

DHU11

DHU-11 FUNC TST PART3  
CZDHWBO

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IDENTIFICATION  
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PRODUCT NAME: CZDHWB0 DHU-11 FUNC TST PART3  
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MAINTAINER: ENE - DIAGNOSTICS GROUP  
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\*\*\*\*\* MODIFICATION HISTORY \*\*\*\*\*

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THE FOLLOWING MODIFICATIONS HAVE BEEN MADE TO THE OLD CZDHWA:

THE HARDWARE QUESTION "TYPE OF LOOPBACK" HAS BEEN ALTERED TO INCLUDE THE STAGGERED LOOPBACK CONNECTORS ON THE DMU11 DISTRIBUTION PANEL (H3029).

THE HARDWARE QUESTION "INTERRUPT VECTOR" HAS BEEN REMOVED.

THE HARDWARE QUESTION "BR LEVEL" HAS BEEN REMOVED.

ALL THE TESTS THAT WERE IN THE PREVIOUS VERSION (CZDHWA); EXCEPT THE "REGISTER ADDRESS TEST" AND THE "REPORT BMP CODES" (THE FIRST AND LAST TESTS COMMON TO EACH PART OF THE DIAGNOSTIC); HAVE BEEN TRANSFERED TO PART (CZDHX).

THE MODEM SIGNAL TESTS FROM PART CZDHVA HAVE BEEN TRANSFERED INTO THIS PART. THEY WERE TESTS 16 THRU 23 IN CZDHVA.

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## 1.0 GENERAL PROGRAM CONSIDERATIONS

### 1.1 PROGRAM ABSTRACT

CZDMW80 IS PART OF THE DHU 11 FUNCTIONAL VERIFICATION TEST. THIS PART OF THE TEST PERFORMS TESTS ON THE MODEM CONTROL SIGNALS OF THE DUT.

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN THE OPERATING INSTRUCTIONS-COMMANDS OF THIS DOCUMENT.

### 1.2 SYSTEM REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE DHU11 FVT:

- 0 UNIBUS PROCESSOR WITH AT LEAST 32K BYTES OF MEMORY.
- 0 DHU BOARDS INSTALLED ON THE UNIBUS.
- 0 APPROPRIATE PROGRAM LOAD DEVICE SUPPORTING XXDP+ MEDIA OR A DOWN LINE LOADING SYSTEM.

### 1.3 RELATED DOCUMENTS AND STANDARDS

- 0 XXDP+ USER'S MANUAL - DESCRIBES THE RUNNING OF DIAGNOSTICS UNDER THE XXDP+ MONITOR.

### 1.4 DIAGNOSTIC HIERARCY PREREQUISITES

THE PROCESSOR, THE UNIBUS, THE SYSTEM MEMORY, THE CONSOLE TERMINAL AND THE LOAD MEDIA ARE ASSUMED TO HAVE BEEN TESTED AND FOUND WORKING BEFORE THIS PROGRAM IS RUN.

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## 2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES.  
 FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

## 2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES  
 (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY  
 BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ↑C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE CONSIDERED TO BE ACTIVE AT START TIME)
DROP	DEACTIVATE A UNIT
PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED BY THE DIAGNOSTIC - SEE PERFORMANCE AND PROGRESS REPORTS SECTION OF THIS DOCUMENT)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE FLAGS SECTION)
ZFLAGS	CLEAR ALL FLAGS (SEE FLAGS SECTION)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO  
 YOU MAY, FOR EXAMPLE, TYPE "STA" INSTEAD OF "START".  
 MORE INFORMATION CAN BE FOUND WITHIN THE SECTION LABELLED  
 EXTENDED COMMAND SYNTAX

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY "DDDD".

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7 10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDD	EXECUTE DDDDD PASSES (DDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. SEE THE FLAGS SECTION OF THIS DOCUMENT.
/EOP:DDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE /UNITS:0:5:10 12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0 63)

EXAMPLE OF SWITCH USAGE:

START/TESTS:1-5/PASS:1000/EOP:100

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1-5" INSTEAD OF "/TESTS:1-5".

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X
FLAGS					
ZFLAGS					
EXIT					

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
MOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXR*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

\*SEE THE ERROR INFORMATION SECTION OF THIS DOCUMENT.

SEE THE XXDP\* USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:

/FLAGS:LOE:IER:BOE



## 2.4 EXTENDED COMMAND SYNTAX

### 2.4.1 START COMMAND

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

#### 2.4.1.1 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.), SEPERATED BY COLONS, THAT SPECIFY THE TESTS TO BE EXECUTED. 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 "EFFECT OF START COMMAND" SECTION.

#### 2.4.1.2 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). 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 "EFFECT OF START COMMAND" SECTION.

#### 2.4.1.3 FLAGS SWITCH (/FLAGS:<FLAG-LIST>) -

<FLAG LIST> IS A SEQUENCE OF ELEMENTS OF THE FORM <FLAG>, <FLAG=1>, OR <FLAG=0>, SEPERATED 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 (NOT RELATED TO BELL PROMPTING).
UAM	RUN IN UNATTENDED MODE, BYPASSING MANUAL INTERVENTION (ILLEGAL FOR THIS DIAGNOSTIC).
ISR	INHIBIT STATISTICAL REPORTS.

IDU INHIBIT DROPPING OF UNITS BY DIAGNOSTIC.  
(HAS NO EFFECT IN THIS 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 "EFFECT OF START  
COMMAND" SECTION.

#### 2.4.1.4 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 "EFFECT OF  
START COMMAND" SECTION.

#### 2.4.1.5 EFFECT OF START COMMAND -

THE EFFECT OF THE START COMMAND IS TO INITIATE THE HARDWARE  
PARAMETER DIALOGUE, THE SOFTWARE PARAMETER DIALOGUE, THE  
INITIALIZATION QUESTIONS, AND THEN THE DIAGNOSTIC COMMENCES TESTING.

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "♦  
UNITS (D) ?" TO WHICH THE OPERATOR SHOULD REPLY WITH THE NUMBER OF  
UNITS TO BE TESTED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE  
P-TABLES THEMSELVES ARE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE  
CONTAINING ALL THE HARDWARE INFORMATION FOR ONE COMPLETE UNIT. 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. FOR THE ACTUAL HARDWARE P TABLE  
QUESTIONS SEE THE "HARDWARE PARAMETERS" SECTION.

FOLLOWING THE HARDWARE QUESTIONS ARE THE SOFTWARE QUESTIONS TO  
BUILD THE SOFTWARE TABLES, WHICH DEFINE OPERATING PARAMETERS OF THE  
DIAGNOSTIC PROGRAM. THESE QUESTIONS ARE DESCRIBED IN THE "SOFTWARE  
PARAMETERS" SECTION.

EXAMPLE:

STA/TESTS:1:3-4:/PASS:3/FLAGS:IER:HOE-1

THIS COMMAND WILL CAUSE THREE PASSES TO BE MADE, WITH EACH PASS  
CONSISTING OF TESTS 1,3, AND 4. 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.

#### 2.4.2 RESTART COMMAND -

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

##### 2.4.2.1 TESTS, PASS, AND FLAGS SWITCHES

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

2.4.2.2 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 DIALOGUE. 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.

