)
        MOV     $REG2,-(SP)
        MOV     #TFM4,-(SP)
        MOV     #3,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #10,SP
        MOV     #STM,-(SP)
        MOV     #1,-(SP)
        MOV     SP,R0
        TRAP    C$PNTB
        ADD     #4,SP
L10016:
        TRAP    C$MSG
```

```
 2687  010006                          SMD     15,12,3,8
 2688  010006                  ERR15::
 2689  010006  012746  005333          MOV     #EM12,-(SP)
 2690  010012  012746  005046          MOV     #FM1,-(SP)
 2691  010016  012746  000002          MOV     #2,-(SP)
 2692  010022  010600                  MOV     SP,R0
 2693  010024  104414                  TRAP    C$PNTB
 2694  010026  062706  000006          ADD     #6,SP
 2695  010032  012746  005775          MOV     #DH3,-(SP)
 2696  010036  012746  005046          MOV     #FM1,-(SP)
 2697  010042  012746  000002          MOV     #2,-(SP)
 2698  010046  010600                  MOV     SP,R0
 2699  010050  104414                  TRAP    C$PNTB
 2700  010052  062706  000006          ADD     #6,SP
 2701  010056  013746  002420          MOV     $REG4,-(SP)
 2702  010062  013746  002416          MOV     $REG5,-(SP)
 2703  010066  013746  002412          MOV     FADR,-(SP)
 2704  010072  012746  003773          MOV     #TFM5,-(SP)
 2705  010076  012746  000004          MOV     #4,-(SP)
 2706  010102  010600                  MOV     SP,R0
 2707  010104  104414                  TRAP    C$PNTB
 2708  010106  062706  000012          ADD     #12,SP
 2709  010112  012746  005627          MOV     #STM,-(SP)
 2710  010116  012746  000001          MOV     #1,-(SP)
 2711  010122  010600                  MOV     SP,R0
 2712  010124  104414                  TRAP    C$PNTB
 2713  010126  062706  000004          ADD     #4,SP
 2714  010132                  L10017:
 2715  010132  104423                  TRAP    C$MSG
 2716  010134                          SMD     16,16,2,7
 2717  010134                  ERR16::
 2718  010134  012746  005353          MOV     #EM16,-(SP)
 2719  010140  012746  005046          MOV     #FM1,-(SP)
 2720  010144  012746  000002          MOV     #2,-(SP)
 2721  010150  010600                  MOV     SP,R0
 2722  010152  104414                  TRAP    C$PNTB
 2723  010154  062706  000006          ADD     #6,SP
 2724  010160  012746  005755          MOV     #DH2,-(SP)
 2725  010164  012746  005046          MOV     #FM1,-(SP)
 2726  010170  012746  000002          MOV     #2,-(SP)
 2727  010174  010600                  MOV     SP,R0
 2728  010176  104414                  TRAP    C$PNTB
 2729  010200  062706  000006          ADD     #6,SP
 2730  010204  013746  002420          MOV     $REG4,-(SP)
 2731  010210  013746  002416          MOV     $REG5,-(SP)
 2732  010214  012746  003755          MOV     #TFM4,-(SP)
 2733  010220  012746  000003          MOV     #3,-(SP)
 2734  010224  010600                  MOV     SP,R0
 2735  010226  104414                  TRAP    C$PNTB
 2736  010230  062706  000010          ADD     #10,SP
 2737  010234  012746  005627          MOV     #STM,-(SP)
 2738  010240  012746  000001          MOV     #1,-(SP)
 2739  010244  010600                  MOV     SP,R0
 2740  010246  104414                  TRAP    C$PNTB
 2741  010250  062706  000004          ADD     #4,SP
 2742  010254                  L10020:
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL ERROR REPORT SECTION

2743 010254 104423 TRAP C$MSG
2744

```
2745
2746  010256                          SMD     17,17,0,0
2747  010256                  ERR17::
2748  010256  012746  005434          MOV     #EM17,-(SP)
2749  010262  012746  005046          MOV     #FM1,-(SP)
2750  010266  012746  000002          MOV     #2,-(SP)
2751  010272  010600                  MOV     SP,R0
2752  010274  104414                  TRAP    C$PNTB
2753  010276  062706  000006          ADD     #6,SP
2754  010302  012746  005723          MOV     #DH0,-(SP)
2755  010306  012746  005046          MOV     #FM1,-(SP)
2756  010312  012746  000002          MOV     #2,-(SP)
2757  010316  010600                  MOV     SP,R0
2758  010320  104414                  TRAP    C$PNTB
2759  010322  062706  000006          ADD     #6,SP
2760  010326  012746  005627          MOV     #STM,-(SP)
2761  010332  012746  000001          MOV     #1,-(SP)
2762  010336  010600                  MOV     SP,R0
2763  010340  104414                  TRAP    C$PNTB
2764  010342  062706  000004          ADD     #4,SP
2765  010346                  L10021:
2766  010346  104423                  TRAP    C$MSG
2767  010350                          SMD     29,29,2,3
2768  010350                  ERR29::
2769  010350  012746  005512          MOV     #EM29,-(SP)
2770  010354  012746  005046          MOV     #FM1,-(SP)
2771  010360  012746  000002          MOV     #2,-(SP)
2772  010364  010600                  MOV     SP,R0
2773  010366  104414                  TRAP    C$PNTB
2774  010370  062706  000006          ADD     #6,SP
2775  010374  012746  005755          MOV     #DH2,-(SP)
2776  010400  012746  005046          MOV     #FM1,-(SP)
2777  010404  012746  000002          MOV     #2,-(SP)
2778  010410  010600                  MOV     SP,R0
2779  010412  104414                  TRAP    C$PNTB
2780  010414  062706  000006          ADD     #6,SP
2781  010420  013746  002420          MOV     $REG4,-(SP)
2782  010424  013746  002416          MOV     $REG5,-(SP)
2783  010430  012746  003712          MOV     #TFM2,-(SP)
2784  010434  012746  000003          MOV     #3,-(SP)
2785  010440  010600                  MOV     SP,R0
2786  010442  104414                  TRAP    C$PNTB
2787  010444  062706  000010          ADD     #10,SP
2788  010450  012746  005627          MOV     #STM,-(SP)
2789  010454  012746  000001          MOV     #1,-(SP)
2790  010460  010600                  MOV     SP,R0
2791  010462  104414                  TRAP    C$PNTB
2792  010464  062706  000004          ADD     #4,SP
2793  010470                  L10022:
2794  010470  104423                  TRAP    C$MSG
2795  010472                          SMD     35,35,2,3
2796  010472                  ERR35::
2797  010472  012746  005434          MOV     #EM35,-(SP)
2798  010476  012746  005046          MOV     #FM1,-(SP)
2799  010502  012746  000002          MOV     #2,-(SP)
2800  010506  010600                  MOV     SP,R0
```

```
 2801  010510  104414                          TRAP    C$PNTB
 2802  010512  062706  000006                  ADD     #6,SP
 2803  010516  012746  005755                  MOV     #DH2,-(SP)
 2804  010522  012746  005046                  MOV     #FM1,-(SP)
 2805  010526  012746  000002                  MOV     #2,-(SP)
 2806  010532  010600                          MOV     SP,R0
 2807  010534  104414                          TRAP    C$PNTB
 2808  010536  062706  000006                  ADD     #6,SP
 2809  010542  013746  002420                  MOV     $REG4,-(SP)
 2810  010546  013746  002416                  MOV     $REG5,-(SP)
 2811  010552  012746  003712                  MOV     #TFM2,-(SP)
 2812  010556  012746  000003                  MOV     #3,-(SP)
 2813  010562  010600                          MOV     SP,R0
 2814  010564  104414                          TRAP    C$PNTB
 2815  010566  062706  000010                  ADD     #10,SP
 2816  010572  012746  005627                  MOV     #STM,-(SP)
 2817  010576  012746  000001                  MOV     #1,-(SP)
 2818  010602  010600                          MOV     SP,R0
 2819  010604  104414                          TRAP    C$PNTB
 2820  010606  062706  000004                  ADD     #4,SP
 2821  010612                          L10023:
 2822  010612  104423                          TRAP    C$MSG
 2823
 2824  010614                          BGNMSG  ERR36
 2825  010614                          ERR36::
 2826  010614                          PRINTB  #STM
 2827  010614  012746  005627                  MOV     #STM,-(SP)
 2828  010620  012746  000001                  MOV     #1,-(SP)
 2829  010624  010600                          MOV     SP,R0
 2830  010626  104414                          TRAP    C$PNTB
 2831  010630  062706  000004                  ADD     #4,SP
 2832  010634                          ENDMSG
 2833  010634                          L10024:
 2834  010634  104423                          TRAP    C$MSG
 2835
 2836  010636                          BGNMSG  ERR40
 2837  010636                          ERR40::
 2838  010636                          PRINTF  #TFM40,R2
 2839  010636  010246                          MOV     R2,-(SP)
 2840  010640  012746  004263                  MOV     #TFM40,-(SP)
 2841  010644  012746  000002                  MOV     #2,-(SP)
 2842  010650  010600                          MOV     SP,R0
 2843  010652  104417                          TRAP    C$PNTF
 2844  010654  062706  000006                  ADD     #6,SP
 2845  010660                          PRINTB  #STM
 2846  010660  012746  005627                  MOV     #STM,-(SP)
 2847  010664  012746  000001                  MOV     #1,-(SP)
 2848  010670  010600                          MOV     SP,R0
 2849  010672  104414                          TRAP    C$PNTB
 2850  010674  062706  000004                  ADD     #4,SP
 2851  010700                          ENDMSG
 2852  010700                          L10025:
 2853  010700  104423                          TRAP    C$MSG
 2854  010702                          BGNMSG  ERR41
 2855  010702                          ERR41::
 2856  010702                          PRINTF  #TFM41
```

```
2857  010702  012746  004105          MOV     #TFM41,-(SP)
2858  010706  012746  000001          MOV     #1,-(SP)
2859  010712  010600                  MOV     SP,R0
2860  010714  104417                  TRAP    C$PNTF
2861  010716  062706  000004          ADD     #4,SP
2862  010722                  PRINTB  #STM
2863  010722  012746  005627          MOV     #STM,-(SP)
2864  010726  012746  000001          MOV     #1,-(SP)
2865  010732  010600                  MOV     SP,R0
2866  010734  104414                  TRAP    C$PNTB
2867  010736  062706  000004          ADD     #4,SP
2868  010742                  ENDMSG
2869  010742                  L10026:
2870  010742  104423                  TRAP    C$MSG
2871  010744                  BGNMSG  ERR42
2872  010744                  ERR42::
2873  010744                  PRINTF  #TFM42
2874  010744  012746  004174          MOV     #TFM42,-(SP)
2875  010750  012746  000001          MOV     #1,-(SP)
2876  010754  010600                  MOV     SP,R0
2877  010756  104417                  TRAP    C$PNTF
2878  010760  062706  000004          ADD     #4,SP
2879  010764                  PRINTB  #STM
2880  010764  012746  005627          MOV     #STM,-(SP)
2881  010770  012746  000001          MOV     #1,-(SP)
2882  010774  010600                  MOV     SP,R0
2883  010776  104414                  TRAP    C$PNTB
2884  011000  062706  000004          ADD     #4,SP
2885  011004                  ENDMSG
2886  011004                  L10027:
2887  011004  104423                  TRAP    C$MSG
2888
2889  011006                  BGNMSG  ERR43
2890  011006                  ERR43::
2891  011006                  PRINTF  #TFM43,R5,R4
2892  011006  010446                  MOV     R4,-(SP)
2893  011010  010546                  MOV     R5,-(SP)
2894  011012  012746  004344          MOV     #TFM43,-(SP)
2895  011016  012746  000003          MOV     #3,-(SP)
2896  011022  010600                  MOV     SP,R0
2897  011024  104417                  TRAP    C$PNTF
2898  011026  062706  000010          ADD     #10,SP
2899  011032                  PRINTB  #STM
2900  011032  012746  005627          MOV     #STM,-(SP)
2901  011036  012746  000001          MOV     #1,-(SP)
2902  011042  010600                  MOV     SP,R0
2903  011044  104414                  TRAP    C$PNTB
2904  011046  062706  000004          ADD     #4,SP
2905  011052                  ENDMSG
2906  011052                  L10030:
2907  011052  104423                  TRAP    C$MSG
2908  011054                  BGNMSG  ERR44
2909  011054                  ERR44::
2910  011054                  PRINTF  #TFM44,#TMMC,R4
2911  011054  010446                  MOV     R4,-(SP)
2912  011056  012746  005010          MOV     #TMMC,-(SP)
```

```
2913  011062  012746  004427          MOV     #TFM44,-(SP)
2914  011066  012746  000003          MOV     #3,-(SP)
2915  011072  010600                  MOV     SP,R0
2916  011074  104417                  TRAP    C$PNTF
2917  011076  062706  000010          ADD     #10,SP
2918  011102                  PRINTB  #STM
2919  011102  012746  005627          MOV     #STM,-(SP)
2920  011106  012746  000001          MOV     #1,-(SP)
2921  011112  010600                  MOV     SP,R0
2922  011114  104414                  TRAP    C$PNTB
2923  011116  062706  000004          ADD     #4,SP
2924  011122                  ENDMSG
2925  011122                  L10031:
2926  011122  104423                  TRAP    C$MSG
2927  011124                  BGNMSG  ERR45
2928  011124                  ERR45::
2929  011124                  PRINTF  #TFM45,#TMMC,R4
2930  011124  010446                  MOV     R4,-(SP)
2931  011126  012746  005010          MOV     #TMMC,-(SP)
2932  011132  012746  004466          MOV     #TFM45,-(SP)
2933  011136  012746  000003          MOV     #3,-(SP)
2934  011142  010600                  MOV     SP,R0
2935  011144  104417                  TRAP    C$PNTF
2936  011146  062706  000010          ADD     #10,SP
2937  011152                  PRINTB  #TFM45A
2938  011152  012746  004524          MOV     #TFM45A,-(SP)
2939  011156  012746  000001          MOV     #1,-(SP)
2940  011162  010600                  MOV     SP,R0
2941  011164  104414                  TRAP    C$PNTB
2942  011166  062706  000004          ADD     #4,SP
2943  011172                  PRINTB  #STM
2944  011172  012746  005627          MOV     #STM,-(SP)
2945  011176  012746  000001          MOV     #1,-(SP)
2946  011202  010600                  MOV     SP,R0
2947  011204  104414                  TRAP    C$PNTB
2948  011206  062706  000004          ADD     #4,SP
2949  011212                  ENDMSG
2950  011212                  L10032:
2951  011212  104423                  TRAP    C$MSG
2952  011214                  BGNMSG  ERR46
2953  011214                  ERR46::
2954  011214                  PRINTF  #TFM46,$GDDAT,R4
2955  011214  010446                  MOV     R4,-(SP)
2956  011216  013746  002452          MOV     $GDDAT,-(SP)
2957  011222  012746  004647          MOV     #TFM46,-(SP)
2958  011226  012746  000003          MOV     #3,-(SP)
2959  011232  010600                  MOV     SP,R0
2960  011234  104417                  TRAP    C$PNTF
2961  011236  062706  000010          ADD     #10,SP
2962  011242                  PRINTB  #STM
2963  011242  012746  005627          MOV     #STM,-(SP)
2964  011246  012746  000001          MOV     #1,-(SP)
2965  011252  010600                  MOV     SP,R0
2966  011254  104414                  TRAP    C$PNTB
2967  011256  062706  000004          ADD     #4,SP
2968  011262                  ENDMSG
```

CZDMQD.P11 12-JAN-82 09:50 GLOBAL ERROR REPORT SECTION

```
 2969  011262
 2970  011262  104423                  L10033:
 2971                                          TRAP    C$MSG
 2972  011264                          BGNMSG  ERR47
 2973  011264                          ERR47::
 2974  011264                          PRINTF  #TFM47,R5,R4
 2975  011264  010446                          MOV     R4,-(SP)
 2976  011266  010546                          MOV     R5,-(SP)
 2977  011270  012746  004733                  MOV     #TFM47,-(SP)
 2978  011274  012746  000003                  MOV     #3,-(SP)
 2979  011300  010600                          MOV     SP,R0
 2980  011302  104417                          TRAP    C$PNTF
 2981  011304  062706  000010                  ADD     #10,SP
 2982  011310                          PRINTB  #STM
 2983  011310  012746  005627                  MOV     #STM,-(SP)
 2984  011314  012746  000001                  MOV     #1,-(SP)
 2985  011320  010600                          MOV     SP,R0
 2986  011322  104414                          TRAP    C$PNTB
 2987  011324  062706  000004                  ADD     #4,SP
 2988  011330                          ENDMSG
 2989  011330                          L10034:
 2990  011330  104423                          TRAP    C$MSG
 2991
```

CZDMQD.P11 12-JAN-82 09:50 REPORT CODING SECTION

```
2992                            .SBTTL  REPORT CODING SECTION
2993
2994
```

```
CZDMQD.P11     12-JAN-82 09:50          REPORT CODING SECTION
  2995                                  ;++
```

```
CZDMQD.P11    12-JAN-82 09:50          REPORT CODING SECTION

  2996                                 ; THE REPORT CODING SECTION CONTAINS THE
  2997                                 ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
  2998                                 ;--
  2999
  3000  011332                                 BGNRPT
  3001  011332                       L$RPT::
  3002
  3003
  3004  011332                                 EXIT    RPT
  3005  011332  000167                         .WORD   J$JMP
  3006  011334  000000                         .WORD   L10035-2-.
  3007
```

CZDMQD.P11 12-JAN-82 09:50 REPORT CODING SECTION

```
3008
3009  011336
3010  011336                    ENDRPT
3011  011336  104425  L10035:   TRAP    C$RPT
3012
```

CZDMQD.P11 12-JAN-82 09:50 REPORT CODING SECTION

```
3013
3014
```

CZDMQD.P11 12-JAN-82 09:50 REPORT CODING SECTION

```
3015
3016
```

```
CZDMQD.P11    12-JAN-82 09:50          INITIALIZE SECTION
  3017                                 .SBTTL  INITIALIZE SECTION
```

```
3018
3019                                    ;////////////////////////////////////////////////////////////////////////
3020                                    ;/ THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
3021                                    ;/ AT THE BEGINNING OF EACH PASS.
3022                                    ;////////////////////////////////////////////////////////////////////////
3023
3024  011340                                    BGNINIT
3025  011340                            L$INIT::
3026
3027                                    ;INITIALIZE SUBROUTINE STACK
3028  011340  012705  002730                    MOV     #SSTACK,R5
3029                                    ;STORE BASE LEVEL PROGRAM STACK POINTER
3030  011344  010637  002344                    MOV     SP,PSTACK
3031  011350  005737  002462                    TST     FTIME
3032  011354  001011                            BNE     1$
3033  011356  013737  000004  002464            MOV     @#4,SAVE4
3034  011364  013737  000006  002466            MOV     @#6,SAVE6
3035  011372  012737  000001  002462            MOV     #1,FTIME
3036  011400  013737  002464  000004    1$:     MOV     SAVE4,@#4
3037  011406  013737  002466  000006            MOV     SAVE6,@#6
3038
3039                                    ;SEE IF PROGRAM JUST STARTED, BR IF YES
3040  011414                                    READEF  #EF.START
3041  011414  012700  000040                    MOV     #EF.START,R0
3042  011420  104447                            TRAP    C$REFG
3043  011422                                    BCOMPLETE       NEWST
3044  011422  103414                            BCS     NEWST
3045                                    ;SEE IF THIS IS A NEW PASS, BR IF YES
3046  011424                                    READEF  #EF.NEW
3047  011424  012700  000035                    MOV     #EF.NEW,R0
3048  011430  104447                            TRAP    C$REFG
3049  011432                                    BCOMPLETE       NEWST
3050  011432  103410                            BCS     NEWST
3051                                    ;SEE IF PROGRAM WAS JUST CONTINUED
3052  011434                                    READEF  #EF.CONTINUE
3053  011434  012700  000036                    MOV     #EF.CONTINUE,R0
3054  011440  104447                            TRAP    C$REFG
3055  011442                                    BCOMPLETE       ENDIT
3056  011442  103576                            BCS     ENDIT
3057                                    ;SEE IF PROGRAM JUST RESTARTED, BR IF NOT
3058  011444                                    READEF  #EF.RESTART
3059  011444  012700  000037                    MOV     #EF.RESTART,R0
3060  011450  104447                            TRAP    C$REFG
3061  011452                                    BNCOMPLETE      GETPRM
3062  011452  103003                            BCC     GETPRM
3063
3064  011454                            NEWST:
3065                                    ;RESET LOGICAL DEVICE TO -1
3066  011454  012737  177777  002342            MOV     #-1,LOGDEV
3067
3068                                    ;GET UNIBUS ADRS, VECTOR, PRIORITY LEVEL, LINE UNIT,SWITCH
3069                                    ;    PACKS, TEST CONNECTOR INFO. FOR THIS M8200,4,7 (CURRENT LOGICAL
3070                                    ;    DEVICE).
3071  011462                            GETPRM:
3072  011462  005237  002342                    INC     LOGDEV
3073  011466  023737  002342  002012            CMP     LOGDEV,L$UNIT
```

```
3074  011474  002367                          BGE     NEWST
3075  011476                                  GPHARD  LOGDEV,R1
3076  011476  013700  002342                  MOV     LOGDEV,R0
3077  011502  104442                          TRAP    C$GPHRD
3078  011504  010001                          MOV     R0,R1
3079  011506                                  BNCOMPLETE      GETPRM
3080  011506  103365                          BCC     GETPRM
3081  011510  012137  002414                  MOV     (R1)+,WTYPE
3082                                  ;GET ADDRESS OF M8200,4,7
3083  011514  011137  002516                  MOV     (R1),KMCSR
3084                                  ;GET POINTER TO M8200,4,7 CSR HI BYTE
3085  011520  011137  002520                  MOV     (R1),KMCSRH
3086  011524  005237  002520                  INC     KMCSRH
3087                                  ;GET POINTER TO M8200,4,7 CTL OUT REG
3088  011530  011137  002522                  MOV     (R1),KMCTL
3089  011534  062737  000002  002522          ADD     #2,KMCTL
3090                                  ;GET POINTER TO M8200,4,7 PORT REG - SEL 4
3091  011542  011137  002524                  MOV     (R1),KMP04
3092  011546  062737  000004  002524          ADD     #4,KMP04
3093                                  ;GET POINTER TO M8200,4,7 PORT REG - SEL 6
3094  011554  012137  002526                  MOV     (R1)+,KMP06
3095  011560  062737  000006  002526          ADD     #6,KMP06
3096                                  ;GET POINTER TO RCV VECTOR
3097  011566  011137  002506                  MOV     (R1),KMRVEC
3098                                  ;GET POINTER TO RCV PRIORITY LEVEL
3099  011572  011137  002510                  MOV     (R1),KMRLVL
3100  011576  062737  000002  002510          ADD     #2,KMRLVL
3101                                  ;GET POINTER TO TX VECTOR
3102  011604  011137  002512                  MOV     (R1),KMTVEC
3103  011610  062737  000004  002512          ADD     #4,KMTVEC
3104                                  ;GET POINTER TO TX PRIORITY LEVEL
3105  011616  011137  002514                  MOV     (R1),KMTLVL
3106  011622  062737  000006  002514          ADD     #6,KMTLVL
3107                                  ;PUT VECTOR INTO STAT1
3108  011630  016137  000020  002472          MOV     20(R1),RUNINH
3109  011636  012137  002500                  MOV     (R1)+,STAT1
3110                                  ;PUT PRIORITY INTO STAT1
3111  011642  052137  002500                  BIS     (R1)+,STAT1
3112                                  ;SEE IF NO LINE UNIT, SET BIT IF YES
3113  011646  005711                          TST     (R1)
3114  011650  001004                          BNE     50000$
3115  011652  052737  010000  002500          BIS     #BIT12,STAT1
3116  011660  000416                          BR      4$
3117  011662                                  50000$:
3118                                  ;SEE IF M8201 LINE UNIT, SET BIT IF YES
3119  011662  021127  000001                  CMP     (R1),#1
3120  011666  001001                          BNE     50001$
3121  011670  000412                          BR      4$
3122  011672                                  50001$:
3123                                  ;SEE IF M8202 LINE UNIT, SET BIT IF YES
3124  011672  021127  000002                  CMP     (R1),#2
3125  011676  001004                          BNE     50002$
3126  011700  052737  020000  002500          BIS     #BIT13,STAT1
3127  011706  000403                          BR      4$
3128  011710                                  50002$:
3129                                  ;SET BIT FOR M8203 LINE UNIT
```

```
3130  011710  052737  100000  002500          BIS     #BIT15,STAT1
3131  011716                          4$:
3132                                  ;SET BIT IN STAT1 FOR TEST CONNECTOR
3133  011716  056137  000006  002500          BIS     6(R1),STAT1
3134  011724  062701  000002                  ADD     #2,R1
3135                                  ;SET SWITCH PACK #1 IN STAT2 LOW BYTE
3136  011730  012137  002502                  MOV     (R1)+,STAT2
3137                                  ;SET SWITCH PACK #2 IN STAT2 HIGH BYTE
3138  011734  111137  002503                  MOVB    (R1),STAT2+1
3139
3140                                  ;INCREMENT LOGICAL UNIT (DEVICE) NUMBER
3141                                  ;       INC     LOGDEV
3142  011740  000240                          NOP
3143  011742  000240                          NOP
3144
3145  011744  012737  002000  002436          MOV     #2000,MEMSZ
3146  011752  005037  002432                  CLR     TYPE
3147  011756  123727  002414  000000          CMPB    WTYPE,#0
3148  011764  001425                          BEQ     ENDIT
3149  011766  123727  002414  000004          CMPB    WTYPE,#4        ;KMC?
3150  011774  001004                          BNE     5$
3151  011776  012737  000001  002432          MOV     #1,TYPE
3152  012004  000415                          BR      ENDIT
3153  012006  012737  007777  002436  5$:     MOV     #7777,MEMSZ
3154  012014  123727  002414  000006          CMPB    WTYPE,#6
3155  012022  001003                          BNE     7$
3156  012024  012737  000001  002432          MOV     #1,TYPE
3157  012032  013737  002472  002470  7$:     MOV     RUNINH,RUNB
3158  012040                          6$:
3159  012040                          ENDIT:
3160  012040                                  ENDINIT
3161  012040                          L10036:
3162  012040  104411                          TRAP    C$INIT
3163
3164                                  .EVEN
3165  012042                                  BGNAUTO
3166  012042                          L$AUTO::
3167                                          ;DEVICE DOES NOT HAVE A "READY"
3168  012042  013701  002516                  MOV     KMCSR,R1        ;R1 CONTAINS BASE M8200,4,7 ADDRESS
3169  012046  012705  000004                  MOV     #4,R5           ;4 REGISTERS TO BE TESTED
3170  012052  012737  012104  000004          MOV     #2$,4           ;SET OUT TIMEOUT TRAP
3171  012060  012737  000240  000006          MOV     #240,6          ;LEVEL 7
3172  012066  005711                  1$:     TST     (R1)            ;REFERENCE DEVICE REGISTERS
3173  012070  000240                          NOP
3174  012072  062701  000002                  ADD     #2,R1           ;NEXT REGISTER
3175  012076  005305                          DEC     R5              ;DEC REGISTER COUNT
3176  012100  001372                          BNE     1$              ;BR IF NOT LAST REGISTER
3177  012102  000405                          BR      3$
3178
3179  012104  062706  000004          2$:     ADD     #4,SP
3180  012110                                  DODU    LOGDEV
3181  012110  013700  002342                  MOV     LOGDEV,R0
3182  012114  104451                          TRAP    C$DODU
3183
3184  012116  013737  002464  000004  3$:     MOV     SAVE4,4
3185  012124  013737  002466  000006          MOV     SAVE6,6
```

CZDMQD.P11 12-JAN-82 09:50 INITIALIZE SECTION

```
3186  012132
3187  012132
3188  012132  104461          L10037:  ENDAUTO
3189                                   TRAP    CSAUTO
```

CZDMQD.P11 12-JAN-82 09:50 CLEANUP CODING SECTION

```
3190                                    .SBTTL  CLEANUP CODING SECTION
3191
3192                                    ;////////////////////////////////////////////////////////////////////////
3193                                    ;// THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
3194                                    ;// AT THE END OF EACH PASS.
3195                                    ;////////////////////////////////////////////////////////////////////////
3196
3197  012134                                    BGNCLN
3198  012134                            L$CLEAN::
3199  012134                                    BRESET
3200  012134  104433                            TRAP    C$RESET
3201
3202  012136                                    ENDCLN
3203  012136                            L10040:
3204  012136  104412                            TRAP    C$CLEAN
3205
3206
3207
3208
3209
```

CZDMQD.P11 12-JAN-82 09:50 DROP UNIT SECTION

```
3210                                    .SBTTL  DROP UNIT SECTION
3211
3212                                    ;////////////////////////////////////////////////////////////////////////
3213                                    ;/ THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3214                                    ;/ TO NO LONGER BE TESTED.
3215                                    ;////////////////////////////////////////////////////////////////////////
3216
3217  012140                                    BGNDU
3218  012140                            L$DU::
3219                                    ;ISSUE UNIBUS RESET TO CLEAN UP
3220  012140                                    BRESET
3221  012140  104433                           TRAP    C$RESET
3222  012142                                    ENDDU
3223  012142                            L10041:
3224  012142  104453                           TRAP    C$DU
3225
3226
3227
3228
3229
```

CZDMQD.P11 12-JAN-82 09:50 ADD UNIT SECTION

```
3230                                    .SBTTL  ADD UNIT SECTION
3231
3232                                    ;////////////////////////////////////////////////////////////////////
3233                                    ;/ THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3234                                    ;/  TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING.  IF
3235                                    ;/  'EF.AUNIT' IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
3236                                    ;////////////////////////////////////////////////////////////////////
3237
3238  012144                                    BGNAU
3239  012144                            L$AU::
3240  012144                                    ENDAU
3241  012144                            L10042:
3242  012144  104452                           TRAP    C$AU
3243
3244
3245
3246
3247
3248
```

```
CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

                                       .SBTTL  HARDWARE TESTS


                                       ;START OF CODE BLOCK WHICH IS USED AS DATA
012146                                 ROMMAP:

                                               BADHEAD
                                               ;*************** TEST 1 ****************
                                               ;*VERIFY THAT REFERENCING UNIBUS DEVICE REGISTERS
                                               ;*DOES NOT CAUSE A TIME OUT TRAP
012146                                         BADHEAD
                                               ;*************** TEST 1 ****************

012146                                 BGNTST
012146                                 T1::
012146  013701  002516                         MOV     KMCSR,R1        ;R1 CONTAINS BASE M8200,4,7 ADDRESS
012152  012705  000004                         MOV     #4,R5           ;4 REGISTERS TO BE TESTED
012156  012737  012214  000004                 MOV     #2$,4           ;SET OUT TIMEOUT TRAP
012164  012737  000240  000006                 MOV     #240,6          ;LEVEL 7
012172  005711                         1$:     TST     (R1)            ;REFERENCE DEVICE REGISTERS
012174  000240                               NOP
012176                                       ESCAPE  TST
012176  104410                               TRAP    C$ESCAPE
012200  000054                               .WORD   L10043-.
012202  062701  000002                       ADD     #2,R1           ;NEXT REGISTER
012206  005305                               DEC     R5              ;DEC REGISTER COUNT
012210  001370                               BNE     1$              ;BR IF NOT LAST REGISTER
012212  000410                               BR      3$

012214  062706  000004                 2$:     ADD     #4,SP
012220                                       ERROR   36              ;TIME OUT ERROR
012224  104455                               TRAP    C$ERDF
012226  000044                               .WORD   36
012230  005055                               .WORD   EM0
012232  010614                               .WORD   ERR36

012234  013737  002464  000004         3$:     MOV     SAVE4,4
012242  013737  002466  000006                 MOV     SAVE6,6
012250                                       ESCAPE  TST
012250  10441u                               TRAP    C$ESCAPE
012252  000002                               .WORD   L10043-.

012254                                 ENDTST
012254                                 L10043:
012254  104401                               TRAP    C$ETST
                                       .EVEN


012256                                         BADHEAD
                                               ;*************** TEST 2 ****************
                                               ;*TEST OF BR RIGHT SHIFT
                                               ;*VERIFY THAT A DEST OF BR RSH (011) OF A MICRO-INSTRUCTION
                                               ;*SHIFTS THE RESULTING BR DATA RIGHT ONCE.
012256                                         BADHEAD
                                               ;*************** TEST 2 ****************
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

```
3305
3306  012256                                BGNTST
3307  012256                                T2::
3308
3309  012256                                        MSTCLR                  ;MASTER CLEAR M8200,4,7
3310  012262  013701  002516                        MOV     KMCSR,R1        ;R1 = M8200,4,7 BASE ADDRESS
3311  012266  005011                                CLR     (R1)            ;CLEAR SELO
3312  012270  012705  052525                        MOV     #52525,R5       ;START WITH 125
3313  012274  010561  000004                        MOV     R5,4(R1)        ;PORT4 125
3314  012300                                        ROMCLK                  ;NEXT WORD IS INSTRUCTION
3315  012300  004537  003044                        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3316  012304  120500                                120500                  ;PORT4 TO BR-REG
3317  012306                                        ROMCLK                  ;NEXT WORD IS INSTRUCTION
3318  012306  004537  003044                        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3319  012312  061620                                061620                  ;BR RSH BR, SHIFT BR RIGHT
3320  012314                                        ROMCLK                  ;NEXT WORD IS INSTRUCTION
3321  012314  004537  003044                        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3322  012320  061225                                061225                  ;PORT5 BR
3323  012322  006005                                ROR     R5              ;R5 = "EXPECTED"
3324  012324  005004                                CLR     R4
3325  012326  116104  000005                        MOVB    5(R1),R4        ;R4 = 'FOUND"
3326  012332  120504                                CMPB    R5,R4           ;DID BR SHIFT RIGHT ONCE?
3327  012334  001410                                BEQ     1$              ;BR IF YES
3328  012336                                        ERROR   12              ;BR RIGHT SHIFT ERROR
3329  012342  104455                                TRAP    C$ERDF
3330  012344  000014                                .WORD   12
3331  012346  005055                                .WORD   EM0
3332  012350  007420                                .WORD   ERR12
3333                                                                        ;SHOULD BE 52
3334  012352                                        ESCAPE TST
3335  012352  104410                                TRAP    C$ESCAPE
3336  012354  000044                                .WORD   L10044-.
3337  012356                                1$:
3338  012356                                        ROMCLK                  ;NEXT WORD IS INSTRUCTION
3339  012356  004537  003044                        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3340  012362  061620                                061620                  ;BR RSH BR, SHFT BR RIGHT AGAIN
3341  012364                                        ROMCLK                  ;NE4XT WORD IS INSTRUCTION
3342  012364  004537  003044                        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3343  012370  061225                                061225                  ;PORT5 BR
3344  012372  006005                                ROR     R5              ;R5 = "EXPECTED"
3345  012374  116104  000005                        MOVB    5(R1),R4        ;R4 = 'FOUND"
3346  012400  120504                                CMPB    R5,R4           ;DID BR SHIFT RIGHT?
3347  012402  001406                                BEQ     2$              ;BR IF YES
3348  012404                                        ERROR   12              ;BR RIGHT SHIFT ERROR
3349  012410  104455                                TRAP    C$ERDF
3350  012412  000014                                .WORD   12
3351  012414  005055                                .WORD   EM0
3352  012416  007420                                .WORD   ERR12
3353                                                                        ;S/B 25
3354  012420                                2$:
3355  012420                                ENDTST
3356  012420                                L10044:
3357  012420  104401                                TRAP    C$ETST
3358
3359  012422                                        BADHEAD
3360                                                ;*************** TEST 3 ***************
```

```
CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

                                       ;*IOP CRAM WRITE/READ TEST
                                       ;*FLOAT A 1 THROUGH EACH CRAM LOCATION
012422                                 BADHEAD
                                       ;*************** TEST 3 ***************

                                       BGNTST
                                       T3::
                                               MACEX
                                               ;DO NOT DO TEST IF M8200
012430  104432                         TRAP    C$EXIT
012432  000116                         .WORD   L10045-.
012434                                 MYINT
012434  013701  002516                 MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
                                                                       ;R1 CONTAINS BASE M8200,4,7 ADDRESS
012440  005037  002434                 CLR     MR0                     ;MR0 = CRAM ADDRESS
012444  012702  000001         ADR4:   MOV     #1,R2                   ;R2 = WRITE DATA
012450                         ADR5:
012450                                 BGNSEG
012450  104404                         TRAP    C$BSEG
012452  012711  002000         3$:     MOV     #BIT10,(R1)             ;SET ROMO
012456  013761  002434  000004         MOV     MR0,4(R1)               ;WRITE ADDRESS TO SEL4
012464  010261  000006                 MOV     R2,6(R1)                ;LOAD SEL6 WITH WRITE DA \
012470  052711  020000                 BIS     #BIT13,(R1)             ;WRITE SEL6 INTO CRAM
012474  016104  000006                 MOV     6(R1),R4                ;READ CRAM INTO 'FOUND'
012500  020204                         CMP     R2,R4                   ;IS DATA CORRECT?
012502  001410                         BEQ     4$                      ;BR IF OK
012504                                 ERROR   1                       ;ERROR
012510  104455                         TRAP    C$ERDF
012512  000001                         .WORD   1
012514  005055                         .WORD   EM0
012516  006032                         .WORD   ERR1
012520                                 ESCAPE SEG
012520  104410                         TRAP    C$ESCAPE
012522  000002                         .WORD   10000$-.
012524                         4$:     ENDSEG
012524                         10000$:
012524  104405                         TRAP    C$ESEG
012526  000241                         CLC                             ;CLEAR CARRY
012530  006102                         ROL     R2                      ;SHIFT WRITE DATA
012532  001346                         BNE     ADR5                    ;BSR IF NOT DONE THIS ADDRESS
012534  005237  002434                 INC     MR0                     ;BUMP TO NEXT CRAM ADDRESS
012540  023737  002436  002434         CMP     MEMSZ,MR0               ;DONE YET?
012546  001336                         BNE     ADR4                    ;BR IF NO
012550                         5$:
012550                         ENDTST
012550                         L10045:
012550  104401                         TRAP    C$ETST

012552                                 BADHEAD
                                       ;*************** TEST 4 ***************
                                       ;*IOP CRAM WRITE/READ TEST
                                       ;*FLOAT A 0 THROUGH EACH CRAM LOCATION
012552                                 BADHEAD
                                       ;*************** TEST 4 ***************