##### 2.4.2.3 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 SHOULD NOT BE USED WITH THIS PROGRAM. 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, OR C) A CONTROL/C WAS ENTERED BY THE OPERATOR.

#### 2.4.3 CONTINUE COMMAND -

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

##### 2.4.3.1 FLAG SWITCH (/FLAGS:<FLAG LIST>) -

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

### 2.4.3.2 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.

### 2.4.4 PROCEED COMMAND -

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

#### 2.4.4.1 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

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

#### 2.4.4.2 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.

### 2.4.5 ADD COMMAND

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

#### 2.4.6 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.

### 2.4.7 DROP COMMAND

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

2.4.8 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.

2.4.9 PRINT COMMAND -  
\*\*\*\*\*  
PRI(NT)  
\*\*\*\*\*

2.4.9.1 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.

2.4.10 DISPLAY COMMAND -  
\*\*\*\*\*  
DIS(PLAY)/UNITS:<UNIT-LIST>  
\*\*\*\*\*

2.4.10.1 EFFECT OF DISPLAY COMMAND -  
THE HARDWARE P-TABLE FOR THE TEST STATION IS PRINTED IN THE  
FORMAT IN WHICH IT WAS ENTERED.

2.4.11 FLAGS COMMAND  
\*\*\*\*\*  
FLA(GS)  
\*\*\*\*\*

2.4.11.1 EFFECT OF FLAGS COMMAND -  
THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

2.4.12 ZFLAGS COMMAND -

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

2.4.13 ZFLAGS COMMAND -

ALL FLAGS ARE CLEARED.

2.4.14 CONTROL CHARACTERS

- C A CONTROL/C (C) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES A RETURN TO COMMAND MODE.
- Z A CONTROL/Z (Z) ENTERED DURING ONE OF THE TWO OPERATOR DIALOGUES-- HARDWARE P-TABLE DIALOGUE OR SOFTWARE P-TABLE DIALOGUE CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.
- O A CONTROL/O (O) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES ALL TELETYPE OUTPUT TO BE SUPPRESSED FOR THE REMAINDER OF THE DIAGNOSTIC OR UNTIL ANOTHER CONTROL/O IS TYPED, WHICH RESTORES NORMAL TELETYPE OUTPUT.

## 2.5 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L) ?" YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL). YOU WILL THEN BE ASKED THE FOLLOWING QUESTIONS FOR EACH UNIT.

1. CSR ADDRESS - THIS QUESTION REQUESTS THE CSR ADDRESS OF THE SPECIFIED DMU-11. THE DEFAULT ANSWER FOR THIS QUESTION IS ADDRESS 160460 (OCTAL).
2. ACTIVE LINES BIT MAP - THIS QUESTION REQUESTS AN OCTAL BIT MAP OF THE SERIAL COMMUNICATION LINES ON THE DMU11 WHICH ARE BEING SELECTED FOR TESTING. IF THE BIT IN THE BIT MAP IS SET WHICH CORRESPONDS TO A PARTICULAR LINE ( I.E. BIT 5 FOR LINE 5 ) THAT LINE WILL BE TESTED BY THE FVT. THE DEFAULT ANSWER FOR THIS QUESTION IS ALL LINES I.E. 177777.
3. TYPE OF LOOPBACK (1=INTERNAL, 2=H3029 OR H3277, 3=H325)  
THIS QUESTION REQUESTS THE TYPE OF LOOPBACK TO BE USED WHEN TESTING THE DMU-11.  
THE FOLLOWING TYPES ARE SUPPORTED:
  - 0 INTERNAL - ONLY INTERNAL UART LOOPBACK IS TO BE USED IN TESTING THE DMU-11. SINCE ALL THE TESTS IN THIS PART REQUIRE EITHER STAGGERED OR SINGLE LINE LOOPBACK, SPECIFYING INTERNAL LOOPBACK WILL CAUSE THE TESTS TO BE SKIPPED. THIS WILL NOT HOWEVER CAUSE ANY ERRORS TO BE REPORTED.
  - 0 H3029 OR H3277 - STAGGERED LOOPBACK CONNECTORS ARE PROVIDED ON THE DMU11 DISTRIBUTION PANEL (H3029) IF THIS DISTRIBUTION PANEL IS NOT PRESENT THEN H3277 STAGGERED BERG CONNECTOR(S) MUST BE INSTALLED ON THE BERG CONNECTOR SOCKETS OF THE DMU11.
  - 0 H325 - SINGLE LINE, 25 PIN LOOPBACK CONNECTORS (TYPE H325) ARE INSTALLED ON THE LINES TO BE TESTED.

## 2.6 SOFTWARE QUESTIONS

AFTER YOU HAVE ANSWERED THE HARDWARE QUESTIONS OR AFTER A RESTART OR CONTINUE COMMAND, THE RUNTIME SERVICES WILL ASK FOR SOFTWARE PARAMETERS. THESE PARAMETERS WILL GOVERN SOME DIAGNOSTIC SPECIFIC OPERATION MODES. YOU WILL BE PROMPTED BY "CHANGE SW (L) ?" IF YOU WISH TO CHANGE ANY PARAMETERS, ANSWER BY TYPING "Y". THE SOFTWARE QUESTIONS AND THE DEFAULT VALUES ARE DESCRIBED IN THE NEXT PARAGRAPH(S).

1. REPORT UNIT NUMBER AS EACH UNIT IS TESTED - THIS QUESTION ASKS WHETHER THE PROGRAM SHOULD REPORT THE NUMBER OF THE UNIT WHICH IT IS TESTING AS IT BEGINS TO TEST THAT UNIT.
2. EXTENDED ERROR REPORTING - THIS QUESTION ASKS WHETHER EXTENDED ERROR INFORMATION IS REQUIRED OTHER THAN THE "TEST FAILED" MESSAGE, ON EACH ERROR REPORTED. THE DEFAULT IS "NO" I.E. ONLY A MESSAGE REPORTING THE FACT THAT THE TEST FAILED WILL BE PRINTED.
3. NUMBER OF INDIVIDUAL DATA ERRORS TO REPORT ON A LINE - THIS QUESTION IS ASKED ONLY IF THE PREVIOUS QUESTION WAS ANSWERED "YES". THE QUESTION ASKS FOR THE NUMBER OF DATA ERRORS WHICH SHOULD BE REPORTED INDIVIDUALLY BY THIS PROGRAM FOR EACH LINE FOR EACH TRANSMISSION TEST. ERRORS WHICH ARE NOT REPORTED INDIVIDUALLY ARE REPORTED IN SUMMARY ERROR REPORTS.



2.7 EXTENDED P TABLE DIALOGUE

WHEN YOU ANSWER THE HARDWARE QUESTIONS, YOU ARE BUILDING ENTRIES IN A TABLE THAT DESCRIBES THE DEVICES UNDER TEST. THE SIMPLEST WAY TO BUILD THIS TABLE IS TO ANSWER ALL QUESTIONS FOR EACH UNIT TO BE TESTED. IF YOU HAVE A MULTIPLEXED DEVICE SUCH AS A MASS STORAGE CONTROLLER WITH SEVERAL DRIVES OR A COMMUNICATION DEVICE WITH SEVERAL LINES, THIS BECOMES TEDIOUS SINCE MOST OF THE ANSWERS ARE REPETITIOUS.