012552                         BGNTST
```

```
3417  012552                          T4::
3418  012552                          MACEX
3419                                          ;DO NOT DO TEST IF M8200
3420  012560  104432                          TRAP    C$EXIT
3421  012562  000126                          .WORD   L10046-.
3422  012564                          MYINT
3423  012564  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
3424  012570                                  MSTCLR                  ;MASTER CLEAR M8200,4,7
3425  012574  005037  002434                  CLR     MR0             ;MR0 = CRAM ADDRESS
3426  012600  012702  000001          ADR1:   MOV     #1,R2           ;R2 = WRITE DATA
3427  012604                          ADR2:
3428  012604                                  BGNSEG
3429  012604  104404                          TRAP    C$BSEG
3430  012606  005102                          COM     R2              ;MAKE IT A FLOATING ZERO
3431  012610  012711  002000          3$:     MOV     #BIT10,(R1)     ;SET ROMO
3432  012614  013761  002434  000004          MOV     MR0,4(R1)       ;WRITE ADDRESS TO SEL4
3433  012622  010261  000006                  MOV     R2,6(R1)        ;LOAD SEL6 WITH WRITE DATA
3434  012626  052711  020000                  BIS     #BIT13,(R1)     ;WRITE SEL6 INTO CRAM
3435  012632  016104  000006                  MOV     6(R1),R4        ;READ CRAM INTO "FOUND"
3436  012636  020204                          CMP     R2,R4           ;IS DATA CORRECT?
3437  012640  001410                          BEQ     4$              ;BR IF OK
3438  012642                                  ERROR   1               ;ERROR
3439  012646  104455                          TRAP    C$ERDF
3440  012650  000001                          .WORD   1
3441  012652  005055                          .WORD   EM0
3442  012654  006032                          .WORD   ERR1
3443  012656                                  ESCAPE SEG
3444  012656  104410                          TRAP    C$ESCAPE
3445  012660  000002                          .WORD   10000$-.
3446  012662                          4$:     ENDSEG
3447  012662                          10000$:
3448  012662  104405                          TRAP    C$ESEG
3449  012664  005102                          COM     R2              ;BACK TO FLOATING ONE
3450  012666  000241                          CLC                     ;CLEAR CARRY
3451  012670  006102                          ROL     R2              ;SHIFT WRITE DATA
3452  012672  001344                          BNE     ADR2            ;BR IF NOT DONE THIS ADDRESS
3453  012674  005237  002434                  INC     MR0             ;BUMP TO NEXT CRAM ADDRESS
3454  012700  023737  002436  002434          CMP     MEMSZ,MR0       ;DONE YET?
3455  012706  001334                          BNE     ADR1            ;BR IF NO
3456  012710                          5$:
3457  012710                          ENDTST
3458  012710                          L10046:
3459  012710  104401                          TRAP    C$ETST
3460
3461  012712                                  BADHEAD
3462                                          ;*************** TEST 5 ***************
3463                                          ;*IOP CRAM DUAL ADDRESSING TEST
3464                                          ;*WRITE EACH ADDRESS INTO ITSELF, READ EACH
3465                                          ;*ADDRESS TO VERIFY CORRECT ADDRESSING
3466  012712                                  BADHEAD
3467                                          ;*************** TEST 5 ***************
3468
3469  012712                          BGNTST
3470  012712                          T5::
3471  012712                          MACEX
3472                                          ;DO NOT DO TEST IF M8200
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

```
3473  012720  104432                  TRAP    C$EXIT
3474  012722  000230                  .WORD   L10047-.
3475  012724                          MYINT
3476  012724  013701  002516          MOV     KMCSR,R1            ;RECORD DEVICE ADDR.
3477                                                              ;R1 CONTAINS BASE M8200,4,7 ADDRESS
3478  012730                          MSTCLR                      ;MASTER CLEAR M8200,4,7
3479  012734  005037  002434          CLR     MR0                 ;MR0 =CRAM ADDRESS
3480  012740                          BGNSEG
3481  012740  104404                  TRAP    C$BSEG
3482  012742  013702  002434  1$:     MOV     MR0,R2              ;SAVE R2 FOR TYPEOUT
3483  012746  012711  002000          MOV     #BIT10,(R1)         ;SET ROM0
3484  012752  013761  002434  000004  MOV     MR0,4(R1)           ;WRITE ADDRESS TO SEL4
3485  012760  013761  002434  000006  MOV     MR0,6(R1)           ;LOAD SEL6 WITH WRITE DATA
3486  012766  052711  020000          BIS     #BIT13,(R1)         ;WRITE CRAM
3487  012772                          SKIP06  15$                 ;IF M8206,SKIP NEXT INSTR.
3488                                  ;GOTO 15$ IF M8206
3489  013002  005061  000006          CLR     6(R1)               ;CLEAR SEL 6
3490  013006                  15$:
3491  013006  016104  000006          MOV     6(R1),R4            ;SHOULD READ BACK OWN ADDRESS
3492  013012  023704  002434          CMP     MR0,R4              ;IS DATA CORRECT?
3493  013016  001410                  BEQ     2$                  ;BR IF YES
3494  013020                          ERROR   1                   ;DATA ERROR
3495  013024  104455                  TRAP    C$ERDF
3496  013026  000001                  .WORD   1
3497  013030  005055                  .WORD   EM0
3498  013032  006032                  .WORD   ERR1
3499  013034                          ESCAPE SEG
3500  013034  104410                  TRAP    C$ESCAPE
3501  013036  000002                  .WORD   10000$-.
3502  013040                  2$:     ENDSEG
3503  013040                  10000$:
3504  013040  104405                  TRAP    C$ESEG
3505  013042                          BGNSEG
3506  013042  104404                  TRAP    C$BSEG
3507  013044  005237  002434          INC     MR0                 ;BUMP TO NEXT ADDRESS
3508  013050  023737  002436  002434  CMP     MEMSZ,MR0           ;DONE WRITING YET?
3509  013056  001331                  BNE     1$                  ;BR IF NO
3510  013060  005037  002434          CLR     MR0                 ;RESTART AT ADDRESS 0
3511  013064  013702  002434  3$:     MOV     MR0,R2              ;SAVE R2 FOR TYPEOUT
3512  013070  012711  002000          MOV     #BIT10,(R1)         ;SET ROM0
3513  013074  013761  002434  000004  MOV     MR0,4(R1)           ;SEL4 = CRAM ADDRESS
3514  013102  016104  000006          MOV     6(R1),R4            ;READ CRAM INTO "FOUND"
3515  013106  023704  002434          CMP     MR0,R4              ;IS DATA CORRECT?
3516  013112  001411                  BEQ     4$                  ;BR IF YES
3517  013114                          ERROR   2                   ;DUAL ADDRESSING ERROR
3518  013120  104455                  TRAP    C$ERDF
3519  013122  000002                  .WORD   2
3520  013124  005055                  .WORD   EM0
3521  013126  006160                  .WORD   ERR2
3522  013130                          ESCAPE SEG
3523  013130  104410                  TRAP    C$ESCAPE
3524  013132  000002                  .WORD   10001$-.
3525  013134                          ENDSEG
3526  013134                  10001$:
3527  013134  104405                  TRAP    C$ESEG
3528  013136                  4$:                                 ;LOOP TO 3$ IF SW09=1
```

```
CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

  3529  013136  005237  002434                INC     MR0             ;BUMP TO NEXT ADDRESS
  3530  013142  023737  002436  002434        CMP     MEMSZ,MR0       ;DONE WRITING YET?
  3531  013150  001345                        BNE     3$              ;BR IF NO
  3532  013152                        5$:
  3533  013152                        ENDTST
  3534  013152                        L10047:
  3535  013152  104401                        TRAP    C$ETST
  3536
  3537
  3538  013154                        BADHEAD
  3539                                ;*************** TEST 6 ***************
  3540                                ;*IOP MAIN MEMORY TEST
  3541                                ;*FLOAT A 1 THROUGH ALL MAIN MEMORY LOCATIONS
  3542  013154                        BADHEAD
  3543                                ;*************** TEST 6 ***************
  3544
```

```
CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

  3545  013154                         BGNTST
  3546  013154                         T6::
  3547  013154                                 MYINT
  3548  013154  013701  002516                 MOV     KMCSR,R1            ;RECORD DEVICE ADDR.
  3549                                                                     ;R1 CONTAINS BASE M8200,4,7 ADDRESS
  3550  013160                                 MSTCLR                      ;MASTER CLEAR M8200,4,7
  3551  013164  005037  002406                 CLR     FLAG                ;START WITH ADDRESS 0
  3552  013170  012737  000001  002434  1$:    MOV     #1,MR0              ;START WITH BIT 0
  3553  013176  042737  003777  013232  65$:   BIC     #3777,66$           ;CLEAR ADDRESS FIELD OF INSTRUCTION
```

```
  3554  013204  042737  000037  013240          BIC     #37,68$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
```

```
3555  013212  153737  002406  013232          BISB    FLAG,66$        ;ADD ADDRESS TO INSTRUCTION7
3556  013220  153737  002407  013240          BISB    FLAG+1,68$      ;ADD ADDRESS TO INSTRUCTION
3557  013226                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3558  013226  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
3559  013232  010000                  66$:    010000
3560  013234                                  ROMCLK
3561  013234  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
3562  013240  004000                  68$:    004000                  ;LOAD MAR HI
3563  013242  013761  002434  000004          MOV     MR0,4(R1)       ;WRITE PATTERN IN PORT4
3564  013250                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3565  013250  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
3566  013254  122500                          122500                  ;MOVE PORT4 TO MEMORY
3567  013256                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3568  013256  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
3569  013262  040620                          040620                  ;MOVE MEMORY TO BR
3570  013264                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3571  013264  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
3572  013270  061225                          61225                   ;MOVE BR TO PORT5
3573  013272  013705  002434                  MOV     MR0,R5          ;PUT 'EXPECTED" IN R5
3574  013276  116104  000005                  MOVB    5(R1),R4        ;PUT 'FOUND" IN R4
3575  013302  120504                          CMPB    R5,R4           ;DATA CORRECT?
3576  013304  001410                          BEQ     67$             ;BR IF YES
3577  013306                                  ERROR   6               ;DATA ERROR
3578  013312  104455                          TRAP    C$ERDF
3579  013314  000006                          .WORD   6
3580  013316  005055                          .WORD   EM0
3581  013320  006700                          .WORD   ERR6
3582  013322                                  ESCAPE TST
3583  013322  104410                          TRAP    C$ESCAPE
3584  013324  000030                          .WORD   L10050-.
3585  013326                          67$:                            ;SW09=1?
3586  013326  000241                          CLC                     ;CLEAR CARRY
3587  013330  106137  002434                  ROLB    MR0             ;SHIFT BIT IN MR0
3588  013334  001320                          BNE     65$             ;DONE IF MR0=0
3589  013336                                  BREAK
3590  013336  104422                          TRAP    C$BRK
3591  013340  005237  002406                  INC     FLAG            ;NEXT ADDRESS
3592  013344  023737  002436  002406          CMP     MEMSZ,FLAG      ;LAST ADDRESS?
3593  013352  001306                          BNE     1$              ;BR IF NO
3594  013354                          2$:
3595  013354                          ENDTST
3596  013354                          L10050:
3597  013354  104401                          TRAP    C$ETST
      8
      9  013356                                BADHEAD
     10                                       ;*************** TEST 7 ***************
     11                                       ;*IOP MAIN MEMORY TEST
     12                                       ;*FLOAT A 0 THROUGH ALL MAIN MEMORY LOCATIONS
     13  013356                               BADHEAD
     14                                       ;*************** TEST 7 ***************
     15
     16  013356                          BGNTST
     17                                  T7::
     18                                  MYINT
     19  013356  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
3010                                                                    ;R1 CONTAINS BASE ADDR 200,4,7 ADDRESS
```

```
3611  013362                                    MSTCLR                  ;MASTER CLEAR M8200,4,7
3612  013366  005037  002406                    CLR     FLAG            ;START WITH ADDRESS 0
3613  013372  012737  000001  002434  1$:       MOV     #1,MR0          ;START WITH BIT 0
3614  013400  005137  002434          64$:      COM     MR0             ;CHANGE TO FLOATING 0
3615  013404  042737  003777  013440  65$:      BIC     #3777,66$       ;CLEAR ADDRESS FIELD OF INSTRUCTION
3616  013412  042737  000037  013446            BIC     #37,68$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
3617  013420  153737  002406  013440            BISB    FLAG,66$        ;ADD ADDRESS TO INSTRUCTION
3618  013426  153737  002407  013446            BISB    FLAG+1,68$      ;ADD ADDRESS TO INSTRUCTION
3619  013434                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3620  013434  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3621  013440  010000                  66$:      010000                  ;LOAD MAR LO WITH ADDRESS IN FLAG
3622  013442                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3623  013442  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3624  013446  004000                  68$:      004000                  ;LOAD MAR HI
3625  013450  013761  002434  000004            MOV     MR0,4(R1)       ;WRITE PATTERN IN PORT4
3626  013456                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3627  013456  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3628  013462  122500                            122500                  ;MOVE PORT4 TO MEMORY
3629  013464                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3630  013464  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3631  013470  040620                            040620                  ;MOVE MEMORY TO BR
3632  013472                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3633  013472  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3634  013476  061225                            61225                   ;MOVE BR TO PORT5
3635  013500  013705  002434                    MOV     MR0,R5          ;PUT "EXPECTED" IN R5
3636  013504  116104  000005                    MOVB    5(R1),R4        ;PUT "FOUND" IN R4
3637  013510  120504                            CMPB    R5,R4           ;DATA CORRECT?
3638  013512  001406                            BEQ     67$             ;BR IF YES
3639  013514                                    ERROR   6               ;DATA ERROR
3640  013520  104455                            TRAP    C$ERDF
3641  013522  000006                            .WORD   6
3642  013524  005055                            .WORD   EM0
3643  013526  006700                            .WORD   ERR6
3644  013530                          67$:      ESCAPE TST
3645  013530  104410                            TRAP    C$ESCAPE
3646  013532  000034                            .WORD   L10051-.
3647  013534  005137  002434                    COM     MR0             ;CHANGE TO FLOATING 1
3648  013540  000241                            CLC                     ;CLEAR CARRY
3649  013542  106137  002434                    ROLB    MR0             ;SHIFT BIT IN MR0
3650  013546  001314                            BNE     64$             ;DONE IF MR0=0
3651  013550                                    BREAK
3652  013550  104422                            TRAP    C$BRK
3653  013552  005237  002406                    INC     FLAG            ;NEXT ADDRESS
3654  013556  023737  002436  002406            CMP     MEMSZ,FLAG      ;LAST ADDRESS?
3655  013564  001302                            BNE     1$              ;BR IF NO
3656  013566                          2$:
3657  013566                          ENDTST
3658  013566                          L10051:
3659  013566  104401                            TRAP    C$ETST
3660
3661  013570                                    BADHEAD
3662                                            ;*************** TEST 8 ***************
3663                                            ;*IOP MAIN MEMORY DUAL ADDRESSING TEST
3664                                            ;*LOAD EACH MEMORY LOCATION WITH ITS OWN ADDRESS
3665                                            ;*READ BACK EACH LOCATION TO VERIFY CORRECT ADDRESSING
3666  013570                                    BADHEAD
```

```
                                  ;*************** TEST 8 ****************

013570                    BGNTST
013570                    T8::
013570                            MYINT
013570  013701  002516            MOV     KMCSR,R1                  ;RECORD DEVICE ADDR.
                                                            ;R1 CONTAINS BASE M8200,4,7 ADDRESS
013574                            MSTCLR                    ;MASTER CLEAR M8200,4,7
013600  005037  002406            CLR     FLAG              ;START WITH ADDRESS 0
013604  013702  002406    1$:     MOV     FLAG,R2           ;PUT DATA IN R2
013610  042737  003777  013644    BIC     #3777,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
013616  042737  000037  013652    BIC     #37,7$            ;CLEAR ADDRESS FIELD OF INSTRUCTION
013624  153737  002406  013644    BISB    FLAG,2$           ;ADD ADDRESS TO INSTRUCTION
013632  153737  002407  013652    BISB    FLAG+1,7$         ;ADD ADDRESS TO INSTRUCTION
013640                            ROMCLK                    ;NEXT WORD IS INSTRUCTION.
013640  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
013644  010000            2$:     010000                    ;LOAD MAR LO
013646                            ROMCLK                    ;NEXT WORD IS INSTRUCTION.
013646  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
013652  004000            7$:     004000                    ;LOAD MAR HI
013654  010261  000004            MOV     R2,4(R1)
013660                            ROMCLK                    ;NEXT WORD IS INSTRUCTION.
013660  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
013664  122500                    122500                    ;MOVE PORT4 TO MEMORY
013666                            ROMCLK                    ;NEXT WORD IS INSTRUCTION.
013666  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
013672  040620                    040620                    ;MOVE MEMORY TO THE BR
013674                            ROMCLK                    ;NEXT WORD IS INSTRUCTION.
013674  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
013700  061225                    61225                     ;MOVE BR TO PORT5
013702  010205                    MOV     R2,R5             ;PUT ''EXPECTED'' IN R5
013704  116104  000005            MOVB    5(R1),R4          ;PUT ''FOUND'' IN R4
013710  120504                    CMPB    R5,R4             ;DATA CORRECT?
013712  001406                    BEQ     3$                ;BR IF YES
013714                            ERROR   6                 ;DATA ERROR
013720  104455                    TRAP    C$ERDF
013722  000006                    .WORD   6
013724  005055                    .WORD   EM0
013726  006700                    .WORD   ERR6
013730                    3$:     ESCAPE TST
013730  104410                    TRAP    C$ESCAPE
013732  000156                    .WORD   L10052-.
013734  005237  002406            INC     FLAG              ;NEXT ADDRESS
013740  023737  002436  002406    CMP     MEMSZ,FLAG        ;LAST ADDRESS?
013746  001316                    BNE     1$                ;BR IF NO
013750  012737  013762  002340    MOV     #4$,LOCK          ;NEW SCOPE 1
013756  005037  002406            CLR     FLAG              ;RESTART AT ADDRESS 0
013762  013702  002406    4$:     MOV     FLAG,R2           ;PUT DATA IN R2
013766  042737  003777  014014    BIC     #3777,5$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
013774  042737  000037  014022    BIC     #37,8$            ;CLEAR ADDRESS FIELD OF INSTRUCTION
014002  153737  002406  014014    BISB    FLAG,5$           ;ADD ADDRESS TO INSTRUCTION
014010                            ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC+5304
014010  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
014014  010000            5$:     010000                    ;LOAD THE MAR LO
014016                            ROMCLK                    ;NEXT WORD IS INSTRUCTION.
014016  004537  003044            JSR     R5,.ROMCLK        ;CLOCK INSTRUCTION
```

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CZLMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 3723  014022  004000                  8$:     004000                  ;LOAD MAR HI
 3724  014024                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
 3725  014024  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 3726  014030  040620                          040620                  ;MOVE MEMORY TO THE BR
 3727  014032                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
 3728  014032  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 3729  014036  061225                          61225                   ;MOV BR TO PORT5
 3730  014040  010205                          MOV     R2,R5           ;PUT 'EXPECTED" IN R5
 3731  014042  116104  000005                  MOVB    5(R1),R4        ;PUT 'FOUND" IN R4
 3732  014046  120504                          CMPB    R5,R4           ;DATA CORRECT?
 3733  014050  001406                          BEQ     6$              ;BR IF YES
 3734  014052                                  ERROR   6               ;ADDRESSING ERROR
 3735  014056  104455                          TRAP    C$ERDF
 3736  014060  000006                          .WORD   6
 3737  014062  005055                          .WORD   EMO
 3738  014064  006700                          .WORD   ERR6
 3739  014066                                  6$:     ESCAPE TST
 3740  014066  104410                          TRAP    C$ESCAPE
 3741  014070  000020                          .WORD   L10052-.
 3742  014072                                  BREAK
 3743  014072  104422                          TRAP    C$BRK
 3744  014074  005237  002406                  INC     FLAG            ;NEXT ADDRESS
 3745  014100  023737  002436  002406          CMP     MEMSZ,FLAG      ;IS IT THE LAST
 3746  014106  001325                          BNE     4$              ;BR IF NO
 3747  014110                                  9$:
 3748  014110                                  ENDTST
 3749  014110                                  L10052:
 3750  014110  104401                          TRAP    C$ETST
 3751
 3752  014112                                  BADHEAD
 3753                                          ;*************** TEST 9 ***************
 3754                                          ;*IOP MAR TEST
 3755                                          ;*PERFORM DUAL ADDRESSING TEST
 3756                                          ;*USING MAR AUTO-INC FEATURE
 3757  014112                                  BADHEAD
 3758                                          ;*************** TEST 9 ***************
 3759
 3760  014112                          BGNTST
 3761  014112                          T9::
 3762  014112                                  K4ONLY                  ;FOR 4K CPUS ONLY.
 3763                                          ;DO NOT DO TEST IF M8200, OR M8204
 3764  014122  104432                          TRAP    C$EXIT
 3765  014124  000342                          .WORD   L10053-.
 3766  014126                                  MYINT
 3767  014126  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 3768                                                                  ;R1 CONTAINS BASE M8200,4,7 ADDRESS
 3769  014132                                  MSTCLR                  ;MASTER CLEAR M8200,4,7
 3770  014136  005002                          CLR     R2              ;START WITH A ZERO
 3771  014140  013703  002436                  MOV     MEMSZ,R3        ;GET MEMORY SIZE
 3772  014144  005203                          INC     R3              ;STOP ADDR=MEMSZ+1
 3773  014146                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
 3774  014146  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 3775  014152  010000                          010000                  ;LOAD MAR WITH A ZERO
 3776  014154                                  CLRMAR
 3777  014154  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 3778  014162  010261  000004          1$:     MOV     R2,4(R1)        ;WRITE DATA TO PORT4
```

CZDMAD.P11 12-JAN-82 09:50 HARDWARE TESTS

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3779  014166
3780  014166  004537  003044          ROMCLK                  ;NEXT WORD IS INSTRUCTION.
3781  014172  136500                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3782  014174  005202                  136500                  ;MEM PORT4, AUTO-INC MAR
3783  014176  020302                  INC     R2              ;INCREMENT DATA
3784  014200  001370                  CMP     R3,R2   ;DONE YET?
3785  014202  005002                  BNE     1$              ;BR IF NO
3786  014204                          CLR     R2              ;RESTART WITH A ZERO
3787  014204  004537  003044          ROMCLK                  ;NEXT WORD IS INSTRUCTION.
3788  014210  010000                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3789  014212                          010000                  ;LOAD MAR WITH A ZERO
3790  014212  004537  003044          CLRMAR
3791  014220                          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3792  014220                  2$:
3793  014220  004537  003100          SROMCLK                 ;NEXT WORD IS INSTRUCTION.
3794  014224  055224                  JSR     R5,..SROMCLK
3795  014226  010205                  055224                  ;MOVE MEM TO PORT4
3796  014230  116104  000004          MOV     R2,R5           ;PUT "EXPECTED" IN R5
3797  014234  120504                  MOVB    4(R1),R4        ;PUT "FOUND" IN R4
3798  014236  001406                  CMPB    R5,R4           ;DATA CORRECT?
3799  014240                          BEQ     3$              ;BR IF YES
3800  014244  104455                  ERROR   11              ;MAR ERROR
3801  014246  000013                  TRAP    C$ERDF
3802  014250  005055                  .WORD   11
3803  014252  007276                  .WORD   EM0
3804  014254                          .WORD   ERR11
3805  014254  004537  003100  3$:     SROMCLK
3806  014260  000000                  JSR     R5,..SROMCLK
3807  014262  005004                  0                       ;DUMP NOP INSTR. TO CLK AUTO INC IN MAR.
3808  014264                          CLR     R4
3809  014264  004537  003044          ROMCLK          ;READ IBUS* <15> (MAR HIGH)
3810  014270  121325                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3811                                  121325          ;MAR HIGH _POT 5
3812  014272                          ROMCLK          ;READ IBUS* <14> (MAR LOW)
3813  014272  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3814  014276  121304                  121304
3815  014300  016104  000004          MOV     4(R1),R4        ;ADD TO MAR HIGH.
3816  014304  042704  160000          BIC     #160000,R4
3817  014310  005202                  INC     R2
3818  014312  020237  002436          CMP     R2,MEMSZ
3819  014316  001002                  BNE     35$
3820  014320  052702  010000          BIS     #10000,R2       ;IF AT HIGH LIMIT,ADD IN OVERFLOW BIT.
3821  014324                  35$:
3822  014324  020204                  CMP     R2,R4   ;ADDR. OK?
3823  014326  001406                  BEQ     4$
3824  014330                          ERROR   11              ;ERROR MAR ADDR. BAD IN IBUS <14>AND <15>
3825  014334  104455                  TRAP    C$ERDF
3826  014336  000013                  .WORD   11
3827  014340  005055                  .WORD   EM0
3828  014342  007276                  .WORD   ERR11
3829                                                          ;EXPECTED (R4) IS COMBINATION OF
3830                                                          ;IBUS* <14> AND <15>
3831  014344                  4$:
3832  014344                          ESCAPE  TST
3833  014344  104410                  TRAP    C$ESCAPE
3834  014346  000120                  .WORD   L10053-.
```

```
3835  014350                          BREAK
3836  014350  104422                  TRAP    C$BRK
3837  014352  032702  010000          BIT     #10000,R2       ;DONE YET?
3838  014356  001720                  BEQ     2$
3839                                  ;*
3840                                  ;*THIS SECTION OF CODE ADDED TO MAKE SURE
3841                                  ;*THAT MASTER CLEAR, CLEARS THE MAR
3842                                  ;*
3843
3844  014360                          SKIP06  40$
3845                                  ;GOTO 40$ IF M8206
3846  014370  005737  002470          TST     RUNB
3847  014374  001034                  BNE     40$
3848  014376  005737  002472          TST     RUNINH
3849  014402  001031                  BNE     40$
3850  014404  052711  040000          BIS     #40000,(R1)     ;SET MASTER CLEAR
3851  014410  005011                  CLR     (R1)            ;CLEAR MASTER CLEAR
3852  014412                          ROMCLK                  ;WE MUST FIRST CLOCK
3853  014412  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3854  014416  121325                  121325                  ;THE MAR LATCH REGS
3855  014420                          ROMCLK                  ;BEFORE WE CAN READ THEM
3856  014420  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3857  014424  121304                  121304
3858  014426                          ROMCLK                  ;READ IBUS* <15> PUT IN PORT5
3859  014426  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3860  014432  121325                  121325                  ;MAR HIGH
3861  014434                          ROMCLK                  ;READ IBUS* <14>, PUT IN PORT4
3862  014434  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3863  014440  121304                  121304                  ;MAR LOW
3864  014442  005002                  CLR     R2              ;EXPECT MAR CLEAR
3865  014444  016104  000004          MOV     4(R1),R4        ;READ PORTS 4&5. THEY CONTAIN
3866                                                          ;THE CONTENTS OF THE MAR
3867                                                          ;MASTER CLEAR SHOULD HAVE
3868                                                          ;CLEARED THE MAR
3869                                                          ;BRANCH END TST IF CLEAR
3870  014450  001406                  BEQ     40$
3871  014452                          ERROR   44
3872  014456  104455                  TRAP    C$ERDF
3873  014460  000054                  .WORD   44
3874  014462  005055                  .WORD   EM0
3875  014464  011054                  .WORD   ERR44
3876  014466                  40$:
3877  014466                  ENDTST
3878  014466                  L10053:
3879  014466  104401                  TRAP    C$ETST
3880
3881  014470                          BADHEAD
3882                                  ;*************** TEST 10 ***************
3883                                  ;*IOP (CRAM) ODT BITS TEST
3884                                  ;*LOAD MAR WITH A 0 INC MAR UNTIL IT OVERFLOWS
3885                                  ;*VERIFY THAT IBUS* 10 BITS IS SET ONLY WHEN MAR BIT 8 IS A ONE
3886                                  ;*AND THAT IBUS* 10 BIT6 IS SET ON MAR OVERFLOW
3887  014470                          BADHEAD
3888                                  ;*************** TEST 10 ***************
3889
3890  014470                  BGNTST
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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 3891  014470
 3892  014470
 3893
 3894  014476  104432
 3895  014500  000234
 3896  014502
 3897  014502  013701  000516
 3898
 3899  014506
 3900  014512  005002
 3901  014514
 3902  014514  004537  003044
 3903  014520  010000
 3904  014522
 3905  014522
 3906  014522  004537  003044
 3907  014526  121204
 3908  014530  005005
 3909  014532  032702  000400
 3910  014536  001402
 3911  014540  012705  000040
 3912  014544  016104  000004
 3913  014550  042704  177637
 3914  014554  020504
 3915  014556  001410
 3916  014560
 3917  014564  104455
 3918  014566  000007
 3919  014570  005055
 3920  014572  007026
 3921  014574
 3922  014574  104410
 3923  014576  000136
 3924  014600
 3925  014600
 3926  014600  004537  003044
 3927  014604  014000
 3928  014606  005202
 3929  014610  022702  002000
 3930  014614  001342
 3931  014616
 3932  014616  004537  003044
 3933  014622  121204
 3934  014624  012705  000100
 3935  014630  016104  000004
 3936  014634  042704  177627
 3937  014640  020504
 3938  014642  001406
 3939  014644
 3940  014650  104455
 3941  014652  000007
 3942  014654  005055
 3943  014656  007026
 3944  014660
 3945  014660  004537  003044
 3946  014664  010000

T10::
        MACEX
        ;DO NOT DO TEST IF M8200
        TRAP    C$EXIT
        .WORD   L10054-.
        MYINT
        MOV     KMCSR,R1            ;RECORD DEVICE ADDR.
                                    ;R1 CONTAINS BASE M8200,4,7 ADDRESS
        MSTCLR                      ;MASTER CLEAR M8200,4,7
        CLR     R2                  ;R2=SAME AS MAR CONTENTS
        ROMCLK                      ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
        010000                      ;MAR_0
1$:
        ROMCLK                      ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
        121204                      ;PORT4=IBUS*10
        CLR     R5                  ;R5='EXPECTED'
        BIT     #BIT8,R2            ;IS BIT8 SET IN MAR?
        BEQ     .+6                 ;BR IF NO
        MOV     #BIT5,R5            ;IF YES THEN SET BIT5
        MOV     4(R1),R4            ;R4='FOUND'
        BIC     #177637,R4          ;CLEAR UNWANTED BITS
        CMP     R5,R4               ;BITS 5&6 SHOULD BE CLEAR.
        BEQ     15$                 ;BR IF OK
        ERROR   7                   ;ERROR BITS 5&6 NOT CLEAR
        TRAP    C$ERDF
        .WORD   7
        .WORD   EM0
        .WORD   ERR7
        ESCAPE  TST
        TRAP    C$ESCAPE
        .WORD   L10054-.
15$:
        ROMCLK                      ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
        014000                      ;INC MAR
        INC     R2                  ;BUMP MEM ADDRESS
        CMP     #2000,R2            ;OVERFLOWED YET?(OVFL PAGE BITS).
        BNE     1$                  ;BR IF NO
        ROMCLK                      ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
        121204                      ;PART4 IBUS* 10
        MOV     #BIT6,R5            ;R5='EXPECTED'
        MOV     4(R1),R4            ;R4='FOUND'
        BIC     #177627,R4          ;CLEAR UNWANTED BITS
        CMP     R5,R4               ;BIT6 SHOULD BE SET
        BEQ     17$                 ;BR IF OK
        ERROR   7                   ;ERROR, BIT6 NOT SET
        TRAP    C$ERDF
        .WORD   7
        .WORD   EM0
        .WORD   ERR7
17$:    ROMCLK                      ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
        010000                      ;MAR_0
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

```
3947  014666
3948  014666  004537  003044          ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3949  014672  004000                  JSR     R5,..RCMCLK     ;CLOCK INSTRUCTION
3950  014674                          004000                  ;MAR HI 0
3951  014674  004537  003044          ROMCLK                  ;NEXT WORD IS INSTRUCTION,
3952  014700  121204                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
3953  014702  005005                  121204                  ;PORT4 IBUS* 10
3954  014704  016104  000004          CLR     R5              ;R5='EXPECTED'
3955  014710  042704  177637          MOV     4(R1),R4        ;R4='FOUND'
3956  014714  020504                  BIC     #177637,R4      ;CLEAR UNWANTED BITS
3957  014716  001406                  CMP     R5,R4           ;BITS 5&6 SHOULD BE CLEAR
3958  014720                          BEQ     2$              ;BR IF OK
3959  014724  104455                  ERROR   7               ;ERROR 5&6 NOT BOTH CLEAR
3960  014726  000007                  TRAP    C$ERDF
3961  014730  005055                  .WORD   7
3962  014732  007026                  .WORD   EM0
3963  014734                          .WORD   ERR7
3964  014734                  2$:
3965  014734                  ENDTST
3966  014734  104401          L10054:
3967                                  TRAP    C$ETST
3968  014736
3969                                  BADHEAD
3970                                  ;*************** TEST 11 ***************
3971                                  ;*CRAM TEST OF JUMP(I) NEVER MICRO-PROCESSOR INSTRUCTION.
3972                                  ;*PERFORM THE JUMP INSTRUCTION
3973                                  ;*VERIFY THE JUMP DID NOT OCCUR BY CLOCKING THE INSTRUCTION
3974                                  ;*IN THE LOCATION IT IS AT.  THIS INSTRUCTION LOADS THE
3975                                  ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
3976                                  ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
3977                                  ;*THEN THE CRAM PC IS CORRECT. IF THE CRAM PC IS NOT RIGHT,
3978  014736                          ;*THEN PORT4 CONTAINS A 37
3979                                  BADHEAD
3980                                  ;*************** TEST 11 ***************
3981  014736          BGNTST
3982  014736          T11::
3983  014736                          SKIF04  10$
3984                                  ;GOTO 10$ IF M8204
3985  014746                          EXIT    TST                     ;CAN'T DO IF ROM,4K
3986  014746  104432                  TRAP    C$EXIT
3987  014750  000230                  .WORD   L10055-.
3988  014752          10$:
3989  014752                          MYINT
3990  014752  013701  002516          MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
3991                                                          ;R1 CONTAINS BASE M8200,4,7 ADDRESS
3992  014756                          MSTCLR                  ;MASTER CLEAR M8200,4,7
3993  014762                          BGNSEG
3994  014762  104404                  TRAP    C$BSEG
3995  014764  004737  003474          JSR     PC,MEMSET       ;SET MEM AND RAM
3996  014770          1$:
3997  014770  004737  003166          JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
3998  014774                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
3999  014774  004537  003100          JSR     R5,..SROMCLK
4000  015000  100400                  100400                  ;START AT ROM PC=0
4001  015002                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4002  015002  004537  003100          JSR     R5,..SROMCLK
```

```
4003  015006  114377                  114377!<400*0>          ;JUMP TO ROM PC OF 1777
4004  015010  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4005  015014  000001                  1                       ;EXPECTED DATA
4006  015016  120504                  CMPB    R5.R4           ;IS ROM PC CORRECT?
4007  015020  001406                  BEQ     2$              ;BR IF NO
4008  015022                          ERROR   5               ;ERROR, CRAM PC IS WRONG
4009  015026  104455                  TRAP    C$ERDF
4010  015030  000005                  .WORD   5
4011  015032  005055                  .WORD   EM0
4012  015034  006556                  .WORD   ERR5
4013  015036                  2$:     ESCAPE SEG
4014  015036  104410                  TRAP    C$ESCAPE
4015  015040  000002                  .WORD   10000$-.
4016  015042                          ENDSEG
4017  015042                  10000$:
4018  015042  104405                  TRAP    C$ESEG
4019  015044                          BGNSEG
4020  015044  104404                  TRAP    C$BSEG
4021  015046  004737  003166          JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
4022  015052                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4023  015052  004537  003100          JSR     R5,.SROMCLK
4024  015056  100403                  100403                  ;START AT ROM PC=3
4025  015060                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4026  015060  004537  003100          JSR     R5,.SROMCLK
4027  015064  100000                  100000!<400*0>  ;JUMP TO ROM PC OF 0
4028  015066  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4029  015072  000004                  4                       ;EXPECTED DATA
4030  015074  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
4031  015076  001406                  BEQ     4$              ;BR IF YES
4032  015100                          ERROR   5               ;ERROR, CROM PC IS WRONG
4033  015104  104455                  TRAP    C$ERDF
4034  015106  000005                  .WORD   5
4035  015110  005055                  .WORD   EM0
4036  015112  006556                  .WORD   ERR5
4037  015114                  4$:     ESCAPE SEG
4038  015114  104410                  TRAP    C$ESCAPE
4039  015116  000002                  .WORD   10001$-.
4040  015120                          ENDSEG
4041  015120                  10001$:
4042  015120  104405                  TRAP    C$ESEG
4043  015122                          BGNSEG
4044  015122  104404                  TRAP    C$BSEG
4045  015124  004737  003166          JSR     PC,CLRALL       ;CLEAR ALL CONDITINS
4046  015130                          SROMCLK                 ;NEXT WORD IS INSTRUCION,
4047  015130  004537  003100          JSR     R5,.SROMCLK
4048  015134  100406                  100406                  ;START AT ROM PC=6
4049  015136                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4050  015136  004537  003100          JSR     R5,.SROMCLK
4051  015142  104125                  104125!<400*0>          ;JUMP TO ROM PC OF 525
4052  015144  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4053  015150  000007                  7                       ;EXPECTED DATA
4054  015152  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
4055  015154  001406                  BEQ     6$              ;BR IF YES
4056  015156                          ERROR   5               ;ERROR, CRAM PC IS WRONG
4057  015162  104455                  TRAP    C$ERDF
4058  015164  000005                  .WORD   5
```

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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 4059  015166  005055                          .WORD   EM0
 4060  015170  006556                          .WORD   ERR5
 4061  015172                        6$:       ESCAPE SEG
 4062  015172  104410                          TRAP    C$ESCAPE
 4063  015174  000002                          .WORD   10002$-.
 4064  015176                                  ENDSEG
 4065  015176                        10002$:
 4066  015176  104405                          TRAP    C$ESEG
 4067  015200                        ENDTST
 4068  015200                        L10055:
 4069  015200  104401                          TRAP    C$ETST
 4070
 4071  015202                                  BADHEAD
 4072                                          ;*************** TEST 12 ***************
 4073                                          ;*CRAM TEST OF JUMP(I) ALWAYS MICRO-PROCESSOR INSTRUCTION.
 4074                                          ;*PERFORM THE JUMP INSTRUCTION
 4075                                          ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
 4076                                          ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
 4077                                          ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
 4078                                          ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
 4079                                          ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
 4080                                          ;*THEN PORT4 WILL CONTAIN A 37
 4081  015202                                  BADHEAD
 4082                                          ;*************** TEST 12 ***************
 4083
 4084  015202                        BGNTST
 4085  015202                        T12::
 4086  015202                                  MACEX2                  ;DON'T DO IF M8200
 4087                                          ;DO NOT DO TEST IF M8200
 4088  015212  104432                          TRAP    C$EXIT
 4089  015214  000214                          .WORD   L10056-.
 4090  015216                                  MYINT
 4091  015216  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 4092                                                                  ;R1 CONTAINS BASE M8200,4,7 ADDRESS
 4093  015222                                  MSTCLR                  ;MASTER CLEAR M8200,4,7
 4094  015226  004737  003474                  JSR     PC,MEMSET       ;SET MEM AND RAM
 4095  015232                        1$:       BGNSEG
 4096  015232  104404                          TRAP    C$BSEG
 4097  015234                                  SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4098  015234  004537  003100                  JSR     R5,..SROMCLK
 4099  015240  100400                          100400                  ;START AT ROM PC=0
 4100  015242                                  SROMCLK                 ;NEXT WORD IS INSTRUCION,
 4101  015242  004537  003100                  JSR     R5,..SROMCLK
 4102  015246  114777                          114377!<400*1>          ;JUMP TO ROM PC OF 1777
 4103  015250  004737  003330                  JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
 4104  015254  000377                          377                     ;EXPECTED DATA
 4105  015256  120504                          .MPB    R5,R4           ;IS ROM PC CORRECT?
 4106  015260  001406                          BEQ     2$              ;BR IF YES
 4107  015262                                  ERROR   5               ;ERROR, CRAM PC IS WRONG
 4108  015266  104455                          TRAP    C$ERDF
 4109  015270  000005                          .WORD   5
 4110  015272  005055                          .WORD   EM0
 4111  015274  006556                          .WORD   ERR5
 4112  015276                        2$:       ESCAPE SEG
 4113  015276  104410                          TRAP    C$ESCAPE
 4114  015300  000002                          .WORD   10000$-.
```

```
4115  015302                        ENDSEG
4116  015302                  10000$:
4117  015302  104405                TRAP    C$ESEG
4118  015304                        BGNSEG
4119  015304  104404                TRAP    C$BSEG
4120  015306                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4121  015306  004537  003100        JSR     R5,..SROMCLK
4122  015312  100403                100403                  ;START AT ROM PC=3
4123  015314                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4124  015314  004537  003100        JSR     R5,..SROMCLK
4125  015320  100400                100000!<400*1>  ;JUMP TO ROM PC OF 0
4126  015322  004737  003330        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4127  015326  000000                0                       ;EXPECTED DATA
4128  015330  120504                CMPB    R5,R4           ;IS ROM PC CORRECT?
4129  015332  001406                BEQ     4$              ;BR IF YES
4130  015334                        ERROR   5       ;ERROR, CRAM PC IS WRONG
4131  015340  104455                TRAP    C$ERDF
4132  015342  000005                .WORD   5
4133  015344  005055                .WOPD   EM0
4134  015346  006556                .WORD   ERR5
4135  015350                  4$:   ESCAPE SEG
4136  015350  104410                TRAP    C$ESCAPE
4137  015352  000002                .WORD   10001$-.
4138  015354                        ENDSEG
4139  015354                  10001$:
4140  015354  104405                TRAP    C$ESEG
4141  015356                        BGNSEG
4142  015356  104404                TRAP    C$BSEG
4143  015360                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4144  015360  004537  003100        JSR     R5,..SROMCLK
4145  015364  100406                100406                  ;START AT ROM PC=6
4146  015366                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4147  015366  004537  003100        JSR     R5,..SROMCLK
4148  015372  104525                104125!<400*1>          ;JUMP TO ROM PC OF 525
4149  015374  004737  003330        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4150  015400  000125                125                     ;EXPECTED DATA
4151  015402  120504                CMPB    R5,R4           ;IS ROM PC CORRECT?
4152  015404  001406                BEQ     6$              ;BR IF YES
4153  015406                        ERROR   5               ;ERROR, CRAM PC IS WRONG
4154  015412  104455                TRAP    C$ERDF
4155  015414  000005                .WORD   5
4156  015416  005055                .WORD   EM0
4157  015420  006556                .WORD   ERR5
4158  015422                  6$:   ESCAPE SEG
4159  015422  104410                TRAP    C$ESCAPE
4160  015424  000002                .WORD   10002$-.
4161  015426                        ENDSEG
4162  015426                  10002$:
4163  015426  104405                TRAP    C$ESEG
4164  015430                  ENDTST
4165  015430                  L10056:
4166  015430  104401                TRAP    C$ETST
4167
4168  015432                        BADHEAD
4169                                ;*************** TEST 13 ***************
4170                                ;*CRAM TEST OF JUMP(I) ON C BIT SET MICRO-PROCESSOR INSTRUCTION.
```

```
 4171                                   ;*SET THE C BIT, PERFORM THE JUMP INSTRUCTION.
 4172                                   ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
 4173                                   ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
 4174                                   ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
 4175                                   ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
 4176                                   ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
 4177                                   ;*THEN PORT4 WILL CONTAIN A 37
 4178  015432                           BADHEAD
 4179                                   ;*************** TEST 13 ***************
 4180
 4181  015432                           BGNTST
 4182  015432                           T13::
 4183  015432                           MACEX2                          ;DON'T DO IF M8200
 4184                                   ;DO NOT DO TEST IF M8200
 4185  015442  104432                   TRAP    C$EXIT
 4186  015444  000230                   .WORD   L10057-.
 4187  015446                           MYINT
 4188  015446  013701  002516           MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 4189                                                                   ;R1 CONTAINS BASE M8200,4,7 ADDRESS
 4190  015452                           MSTCLR                          ;MASTER CLEAR M8200,4,7
 4191  015456  004737  003474           JSR     PC,MEMSET               ;SET MEM AND RAM
 4192  015462                   1$:     BGNSEG
 4193  015462  104404                   TRAP    C$BSEG
 4194  015464  004737  00326C           JS.     PC,SETC                 ;SET THE C BIT'
 4195  015470                           SROMCLK                         ;NEXT WORD IS INSTRUCTION,
 4196  015470  004537  003100           JSR     R5,..SROMCLK
 4197  015474  100400                   100400                          ;START AT ROM PC=0
 4198  015476                           SROMCLK                         ;NEXT WORD IS INSTRUCION,
 4199  015476  004537  003100           JSR     R5,..SROMCLK
 4200  015502  115377                   114377!<400*2>                  ;JUMP TO ROM PC OF 1777
 4201  015504  004737  003330           JSR     PC,RAMDAT               ;R4=CRAM PC (LSB 8 BITS)
 4202  015510  000377                   377                             ;EXPECTED DATA
 4203  015512  120504                   CMPB    R5,R4                   ;IS ROM PC CORRECT?
 4204  015514  001406                   BEQ     2$                      ;BR IF YES
 4205  015516                           ERROR   5                       ;ERROR, CRAM PC IS WRONG
 4206  015522  104455                   TRAP    C$ERDF
 4207  015524  000005                   .WORD   5
 4208  015526  005055                   .WORD   EM0
 4209  015530  006556                   .WORD   ERR5
 4210  015532                   2$:                                     ;LOOP TO 1$ IF SW09=1
 4211  015532                           ESCAPE SEG
 4212  015532  104410                   TRAP    C$ESCAPE
 4213  015534  000002                   .WORD   10000$-.
 4214  015536                           ENDSEG
 4215  015536                   10000$:
 4216  015536  104405                   TRAP    C$ESEG
 4217  015540                           BGNSEG
 4218  015540  104404                   TRAP    C$BSEG
 4219  015542  004737  003260           JSR     PC,SETC                 ;SET THE C BIT'
 4220  015546                           SROMCLK                         ;NEXT WORD IS INSTRUCTION,
 4221  015546  004537  003100           JSR     R5,..SROMCLK
 4222  015552  100403                   100403                          ;START AT ROM PC=3
 4223  015554                           SROMCLK                         ;NEXT WORD IS INSTRUCTION,
 4224  015554  004537  003100           JSR     R5,..SROMCLK
 4225  015560  101000                   100000!<400*2>                  ;JUMP TO ROM PC OF 0
 4226  015562  004737  003330           JSR     PC,RAMDAT               ;R4=CRAM PC (LSB 8 BITS)
```

```
4227  015566  000000                    0                       ;EXPECTED DATA
4228  015570  120504                    CMPB    R5,R4           ;IS ROM PC CORRECT?
4229  015572  001406                    BEQ     4$              ;BR IF YES
4230  015574                            ERROR   5               ;ERROR, CRAM PC IS WRONG
4231  015600  104455                    TRAP    C$ERDF
4232  015602  000005                    .WORD   5
4233  015604  005055                    .WORD   EM0
4234  015606  006556                    .WORD   ERR5
4235  015610                    4$:                             ;LOOP TO 3$ IF SW09=1
4236  015610                            ESCAPE SEG
4237  015610  104410                    TRAP    C$ESCAPE
4238  015612  000002                    .WORD   10001$-.
4239  015614                            ENDSEG
4240  015614                    10001$:
4241  015614  104405                    TRAP    C$ESEG
4242  015616                            BGNSEG
4243  015616  104404                    TRAP    C$BSEG
4244  015620  004737  003260            JSR     PC,SETC         ;SET THE C BIT'
4245  015624                            SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4246  015624  004537  003100            JSR     R5,..SROMCLK
4247  015630  100406                    100406                  ;START AT ROM PC=6
4248  015632                            SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4249  015632  004537  003100            JSR     R5,..SROMCLK
4250  015636  105125                    104125!<400*2>          ;JUMP TO ROM PC OF 525
4251  015640  004737  003330            JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4252  015644  000125                    125                     ;EXPECTED DATA
4253  015646  120504                    CMPB    R5,R4           ;IS ROM PC CORRECT?
4254  015650  001406                    BEQ     6$              ;BR IF YES
4255  015652                            ERROR   5               ;ERROR, CRAM PC IS WRONG
4256  015656  104455                    TRAP    C$ERDF
4257  015660  000005                    .WORD   5
4258  015662  005055                    .WORD   EM0
4259  015664  006556                    .WORD   ERR5
4260  015666                    6$:     ESCAPE SEG
4261  015666  104410                    TRAP    C$ESCAPE
4262  015670  000002                    .WORD   10002$-.
4263  015672                            ENDSEG
4264  015672                    10002$:
4265  015672  104405                    TRAP    C$ESEG
4266  015674                    ENDTST
4267  015674                    L10057:
4268  015674  104401                    TRAP    C$ETST
4269
4270  015676                            BADHEAD
4271                                    ;*************** TEST 14 ****************
4272                                    ;*CRAM TEST OF JUMP(I) ON Z BIT SET MICRO-PROCESSOR INSTRUCTION.
4273                                    ;*SET THE Z BIT, PERFORM THE JUMP INSTRUCTION.
4274                                    ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
4275                                    ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
4276                                    ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
4277                                    ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
4278                                    ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
4279                                    ;*THEN PORT4 WILL CONTAIN A 37
4280  015676                            BADHEAD
4281                                    ;*************** TEST 14 ****************
4282
```

```
4283  015676                          BGNTST
4284  015676                          T14::
4285  015676                                MACEX2                  ;DON'T DO IF M8200.
4286                                        ;DO NOT DO TEST IF M8200
4287  015706  104432                        TRAP    C$EXIT
4288  015710  000230                        .WORD   L10060-.
4289  015712                                MYINT
4290  015712  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
4291                                                                    ;R1 CONTAINS BASE M8200,4,7 ADDRESS
4292  015716                                MSTCLR                  ;MASTER CLEAR M8200,4,7
4293  015722  004737  003474                JSR     PC,MEMSET       ;SET MEM AND RAM
4294  015726                          1$:   BGNSEG
4295  015726  104404                        TRAP    C$BSEG
4296  015730  004737  003312                JSR     PC,SETZ         ;SET THE Z BIT'
4297  015734                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4298  015734  004537  003100                JSR     R5,..SROMCLK
4299  015740  100400                        100400                  ;START AT ROM PC=0
4300  015742                                SROMCLK                 ;NEXT WORD IS INSTRUCION,
4301  015742  004537  003100                JSR     R5,..SROMCLK
4302  015746  115777                        114377!<400*3>          ;JUMP TO ROM PC OF 1777
4303  015750  004737  003330                JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4304  015754  000377                        377                     ;EXPECTED DATA
4305  015756  120504                        CMPB    R5,R4           ;IS ROM PC CORRECT?
4306  015760  001406                        BEQ     2$              ;BR IF YES
4307  015762                                ERROR   5               ;ERROR, CRAM PC IS WRONG
4308  015766  104455                        TRAP    C$ERDF
4309  015770  000005                        .WORD   5
4310  015772  005055                        .WORD   EM0
4311  015774  006556                        .WORD   ERR5
4312  015776                          2$:   ESCAPE SEG
4313  015776  104410                        TRAP    C$ESCAPE
4314  016000  000002                        .WORD   10000$-.
4315  016002                                ENDSEG
4316  016002                          10000$:
4317  016002  104405                        TRAP    C$ESEG
4318  016004                                BGNSEG
4319  016004  104404                        TRAP    C$BSEG
4320  016006  004737  003312                JSR     PC,SETZ         ;SET THE Z BIT'
4321  016012                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4322  016012  004537  003100                JSR     R5,..SROMCLK
4323  016016  100403                        100403                  ;START AT ROM PC=3
4324  016020                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4325  016020  004537  003100                JSR     R5,..SROMCLK
4326  016024  101400                        100000!<400*3>          ;JUMP TO ROM PC OF 0
4327  016026  004737  003330                JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4328  016032  000000                        0                       ;EXPECTED DATA
4329  016034  120504                        CMPB    R5,R4           ;IS ROM PC CORRECT?
4330  016036  001406                        BEQ     4$              ;BR IF YES
4331  016040                                ERROR   5               ;ERROR, CRAM PC IS WRONG
4332  016044  104455                        TRAP    C$ERDF
4333  016046  000005                        .WORD   5
4334  016050  005055                        .WORD   EM0
4335  016052  006556                        .WORD   ERR5
4336  016054                          4$:   ESCAPE SEG
4337  016054  104410                        TRAP    C$ESCAPE
4338  016056  000002                        .WORD   10001$-.
```

```
016060                                   ENDSEG
016060                           10001$:
016060  104405                           TRAP    C$ESEG
016062                                   BGNSEG
016062  104404                           TRAP    C$BSEG
016064  004737  003312                   JSR     PC,SETZ         ;SET THE Z BIT'
016070                                   SROMCLK                 ;NEXT WORD IS INSTRUCTION,
016070  004537  003100                   JSR     R5,.SROMCLK
016074  100406                           100406                  ;START AT ROM PC=6
016076                                   SROMCLK                 ;NEXT WORD IS INSTRUCTION,
016076  004537  003100                   JSR     R5,.SROMCLK
016102  105525                           104125!<400*3>          ;JUMP TO ROM PC OF 525
016104  004737  003330                   JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
016110  000125                           125                     ;EXPECTED DATA
016112  120504                           CMPB    R5,R4           ;IS ROM PC CORRECT?
016114  001406                           BEQ     6$              ;BR IF YES
016116                                   ERROR   5               ;ERROR, CRAM PC IS WRONG
016122  104455                           TRAP    C$ERDF
016124  000005                           .WORD   5
016126  005055                           .WORD   EM0
016130  006556                           .WORD   ERR5
016132                           6$:     ESCAPE SEG
016132  104410                           TRAP    C$ESCAPE
016134  000002                           .WORD   10002$-.
016136                                   ENDSEG
016136                           10002$:
016136  104405                           TRAP    C$ESEG
016140                           ENDTST
016140                           L10060:
016140  104401                           TRAP    C$ETST

016142                                   BADHEAD
                                         ;************** TEST 15 ***************
                                         ;*CRAM TEST OF JUMP(I) ON BR0 SET MICRO-PROCESSOR INSTRUCTION.
                                         ;*SET THE BR0 BIT, PERFORM THE JUMP INSTRUCTION.
                                         ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
                                         ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
                                         ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
                                         ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
                                         ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
                                         ;*THEN PORT4 WILL CONTAIN A 37
016142                                   BADHEAD
                                         ;************** TEST 15 ***************

016142                           BGNTST
016142                           T15::
016142                                   MACEX2                  ;DON'T DO IF M8200.
                                         ;DO NOT DO TEST IF M8200
016152  104432                           TRAP    C$EXIT
016154  000230                           .WORD   L10061-.
016156                                   MYINT
016156  013701  002516                   MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
                                                                 ;R1 CONTAINS BASE M8200,4,7 ADDRESS
016162                                   MSTCLR                  ;MASTER CLEAR M8200,4,7
016166  004737  003474                   JSR     PC,MEMSET       ;SET MEM AND RAM
016172                           1$:
```

```
4395  016172
4396  016172  104404
4397  016174  004737  003220
4398  016200
4399  016200  004537  003100
4400  016204  100400
4401  016206
4402  016206  004537  003100
4403  016212  116377
4404  016214  004737  003330
4405  016220  000377
4406  016222  120504
4407  016224  001406
4408  016226
4409  016232  104455
4410  016234  000005
4411  016236  005055
4412  016240  006556
4413  016242
4414  016242  104410
4415  016244  000002
4416  016246
4417  016246
4418  016246  104405
4419  016250
4420  016250  104404
4421  016252  004737  003220
4422  016256
4423  016256  004537  003100
4424  016262  100403
4425  016264
4426  016264  004537  003100
4427  016270  102000
4428  016272  004737  003330
4429  016276  000000
4430  016300  120504
4431  016302  001406
4432  016304
4433  016310  104455
4434  016312  000005
4435  016314  005055
4436  016316  006556
4437  016320
4438  016320  104410
4439  016322  000002
4440  016324
4441  016324
4442  016324  104405
4443  016326
4444  016326  104404
4445  016330  004737  003220
4446  016334
4447  016334  004537  003100
4448  016340  100406
4449  016342
4450  016342  004537  003100
```

```
        BGNSEG
        TRAP    C$BSEG
        JSR     PC,SETBRO       ;SET THE BRO BIT'
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100400                  ;START AT ROM PC=0
        SROMCLK                 ;NEXT WORD IS INSTRUCION,
        JSR     R5,..SROMCLK
        114377!<400*4>          ;JUMP TO ROM PC OF 1777
        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
        377                     ;EXPECTED DATA
        CMPB    R5,R4           ;IS ROM PC CORRECT?
        BEQ     2$              ;BR IF YES
        ERROR   5               ;ERROR, CRAM PC IS WRONG
        TRAP    C$ERDF
        .WORD   5
        .WORD   EM0
        .WORD   ERR5
2$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10000$-.
        ENDSEG
10000$:
        TRAP    C$ESEG
        BGNSEG
        TRAP    C$BSEG
        JSR     PC,SETBRO               ;SET THE BRO BIT'
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100403                  ;START AT ROM PC=3
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100000!<400*4>          ;JUMP TO ROM PC OF 0
        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
        0                       ;EXPECTED DATA
        CMPB    R5,R4           ;IS ROM PC CORRECT?
        BEQ     4$              ;BR IF YES
        ERROR   5               ;ERROR, CRAM PC IS WRONG
        TRAP    C$ERDF
        .WORD   5
        .WORD   EM0
        .WORD   ERR5
4$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10001$-.
        ENDSEG
10001$:
        TRAP    C$ESEG
        BGNSEG
        TRAP    C$BSEG
        JSR     PC,SETBRO               ;SET THE BRO BIT'
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100406                  ;START AT ROM PC=6
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
```

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CZDMQD.P11    12-JAN-82 09:50        HARDWARE TESTS

 4451  016346  106125                        104125!<400*4>          ;JUMP TO ROM PC OF 525
 4452  016350  004737  003330        JSR     PC,RAMDAT               ;R4=CRAM PC (LSB 8 BITS)
 4453  016354  000125                125                             ;EXPECTED DATA
 4454  016356  120504                CMPB    R5,R4                   ;IS ROM PC CORRECT?
 4455  016360  001406                BEQ     6$                      ;BR IF YES
 4456  016362                        ERROR   5                       ;ERROR, CRAM PC IS WRONG
 4457  016366  104455                TRAP    C$ERDF
 4458  016370  000005                .WORD   5
 4459  016372  005055                .WORD   EM0
 4460  016374  006556                .WORD   ERR5
 4461  016376                6$:     ESCAPE SEG
 4462  016376  104410                TRAP    C$ESCAPE
 4463  016400  000002                .WORD   10002$-.
 4464  016402                        ENDSEG
 4465  016402                10002$:
 4466  016402  104405                TRAP    C$ESEG
 4467  016404                ENDTST
 4468  016404                L10061:
 4469  016404  104401                TRAP    C$ETST
 4470
 4471  016406                        BADHEAD
 4472                                ;*************** TEST 16 ***************
 4473                                ;*CRAM TEST OF JUMP(I) ON BR1 SET MICRO-PROCESSOR INSTRUCTION.
 4474                                ;*SET THE BR1 BIT, PERFORM THE JUMP INSTRUCTION.
 4475                                ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
 4476                                ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
 4477                                ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
 4478                                ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
 4479                                ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
 4480                                ;*THEN PORT4 WILL CONTAIN A 37
 4481  016406                        BADHEAD
 4482                                ;*************** TEST 16 ***************
 4483
 4484  016406                BGNTST
 4485  016406                T16::
 4486  016406                        MACEX2                          ;DON'T DO IF M8200.
 4487                                ;DO NOT DO TEST IF M8200
 4488  016416  104432                TRAP    C$EXIT
 4489  016420  000230                .WORD   L10062-.
 4490  016422                        MYINT
 4491  016422  013701  002516        MOV     KMCSR,R1                        ;RECORD DEVICE ADDR.
 4492                                                                ;R1 CONTAINS BASE M8200,4,7 ADDRESS
 4493  016426                        MSTCLR                          ;MASTER CLEAR M8200,4,7
 4494  016432  004737  003474        JSR     PC,MEMSET               ;SET MEM AND RAM
 4495  016436                1$:
 4496  016436                        BGNSEG
 4497  016436  104404                TRAP    C$BSEG
 4498  016440  004737  003230        JSR     PC,SETBR1               ;SET THE BR1 BIT'
 4499  016444                        SROMCLK                         ;NEXT WORD IS INSTRUCTION,
 4500  016444  004537  003100        JSR     R5,..SROMCLK
 4501  016450  100400                100400                          ;START AT ROM PC=0
 4502  016452                        SROMCLK                         ;NEXT WORD IS INSTRUCION,
 4503  016452  004537  003100        JSR     R5,..SROMCLK
 4504  016456  116777                114377!<400*5>                  ;JUMP TO ROM PC OF 1777
 4505  016460  004737  003330        JSR     PC,RAMDAT               ;R4=CRAM PC (LSB 8 BITS)
 4506  016464  000377                377                             ;EXPECTED DATA
```

```
4507  016466  120504                CMPB    R5,R4           ;IS ROM PC CORRECT?
4508  016470  001406                BEQ     2$              ;BR IF YES
4509  016472                        ERROR   5               ;ERROR, CRAM PC IS WRONG
4510  016476  104455                TRAP    C$ERDF
4511  016500  000005                .WORD   5
4512  016502  005055                .WORD   EM0
4513  016504  006556                .WORD   ERR5
4514  016506                2$:     ESCAPE SEG
4515  016506  104410                TRAP    C$ESCAPE
4516  016510  000002                .WORD   10000$-.
4517  016512                        ENDSEG
4518  016512                10000$:
4519  016512  104405                TRAP    C$ESEG
4520  016514                        BGNSEG
4521  016514  104404                TRAP    C$BSEG
4522  016516  004737  003230        JSR     PC,SETBR1               ;SET THE BR1 BIT'
4523  016522                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4524  016522  004537  003100        JSR     R5,.SROMCLK
4525  016526  100403                100403                  ;START AT ROM PC=3
4526  016530                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4527  016530  004537  003100        JSR     R5,.SROMCLK
4528  016534  102400                100000!<400*5>          ;JUMP TO ROM PC OF 0
4529  016536  004737  003330        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4530  016542  000000                0                       ;EXPECTED DATA
4531  016544  120504                CMPB    R5,R4           ;IS ROM PC CORRECT?
4532  016546  001406                BEQ     4$              ;BR IF YES
4533  016550                        ERROR   5               ;ERROR, CRAM PC IS WRONG
4534  016554  104455                TRAP    C$ERDF
4535  016556  000005                .WORD   5
4536  016560  005055                .WORD   EM0
4537  016562  006556                .WORD   ERR5
4538  016564                4$:     ESCAPE SEG
4539  016564  104410                TRAP    C$ESCAPE
4540  016566  000002                .WORD   10001$-.
4541  016570                        ENDSEG
4542  016570                10001$:
4543  016570  104405                TRAP    C$ESEG
4544  016572                        BGNSEG
4545  016572  104404                TRAP    C$BSEG
4546  016574  004737  003230        JSR     PC,SETBR1               ;SET THE BR1 BIT'
4547  016600                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4548  016600  004537  003100        JSR     R5,.SROMCLK
4549  016604  100406                100406                  ;START AT ROM PC=6
4550  016606                        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4551  016606  004537  003100        JSR     R5,.SROMCLK
4552  016612  106525                104125!<400*5>          ;JUMP TO ROM PC OF 525
4553  016614  004737  003330        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4554  016620  000125                125                     ;EXPECTED DATA
4555  016622  120504                CMPB    R5,R4           ;IS ROM PC CORRECT?
4556  016624  001406                BEQ     6$              ;BR IF YES
4557  016626                        ERROR   5               ;ERROR, CRAM PC IS WRONG
4558  016632  104455                TRAP    C$ERDF
4559  016634  000005                .WORD   5
4560  016636  005055                .WORD   EM0
4561  016640  006556                .WORD   ERR5
4562  016642                6$:     ESCAPE SEG
```

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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 4563  016642  104410                          TRAP    C$ESCAPE
 4564  016644  000002                          .WORD   10002$-.
 4565  016646                                  ENDSEG
 4566  016646                          10002$:
 4567  016646  104405                          TRAP    C$ESEG
 4568  016650                          ENDTST
 4569  016650                          L10062;
 4570  016650  104401                          TRAP    C$ETST
 4571
 4572  016652                                  BADHEAD
 4573                                          ;*************** TEST 17 ***************
 4574                                          ;*CRAM TEST OF JUMP(I) ON BR4 SET MICRO-PROCESSOR INSTRUCTION.
 4575                                          ;*SET THE BR4 BIT, PERFORM THE JUMP INSTRUCTION.
 4576                                          ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
 4577                                          ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
 4578                                          ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
 4579                                          ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
 4580                                          ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
 4581                                          ;*THEN PORT4 WILL CONTAIN A 37
 4582  016652                                  BADHEAD
 4583                                          ;*************** TEST 17 ***************
 4584
 4585  016652                          BGNTST
 4586  016652                          T17::
 4587  016652                                  MACEX2                  ;DON'T DO IF M8200.
 4588                                          ;DO NOT DO TEST IF M8200
 4589  016662  104432                          TRAP    C$EXIT
 4590  016664  000230                          .WORD   L10063-.
 4591  016666                                  MYINT
 4592  016666  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 4593  016672                                  MSTCLR                  ;MASTER CLEAR M8200,4,7
 4594  016676  004737  003474                  JSR     PC,MEMSET       ;SET MEM AND RAM
 4595  016702                          1$:
 4596  016702                                  BGNSEG
 4597  016702  104404                          TRAP    C$BSEG
```

```
 4598  016704  004737  003240          JSR     PC,SETBR4       ;SET THE BR4 BIT'
 4599  016710                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4600  016710  004537  003100          JSR     R5,..SROMCLK
 4601  016714  100400                  100400                  ;START AT ROM PC=0
 4602  016716                          SROMCLK                 ;NEXT WORD IS INSTRUCION,
 4603  016716  004537  003100          JSR     R5,..SROMCLK
```

```
 4604  016722  117377                    114377!<400*6>          ;JUMP TO ROM PC OF 1777
 4605  016724  004737  003330            JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
```

```
 4606  016730  000377                    377                     ;EXPECTED DATA
 4607  016732  120504                    CMPB    R5,R4           ;IS ROM PC CORRECT?
```

```
  4608  016734  001406                BEQ     2$              ;BR IF YES
```

```
 4609  016736                          ERROR   5               ;ERROR, CRAM PC IS WRONG
 4610  016742  104455                  TRAP    CSERDF
 4611  016744  000005                  .WORD   5
 4612  016746  005055                  .WORD   EM0
 4613  016750  006556                  .WORD   ERR5
```

```
4614  016752                  2$:     ESCAPE SEG
4615  016752  104410                  TRAP    C$ESCAPE
4616  016754  000002                  .WORD   10000$-.
4617  016756                          ENDSEG
4618  016756                   0000$:
4619  016756  104405                  TRAP    C$ESEG
4620  016760                          BGNSEG
4621  016760  104404                  TRAP    C$BSEG
4622  016762  004737  003240          JSR     PC,SETBR4               ;SET THE BR4 BIT'
4623  016766                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4624  016766  004537  003100          JSR     R5,..SROMCLK
4625  016772  100403                  100403                  ;START AT ROM PC=3
4626  016774                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4627  016774  004537  003100          JSR     R5,..SROMCLK
4628  017000  103000                  100000!<400*6>          ;JUMP TO ROM PC OF 0
4629  017002  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4630  017006  000000                  0                       ;EXPECTED DATA
4631  017010  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
4632  017012  001406                  BEQ     4$              ;BR IF YES
4633  017014                          ERROR   5               ;ERROR, CRAM PC IS WRONG
4634  017020  104455                  TRAP    C$ERDF
4635  017022  000005                  .WORD   5
4636  017024  005055                  .WORD   EM0
4637  017026  006556                  .WORD   ERR5
4638  017030                   4$:    ESCAPE SEG
4639  017030  104410                  TRAP    C$ESCAPE
4640  017032  000002                  .WORD   10001$-.
4641  017034                          ENDSEG
4642  017034                   10001$:
4643  017034  104405                  TRAP    C$ESEG
4644  017036                          BGNSEG
4645  017036  104404                  TRAP    C$BSEG
4646  017040  004737  003240          JSR     PC,SETBR4               ;SET THE BR4 BIT'
4647  017044                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4648  017044  004537  003100          JSR     R5,..SROMCLK
4649  017050  100406                  100406                  ;START AT ROM PC=6
4650  017052                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4651  017052  004537  003100          JSR     R5,..SROMCLK
4652  017056  107125                  104125!<400*6>          ;JUMP TO ROM PC OF 525
4653  017060  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4654  017064  000125                  125                     ;EXPECTED DATA
4655  017066  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
4656  017070  001406                  BEQ     6$              ;BR IF YES
4657  017072                          ERROR   5               ;ERROR, CRAM PC IS WRONG
4658  017076  104455                  TRAP    C$ERDF
4659  017100  000005                  .WORD   5
4660  017102  005055                  .WORD   EM0
4661  017104  006556                  .WORD   ERR5
4662  017106                   6$:    ESCAPE SEG
4663  017106  104410                  TRAP    C$ESCAPE
4664  017110  000002                  .WORD   10002$-.
4665  017112                          ENDSEG
4666  017112                   10002$:
4667  017112  104405                  TRAP    C$ESEG
4668  017114                   ENDTST
4669  017114                   L10063:
```

```
 4670  017114  104401                    TRAP    C$ETST
 4671
 4672  017116                            BADHEAD
 4673                                    ;*************** TEST 18 ****************
 4674                                    ;*CRAM TEST OF JUMP(I) ON BR7 SET MICRO-PROCESSOR INSTRUCTION.
 4675                                    ;*SET THE BR7 BIT, PERFORM THE JUMP INSTRUCTION.
 4676                                    ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
 4677                                    ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
 4678                                    ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
 4679                                    ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
 4680                                    ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
 4681                                    ;*THEN PORT4 WILL CONTAIN A 37
 4682  017116                            BADHEAD
 4683                                    ;*************** TEST 18 ****************
 4684
 4685  017116                    BGNTST
 4686  017116                    T18::
 4687  017116                            MACEX2                  ;DON'T DO IF M8200.
 4688                                    ;DO NOT DO TEST IF M8200
 4689  017126  104432                    TRAP    C$EXIT
 4690  017130  000230                    .WORD   L10064-.
 4691  017132                            MYINT
 4692  017132  013701  002516            MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 4693                                                            ;R1 CONTAINS BASE M8200,4,7 ADDRESS
 4694  017136                            MSTCLR                  ;MASTER CLEAR M8200,4,7
 4695  017142  004737  003474            JSR     PC,MEMSET       ;SET MEM AND RAM
 4696  017146                    1$:     BGNSEG
 4697  017146  104404                    TRAP    C$BSEG
 4698  017150  004737  003250            JSR     PC,SETBR7       ;SET THE BR7 BIT'
 4699  017154                            SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4700  017154  004537  003100            JSR     R5,..SROMCLK
 4701  017160  100400                    100400                  ;START AT ROM PC=0
 4702  017162                            SROMCLK                 ;NEXT WORD IS INSTRUCION,
 4703  017162  004537  003100            JSR     R5,..SROMCLK
 4704  017166  117777                    114377!<400*7>          ;JUMP TO ROM PC OF 1777
 4705  017170  004737  003330            JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
 4706  017174  000377                    377                     ;EXPECTED DATA
 4707  017176  120504                    CMPB    R5,R4           ;IS ROM PC CORRECT?
 4708  017200  001406                    BEQ     2$              ;BR IF YES
 4709  017202                            ERROR   5               ;ERROR, CRAM PC IS WRONG
 4710  017206  104455                    TRAP    C$ERDF
 4711  017210  000005                    .WORD   5
 4712  017212  005055                    .WORD   EM0
 4713  017214  006556                    .WORD   ERR5
 4714  017216                    2$:     ESCAPE SEG
 4715  017216  104410                    TRAP    C$ESCAPE
 4716  017220  000002                    .WORD   10000$-.
 4717  017222                            ENDSEG
 4718  017222                    10000$:
 4719  017222  104405                    TRAP    C$ESEG
 4720  017224                            BGNSEG
 4721  017224  104404                    TRAP    C$BSEG
 4722  017226  004737  003250            JSR     PC,SETBR7               ;SET THE BR7 BIT'
 4723  017232                            SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4724  017232  004537  003100            JSR     R5,..SROMCLK
 4725  017236  100403                    100403                  ;START AT ROM PC=3
```

```
4726  017240                    SROMCLK                 ;NEXT WORD IS INSTRUCTION.
4727  017240  004537  003100    JSR     R5,..SROMCLK
4728  017244  103400            100000!<400*7>          ;JUMP TO ROM PC OF 0
4729  017246  004737  003330    JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4730  017252  000000            0                       ;EXPECTED DATA
4731  017254  120504            CMPB    R5,R4           ;IS ROM PC CORRECT?
4732  017256  001406            BEQ     4$              ;BR IF YES
4733  017260                    ERROR   5               ;ERROR, CRAM PC IS WRONG
4734  017264  104455            TRAP    C$ERDF
4735  017266  000005            .WORD   5
4736  017270  005055            .WORD   EM0
4737  017272  006556            .WORD   ERR5
4738  017274                4$: ESCAPE SEG
4739  017274  104410            TRAP    C$ESCAPE
4740  017276  000002            .WORD   10001$-.
4741  017300                    ENDSEG
4742  017300                10001$:
4743  017300  104405            TRAP    C$ESEG
4744  017302                    BGNSEG
4745  017302  104404            TRAP    C$BSEG
4746  017304  004737  003250    JSR     PC,SETBR7               ;SET THE BR7 BIT'
4747  017310                    SROMCLK                 ;NEXT WORD IS INSTRUCTION.
4748  017310  004537  003100    JSR     R5,..SROMCLK
4749  017314  100406            100406                  ;START AT ROM PC=6
4750  017316                    SROMCLK                 ;NEXT WORD IS INSTRUCTION.
4751  017316  004537  003100    JSR     R5,..SROMCLK
4752  017322  107525            104125!<400*7>          ;JUMP TO ROM PC OF 525
4753  017324  004737  003330    JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4754  017330  000125            125                     ;EXPECTED DATA
4755  017332  120504            CMPB    R5,R4           ;IS ROM PC CORRECT?
4756  017334  001406            BEQ     6$              ;BR IF YES
4757  017336                    ERROR   5               ;ERROR, CRAM PC IS WRONG
4758  017342  104455            TRAP    C$ERDF
4759  017344  000005            .WORD   5
4760  017346  005055            .WORD   EM0
4761  017350  006556            .WORD   ERR5
4762  017352                6$: ESCAPE SEG
4763  017352  104410            TRAP    C$ESCAPE
4764  017354  000002            .WORD   10002$-.
4765  017356                    ENDSEG
4766  017356                10002$:
4767  017356  104405            TRAP    C$ESEG
4768  017360                ENDTST
4769  017360                L10064:
4770  017360  104401            TRAP    C$ETST
4771
4772  017362                    BADHEAD
4773                            ;*************** TEST 19 ***************
4774                            ;*CRAM TEST OF JUMP(I) ON C BIT CLEAR MICRO-PROCESSOR INSTRUCTION.
4775                            ;*SET THE C BIT, PERFORM THE JUMP INSTRUCTION.
4776                            ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
4777                            ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
4778                            ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
4779                            ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
4780                            ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
4781                            ;*THEN PORT4 WILL CONTAIN A 37
```

```
4782  017362                                BADHEAD
4783                                        ;*************** TEST 19 ***************
4784
4785  017362                          BGNTST
4786  017362                          T19::
4787  017362                                MACEX2                    ;DON'T DO IF M8200.
4788                                        ;DO NOT DO TEST IF M8200
4789  017372  104432                        TRAP    C$EXIT
4790  017374  000244                        .WORD   L10065-.
4791  017376                                MYINT
4792  017376  013701  002516                MOV     KMCSR,R1                  ;RECORD DEVICE ADDR.
4793  017402                                MSTCLR                    ;MASTER CLEAR M8200,4,7
4794  017406  004737  003474                JSR     PC,MEMSET         ;SET MEM AND RAM
4795  017412                          1$:   BGNSEG
4796  017412  104404                        TRAP    C$BSEG
4797  017414  004737  003260                JSR     PC,SETC
4798  017420  004737  003166                JSR     PC,CLRALL
4799  017424                                SROMCLK                   ;NEXT WORD IS INSTRUCTION.
4800  017424  004537  003100                JSR     R5,..SROMCLK
4801  017430  100400                        100400                    ;START AT ROM PC=0
4802  017432                                SROMCLK                   ;NEXT WORD IS INSTRUCION.
4803  017432  004537  003100                JSR     R5,..SROMCLK
4804  017436  115377                        114377!<400*2>            ;JUMP TO ROM PC OF 1777
4805  017440  004737  003330                JSR     PC,RAMDAT         ;R4=CRAM PC (LSB 8 BITS)
4806  017444  000001                        1                         ;EXPECTED DATA
4807  017446  120504                        CMPB    R5,R4             ;IS ROM PC CORRECT?
4808  017450  001406                        BEQ     2$                ;BR IF YES
4809  017452                                ERROR   5                 ;ERROR, CRAM PC IS WRONG
4810  017456  104455                        TRAP    C$ERDF
4811  017460  000005                        .WORD   5
4812  017462  005055                        .WORD   EM0
4813  017464  006556                        .WORD   ERR5
4814  017466                          2$:   ESCAPE SEG
4815  017466  104410                        TRAP    C$ESCAPE
4816  017470  000002                        .WORD   10000$-.
4817  017472                                ENDSEG
4818  017472                          10000$:
4819  017472  104405                        TRAP    C$ESEG
4820  017474                                BGNSEG
4821  017474  104404                        TRAP    C$BSEG
4822  017476                                SKIP06  6$
4823                                        ;GOTO 6$ IF M8206
4824  017506  004737  003166                JSR     PC,CLRALL         ;CLEAR ALL CONDITIONS
4825  017512                                SROMCLK                   ;NEXT WORD OF INSTRUCTION
4826  017512  004537  003100                JSR     R5,..SROMCLK
4827  017516  100403                        100403                    ;START AT ROM PC=3
4828  017520                                SROMCLK                   ;NEXT WORD OF INSTRUCTION
4829  017520  004537  003100                JSR     R5,..SROMCLK
4830  017524  101000                        100000!<400*2>            ;JUMP TO ROM PC OF 0
4831  017526  004737  003330                JSR     PC,RAMDAT         ;R4=CRAM PC(LSB 8 BITS)
4832  017532  000004                        4                         ;EXPECTED DATA
4833  017534  120504                        CMPB    R5,R4             ;IS ROM PC CORRECT?
4834  017536  001406                        BEQ     4$                ;BR IF YES
4835  017540                                ERROR   5                 ;ERROR, CRAM PC IS WRONG
4836  017544  104455                        TRAP    C$ERDF
4837  017546  000005                        .WORD   5
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

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4838  017550  005055                  .WORD   EM0
4839  017552  006556                  .WORD   ERR5
4840  017554                  4$:     ESCAPE SEG
4841  017554  104410                  TRAP    C$ESCAPE
4842  017556  000002                  .WORD   10001$-.
4843  017560                          ENDSEG
4844  017560                  10001$:
4845  017560  104405                  TRAP    C$ESEG
4846  017562                          BGNSEG
4847  017562  104404                  TRAP    C$BSEG
4848  017564  004737  003166          JSR     PC,CLRALL               ;CLEAR ALL CONDITIONS
4849  017570                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4850  017570  004537  003100          JSR     R5,..SROMCLK
4851  017574  100406                  100406                  ;START AT ROM PC=6
4852  017576                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
4853  017576  004537  003100          JSR     R5,..SROMCLK
4854  017602  105125                  104125!<400*2>          ;JUMP TO ROM PC OF 525
4855  017604  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
4856  017610  000007                  7                       ;EXPECTED DATA
4857  017612  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
4858  017614  001406                  BEQ     6$              ;BR IF YES
4859  017616                          ERROR   5               ;ERROR, CRAM PC IS WRONG
4860  017622  104455                  TRAP    C$ERDF
4861  017624  000005                  .WORD   5
4862  017626  005055                  .WORD   EM0
4863  017630  006556                  .WORD   ERR5
4864  017632                  6$:     ESCAPE SEG
4865  017632  104410                  TRAP    C$ESCAPE
4866  017634  000002                  .WORD   10002$-.
4867  017636                          ENDSEG
4868  017636                  10002$:
4869  017636  104405                  TRAP    C$ESEG
4870  017640                  ENDTST
4871  017640                  L10065:
4872  017640  104401                  TRAP    C$ETST
4873
4874  017642                          BADHEAD
4875                                  ;*************** TEST 20 ***************
4876                                  ;*CRAM TEST OF JUMP(I) ON Z BIT CLEAR MICRO-PROCESSOR INSTRUCTION.
4877                                  ;*CLEAR THE Z BIT, PERFORM THE JUMP INSTRUCTION.
4878                                  ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
4879                                  ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
4880                                  ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
4881                                  ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
4882                                  ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
4883                                  ;*THEN PORT4 WILL CONTAIN A 37
4884  017642                          BADHEAD
4885                                  ;*************** TEST 20 ***************
4886
4887  017642                  BGNTST
4888  017642                  T20::
4889  017642                          MACEX2                  ;DON'T DO IF M8200.
4890                                  ;DO NOT DO TEST IF M8200
4891  017652  104432                  TRAP    C$EXIT
4892  017654  000244                  .WORD   L10066-.
4893  017656                          MYINT
```

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C:DMQD.P11    12-JAN-82 09:50        HARDWARE TESTS

 4894  017656  013701  002516              MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 4895  017662                              MSTCLR                  ;MASTER CLEAR M8200,4,7
 4896  017666  004737  003474              JSR     PC,MEMSET       ;SET MEM AND RAM
 4897  017672                      1$:     BGNSEG
 4898  017672  104404                      TRAP    C$BSEG
 4899  017674  004737  003312              JSR     PC,SETZ
 4900  017700  004737  003166              JSR     PC,CLRALL       ; CLEAR CONDITION CODES ;*** B0
 4901  017704                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4902  017704  004537  003100              JSR     R5,..SROMCLK
 4903  017710  100400                      100400                  ;START AT ROM PC=0
 4904  017712                              SROMCLK                 ;NEXT WORD IS INSTRUCION,
 4905  017712  004537  003100              JSR     R5,..SROMCLK
 4906  017716  115777                      114377!<400*3>          ;JUMP TO ROM PC OF 1777
 4907  017720  004737  003330              JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
 4908  017724  000001                      1                       ;EXPECTED DATA
 4909  017726  120504                      CMPB    R5,R4           ;IS ROM PC CORRECT?
 4910  017730  001406                      BEQ     2$              ;BR IF YES
 4911  017732                              ERROR   5               ;ERROR, CRAM PC IS WRONG
 4912  017736  104455                      TRAP    C$ERDF
 4913  017740  000005                      .WORD   5
 4914  017742  005055                      .WORD   EM0
 4915  017744  006556                      .WORD   ERR5
 4916  017746                      2$:     ESCAPE SEG
 4917  017746  104410                      TRAP    C$ESCAPE
 4918  017750  000002                      .WORD   10000$-.
 4919  017752                              ENDSEG
 4920  017752                      10000$:
 4921  017752  104405                      TRAP    C$ESEG
 4922  017754                              BGNSEG
 4923  017754  104404                      TRAP    C$BSEG
 4924  017756                              SKIP06  6$
 4925                                      ;GOTO 6$ IF M8206
 4926  017766  004737  003166              JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
 4927  017772                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4928  017772  004537  003100              JSR     R5,..SROMCLK
 4929  017776  100403                      100403                  ;START AT ROM PC=3
 4930  020000                              SROMCLK                 ;NEXT WORD IS INSTRUCION,
 4931  020000  004537  003100              JSR     R5,..SROMCLK
 4932  020004  101400                      100000!<400*3>          ;JUMP TO ROM PC OF 0
 4933  020006  004737  003330              JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
 4934  020012  000004                      4                       ;EXPECTED DATA
 4935  020014  120504                      CMPB    R5,R4           ;IS ROM PC CORRECT?
 4936  020016  001406                      BEQ     4$              ;BR IF YES
 4937  020020                              ERROR   5               ;ERROR, CRAM PC IS WRONG
 4938  020024  104455                      TRAP    C$ERDF
 4939  020026  000005                      .WORD   5
 4940  020030  005055                      .WORD   EM0
 4941  020032  006556                      .WORD   ERR5
 4942  020034                      4$:     ESCAPE SEG
 4943  020034  104410                      TRAP    C$ESCAPE
 4944  020036  000002                      .WORD   10001$-.
 4945  020040                              ENDSEG
 4946  020040                      10001$:
 4947  020040  104405                      TRAP    C$ESEG
 4948  020042                              BGNSEG
 4949  020042  104404                      TRAP    C$BSEG
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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 4950  020044  004737  003166                JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
 4951  020050                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4952  020050  004537  003100                JSR     R5,..SROMCLK
 4953  020054  100406                        100406                  ;START AT ROM PC=6
 4954  020056                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 4955  020056  004537  003100                JSR     R5,..SROMCLK
 4956  020062  105525                        104125!<400*3>          ;JUMP TO ROM PC OF 525
 4957  020064  004737  003330                JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
 4958  020070  000007                        7                       ;EXPECTED DATA
 4959  020072  120504                        CMPB    R5,R4           ;IS ROM PC CORRECT?
 4960  020074  001406                        BEQ     6$              ;BR IF YES
 4961  020076                                ERROR   5               ;ERROR, CRAM PC IS WRONG
 4962  020102  104455                        TRAP    C$ERDF
 4963  020104  000005                        .WORD   5
 4964  020106  005055                        .WORD   EMO
 4965  020110  006556                        .WORD   ERR5
 4966  020112                          6$:   ESCAPE SEG
 4967  020112  104410                        TRAP    C$ESCAPE
 4968  020114  000002                        .WORD   10002$-.
 4969  020116                                ENDSEG
 4970  020116                          10002$:
 4971  020116  104405                        TRAP    C$ESEG
 4972  020120                          ENDTST
 4973  020120                          L10066:
 4974  020120  104401                        TRAP    C$ETST
 4975
 4976  020122                                BADHEAD
 4977                                        ;*************** TEST 21 ***************
 4978                                        ;*CRAM TEST OF JUMP(I) ON BRO CLEAR MICRO-PROCESSOR INSTRUCTION.
 4979                                        ;*CLEAR THE BRO BIT, PERFORM THE JUMP INSTRUCTION.
 4980                                        ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
 4981                                        ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
 4982                                        ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
 4983                                        ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
 4984                                        ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
 4985                                        ;*THEN PORT4 WILL CONTAIN A 37
 4986  020122                                BADHEAD
 4987                                        ;*************** TEST 21 ***************
 4988
 4989  020122                          BGNTST
 4990  020122                          T21::
 4991  020122                                MACEX2                  ;DON'T DO IF M8200.
 4992                                        ;DO NOT DO TEST IF M8200
 4993  020132  104432                        TRAP    C$EXIT
 4994  020134  000240                        .WORD   L10067-.
 4995  020136                                MYINT
 4996  020136  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 4997  020142                                MSTCLR                  ;MASTER CLEAR M8200,4,7
 4998  020146  004737  003474                JSR     PC,MEMSET       ;SET MEM AND RAM
 4999  020152                          1$:   BGNSEG
 5000  020152  104404                        TRAP    C$BSEG
 5001  020154  004737  003166                JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
 5002  020160                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
 5003  020160  004537  003100                JSR     R5,..SROMCLK
 5004  020164  100400                        100400                  ;START AT ROM PC=0
 5005  020166                                SROMCLK                 ;NEXT WORD IS INSTRUCION,
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CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