TO ILLUSTRATE A MORE EFFICIENT METHOD, SUPPOSE YOU ARE TESTING A FICTIONAL DEVICE, THE XY11. SUPPOSE THIS DEVICE CONSISTS OF A CONTROL MODULE WITH EIGHT UNITS (SUB-DEVICES) ATTACHED TO IT. THESE UNITS ARE DESCRIBED BY THE OCTAL NUMBERS 0 THROUGH 7. THERE IS ONE HARDWARE PARAMETER THAT CAN VARY AMONG UNITS CALLED THE Q FACTOR. THIS Q-FACTOR MAY BE 0 OR 1. BELOW IS A STMPLE WAY TO BUILD A TABLE FOR ONE XY11 WITH EIGHT UNITS.

\* UNITS (D) ? 8<CR>

UNIT 1  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 0<CR>  
 Q-FACTOR (O) 0 ? 1<CR>

UNIT 2  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 1<CR>  
 Q-FACTOR (O) 1 ? 0<CR>

UNIT 3  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 2<CR>  
 Q-FACTOR (O) 0 ? <CR>

UNIT 4  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 3<CR>  
 Q-FACTOR (O) 0 ? <CR>

UNIT 5  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 4<CR>  
 Q-FACTOR (O) 0 ? <CR>

UNIT 6  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 5<CR>  
 Q-FACTOR (O) 0 ? <CR>

UNIT 7  
 CSR ADDRESS (O) ? 160000<CR>  
 SUB-DEVICE # (O) ? 6<CR>  
 Q-FACTOR (O) 0 ? 1<CR>

UNIT 8  
CSR ADDRESS (0) 160000<CR>  
SUB-DEVICE # (0) ? 7<CR>  
Q-FACTOR (0) 1 ? <CR>

NOTICE THAT THE DEFAULT VALUE FOR THE Q FACTOR CHANGES WHEN A NON-DEFAULT RESPONSE IS GIVEN. BE CAREFUL WHEN SPECIFYING MULTIPLE UNITS!

AS YOU CAN SEE FROM THE ABOVE EXAMPLE, THE HARDWARE PARAMETERS DO NOT VARY SIGNIFICANTLY FROM UNIT TO UNIT. THE PROCEDURE SHOWN IS NOT VERY EFFICIENT.

THE RUNTIME SERVICES CAN TAKE MULTIPLE UNIT SPECIFICATIONS HOWEVER. LET'S BUILD THE SAME TABLE USING THE MULTIPLE SPECIFICATION FEATURE.

# UNITS (0) ? 8<CR>

UNIT 1  
CSR ADDRESS (0) ? 160000<CR>  
SUB-DEVICE # (0) ? 0.1<CR>  
Q-FACTOR (0) 0 ? 1.0<CR>

UNIT 3  
CSR ADDRESS (0) ? 160000<CR>  
SUB-DEVICE # (0) ? 2-5<CR>  
Q-FACTOR (0) 0 ? 0<CR>

UNIT 7  
CSR ADDRESS (0) ? 160000<CR>  
SUB-DEVICE # (0) ? 6.7<CR>  
Q-FACTOR (0) 0 ? 1<CR>

AS YOU CAN SEE IN THE ABOVE DIALOGUE, THE RUNTIME SERVICES WILL BUILD AS MANY ENTRIES AS IT CAN WITH THE INFORMATION GIVEN IN ANY ONE PASS THROUGH THE QUESTIONS. IN THE FIRST PASS, TWO ENTRIES ARE BUILT SINCE TWO SUB-DEVICES AND Q-FACTORS WERE SPECIFIED. THE SERVICES ASSUME THAT THE CSR ADDRESS IS 160000 FOR BOTH SINCE IT WAS SPECIFIED ONLY ONCE. IN THE SECOND PASS, FOUR ENTRIES WERE BUILT. THIS IS BECAUSE FOUR SUB-DEVICES WERE SPECIFIED. THE "-" CONSTRUCT TELLS THE RUNTIME SERVICES TO INCREMENT THE DATA FROM THE FIRST NUMBER TO THE SECOND. IN THIS CASE, SUB-DEVICES 2, 3, 4 AND 5 WERE SPECIFIED. (IF THE SUB-DEVICE WERE SPECIFIED BY ADDRESSES, THE INCREMENT WOULD BE BY 2 SINCE ADDRESSES MUST BE ON AN EVEN BOUNDARY.) THE CSR ADDRESSES AND Q-FACTORS FOR THE FOUR ENTRIES ARE ASSUMED TO BE 160000 AND 0 RESPECTIVELY SINCE THEY WERE ONLY SPECIFIED ONCE. THE LAST TWO UNITS ARE SPECIFIED IN THE THIRD PASS.

THE WHOLE PROCESS COULD HAVE BEEN ACCOMPLISHED IN ONE PASS AS SHOWN BELOW.

# UNITS (0) ? 8<CR>

UNIT 1  
CSR ADDRESS (0) ? 1600C0<CR>  
SUB-DEVICE # (0) ? 0 7<CR>  
Q-FACTOR (0) 0 ? 0.1,0....1,1<CR>

AS YOU CAN SEE FROM THIS EXAMPLE, NULL REPLIES (COMMAS ENCLOSING  
A NULL FIELD) TELL THE RUNTIME SERVICES TO REPEAT THE LAST REPLY.

## 2.8 QUICK START-UP PROCEDURE (XXDP\*)

TO START UP THIS PROGRAM:

1. BOOT XXDP\*
2. GIVE THE DATE AND ANSWER THE LSI/UNIBUS AND 50HZ (IF THERE IS A CLOCK) QUESTIONS. NOTE, NOT ALL VERSIONS OF XXDP\* ASK FOR THE CLOCK FREQUENCY
3. TYPE "R NAME", WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH "Y"
6. ANSWER ALL THE HARDWARE QUESTIONS
7. ANSWER THE "CHANGE SW" QUESTION WITH "N"

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE  
DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. FOR DEFAULT INFORMATION  
SEE THE SECTIONS WITHIN THIS DOCUMENT ON FLAGS, AND HARDWARE QUESTIONS.