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5006  020166  004537  003100          JSR     R5,.SROMCLK
5007  020172  116377                  114377!<400*4>          ;JUMP TO ROM PC OF 1777
5008  020174  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
5009  020200  000001                  1                       ;EXPECTED DATA
5010  020202  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
5011  020204  001406                  BEQ     2$              ;BR IF YES
5012  020206                          ERROR   5               ;ERROR, CRAM PC IS WRONG
5013  020212  104455                  TRAP    C$ERDF
5014  020214  000005                  .WORD   5
5015  020216  005055                  .WORD   EM0
5016  020220  006556                  .WORD   ERR5
5017  020222                  2$:     ESCAPE SEG
5018  020222  104410                  TRAP    C$ESCAPE
5019  020224  000002                  .WORD   10000$-.
5020  020226                          ENDSEG
5021  020226                  10000$:
5022  020226  104405                  TRAP    C$ESEG
5023  020230                          BGNSEG
5024  020230  104404                  TRAP    C$BSEG
5025  020232                          SKIP06  6$
5026                                  ;GOTO 6$ IF M8206
5027  020242  004737  003166          JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
5028  020246                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5029  020246  004537  003100          JSR     R5,.SROMCLK
5030  020252  100403                  100403                  ;START AT ROM PC=3
5031  020254                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5032  020254  004537  003100          JSR     R5,.SROMCLK
5033  020260  102000                  100000!<400*4>          ;JUMP TO ROM PC OF 0
5034  020262  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
5035  020266  000004                  4                       ;EXPECTED DATA
5036  020270  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
5037  020272  001406                  BEQ     4$              ;BR IF YES
5038  020274                          ERROR   5               ;ERROR, CRAM PC IS WRONG
5039  020300  104455                  TRAP    C$ERDF
5040  020302  000005                  .WORD   5
5041  020304  005055                  .WORD   EM0
5042  020306  006556                  .WORD   ERR5
5043  020310                  4$:     ESCAPE SEG
5044  020310  104410                  TRAP    C$ESCAPE
5045  020312  000002                  .WORD   10001$-.
5046  020314                          ENDSEG
5047  020314                  10001$:
5048  020314  104405                  TRAP    C$ESEG
5049  020316                          BGNSEG
5050  020316  104404                  TRAP    C$BSEG
5051  020320  004737  003166          JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
5052  020324                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5053  020324  004537  003100          JSR     R5,.SROMCLK
5054  020330  100406                  100406                  ;START AT ROM PC=6
5055  020332                          SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5056  020332  004537  003100          JSR     R5,.SROMCLK
5057  020336  106125                  104125!<400*4>          ;JUMP TO ROM PC OF 525
5058  020340  004737  003330          JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
5059  020344  000007                  7                       ;EXPECTED DATA
5060  020346  120504                  CMPB    R5,R4           ;IS ROM PC CORRECT?
5061  020350  001406                  BEQ     6$              ;BR IF YES
```

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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

  5062  020352
  5063  020356  104455                          ERROR   5               ;ERROR, CRAM PC IS WRONG
  5064  020360  000005                          TRAP    C$ERDF
  5065  020362  005055                          .WORD   5
  5066  020364  006556                          .WORD   EM0
  5067  020366                          6$:     .WORD   ERR5
  5068  020366  104410                          ESCAPE SEG
  5069  020370  000002                          TRAP    C$ESCAPE
  5070  020372                                  .WORD   10002$-.
  5071  020372                                  ENDSEG
  5072  020372  104405                  10002$:
  5073  020374                                  TRAP    C$ESEG
  5074  020374                          ENDTST
  5075  020374  104401                  L10067:
  5076                                          TRAP    C$ETST
  5077  020376
  5078                                          BADHEAD
  5079                                          ;*************** TEST 22 ***************
  5080                                          ;*CRAM TEST OF JUMP(I) ON BR1 CLEAR MICRO-PROCESSOR INSTRUCTION.
  5081                                          ;*CLEAR THE BR1 BIT, PERFORM THE JUMP INSTRUCTION.
  5082                                          ;*VERIFY THE JUMP DID OCCUR BY CLOCKING THE INSTRUCTION
  5083                                          ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
  5084                                          ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
  5085                                          ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
  5086                                          ;*THE JUMP WAS SUCCESSFUL, IF THE JUMP WAS UNSUCCESSFUL
  5087  020376                                  ;*THEN PORT4 WILL CONTAIN A 37
  5088                                          BADHEAD
  5089                                          ;*************** TEST 22 ***************
  5090  020376                          BGNTST
  5091  020376                          T22::
  5092  020376                                  MACEX2                  ;DON'T DO IF M8200.
  5093                                          ;DO NOT DO TEST IF M8200
  5094  020406  104432                          TRAP    C$EXIT
  5095  020410  000240                          .WORD   L10070-.
  5096  020412                                  MYINT
  5097  020412  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
  5098  020416                                  MSTCLR                  ;MASTER CLEAR M8200,4,7
  5099  020422  004737  003474                  JSR     PC,MEMSET       ;SET MEM AND RAM
  5100  020426                          1$:     BGNSEG
  5101  020426  104404                          TRAP    C$BSEG
  5102  020430  004737  003166                  JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
  5103  020434                                  SROMCLK                 ;NEXT WORD IS INSTRUCTION,
  5104  020434  004537  003100                  JSR     R5,..SROMCLK
  5105  020440  100400                          100400                  ;START AT ROM PC=0
  5106  020442                                  SROMCLK                 ;NEXT WORD IS INSTRUCION,
  5107  020442  004537  003100                  JSR     R5,..SROMCLK
  5108  020446  116777                          114377:<400*5>          ;JUMP TO ROM PC OF 1777
  5109  020450  004737  003330                  JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
  5110  020454  000001                          1                       ;EXPECTED DATA
  5111  020456  120504                          CMPB    R5,R4           ;IS ROM PC CORRECT?
  5112  020460  001406                          BEQ     2$              ;BR IF YES
  5113  020462                                  ERROR   5               ;ERROR, CRAM PC IS WRONG
  5114  020466  104455                          TRAP    C$ERDF
  5115  020470  000005                          .WORD   5
  5116  020472  005055                          .WORD   EM0
  5117  020474  006556                          .WORD   ERR5
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

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5118  020476
5119  020476  104410
5120  020500  000002
5121  020502
5122  020502
5123  020502  104405
5124  020504
5125  020504  104404
5126  020506
5127
5128  020516  004737  003166
5129  020522
5130  020522  004537  003100
5131  020526  100403
5132  020530
5133  020530  004537  003100
5134  020534  102400
5135  020536  004737  003330
5136  020542  000004
5137  020544  120504
5138  020546  001406
5139  020550
5140  020554  104455
5141  020556  000005
5142  020560  005055
5143  020562  006556
5144  020564
5145  020564  104410
5146  020566  000002
5147  020570
5148  020570
5149  020570  104405
5150  020572
5151  020572  104404
5152  020574  004737  003166
5153  020600
5154  020600  004537  003100
5155  020604  100406
5156  020606
5157  020606  004537  003100
5158  020612  106525
5159  020614  004737  003330
5160  020620  000007
5161  020622  120504
5162  020624  001406
5163  020626
5164  020632  104455
5165  020634  000005
5166  020636  005055
5167  020640  006556
5168  020642
5169  020642  104410
5170  020644  000002
5171  020646
5172  020646
5173  020646  104405
```

```
2$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10000$-.
        ENDSEG
10000$:
        TRAP    C$ESEG
        BGNSEG
        TRAP    C$BSEG
        SKIP06  6$
        ;GOTO 6$ IF M8206
        JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100403                  ;START AT ROM PC=3
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100000!<400*5>          ;JUMP TO ROM PC OF 0
        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
        4                       ;EXPECTED DATA
        CMPB    R5,R4           ;IS ROM PC CORRECT?
        BEQ     4$              ;BR IF YES
        ERROR   5               ;ERROR, CRAM PC IS WRONG
        TRAP    C$ERDF
        .WORD   5
        .WORD   EM0
        .WORD   ERR5
4$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10001$-.
        ENDSEG
10001$:
        TRAP    C$ESEG
        BGNSEG
        TRAP    C$BSEG
        JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        100406                  ;START AT ROM PC=6
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,..SROMCLK
        104125!<400*5>          ;JUMP TO ROM PC OF 525
        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
        7                       ;EXPECTED DATA
        CMPB    R5,R4           ;IS ROM PC CORRECT?
        BEQ     6$              ;BR IF YES
        ERROR   5               ;ERROR, CRAM PC IS WRONG
        TRAP    C$ERDF
        .WORD   5
        .WORD   EM0
        .WORD   ERR5
6$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10002$-.
        ENDSEG
10002$:
        TRAP    C$ESEG
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

```
5174  020650                        ENDTST
5175  020650                        L10070:
5176  020650  104401                        TRAP    C$ETST
5177
5178  020652                                BADHEAD
5179                                        ;*************** TEST 23 ***************
5180                                        ;*CRAM TEST OF JUMP(I) ON BR4 CLEAR MICRO-PROCESSOR INSTRUCTION.
5181                                        ;*CLEAR THE BR4 BIT, PERFORM THE JUMP INSTRUCTION.
5182                                        ;*VERIFY THE JUMP DID NOT OCCUR BY CLOCKING THE INSTRUCTION
5183                                        ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
5184                                        ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
5185                                        ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
5186  020652  020652                .
5187                                        ;*THE CRAM PC IS CORRECT, IF THE CRAM PC IS NOT RIGHT.
5188                                        ;*THEN PORT4 CONTAINS A 37
5189  020654                                BADHEAD
5190                                        ;*************** TEST 23 ***************
5191
```

```
 5192  020654                          BGNTST
 5193  020654                          T23::
 5194  020654                                  MACEX2                          ;DON'T DO IF M8200.
 5195                                          ;DO NOT DO TEST IF M8200
 5196  020664  104432                          TRAP    C$EXIT
 5197  020666  000240                          .WORD   L10071-.
 5198  020670                                  MYINT
 5199  020670  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 5200  020674                                  MSTCLR                          ;MASTER CLEAR M8200,4,7
 5201  020700  004737  003474                  JSR     PC,MEMSET               ;SET MEM AND RAM
 5202  020704                          1$:     BGNSEG
 5203  020704  104404                          TRAP    C$BSEG
 5204  020706  004737  003166                  JSR     PC,CLRALL               ;CLEAR ALL CONDITIONS
 5205  020712                                  SROMCLK                         ;NEXT WORD IS INSTRUCTION.
 5206  020712  004537  003100                  JSR     R5,..SROMCLK
 5207  020716  100400                          100400                          ;START AT ROM PC=0
 5208  020720                                  SROMCLK                         ;NEXT WORD IS INSTRUCTION.
 5209  020720  004537  003100                  JSR     R5,..SROMCLK
 5210  020724  117377                          114377!<400*6>                  ;JUMP TO ROM PC OF 1777
 5211  020726  004737  003330                  JSR     PC,RAMDAT               ;R4=CRAM PC (LSB 8 BITS)
```

```
5212  020732  000001                        1                       ;EXPECTED DATA
5213  020734  120504                        CMPB    R5,R4           ;IS ROM PC CORRECT?
5214  020736  001406                        BEQ     2$              ;BR IF YES
5215  020740                                ERROR   5               ;ERROR, CRAM PC IS WRONG
5216  020744  104455                        TRAP    C$ERDF
5217  020746  000005                        .WORD   5
5218  020750  005055                        .WORD   EM0
5219  020752  006556                        .WORD   ERR5
5220  020754                        2$:     ESCAPE SEG
5221  020754  104410                        TRAP    C$ESCAPE
5222  020756  000002                        .WORD   10000$-.
5223  020760                                ENDSEG
5224  020760                        10000$:
5225  020760  104405                        TRAP    C$ESEG
5226  020762                                BGNSEG
5227  020762  104404                        TRAP    C$BSEG
5228  020764                                SKIP06  6$
5229                                        ;GOTO 6$ IF M8206
5230  020774  004737  003166                JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
5231  021000                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5232  021000  004537  003100                JSR     R5,..SROMCLK
5233  021004  100403                        100403                  ;START AT ROM PC=3
5234  021006                                SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5235  021006  004537  003100                JSR     R5,..SROMCLK
5236  021012  103000                        100000!<400*6>  ;JUMP TO ROM PC OF 0
5237  021014  004737  003330                JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
5238  021020  000004                        4                       ;EXPECTED DATA
```

```
 5239  021022  120504                CMPB    R5,R4           ;IS ROM PC CORRECT?
 5240  021024  001406                BEQ     4$              ;BSR IF YES
```

```
 5241  021026                          ERROR   5               ;ERROR, CRAM PC IS WRONG
 5242  021032  104455                  TRAP    C$ERDF
 5243  021034  000005                  .WORD   5
 5244  021036  005055                  .WORD   EM0
 5245  021040  006556                  .WORD   ERR5
```

```
5246  021042
5247  021042  104410
5248  021044  000002
5249  021046
5250  021046
5251  021046  104405
5252  021050
5253  021050  104404
5254  021052  004737  003166
5255  021056
5256  021056  004537  003100
5257  021062  100406
5258  021064
5259  021064  004537  003100
5260  021070  107125
5261  021072  004737  003330
5262  021076  000007
5263  021100  120504
5264  021102  001406
5265  021104
5266  021110  104455
5267  021112  000005
5268  021114  005055
5269  021116  006556
5270  021120
5271  021120  104410
5272  021122  000002
5273  021124
5274  021124
5275  021124  104405
5276  021126
5277  021126
5278  021126  104401
5279
5280  021130
5281
5282
5283
5284
5285
5286
5287
5288
5289
5290  021130
5291
5292
5293  021130
5294  021130
5295  021130
5296
5297  021140  104432
5298  021142  000240
5299  021144
5300  021144  013701  002516
5301  021150
```

```
4$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10001$-.
        ENDSEG
10001$:
        TRAP    C$ESEG
        BGNSEG
        TRAP    C$BSEG
        JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,.SROMCLK
        100406                  ;START AT ROM PC=6
        SROMCLK                 ;NEXT WORD IS INSTRUCTION,
        JSR     R5,.SROMCLK
        104125!<400*6>  ;JUMP TO ROM PC OF 525
        JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
        7                       ;EXPECTED DATA
        CMPB    R5,R4           ;IS ROM PC CORRECT?
        BEQ     6$              ;BR IF YES
        ERROR   5               ;ERROR, CRAM PC IS WRONG
        TRAP    C$ERDF
        .WORD   5
        .WORD   EM0
        .WORD   ERR5
6$:     ESCAPE SEG
        TRAP    C$ESCAPE
        .WORD   10002$-.
        ENDSEG
10002$:
        TRAP    C$ESEG
ENDTST
L10071:
        TRAP    C$ETST

        BADHEAD
        ;*************** TEST 24 ***************
        ;*CRAM TEST OF JUMP(I) ON BR7 CLEAR MICRO-PROCESSOR INSTRUCTION.
        ;*CLEAR THE BR7 BIT, PERFORM THE JUMP INSTRUCTION.
        ;*VERIFY THE JUMP DID NOT OCCUR BY CLOCKING THE INSTRUCTION
        ;*IN THE LOCATION IT IS AT. THIS INSTRUCTION LOADS THE
        ;*BR WITH THE LOWEST 8 BITS OF THE CRAM PC. AT THIS POINT
        ;*THE BR DATA IS MOVED TO PORT4. IF THIS DATA IS CORRECT
        ;*THE CRAM PC IS CORRECT, IF THE CRAM PC IS NOT RIGHT.
        ;*THEN PORT4 CONTAINS A 37
        BADHEAD
        ;*************** TEST 24 ***************

BGNTST
T24::
        MACEX2                  ;DON'T DO IF M8200.
        ;DO NOT DO TEST IF M8200
        TRAP    C$EXIT
        .WORD   L10072-.
        MYINT
        MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
        MSTCLR                  ;MASTER CLEAR M8200,4,7
```

```
CZDMQD.P11    12-JAN-82 09:50        HARDWARE TESTS

  5302  021154  004737  003474              JSR     PC,MEMSET       ;SET MEM AND RAM
  5303  021160                      1$:     BGNSEG
  5304  021160  104404                      TRAP    C$BSEG
  5305  021162  004737  003166              JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
  5306  021166                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
  5307  021166  004537  003100              JSR     R5,..SROMCLK
  5308  021172  100400                      100400          ;START AT ROM PC=0
  5309  021174                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
  5310  021174  004537  003100              JSR     R5,..SROMCLK
  5311  021200  117777                      114377!<400*7>          ;JUMP TO ROM PC OF 1777
  5312  021202  004737  003330              JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
  5313  021206  000001                      1                       ;EXPECTED DATA
  5314  021210  120504                      CMPB    R5,R4           ;IS ROM PC CORRECT?
  5315  021212  001406                      BEQ     2$              ;BR IF YES
  5316  021214                              ERROR   5               ;ERROR, CRAM PC IS WRONG
  5317  021220  104455                      TRAP    C$ERDF
  5318  021222  000005                      .WORD   5
  5319  021224  005055                      .WORD   EM0
  5320  021226  006556                      .WORD   ERR5
  5321  021230                      2$:     ESCAPE SEG
  5322  021230  104410                      TRAP    C$ESCAPE
  5323  021232  000002                      .WORD   10000$-.
  5324  021234                              ENDSEG
  5325  021234                      10000$:
  5326  021234  104405                      TRAP    C$ESEG
  5327  021236                              BGNSEG
  5328  021236  104404                      TRAP    C$BSEG
  5329  021240                              SKIP06  6$
  5330                                      ;GOTO 6$ IF M8206
  5331  021250  004737  003166              JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
  5332  021254                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
  5333  021254  004537  003100              JSR     R5,..SROMCLK
  5334  021260  100403                      100403                  ;START AT ROM PC=3
  5335  021262                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
  5336  021262  004537  003100              JSR     R5,..SROMCLK
  5337  021266  103400                      100000!<400*7>  ;JUMP TO ROM PC OF 0
  5338  021270  004737  003330              JSR     PC,RAMDAT       ;;R4=CRAM PC (LCB 8 BITS)
  5339  021274  000004                      4                       ;EXPECTED DATA
  5340  021276  120504                      CMPB    R5,R4           ;IS ROM PC CORRECT?
  5341  021300  001406                      BEQ     4$              ;BR IF YES
  5342  021302                              ERROR   5               ;ERROR, CRAM PC IS WRONG
  5343  021306  104455                      TRAP    C$ERDF
  5344  021310  000005                      .WORD   5
  5345  021312  005055                      .WORD   EM0
  5346  021314  006556                      .WORD   ERR5
  5347  021316                      4$:     ESCAPE SEG
  5348  021316  104410                      TRAP    C$ESCAPE
  5349  021320  000002                      .WORD   10001$-.
  5350  021322                              ENDSEG
  5351  021322                      10001$:
  5352  021322  104405                      TRAP    C$ESEG
  5353  021324                              BGNSEG
  5354  021324  104404                      TRAP    C$BSEG
  5355  021326  004737  003166              JSR     PC,CLRALL       ;CLEAR ALL CONDITIONS
  5356  021332                              SROMCLK                 ;NEXT WORD IS INSTRUCTION,
  5357  021332  004537  003100              JSR     R5,..SROMCLK
```

```
5358  021336  100406                          100406                  ;START AT ROM PC=6
5359  021340                                  SROMCLK                 ;NEXT WORD IS INSTRUCTION,
5360  021340  004537  003100                  JSR     R5,.SROMCLK
5361  021344  107525                          104125!<400*7>          ;JUMP TO ROM PC OF 525
5362  021346  004737  003330                  JSR     PC,RAMDAT       ;R4=CRAM PC (LSB 8 BITS)
5363  021352  000007                          7                       ;EXPECTED DATA
5364  021354  120504                          CMPB    R5,R4           ;IS ROM PC CORRECT?
5365  021356  001406                          BEQ     6$              ;BR IF YES
5366  021360                                  ERROR   5               ;ERROR, CRAM PC IS WRONG
5367  021364  104455                          TRAP    C$ERDF
5368  021366  000005                          .WORD   5
5369  021370  005055                          .WORD   EM0
5370  021372  006556                          .WORD   ERR5
5371  021374                          6$:     ESCAPE SEG
5372  021374  104410                          TRAP    C$ESCAPE
5373  021376  000002                          .WORD   10002$-.
5374  021400                                  ENDSEG
5375  021400                          10002$:
5376  021400  104405                          TRAP    C$ESEG
5377  021402                          ENDTST
5378  021402                          L10072:
5379  021402  104401                          TRAP    C$ETST
5380
5381  021404                                  BADHEAD
5382                                          ;*************** TEST 25 ***************
5383                                          ;*
5384                                          ;*MAIN MEMORY PAGE DUAL ADDRESS TEST.
5385                                          ;*IN THIS TEST WE WILL VERIFY THAT PAGES DO
5386                                          ;*NOT DUAL ADDRESS.  THIS TEST IS DIFFERENT FROM THE
5387                                          ;*PREVIOUS DUAL ADDRESS TESTS IN THAT THE OTHER
5388                                          ;*TEST REALLY DIDN'T CHECK PAGE DUAL ADDRESSING
5389  021404                                  BADHEAD
5390                                          ;*************** TEST 25 ***************
5391
5392  021404                          BGNTST
5393  021404                          T25::
5394  021404                                  K4ONLY                  ;FOR 4K CPUS ONLY.
5395                                          ;DO NOT DO TEST IF M8200, OR M8204
5396  021414  104432                          TRAP    C$EXIT
5397  021416  000156                          .WORD   L10073-.
5398  021420                                  MYINT
5399  021420  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
5400  021424                                  MSTCLR
5401  021430  005002                          CLR R2                  ;R2 WILL BE PAGE #
5402  021432  042737  000037  021456  1$:     BIC #37,2$              ;CLEAR UNUSED BITS
5403  021440  050237  021456                  BIS R2,2$               ;ADD CURRENT PAGE MARKER.
5404  021444                                  ROMCLK                  ;SET ADDR D
5405  021444  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
5406  021450  010000                          10000
5407  021452                                  ROMCLK                  ;OF PAGE X
5408  021452  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
5409  021456  004000                  2$:     4000                    ;THIS LOCATION MODIFIED BY LOST
5410                                                                  ;FEW INSTRUCTIONS
5411  021460  010261  000004                  MOV R2,4(R1)            ;PUT PAGE # INTO PART 4
5412  021464                                  ROMCLK                  ;CLOCK PART 4 INTO MEMORY
5413  021464  004537  003044                  JSR     R5,.ROMCLK      ;CLOCK INSTRUCTION
```

```
5414  021470  122500                          122500                  ;WHOSE PAGE # IS IN R2
5415  021472  005202                          INC R2                  ;UPDATE PAGE #
5416  021474  032702  000020                  BIT #20,R2              ;DONE ALL PAGES?
5417  021500  001754                          BEQ 1$                  ;NO-DO NEXT ONE
5418
5419                                                                  ;OK, ALL LOADS OF ALL PAGES
5420                                                                  ;CONTAIN THIER PAGE NUMBER, NOW
5421                                                                  ;WE'LL GO BACK THROUGH
5422                                                                  ;THEM CHECKING THEM OUT.
5423
5424  021502  005002                          CLR R2                  ;R2 STILL HAS PAGE NUMBER
5425
5426  021504  042737  000037  021522  3$:     BIC #37,4$
5427  021512  050237  021522                  BIS R2,4$
5428  021516                                  ROMCLK                  ;LOAD PAGE NUMBER
5429  021516  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5430  021522  004000                  4$:     4000
5431  021524                                  ROMCLK                  ;MOVE MEM TO PART 4
5432  021524  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5433  021530  041224                          041224
5434  021532  116104  000004                  MOVB 4(R1),R4           ;'FOUND'
5435  021536  110205                          MOVB R2,R5              ;'EXPECTED'
5436  021540  120504                          CMPB R5,R4              ;ADDRESS PROBLEM?
5437  021542  001406                          BEQ 5$
5438
5439  021544                                  ERROR 13                ;PAGE ADDRESSING ERROR IN MAIN
5440  021550  104455                          TRAP    C$ERDF
5441  021552  000015                          .WORD   13
5442  021554  005055                          .WORD   EM0
5443  021556  007542                          .WORD   ERR13
5444                                                                  ;MEMORY.
5445                                                                  ;MAR BITS 8 THROUGH 12 ARE REPRESENTED
5446                                                                  ;BY R2 ('EXP'ED')BITS 0-4)
5447
5448  021560                          5$:     ESCAPE TST
5449  021560  104410                          TRAP    C$ESCAPE
5450  021562  000012                          .WORD   L10073-.
5451  021564  005202                          INC R2                  ;UPDATE PAGE ADDRESS
5452  021566  032702  000020                  BIT #20,R2              ;ALL DONE?
5453  021572  001744                          BEQ 3$                  ;NO-CHECK NEXT PAGE.
5454                                                                  ;YES-EXIT.
5455  021574                          ENDTST
5456  021574                          L10073:
5457  021574  104401                          TRAP    C$ETST
5458
5459
5460  021576                                  BADHEAD
5461                                          ;*************** TEST 26 ***************
5462                                          ;*
5463                                          ;*JUMP FIELD,PAGE TEST
5464                                          ;*
5465                                          ;*IN THIS TEST WILL MAKE SURE A JUMP FIELD INSTRUCTION
5466                                          ;*WORKS.  TO DO THIS, WE'LL PUT THE DESIRED PAGE,FIELD
5467                                          ;*INORMATION IN IBUS*<13> THEN ISSUE A JUMP FIELD
5468                                          ;*THEN WE'LL READ PC REG. AND VERIFY.
5469  021576                                  BADHEAD
```

```
                                        ;*************** TEST 26 ***************
                                BGNTST
                                T26::
                                        K4ONLY                  ;FOR 4K CPUS ONLY
                                        ;DO NOT DO TEST IF M8200, OR M8204
021606  104432                        TRAP    C$EXIT
021610  000132                        .WORD   L10074-.
021612                                  MYINT
021612  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
021616                                  MSTCLR
                                        CLR R2                  ;R2 TO CONTAIN FIELD #
021624  042737  000017  021642  1$:    BIC #17,2$              ;CLEAR ANY JUNK
021632  050237  021642                BIS R2,2$               ;SET FIELD # INTO INSTR.
021636                                  ROMCLK                  ;CLOCK FIELD BITS INTO BREG.
021636  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
021642  000400                  2$:   000400                  ;CONTAINS FIELD,PAGE BITS
021644                                  ROMCLK                  ;XFERR BREG INTO IBUS*<13>
021644  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
021650  061233                        061233
021652                                  SROMCLK                 ;GET INSTRUCTION CLOCKED.
021652  004537  003100                JSR     R5,..SROMCLK
021656  100000                        100000                  ;BAS FORM FOR JUM FIELD INSTR.

021660  142761  000002  000001        BICB #BIT1,1(R1)                ;CLEAR ROMI
021666                                  ROMCLK                  ;CLOCK NEXT INSTR.
021666  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
021672  121264                        121264                  ;MOVE IBUS*TO PORT 4
021674  116104  000004                MOVB 4(R1),R4           ;GET IT.
021700  042704  177760                BIC     #^C<17>,R4
021704  120402                        CMPB R4,R2              ;FIELD OK?
021706  001407                        BEQ 3$                  ;IF OK GO AHEAD
021710  010205                        MOV     R2,R5
021712                                  ERROR 14                ;CHANGE FIELD INSTRUCTION   ;*** BO
021716  104455                        TRAP    C$ERDF
021720  000016                        .WORD   14
021722  005055                        .WORD   EMO
021724  007664                        .WORD   ERR14
                                                                ;FAILED.  FOR FIELD,PAGE INDICATES
                                                                ;BY 'EXPECTED'' BITS 0,1,2,3 OF
                                                                ;EXPECTED REPRESENT FIELD BITS.
021726                          3$:     ESCAPE TST
021726  104410                        TRAP    C$ESCAPE
021730  000012                        .WORD   L10074-.

021732  005202                        INC R2                  ;UPDATE TO NEXT FIELD
021734  032702  000020                BIT #20,R2              ;DONE ALL FIELDS?
021740  001731                        BEQ     1$

021742                          ENDTST
021742                          L10074:
```

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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 5526  021742  104401                          TRAP    C$ETST
 5527
 5528  021744                                  BADHEAD
 5529                                          ;************** TEST 27 ***************
 5530                                          ;*
 5531                                          ;*JUMP TEST, JUMP ALWAYS, JUMP CHANGE FIELD
 5532                                          ;*
 5533                                          ;*IN THIS TEST, WE WILL CHECK THE ABILITY OF THE
 5534                                          ;*MICRO PROCESSOR TO JUMP (BRANCH & ALWAYS INSTRUCTION)
 5535                                          ;*TO LOCATIONS, FIELDS FROM OTHER LOCATIONS FIELDS.
 5536                                          ;*WE ALREADY KNOW THAT THE BRANCH INSTR WORKS FROM
 5537                                          ;*OTHER TEST.                PROCEDURE:
 5538                                          ;*      1. START ADDR 0, FIELD 0
 5539                                          ;*      2. **CALCULATE NEW ADDRS, FIELD  VIA INC,
 5540                                          ;*      3. CAUSE JUMP (BRANCH) TO NEW ADDRESS
 5541                                          ;*      4. READ PC FROM IBUS*12 AND IBUS*13
 5542                                          ;*      5. REPEAT STEP 2-4 256.TIMES
 5543                                          ;*
 5544                                          ;*      TO CALCULATE NEW ADDRESS:
 5545                                          ;*      1. INC LOW BYTE OF ADDRESS FOR PC ADDRES 0-7
 5546                                          ;*      2. INC LOW BYTE OF NADDRESS FOR PC ADDRESS 8-11
 5547                                          ;*         BITS REPRESENTED AS BITS 0-3. WHEN  0-3 OVERFLOWS,
 5548                                          ;*         RESTARTS AT ZERO.
 5549                                          ;*         NET RESULT IS JUMPS FROM:
 5550                                          ;*              FIELD,PAGE              LOC
 5551                                          ;*                   0                  0
 5552                                          ;*                   1                  1
 5553                                          ;*                   2                  2
 5554                                          ;*                   3                  3
 5555                                          ;*                   10                 7
 5556                                          ;*                   11                 11
 5557                                          ;*                   :TO                :
 5558                                          ;*                   17                 377
 5559                                          ;*
 5560  021744                                  BADHEAD
 5561                                          ;************** TEST 27 ***************
 5562
 5563  021744                                  BGNTST
 5564  021744                          T27::
 5565  021744                                  MYINT
 5566  021744  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 5567  021750                                  K4ONLY                          ;4K CPUS ONLY.
 5568                                          ;DO NOT DO TEST IF M8200, OR M8204
 5569  021760  104432                          TRAP    C$EXIT
 5570  021762  000336                          .WORD   L10075-.
 5571  021764                                  MSTCLR
 5572
 5573  021770  012737  000000  002406          MOV     #0, FLAG        ;FLAG TO REPRESENT
 5574                                                                  ;FIELD,PAGE
 5575                                                                  ;TO VARIE STARTING PAGE,FIELD,
 5576                                                                  ;CHANGE #0 PORTION OF INSTR.
 5577  021776  012702  000000                  MOV     #0, R2          ;R2 TO CONTAIN JUMPED
 5578                                                                  ;TO CHANGE STARTING IMM ADDR.,
 5579                                                                  ;VARIE #0 PORTIONS OF INSTR.
 5580  022002  012737  000000  002412          MOV     #0, FADR        ;ADDRESS
 5581                                          ;LOOP HERE
```

```
5582  022010
5583  022010  042737  000017  022050          1$:     BIC #17,2$              ;CLEAR JUNK FROM FIELD
                                                      ;PORTION OF CHANGE FIELD INSTR
5584
5585  022016  013700  002406                          MOV FLAG,R0             ;INORDER TO INC, DEC FIELD,PAGE
5586  022022  042700  177760                          BIC #^C<17>,R0
5587  022026  050037  022050                          BIS R0,2$               ;NOW POSITION IN INSTR.
5588  022032  042737  077777  022064                  BIC #077777,3$                  ;NOW FOR IMMED. BR INSTR.
5589  022040  050237  022064                          BIS R2,3$               ;NOW ADD IMMEDIATE ADDR
5590
5591
5592
5593  022044                                          ROMCLK
5594  022044  004537  003044                          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5595  022050  000400                          2$:     000400                  ;MOVE PAGE,FIELD # TO BREG.
5596  022052                                          ROMCLK
5597  022052  004537  003044                          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5598  022056  061233                                  61233                   ;MOV    BREG TO PC HIGH REG.
5599  022060                                          SROMCLK
5600  022060  004537  003100                          JSR     R5,..SROMCLK
5601  022064  100000                          3$:     100000                  ;NOW CLOCK IT IN BY JMP FIELD INSTR.
5602
5603  022066                                          ROMCLK                  ;READ PC REG HI
5604  022066  004537  003044                          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5605  022072  121265                                  121265
5606  022074                                          ROMCLK                  ;READ PC REG LOW
5607  022074  004537  003044                          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5608  022100  121244                                  121244
5609
5610  022102  016104  000004                          MOV 4(R1),R4            ;READ PC REG (NOW IN SEL 4)
5611  022106  042704  170000                          BIC     #170000,R4      ;STRIP FOR ONLY PAGE,FIELD BITS.
5612
5613  022112  013705  022050                          MOV 2$,R5               ;NOW FROM ADDR WE WANTED TO
5614  022116  000305                                  SWAB R5                 ;JUMP TO
5615  022120  042705  170377                          BIC #170377,R5          ;CLEAR JUNK
5616  022124  050205                                  BIS R2,R5               ;ADD IMMED ADDR
5617  022126                                          SKIP06  5$
5618                                                  ;GOTO 5$ IF M8206
5619  022136  105205                                  INCB    R5              ;UPDATE ADDR. EXPECTED SENCE THE READ
5620  022140                                  5$:
5621                                                                          ;OF THE IBUS <13> INC THE PC.
5622
5623  022140  020504                                  CMP R5,R4               ;JUMP GO OK?
5624  022142  001406                                  BEQ 4$                  ;YEA, CONTINUES
5625  022144                                          ERROR 15                ;FAILED TO JUMP PROPERLY.
5626  022150  104455                                  TRAP    C$ERDF
5627  022152  000017                                  .WORD   15
5628  022154  005055                                  .WORD   EMO
5629  022156  010006                                  .WORD   ERR15
5630                                                                          ;'FROM ADDR" REPRESENTS
5631                                                                          ;THE ADDRESS WE STARTED AT
5632                                                                          ;'TO ADDR" REPRESENTS WHERE
5633                                                                          ;WE EXPECTED TO JUMP TO,
5634                                                                          ;'BAD ADDR" REPRESENTS WHERE
5635                                                                          ;WE WENT TO.
5636
5637                                          .REM %
```

```
                                        15      12      11      10      9 8 7           0
                                        ----------------------------------------------
                                        !UNUSED !  FIELD        ! PAGE    !IMMED. ADDR  !
                                        !       !   BITS        ! BITS    !             !
                                        ----------------------------------------------

                                ;THIS IS A PICTURE OF THE P.C. REG.
                                 BITS 0-7 ARE IN IBUS*<12>
                                 BITS 8-11 ARE IN IBUS*<13>
                                 THEY GOT CLOCK IN THERE VIA JUMPS TAKEN
                                 THE FIELD BITS
                                 ARE IN BIT POSITION 0,1 OF THE INSTRUCTION AT 2$.

                                 3$ WAS THE JUMP ALWAYS INSTRUCTION. THE IMMED. ADDR.
                                 WAS IN 0-7 OF THE JUMP INSTR.  THE PAGE BITS,
                                 PC REG BITS 8,9, WERE IN BITS 11,12 OF THE INSTR.
                                 JUMP INSTRUCTIONS HAVE BEEN CHECKED OUT
                                 BEFORE, SO THE IMPORTANT THING TO REMEMBER TO
                                 WATCH IS THE "FROM ADDR","TO ADDR"

                                %

5660  022160                    4$:     ESCAPE TST
5661  022160  104410                    TRAP    C$ESCAPE
5662  022162  000136                    .WORD   L10075-.
5663  022164  010437  002412          MOV R4,FADR
5664  022170  005237  002406          INC FLAG                ;UPDATE PAGE,FIELD
5665  022174  105202                  INCB R2                 ;UPDATE JMMED. ADDR
5666  022176  001304                  BNE 1$                  ;LOOP IF NOT DONE.
5667
5668                                  ;*
5669                                  ;*CHECK HERE TO SEE IF MASTER CLEAR CLEARS P.C. REG
5670                                  ;*
5671
5672  022200                          SKIP06  40$
5673                                  ;GOTO 40$ IF M8206
5674  022210  005737  002470          TST     RUNB
5675  022214  001041                  BNE     40$
5676  022216  005737  002472          TST     RUNINH
5677  022222  001036                  BNE     40$
5678  022224  052711  040000          BIS     #40000,(R1)     ;SET MASTER CLEAR
5679  022230  105761  000001          TSTB    1(R1)
5680  022234  042711  040000          BIC     #40000,(R1)
5681
5682                                  ;TO RUN THIS SECTION OF CODE YOU MUST TURN SW7 OF SWITCH PACK #E28
5683                                  ;OFF SO THAT M8207 NOT SELFSTARTING.
5684
5685  022240                          ROMCLK                  ;WE MUST FIRST CLOCK
5686  022240  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5687  022244  121265                  121265                  ;THE PC LATCH REGS
5688  022246                          ROMCLK                  ;BEFORE WE CAN READ THEM
5689  022246  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5690  022252  121244                  121244
5691  022254                          ROMCLK                  ;REG PC REG HI, PUT IN PORT5
5692  022254  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5693  022260  121265                  121265
```

```
5694
5695  022262
5696  022262  004537  003044          ROMCLK                  ;REG PC REG LOW, PUT IN PORT4
5697  022266  121244                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5698  022270  005005                  121244
5699  022272  016104  000004          CLR     R5              ;EXPECT ZERO
5700  022276  042704  170003          MOV     4(R1),R4        ;READ PC REG FROM PORT 4&5
5701  022302  001406                  BIC     #170003,R4
5702                                  BEQ     40$             ;IF CLEARED, EXIT
5703                                                          ;NOTE WE ALSO CLEARED BIT 1 OF THE
5704                                                          ;PC REG, BECAUSE AFTER THE MASTER
5705                                                          ;CLEAR, WE DID TWO INSTRUCTIONS TO
5706                                                          ;READ IT, THUS CAUSING THE PC REG
5707                                                          ;TO GET BUMPED.
5708  022304                          ERROR   45              ;MASTER CLEAR FAILED TO CLEAR
5709  022310  104455                  TRAP    C$ERDF
5710  022312  000055                  .WORD   45
5711  022314  005055                  .WORD   EM0
5712  022316  011124                  .WORD   ERR45
5713                                                          ;PC REG
5714  022320                  40$:
5715  022320                  ENDTST
5716  022320                  L10075:
5717  022320  104401                  TRAP    C$ETST
5718  022322                          BADHEAD
5719                                  ;*************** TEST 28 ***************
5720                                  ;*
5721                                  ;*JUMP TEST, JUMP ALWAYS, JUMP CHANGE FIELD
5722                                  ;*
5723                                  ;*IN THIS TEST, WE WILL CHECK THE ABILITY OF THE
5724                                  ;*MICRO PROCESSOR TO JUMP (BRANCH & ALWAYS INSTRUCTION)
5725                                  ;*TO LOCATIONS, FIELDS FROM OTHER LOCATIONS FIELDS.
5726                                  ;*WE ALREADY KNOW THAT THE BRANCH INSTR WORKS FROM
5727                                  ;*OTHER TEST.                   PROCEDURE:
5728                                  ;*      1. START ADDR 0, FIELD 0
5729                                  ;*      2. **CALCULATE NEW ADDRS, FIELD  VIA DEC,
5730                                  ;*      3. CAUSE JUMP (BRANCH) TO NEW ADDRESS
5731                                  ;*      4. READ PC FROM IBUS*12 AND IBUS*13
5732                                  ;*      5. REPEAT STEP 2-4 256.TIMES
5733                                  ;*
5734                                  ;*      TO CALCULATE NEW ADDRESS:
5735                                  ;*      1. DEC LOW BYTE OF ADDRESS FOR PC ADDRES 0-7
5736                                  ;*      2. DEC LOW BYTE OF NADDRESS FOR PC ADDRESS 8-11
5737                                  ;*         BITS REPRESENTED AS BITS 0-3. WHEN  0-3 OVERFLOWS,
5738                                  ;*         RESTARTS AT ZERO.
5739                                  ;*         NET RESULT IS JUMPS FROM:
5740                                  ;*              FIELD,PAGE              LOC
5741                                  ;*                   0                  0
5742                                  ;*                   17                 377
```

```
                                        ;*                      16              376
                                        ;*                      15              375
                                        ;*                      :TO             :
                                        ;*                      00              000
                                        ;*
                                        BADHEAD
                                        ;*************** TEST 28 ****************

                                        BGNTST
                                T28::
                                        MYINT
                                        MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
                                        K4ONLY                          ;4K CPUS ONLY.
                                        ;DO NOT DO TEST IF M8200, OR M8204
                                        TRAP    C$EXIT
                                        .WORD   L10076-.
                                        MSTCLR

                                        MOV     #0, FLAG                ;FLAG TO REPRESENT
                                                                        ;FIELD,PAGE
                                                                        ;TO VARIE STARTING PAGE,FIELD,
                                                                        ;CHANGE #0 PORTION OF INSTR.
                                        MOV     #0, R2                  ;R2 TO CONTAIN JUMPED
                                                                        ;TO CHANGE STARTING IMM ADDR.,
                                                                        ;VARIE #0 PORTIONS OF INSTR.
                                        MOV     #0, FADR                ;ADDRESS
                                        ;LOOP HERE
                                1$:
                                        BIC #17,2$                      ;CLEAR JUNK FROM FIELD
                                                                        ;PORTION OF CHANGE FIELD INSTR
                                        MOV FLAG,R0                     ;INORDER TO INC, DEC FIELD,PAGE
                                        BIC #^C<17>,R0
                                        BIS R0,2$                       ;NOW POSITION IN INSTR.
                                        BIC #077777,3$                          ;NOW FOR IMMED. BR INSTR.
                                        BIS R2,3$                       ;NOW ADD IMMEDIATE ADDR


                                        ROMCLK
                                        JSR     R5,..ROMCLK             ;CLOCK INSTRUCTION
                                2$:     000400                          ;MOVE PAGE,FIELD # TO BREG.
                                        ROMCLK
                                        JSR     R5,..ROMCLK             ;CLOCK INSTRUCTION
                                        61233                           ;MOV    BREG TO PC HIGH REG.
                                        SROMCLK
                                        JSR     R5,..SROMCLK
                                3$:     100000                          ;NOW CLOCK IT IN BY JMP FIELD INSTR.

                                        ROMCLK                          ;READ PC REG HI
                                        JSR     R5,..ROMCLK             ;CLOCK INSTRUCTION
                                        121265
                                        ROMCLK                          ;READ PC REG LOW
                                        JSR     R5,..ROMCLK             ;CLOCK INSTRUCTION
                                        121244

                                        MOV 4(R1),R4                    ;READ PC REG (NOW IN SEL 4)
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

```
5799  022464  042704  170000          BIC     #170000,R4      ;STRIP FOR ONLY PAGE,FIELD BITS.
5800
5801  022470  013705  022426          MOV 2$,R5               ;NOW FROM ADDR WE WANTED TO
5802  022474  000305                  SWAB R5                 ;JUMP TO
5803  022476  042705  170377          BIC #170377,R5          ;CLEAR JUNK
5804  022502  050205                  BIS R2,R5               ;ADD IMMED ADDR
5805  022504                          SKIP06  5$
                                      ;GOTO 5$ IF M8206
5806
5807  022514  105205                  INCB    R5              ;UPDATE ADDR. EXPECTED SENCE THE READ
5808  022516                  5$:
5809                                                          ;OF THE IBUS <13> INC THE PC.
5810
5811  022516  020504                  CMP R5,R4               ;JUMP GO OK?
5812  022520  001406                  BEQ 4$                  ;YEA, CONTINUES
5813  022522                          ERROR 15                ;FAILED TO JUMP PROPERLY.
5814  022526  104455                  TRAP    C$ERDF
5815  022530  000017                  .WORD   15
5816  022532  005055                  .WORD   EM0
5817  022534  010006                  .WORD   ERR15
5818                                                          ;"FROM ADDR" REPRESENTS
5819                                                          ;THE ADDRESS WE STARTED AT
5820                                                          ;"TO ADDR" REPRESENTS WHERE
5821                                                          ;WE EXPECTED TO JUMP TO,
5822                                                          ;"BAD ADDR" REPRESENTS WHERE
5823                                                          ;WE WENT TO.
5824
5825                          .REM %
5826                                          15      12      11      10      9 8 7           0
5827                                          ----------------------------------------------
5828                                          !UNUSED ! FIELD         ! PAGE    !IMMED. ADDR  !
5829                                          !       !  BITS         ! BITS    !             !
5830                                          ----------------------------------------------
5831
5832                                      ;THIS IS A PICTURE OF THE P.C. REG.
5833                                       BITS 0-7 ARE IN IBUS*<12>
5834                                       BITS 8-11 ARE IN IBUS*<13>
5835                                       THEY GOT CLOCK IN THERE VIA JUMPS TAKEN
5836                                       THE FIELD BITS
5837                                       ARE IN BIT POSITION 0,1 OF THE INSTRUCTION AT 2$.
5838
5839                                       3$ WAS THE JUMP ALWAYS INSTRUCTION. THE IMMED. ADDR.
5840                                       WAS IN 0-7 OF THE JUMP INSTR.  THE PAGE BITS,
5841                                       PC REG BITS 8,9, WERE IN BITS 11,12 OF THE INSTR.
5842                                       JUMP INSTRUCTIONS HAVE BEEN CHECKED OUT
5843                                       BEFORE, SO THE IMPORTANT THING TO REMEMBER TO
5844                                       WATCH IS THE "FROM ADDR","TO ADDR"
5845
5846                                  %
5847
5848  022536                  4$:     ESCAPE TST
5849  022536  104410                  TRAP    C$ESCAPE
5850  022540  000016                  .WORD   L10076-.
5851  022542  010437  002412          MOV R4,FADR
5852  022546  005337  002406          DEC FLAG                ;UPDATE PAGE,FIELD
5853  022552  105302                  DECB R2                 ;UPDATE JMMED. ADDR
5854  022554  001304                  BNE 1$                  ;LOOP IF NOT DONE.
```

```
5855
5856
5857  022556                                ENDTST
5858  022556                                L10076:
5859  022556  104401                              TRAP    C$ETST
5860  022560                                      BADHEAD
5861                                              ;*************** TEST 29 ***************
5862                                              ;*
5863                                              ;* IN THIS TEST WE'LL VERIFY THAT THE Z BIT CAN BE READ FROM
5864                                              ;* IBUS*<13>. WE ALLREADY KNOW THAT THE Z BIT WORKS PROPERLY,
5865                                              ;* ALL WE WANT TO KNOW HERE IS THAT IT CAN BE READ.
5866                                              ;*
5867  022560                                      BADHEAD
5868                                              ;*************** TEST 29 ***************
5869
5870  022560                                      BGNTST
5871  022560                                T29::
5872  022560                                      K4ONLY                          ;M8206 &M8207 ONLY!
5873                                              ;DO NOT DO TEST IF M8200, OR M8204
5874  022570  104432                              TRAP    C$EXIT
5875  022572  000200                              .WORD   L10077-.
5876  022574                                      MSTCLR
5877  022600                                      MYINT
5878  022600  013701  002516                      MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
5879  022604  004737  003166                      JSR     PC,CLRALL               ;CLR CONDITION CODES.
5880  022610                                      ROMCLK                          ;NOW READ IBUS*<15>PUT IN PORT 4
5881  022610  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5882  022614  121264                              121264
5883  022616  116104  000004                      MOVB    4(R1),R4                ;READ IT FROM PORT 4
5884  022622  042704  177477                      BIC     #177477,R4              ;STRIP ANY JUNK,C&Z BITS 6,7
5885  022626  012705  000000                      MOV     #0,R5                   ;EXPECT IT CLEAR
5886  022632  120405                              CMPB    R4,R5                   ;OK?
5887  022634  001410                              BEQ     1$
5888  022636                                      ERROR   16                      ;FAILURE OF Z&C TO BE CLEAR.
5889  022642  104455                              TRAP    C$ERDF
5890  022644  000020                              .WORD   16
5891  022646  005055                              .WORD   EM0
5892  022650  010134                              .WORD   ERR16
5893
5894  022652                                      ESCAPE TST
5895  022652  104410                              TRAP    C$ESCAPE
5896  022654  000116                              .WORD   L10077-.
5897  022656  004737  003312              1$:     JSR     PC,SETZ                 ;SET Z BIT.
5898  022662                                      ROMCLK                          ;NOW GO BACK AND CHECK Z BIT SET.
5899  022662  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5900  022666  121264                              121264
5901
5902  022670  016104  000004                      MOV     4(R1),R4                ;GET INFO.
5903  022674  042704  177477                      BIC     #^C<300>,R4             ;STRIP FOR C&Z BITS.
5904  022700  012705  000200                      MOV     #200,R5                 ;EXPECT ONLY Z BIT SET.
5905  022704  120405                              CMPB    R4,R5                   ;SET OK?
5906  022706  001410                              BEQ     2$
5907  022710                                      ERROR   16                      ;Z BIT FAILED TO SET PROPERLY.
5908  022714  104455                              TRAP    C$ERDF
5909  022716  000020                              .WORD   16
5910  022720  005055                              .WORD   EM0
```

```
5911  022722  010134                        .WORD   ERR16
5912
5913  022724                                ESCAPE  TST
5914  022724  104410                        TRAP    C$ESCAPE
5915  022726  000044                        .WORD   L10077-.
5916  022730  004737  003166        2$:     JSR     PC,CLRALL               ;NOW TRY TO CLEAR Z BIT.
5917  022734                                ROMCLK
5918  022734  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5919  022740  121264                        121264
5920  022742  016104  000004                MOV     4(R1),R4
5921  022746  042704  177477                BIC     #^C<300>,R4             ;STRIP FOR C&Z BITS
5922  022752  001407                        BEQ     3$                      ;IF ZERO,WE'RE OK
5923  022754  005005                        CLR     R5                      ;ELSE REPORT ERROR
5924  022756                                ERROR   16                      ;Z BIT FAILED TO CLEAR PROPERLY.
5925  022762  104455                        TRAP    C$ERDF
5926  022764  000020                        .WORD   16
5927  022766  005055                        .WORD   EM0
5928  022770  010134                        .WORD   ERR16
5929  022772                        3$:
5930  022772                                ENDTST
5931  022772                        L10077:
5932  022772  104401                        TRAP    C$ETST
5933                                ;FINDFAST
5934  022774                                BADHEAD
5935                                        ;*************** TEST 30 ***************
5936                                        ;*
5937                                        ;* IN THIS TEST WE'LL VERIFY THAT THE C BIT CAN BE READ FROM
5938                                        ;* IBUS*<13>. WE ALLREADY KNOW THAT THE C BIT WORKS PROPERLY,
5939                                        ;* ALL WE WANT TO KNOW HERE IS THAT IT CAN BE READ.
5940                                        ;*
5941  022774                                BADHEAD
5942                                        ;*************** TEST 30 ***************
5943
5944  022774                                BGNTST
5945  022774                        T30::
5946  022774                                K4ONLY                          ;M8206 &M8207 ONLY!
5947                                        ;DO NOT DO TEST IF M8200, OR M8204
5948  023004  104432                        TRAP    C$EXIT
5949  023006  000200                        .WORD   L10100-.
5950  023010                                MSTCLR
5951  023014                                MYINT
5952  023014  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
5953  023020  004737  003166                JSR     PC,CLRALL               ;CLR CONDITION CODES.
5954  023024                                ROMCLK                          ;NOW READ IBUS*<13>PUT IN PORT 4
5955  023024  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5956  023030  121264                        121264
5957  023032  116104  000004                MOVB    4(R1),R4                ;READ IT FROM PORT 4
5958  023036  042704  177477                BIC     #177477,R4              ;STRIP ANY JUNK,C&Z BITS 6,7
5959  023042  012705  000000                MOV     #0,R5                   ;EXPECT IT CLEAR
5960  023046  120405                        CMPB    R4,R5                   ;OK?
5961  023050  001410                        BEQ     1$
5962  023052                                ERROR   16                      ;FAILURE OF Z&C TO BE CLEAR.
5963  023056  104455                        TRAP    C$ERDF
5964  023060  000020                        .WORD   16
5965  023062  005055                        .WORD   EM0
5966  023064  010134                        .WORD   ERR16
```

```
5967
5968  023066                                    ESCAPE TST
5969  023066  104410                            TRAP    C$ESCAPE
5970  023070  000116                            .WORD   L10100-.
5971  023072  004737  003260            1$:     JSR     PC,SETC                 ;SET C BIT.
5972  023076                                    ROMCLK                          ;NOW GO BACK AND CHECK C BIT SET.
5973  023076  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5974  023102  121264                            121264
5975  023104  016104  000004                    MOV     4(R1),R4                ;GET INFO.
5976  023110  042704  177477                    BIC     #^C<300>,R4             ;STRIP FOR C&Z BITS.
5977  023114  012705  000100                    MOV     #100,R5                 ;EXPECT ONLY C BIT SET.
5978  023120  120405                            CMPB    R4,R5                   ;SET OK?
5979  023122  001410                            BEQ     2$
5980  023124                                    ERROR   16                      ;C BIT FAILED TO SET PROPERLY.
5981  023130  104455                            TRAP    C$ERDF
5982  023132  000020                            .WORD   16
5983  023134  005055                            .WORD   EMO
5984  023136  010134                            .WORD   ERR16
5985
5986  023140                                    ESCAPE  TST
5987  023140  104410                            TRAP    C$ESCAPE
5988  023142  000044                            .WORD   L10100-.
5989  023144  004737  003166            2$:     JSR     PC,CLRALL               ;NOW TRY TO CLEAR C BIT.
5990  023150                                    ROMCLK
5991  023150  004537  003044                    JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
5992  023154  121264                            121264
5993  023156  016104  000004                    MOV     4(R1),R4
5994  023162  042704  177477                    BIC     #^C<300>,R4             ;STRIP FOR C&Z BITS
5995  023166  001407                            BEQ     3$                      ;IF ZERO,WE'RE OK
5996  023170  005005                            CLR     R5                      ;ELSE REPORT ERROR
5997  023172                                    ERROR   16                      ;C BIT FAILED TO CLEAR PROPERLY.
5998  023176  104455                            TRAP    C$ERDF
5999  023200  000020                            .WORD   16
6000  023202  005055                            .WORD   EMO
6001  023204  010134                            .WORD   ERR16
6002  023206                            3$:
6003  023206                                    ENDTST
6004  023206                            L10100:
6005  023206  104401                            TRAP    C$ETST
6006  023210                                    BADHEAD
6007                                            ;*************** TEST 31 ***************
6008                                            ;*TEST OF PROGRAM CLOCK BIT
6009                                            ;*DO A MASTER CLEAR, VERIFY THAT PROGRAM CLOCK IS SET
6010                                            ;*WRITE PROGRAM CLOCK BIT TO A ONE, VERIFY THAT IT CLEARS,
6011                                            ;*AND THEN SETS SOME TIME LATER
6012  023210                                    BADHEAD
6013                                            ;*************** TEST 31 ***************
6014
6015  023210                            BGNTST
6016  023210                            T31::
6017  023210                                    MYINT
6018  023210  013701  002516                    MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
6019  023214                                    MSTCLR                  ;MASTER CLEAR M8200,4,7
6020  023220  005037  002440                    CLR     TEMP                    ;PREPARE FOR
6021  023224  005037  002444                    CLR     STMP0                   ;DELAY
6022  023230  012761  000020  000004    1$:     MOV     #20,4(R1)               ;LOAD PORT 4
```

```
6023  023236  152761  000002  000001          BISB    #BIT1,1(R1)      ;SET ROMI
6024  023244  012761  121111  000006          MOV     #121111,6(R1)    ;SEL6   INSTRUCTION
6025  023252  152761  000003  000001          BISB    #BIT1!BIT0,1(R1);SET CLOCK BIT
6026  023260  012761  121224  000006          MOV     #121224,6(R1)    ;LOAD NEXT INSTRUCTION
6027  023266  152761  000003  000001          BISB    #BIT1!BIT0,1(R1);READ CLOCK BIT
6028  023274  142761  030001  000001          BICB    #BIT!BIT0,1(R1);CLEAR MAINT BITS
6029  023302  016104  000004                  MOV     4(R1),R4         ;PUT 'FOUND" IN R4
6030  023306  005037  002452                  CLR     $GDDAT           ;PUT 'EXPECTED" IN $GDDAT
6031  023312  123704  002452                  CMPB    $GDDAT,R4                ;IS PGM CLOCK CLEAR?
6032  023316  001406                          BEQ     2$
6033  023320  013702  002452                  MOV     $GDDAT,R2
6034  023324                                  ERRDF   50,EMB50                 ;ERROR, PGM CLOCK IS NOT CLEAR
6035  023324  104455                          TRAP    C$ERDF
6036  023326  000062                          .WORD   50
6037  023330  005545                          .WORD   EMB50
6038  023332  000000                          .WORD   0
6039  023334                          2$:
6040  023334                                  ROMCLK                   ;NEXT WORD IS INSTRUCTION,
6041  023334  004537  003044                  JSR     R5,..ROMCLK      ;CLOCK INSTRUCTION
6042  023340  121224                          121224                   ;PORT4 LU11
6043  023342  122761  000020  000004          CMPB    #20,4(R1)        ;IS PGM CLOCK SET?
6044  023350  001420                          BEQ     3$               ;BR IF YES
6045  023352  005237  002440                  INC     TEMP             ;INCREMENT DELAY
6046  023356  005537  002444                  ADC     $TMP0            ;INCREMENT DELAY
6047  023362  022737  000006  002444          CMP     #6,$TMP0         ;IS DELAY DONE
6048  023370  001361                          BNE     2$               ;BR IF NO
6049  023372  012702  000006                  MOV     #6,R2
6050  023376  013704  002444                  MOV     $TMP0,R4
6051  023402                                  ERRDF   51,EMB51                 ;ERROR PGM CLOCK NOT SET
6052  023402  104455                          TRAP    C$ERDF
6053  023404  000063                          .WORD   51
6054  023406  005577                          .WORD   EMB51
6055  023410  000000                          .WORD   0
6056  023412                          3$:
6057
6058  023412  122737  000007  002414          CMPB    #7,WTYPE         ; ONLY DO NEXT TEST IF M8207
6059  023420  001013                          BNE     4$               ; EXIT IF NOT.
6060
6061  023422  005737  002444                  TST     $TMP0            ; IF ANY LARGE COUNT, WE'RE OK
6062  023426  001010                          BNE     4$               ; THEN EXIT
6063
6064  023430  042737  000007  002440          BIC     #7,TEMP          ; CLEAR OUT ANY SMALL COUNT
6065  023436  001004                          BNE     4$               ; IF LARGE COUNT LEFT OVER, WE'RE OK.
6066
6067  023440                                  ERRDF   100,EMB1         ; ERROR
6068  023440  104455                          TRAP    C$ERDF
6069  023442  000144                          .WORD   100
6070  023444  005410                          .WORD   EMB1
6071  023446  000000                          .WORD   0
6072                                                                   ; TIME TTOOO SHORT FOR CLOCK.  MUST BE
6073                                                                   ; DEFECTIVE CAPACITOR IN TIMEING CIRCUIT.
6074  023450                          4$:
6075
6076  023450                          ENDTST
6077  023450                          L10101:
6078  023450  104401                          TRAP    CSETST
```

```
                                        BADHEAD
                                        ;*************** TEST 32 ***************
                                        ;*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 M8200,4,7 DURING THE POWER FAIL
                                        ;*THIS TEST WILL TAKE LONGER THAN 2 SECONDS TO RUN. THIS TEST
                                        ;*SHOULD NOT BE RUN IF YOU HAVE VOLATILABLE MEMORY IN YOUR SYSTEM.
                                        BADHEAD
                                        ;*************** TEST 32 ***************

                                BGNTST
                                T32::
                                        BRESET                  ;STALL FOR TIME
                                        TRAP    C$RESET
                                        MYINT
                                        MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
                                                                ;R1 CONTAINS BASE M8200,4,7 ADDRESS
                                        MSTCLR                  ;MASTER CLEAR M8200,4,7
                                        CLR     TEMP            ;PREPARE FOR DELAY
                                        MOV     @#24,STMP0      ;SAVE POWER FAIL ADDRESS
                                        MOV     @#24,-(SP)      ;STORE POWER FAIL ADDRESS
                                        MOV     #1$,@#24        ;SET U FOPR FORCE POWER FAIL
                                        MOV     #2,4(R1)        ;LOAD PORT4
                                        MOV     #BIT9,(R1)      ;SET ROMI
                                        MOV     #121111,6(R1)   ;LOAD INSTRUCTION
                                        MOV     #BIT9!BIT8!BIT11,(R1)   ;CLOCK INSTRUCTION
                                5$:     INC     TEMP            ;WAIT FOR POWER FAIL
                                        BNE     5$              ;BR IF DELAY NOT DONE
                                        MSTCLR
                                        ERROR   17      ;ERROR, NO POWER FAIL
                                        TRAP    C$ERDF
                                        .WORD   17
                                        .WORD   EM0
                                        .WORD   ERR17
                                        BR      4$
                                1$:     MOV     #3$,@#24        ;POWER UP ADDRESS
                                        MOV     SP,2$           ;STORE STACK
                                        HALT                    ;WAIT FOR POWER UP SEQUENCE
                                2$:     0
                                3$:     MOV     2$,SP           ;RESTORE STACK
                                        MOV     #10$,@#24       ;PUT IN CASE OF FALSE POWER-UP.
                                        CLR     11$
                                12$:    INC     11$     ;STALL ON POWER UP.
                                        BNE     12$             ;WAIT HERE IF BAD,WILL POWER OUT OF HERE.
                                                                ;ELSE PROCEED.

                                        POPSP2                  ;POP STACK TWICE2
                                        MOV     KMCSR,R1
                                        MOV     (SP)+,@#24      ;RESTORE TRUE POWER FAIL ADDRESS
                                        CMP     STMP0,@#24      ;IS IT CORRECT?
                                        BEQ     4$              ;BR IF YES
                                        ERROR   17              ;ERROR, STACK IS INCORRECT
                                        TRAP    C$ERDF
                                        .WORD   17
```

```
6135  023660  005055                          .WORD   EM0
6136  023662  010256                          .WORD   ERR17
6137  023664  013737  002444  000024          MOV     $TMP0,@#24      ;RESTORE TRUE POWER FAIL ADDRESS
6138  023672  013706  002344                  MOV     PSTACK,SP       ;RESTORE STACK
6139  023676  032711  004000          4$:     BIT     #BIT11,(R1)     ;BIT11 STILL SET?
6140  023702  001016                          BNE     7$
6141  023704  005737  002470                  TST     RUNB
6142  023710  001013                          BNE     7$
6143  023712  011104                          MOV     (R1),R4
6144  023714  012705  004000                  MOV     #BIT11,R5
6145  023720                                  ERROR   35              ;OAC FAILED
6146  023724  104455                          TRAP    C$ERDF
6147  023726  000043                          .WORD   35
6148  023730  005055                          .WORD   EM0
6149  023732  010472                          .WORD   ERR35
6150                                                                  ;TO PREVENT
6151                                                                  ;INIT FROM
6152                                                                  ;CLEARING CSR
6153  023734                          EXIT    TST
6154  023734  104432                          TRAP    C$EXIT
6155  023736  000104                          .WORD   L10102-.
6156  023740  012711  003000          7$:     MOV     #BIT9!BIT10,(R1) ;SEL6 = MAINT IR
6157  023744  012705  121111                  MOV     #121111,R5      ;R5 = EXPECTED
6158  023750  016104  000006                  MOV     6(R1),R4        ;R4 = FOUND
6159  023754  020504                          CMP     R5,R4           ;MAINT IR SHOULD = 12111
6160  023756  001431                          BEQ     6$              ;BR IF OK
6161  023760                                  MSTCLR
6162  023764                                  ERROR   35              ;IF = 0 THEN BUS INIT WAS
6163  023770  104455                          TRAP    C$ERDF
6164  023772  000043                          .WORD   35
6165  023774  005055                          .WORD   EM0
6166  023776  010472                          .WORD   ERR35
6167                                                                  ;NOT BLOCKED FROM CLEARING
6168                                                                  ;THE M8200,4,7
6169
6170  024000  000000          11$:    .WORD   0                       ;TEMP COUNT FOR STALL ON POWER UP.
6171
6172  024002  052711  040000          10$:    BIS     #BIT14,(R1)     ;CLR THE THING SO IT CAN'T ASSIRT AC LOW
6173                                                                  ;AGAIN!
6174  024006                                  MSTCLR
6175  024012                                  ERROR   17              ;ERROR  GLIP GAVE US SECOUND UNEXPECTED
6176  024016  104455                          TRAP    C$ERDF
6177  024020  000021                          .WORD   17
6178  024022  005055                          .WORD   EM0
6179  024024  010256                          .WORD   ERR17
6180                                                                  ;ASSERTION OF AC LOW ON UNIBUS.
6181                                                                  ;FATEL TYPE OF ERROR.
6182  024026  062706  000004                  ADD     #4,SP           ;RESTORE STACK.
6183  024032  012637  000024                  MOV     (SP)+,@#24
6184  024036                                  MSTCLR
6185  024042                          6$:
6186  024042                          ENDTST
6187  024042                          L10102:
6188  024042  104401                          TRAP    C$ETST
6189
6190  024044                                  BADHEAD
```

```
                                        ;*************** TEST 33 ****************
                                        ;*MICRO-PROCESSOR NOISE TEST
                                        ;*WRITE ALL ZERO'S THEN ALL ONE'S THEN A DATA PATTTERN
                                        ;*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.
024044                                  BADHEAD
                                        ;*************** TEST 33 ****************

                                BGNTST
                                T33::
                                        MYINT
024044  013701  002516                  MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
024050                                  MSTCLR                  ;MASTER CLEAR M8200,4,7
024054  005002                          CLR     R2              ;R2 IS INDEX REGISTER
024056  042737  000017  024104  1$:     BIC     #17,2$          ;CLEAR ADDRESS FIELD
024064  156237  025100  024104          BISB    30$(R2),2$      ;ADD IBUS* REG ADDRESS TO INSTRUCTION
024072  116261  025106  000004          MOVB    31$(R2),4(R1)   ;LOAD PORT4
024100                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
024100  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
024104  121100                  2$:     121100                  ;WRITE IBUS* REGISTER
024106  005202                          INC     R2              ;INC INDEX REGISTER
024110  022702  000005                  CMP     #5,R2           ;DONE YET?
024114  001360                          BNE     1$              ;BR IF NO
024116  005002                          CLR     R2              ;R2 IS IBUS REGISTER ADDRESS
024120  042737  000017  024166  3$:     BIC     #17,4$          ;CLEAR ADDRESS FIELD OF INSTRUCTIONS
024126  042737  000017  024202          BIC     #17,5$
024134  042737  000017  024214          BIC     #17,6$
024142  050237  024166                  BIS     R2,4$           ;ADD IBUS REG ADDRESS TO INSTRUCTION
024146  050237  024202                  BIS     R2,5$
024152  050237  024214                  BIS     R2,6$
024156  105061  000004                  CLRB    4(R1)           ;CLEAR PORT4
024162                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
024162  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
024166  122100                  4$:     122100                  ;WRITE 0 TO IBUS REG
024170  112761  000377  000004          MOVB    #377,4(R1)      ;LOAD PORT4
024176                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
024176  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
024202  122100                  5$:     122100                  ;WRITE ALL ONES TO  IBUS REG
024204  110261  000004                  MOVB    R2,4(R1)        ;LOAD PORT4
024210                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
024210  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
024214  122100                  6$:     122100                  ;WRITE ITS OWN ADDRESS TO IBUS REG
024216  005202                          INC     R2              ;NEXT ADDRESS
024220  022702  000010                  CMP     #10,R2          ;DONE YET?
024224  001335                          BNE     3$              ;BR IF NO
024226  005002                          CLR     R2              ;START AT SP ADDRESS 0
024230  042737  000017  024276  7$:     BIC     #17,8$          ;CLEAR ADDRESS FIELD
024236  042737  000017  024312          BIC     #17,9$
024244  042737  000017  024324          BIC     #17,10$
024252  050237  024276                  BIS     R2,8$           ;ADD ADDRESS TO INSTRUCTION
024256  050237  024312                  BIS     R2,9$
024262  050237  024324                  BIS     R2,10$
024266  105061  000004                  CLRB    4(R1)           ;CLEAR PORT4
024272                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
```

```
6247  024272  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6248  024276  123100                  8$:     123100                  ;WRITE ZERO TO SP
6249  024300  112761  000377  000004          MOVB    #377,4(R1)      ;LOAD PORT4
6250  024306                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6251  024306  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6252  024312  123100                  9$:     123100                  ;WRITE ALL ONES TO SP
6253  024314  110261  000004                  MOVB    R2,4(R1)        ;LOAD PORT4
6254  024320                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6255  024320  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6256  024324  123100                  10$:    123100                  ;WRITE SP ADDRESS TO ITSELF
6257  024326  005202                          INC     R2              ;NEXT SP ADDRESS
6258  024330  022702  000020                  CMP     #20,R2          ;DONE YET?
6259  024334  001335                          BNE     7$              ;BR IF NO
6260  024336  005002                          CLR     R2              ;R2 = ,AOM ,E, ADDRESS
6261  024340                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6262  024340  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6263  024344  010000                          010000                  ;MAR _ 0
6264  024346                                  ROMCLK
6265  024346  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6266  024352  004000                          4000
6267  024354  105061  000004          11$:    CLRB    4(R1)           ;CLEAR PORT4
6268  024360                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6269  024360  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6270  024364  122500                          122500                  ;WRITE ZEROS TO MEM
6271  024366  112761  000377  000004          MOVB    #377,4(R1)      ;LOAD PORT4
6272  024374                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6273  024374  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6274  024400  122500                          122500                  ;WRITE ONES TO MEM
6275  024402  110261  000004                  MOVB    R2,4(R1)        ;LOAD PORT4
6276  024406                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6277  024406  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6278  024412  136500                          136500                  ;WRITE TO MEM IT OWN ADDRESS
6279  024414  005202                          INC     R2              ;NEXT MEM ADDRESS
6280  024416  022702  001000                  CMP     #1000,R2        ;DONE YET?
6281  024422  001354                          BNE     11$             ;BR IF NO
6282
6283                                          ;NOW GO BACK AND READ EVERYTHIN
6284
6285  024424                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6286  024424  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6287  024430  010000                          010000                  ;MAR 0
6288  024432                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6289  024432  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6290  024436  004000                          4000                    ;MAR HI _ 0 (M8200,4,7 ONLY)
6291                                          ;WOULD BE CRAM CODE
6292  024440  003737  002432                  TST     TYPE
6293  024444  001452                          BEQ     40$
6294  024446  005005                          CLR     R5              ;R5 IS INDEX REGISTER
6295  024450  042737  000360  024512  12$:    BIC     #360,13$        ;CLEAR ADDRESS FIELD
6296  024456  116502  025100                  MOVB    30$(R5),R2      ;R2 = IBUS* ADDRESS
6297  024462  010203                          MOV     R2,R3           ;PUT IBUS* ADDRESS IN R3
6298  024464  006303                          ASL     R3              ;SHIFT ADDRESS TO BITS 4-7
6299  024466  006303                          ASL     R3
6300  024470  006303                          ASL     R3
6301  024472  006303                          ASL     R3
6302  024474  050337  024512                  BIS     R3,13$          ;ADD ADDRESS TO INSTRUCTION
```

```
6303  024500  116537  025106  002452          MOVB    31$(R5),$GDDAT  ;$GDDAT = 'EXPECTED'
6304  024506                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6305  024506  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6306  024512  121004                  13$:    121004                  ;PORT4 - IBUS* REGISTER
6307  024514  016104  000004                  MOV     4(R1),R4        ;R4 = 'FOUND'
6308  024520  123704  002452                  CMPB    $GDDAT,R4               ;IBUS* CONTENTS OK?
6309  024524  001416                          BEQ     20$             ;BR IF YES
6310  024526  010237  002434                  MOV     R2,MR0
6311  024532  105037  002453                  CLRB    $GDDAT+1
6312  024536  013705  002452                  MOV     $GDDAT,R5
6313  024542                                  ERROR   29              ;IBUS* DATA ERROR
6314  024546  104455                          TRAP    C$ERDF
6315  024550  000035                          .WORD   29
6316  024552  005055                          .WORD   EM0
6317  024554  010350                          .WORD   ERR29
6318  024556                                  ESCAPE  TST
6319  024556  104410                          TRAP    C$ESCAPE
6320  024560  000334                          .WORD   L10103-.
6321  024562  005205                  20$:    INC     R5              ;INC COUNTER
6322  024564  022705  000005                  CMP     #5,R5           ;DONE YET?
6323  024570  001327                          BNE     12$             ;BR IF NO
6324
6325  024572                          40$:
6326                                  ;END CRAM,GENERAL TESTS
6327
6328  024572  005002                          CLR     R2              ;R2 = IBUS REG ADDRESS
6329  024574  042737  000360  024630  14$:    BIC     #360,15$        ;CLEAR ADDRESS FIELD OF INSTRUCTION
6330  024602  010203                          MOV     R2,R3           ;R3 = IBUS ADDRESS
6331  024604  006303                          ASL     R3              ;SHIFT ADDRESS TO BITS 4-7
6332  024606  006303                          ASL     R3
6333  024610  006303                          ASL     R3
6334  024612  006303                          ASL     R3
6335  024614  050337  024630                  BIS     R3,15$          ;ADD ADDRESS TO INSTRUCTION
6336  024620  010237  002452                  MOV     R2,$GDDAT               ;$GDDAT = 'EXPECTED'
6337  024624                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6338  024624  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6339  024630  021004                  15$:    021004                  ;PORT4 - IBUS REG
6340  024632  016104  000004                  MOV     4(R1),R4        ;IBUS = 'FOUND'
6341  024636  123704  002452                  CMPB    $GDDAT,R4               ;IBUS CONTENTS OK?
6342  024642  001410                          BEQ     21$             ;BR IF YES
6343  024644  013705  002452                  MOV     $GDDAT,R5
6344  024650                                  ERROR   29              ;IBUS DATA ERROR
6345  024654  104455                          TRAP    C$ERDF
6346  024656  000035                          .WORD   29
6347  024660  005055                          .WORD   EM0
6348  024662  010350                          .WORD   ERR29
6349  024664  005202                  21$:    INC     R2              ;NEXT IBUS REGISTER
6350  024666  022702  000010                  CMP     #10,R2          ;DONE YET?
6351  024672  001340                          BNE     14$             ;BR IF NO
6352  024674  005002                          CLR     R2              ;R2 = SP ADDRESS
6353  024676  042737  000017  024714  16$:    BIC     #17,17$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
6354  024704  050237  024714                  BIS     R2,17$          ;ADD ADDRESS TO INSTRUCTION
6355  024710                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6356  024710  004537  003044                  JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6357  024714  040600                  17$:    040600                  ;BR - SP
6358  024716  010237  002452                  MOV     R2,$GDDAT               ;$GDDAT = 'EXPECTED'
```

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6359  024722                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
6360  024722  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6361  024726  061224                  061224                  ;PORT4   BR
6362  024730  016104  000004          MOV     4(R1),R4        ;R4 = 'FOUND"
6363  024734  123704  002452          CMPB    $GDDAT,R4               ;SP CONTENTS OK?
6364  024740  001412                  BEQ     22$             ;BR IF YES
6365  024742  013705  002452          MOV     $GDDAT,R5
6366  024746                          ERROR   7               ;SP DATA ERROR
6367  024752  104455                  TRAP    C$ERDF
6368  024754  000007                  .WORD   7
6369  024756  005055                  .WORD   EM0
6370  024760  007026                  .WORD   ERR7
6371  024762                          ESCAPE  TST
6372  024762  104410                  TRAP    C$ESCAPE
6373  024764  000130                  .WORD   L10103-.
6374  024766  005202          22$:    INC     R2              ;NEXT SP LOCATION
6375  024770  022702  000020          CMP     #20,R2          ;DONE YET?
6376  024774  001340                  BNE     16$             ;BR IF NO
6377  024776  005002                  CLR     R2              ;R2 = MEMORY ADDRESS
6378  025000                          ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6379  025000  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6380  025004  010000                  010000                  ;MAR   0
6381  025006                          ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6382  025006  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6383  025012  004000                  4000                    ;MAR HI   0 (M8200,4,7 OR FAMILY ONLY)
6384  025014  010237  002452  18$:    MOV     R2,$GDDAT               ;$GDDAT = 'EXPECTED"
6385  025020                          ROMCLK                  ;NEXT WORD IS INSTRUCTION,
6386  025020  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6387  025024  055224                  055224                  ;PORT4   MAIN MEM
6388  025026  016104  000004          MOV     4(R1),R4        ;R4 = 'FOUND"
6389  025032  123704  002452          CMPB    $GDDAT,R4               ;MAIN MEM CONTENTS OK?
6390  025036  001412                  BEQ     23$             ;BR IF YES
6391  025040  013705  002452          MOV     $GDDAT,R5
6392  025044                          ERROR   6               ;MAIN MEM DATA ERROR
6393  025050  104455                  TRAP    C$ERDF
6394  025052  000006                  .WORD   6
6395  025054  005055                  .WORD   EM0
6396  025056  006700                  .WORD   ERR6
6397  025060                          ESCAPE  TST
6398  025060  104410                  TRAP    C$ESCAPE
6399  025062  000032                  .WORD   L10103-.
6400  025064  005202          23$:    INC     R2              ;NEXT MEM ADDRESS
6401  025066  022702  001000          CMP     #1000,R2                ;DONE YET?
6402  025072  001350                  BNE     18$             ;BR IF NO
6403  025074                          EXIT    TST
6404  025074  104432                  TRAP    C$EXIT
6405  025076  000016                  .WORD   L10103-.
6406  025100     000     002     003  30$:    .BYTE   0,2,3,5,10
6407  025103     005     010
6408
6409          025106                  .EVEN
6410  025106     001     003     004  31$:    .BYTE   1,3,4,6,10
6411  025111     006     010
```

```
6412
6413                025114                  .EVEN
6414
6415  025114                                ENDTST
6416  025114                                L10103:
6417  025114  104401                              TRAP    C$ETST
6418
6419  025116                                      BADHEAD
6420                                                ;*************** TEST 34 ***************
6421                                                ;* THIS TEST IS DESIGNED TO MAKE SURE THAT A NODST INSTRUCTION
6422                                                ;* DOES NOT WRITE INTO PORT B OF THE MULTIPORT RAM.
6423                                                ;* TO DO THIS,WE'LL PUT A 125 INTO INDAT2,THEN WE'LL PUT A
6424                                                ;* 125 INTO BOTH SP1 AND BR. LAST WE'LL DO A NODST BR,SUBOC,SP1
6425                                                ;* IF THERE IS A WRITE INTO PORTB,INDAT2 WILL CONTAIN A 377.
6426  025116                                      BADHEAD
6427                                                ;*************** TEST 34 ***************
6428
6429  025116                                BGNTST
6430  025116                                T34::
6431  025116                                      MYINT
6432  025116  013701  002516                      MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
6433  025122                                      ROMCLK
6434  025122  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6435  025126  000525                              00525                   ;PUT A 125 INTO BRG.
6436  025130                                      ROMCLK
6437  025130  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6438  025134  062221                              062221                  ;NOW INTO OIDAT2
6439  025136                                      ROMCLK
6440  025136  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6441  025142  063221                              63221                   ;NOW INTO SP1
6442  025144                                      ROMCLK
6443  025144  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6444  025150  060361                              060361                  ;NOW THE 'NODST  BR,SUBOC,SP1"
6445                                                                        ;THE NODST SHOULD NOT MODIFY INDAT2!
6446
6447  025152                                      ROMCLK
6448  025152  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6449  025156  020420                              020420                  ;PUT CONTENT OF INDAT2 IN BRG.
6450
6451  025160                                      ROMCLK
6452  025160  004537  003044                      JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6453  025164  061220                              061220                  ;PUT BRG INTO BSEL0
6454
6455  025166  111104                              MOVB    (R1),R4         ;SEE WHAT CAME BACK,
6456  025170  012705  000125                      MOV     #125,R5         ;SHOULD BE 125  IF 377 CAME BACK,
6457                                                                        ;YOU CAN BET THAT THE 'NODST" WROTE
6458                                                                        ;INTO THE MULTIPORT RAM!  WATCH SIGNAL
6459                                                                        ; 'D1 WRITE OUT L"
6460
6461  025174  020405                              CMP     R4,R5           ;NOW LOOK.
6462  025176  001406                              BEQ     10$
6463
6464  025200                                      ERROR   7
6465  025204  104455                              TRAP    C$ERDF
6466  025206  000007                              .WORD   7
6467  025210  005055                              .WORD   EM0
```