### 3.0 ERROR INFORMATION

#### 3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SEE THE FLAGS SECTION OF THIS DOCUMENT).

THE GENERAL ERROR MESSAGE IS OF THE FORM:

```
NAME TYPE NUMBER ON UNIT NUMBER TST NUMBER PC:XXXXXX  
ERROR MESSAGE
```

WHERE: NAME = DIAGNOSTIC NAME  
TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)  
NUMBER = ERROR NUMBER  
UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)  
TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED  
PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE "IER" OR "IBR" FLAGS ARE SET (SEE THE FLAGS SECTION OF THIS DOCUMENT).  
THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE "IER", "IBR" OR "IXR" FLAGS ARE SET (SEE THE FLAGS SECTION OF THIS DOCUMENT).  
THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

### 3.2 SPECIFIC ERROR MESSAGES

THIS PROGRAM IS INTENDED TO PROVIDE A GO/NOGO INDICATION OF THE FUNCTIONALITY OF THE DHU-11 BOARDS. TO EXECUTE THE PROGRAM IN THIS MODE THE OPERATOR NEED ONLY ANSWER THE "EXTENDED ERROR REPORTING" SOFTWARE QUESTION WITH "NO". THE PROGRAM WILL THEN ONLY PRINT THE NAME OF THE FAILING TEST THE TEST AND ERROR NUMBERS. FOR A LIST OF THE TEST NAMES IN THIS PROGRAM SEE THE TEST SUMMARIES SECTION OF THIS DOCUMENT. AN EXAMPLE OF SUCH A AN ERROR MESSAGE IS THE FOLLOWING:

CZDHW DVC FTL ERR 7802 ON UNIT 00 TST 002 SUB 000 PC: XXXXXX  
MODEM CONTROL DTR BIT TEST FAILED

THIS ERROR INDICATES THAT A FATAL ERROR WAS ENCOUNTERED DURING THE TEST WHICH TESTS THE DATA TERMINAL READY CONTROL SIGNAL.

IF THE OPERATOR HAD REQUESTED EXTENDED ERROR REPORTING THE SAME ERROR WOULD BE REPORTED AS FOLLOWS:

CZDHW DVC FTL ERR 7802 ON UNIT 00 TST 002 SUB 000 PC: XXXXXX  
MODEM CONTROL DTR BIT TEST FAILED  
DTR BIT FAULTY ON LINE 4 DECIMAL.

### 4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE "EOP" SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. FOR FUTHER INFORMATION SEE THE SWITCHES SECTION OF THIS DOCUMENT.

## 5.0 TEST SUMMARIES

THE FOLLOWING ARE INCLUDED WITHIN CZDMWB:

1. DEVICE REGISTER ACCESS TEST - VERIFIES THAT THE UUT REGISTERS WILL RESPOND WITH THE CORRECT UNIBUS HANDSHAKING SIGNALS. VERIFIES THAT THE UUT IS AT THE CORRECT ADDRESS.
2. DTR TEST - VERIFIES THAT CHANGING THE STATE OF THE DTR BIT AFFECTS THE STATE OF THE DTR CONTROL LINE.
3. RTS TEST - VERIFIES THAT CHANGING THE STATE OF THE RTS BIT AFFECTS THE STATE OF THE RTS CONTROL LINE.
4. DSR TEST - VERIFIES THAT THE DSR STATUS SIGNAL CORRECTLY REPORTS THE STATE OF THE LOOPED BACK DTR CONTROL LINE.
5. RI TEST - VERIFIES THAT THE RI STATUS SIGNAL CORRECTLY REPORTS THE STATE OF THE LOOPED BACK DTR CONTROL LINE.
6. CTS TEST - VERIFIES THAT THE CTS STATUS SIGNAL CORRECTLY REPORTS THE STATE OF THE LOOPED BACK RTS CONTROL LINE.
7. DCD TEST - VERIFIES THAT THE DCD STATUS SIGNAL CORRECTLY REPORTS THE STATE OF THE LOOPED BACK RTS CONTROL LINE.
8. DTR INTERACTIONS TEST - VERIFIES THAT CHANGING THE STATE OF THE DTR CONTROL SIGNAL ON ANY LINE DOES NOT AFFECT THE STATE OF ANY STATUS SIGNALS THAT IT IS NOT LOOPED BACK TO.
9. RTS INTERACTIONS TEST - VERIFIES THAT CHANGING THE STATE OF THE RTS CONTROL SIGNAL ON ANY LINE DOES NOT AFFECT THE STATE OF ANY STATUS SIGNALS THAT IT IS NOT LOOPED BACK TO.
10. REPORT BMP CODES TEST THIS PSEUDO TEST REPORTS THE FIRST 32 CHARACTERS WHICH WERE DISCOVERED IN THE FIFO DURING THE EXECUTION OF THE OTHER TESTS. THIS AVOIDS INTERRUPTION OF THE OTHER TESTS BY THESE CODES IF THEY ARE NOT CRITICAL TO THE PERFORMANCE OF THE TESTS.

6.0 EXAMPLE ERROR FREE PASS

THE FOLLOWING IS AN EXAMPLE OF AN ERROR FREE PASS DIALOGUE:

```
.R CZDHWBO
CZDHWBO.BIN
DRS
CZDHW-B-0
DHU-11 FUNC TST PART3
UNIT IS DHU-11
RESTRT ADDR: 147670
DR>STA/PAS:1

CHANGE HW (L) ? Y

# UNITS (D) ? 2

UNIT 0
CSR ADDRESS: (0) 160460 ? +Z

UNIT 1
CSR ADDRESS: (0) 160460 ? 160500
ACTIVE LINE BIT MAP: (0) 177777 ? <CR>
TYPE OF LOOPBACK (1=INTERNAL, 2=H3029 OR H3277, 3=H325): (0) 2 ?

CHANGE SW (L) ? Y

REPORT UNIT NUMBER AS EACH UNIT IS TESTED: (L) Y ? <CR>
EXTENDED ERROR REPORTING: (L) N ? Y
NUMBER OF INDIVIDUAL DATA ERRORS TO REPORT ON A LINE: (D) 0 ? <CR>

TESTING UNIT : 0

TESTING UNIT : 1

CZDHW EOP      1
  0 TOTAL ERRS

DR>
```

```

1021                                     .LIST SEQ,LOC,BIN,MEB
1022                                     .NLIST CND
1030
1031
1032                                     .SBTTL PROGRAM HEADER
1033
1034
1035                                     .MCALL SVC
1036 000000 SVC ; INITIALIZE SUPERVISOR MACROS
1037
1038 ;*****
1039 ; IF STRUCTURED MACROS ARE TO BE USED, ADD ".MCALL STRUCT" AND "STRUCT"
1040 ; TO INITIALIZE THE STRUCTURED MACROS.
1041
1042 SVCINS= 1 ; LIST INSTRUCTIONS, SHIFTED RIGHT
1043 SVCTST= 1 ; LIST TEST TAGS, SHIFTED RIGHT
1044 SVCSUB= 1 ; LIST SUBTEST TAGS, SHIFTED RIGHT
1045 SVCGBL= 1 ; LIST GLOBAL TAGS, SHIFTED RIGHT
1046 SVCTAG= 1 ; LIST OTHER TAGS, SHIFTED RIGHT
1047
1048 ; CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
1049 ; TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS. CHANGE THE
1050 ; SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS. YOU MAY
1051 ; CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
1052 ;*****
1053
1054 000000 .ENABL ABS
1055 ;.ENABL AMA
1056 002000 " 2000
1057
1058 002000 BGNMOD
1059
1060
1061 ;**
1062 ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
1063 ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
1064 ;-
1065 002000 POINTER BGNRPT,BGNSW,BGNSFT,BGNDU,ERRTBL
1066
1083
1084 002000 HEADER CZDHW,B,0,10,0,PRI07
1084 002000
1084 002000 103
1084 002001 132
1084 002002 104
1084 002003 110
1084 002004 127
1084 002005 000
1084 002006 000
1084 002007 000
1084 002010
1084 002010 102
1084 002011
1084 002011 060
1084 002012
1084 002012 000000
1084 002014

L$NAME::
        .ASCII /C/
        .ASCII /Z/
        .ASCII /D/
        .ASCII /H/
        .ASCII /W/
        .BYTE 0
        .BYTE 0
        .BYTE 0
L$REV::
        .ASCII /B/
L$DEPO::
        .ASCII /0
L$UNIT::
        .WORD 0
L$TIML::