CZDMQD.P11 12-JAN-82 09:50 HARDWARE TESTS

```
6468  025212  007026                .WORD   ERR7
6469
6470  025214                10$:
6471  025214                        ENDTST
6472  025214                L10104:
6473  025214  104401                TRAP    C$ETST
6474
6475  025216                        BADHEAD
6476                                ;*************** TEST 35 ***************
6477                                ;*
6478                                ;* EXTENDED CRAM TEST FOR M8206. IN THIS TEST WE WILL LOAD DATA
6479                                ;* THROUGHOUT THE CRAM (TEST DATA IS JUST 4K OF DIAG. CODE) AND
6480                                ;* THEN READ IT BACK AND VERIFY THAT IT IS CORRECT.
6481  025216                        BADHEAD
6482                                ;*************** TEST 35 ***************
6483
6484  025216                        BGNTST
6485  025216                T35::
6486  025216                        SKIP06  10$                     ;DO TEST ONLY IF IT IS A M8206
6487                                ;GOTO 10$ IF M8206
6488  025226                        EXIT    TST                     ;OTHERWIZE,SKIP TEST.
6489  025226  104432                TRAP    C$EXIT
6490  025230  000132                .WORD   L10105-.
6491
6492  025232                10$:    MYINT
6493  025232  013701  002516        MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
6494
6495  025236  012702  012146        MOV     #ROMMAP,R2              ;GET ADDR. OF LIST.
6496
6497  025242  012711  002000        MOV     #2000,(R1)              ;SET TO WRITE DATA.
6498  025246  005003                CLR     R3                      ;CRAM ADDR ZERO.
6499
6500  025250  010361  000004  15$:  MOV     R3,4(R1)                ;SET ADDR.
6501  025254  012261  000006        MOV     (R2)+,6(R1)             ;WRITE DATA.
6502
6503  025260  020337  002436        CMP     R3,MEMSZ                ;DONE WHOLE CRAM?
6504  025264  001402                BEQ     20$                     ;YES,EXIT THIS LOOP.
6505  025266  005203                INC     R3                      ;NO,UPDAT ADDR.
6506  025270  000767                BR      15$
6507  025272  005003        20$:    CLR     R3                      ;NOW WE WILL READ BACK,STARTING AT
6508                                                                ;CRAM ADDR. ZERO.
6509  025274  012705  012146        MOV     #ROMMAP,R5              ;GET ADDR. LIST OF DATA
6510
6511  025300  010361  000004  30$:  MOV     R3,4(R1)                ;SET ADDR.
6512
6513  025304  011502                MOV     (R5),R2                 ;PUT EXPECTED INTO R2
6514  025306  016104  000006        MOV     6(R1),R4                ;READ ACCUAL
6515  025312  020204                CMP     R2,R4                   ;EQUAL?
6516  025314  001411                BEQ     40$                     ;YES,CONTINUE.
6517  025316  010300                MOV     R3,R0
6518
6519  025320                        ERROR   1                       ;ERROR CRAM DATA TEST,DATA
6520  025324  104455                TRAP    C$ERDF
6521  025326  000001                .WORD   1
6522  025330  005055                .WORD   EM0
6523  025332  006032                .WORD   ERR1
```

```
                                                        ;READ NOT DATA THAT WAS WRITTEN.

                        ESCAPE TST
                        TRAP    C$ESCAPE
                        .WORD   L10105-.
40$:                    CMP     R3,MEMSZ                ;ALL DONE?
                        BNE     50$

                        EXIT    TST
                        TRAP    C$EXIT
                        .WORD   L10105-.

50$:                    INC     R3                      ;UPDATE ADDR.
                        ADD     #2,R5
                        BR      30$

                        ENDTST
                        L10105:
                        TRAP    C$ETST

                        BADHEAD
                        ;*************** TEST 36 ***************
                        ;*
                        ;* THIS TEST LOADS MICRO-CODE INTO A M8206 MCPU THEN EXECTUES IT.
                        ;* THE MICRO CODE IS DESIGNED TO WRITE ALL ONES INTO THE SEL REGS.
                        ;* THIS TEST IS ONLY PERFORMED ON AN M8206.
                        BADHEAD
                        ;*************** TEST 36 ***************

                        BGNTST
                T36::

                        SKIP06  1$                      ;ONLY DO THIS TEST IF M8206
                        ;GOTO 1$ IF M8206
                        EXIT    TST
                        TRAP    C$EXIT
                        .WORD   L10106-.

                1$:     MYINT
                        MOV     KMCSR,R1                ;RECORD DEVICE ADDR.

                        JSR     R5,LOADER               ;LOAD THE MICRO CODE

                        777                             ;MOVE #377,BRG
                        061220                          ;MOVE BRG,BSEL0
                        061222                          ;MOVE BRG,BSEL2
                        061223                          ;MOVE   BRG,BSEL3
                        061224                          ;MOVE   BRG,BSEL4
                        061225                          ;MOVE   BRG,BSEL5
                        061226                          ;MOVE BRG,BSEL6
                        061227                          ;MOVE   BRG,BSEL7
                        123000                          ;MOVE BSEL0,SP0
                        101410                          ;BRANCH BACK ONE UNTIL <>377

                        400                             ;MOVE   #0,BRG
```

```
6580  025436  061220                        61220                   ;MOVE BRG,BSEL0
6581  025440  061222                        61222                   ;MOVE BRG,BSEL2
6582  025442  061223                        61223                   ;MOVE BRG,BSEL3
6583  025444  061224                        61224                   ;MOVE BRG,BSEL4
6584  025446  061225                        61225                   ;MOVE BRG,BSEL5
6585  025450  061226                        61226                   ;MOVE BRG,,BSEL6
6586  025452  061227                        61227                   ;MOVE BRG,BSEL7
6587  025454  123000                        123000                  ;MOVE BSEL0,SP0
6588  025456  104022                        104022                  ;BRANCH BACK ONE LOCATION.
6589  025460  177777                        177777
6590
6591  025462  012711  040000                MOV     #040000,(R1)    ;INITIALIZE MCPU
6592  025466  012711  100000                MOV     #100000,(R1)    ;START CPU.
6593
6594  025472  012700  000062                MOV     #50.,R0         ;THE CYCLE TIME ON THE M8206 IS
6595                                                                 ;200NS.  WE ARE ASKING THE MCPU TO
6596                                                                 ;DO 8 INSTRUCTIONS.  WE'LL DELAY
6597                                                                 ;100 PDP11 INSTRUCTIONS
6598                                                                 ;THIS REALLY SHOULD BE PLENTY OF TIME.
6599
6600  025476  005300                20$:     DEC     R0
6601  025500  001376                        BNE     20$
6602
6603  025502  005005                        CLR     R5              ;JUST FOR TYPEOUT.
6604  025504  012705  000377                MOV     #377,R5         ;EXPECT 377
6605  025510  111104                        MOVB    (R1),R4         ;READ MCPU
6606  025512  120405                        CMPB    R4,R5           ;SEE IF OK.
6607  025514  001410                        BEQ     30$
6608
6609  025516                                ERROR   29              ;ERROR! MCPU WAS TO WRITE ALL
6610  025522  104455                        TRAP    C$ERDF
6611  025524  000035                        .WORD   29
6612  025526  005055                        .WORD   EM0
6613  025530  010350                        .WORD   ERR29
6614                                                                 ;ONES INTO BSEL0,BUT INSTEAD FAILED.
6615  025532                                ESCAPE  TST
6616  025532  104410                        TRAP    C$ESCAPE
6617  025534  000304                        .WORD   L10106-.
6618
6619  025536  012705  177777        30$:    MOV     #177777,R5      ;EXPECT ALL ONES
6620  025542  016104  000002                MOV     2(R1),R4        ;RECIEVED
6621  025546  020405                        CMP     R4,R5           ;RECIEVE OK?
6622  025550  001410                        BEQ     40$
6623
6624  025552                                ERROR   29              ;ERROR! MCPU WAS TO WRITE ALL ONES
6625  025556  104455                        TRAP    C$ERDF
6626  025560  000035                        .WORD   29
6627  025562  005055                        .WORD   EM0
6628  025564  010350                        .WORD   ERR29
6629                                                                 ;INTO BSEL 2&3
6630
6631  025566                                ESCAPE  TST
6632  025566  104410                        TRAP    C$ESCAPE
6633  025570  000250                        .WORD   L10106-.
6634
6635  025572  016104  000004        40$:    MOV     4(R1),R4        ;READ BSEL 4&5
```

```
6636  025576  020405                  CMP     R4,R5           ;READ OK?
6637  025600  001410                  BEQ     50$
6638
6639  025602                          ERROR   29              ;ERROR! FAILED TO WRITE BSEL $85
6640  025606  104455                  TRAP    C$ERDF
6641  025610  000035                  .WORD   29
6642  025612  005055                  .WORD   EM0
6643  025614  010350                  .WORD   ERR29
6644                                                          ; TO ALL ONES.
6645  025616                          ESCAPE  TST
6646  025616  104410                  TRAP    C$ESCAPE
6647  025620  000220                  .WORD   L10106-.
6648
6649  025622  016104  000006  50$:    MOV     6(R1),R4        ;READ BSEL 6&7
6650  025626  020405                  CMP     R4,R5           ;READ OK?
6651  025630  001410                  BEQ     60$
6652
6653  025632                          ERROR   29              ;ERROR! FAILED TO WRITE BSEL 6&7
6654  025636  104455                  TRAP    C$ERDF
6655  025640  000035                  .WORD   29
6656  025642  005055                  .WORD   EM0
6657  025644  010350                  .WORD   ERR29
6658                                                          ; TO ALL ONES.
6659  025646                          ESCAPE  TST
6660  025646  104410                  TRAP    C$ESCAPE
6661  025650  000170                  .WORD   L10106-.
6662  025652  105011          60$:    CLRB    (R1)            ;SIGNAL MCPU TO WRITE ALL ZEROS.
6663  025654  005005                  CLR     R5              ;EXPECT TO READ ALL ZEROS.
6664
6665  025656  005004                  CLR     R4
6666  025660  111104                  MOVB    (R1),R4         ;READ BSEL0
6667  025662  001410                  BEQ     70$             ;EXPECT ZERO.
6668
6669  025664                          ERROR   29              ;MCPU FAILED TO CLEAR BSEL0
6670  025670  104455                  TRAP    C$ERDF
6671  025672  000035                  .WORD   29
6672  025674  005055                  .WORD   EM0
6673  025676  010350                  .WORD   ERR29
6674
6675  025700                          ESCAPE  TST
6676  025700  104410                  TRAP    C$ESCAPE
6677  025702  000136                  .WORD   L10106-.
6678  025704  016104  000002  70$:    MOV     2(R1),R4        ;READ BSEL 2&3
6679  025710  001410                  BEQ     80$             ;IF ZERO,OK
6680
6681  025712                          ERROR   29              ;MCPU FAILED TO CLEAR BSEL 2&3
6682  025716  104455                  TRAP    C$ERDF
6683  025720  000035                  .WORD   29
6684  025722  005055                  .WORD   EM0
6685  025724  010350                  .WORD   ERR29
6686  025726                          ESCAPE  TST
6687  025726  104410                  TRAP    C$ESCAPE
6688  025730  000110                  .WORD   L10106-.
6689  025732                  80$:
6690  025732  016104  000004          MOV     4(R1),R4        ;READ BSEL 4&5
6691  025736  001410                  BEQ     90$
```

```
                                        ERROR   29                      ;MCPU FA.LED TO CLEAR BSEL 4&5
                                        TRAP    C$ERDF
                                        .WORD   29
                                        .WORD   EM0
                                        .WORD   ERR29
                                        ESCAPE  TST
                                        TRAP    C$ESCAPE
                                        .WORD   L10106-.
                                90$:
                                        MOV     6(R1),R4                ;READ BSEL 6&7
                                        BEQ     95$

                                        ERROR   29                      ;MCPU FAILED TO CLEAR BSEL 6&7
                                        TRAP    C$ERDF
                                        .WORD   29
                                        .WORD   EM0
                                        .WORD   ERR29

                                95$:    EXIT    TST
                                        TRAP    C$EXIT
                                        .WORD   L10106-.


                                        ;
                                        ;LOADER   SUBROUTINE USED BY THIS TEST TO LOAD MICRO CODE INTO A M8206
                                        ;

026006  012711  002000          LOADER: MOV     #2000,(R1)

026012  005000                          CLR     R0

026014  010061  000004          10$:    MOV     R0,4(R1)                ;SET ADDR.
026020  005200                          INC     R0
026022  011561  000006                  MOV     (R5),6(R1)              ;WRIITE MICRO CODE.
026026  022527  177777                  CMP     (R5)+,#177777           ;SEE IF TERM.
026032  001370                          BNE     10$
026034  005011                          CLR     (R1)
026036  000205                          RTS     R5

026040                                  ENDTST
026040                          L10106:
026040  104401                          TRAP    C$ETST

026042                                  BADHEAD
                                        ;*************** TEST 37 ***************
                                        ;*
                                        ;*NEGATIVE ADDRESS TEST.
                                        ;*      IN THIS TEST, WE'LL MAKE SURE THAT THE M8207
                                        ;*      DOES NOT RESPOND TO AN ADDRESS THAT ISN'T ASSIGNED
                                        ;*      TO IT
                                        ;*
026042                                  BADHEAD
                                        ;*************** TEST 37 ***************

026042                                  BGNTST
```

```
6748  026042                          T37::
6749  026042                                MYINT
6750  026042  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
6751
6752  026046  012711  000641                MOV     #641,(R1)       ;PUT A DEFINITE PATTERN IN MCPU.
6753  026052  012737  026130  000004        MOV     #20$,@#4        ;SET UP FOR TRAPS FROM NON-EX.
6754  026060  005037  000006                CLR     @#6
6755  026064  012702  160000                MOV     #160000,R2      ;GET STARTING ADDRESS.
6756
6757  026070  022712  000641        10$:    CMP     #641,(R2)       ;SEE IF CONTENTS OF THE ADDRESS
6758                                                                ;POINTED TO BY R2 EQUALS THE CONTENTS
6759                                                                ;OF THE MCPU CSR
6760  026074  001420                        BEQ     40$
6761
6762  026076  062702  000002        15$:    ADD     #2,R2           ;UPDATE ADDRESS.
6763  026102  020227  177700                CMP     R2,#177700      ;DONE?     ;BO
6764  026106  001370                        BNE     10$             ;NO-LOOP
6765
6766  026110  013737  002464  000004  17$:  MOV     SAVE4,@#4       ;RESTORE TRAP CATCHER
6767  026116  013737  002466  000006        MOV     SAVE6,@#6       ;FROM VALUES SAVED BY INIT SECTION
6768  026124                                EXIT    TST             ;EXIT, ALL DONE
6769  026124  104432                        TRAP    C$EXIT
6770  026126  000052                        .WORD   L10107-.
6771
6772  026130  062706  000004        20$:    ADD     #4,SP           ;SAVE FROM TRAP
6773  026134  000760                        BR      15$             ;LOOP
6774
6775  026136                          40$:  ;*OH NO, WE MAY HAVE A DUAL ADDRESS PROBLEM!
6776
6777  026136  012711  000174                MOV     #174,(R1)       ;WRITE NEW PATTERN IN MCPU CSR
6778  026142  022712  000174                CMP     #174,(R2)       ;DID NEW PATTERN SHOW UP IN ADDR?
6779  026146  001403                        BEQ     60$
6780
6781  026150  012711  000641        50$:    MOV     #641,(R1)       ;PUT OLD PATTERN BACK IN MCPU CSR.
6782  026154  000750                        BR      15$             ;LOOP
6783
6784  026156  020102                  60$:  CMP     R1,R2           ;IS THIS THE MCPU ADDRESS?
6785  026160  001773                        BEQ     50$             ;YES-NO ERROR
6786
6787  026162                                ERROR   40              ;DUAL ADDRESS ERROR
6788  026166  104455                        TRAP    C$ERDF
6789  026170  000050                        .WORD   40
6790  026172  005055                        .WORD   EM0
6791  026174  010636                        .WORD   ERR40
6792  026176  000744                        BR      17$
6793
6794  026200                                ENDTST
6795  026200                          L10107:
6796  026200  104401                        TRAP    C$ETST
6797
6798  026202                                BADHEAD
6799                                        ;*************** TEST 38 ***************
6800                                        ;*
6801                                        ;*BYTE ADDRESSING TEST
6802                                        ;*      HERE, WE'RE GOING TO MAKE SURE THAT WE CAN
6803                                        ;*      WRITE INTO ONLY A HIGH OR LOW BYTE OF THE MCPU.
```

```
                                        ;*
                                        BADHEAD
                                        ;*************** TEST 38 ***************

                                        BGNTST
                                T38::
                                        MYINT
026202  013701  002516          MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
026206  005061  000002          CLR     2(R1)                   ;CLEAR CSR
026212  112761  177777  000002  MOVB    #-1,2(R1)               ;WRITE ALL ONES INTO LOW BYTE
                                                                ;OF CSR
026220  032761  177400  000002  BIT     #177400,2(R1)           ;SEE IF HIGH BYTE GOT WRITTEN
026226  001410                  BEQ     10$

026230                          ERROR   41                      ;HIGH BYTE GOT WRITTEN INTO ON A LOW BYTE
026234  104455                  TRAP    C$ERDF
026236  000051                  .WORD   41
026240  005055                  .WORD   EM0
026242  010702                  .WORD   ERR41
026244                          ESCAPE  TST                     ;OPERATION
026244  104410                  TRAP    C$ESCAPE
026246  000040                  .WORD   L10110-.

026250  005061  000002  10$:    CLR     2(R1)
026254  112761  177777  000003  MOVB    #-1,3(R1)               ;WRITE INTO HIGH BYTE
026262  032761  000377  000002  BIT     #377,2(R1)              ;SEE IF LOW BYTE GOT WRITTEN
026270  001406                  BEQ     20$

026272                          ERROR   42                      ;LOW BYTE GOT WRITTEN INTO ON A
026276  104455                  TRAP    C$ERDF
026300  000052                  .WORD   42
026302  005055                  .WORD   EM0
026304  010744                  .WORD   ERR42
                                                                ;HIGH BYTE OPERATION.

026306                  20$:
026306                          ENDTST
026306                  L10110:
026306  104401                  TRAP    C$ETST

026310                          BADHEAD
                                ;*************** TEST 39 ***************
                                ;*
                                ;*IN THIS TEST WE'RE GOING TO MAKE SURE THAT THE PC
                                ;*REG COUNTS UP PROPERLY. THE PC REG SHOULD INCREMENT
                                ;*ONCE AFTER EACH INSTRUCTION.
                                ;*
026310                          BADHEAD
                                ;*************** TEST 39 ***************

026310                          BGNTST
026310                  T39::
026310                          SKIP07  10$                     ;ONLY DO IF M8207
                                ;GOTO 10$ IF M8207
026320                          EXIT TST
026320  104432                  TRAP    C$EXIT
```

```
CZDMQD.P11    12-JAN-82 09:50        HARDWARE TESTS

 6860  026322  000122                        .WORD   L10111-.
 6861
 6862  026324                        10$:    MYINT
 6863  026324  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
 6864  026330                                MSTCLR
 6865  026334                                ROMCLK
 6866  026334  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 6867  026340  000400                        400
 6868  026342                                ROMCLK
 6869  026342  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 6870  026346  061233                        61233
 6871  026350                                SROMCLK
 6872  026350  004537  003100                JSR     R5,..SROMCLK
 6873  026354  100000                        100000
 6874  026356  012705  000001                MOV     #1,R5           ;START AT ZERO
 6875
 6876  026362                        20$:    ROMCLK                  ;READ PC HIGH REG.
 6877  026362  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 6878  026366  121265                        121265
 6879
 6880  026370                                ROMCLK                  ;READ PC LOW REG.
 6881  026370  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
 6882  026374  121244                        121244
 6883  026376  016104  000004                MOV     4(R1),R4        ;GET WHOLE PICTURE
 6884  026402  042704  170000                BIC     #170000,R4
 6885  026406  020405                        CMP     R4,R5           ;INCREMENT OK?
 6886  026410  001410                        BEQ     30$
 6887
 6888  026412                                ERROR   47              ;PC FAILED TO INCREMENT PROPERLY
 6889  026416  104455                        TRAP    C$ERDF
 6890  026420  000057                        .WORD   47
 6891  026422  005055                        .WORD   EMO
 6892  026424  011264                        .WORD   ERR47
 6893                                                                ;SHOULD INCREMENT BY ONE
 6894                                                                ;FOR EACH INSTRUCTION.
 6895  026426                                ESCAPE  TST
 6896  026426  104410                        TRAP    C$ESCAPE
 6897  026430  000014                        .WORD   L10111-.
 6898
 6899  026432  062705  000002        30$:    ADD     #2,R5           ;UPDATE EXPECTED ADDRESS BY 2.
 6900  026436  020527  000777                CMP     R5,#777
 6901  026442  001347                        BNE     20$
 6902
 6903  026444                                ENDTST
 6904  026444                        L10111:
 6905  026444  104401                        TRAP    C$ETST
 6906
 6907  026446                                BADHEAD
 6908                                        ;*************** TEST 40 ***************
 6909                                        ;*
 6910                                        ;*IN THIS TEST WE'LL MAKE SURE THAT 'BRANCH FIELD H'' DOESN'T
 6911                                        ;*GET SUCH HIGH.
 6912                                        ;*FIRST WE'LL CLEAR THE PC HIGH REG. THEN WE'LL DO A BRANCH INSTR
 6913                                        ;*WITH BAB BITS 11&12 SET. IF PCR BITS 8&9 SET THEN WE'LL KNOW
 6914                                        ;*WE WERE SUCCESSFUL IF PCR BITS 8&9 FAIL TO SET, WE'LL KNOW
 6915                                        ;*THAT THE MUX SELECTED THE WRONG INPUT TO BE CLOCKED INTO THE PCR.
```

```
6916
6917  026446                        ;*
6918                                BADHEAD
6919                                ;*************** TEST 40 ***************
6920  026446                        BGNTST
6921  026446                  T40::
6922  026446                        SKIP07  10$             ;ONLY DO IF M8207
6923                                ;GOTO 10$ IF M8207
6924  026456                        EXIT TST
6925  026456  104432                TRAP    C$EXIT
6926  026460  000062                .WORD   L10112-.
6927
6928  026462                  10$:  MYINT                   ;INITIALIZE PARAMETERS
6929  026462  013701  002516        MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
6930  026466                        MSTCLR                  ;CLEAR DEVICE.
6931
6932  026472                        ROMCLK                  ;DO A "BRANCH ALWAYS" WITH
6933  026472  004537  003044        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6934  026476  114400                114400                  ;BAB BITS 11&12 SET THIS SHOULD CLOCK
6935                                                        ;THESE BITS INTO BITS 8&9 OF THE PCR.
6936  026500                        ROMCLK                  ;NOW READ THE PCR HIGH
6937  026500  004537  003044        JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
6938  026504  121265                121265                  ;AND PUT INTO PORT5.
6939                                                        ;REG. BR NO CLK OF BAB BITS
6940  026506  116105  000005        MOVB    5(R1),R5        ;READ THE PCR.
6941  026512  112704  000003        MOVB    #3,R4           ;EXPECT BITS 8,9 TO BE SET.
6942  026516  042705  177774        BIC     #177774,R5      ;;STRIP ANY JUNK                VRG0182
6943  026522  020405                CMP     R4,R5           ;OK?
6944  026524  001406                BEQ     20$
6945
6946  026526                        ERROR   15              ;"BRANCH FIELD H" STUCK HIGH OR
6947  026532  104455                TRAP    C$ERDF
6948  026534  000017                .WORD   15
6949  026536  005055                .WORD   EM0
6950  026540  010006                .WORD   ERR15
6951                                                        ;OTHER PROBLEM IN THIS AREA.
6952
6953  026542                  20$:
6954  026542                        ENDTST
6955  026542                  L10112:
6956  026542  104401                TRAP    C$ETST
6957
6958  026544                        BADHEAD
6959                                ;*************** TEST 41 ***************
6960                                ;*
6961                                ;*IN THIS TEST WE'RE GOING TO MAKE SURE THAT ONLY SP0
6962                                ;*IS SELECTED FOR SOURCE WHEN THE DESTINATION
6963                                ;*IS THE OUTBUS
6964                                ;*FIRST WE'LL WRITE EACH SP ADDRS INTO ITSELF THEN WE'LL
6965                                ;*MOV SP TO OBUS4. THAT SHOULD SELECT
6966                                ;*SP ADDRESS 0. IF ANY OTHER DATA SHOWS UP, WE'LL
6967                                ;*BLAME IT ON THE SELECTION OF A DIFFERENT SCRATCH PAD.
6968  026544                        BADHEAD
6969                                ;*************** TEST 41 ***************
6970
6971  026544                        BGNTST
```

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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS

 6972  026544                         T41::
 6973  026544                                 MYINT
 6974  026544  013701  002516                 MOV     KMCSR,R1            ;RECORD DEVICE ADDR.
 6975  026550  005005                         CLR     R5                  ;START WITH ADDR-ZERO
 6976
 6977  026552  042737  000017  026574 10$:    BIC     #17,20$             ;STRIP SP ADDR FIELD FROM INSTR
 6978  026560  010561  000004                 MOV     R5,4(R1)            ;PUT SP ADDR INTO PORT4.
 6979  026564  050537  026574                 BIS     R5,20$              ;ADD SP ADDR TO INSTR.
 6980  026570                                 ROMCLK
 6981  026570  004537  003044                 JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
 6982  026574  123100                 20$:    123100                      ;WRITE TO SP
 6983  026576  005205                         INC     R5                  ;UPDATE ADDRESS
 6984  026600  120527  000020                 CMPB    R5,#20              ;IF NOT THROUGH, REPEAT.
 6985  026604  001362                         BNE     10$
 6986
 6987  026606                                 ROMCLK                      ;NOW MOV SP0 TO OBUS* PORT4
 6988  026606  004537  003044                 JSR     R5,..ROMCLK         ;CLOCK INSTRUCTION
 6989  026612  061204                         061204                      ;
 6990  026614  116104  000004                 MOVB    4(R1),R4            ;READ PORT4 IT S/B ZERO
 6991  026620  001410                         BEQ     30$
 6992  026622  012705  000000                 MOV     #0,R5
 6993  026626                                 ERROR   43                  ;SP0 NOT SELECTED FOR SOURCE-SEE
 6994  026632  104455                         TRAP    C$ERDF
 6995  026634  000053                         .WORD   43
 6996  026636  005055                         .WORD   EM0
 6997  026640  011006                         .WORD   ERR43
 6998                                                                     ;DISCUSSION IN HEADER.
 6999
 7000  026642                         30$:    ENDTST
 7001  026642                         L10113:
 7002  026642  104401                         TRAP    C$ETST
 7003
 7004  026644                                 BADHEAD
 7005                                         ;*************** TEST 42 ***************
 7006                                         ;*
 7007                                         ;*IN THIS TEST WE ARE GOING TO MAKE SURE THAT THE
 7008                                         ;*SIGNAL 'MOV INST H' (AND ITS ASSOC. TRIBS) DOESN'T GET
 7009                                         ;*STUCK HIGH. IN ORDER TO DO THIS WE'LL CLEAR THE PC HIGH REG
 7010                                         ;*PUT KNOWN DATA IN THE BREG AND SP1 THEN WE'LL A BRANCH
 7011                                         ;*WITH CROM BITS 0-3 SET AS WELL AS CROM BIT 9 WITH CROM BITS 8 AND 11 CLEAR.
 7012                                         ;*IF 'MOV INST H' GETS STUCK HIGH, THE PC REG HIGH WILL GET LOADED
 7013                                         ;*WITH THE CONTENTS OF THE ALU
 7014  026644                                 BADHEAD
 7015                                         ;*************** TEST 42 ***************
 7016
 7017  026644                                 BGNTST
 7018  026644                         T42::
 7019  026644                                 SKIP07  10$                 ;ONLY DO IF M8207
 7020                                         ;GOTO 10$ IF M8207
 7021  026654                                 EXIT TST                    ;ELSE EXIT
 7022  026654  104432                         TRAP    C$EXIT
 7023  026656  000110                         .WORD   L10114-.
 7024
 7025  026660                         10$:    MYINT                       ;DO INITIAL TEST SET-UP.
 7026  026660  013701  002516                 MOV     KMCSR,R1                    ;RECORD DEVICE ADDR.
 7027  026664                                 MSTCLR                      ;DO A MASTER CLEAR.
```

```
7028  026670  005737  002470          TST     RUNB
7029  026674  001034                  BNE     20$
7030
7031                                  ;TO RUN THIS SECTION OF CODE YOU MUST TURN SW7 OF SWITCH PACK #E28
7032                                  ;OFF SO THAT M8207 NOT SELFSTARTING.
7033
7034  026676  012761  000002  000004  MOV     #2,4(R1)        ;PUT A 2 INTO SP1
7035  026704                          ROMCLK                  ;PORT4 TO SCRATCH PAD 1
7036  026704  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7037  026710  123101                  123101
7038  026712  012761  000004  000004  MOV     #4,4(R1)
7039  026720                          ROMCLK
7040  026720  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7041  026724  123100                  123100
7042  026726                          ROMCLK                  ;NOW DO A BRANCH ON C-BIT SET
7043  026726  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7044  026732  141201                  141201                  ;BASED ON SP CONTENTS
7045                                                          ;OK-WHAT WE ARE REALLY
7046                                                          ;INTERESTED IN IS SEEING IF THE
7047                                                          ;PC HIGH REG GETS LOADED WITH
7048                                                          ;THE CONTENTS OF THE ALU (2)
7049                                                          ;IF THIS OCCURS, WE CAN PROBABLY
7050                                                          ;SAY THAT "MOV INSTR" REMAINED
7051                                                          ;HIGH.
7052  026734                          ROMCLK                  ;READ PC HIGH, PUT INTO PORT5
7053  026734  004537  003044          JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7054  026740  121265                  121265
7055  026742  116104  000005          MOVB    5(R1),R4        ;READ PC REG HIGH FROM PORT
7056  026746  001407                  BEQ     20$             ;SHOULD BE CLEAR
7057  026750  005005                  CLR     R5
7058
7059  026752                          ERROR   15              ;ERROR-PC REG HIGH S/B CLEAR-SEE HEADER
7060  026756  104455                  TRAP    C$ERDF
7061  026760  000017                  .WORD   15
7062  026762  005055                  .WORD   EM0
7063  026764  010006                  .WORD   ERR15
7064                                                          ;DISCUSSION.
7065
7066  026766                  20$:
7067  026766                          ENDTST
7068  026766                  L10114:
7069  026766  104401                  TRAP    C$ETST
7070
7071  026770                          BADHEAD
7072                                  ;*************** TEST 43 ***************
7073                                  ;*TEST THAT MASTER CLEAR, CLEARS BITS IN THE NPR CONTROL REGISTER AND
7074                                  ;*MICROPROCESSOR MISCELLANEOUS REGISTER-FIRST WE'LL SET THE
7075                                  ;*PRIORITY UP SO THAT WHEN WE SET THE BUS REQUEST BIT THAT IT WON'T BUG US
7076                                  ;*THEN WE'LL SET ALL THE BITS IN BOTH REGS EXCEPT THE
7077                                  ;*NPR REQUEST. WE'LL LOOK TO SEE THAT ALL GOT SET, NEXT
7078                                  ;*WE'LL DO A MASTER CLEAR AND BE SURE THAT THEY ALL
7079                                  ;*CLEAR.
7080  026770                          BADHEAD
7081                                  ;*************** TEST 43 ***************
7082
7083  026770                          BGNTST
```

```
7084  026770                          T43::
7085  026770                                MYINT
7086  026770  013701  002516                MOV     KMCSR,R1                ;RECORD DEVICE ADDR.
7087  026774                                MSTCLR
7088  027000                                SETPRI  #PRI07          ;DON'T ALLOW INTERRUPTS.
7089  027000  012700  000340                MOV     #PRI07,R0
7090  027004  104441                        TRAP    C$SPRI
7091  027006  012761  177777  000004        MOV     #-1,4(R1)       ;DATA TO BE SET
7092  027014  042761  000002  000004        BIC     #2,4(R1)        ;DON'T SET AC LOW!
7093  027022                                ROMCLK
7094  027022  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7095  027026  121111                        121111                  ;PUT INTO MISC REG.
7096  027030  042761  000400  000004        BIC     #400,4(R1)      ;DON'T SET NPR BIT
7097  027036                                ROMCLK
7098  027036  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7099  027042  121130                        121130                  ;PUT INTO NPR REG
7100  027044                                ROMCLK
7101  027044  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7102  027050  121225                        121225                  ;MOV MISC REG (11) TO PORT5
7103
7104  027052                                ROMCLK
7105  027052  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7106  027056  121204                        121204                  ;MOVE NPR REG (10) TO PORT4
7107  027060  012737  146636  002452        MOV     #146636,$GDDAT  ;EXPECT ALL TO SET
7108  027066  016104  000004                MOV     4(R1),R4        ;READ WHAT HAPPEN
7109  027072  042704  030140                BIC     #030140,R4      ;MASK UNUSED BITS
7110  027076  023704  002452                CMP     $GDDAT,R4       ;DID ALL BITS GET SET?
7111  027102  001410                        BEQ     10$             ;YES CONTINUE.
7112  027104                                BRESET
7113  027104  104433                        TRAP    C$RESET
7114  027106                                ERROR   46              ;SO SORT OF PROBLEM SETTING BITS
7115  027112  104455                        TRAP    C$ERDF
7116  027114  000056                        .WORD   46
7117  027116  005055                        .WORD   EM0
7118  027120  011214                        .WORD   ERR46
7119                                                                  ;IN THE NPR AND/OR MISC REG.
7120  027122                                CKLOOP
7121  027122  104406                        TRAP    C$CLP1
7122
7123  027124  152761  000100  000001  10$:  BISB    #100,1(R1)      ;SET MASTER CLEAR
7124  027132  142761  000300  000001        BICB    #300,1(R1)      ;CLEAR MASTER CLEAR
7125
7126  027140                                ROMCLK
7127  027140  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7128  027144  121225                        121225                  ;MOV MISC REG (11) TO PORT5
7129
7130  027146                                ROMCLK
7131  027146  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7132  027152  121204                        121204                  ;MOV NPR REG (10) TO PORT4
7133  027154  016104  000004                MOV     4(R1),R4        ;READ RESULTS
7134  027160  005037  002452                CLR     $GDDAT          ;EXPECT ZERO
7135  027164  042704  010140                BIC     #010140,R4      ;MASK UNUSED BITS
7136  027170  001407                        BEQ     20$             ;IF ALL ZERO, EVERYTHING COOL.
7137
7138  027172                                ERROR   46              ;MASTER CLEAR FAILED TO CLEAR
7139  027176  104455                        TRAP    C$ERDF
```

```
7140  027200  000056                        .WORD   46
7141  027202  005055                        .WORD   EM0
7142  027204  011214                        .WORD   ERR46
7143                                                  ;SOME BITS IN THE NPR AND/OR MISC REGS.
7144  027206                                CKLOOP
7145  027206  104406                        TRAP    C$CLP1
7146
7147  027210                          20$:
7148  027210  012761  000014  000004        MOV     #14,4(R1)       ;NOW WE ARE GOING TO TRY TO
7149  027216                                ROMCLK                  ;SET THE EXT BITS (16&17) IN THE NPR REG.
7150  027216  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7151  027222  121110                        121110                  ;IF MASTER CLEAR FAILED TO CLEAR ITSELF
7152  027224                                ROMCLK                  ;THEN WE WILL BE UNABLE TO SET
7153  027224  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7154  027230  121205                        121205                  ;THESE BITS
7155  027232  116104  000005                MOVB    5(R1),R4        ;READ REG
7156  027236  042704  000140                BIC     #140,R4         ;MASK UNUSED BITS
7157  027242  012737  000014  002452        MOV     #14,$GDDAT      ;STORE GOOD
7158  027250  023704  002452                CMP     $GDDAT,R4       ;DID BITS SET?
7159  027254  001407                        BEQ     30$             ;YES-CONTINUE
7160
7161  027256                                ERROR   46              ;MASTER CLEAR FAILED TO CLEAR
7162  027262  104455                        TRAP    C$ERDF
7163  027264  000056                        .WORD   46
7164  027266  005055                        .WORD   EM0
7165  027270  011214                        .WORD   ERR46
7166                                                  ;ITSELF, THUS PROHIBITING US FROM
7167                                                  ;FURTHER SETTING BITS IN THE NPR REG.
7168  027272                                CKLOOP
7169  027272  104406                        TRAP    C$CLP1
7170
7171  027274                          30$:  BRESET                  ;NOW WE'LL SEE IF A BUS RESET CLEARS
7172  027274  104433                        TRAP    C$RESET
7173                                                  ;THESE BITS.
7174  027276  005737  002470                TST     RUNB            ;CAN'T DO THIS
7175  027302  001016                        BNE     40$             ;TEST IF RUN SW SET.
7176  027304                                ROMCLK
7177  027304  004537  003044                JSR     R5,..ROMCLK     ;CLOCK INSTRUCTION
7178  027310  121204                        121204                  ;READ MISC REG
7179  027312  116104  000004                MOVB    4(R1),R4
7180  027316  001410                        BEQ     40$             ;IF ZERO-END TST
7181
7182  027320  005037  002452                CLR     $GDDAT          ;S/B ZERO
7183
7184  027324                                ERROR   46              ;BUS RESET FAILED TO CLEAR NPR REG
7185  027330  104455                        TRAP    C$ERDF
7186  027332  000056                        .WORD   46
7187  027334  005055                        .WORD   EM0
7188  027336  011214                        .WORD   ERR46
7189                                                  ;MASTER CLEAR WAS ABLE TO LOOK TO THE
7190                                                  ;CIRCUITRY THAT CONVERTS BUS INIT
7191                                                  ;TO "CLEAR"
7192
7193  027340                          40$:
7194  027340                                ENDTST
7195  027340                          L10115:
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CZDMQD.P11    12-JAN-82 09:50          HARDWARE TESTS
  7196  027340  104401                         TRAP    C$ETST
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CZDMQD.P11    12-JAN-82 09:50          HARDWARE PARAMETER CODING SECTION

  7197                                 .SBTTL HARDWARE PARAMETER CODING SECTION
  7198
  7199
  7200
  7201                                 ;////////////////////////////////////////////////////////////////////////
  7202                                 ;/ THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
  7203                                 ;/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
  7204                                 ;/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
  7205                                 ;/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
  7206                                 ;/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
  7207                                 ;/ WITH THE OPERATOR.
  7208                                 ;////////////////////////////////////////////////////////////////////////
  7209
  7210  027342                                 BGNHRD
  7211  027342  000016                         .WORD L10116-L$HARD/2
  7212  027344                         L$HARD::
  7213
  7214  027344                                 GPRMD   WPM,0,0,7,0,7,YES
  7215  027344  000032                         .WORD   T$CODE
  7216  027346  027400                         .WORD   WPM
  7217  027350  000007                         .WORD   7
  7218  027352  000000                         .WORD   T$LOLIM
  7219  027354  000007                         .WORD   T$HILIM
  7220  027356                                 GPRMA   ADDRES,2,0,160000,177776,YES
  7221  027356  001031                         .WORD   T$CODE
  7222  027360  027452                         .WORD   ADDRES
  7223  027362  160000                         .WORD   T$LOLIM
  7224  027364  177776                         .WORD   T$HILIM
  7225                                 ;       GPRMA   VECTOR,4,0,0,674,YES
  7226                                 ;       GPRMD   PRIRTY,6,0,7000,4,7,YES
  7227                                 ;       GPRMD   LNUNIT,10,0,3,0,3,YES
  7228                                 ;       GPRMD   SWPAC1,12,0,377,0,377,YES
  7229                                 ;       GPRMD   SWPAC2,14,0,377,0,377,YES
  7230                                 ;       GPRMD   LOOPBK,16,0,40000,0,1,YES
  7231  027366                                 GPRMD   ISRUN,24,0,7,0,1,YES
  7232  027366  012032                         .WORD   T$CODE
  7233  027370  030050                         .WORD   ISRUN
  7234  027372  000007                         .WORD   7
  7235  027374  000000                         .WORD   T$LOLIM
  7236  027376  000001                         .WORD   T$HILIM
  7237  027400                                 ENDHRD
  7238                                         .EVEN
  7239  027400                         L10116:
  7240
  7241  027400  044127  041511  020110  WPM:    .ASCIZ  'WHICH MICRO-CPU? (0=M8200,4=M8204,7=M8207''
  7242  027406  044515  051103  026517
  7243  027414  050103  037525  024040
  7244  027422  036460  034115  030062
  7245  027430  026060  036464  034115
  7246  027436  030062  026064  036467
  7247  027444  034115  030062  000067
  7248  027452  044515  051103  026517  ADDRES: .ASCIZ  /MICRO-CPU  CSR ADDRESS : /
  7249  027460  050103  020125  041440
  7250  027466  051123  040440  042104
  7251  027474  042522  051523  035040
  7252  027502  000040
```

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7253  027504  044515  051103  026517  VECTOR: .ASCIZ  /MICRO-CPU VECTOR ADDRESS : /
7254  027512  050103  020125  042526
7255  027520  052103  051117  040440
7256  027526  042104  042522  051523
7257  027534  035040  000040
7258  027540  044515  051103  026517  PRIRTY: .ASCIZ  /MICRO-CPU PRIORITY LEVEL : /
7259  027546  050103  020125  051120
7260  027554  047511  044522  054524
7261  027562  046040  053105  046105
7262  027570  035040  000040
7263  027574  044127  041511  020110  LNUNIT: .ASCIZ  /WHICH LINE UNIT (0-3)? 0=NONE,1=M8201,2=M8202,3=M8203 : /
7264  027602  044514  042516  052440
7265  027610  044516  020124  030050
7266  027616  031455  037451  030040
7267  027624  047075  047117  026105
7268  027632  036461  034115  030062
7269  027640  026061  036462  034115
7270  027646  030062  026062  036463
7271  027654  034115  030062  020063
7272  027662  020072     000
7273  027665     123  044527  041524  SWPAC1: .ASCIZ  /SWITCH PACK #1 (DDCMP LINE #) : /
7274  027672  020110  040520  045503
7275  027700  021440  020061  042050
7276  027706  041504  050115  046040
7277  027714  047111  020105  024443
7278  027722  035040  000040
7279  027726  053523  052111  044103  SWPAC2: .ASCIZ  /SWITCH PACK #2 (BM873 BOOT ADR) : /
7280  027734  050040  041501  020113
7281  027742  031043  024040  046502
7282  027750  033470  020063  047502
7283  027756  052117  040440  051104
7284  027764  020051  020072     000
7285  027771     127  046111  020114  LOOPBK: .ASCIZ  /WILL TEST CONNECTOR(S) BE USED ? 0=NO,1=YES : /
7286  027776  042524  052123  041440
7287  030004  047117  042516  052103
7288  030012  051117  051450  020051
7289  030020  042502  052440  042523
7290  030026  020104  020077  036460
7291  030034  047516  030454  054475
7292  030042  051505  035040  000040
7293  030050  044515  051103  026517  ISRUN:  .ASCIZ  'MICRO-PROCESSOR RUN SWITCH  TYPE 0 IF OFF, 1 IF ON :"
7294  030056  051120  041517  051505
7295  030064  047523  020122  052522
7296  030072  020116  053523  052111
7297  030100  044103  020040  054524
7298  030106  042520  030040  044440
7299  030114  020106  043117  026106
7300  030122  030440  044440  020106
7301  030130  047117  035040     000
7302
7303        030136                  .EVEN
7304
7305
7306
7307
7308
```

7309

```
                                .SBTTL  SOFTWARE PARAMETER CODING SECTION


                                ;////////////////////////////////////////////////////////////////
                                ;/ THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ;/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                ;/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                ;/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                ;/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                ;/ WITH THE OPERATOR.
                                ;////////////////////////////////////////////////////////////////

030136                                  BGNSFT
030136  000000                          .WORD L10117-L$SOFT/2
030140                          L$SOFT::


030140                                  ENDSFT
                                        .EVEN
030140                          L10117:

                                .EVEN









030140                                          LASTAD
                                                .EVEN
030140  000000                                  .WORD   0
030142  000000                                  .WORD   0
030144                                  L$LAST::

        000001                  .END
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
ADDRES  027452          7222    7248#
ADR   = 000020 G        1545#
ADR1    012600          3426#   3455
ADR2    012604          3427#   3452
ADR4    012444          3376#   3403
ADR5    012450          3377#   3400
ASSEMB= 000010          1234
BIT0  = 000001 G        1518#   1865    1866    1879    1880    6025    6027    6028
BIT00 = 000001 G        1507#   1518
BIT01 = 000002 G        1506#   1517
BIT02 = 000004 G        1505#   1516
BIT03 = 000010 G        1504#   1515
BIT04 = 000020 G        1503#   1514
BIT05 = 000040 G        1502#   1513
BIT06 = 000100 G        1501#   1512
BIT07 = 000200 G        1500#   1511
BIT08 = 000400 G        1499#   1510
BIT09 = 001000 G        1498#   1509
BIT1  = 000002 G        1517#   1863    1865    1866    1873    1880    5498    6023    6025    6027
BIT10 = 002000 G        1497#   1997    2018    2026    3380    3431    3483    3512    6156
BIT11 = 004000 G        1496#   6106    6139    6144
BIT12 = 010000 G        1495#   3115
BIT13 = 020000 G        1494#   2000    2021    2029    3126    3383    3434    3486
BIT14 = 040000 G        1493#   6172
BIT15 = 100000 G        1492#   3130
BIT2  = 000004 G        1516#   1866    1880
BIT3  = 000010 G        1515#
BIT4  = 000020 G        1514#
BIT5  = 000040 G        1513#   3911
BIT6  = 000100 G        1512#   1850    1851    3934
BIT7  = 000200 G        1511#   1851
BIT8  = 000400 G        1510#   1973    3909    6106
BIT9  = 001000 G        1509#   6104    6106    6156
BOE   = 000400 G        1549#
CLKX    002360          1601#
CLRALL  003166          1886#   3997    4021    4045    4798    4824    4848    4900    4926    4950    5001    5027    5051
                        5102    5128    5152    5204    5230    5254    5305    5331    5355    5879    5916    5953    5989
CRAMA   003602          2027    2036#
CZDMQ   002000 G        1240#
C$AU  = 000052          1234#   3242
C$AUTO= 000061          1234#   3188
C$BRK = 000022          1234#   3590    3652    3743    3836
C$BSEG= 000004          1234#   3379    3429    3481    3506    3994    4020    4044    4096    4119    4142    4193    4218
                        4243    4295    4319    4343    4396    4420    4444    4497    4521    4545    4597    4621    4645
                        4697    4721    4745    4796    4821    4847    4898    4923    4949    5000    5024    5050    5101
                        5125    5151    5203    5227    5253    5304    5328    5354
C$BSUB= 000002          1234#
C$CEFG= 000045          1234#
C$CLCK= 000062          1234#
C$CLEA= 000012          1234#   3204
C$CLOS= 000035          1234#
C$CLP1= 000006          1234#   7121    7145    7169
C$CVEC= 000036          1234#
C$DCLN= 000044          1234#
C$DODU= 000051          1234#   3182
C$DRPT= 000024          1234#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
C$DU  = 000053   1234#  3224
C$EDIT= 000003   1234#  1311
C$ERDF= 000055   1234#  3281  3329  3349  3388  3439  3495  3518  3578  3640  3702  3735  3800
                 3825  3872  3917  3940  3959  4009  4033  4057  4108  4131  4154  4206  4231
                 4256  4308  4332  4356  4409  4433  4457  4510  4534  4558  4610  4634  4658
                 4710  4734  4758  4810  4836  4860  4912  4938  4962  5013  5039  5063  5114
                 5140  5164  5216  5242  5266  5317  5343  5367  5440  5508  5626  5709  5814
                 5889  5908  5925  5963  5981  5998  6035  6052  6068  6111  6133  6146  6163
                 6176  6314  6345  6367  6393  6465  6520  6610  6625  6640  6654  6670  6682
                 6694  6706  6788  6819  6833  6884  6947  6994  7060  7115  7139  7162  7185
C$ERHR= 000056   1234#
C$ERRO= 000060   1234#
C$ERSF= 000054   1234#
C$ERSO= 000057   1234#
C$ESCA= 000010   1234#  3272  3289  3335  3393  3444  3500  3523  3583  3645  3707  3740  3833
                 3922  4014  4038  4062  4113  4136  4159  4212  4237  4261  4313  4337  4361
                 4414  4438  4462  4515  4539  4563  4615  4639  4663  4715  4739  4763  4815
                 4841  4865  4917  4943  4967  5018  5044  5068  5119  5145  5169  5221  5247
                 5271  5322  5348  5372  5449  5516  5661  5849  5895  5914  5969  5987  6319
                 6372  6398  6527  6616  6632  6646  6660  6676  6687  6699  6824  6896
C$ESEG= 000005   1234#  3397  3448  3504  3527  4018  4042  4066  4117  4140  4163  4216  4241
                 4265  4317  4341  4365  4418  4442  4466  4519  4543  4567  4619  4643  4667
                 4719  4743  4767  4819  4845  4869  4921  4947  4971  5022  5048  5072  5123
                 5149  5173  5225  5251  5275  5326  5352  5376
C$ESUB= 000003   1234#
C$ETST= 000001   1234#  3294  3357  3407  3459  3535  3597  3659  3750  3879  3966  4069  4166
                 4268  4368  4469  4570  4670  4770  4872  4974  5075  5176  5278  5379  5457
                 5526  5717  5859  5932  6005  6078  6188  6417  6473  6542  6734  6796  6842
                 6905  6956  7002  7069  7196
C$EXIT= 000032   1234#  3370  3420  3473  3764  3894  3986  4088  4185  4287  4387  4488  4589
                 4689  4789  4891  4993  5094  5196  5297  5396  5476  5569  5757  5874  5948
                 6154  6404  6489  6533  6560  6712  6769  6859  6925  7022
C$GETB= 000026   1234#
C$GETW= 000027   1234#
C$GMAN= 000043   1234#
C$GPHR= 000042   1234#  3077
C$GPLO= 000030   1234#
C$GPRI= 000040   1234#
C$INIT= 000011   1234#  3162
C$INLP= 000020   1234#
C$MANI= 000050   1234#
C$MEM = 000031   1234#
C$MSG = 000023   1234#  2374  2403  2432  2460  2488  2517  2546  2574  2602  2630  2658  2686
                 2715  2743  2766  2794  2822  2834  2853  2870  2887  2907  2926  2951  2970
                 2990
C$OPEN= 000034   1234#
C$PNTB= 000014   1234#  2352  2358  2366  2371  2381  2387  2395  2400  2410  2416  2424  2429
                 2439  2445  2452  2457  2467  2473  2480  2485  2495  2501  2509  2514  2524
                 2530  2538  2543  2553  2559  2566  2571  2581  2587  2594  2599  2609  2615
                 2622  2627  2637  2643  2650  2655  2665  2671  2678  2683  2693  2699  2707
                 2712  2722  2728  2735  2740  2752  2758  2763  2773  2779  2786  2791  2801
                 2807  2814  2819  2830  2849  2866  2883  2903  2922  2941  2947  2966  2986
C$PNTF= 000017   1234#  2843  2860  2877  2897  2916  2935  296C  2980
C$PNTS= 000016   1234#
C$PNTX= 000015   1234#
C$QIO = 000377   1234#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
C$RDBU= 000007          1234#
C$REFG= 000047          1234#  3042  3048  3054  3060
C$RESE= 000033          1234#  3200  3221  6094  7113  7172
C$REVI= 000003          1234#  1310
C$RFLA= 000021          1234#
C$RPT = 000025          1234#  3011
C$SEFG= 000046          1234#
C$SPRI= 000041          1234#  7090
C$SVEC= 000037          1234#
C$TPRI= 000013          1234#
DFPTBL  002262 G        1431#
DH0     005723          2271#  2754
DH1     005724          2274#  2354  2383  2412  2497  2526
DH2     005755          2279#  2441  2469  2555  2583  2611  2639  2667  2724  2775  2803
DH3     005775          2282#  2695
DIAGMC= 000000          1234
EF.CON= 000036 G        1525#  3053
EF.NEW= 000035 G        1526#  3047
EF.PWR= 000034 G        1527#
EF.RES= 000037 G        1524#  3059
EF.STA= 000040 G        1523#  3041
EMB1    005410          2230#  6070
EMB50   005545          2250#  6037
EMB51   005577          2255#  6054
EM0     005055          2188#  3283  3331  3351  3390  3441  3497  3520  3580  3642  3704  3737  3802
                        3827   3874  3919  3942  3961  4011  4035  4059  4110  4133  4156  4208  4233
                        4258   4310  4334  4358  4411  4435  4459  4512  4536  4560  4612  4636  4660
                        4712   4736  4760  4812  4838  4862  4914  4940  4964  5015  5041  5065  5116
                        5142   5166  5218  5244  5268  5319  5345  5369  5442  5510  5628  5711  5816
                        5891   5910  5927  5965  5983  6000  6113  6135  6148  6165  6178  6316  6347
                        6369   6395  6467  6522  6612  6627  6642  6656  6672  6684  6696  6708  6790
                        6821   6835  6891  6949  6996  7062  7117  7141  7164  7187
EM1     005056          2189#  2348  2406
EM10    005260          2214#  2577  2633
EM11    005312          2219#  2661
EM12    005333          2222#  2689
EM16    005353          2225#  2718
EM17    005434          2235#  2748
EM2     005076          2192#  2377
EM27    005463          2239#
EM29    005512          2244#  2769
EM3     005131          2197#  2435
EM35    005434          2234#  2797
EM4     005144          2199#  2463
EM5     005171          2203#  2491
EM6     005216          2207#  2520
EM7     005233          2210#  2549  2605
ENDBUG  003044          1858#
ENDIT   012040          3056   3148  3152  3159#
ERRFLG  002350          1597#
ERR1    006032 G        2347#  3391  3442  3498  6523
ERR10   007154 G        2548#
ERR11   007276 G        2576#  3803  3828
ERR12   007420 G        2604#  3332  3352
ERR13   007542 G        2632#  5443
ERR14   007664 G        2660#  5511
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
ERR15   010006 G   2688#  5629  5817  6950  7063
ERR16   010134 G   2717#  5892  5911  5928  5966  5984  6001
ERR17   010256 G   2747#  6114  6136  6179
ERR2    00616C G   2376#  3521
ERR29   010350 G   2768#  6317  6348  6613  6628  6643  6657  6673  6685  6697  6709
ERR3    006306 G   2405#
ERR35   010472 G   2796#  6149  6166
ERR36   010614 G   2825#  3284
ERR4    006434 G   2434#
ERR40   010636 G   2837#  6791
ERR41   010702 G   2855#  6822
ERR42   010744 G   2872#  6836
ERR43   011006 G   2890#  6997
ERR44   011054 G   2909#  3875
ERR45   011124 G   2928#  5712
ERR46   011214 G   2953#  7118  7142  7165  7188
ERR47   011264 G   2973#  6892
ERR5    006556 G   2462#  4012  4036  4060  4111  4134  4157  4209  4234  4259  4311  4335  4359
                   4412  4436  4460  4513  4537  4561  4613  4637  4661  4713  4737  4761  4813
                   4839  4863  4915  4941  4965  5016  5042  5066  5117  5143  5167  5219  5245
                   5269  5320  5346  5370
ERR6    006700 G   2490#  3581  3643  3705  3738  6396
ERR7    007026 G   2519#  3920  3943  3962  6370  6468
EVL   = 000004 G   1543#
ESEND = 002100     1234#
ESLOAD= 000035     1234#  1334
FADR    002412     1614#  2703  5580*  5663*  5768*  5851*
FLAG    002406     1612#  2503  3551*  3555  3556  3591*  3592  3612*  3617  3618  3653*  3654  3675*
                   3676  3679  3680  3709*  3710  3713*  3714  3717  3744*  3745  5573*  5585  5664*
                   5761*  5773  5852*
FM1     005046     2183#  2349  2355  2378  2384  2407  2413  2436  2442  2464  2470  2492  2498
                   2521  2527  2550  2556  2578  2584  2606  2612  2634  2640  2662  2668  2690
                   2696  2719  2725  2749  2755  2770  2776  2798  2804
FTIME   002462     1634#  3031  3035*
FSAU  = 000015     1234#  3239  3241
FSAUTO= 000020     1234#  3166  3187
FSBGN = 000040     1234#  1240  1354  2347  2376  2405  2434  2462  2490  2519  2548  2576  2604
                   2632  2660  2688  2717  2747  2768  2796  2825  2837  2855  2872  2890  2909
                   2928  2953  2973  3001  3007  3025  3166  3198  3218  3239  3264  3272  3289
                   3293  3307  3335  3356  3367  3370  3379  3393  3406  3417  3420  3429  3444
                   3458  3470  3473  3481  3500  3506  3523  3534  3546  3583  3596  3607  3645
                   3658  3670  3707  3740  3749  3761  3764  3833  3878  3891  3894  3922  3965
                   3982  3986  3994  4014  4020  4038  4044  4062  4068  4085  4088  4096  4113
                   4119  4136  4142  4159  4165  4182  4185  4193  4212  4218  4237  4243  4261
                   4267  4284  4287  4295  4313  4319  4337  4343  4361  4367  4384  4387  4396
                   4414  4420  4438  4444  4462  4468  4485  4488  4497  4515  4521  4539  4545
                   4563  4569  4586  4589  4597  4615  4621  4639  4645  4663  4669  4686  4689
                   4697  4715  4721  4739  4745  4763  4769  4786  4789  4796  4815  4821  4841
                   4847  4865  4871  4888  4891  4898  4917  4923  4943  4949  4967  4973  4990
                   4993  5000  5018  5024  5044  5050  5068  5074  5091  5094  5101  5119  5125
                   5145  5151  5169  5175  5193  5196  5203  5221  5227  5247  5253  5271  5277
                   5294  5297  5304  5322  5328  5348  5354  5372  5378  5393  5396  5449  5456
                   5473  5476  5516  5525  5564  5569  5661  5716  5752  5757  5849  5858  5871
                   5874  5895  5914  5931  5945  5948  5969  5987  6004  6016  6077  6092  6154
                   6187  6202  6319  6372  6398  6404  6416  6430  6472  6485  6489  6527  6533
                   6541  6555  6560  6616  6632  6646  6660  6676  6687  6699  6712  6733  6748
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
                    6769  6795  6809  6824  6841  6855  6859  6896  6904  6921  6925  6955  6972
                    7001  7018  7022  7068  7084  7195  7211  7323
FSCLEA= \00007      1234# 3198  3203
FSDU  = 000016      1234# 3218  3223
FSEND = 000041      1234# 1240  2375  2404  2433  2461  2489  2518  2547  2575  2603  2631  2659
                    2687  2716  2744  2767  2795  2823  2835  2854  2871  2888  2908  2927  2952
                    2971  2991  3005  3012  3163  3189  3205  3225  3243  3264  3272  3289  3293
                    3295  3307  3335  3356  3358  3367  3370  3393  3398  3406  3408  3417  3420
                    3444  3449  3458  3460  3470  3473  3500  3505  3523  3528  3534  3536  3546
                    3583  3596  3598  3607  3645  3658  3660  3670  3707  3740  3749  3751  3761
                    3764  3833  3878  3880  3891  3894  3922  3965  3967  3982  3986  4014  4019
                    4038  4043  4062  4067  4068  4070  4085  4088  4113  4118  4136  4141  4159
                    4164  4165  4167  4182  4185  4212  4217  4237  4242  4261  4266  4267  4269
                    4284  4287  4313  4318  4337  4342  4361  4366  4367  4369  4384  4387  4414
                    4419  4438  4443  4462  4467  4468  4470  4485  4488  4515  4520  4539  4544
                    4563  4568  4569  4571  4586  4589  4615  4620  4639  4644  4663  4668  4669
                    4671  4686  4689  4715  4720  4739  4744  4763  4768  4769  4771  4786  4789
                    4815  4820  4841  4846  4865  4870  4871  4873  4888  4891  4917  4922  4943
                    4948  4967  4972  4973  4975  4990  4993  5018  5023  5044  5049  5068  5073
                    5074  5076  5091  5094  5119  5124  5145  5150  5169  5174  5175  5177  5193
                    5196  5221  5226  5247  5252  5271  5276  5277  5279  5294  5297  5322  5327
                    5348  5353  5372  5377  5378  5380  5393  5396  5449  5456  5458  5473  5476
                    5516  5525  5527  5564  5569  5661  5716  5718  5752  5757  5849  5858  5860
                    5871  5874  5895  5914  5931  5933  5945  5948  5969  5987  6004  6006  6016
                    6077  6079  6092  6154  6187  6189  6202  6319  6372  6398  6404  6416  6418
                    6430  6472  6474  6485  6489  6527  6533  6541  6543  6555  6560  6616  6632
                    6646  6660  6676  6687  6699  6712  6733  6735  6748  6769  6795  6797  6809
                    6824  6841  6843  6855  6859  6896  6904  6906  6921  6925  6955  6957  6972
                    7001  7003  7018  7022  7068  7070  7084  7195  7197  7240  7330
FSHARD= 000004      1234# 7211  7238
FSHW  = 000013      1234# 1429  1447
FSINIT= 000006      1234# 3025  3161
FSJMP = 000050      1234# 3005  3370  3420  3473  3764  3894  3986  4088  4185  4287  4387  4488
                    4589  4689  4789  4891  4993  5094  5196  5297  5396  5476  5569  5757  5874
                    5948  6154  6404  6489  6533  6560  6712  6769  6859  6925  7022
FSMOD = 000000      1234# 1240
FSMSG = 000011      1234# 2347  2373  2376  2402  2405  2431  2434  2459  2462  2487  2490  2516
                    2519  2545  2548  2573  2576  2601  2604  2629  2632  2657  2660  2685  2688
                    2714  2717  2742  2747  2765  2768  2793  2796  2821  2825  2833  2837  2852
                    2855  2869  2872  2886  2890  2906  2909  2925  2928  2950  2953  2969  2973
                    2989
FSPROT= 000021      1234# 1354  1359
FSPWR = 000017      1234#
FSRPT = 000012      1234# 3001  3010
FSSEG = 000003      1234# 3379  3396  3429  3447  3481  3503  3506  3526  3994  4017  4020  4041
                    4044  4065  4096  4116  4119  4139  4142  4162  4193  4215  4218  4240  4243
                    4264  4295  4316  4319  4340  4343  4364  4396  4417  4420  4441  4444  4465
                    4497  4518  4521  4542  4545  4566  4597  4618  4621  4642  4645  4666  4697
                    4718  4721  4742  4745  4766  4796  4818  4821  4844  4847  4868  4898  4920
                    4923  4946  4949  4970  5000  5021  5024  5047  5050  5071  5101  5122  5125
                    5148  5151  5172  5203  5224  5227  5250  5253  5274  5304  5325  5328  5351
                    5354  5375
FSSOFT= 000005      1234# 7323  7328
FSSRV = 000010      1234#
FSSUB = 000002      1234#
FSSW  = 000014      1234# 1456  1462
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
F$TEST= 000001          1234#   3265    3293    3308    3356    3368    3406    3418    3458    3471    3534    3547    3596
                        3608    3658    3671    3749    3762    3878    3892    3965    3983    4068    4086    4165    4183
                        4267    4285    4367    4385    4468    4486    4569    4587    4669    4687    4769    4787    4871
                        4889    4973    4991    5074    5092    5175    5194    5277    5295    5378    5394    5456    5474
                        5525    5565    5716    5753    5858    5872    5931    5946    6004    6017    6077    6093    6187
                        6203    6416    6431    6472    6486    6541    6556    6733    6749    6795    6810    6841    6856
                        6904    6922    6955    6973    7001    7019    7068    7085    7195
GETPRM  011462          3062    3071#   3080
G$CNTO= 000200          1234#
G$DELM= 000372          1234#
G$DISP= 000003          1234#
G$EXCP= 000400          1234#
G$HILI= 000002          1234#
G$LOLI= 000001          1234#
G$NO  = 000000          1234#
G$OFFS= 000400          1234#   7215    7221    7232
G$OFSI= 000376          1234#   7215    7221    7232
G$PRMA= 000001          1234#   7221
G$PRMD= 000002          1234#   7215    7232
G$PRML= 000000          1234#
G$RADA= 000140          1234#
G$RADB= 000000          1234#
G$RADD= 000040          1234#
G$RADL= 000120          1234#
G$RADO= 000020          1234#   7215    7221    7232
G$XFER= 000004          1234#
G$YES = 000010          1234#   7215    7221    7232
HELP  = 000000          1225#   1264    1353    1414    1723    3003    3008
HOE   = 100000 G        1556#
IBE   = 010000 G        1553#
IDU   = 000040 G        1546#
IER   = 020000 G        1554#
INIFLG  002474          1643#
INSTU   003616          2028    2039#
ISR   = 000100 G        1547#
ISRUN   030050          7233    7293#
IXE   = 004000 G        1552#
I$AU  = 000041          1234#   3239#   3243#
I$AUTO= 000041          1234#   3166#   3189#
I$CLN = 000041          1234#   3198#   3205#
I$DU  = 000041          1234#   3218#   3225#
I$HRD = 000041          7211#   7240#
I$INIT= 000041          1234#   3025#   3163#
I$MOD = 000040          1234#   1240#
I$MSG = 000041          1234#   2347#   2375#   2376#   2404#   2405#   2433#   2434#   2461#   2462#   2489#   2490#   2518#
                        2519#   2547#   2548#   2575#   2576#   2603#   2604#   2631#   2632#   2659#   2660#   2687#   2688#
                        2716#   2717#   2744#   2747#   2767#   2768#   2795#   2796#   2823#   2825#   2835#   2837#   2854#
                        2855#   2871#   2872#   2888#   2890#   2908#   2909#   2927#   2928#   2952#   2953#   2971#   2973#
                        2991#
I$PROT= 000040          1234#   1354#
I$PTAB= 000041          1234#
I$PWR = 000041          1234#
I$RPT = 000041          1234#   3001#   3012#
I$SEG = 000041          1234#   3264    3307    3367    3379#   3393    3398#   3417    3429#   3444    3449#   3470    3481#
                        3500    3505#   3506#   3523    3528#   3546    3607    3670    3761    3891    3982    3994#   4014
                        4019#   4020#   4038    4043#   4044#   4062    4067#   4085    4096#   4113    4118#   4119#   4136
```

```
                    4141#  4142#  4159   4164#  4182   4193#  4212   4217#  4218#  4237   4242#  4243#  4261
                    4266#  4284   4295#  4313   4318#  4319#  4337   4342#  4343#  4361   4366#  4384   4396#
                    4414   4419#  4420#  4438   4443#  4444#  4462   4467#  4485   4497#  4515   4520#  4521#
                    4539   4544#  4545#  4563   4568#  4586   4597#  4615   4620#  4621#  4639   4644#  4645#
                    4663   4668#  4686   4697#  4715   4720#  4721#  4739   4744#  4745#  4763   4768#  4786
                    4796#  4815   4820#  4821#  4841   4846#  4847#  4865   4870#  4888   4898#  4917   4922#
                    4923#  4943   4948#  4949#  4967   4972#  4990   5000#  5018   5023#  5024#  5044   5049#
                    5050#  5068   5073#  5091   5101#  5119   5124#  5125#  5145   5150#  5151#  5169   5174#
                    5193   5203#  5221   5226#  5227#  5247   5252#  5253#  5271   5276#  5294   5304#  5322
                    5327#  5328#  5348   5353#  5354#  5372   5377#  5393   5473   5564   5752   5871   5945
                    6016   6092   6202   6430   6485   6555   6748   6809   6855   6921   6972   7018   7084
I$SETU= 000041       1234#
I$SFT = 000041       7323#  7330#
I$SRV = 000041       1234#
I$SUB = 000041       1234#  3264   3307   3367   3417   3470   3546   3607   3670   3761   3891   3982   4085
                     4182   4284   4384   4485   4586   4686   4786   4888   4990   5091   5193   5294   5393
                     5473   5564   5752   5871   5945   6016   6092   6202   6430   6485   6555   6748   6809
                     6855   6921   6972   7018   7084
I$TST = 000041       1234#  3264#  3272   3289   3293#  3295#  3307#  3335   3356#  3358#  3367#  3370   3406#
                     3408#  3417#  3420   3458#  3460#  3470#  3473   3534#  3536#  3546#  3583   3596#  3598#
                     3607#  3645   3658#  3660#  3670#  3707   3740   3749#  3751#  3761#  3764   3833   3878#
                     3880#  3891#  3894   3922   3965#  3967#  3982#  3986   4068#  4070#  4085#  4088   4165#
                     4167#  4182#  4185   4267#  4269#  4284#  4287   4367#  4369#  4384#  4387   4468#  4470#
                     4485#  4488   4569#  4571#  4586#  4589   4669#  4671#  4686#  4689   4769#  4771#  4786#
                     4789   4871#  4873#  4888#  4891   4973#  4975#  4990#  4993   5074#  5076#  5091#  5094
                     5175#  5177#  5193#  5196   5277#  5279#  5294#  5297   5378#  5380#  5393#  5396   5449
                     5456#  5458#  5473#  5476   5516   5525#  5527#  5564#  5569   5661   5716#  5718#  5752#
                     5757   5849   5858#  5860#  5871#  5874   5895   5914   5931#  5933#  5945#  5948   5969
                     5987   6004#  6006#  6016#  6077#  6079#  6092#  6154   6187#  6189#  6202#  6319   6372
                     6398   6404   6416#  6418#  6430#  6472#  6474#  6485#  6489   6527   6533   6541#  6543#
                     6555#  6560   6616   6632   6646   6660   6676   6687   6699   6712   6733#  6735#  6748#
                     6769   6795#  6797#  6809#  6824   6841#  6843#  6855#  6859   6896   6904#  6906#  6921#
                     6925   6955#  6957#  6972#  7001#  7003#  7018#  7022   7068#  7070#  7084#  7195#  7197#
JSJMP = 000167        1234#  3005
KMACTV  002376        1608#
KMCSR   002516        1679#  3083*  3168   3265   3310   3373   3423   3476   3548   3609   3672   3767   3897
                      3990   4091   4188   4290   4390   4491   4592   4692   4792   4894   4996   5097   5199
                      5300   5399   5479   5566   5754   5878   5952   6018   6096   6128   6204   6432   6493
                      6564   6750   6811   6863   6929   6974   7026   7086
KMCSRH  002520        1680#  1850*  1851*  1863*  1865*  1866*  1873*  1877*  1879*  1880*  1883*  3085*  3086*
KMCTL   002522        1681#  3088*  3089*
KMNUM   002400        1609#
KMPO4   002524        1682#  3091*  3092*
KMPO6   002526        1683#  1864*  1874*  3094*  3095*
KMRLVL  002510        1676#  3099*  3100*
KMRVEC  002506        1675#  3097*
KMTLVL  002514        1678#  3105*  3106*
KMTVEC  002512        1677#  3102*  3103*
LNUNIT  027574        7263#
LOADER  026006        6566   6720#
LOCK    002340        1589#  3712*
LOE   = 040000 G      1555#
LOGDEV  002342        1594#  3066*  3072*  3073   3076   3181
LOKFLG  002476        1645#
LOOPBK  027771        7285#
LOT   = 000010 G      1544#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
LSACP   002110 G          1341#
LSAPT   002036 G          1299#
LSAU    012144 G          1326    3239#
LSAUT   002070 G          1325#
LSAUTO  012042 G          1342    3166#
LSCCP   002106 G          1339#
LSCLEA  012134 G          1340    3198#
LSCO    002032 G          1295#
LSDEPO  002011 G          1277#
LSDESC  002312 G          1332    1578#
LSDESP  002076 G          1331#
LSDEVP  002060 G          1317#
LSDISP  002132 G          1302    1369#
LSDLY   002116 G          1347#
LSDTP   002040 G          1301#
LSDTYP  002034 G          1297#
LSDU    012140 G          1328    3218#
LSDUT   002072 G          1327#
LSDVTY  002730 G          1318    1711#
LSEF    002052 G          1312#
LSENVI  002044 G          1305#
LSETP   002102 G          1335#
LSEXP1  002046 G          1307#
LSEXP4  002064 G          1321#
LSEXP5  002066 G          1323#
LSHARD  027344 G          1284    7211    7212#
LSHIME  002120 G          1349#
LSHPCP  00.016 G          1283#
LSHPTP  002022 G          1287#
LSHW    002262 G          1288    1429    1430#
LSICP   002104 G          1337#
LSINIT  011340 G          1338    3025#
LSLADP  002026 G          1291#
LSLAST  030144 G          1292    7342#
LSLOAD  002100 G          1333#
LSLUN   002074 G          1329#
LSMREV  002050 G          1309#
LSNAME  002000 G          1266#
LSPRIO  002042 G          1303#
LSPROT  002122 G          1344    1354#
LSPRT   002112 G          1343#
LSREPP  002062 G          1319#
LSREV   002010 G          1275#
LSRPT   011332 G          3001#
LSSOFT  030140 G          7323    7324#
LSSPC   002056 G          1315#
LSSPCP  002020 G          1285#
LSSPTP  002024 G          1289#
LSSTA   002030 G          1293#
LSSW    002312 G          1456    1457#
LSTEST  002114 G          1345#
LSTIML  002014 G          1281#
LSUNIT  002012 G          1279#   3073
L10001  002310            1429    1447#
L10002  002312            1456    1462#
L10003  006156            2373#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

L10004	006304	2402#		
L10005	006432	2431#		
L10006	006554	2459#		
L10007	006676	2487#		
L10010	007024	2516#		
L10011	007152	2545#		
L10012	007274	2573#		
L10013	007416	2601#		
L10014	007540	2629#		
L10015	007662	2657#		
L10016	010004	2685#		
L10017	010132	2714#		
L10020	010254	2742#		
L10021	010346	2765#		
L10022	010470	2793#		
L10023	010612	2821#		
L10024	010634	2833#		
L10025	010700	2852#		
L10026	010742	2869#		
L10027	011004	2886#		
L10030	011052	2906#		
L10031	011122	2925#		
L10032	011212	2950#		
L10033	011262	2969#		
L10034	011330	2989#		
L10035	011336	3006	3010#	
L10036	012040	3161#		
L10037	012132	3187#		
L10040	012136	3203#		
L10041	012142	3223#		
L10042	012144	3241#		
L10043	012254	3273	3290	3293#
L10044	012420	3336	3356#	
L10045	012550	3371	3406#	
L10046	012710	3421	3458#	
L10047	013152	3474	3534#	
L10050	013354	3584	3596#	
L10051	013566	3646	3658#	
L10052	014110	3708	3741	3749#
L10053	014466	3765	3834	3878#
L10054	014734	3895	3923	3965#
L10055	015200	3987	4068#	
L10056	015430	4089	4165#	
L10057	015674	4186	4267#	
L10060	016140	4288	4367#	
L10061	016404	4388	4468#	
L10062	016650	4489	4569#	
L10063	017114	4590	4669#	
L10064	017360	4690	4769#	
L10065	017640	4790	4871#	
L10066	020120	4892	4973#	
L10067	020374	4994	5074#	
L10070	020650	5095	5175#	
L10071	021126	5197	5277#	
L10072	021402	5298	5378#	
L10073	021574	5397	5450	5456#

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
L10074  021742          5477    5517    5525#
L10075  022320          5570    5662    5716#
L10076  022556          5758    5850    5858#
L10077  022772          5875    5896    5915    5931#
L10100  023206          5949    5970    5988    6004#
L10101  023450          6077#
L10102  024042          6155    6187#
L10103  025114          6320    6373    6399    6405    6416#
L10104  025214          6472#
L10105  025362          6490    6528    6534    6541#
L10106  026040          6561    6617    6633    6647    6661    6677    6688    6700    6713    6733#
L10107  026200          6770    6795#
L10110  026306          6825    6841#
L10111  026444          6860    6897    6904#
L10112  026542          6926    6955#
L10113  026642          7001#
L10114  026766          7023    7068#
L10115  027340          7195#
L10116  027400          7211    7239#
L10117  030140          7323    7329#
MASKX   002362          1602#
MEMLIM  002374          1607#
MEMSET  003474          2007#   3995    4094    4191    4293    4393    4494    4594    4695    4794    4896    4998    5099
                        5201    5302
MEMSZ   002436          1624#   2002    2023    3145*   3153*   3402    3454    3508    3530    3592    3654    3710    3745
                        3764    3771    3818    5396    5476    5569    5757    5874    5948    6503    6529
MRO     002434          1623#   2054    3375*   3381    3401*   3402    3425*   3432    3453*   3454    3479*   3482    3484
                        3485    3492    3507*   3508    3510*   3511    3513    3515    3529*   3530    3552*   3563    3573
                        3587*   3613*   3614*   3625    3635    3647*   3649*   6310*
NEWST   011454          3044    3050    3064#   3074
NEXT    002336          1588#
ONE     002372          1606#
O$APTS= 000000          1234#   1293
O$AU  = 000001          1234#   1263#   1325
O$BGNR= 000000          1234#   1319
O$BGNS= 000000          1234#   1285
O$DU  = 000001          1234#   1263#   1327
O$ERRT= 000000          1234#   1335
O$GNSW= 000000          1234#   1289
O$POIN= 000001          1234#   1263#   1351
O$SETU= 000000          1234#   1279    7340
PATCH   002774          1854#
PNT   = 001000 G        1550#
PRI   = 002000 G        1551#
PRIRTY  027540          7258#
PRI00 = 000000 G        1539#
PRI01 = 000040 G        1538#
PRI02 = 000100 G        1537#
PRI03 = 000140 G        1536#
PRI04 = 000200 G        1535#
PRI05 = 000240 G        1534#
PRI06 = 000300 G        1533#
PRI07 = 000340 G        1532#   7089
PSTACK  002344          1595#   3030*   6138
QV.FLG  002477          1646#
RAMDAT  003330          1961#   4004    4028    4052    4103    4126    4149    4201    4226    4251    4303    4327    4351
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
                        4404    4428    4452    4505    4529    4553    4605    4629    4653    4705    4729    4753    4805
                        4831    4855    4907    4933    4957    5008    5034    5058    5109    5135    5159    5211    5237
                        5261    5312    5338    5362
REGADR  002530          1687#
RETADR  002352          1598#
ROMMAP  012146          1996    3254#   6495    6509
RUN     002410          1613#
RUNB    002470          1637#   3157*   3846    5674    6141    7028    7174
RUNINH  002472          1638#   3108*   3157    3848    5676
SAVACT  002402          1610#
SAVE4   002464          1635#   3033*   3036    3184    3286    6766
SAVE6   002466          1636#   3034*   3037    3185    3287    6767
SAVNUM  002404          1611#
SAVPC   002366          1604#
SAVSP   002364          1603#
SETBR0  003220          1902#   4397    4421    4445
SETBR1  003230          1909#   4498    4522    4546
SETBR4  003240          1917#   4598    4622    4646
SETBR7  003250          1925#   4698    4722    4746
SETC    003260          1933#   4194    4219    4244    4797    5971
SETZ    003312          1950#   4296    4320    4344    4899    5897
SFPTBL  002312  G       1458#
SSTACK  002730          1691#   3028
STAT    002356          1600#
STAT1   002500          1668#   3109*   3111*   3115*   3126*   3130*   3133*
STAT2   002502          1669#   3136*   3138*
STAT3   002504          1670#
STM     005627          2260#   2368    2397    2426    2454    2482    2511    2540    2568    2596    2624    2652    2680
                        2709    2737    2760    2788    2816    2827    2846    2863    2880    2900    2919    2944    2963
                        2983
STRTSW  002354          1599#
SUBRPC  002346          1596#
SVCGBL= 000000          1234#   1240    1247#   1266    1267    1275    1276    1277    1278    1279    1280    1281    1282
                        1283    1284    1285    1286    1287    1288    1289    1290    1291    1292    1293    1294    1295
                        1296    1297    1298    1299    1300    1301    1302    1303    1304    1305    1306    1307    1308
                        1309    1310    1312    1313    1315    1316    1317    1318    1319    1320    1321    1322    1323
                        1324    1325    1326    1327    1328    1329    1330    1331    1332    1333    1334    1335    1336
                        1337    1338    1339    1340    1341    1342    1343    1344    1345    1346    1347    1348    1349
                        1350    1354    1355    1369    1370    1430    1431    1432    1457    1458    1459    1578    1579
                        1711    1712    2347    2348    2376    2377    2405    2406    2434    2435    2462    2463    2490
                        2491    2519    2520    2548    2549    2576    2577    2604    2605    2632    2633    2660    2661
                        2688    2689    2717    2718    2747    2748    2768    2769    2796    2797    2825    2826    2837
                        2838    2855    2856    2872    2873    2890    2891    2909    2910    2928    2929    2953    2954
                        2973    2974    3001    3002    3025    3026    3166    3167    3198    3199    3218    3219    3239
                        3240    7212    7213    7324    7325    7342#   7343
SVCINS= 000000          1234#   1244#   1267    1268    1269    1270    1271    1272    1273    1274    1275    1276    1277
                        1278    1279    1280    1281    1282    1283    1284    1285    1286    1287    1288    1289    1290
                        1291    1292    1293    1294    1295    1296    1297    1298    1299    1300    1301    1302    1303
                        1304    1305    1306    1307    1308    1309    1310    1311    1312    1313    1314    1315    1316
                        1317    1318    1319    1320    1321    1322    1323    1324    1325    1326    1327    1328    1329
                        1330    1331    1332    1333    1334    1335    1336    1337    1338    1339    1340    1341    1342
                        1343    1344    1345    1346    1347    1348    1349    1350    1351    1368    1369    1370    1371
                        1372    1373    1374    1375    1376    1377    1378    1379    1380    1381    1382    1383    1384
                        1385    1386    1387    1388    1389    1390    1391    1392    1393    1394    1395    1396    1397
                        1398    1399    1400    1401    1402    1403    1404    1405    1406    1407    1408    1409    1410
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CROSS REFERENCE TABLE -- USER SYMBOLS

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CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

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CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

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                2900#  2904   2911#  2917   2919#  2923   2930#  2936   2938#  2942   2944#  2948   2955#
                2961   2963#  2967   2975#  2981   2983#  2987
T$CODE= 012032  7215#  7221#  7232#
T$ERRN= 000056  1234#  3282#  3330#  3350#  3389#  3440#  3496#  3519#  3579#  3641#  3703#  3736#  3801#
                3826#  3873#  3918#  3941#  3960#  4010#  4034#  4058#  4109#  4132#  4155#  4207#  4232#
                4257#  4309#  4333#  4357#  4410#  4434#  4458#  4511#  4535#  4559#  4611#  4635#  4659#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
                    4711#  4735#  4759#  4811#  4837#  4861#  4913#  4939#  4963#  5014#  5040#  5064#  5115#
                    5141#  5165#  5217#  5243#  5267#  5318#  5344#  5368#  5441#  5509#  5627#  5710#  5815#
                    5890#  5909#  5926#  5964#  5982#  5999#  6036#  6053#  6069#  6112#  6134#  6147#  6164#
                    6177#  6315#  6346#  6368#  6394#  6466#  6521#  6611#  6626#  6641#  6655#  6671#  6683#
                    6695#  6707#  6789#  6820#  6834#  6890#  6948#  6995#  7061#  7116#  7140#  7163#  7186#
TSEXCP= 000000       7215#  7220   7221#  7225   7232#  7237
TSFLAG= 000040       3005#  3007   3272#  3289#  3335#  3370#  3393#  3420#  3444#  3473#  3500#  3523#  3583#
                    3645#  3707#  3740#  3764#  3833#  3894#  3922#  3986#  4014#  4038#  4062#  4088#  4113#
                    4136#  4159#  4185#  4212#  4237#  4261#  4287#  4313#  4337#  4361#  4387#  4414#  4438#
                    4462#  4488#  4515#  4539#  4563#  4589#  4615#  4639#  4663#  4689#  4715#  4739#  4763#
                    4789#  4815#  4841#  4865#  4891#  4917#  4943#  4967#  4993#  5018#  5044#  5068#  5094#
                    5119#  5145#  5169#  5196#  5221#  5247#  5271#  5297#  5322#  5348#  5372#  5396#  5449#
                    5476#  5516#  5569#  5661#  5757#  5849#  5874#  5895#  5914#  5948#  5969#  5987#  6154#
                    6319#  6372#  6398#  6404#  6489#  6527#  6533#  6560#  6616#  6632#  6646#  6660#  6676#
                    6687#  6699#  6712#  6769#  6824#  6859#  6896#  6925#  7022#
TSGMAN= 000000       1234#
TSHILI= 000001       7215#  7219   7221#  7224   7232#  7236
TSLAST= 000001       1234#  7340#
TSLOLI= 000000       7215#  7218   7221#  7223   7232#  7235
TSLSYM= 010000       1234#  1448   1463   2374   2403   2432   2460   2488   2517   2546   2574   2602   2630
                    2658   2686   2715   2743   2766   2794   2822   2834   2853   2870   2887   2907   2926
                    2951   2970   2990   3011   3162   3188   3204   3224   3242   3294   3357   3407   3459
                    3535   3597   3659   3750   3879   3966   4069   4166   4268   4368   4469   4570   4670
                    4770   4872   4974   5075   5176   5278   5379   5457   5526   5717   5859   5932   6005
                    6078   6188   6417   6473   6542   6734   6796   6842   6905   6956   7002   7069   7196
                    7240   7330
TSLTNO= 000053       7343#
TSNEST= 000000       1234#  1240#  1354#  1359#  1429#  1447#  1456#  1462#  2347#  2373#  2376#  2402#  2405#
                    2431#  2434#  2459#  2462#  2487#  2490#  2516#  2519#  2545#  2548#  2573#  2576#  2601#
                    2604#  2629#  2632#  2657#  2660#  2685#  2688#  2714#  2717#  2742#  2747#  2765#  2768#
                    2793#  2796#  2821#  2825#  2833#  2837#  2852#  2855#  2869#  2872#  2886#  2890#  2906#
                    2909#  2925#  2928#  2950#  2953#  2969#  2973#  2989#  3001#  3010#  3025#  3161#  3166#
                    3187#  3198#  3203#  3218#  3223#  3239#  3241#  3265#  3293#  3308#  3356#  3368#  3379#
                    3396#  3406#  3418#  3429#  3447#  3458#  3471#  3481#  3503#  3506#  3526#  3534#  3547#
                    3596#  3608#  3658#  3671#  3749#  3762#  3878#  3892#  3965#  3983#  3994#  4017#  4020#
                    4041#  4044#  4065#  4068#  4086#  4096#  4116#  4119#  4139#  4142#  4162#  4165#  4183#
                    4193#  4215#  4218#  4240#  4243#  4264#  4267#  4285#  4295#  4316#  4319#  4340#  4343#
                    4364#  4367#  4385#  4396#  4417#  4420#  4441#  4444#  4465#  4468#  4486#  4497#  4518#
                    4521#  4542#  4545#  4566#  4569#  4587#  4597#  4618#  4621#  4642#  4645#  4666#  4669#
                    4687#  4697#  4718#  4721#  4742#  4745#  4766#  4769#  4787#  4796#  4818#  4821#  4844#
                    4847#  4868#  4871#  4889#  4898#  4920#  4923#  4946#  4949#  4970#  4973#  4991#  5000#
                    5021#  5024#  5047#  5050#  5071#  5074#  5092#  5101#  5122#  5125#  5148#  5151#  5172#
                    5175#  5194#  5203#  5224#  5227#  5250#  5253#  5274#  5277#  5295#  5304#  5325#  5328#
                    5351#  5354#  5375#  5378#  5394#  5456#  5474#  5525#  5565#  5716#  5753#  5858#  5872#
                    5931#  5946#  6004#  6017#  6077#  6093#  6187#  6203#  6416#  6431#  6472#  6486#  6541#
                    6556#  6733#  6749#  6795#  6810#  6841#  6856#  6904#  6922#  6955#  6973#  7001#  7019#
                    7068#  7085#  7195#  7211#  7238#  7323#  7328#
TSNS0 = 000000       1240#
TSNS1 = 000005       1354#  1359   1429#  1447   1456#  1462   2347#  2373   2376#  2402   2405#  2431   2434#
                    2459   2462#  2487   2490#  2516   2519#  2545   2548#  2573   2576#  2601   2604#  2629
                    2632#  2657   2660#  2685   2688#  2714   2717#  2742   2747#  2765   2768#  2793   2796#
                    2821   2825#  2833   2837#  2852   2855#  2869   2872#  2886   2890#  2906   2909#  2925
                    2928#  2950   2953#  2969   2973#  2989   3001#  3010   3025#  3161   3166#  3187   3198#
                    3203   3218#  3223   3239#  3241   3265#  3293   3308#  3356   3368#  3406   3418#  3458
                    3471#  3534   3547#  3596   3608#  3658   3671#  3749   3762#  3878   3892#  3965   3983#
                    4068   4086#  4165   4183#  4267   4285#  4367   4385#  4468   4486#  4569   4587#  4669
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
                    4687#  4769   4787#  4871   4889#  4973   4991#  5074   5092#  5175   5194#  5277   5295#
                    5378   5394#  5456   5474#  5525   5565#  5716   5753#  5858   5872#  5931   5946#  6004
                    6017#  6077   6093#  6187   6203#  6416   6431#  6472   6486#  6541   6556#  6733   6749#
                    6795   6810#  6841   6856#  6904   6922#  6955   6973#  7001   7019#  7068   7085#  7195
                    7211#  7238   7323#  7328
T$NS2 = 000003      3379#  3396   3429#  3447   3481#  3503   3506#  3526   3994#  4017   4020#  4041   4044#
                    4065   4096#  4116   4119#  4139   4142#  4162   4193#  4215   4218#  4240   4243#  4264
                    4295#  4316   4319#  4340   4343#  4364   4396#  4417   4420#  4441   4444#  4465   4497#
                    4518   4521#  4542   4545#  4566   4597#  4618   4621#  4642   4645#  4666   4697#  4718
                    4721#  4742   4745#  4766   4796#  4818   4821#  4844   4847#  4868   4898#  4920   4923#
                    4946   4949#  4970   5000#  5021   5024#  5047   5050#  5071   5101#  5122   5125#  5148
                    5151#  5172   5203#  5224   5227#  5250   5253#  5274   5304#  5325   5328#  5351   5354#
                    5375
T$PTNU= 000000      1234#
T$SAVL= 177777      1234#
T$SEGL= 177777      1234#  3379#  3394   3396#  3398   3429#  3445   3447#  3449   3481#  3501   3503#  3505
                    3506#  3524   3526#  3528   3994#  4015   4017#  4019   4020#  4039   4041#  4043   4044#
                    4063   4065#  4067   4096#  4114   4116#  4118   4119#  4137   4139#  4141   4142#  4160
                    4162#  4164   4193#  4213   4215#  4217   4218#  4238   4240#  4242   4243#  4262   4264#
                    4266   4295#  4314   4316#  4318   4319#  4338   4340#  4342   4343#  4362   4364#  4366
                    4396#  4415   4417#  4419   4420#  4439   4441#  4443   4444#  4463   4465#  4467   4497#
                    4516   4518#  4520   4521#  4540   4542#  4544   4545#  4564   4566#  4568   4597#  4616
                    4618#  4620   4621#  4640   4642#  4644   4645#  4664   4666#  4668   4697#  4716   4718#
                    4720   4721#  4740   4742#  4744   4745#  4764   4766#  4768   4796#  4816   4818#  4820
                    4821#  4842   4844#  4846   4847#  4866   4868#  4870   4898#  4918   4920#  4922   4923#
                    4944   4946#  4948   4949#  4968   4970#  4972   5000#  5019   5021#  5023   5024#  5045
                    5047#  5049   5050#  5069   5071#  5073   5101#  5120   5122#  5124   5125#  5146   5148#
                    5150   5151#  5170   5172#  5174   5203#  5222   5224#  5226   5227#  5248   5250#  5252
                    5253#  5272   5274#  5276   5304#  5323   5325#  5327   5328#  5349   5351#  5353   5354#
                    5373   5375#  5377
T$SEK0= 010002      3379#  3394   3396   3429#  3445   3447   3481#  3501   3503   3506#  3524   3526   3994#
                    4015   4017   4020#  4039   4041   4044#  4063   4065   4096#  4114   4116   4119#  4137
                    4139   4142#  4160   4162   4193#  4213   4215   4218#  4238   4240   4243#  4262   4264
                    4295#  4314   4316   4319#  4338   4340   4343#  4362   4364   4396#  4415   4417   4420#
                    4439   4441   4444#  4463   4465   4497#  4516   4518   4521#  4540   4542   4545#  4564
                    4566   4597#  4616   4618   4621#  4640   4642   4645#  4664   4666   4697#  4716   4718
                    4721#  4740   4742   4745#  4764   4766   4796#  4816   4818   4821#  4842   4844   4847#
                    4866   4868   4898#  4918   4920   4923#  4944   4946   4949#  4968   4970   5000#  5019
                    5021   5024#  5045   5047   5050#  5069   5071   5101#  5120   5122   5125#  5146   5148
                    5151#  5170   5172   5203#  5222   5224   5227#  5248   5250   5253#  5272   5274   5304#
                    5323   5325   5328#  5349   5351   5354#  5373   5375
T$SUBN= 000000      1234#  3264#  3307#  3367#  3417#  3470#  3546#  3607#  3670#  3761#  3891#  3982#  4085#
                    4182#  4284#  4384#  4485#  4586#  4686#  4786#  4888#  4990#  5091#  5193#  5294#  5393#
                    5473#  5564#  5752#  5871#  5945#  6016#  6092#  6202#  6430#  6485#  6555#  6748#  6809#
                    6855#  6921#  6972#  7018#  7084#
T$TAGL= 177777      1234#
T$TAGN= 010120      1234#  1354#  1429#  1456#  2347#  2376#  2405#  2434#  2462#  2490#  2519#  2548#  2576#
                    2604#  2632#  2660#  2688#  2717#  2747#  2768#  2796#  2825#  2837#  2855#  2872#  2890#
                    2909#  2928#  2953#  2973#  3001#  3025#  3166#  3198#  3218#  3239#  3265#  3308#  3368#
                    3418#  3471#  3547#  3608#  3671#  3762#  3892#  3983#  4086#  4183#  4285#  4385#  4486#
                    4587#  4687#  4787#  4889#  4991#  5092#  5194#  5295#  5394#  5474#  5565#  5753#  5872#
                    5946#  6017#  6093#  6203#  6431#  6486#  6556#  6749#  6810#  6856#  6922#  6973#  7019#
                    7085#  7211#  7323#
T$TEMP= 000005      1359#  1370#  1371#  1372#  1373#  1374#  1375#  1376#  1377#  1378#  1379#  1380#  1381#
                    1382#  1383#  1384#  1385#  1386#  1387#  1388#  1389#  1390#  1391#  1392#  1393#  1394#
                    1395#  1396#  1397#  1398#  1399#  1400#  1401#  1402#  1403#  1404#  1405#  1406#  1407#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

1408# 1409# 1410# 1411# 1412# 1413# 1447# 1462# 2373# 2402# 2431# 2459# 2487#
2516# 2545# 2573# 2601# 2629# 2657# 2685# 2714# 2742# 2765# 2793# 2821# 2833#
2852# 2869# 2886# 2906# 2925# 2950# 2969# 2989# 3005# 3006 3010# 3161# 3187#
3203# 3223# 3241# 3272# 3273 3289# 3290 3293# 3335# 3336 3356# 3370# 3371
3393# 3394# 3396# 3406# 3420# 3421 3444# 3445# 3447# 3458# 3473# 3474 3500#
3501# 3503# 3523# 3524# 3526# 3534# 3583# 3584 3596# 3645# 3646 3658# 3707#
3708 3740# 3741 3749# 3764# 3765 3833# 3834 3878# 3894# 3895 3922# 3923
3965# 3986# 3987 4014# 4015# 4017# 4038# 4039# 4041# 4062# 4063# 4065# 4068#
4088# 4089 4113# 4114# 4116# 4136# 4137# 4139# 4159# 4160# 4162# 4165# 4185#
4186 4212# 4213# 4215# 4237# 4238# 4240# 4261# 4262# 4264# 4267# 4287# 4288
4313# 4314# 4316# 4337# 4338# 4340# 4361# 4362# 4364# 4367# 4387# 4388 4414#
4415# 4417# 4438# 4439# 4441# 4462# 4463# 4465# 4468# 4488# 4489 4515# 4516#
4518# 4539# 4540# 4542# 4563# 4564# 4566# 4569# 4589# 4590 4615# 4616# 4618#
4639# 4640# 4642# 4663# 4664# 4666# 4669# 4689# 4690 4715# 4716# 4718# 4739#
4740# 4742# 4763# 4764# 4766# 4769# 4789# 4790 4815# 4816# 4818# 4841# 4842#
4844# 4865# 4866# 4868# 4871# 4891# 4892 4917# 4918# 4920# 4943# 4944# 4946#
4967# 4968# 4970# 4973# 4993# 4994 5018# 5019# 5021# 5044# 5045# 5047# 5068#
5069# 5071# 5074# 5094# 5095 5119# 5120# 5122# 5145# 5146# 5148# 5169# 5170#
5172# 5175# 5196# 5197 5221# 5222# 5224# 5247# 5248# 5250# 5271# 5272# 5274#
5277# 5297# 5298 5322# 5323# 5325# 5348# 5349# 5351# 5372# 5373# 5375# 5378#
5396# 5397 5449# 5450 5456# 5476# 5477 5516# 5517 5525# 5569# 5570 5661#
5662 5716# 5757# 5758 5849# 5850 5858# 5874# 5875 5895# 5896 5914# 5915
5931# 5948# 5949 5969# 5970 5987# 5988 6004# 6077# 6154# 6155 6187# 6319#
6320 6372# 6373 6398# 6399 6404# 6405 6416# 6472# 6489# 6490 6527# 6528
6533# 6534 6541# 6560# 6561 6616# 6617 6632# 6633 6646# 6647 6660# 6661
6676# 6677 6687# 6688 6699# 6700 6712# 6713 6733# 6769# 6770 6795# 6824#
6825 6841# 6859# 6860 6896# 6897 6904# 6925# 6926 6955# 7001# 7022# 7023
7068# 7195# 7215# 7221# 7232# 7238# 7328#

TSTEST= 000053

1234# 3257 3261 3264# 3299 3304 3307# 3360 3364 3367# 3410 3414 3417#
3462 3467 3470# 3539 3543 3546# 3600 3604 3607# 3662 3667 3670# 3753
3758 3761# 3882 3888 3891# 3969 3979 3982# 4072 4082 4085# 4169 4179
4182# 4271 4281 4284# 4371 4381 4384# 4472 4482 4485# 4573 4583 4586#
4673 4683 4686# 4773 4783 4786# 4875 4885 4888# 4977 4987 4990# 5078
5088 5091# 5179 5190 5193# 5281 5291 5294# 5382 5390 5393# 5461 5470
5473# 5529 5561 5564# 5719 5749 5752# 5861 5868 5871# 5935 5942 5945#
6007 6013 6016# 6081 6089 6092# 6191 6199 6202# 6420 6427 6430# 6476
6482 6485# 6546 6552 6555# 6737 6745 6748# 6799 6806 6809# 6845 6852
6855# 6908 6918 6921# 6959 6969 6972# 7005 7015 7018# 7072 7081 7084#
7343

TSTSTM= 177777

1234# 2352 2358 2366 2371 2374 2381 2387 2395 2400 2403 2410 2416
2424 2429 2432 2439 2445 2452 2457 2460 2467 2473 2480 2485 2488
2495 2501 2509 2514 2517 2524 2530 2538 2543 2546 2553 2559 2566
2571 2574 2581 2587 2594 2599 2602 2609 2615 2622 2627 2630 2637
2643 2650 2655 2658 2665 2671 2678 2683 2686 2693 2699 2707 2712
2715 2722 2728 2735 2740 2743 2752 2758 2763 2766 2773 2779 2786
2791 2794 2801 2807 2814 2819 2822 2830 2834 2843 2849 2853 2860
2866 2870 2877 2883 2887 2897 2903 2907 2916 2922 2926 2935 2941
2947 2951 2960 2966 2970 2980 2986 2990 3011 3042 3048 3054 3060
3077 3162 3182 3188 3200 3204 3221 3224 3242 3272 3281 3289 3294
3329 3335 3349 3357 3370 3379 3388 3393 3397 3407 3420 3429 3439
3444 3448 3459 3473 3481 3495 3500 3504 3506 3518 3523 3527 3535
3578 3583 3590 3597 3640 3645 3652 3659 3702 3707 3735 3740 3743
3750 3764 3800 3825 3833 3836 3872 3879 3894 3917 3922 3940 3959
3966 3986 3994 4009 4014 4018 4020 4033 4038 4042 4044 4057 4062
4066 4069 4088 4096 4108 4113 4117 4119 4131 4136 4140 4142 4154
4159 4163 4166 4185 4193 4206 4212 4216 4218 4231 4237 4241 4243