```



PROGRAM HEADER  
 002014 000010  
 002016  
 002016 017702  
 002020  
 002020 020076  
 002022  
 002022 002152  
 002024  
 002024 002162  
 002026  
 002026 020400  
 002030  
 002030 000000  
 002032  
 002032 000000  
 002034  
 002034 000000  
 002036  
 002036 000000  
 002040  
 002040 002124  
 002042  
 002042 000340  
 002044  
 002044 000000  
 002046  
 002046 000000  
 002050  
 002050 003  
 002051 003  
 002052  
 002052 000000  
 002054 000000  
 002056  
 002056 000000  
 002060  
 002060 004060  
 002062  
 002062 011552  
 002064  
 002064 000000  
 002066  
 002066 000000  
 002070  
 002070 000000  
 002072  
 002072 012410  
 002074  
 002074 000000  
 002076  
 002076 004070  
 002100  
 002100 104035  
 002102  
 002102 004010  
 002104  
 002104 011566

L\$HPCP:: .WORD 10  
 L\$SPCP:: .WORD L\$HARD  
 L\$HPTP:: .WORD L\$SOFT  
 L\$SPTP:: .WORD L\$HW  
 L\$LADP:: .WORD L\$SW  
 L\$STA:: .WORD L\$LAST  
 L\$CO:: .WORD 0  
 L\$DTYP:: .WORD 0  
 L\$APT:: .WORD 0  
 L\$DTP:: .WORD 0  
 L\$PRIO:: .WORD L\$DISPATCH  
 L\$ENVI:: .WORD PRI07  
 L\$EXP1:: .WORD G  
 L\$MREV:: .WORD 0  
 L\$EF:: .BYTE C\$REVISION  
 .BYTE C\$EDIT  
 L\$SPC:: .WORD 0  
 L\$DEVP:: .WORD 0  
 L\$REPP:: .WORD L\$DVTYP  
 L\$EXP4:: .WORD L\$RPT  
 L\$EXP5:: .WORD 0  
 L\$AUT:: .WORD 0  
 L\$DUT:: .WORD 0  
 L\$LUN:: .WORD L\$DU  
 L\$DESP:: .WORD 0  
 L\$LOAD:: .WORD L\$DESC  
 L\$ETP:: EMT E\$LOAD  
 L\$ICP:: .WORD L\$ERRTBL  
 .WORD L\$INIT

PROGRAM HEADER  
002106  
002106 012372  
002110  
002110 012370  
002112  
002112 011560  
002114  
002114 000000  
002116  
002116 000000  
002120  
002120 000000

1085

L\$CCP:: .WORD L\$CLEAN  
L\$ACP:: .WORD L\$AUTO  
L\$PRT:: .WORD L\$PROT  
L\$TEST:: .WORD 0  
L\$DLY:: .WORD 0  
L\$HIME:: .WORD 0

1097  
1098  
1099  
1100  
1101  
1102  
1103  
1104  
1105

002122  
002122 000012  
002124  
002124 012526  
002126 013010  
002130 013544  
002132 014300  
002134 014750  
002136 015420  
002140 016070  
002142 016540  
002144 017170  
002146 017620

.SBTTL DISPATCH TABLE

\*\*\*  
; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.  
; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.  
;

DISPATCH 10

.WORD 10  
L\$DISPATCH:;  
.WORD T1  
.WORD T2  
.WORD T3  
.WORD T4  
.WORD T5  
.WORD T6  
.WORD T7  
.WORD T8  
.WORD T9  
.WORD T10

1120  
1121  
1122  
1123  
1124  
1125  
1126  
1127  
1128  
1129  
1130

.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 HARDWARE P-TABLES,  
; AND IS USED AS A "TEMPLATE" FOR BUILDING THE P TABLES.  
\*\*\*

1131 002150  
002150 000003  
002152  
002152

BGNHW DFPTBL

.WORD L10000 L\$HW/2  
L\$HW::  
DFPTBL::

1132  
1133 002152 160460  
1134 002154 177777  
1135 002156 002

.WORD 160460 ;DEFAULT CSR ADDRESS  
.WORD 177777 ;DEFAULT ACTIVE LINES BIT MAP  
.BYTE 2 ;DEFAULT LOOPBACK TYPE  
.EVEN

1136  
1137  
1138 002160  
002160

ENDHW

L10000:

1147  
1148  
1149  
1150  
1151  
1152  
1153  
1154  
1155  
1156  
1157

.SBTTL SOFTWARE P TABLE

\*\*\*  
; THE SOFTWARE TABLE CONTAINS VARIOUS DATA USED BY THE  
; PROGRAM AS OPERATIONAL PARAMETERS. THESE PARAMETERS ARE  
; SET UP AT ASSEMBLY TIME AND MAY BE VARIED BY THE OPERATOR  
; AT RUN TIME.  
;--

1158 002160  
002160 000002  
002162  
002162

BGNSW SFPTBL

.WORD L10001-L\$SW/2  
L\$SW::  
SFPTBL::

1159  
1160 002162 000020  
1161 002164 000000  
1162  
1163 002166  
002166

OPTION::  
NDERPT::  
ENDSW

.WORD 20 ;BIT MAP OF PROGRAM CONTROL FLAGS  
.WORD 0 ;DEFAULT NUMBER OF INDIVIDUAL DATA ERRORS TO RPT.

L10001:

D3

1172  
 1173  
 1174  
 1184  
 1185  
 1186  
 1187  
 1188  
 1189  
 1190  
 1191  
 1192  
 1193  
 1194  
 1195  
 1196  
 1197  
 1198  
 1199  
 1200  
 1201  
 1202  
 1203  
 1204  
 1205  
 1206  
 1207  
 1208  
 1209  
 1210  
 1211  
 1212  
 1227 002166

.SBTTL GLOBAL EQUATES SECTION

;  
 ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT  
 ; ARE USED IN MORE THAN ONE TEST.  
 ;

000020  
 177777

NUMLNS==20 ;NUMBER OF LINES ON DMU11 IS 8.  
 MAPLNS==177777 ;BIT MAP OF LINES ON DMU11.

;\*\*\*\*\* DEVICE REGISTER OFFSETS FROM THE CSR'S ADDRESS \*\*\*\*\*  
 CSRO==0 ;CSR REGISTER OFFSET FROM THE CSR ADDRESS  
 RBUFO==2 ;RECEIVE REGISTER OFFSET FROM THE CSR ADDRESS  
 RXTIMO==2 ;RECTEIVE TIMER REGISTER OFFSET FROM THE CSR ADDRESS  
 LPRO==4 ;LINE PARAMETER REGISTER OFFSET FROM THE CSR ADDRESS  
 FLSO==6 ;FIFOSIZE/STATUS REGISTER OFFSET FROM THE CSR ADDRESS  
 FDATA==6 ;FIFODATA REGISTER OFFSET FROM THE CSR ADDRESS  
 LNCTRO==10 ;LINE CONTROL REGISTER OFFSET FROM THE CSR ADDRESS  
 TXAD10==12 ;TRANSMIT ADDRESS 1 REGISTER OFFSET FROM THE CSR ADDRESS  
 TXAD20==14 ;TRANSMIT ADDRESS 2 REGISTER OFFSET FROM THE CSR ADDRESS  
 TXBFCO==16 ;TRANSMIT COUNT REGISTER OFFSET FROM THE CSR ADDRESS

000020  
 000030  
 000100

;\*\*\*\*\* EQUATES USED WITH RESPECT TO THE RX BUFFER \*\*\*\*\*  
 RXBETX==16. ;LEVEL OF RX BUFFER AT WHICH TO RE-ENABLE TRANSMISSION.  
 RXBDTX==24. ;LEVEL OF RX BUFFER AT WHICH TO DISABLE TRANSMISSION.  
 RXBFUL==64. ;TOTAL CHARACTER CAPACITY OF THE RX BUFFER.

EQUALS

; BIT DIFINITIONS

100000  
 040000  
 020000  
 010000  
 004000  
 002000  
 001000  
 000400  
 000200  
 000100  
 000040  
 000020  
 000010  
 000004  
 000002  
 000001  
  
 001000  
 000400  
 000200  
 000100

BIT15== 100000  
 BIT14== 40000  
 BIT13== 20000  
 BIT12== 10000  
 BIT11== 4000  
 BIT10== 2000  
 BIT09== 1000  
 BIT08== 400  
 BIT07== 200  
 BIT06== 100  
 BIT05== 40  
 BIT04== 20  
 BIT03== 10  
 BIT02== 4  
 BIT01== 2  
 BIT00== 1  
  
 BIT9== BIT09  
 BIT8== BIT08  
 BIT7== BIT07  
 BIT6== BIT06

```

000040      BITS== BIT05
000020      BIT4== BIT04
000010      BIT3== BIT03
000004      BIT2== BIT02
000002      BIT1== BIT01
000001      BIT0== BIT00
;
; EVENT FLAG DEFINITIONS
; EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
;
000040      EF.START==      32.      ; START COMMAND WAS ISSUED
000037      EF.RESTART==    31.      ; RESTART COMMAND WAS ISSUED
000036      EF.CONTINUE==   30.      ; CONTINUE COMMAND WAS ISSUED
000035      EF.NEW==        29.      ; A NEW PASS HAS BEEN STARTED
000034      EF.PWR==        28.      ; A POWER-FAIL/POWER UP OCCURRED
;
; PRIORITY LEVEL DEFINITIONS
;
000340      PRI07== 340
000300      PRI06== 300
000240      PRI05== 240
000200      PRI04== 200
000140      PRI03== 140
000100      PRI02== 100
000040      PRI01== 40
000000      PRI00== 0
;
; OPERATOR FLAG BITS
;
000004      EVL==          4
000010      LOT==         10
000020      ADR==         20
000040      IDU==         40
000100      ISR==        100
000200      UAM==        200
000400      BOE==        400
001000      PNT==       1000
002000      PRI==       2000
004000      IXE==       4000
010000      IBE==      10000
020000      IER==      20000
040000      LOE==      40000
100000      HOE==     100000
    
```

1237  
1238  
1239  
1240  
1241  
1242  
1243  
1244  
1245  
1246  
1247  
1248  
1249  
1250 002166 000200  
1251 002170 000204  
1252 002172 177777  
1253 002174 000  
1254 002175 004  
1255 002176 000000  
1256  
1257  
1258  
1259  
1260 002200  
1261 002200 160020  
1262 002202 160022  
1263 002204 160024  
1264 002206 160026  
1265  
1266 002210 160030  
1267 002212 160032  
1268 002214 160034  
1269 002216 160036  
1270  
1271  
1272  
1273  
1274 002220 000000  
1275 002222 000000  
1276 002224 000000  
1277 002226 000001  
1278 002230 000000  
1279 002232 031463  
1280 002234 146314  
1281 002236 000000  
1282 002240 000000  
1283 002242 000000  
1284 002244 000000  
1285 002246 000000  
1286 002250 000000  
1287 002252 000000  
1288 002254 000000  
1289  
1290  
1291  
1292 002256 177546  
1293 002260 000300

.SBTTL GLOBAL DATA SECTION

\*\*\*  
; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED  
; IN MORE THAN ONE TEST.  
--

\*\*\*\*\*  
; UNIT VARIABLE AREA  
\*\*\*\*\*

RXVECA:: .WORD 200 ;RX VECTOR ADDRESS.  
TXVECA:: .WORD 204 ;TX VECTOR ADDRESS.  
ACTLNS:: .WORD 177777 ;ACTIVE LINE BIT MAP.  
LOPBCK:: .BYTE 0 ;LOOPBACK MODE  
BRLEVL:: .BYTE 4 ;INTERRUPT BUS REQUEST LEVEL  
UNITN:: .WORD 0 ;UNIT NUMBER.

\*\*\*\*\*  
; DEVICE REGISTER ADDRESS TABLE  
\*\*\*\*\*

DRADRT::  
CSRA:: .WORD 160020 ;DMU-11 CSR ADDRESS.  
RXTMA:: RBUFA:: .WORD 160022 ;DMU-11 RECIEVE BUFFER/TIMER ADDRESS.  
LPRA:: .WORD 160024 ;DMU-11 LINE PARAMETER REGISTER ADDRESS.  
FDATA:: FLSA:: .WORD 160026 ;DMU-11 FIFO SIZE/LINE STATUS REGISTER ADDRESS.  
;AND FIFO DATA REGISTER ADDRESS.  
LNCTRA:: .WORD 160030 ;DMU-11 LINE CONTROL REGISTER ADDRESS.  
TXAD1A:: .WORD 160032 ;DMU-11 TRANSMIT BUFFER 1 REGISTER ADDRESS  
TXAD2A:: .WORD 160034 ;DMU-11 TRANSMIT BUFFER 2 REGISTER ADDRESS  
TXBFCA:: .WORD 160036 ;DMU-11 TRANSMIT BUFFER COUNT REGISTER ADDRESS

\*\*\*\*\*  
; ASSORTED GLOBAL VARIABLES:  
\*\*\*\*\*

BUFPTR:: .WORD 0 ;STORAGE FOR RECEIVE CHARACTER BUFFER POINTER.  
CTRLCF:: .WORD 0 ;STORAGE FOR THE CONTROL-C FLAG.  
EXOERR:: .WORD 0 ; "EXIT ON ERROR" FLAG.  
TSTNUM:: .WORD 1 ;STORAGE FOR THE TEST NUMBER.  
IESTAT:: .WORD 0 ;STORAGE FOR STATES OF THE DUT INT ENABLE BITS.  
LGRP1M:: .WORD 31463 ;BIT MAP OF LINES IN LINE GROUP I.  
LGRP2M:: .WORD 146314 ;BIT MAP OF LINES IN LINE GROUP II.  
PASCNT:: .WORD 0 ;STO'G FOR PASS COUNT USED IN ROM VERSION# TST.  
RXINTC:: .WORD 0 ;STORAGE FOR RECEIVER INTERRUPT FLAGS.  
RXINTF:: .WORD 0 ;STORAGE FOR RECEIVER INTERRUPT FLAGS.  
TXINTC:: .WORD 0 ;STORAGE FOR TRANSMIT INTERRUPT COUNT.  
TXINTF:: .WORD 0 ;STORAGE FOR TRANSMIT INTERRUPT FLAGS.  
TP4VEC:: .WORD 0 ;STORAGE FOR THE NORM'L 004 TRAP VECTOR.  
TP4FLG:: .WORD 0 ;FLAGS SET WHEN AN EXPECTED 004 TRAP OCCURS.  
WORD1:: .WORD 0 ;LOCATION FOR PASSING INDIRECT PARAMETERS.