```
                    4256  4261  4265  4268  4287  4295  4308  4313  4317  4319  4332  4337  4341
                    4343  4356  4361  4365  4368  4387  4396  4409  4414  4418  4420  4433  4438
                    4442  4444  4457  4462  4466  4469  4488  4497  4510  4515  4519  4521  4534
                    4539  4543  4545  4558  4563  4567  4570  4589  4597  4610  4615  4619  4621
                    4634  4639  4643  4645  4658  4663  4667  4670  4689  4697  4710  4715  4719
                    4721  4734  4739  4743  4745  4758  4763  4767  4770  4789  4796  4810  4815
                    4819  4821  4836  4841  4845  4847  4860  4865  4869  4872  4891  4898  4912
                    4917  4921  4923  4938  4943  4947  4949  4962  4967  4971  4974  4993  5000
                    5013  5018  5022  5024  5039  5044  5048  5050  5063  5068  5072  5075  5094
                    5101  5114  5119  5123  5125  5140  5145  5149  5151  5164  5169  5173  5176
                    5196  5203  5216  5221  5225  5227  5242  5247  5251  5253  5266  5271  5275
                    5278  5297  5304  5317  5322  5326  5328  5343  5348  5352  5354  5367  5372
                    5376  5379  5396  5440  5449  5457  5476  5508  5516  5526  5569  5626  5661
                    5709  5717  5757  5814  5849  5859  5874  5889  5895  5908  5914  5925  5932
                    5948  5963  5969  5981  5987  5998  6005  6035  6052  6068  6078  6094  6111
                    6133  6146  6154  6163  6176  6188  6314  6319  6345  6367  6372  6393  6398
                    6404  6417  6465  6473  6489  6520  6527  6533  6542  6560  6610  6616  6625
                    6632  6640  6646  6654  6660  6670  6676  6682  6687  6694  6699  6706  6712
                    6734  6769  6788  6796  6819  6824  6833  6842  6859  6889  6896  6905  6925
                    6947  6956  6994  7002  7022  7060  7069  7090  7113  7115  7121  7139  7145
                    7162  7169  7172  7185  7196
T$TSTS= 000001       1234#  3265#  3308#  3368#  3418#  3471#  3547#  3608#  3671#  3762#  3892#  3983#  4086#
                    4183#  4285#  4385#  4486#  4587#  4687#  4787#  4889#  4991#  5092#  5194#  5295#  5394#
                    5474#  5565#  5753#  5872#  5946#  6017#  6093#  6203#  6431#  6486#  6556#  6749#  6810#
                    6856#  6922#  6973#  7019#  7085#
T$SAU  = 010042      3239#  3241
T$SAUT= 010037       3166#  3187
T$SCLE= 010040       3198#  3203
T$SDU  = 010041      3218#  3223
T$SHAR= 010116       7211#  7239
T$SHW  = 010001      1429#  1447
T$SINI= 010036       3025#  3161
T$SMSG= 010034       2347#  2373  2376#  2402  2405#  2431  2434#  2459  2462#  2487  2490#  2516  2519#
                    2545  2548#  2573  2576#  2601  2604#  2629  2632#  2657  2660#  2685  2688#  2714
                    2717#  2742  2747#  2765  2768#  2793  2796#  2821  2825#  2833  2837#  2852  2855#
                    2869  2872#  2886  2890#  2906  2909#  2925  2928#  2950  2953#  2969  2973#  2989
T$SPRO= 010000       1354#
T$SRPT= 010035       3001#  3005  3010
T$SSEG= 010002       3379#  3393  3396#  3429#  3444  3447#  3481#  3500  3503#  3506#  3523  3526#  3994#
                    4014  4017#  4020#  4038  4041#  4044#  4062  4065#  4096#  4113  4116#  4119#  4136
                    4139#  4142#  4159  4162#  4193#  4212  4215#  4218#  4237  4240#  4243#  4261  4264#
                    4295#  4313  4316#  4319#  4337  4340#  4343#  4361  4364#  4396#  4414  4417#  4420#
                    4438  4441#  4444#  4462  4465#  4497#  4515  4518#  4521#  4539  4542#  4545#  4563
                    4566#  4597#  4615  4618#  4621#  4639  4642#  4645#  4663  4666#  4697#  4715  4718#
                    4721#  4739  4742#  4745#  4763  4766#  4796#  4815  4818#  4821#  4841  4844#  4847#
                    4865  4868#  4898#  4917  4920#  4923#  4943  4946#  4949#  4967  4970#  5000#  5018
                    5021#  5024#  5044  5047#  5050#  5068  5071#  5101#  5119  5122#  5125#  5145  5148#
                    5151#  5169  5172#  5203#  5221  5224#  5227#  5247  5250#  5253#  5271  5274#  5304#
                    5322  5325#  5328#  5348  5351#  5354#  5372  5375#
T$SSOF= 010117       7323#  7329
T$SSW  = 010002      1456#  1462
T$STES= 010115       3265#  3272  3289  3293  3308#  3335  3356  3368#  3370  3406  3418#  3420  3458
                    3471#  3473  3534  3547#  3583  3596  3608#  3645  3658  3671#  3707  3740  3749
                    3762#  3764  3833  3878  3892#  3894  3922  3965  3983#  3986  4068  4086#  4088
                    4165  4183#  4185  4267  4285#  4287  4367  4385#  4387  4468  4486#  4488  4569
                    4587#  4589  4669  4687#  4689  4769  4787#  4789  4871  4889#  4891  4973  4991#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

			4993	5074	5092#	5094	5175	5194#	5196	5277	5295#	5297	5378	5394#	5396
			5449	5456	5474#	5476	5516	5525	5565#	5569	5661	5716	5753#	5757	5849
			5858	5872#	5874	5895	5914	5931	5946#	5948	5969	5987	6004	6017#	6077
			6093#	6154	6187	6203#	6319	6372	6398	6404	6416	6431#	6472	6486#	6489
			6527	6533	6541	6556#	6560	6616	6632	6646	6660	6676	6687	6699	6712
			6733	6749#	6769	6795	6810#	6824	6841	6856#	6859	6896	6904	6922#	6925
			6955	6973#	7001	7019#	7022	7068	7085#	7195					
T1	012146	G	1370	3264#											
T10	014470	G	1379	3891#											
T11	014736	G	1380	3982#											
T12	015202	G	1381	4085#											
T13	015432	G	1382	4182#											
T14	015676	G	1383	4284#											
T15	016142	G	1384	4384#											
T16	016406	G	1385	4485#											
T17	016652	G	1386	4586#											
T18	017116	G	1387	4686#											
T19	017362	G	1388	4786#											
T2	012256	G	1371	3307#											
T20	017642	G	1389	4888#											
T21	020122	G	1390	4990#											
T22	020376	G	1391	5091#											
T23	020654	G	1392	5193#											
T24	021130	G	1393	5294#											
T25	021404	G	1394	5393#											
T26	021576	G	1395	5473#											
T27	021744	G	1396	5564#											
T28	022322	G	1397	5752#											
T29	022560	G	1398	5871#											
T3	012422	G	1372	3367#											
T30	022774	G	1399	5945#											
T31	023210	G	1400	6016#											
T32	023452	G	1401	6092#											
T33	024044	G	1402	6202#											
T34	025116	G	1403	6430#											
T35	025216	G	1404	6485#											
T36	025364	G	1405	6555#											
T37	026042	G	1406	6748#											
T38	026202	G	1407	6809#											
T39	026310	G	1408	6855#											
T4	012552	G	1373	3417#											
T40	026446	G	1409	6921#											
T41	026544	G	1410	6972#											
T42	026644	G	1411	7018#											
T43	026770	G	1412	7084#											
T5	012712	G	1374	3470#											
T6	013154	G	1375	3546#											
T7	013356	G	1376	3607#											
T8	013570	G	1377	3670#											
T9	014112	G	1378	3761#											
UAM =	000200	G	1548#												
VECTOR	027504		7253#												
WPM	027400		7216	7241#											
WROM	003422		1988#												
WTYPE	002414		1615#	1871	1970	1972	1995	2017	3081*	3147	3149	3154	3489	3846	3985
			4088	4185	4287	4387	4488	4589	4689	4789	4824	4891	4926	4993	5027

CZDMGD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

```
                      5094   5128   5196   5230   5297   5331   5619   5674   5807   6058   6488   6559   6858
                      6924   7021
X$ALWA= 000000        1234#
X$FALS= 000040        1234#
X$OFFS= 000400        1234#
X$TRUE= 000020        1234#
ZERO    002370        1605#
$BDADR  002450        1629#
$BDDAT  002454        1631#
$GDADR  002446        1628#
$GDDAT  002452        1630#  2956   6030*  6031   6033   6303*  6308   6311*  6312   6336*  6341   6343   6358*
                      6363   6365   6384*  6389   6391   7107*  7110   7134*  7157*  7158   7182*
$LSTIN= 000000        1242#
$LSTTA= 000000        1243#
$REG0   002430        1621#  2054*  2360   2389
$REG1   002426        1620#  2053*
$REG2   002424        1619#  2052*  2362   2391   2418   2532   2590   2674
$REG3   002422        1618#  2051*
$REG4   002420        1617#  2050*  2361   2390   2419   2447   2475   2504   2533   2561   2589   2617   2645
                      2673   2701   2730   2781   2809
$REG5   002416        1616#  2049*  2420   2448   2476   2505   2534   2562   2618   2646   2702   2731   2782
                      2810
$TEMP0  002442        1626#
$TMP0   002444        1627#  6021*  6046*  6047   6050   6061   6100*  6130   6137
.       = 030144      1225#  1608#  1609#  1610#  1611#  1644#  1690#  1716#  1854#  3006   3273   3290   3336
                      3371   3394   3421   3445   3474   3501   3524   3584   3646   3708   3741   3765   3834
                      3895   3910   3923   3987   4015   4039   4063   4089   4114   4137   4160   4186   4213
                      4238   4262   4288   4314   4338   4362   4388   4415   4439   4463   4489   4516   4540
                      4564   4590   4616   4640   4664   4690   4716   4740   4764   4790   4816   4842   4866
                      4892   4918   4944   4968   4994   5019   5045   5069   5095   5120   5146   5170   5186
                      5197   5222   5248   5272   5298   5323   5349   5373   5397   5450   5477   5517   5570
                      5662   5718   5850   5875   5896   5915   5949   5970   5988   6155   6320   6373   6399
                      6405   6409#  6413#  6490   6528   6534   6561   6617   6633   6647   6661   6677   6688
                      6700   6713   6770   6825   6860   6897   6926   7023   7303#
.MSTCL  002756        1849#  3310   3425   3479   3551   3612   3675   3770   3900   3993   4094   4191   4293
                      4393   4494   4594   4695   4794   4896   4998   5099   5201   5302   5401   5481   5572
                      5760   5877   5951   6020   6099   6110   6162   6175   6185   6206   6865   6931   7028
                      7088
.REGT   003050        1863#  1872
.ROMCL  003044        1860#  1889   1892   1895   1905   1913   1921   1929   1937   1940   1943   1954   1977
                      1983   3315   3318   3321   3339   3342   3558   3561   3565   3568   3571   3620   3623
                      3627   3630   3633   3682   3685   3689   3692   3695   3719   3722   3725   3728   3774
                      3777   3780   3787   3790   3809   3813   3853   3856   3859   3862   3902   3906   3926
                      3932   3945   3948   3951   5405   5408   5413   5429   543?   5488   5491   5500   5594
                      5597   5604   5607   5686   5689   5692   5696   5782   5785   5792   5795   5881   5899
                      5918   5955   5973   5991   6041   6211   6225   6229   6233   6247   6251   6255   6262
                      6265   6269   6273   6277   6286   6289   6305   6338   6356   6360   6379   6382   6386
                      6434   6437   6440   6443   6448   6452   6866   6869   6877   6881   6933   6937   6981
                      6988   7036   7040   7043   7053   7094   7098   7101   7105   7127   7131   7150   7153
                      7177
.SROMC  003100        1869#  1898   1946   1957   3793   3805   3999   4002   4023   4026   4047   4050   4098
                      4101   4121   4124   4144   4147   4196   4199   4221   4224   4246   4249   4298   4301
                      4322   4325   4346   4349   4399   4402   4423   4426   4447   4450   4500   4503   4524
                      4527   4548   4551   4600   4603   4624   4627   4648   4651   4700   4703   4724   4727
                      4748   4751   4800   4803   4826   4829   4850   4853   4902   4905   4928   4931   4952
                      4955   5003   5006   5029   5032   5053   5056   5104   5107   5130   5133   5154   5157
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- USER SYMBOLS

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

```
BADHEA  1769#  3256  3260  3298  3303  3359  3363  3409  3413  3461  3466  3538  3542  3599  3603
        3661   3666  3752  3757  3881  3887  3968  3978  4071  4081  4168  4178  4270  4280  4370
        4380   4471  4481  4572  4582  4672  4682  4772  4782  4874  4884  4976  4986  5077  5087
        5178   5189  5280  5290  5381  5389  5460  5469  5528  5560  5718  5748  5860  5867  5934
        5941   6006  6012  6080  6088  6190  6198  6419  6426  6475  6481  6545  6551  6736  6744
        6798   6805  6844  6851  6907  6917  6958  6968  7004  7014  7071  7080
BCOMPL     1#  1234#  3043  3049  3055
BERROR     1#  1234#
BGNAU      1#  1234#  3238
BGNAUT     1#  1234#  3165
BGNCLN     1#  1234#  3197
BGNDU      1#  1234#  3217
BGNHRD     1#  1234#  7210
BGNHW      1#  1234#  1428
BGNINI     1#  1234#  3024
BGNMOD     1#  1234#  1239
BGNMSG     1#  1234#  2347  2376  2405  2434  2462  2490  2519  2548  2576  2604  2632  2660  2688
        2717   2747  2768  2796  2824  2836  2854  2871  2889  2908  2927  2952  2972
BGNPRO     1#  1234#  1353
BGNPTA     1#  1234#
BGNRPT     1#  1234#  3000
BGNSEG     1#  1234#  3378  3428  3480  3505  3993  4019  4043  4095  4118  4141  4192  4217  4242
        4294   4318  4342  4395  4419  4443  4496  4520  4544  4596  4620  4644  4696  4720  4744
        4795   4820  4846  4897  4922  4948  4999  5023  5049  5100  5124  5150  5202  5226  5252
        5303   5327  5353
BGNSET     1#  1234#
BGNSFT     1#  1234#  7322
BGNSRV     1#  1234#
BGNSUB     1#  1234#
BGNSW      1#  1234#  1455
BGNTST     1#  1234#  3263  3306  3366  3416  3469  3545  3606  3669  3760  3890  3981  4084  4181
        4283   4383  4484  4585  4685  4785  4887  4989  5090  5192  5293  5392  5472  5563  5751
        5870   5944  6015  6091  6201  6429  6484  6554  6747  6808  6854  6920  6971  7017  7083
BNCOMP     1#  1234#  3061  3079
BNERRO     1#  1234#
BREAK      1#  1234#  3589  3651  3742  3835
BRESET     1#  1234#  3199  3220  6093  7112  7171
CKLOOP     1#  1234#  7120  7144  7168
CLOCK      1#  1234#
CLOSE      1#  1234#
CLRMAR  1809#  3776  3789
CLRVEC     1#  1234#
COMMEN     1#  1234#
DELAY      1#  1234#
DESCRI     1#  1234#  1577
DEVTYP     1#  1234#  1710
DISPAT     1#  1234#  1367
DISPLA     1#  1234#
DOCLN      1#  1234#
DODU       1#  1234#  3180
DORPT      1#  1234#
EDSCAL  1764#  3257  3261  3299  3304  3360  3364  3410  3414  3462  3467  3539  3543  3600  3604
        3662   3667  3753  3758  3882  3888  3969  3979  4072  4082  4169  4179  4271  4281  4371
        4381   4472  4482  4573  4583  4673  4683  4773  4783  4875  4885  4977  4987  5078  5088
        5179   5190  5281  5291  5382  5390  5461  5470  5529  5561  5719  5749  5861  5868  5935
        5942   6007  6013  6081  6089  6191  6199  6420  6427  6476  6482  6546  6552  6737  6745
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

```
        6799    6806    6845    6852    6908    6918    6959    6969    7005    7015    7072    7081
ENDAU      1#   1234#   3240
ENDAUT     1#   1234#   3186
ENDCLN     1#   1234#   3202
ENDCOM     1#   1234#
ENDDU      1#   1234#   3222
ENDHRD     1#   1234#   7237
ENDHW      1#   1234#   1446
ENDINI     1#   1234#   3160
ENDMOD     1#   1234#
ENDMSG     1#   1234#   2373    2402    2431    2459    2487    2516    2545    2573    2601    2629    2657    2685    2714
        2742    2765    2793    2821    2832    2851    2868    2885    2905    2924    2949    2968    2988
ENDPRO     1#   1234#   1358
ENDPTA     1#   1234#
ENDRPT     1#   1234#   3009
ENDSEG     1#   1234#   3395    3446    3502    3525    4016    4040    4064    4115    4138    4161    4214    4239    4263
        4315    4339    4363    4416    4440    4464    4517    4541    4565    4617    4641    4665    4717    4741    4765
        4817    4843    4867    4919    4945    4969    5020    5046    5070    5121    5147    5171    5223    5249    5273
        5324    5350    5374
ENDSET     1#   1234#
ENDSFT     1#   1234#   7327
ENDSRV     1#   1234#
ENDSUB     1#   1234#
ENDSW      1#   1234#   1461
ENDTST     1#   1234#   3292    3355    3405    3457    3533    3595    3657    3748    3877    3964    4067    4164    4266
        4366    4467    4568    4668    4768    4870    4972    5073    5174    5276    5377    5455    5524    5715    5857
        5930    6003    6076    6186    6415    6471    6540    6732    6794    6840    6903    6954    7000    7067    7194
EQUALS     1#   1234#   1488
ERRDF      1#   1234#   3281    3329    3349    3388    3439    3495    3518    3578    3640    3702    3735    380(    3825
        3872    3917    3940    3959    4009    4033    4057    4108    4131    4154    4206    4231    4256    4308    4332
        4356    4409    4433    4457    4510    4534    4558    4610    4634    4658    4710    4734    4758    4810    4836
        4860    4912    4938    4962    5013    5039    5063    5114    5140    5164    5216    5242    5266    5317    5343
        5367    5440    5508    5626    5709    5814    5889    5908    5925    5963    5981    5998    6034    6051    6067
        6111    6133    6146    6163    6176    6314    6345    6367    6393    6465    6520    6610    6625    6640    6654
        6670    6682    6694    6706    6788    6819    6833    6889    6947    6994    7060    7115    7139    7162    7185
ERRHRD     1#   1234#
ERROR      1#   1234#   2339#   3280    3328    3348    3387    3438    3494    3517    3577    3639    3701    3734    3799
        3824    3871    3916    3939    3958    4008    4032    4056    4107    4130    4153    4205    4230    4255    4307
        4331    4355    4408    4432    4456    4509    4533    4557    4609    4633    4657    4709    4733    4757    4809
        4835    4859    4911    4937    4961    5012    5038    5062    5113    5139    5163    5215    5241    5265    5316
        5342    5366    5439    5507    5625    5708    5813    5888    5907    5924    5962    5980    5997    6110    6132
        6145    6162    6175    6313    6344    6366    6392    6464    6519    6609    6624    6639    6653    6669    6681
        6693    6705    6787    6818    6832    6888    6946    6993    7059    7114    7138    7161    7184
ERRSF      1#   1234#
ERRSOF     1#   1234#
ERRTBL     1#   1234#
ESCAPE     1#   1234#   3271    3288    3334    3392    3443    3499    3522    3582    3644    3706    3739    3832    3921
        4013    4037    4061    4112    4135    4158    4211    4236    4260    4312    4336    4360    4413    4437    4461
        4514    4538    4562    4614    4638    4662    4714    4738    4762    4814    4840    4864    4916    4942    4966
        5017    5043    5067    5118    5144    5168    5220    5246    5270    5321    5347    5371    5448    5515    5660
        5848    5894    5913    5968    5986    6318    6371    6397    6526    6615    6631    6645    6659    6675    6686
        6698    6823    6895
EXIT       1#   1234#   3004    3370    3420    3473    3764    3894    3985    4088    4185    4287    4387    4488    4589
        4689    4789    4891    4993    5094    5196    5297    5396    5476    5569    5757    5874    5948    6153    6403
        6488    6532    6559    6711    6768    6858    6924    7021
FEQUAL     1#   1234#
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

```
GETBYT      1#    1234#
GETPRI      1#    1234#
GETWOR      1#    1234#
GMANIA      1#    1234#
GMANID      1#    1234#
GMANIL      1#    1234#
GPHARD      1#    1234#  3075
GPRMA       1#    1234#  7220
GPRMD       1#    1234#  7214  7231
GPRML       1#    1234#
HEADER      1#    1234#  1265
INLOOP      1#    1234#
IOSETU      1#    1234#
IOSTAR      1#    1234#
KT11        1#    1234#
K40NLY   1759#   1798#  3762  5394  5474  5567  5755  5872  5946
LASTAD      1#    1234#  7338
MACEX    1780#    3368   3418  3471  3892
MACEX2   1789#    4086   4183  4285  4385  4486  4587  4687  4787  4889  4991  5092  5194  5295
MANUAL      1#    1234#
MDT0     2317#    2760
MDT1     2297#    2360   2389
MDT2     2301#    2418
MDT3     2305#    2447   2475  2561  2645  2781  2809
MDT4     2309#    2503
MDT5     2313#    2532
MDT6     2319#    2589   2673
MDT7     2323#    2617   2730
MDT8     2326#    2701
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MYINT    1774#    3372   3422  3475  3547  3608  3671  3766  3896  3989  4090  4187  4289  4389  4490
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MSCOUN      1#    1234#  2348#  2354#  2360#  2368#  2377#  2383#  2389#  2397#  2406#  2412#  2418#  2426#  2435#
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CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

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CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

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CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

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CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

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	4062#	4066#	4069#	4088#	4096#	4108#	4113#	4117#	4119#	4131#	4136#	4140#	4142#	4154#	4159#
	4163#	4166#	4185#	4193#	4206#	4212#	4216#	4218#	4231#	4237#	4241#	4243#	4256#	4261#	4265#
	4268#	4287#	4295#	4308#	4313#	4317#	4319#	4332#	4337#	4341#	4343#	4356#	4361#	4365#	4368#
	4387#	4396#	4409#	4414#	4418#	4420#	4433#	4438#	4442#	4444#	4457#	4462#	4466#	4469#	4488#
	4497#	4510#	4515#	4519#	4521#	4534#	4539#	4543#	4545#	4558#	4563#	4567#	4570#	4589#	4597#
	4610#	4615#	4619#	4621#	4634#	4639#	4643#	4645#	4658#	4663#	4667#	4670#	4689#	4697#	4710#
	4715#	4719#	4721#	4734#	4739#	4743#	4745#	4758#	4763#	4767#	4770#	4789#	4796#	4810#	4815#
	4819#	4821#	4836#	4841#	4845#	4847#	4860#	4865#	4869#	4872#	4891#	4898#	4912#	4917#	4921#
	4923#	4938#	4943#	4947#	4949#	4962#	4967#	4971#	4974#	4993#	5000#	5013#	5018#	5022#	5024#
	5039#	5044#	5048#	5050#	5063#	5068#	5072#	5075#	5094#	5101#	5114#	5119#	5123#	5125#	5140#
	5145#	5149#	5151#	5164#	5169#	5173#	5176#	5196#	5203#	5216#	5221#	5225#	5227#	5242#	5247#
	5251#	5253#	5266#	5271#	5275#	5278#	5297#	5304#	5317#	5322#	5326#	5328#	5343#	5348#	5352#
	5354#	5367#	5372#	5376#	5379#	5396#	5440#	5449#	5457#	5476#	5508#	5516#	5526#	5569#	5626#
	5661#	5709#	5717#	5757#	5814#	5849#	5859#	5874#	5889#	5895#	5908#	5914#	5925#	5932#	5948#
	5963#	5969#	5981#	5987#	5998#	6005#	6035#	6052#	6068#	6078#	6094#	6111#	6133#	6146#	6154#
	6163#	6176#	6188#	6314#	6319#	6345#	6367#	6372#	6393#	6398#	6404#	6417#	6465#	6473#	6489#
	6520#	6527#	6533#	6542#	6560#	6610#	6616#	6625#	6632#	6640#	6646#	6654#	6660#	6670#	6676#
	6682#	6687#	6694#	6699#	6706#	6712#	6734#	6769#	6788#	6796#	6819#	6824#	6833#	6842#	6859#
	6889#	6896#	6905#	6925#	6947#	6956#	6994#	7002#	7022#	7060#	7069#	7090#	7113#	7115#	7121#
	7139#	7145#	7162#	7169#	7172#	7185#	7196#								
MSWORD	1#	1234#	1305#	1314	1368#	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379
	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394
	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409
	1410	1411	1412	3005#	3281#	3282	3283	3284	3329#	3330	3331	3332	3349#	3350	3351
	3352	3370#	3388#	3389	3390	3391	3420#	3439#	3440	3441	3442	3473#	3495#	3496	3497
	3498	3518#	3519	3520	3521	3578#	3579	3580	3581	3640#	3641	3642	3643	3702#	3703
	3704	3705	3735#	3736	3737	3738	3764#	3800#	3801	3802	3803	3825#	3826	3827	3828
	3872#	3873	3874	3875	3894#	3917#	3918	3919	3920	3940#	3941	3942	3943	3959#	3960
	3961	3962	3986#	4009#	4010	4011	4012	4033#	4034	4035	4036	4057#	4058	4059	4060
	4088#	4108#	4109	4110	4111	4131#	4132	4133	4134	4154#	4155	4156	4157	4185#	4206#
	4207	4208	4209	4231#	4232	4233	4234	4256#	4257	4258	4259	4287#	4308#	4309	4310
	4311	4332#	4333	4334	4335	4356#	4357	4358	4359	4387#	4409#	4410	4411	4412	4433#

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

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        4434   4435   4436   4457#  4458   4459   4460   4488#  4510#  4511   4512   4513   4534#  4535   4536
        4537   4558#  4559   4560   4561   4589#  4610#  4611   4612   4613   4634#  4635   4636   4637   4658#
        4659   4660   4661   4689#  4710#  4711   4712   4713   4734#  4735   4736   4737   4758#  4759   4760
        4761   4789#  4810#  4811   4812   4813   4836#  4837   4838   4839   4860#  4861   4862   4863   4891#
        4912#  4913   4914   4915   4938#  4939   4940   4941   4962#  4963   4964   4965   4993#  5013#  5014
        5015   5016   5039#  5040   5041   5042   5063#  5064   5065   5066   5094#  5114#  5115   5116   5117
        5140#  5141   5142   5143   5164#  5165   5166   5167   5196#  5216#  5217   5218   5219   5242#  5243
        5244   5245   5266#  5267   5268   5269   5297#  5317#  5318   5319   5320   5343#  5344   5345   5346
        5367#  5368   5369   5370   5396#  5440#  5441   5442   5443   5476#  5508#  5509   5510   5511   5569#
        5626#  5627   5628   5629   5709#  5710   5711   5712   5757#  5814#  5815   5816   5817   5874#  5889#
        5890   5891   5892   5908#  5909   5910   5911   5925#  5926   5927   5928   5948#  5963#  5964   5965
        5966   5981#  5982   5983   5984   5998#  5999   6000   6001   6035#  6036   6037   6038   6052#  6053
        6054   6055   6068#  6069   6070   6071   6111#  6112   6113   6114   6133#  6134   6135   6136   6146#
        6147   6148   6149   6154#  6163#  6164   6165   6166   6176#  6177   6178   6179   6314#  6315   6316
        6317   6345#  6346   6347   6348   6367#  6368   6369   6370   6393#  6394   6395   6396   6404#  6465#
        6466   6467   6468   6489#  6520#  6521   6522   6523   6533#  6560#  6610#  6611   6612   6613   6625#
        6626   6627   6628   6640#  6641   6642   6643   6654#  6655   6656   6657   6670#  6671   6672   6673
        6682#  6683   6684   6685   6694#  6695   6696   6697   6706#  6707   6708   6709   6712#  6769#  6788#
        6789   6790   6791   6819#  6820   6821   6822   6833#  6834   6835   6836   6859#  6889#  6890   6891
        6892   6925#  6947#  6948   6949   6950   6994#  6995   6996   6997   7022#  7060#  7061   7062   7063
        7115#  7116   7117   7118   7139#  7140   7141   7142   7162#  7163   7164   7165   7185#  7186   7187
        7188   7215#  7221#  7232#  7340   7341
MSXFER     1#  1234#
OPEN       1#  1234#
POINTE     1#  1234#  1262
POPSP2  1740#  6127
PRINTB     1#  1234#  2348   2354   2360   2368   2377   2383   2389   2397   2406   2412   2418   2426   2435
        2441   2447   2454   2463   2469   2475   2482   2491   2497   2503   2511   2520   2526   2532   2540
        2549   2555   2561   2568   2577   2583   2589   2596   2605   2611   2617   2624   2633   2639   2645
        2652   2661   2667   2673   2680   2689   2695   2701   2709   2718   2724   2730   2737   2748   2754
        2760   2769   2775   2781   2788   2797   2803   2809   2816   2826   2845   2862   2879   2899   2918
        2937   2943   2962   2982
PRINTF     1#  1234#  2838   2856   2873   2891   2910   2929   2954   2974
PRINTS     1#  1234#
PRINTX     1#  1234#
READBU     1#  1234#
READEF     1#  1234#  3040   3046   3052   3058
RFLAGS     1#  1234#
ROMCLK  1813#  1888   1891   1894   1904   1912   1920   1928   1936   1939   1942   1953   1976   1982   3314
        3317   3320   3338   3341   3557   3560   3564   3567   3570   3619   3622   3626   3629   3632   3681
        3684   3688   3691   3694   3718   3721   3724   3727   3773   3777   3779   3786   3790   3808   3812
        3852   3855   3858   3861   3901   3905   3925   3931   3944   3947   3950   5404   5407   5412   5428
        5431   5487   5490   5499   5593   5596   5603   5606   5685   5688   5691   5695   5781   5784   5791
        5794   5880   5898   5917   5954   5972   5990   6040   6210   6224   6228   6232   6246   6250   6254
        6261   6264   6268   6272   6276   6285   6288   6304   6337   6355   6359   6378   6381   6385   6433
        6436   6439   6442   6447   6451   6865   6868   6876   6880   6932   6936   6980   6987   7035   7039
        7042   7052   7093   7097   7100   7104   7126   7130   7149   7152   7176
SETPRI     1#  1234#  7088
SETVEC     1#  1234#
SKIP04  1838#  3983
SKIP06  1824#  1968   3487   3844   4822   4924   5025   5126   5228   5329   5617   5672   5805   6486   6557
SKIP07  1831#  1970   1993   2015   6856   6922   7019
SLASH      1#  1234#
SROMCL  1819#  1897   1945   1956   3792   3804   3998   4001   4022   4025   4046   4049   4097   4100   4120
        4123   4143   4146   4195   4198   4220   4223   4245   4248   4297   4300   4321   4324   4345   4348
        4398   4401   4422   4425   4446   4449   4499   4502   4523   4526   4547   4550   4599   4602   4623
```

CZDMQD.P11 12-JAN-82 09:50 CROSS REFERENCE TABLE -- MACRO NAMES

```
        4626    4647    4650    4699    4702    4723    4726    4747    4750    4799    4802    4825    4828    4849    4852
        4901    4904    4927    4930    4951    4954    5002    5005    5028    5031    5052    5055    5103    5106    5129
        5132    5153    5156    5205    5208    5231    5234    5255    5258    5306    5309    5332    5335    5356    5359
        5493    5599    5787    6871
STARS     1#    1234#
SVC       1#    1232#   1233
XFER      1#    1234#   3005#   3370#   3420#   3473#   3764#   3894#   3986#   4088#   4185#   4287#   4387#   4488#   4589#
        4689#   4789#   4891#   4993#   5094#   5196#   5297#   5396#   5476#   5569#   5757#   5874#   5948#   6154#   6404#
        6489#   6533#   6560#   6712#   6769#   6859#   6925#   7022#
XFERF     1#    1234#
XFERT     1#    1234#
$MD     2330#   2346    2375    2404    2433    2461    2489    2518    2547    2575    2603    2631    2659    2687    2716
        2746    2767    2795
```

. ABS. 030144 000

ERRORS DETECTED: 0

CZDMQD,CZDMQD/SOL/CRF=SVC34R.MLB,CZDMQD.P11
RUN-TIME: 41 49 5 SECONDS
RUN-TIME RATIO: 159/96=1.6
CORE USED: 21K (41 PAGES)