\*\*\*\*\*  
; LINE TIME CLOCK VARIABLES AND STORAGE.  
\*\*\*\*\*

CLKCSR:: .WORD 177546 ;CSR ADDRESS OF THE LTC.  
CLKBRL:: .WORD PRI06 ;INTERRUPT PRIORITY LEVEL OF THE LTC.



1294 002262 000100  
1295 002264 000074  
1296 002266 000000  
1297 002270 000000  
1298 002272 000170  
1299 002274 000170  
1300 002276 000021  
1301 002300 000062  
1302  
1303  
1304  
1305  
1306 002302 177572  
1307 002304 000000  
1308 002306 000000  
1309  
1310  
1311  
1312  
1313 002310 000001  
1314 002312 000002  
1315 002314 000004  
1316 002316 000010  
1317 002320 000020  
1318 002322 000040  
1319 002324 000100  
1320 002326 000200  
1321 002330 000400  
1322 002332 001000  
1323 002334 002000  
1324 002336 004000  
1325 002340 010000  
1326 002342 020000  
1327 002344 040000  
1328 002346 100000  
1329  
1330  
1331  
1332  
1333 002350 000000  
1334 002352  
1335 002552  
1336  
1337  
1338  
1339  
1340 002552 000000  
1341 002554  
1342  
1343  
1344  
1345  
1346 002610  
1347 002610 000000  
1348 002612 000000  
1349 002614 000000  
1350 002616 000000

CLKVEC:: .WORD 100 ; INTERRUPT VECTOR ADDRESS OF THE LTC.  
CLKHRZ:: .WORD 60. ; INTERRUPT FREQUENCY OF THE LTC.  
TIMER1:: .WORD C ; HARDWARE CLOCK COUNTER #1.  
TIMER2:: .WORD 0 ; HARDWARE CLOCK COUNTER #2.  
TIMER3:: .WORD 120. ; HARDWARE BREAK COUNTER LOCATION.  
BCOUNT:: .WORD 120. ; BREAK COUNT VALUE IN CLOCK TICKS.  
MSTICK:: .WORD 17. ; NUMBER OF MILLI-SECONDS PER LTC TICK.  
MSLCNT:: .WORD 62 ; LOOP COUNT (USED BY MSLOOP) TO DELAY 1 MS.

\*\*\*\*\*  
; MEMORY MANAGEMENT VARIABLES AND FLAGS.  
\*\*\*\*\*

MMSRO:: .WORD 177572 ; ADDRESS OF MEM MGT STATUS REGISTER #0.  
MMPRES:: .WORD 0 ; MEM MGT PRESENT FLAG (0 IF MM NOT PRESENT).  
MMENAB:: .WORD 0 ; MEM MGT ENABLED FLAG (0 IF MM NOT ENABLED).

\*\*\*\*\*  
; TABLE OF WORDS WITH CORRESPONDING BIT SET FOR GENERATION OF BIT MAPS.  
\*\*\*\*\*

BITTBL:: .WORD 1 ; BIT 0 SET.  
.WORD 2 ; BIT 1 SET.  
.WORD 4 ; BIT 2 SET.  
.WORD 10 ; BIT 3 SET.  
.WORD 20 ; BIT 4 SET.  
.WORD 40 ; BIT 5 SET.  
.WORD 100 ; BIT 6 SET.  
.WORD 200 ; BIT 7 SET.  
.WORD 400 ; BIT 8 SET.  
.WORD 1000 ; BIT 9 SET.  
.WORD 2000 ; BIT 10 SET.  
.WORD 4000 ; BIT 11 SET.  
.WORD 10000 ; BIT 12 SET.  
.WORD 20000 ; BIT 13 SET.  
.WORD 40000 ; BIT 14 SET.  
.WORD 100000 ; BIT 15 SET.

\*\*\*\*\*  
; STORAGE AREA FOR THE BMP CODE QUEUE.  
\*\*\*\*\*

BMPCQP:: .WORD 0 ; POINTER USED TO ACCESS THE NEXT CELL IN QUE.  
BMPCQB:: .BLKW 64. ; STORAGE FOR 32 CELLS, TEST# PLUS BMP CODE.  
BMPCQE:: ; LAST ADDRESS PLUS 2 OF THE BMP CODE QUEUE.

\*\*\*\*\*  
; STORAGE AREA FOR ERROR SUMMARY TABLE AND FLAGS.  
\*\*\*\*\*

ERSMRF:: .WORD 0 ; ERROR SUMMARY FLAGS.  
ERCNTB:: .BLKW 16 ; TABLE OF ERROR COUNTS.

\*\*\*\*\*  
; STORAGE AREA FOR THE CONTENTS OF THE DUT STAT REGISTER STATES.  
\*\*\*\*\*

STSTB:: ; BASE OF DUT STAT STORAGE TABLE.  
.WORD 0 ; STORAGE FOR STAT REGISTER FOR LINE 0.  
.WORD 0 ; STORAGE FOR STAT REGISTER FOR LINE 1.  
.WORD 0 ; STORAGE FOR STAT REGISTER FOR LINE 2.  
.WORD 0 ; STORAGE FOR STAT REGISTER FOR LINE 3.

1351 002620 000000  
 1352 002622 000000  
 1353 002624 000000  
 1354 002626 000000  
 1355 002630 000000  
 1356 002632 000000  
 1357 002634 000000  
 1358 002636 000000  
 1359 002640 000000  
 1360 002642 000000  
 1361 002644 000000  
 1362 002646 000000  
 1363 002650  
 1364  
 1365  
 1366  
 1367  
 1368 002650  
 1369 002650  
 1370 003250  
 1371 003450  
 1372 003650  
 1373 003650  
 1374  
 1375  
 1376  
 1377  
 1378  
 1379  
 1380  
 1381 003710  
 1382 003710 000000  
 1383 003712 000002  
 1384 003714 000004  
 1385 003716 000006  
 1386 003720 000010  
 1387 003722 000012  
 1388 003724 000014  
 1389 003726 000016  
 1390 003730 000020  
 1391 003732 000022  
 1392 003734 000024  
 1393 003736 000026  
 1394 003740 000030  
 1395 003742 000032  
 1396 003744 000034  
 1397 003746 000036  
 1398 003750  
 1399  
 1400  
 1401  
 1402  
 1403  
 1404  
 1405  
 1406 003750  
 1407 003750 000

```

.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 4.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 5.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 6.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 7.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 8.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 9.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 10.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 11.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 12.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 13.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 14.
.WORD 0 ;STORAGE FOR STAT REGISTER FOR LINE 15.
STSTE:: ;END OF DUT STAT STORAGE TABLE.

;*****
; GENERAL TABLE AND BUFFER AREA--513 WORDS.
;*****
BUFBAS:: ;BASE OF MEMORY BUFFER.
ERLTBL:: .BLKW 128. ;FIRST HALF OF GENERAL TABLE OR BUFFER.
BUFMID:: .BLKW 64. ;SECOND HALF OF GENERAL TABLE OR BUFFER.
BUF3QT:: .BLKW 64. ;LAST QUARTER OF THE BUFFER AREA.
BUFEND:: ;END OF GENERAL PURPOSE MEMORY BUFFER.
ENDETB:: .BLKW 16. ;BUFFER OVERFLOW SPACE.

;*****
;* TABLE FOR STORAGE OF RX/TX LINE NUMBER ASSOCIATIONS.
;* THE ASSOCIATIONS ARE STORED AS LINE NUMBER TIMES 2 FOR USE AS OFFSETS
;* WHEN ACCESSING A TABLE OF WORDS.
;* NOTE: DO NOT WRITE A NON-ZERO VALUE INTO THE UPPER BYTE OF ANY ENTRY.
;*****
TXRXLB:: ;BASE OF TX/RX LINE NUMBER ASSOCIATION TABLE.
.WORD 0 ;TX/RX LINE OFFSET FOR RX/TX LINE 0.
.WORD 2. ;TX/RX LINE OFFSET FOR RX/TX LINE 1.
.WORD 4. ;TX/RX LINE OFFSET FOR RX/TX LINE 2.
.WORD 6. ;TX/RX LINE OFFSET FOR RX/TX LINE 3.
.WORD 8. ;TX/RX LINE OFFSET FOR RX/TX LINE 4.
.WORD 10. ;TX/RX LINE OFFSET FOR RX/TX LINE 5.
.WORD 12. ;TX/RX LINE OFFSET FOR RX/TX LINE 6.
.WORD 14. ;TX/RX LINE OFFSET FOR RX/TX LINE 7.
.WORD 16. ;TX/RX LINE OFFSET FOR RX/TX LINE 8.
.WORD 18. ;TX/RX LINE OFFSET FOR RX/TX LINE 9.
.WORD 20. ;TX/RX LINE OFFSET FOR RX/TX LINE 10.
.WORD 22. ;TX/RX LINE OFFSET FOR RX/TX LINE 11.
.WORD 24. ;TX/RX LINE OFFSET FOR RX/TX LINE 12.
.WORD 26. ;TX/RX LINE OFFSET FOR RX/TX LINE 13.
.WORD 28. ;TX/RX LINE OFFSET FOR RX/TX LINE 14.
.WORD 30. ;TX/RX LINE OFFSET FOR RX/TX LINE 15.
TXRXLE:: ;END OF TX/RX LINE NUMBER ASSOCIATION TABLE.
.EVEN ;GUARANTEE THAT NEXT TABLE IS ON WORD BOUNDARY.

;*****
;* TABLE FOR STORAGE OF RX/TX LINE NUMBER ASSOCIATIONS.
;* THE ASSOCIATIONS ARE STORED AS LINE NUMBERS WHICH CAN BE USED AS SUCH OR
;* AS OFFSETS WHEN ACCESSING A TABLE OF BYTES.
;*****
TXRLNB:: ;BASE OF TX/RX LINE NUMBER ASSOCIATION TABLE.
.BYTE 0 ;TX/RX LINE FOR RX/TX LINE 0.
  
```

1408 003751 001  
 1409 003752 002  
 1410 003753 003  
 1411 003754 004  
 1412 003755 005  
 1413 003756 006  
 1414 003757 007  
 1415 003760 010  
 1416 003761 011  
 1417 003762 012  
 1418 003763 013  
 1419 003764 014  
 1420 003765 015  
 1421 003766 016  
 1422 003767 017  
 1423 003770

```

.BYTE 1. ;TX/RX LINE FOR RX/TX LINE 1.
.BYTE 2. ;TX/RX LINE FOR RX/TX LINE 2.
.BYTE 3. ;TX/RX LINE FOR RX/TX LINE 3.
.BYTE 4. ;TX/RX LINE FOR RX/TX LINE 4.
.BYTE 5. ;TX/RX LINE FOR RX/TX LINE 5.
.BYTE 6. ;TX/RX LINE FOR RX/TX LINE 6.
.BYTE 7. ;TX/RX LINE FOR RX/TX LINE 7.
.BYTE 8. ;TX/RX LINE FOR RX/TX LINE 8.
.BYTE 9. ;TX/RX LINE FOR RX/TX LINE 9.
.BYTE 10. ;TX/RX LINE FOR RX/TX LINE 10.
.BYTE 11. ;TX/RX LINE FOR RX/TX LINE 11.
.BYTE 12. ;TX/RX LINE FOR RX/TX LINE 12.
.BYTE 13. ;TX/RX LINE FOR RX/TX LINE 13.
.BYTE 14. ;TX/RX LINE FOR RX/TX LINE 14.
.BYTE 15. ;TX/RX LINE FOR RX/TX LINE 15.
TXRLNE:: ;END OF TX/RX LINE NUMBER ASSOCIATION TABLE.
.EVEN ;GUARANTEE THAT NEXT TABLE IS ON WORD BOUNDARY.
    
```

1424  
 1425  
 1426  
 1427  
 1428  
 1429  
 1430  
 1431  
 1432

```

;*****
;* TABLE OF TX/RX LINE NUMBER ASSOCIATIONS IN STAGGERED LOOPBACK.
;* THE ASSOCIATIONS ARE STORED AS LINE NUMBER TIMES 2 FOR USE AS OFFSETS
;* WHEN ACCESSING A TABLE OF WORDS.
;* THIS IS A TABLE OF DATA FOR READING ONLY. USE TO LOAD THE ABOVE TABLE.
;* NOTE: MUST CONVERT FROM BYTES TO WORDS WHEN LOADING ABOVE TABLE.
;*****
    
```

1433 003770  
 1434 003770 004  
 1435 003771 006  
 1436 003772 000  
 1437 003773 002  
 1438 003774 014  
 1439 003775 016  
 1440 003776 010  
 1441 003777 012  
 1442 004000 024  
 1443 004001 026  
 1444 004002 020  
 1445 004003 022  
 1446 004004 034  
 1447 004005 036  
 1448 004006 030  
 1449 004007 032  
 1450  
 1451

```

STGTRB:: ;BASE OF STAGGERED TX/RX LINE NUMBER TABLE.
.BYTE 4. ;TX/RX LINE OFFSET FOR RX/TX LINE 0.
.BYTE 6. ;TX/RX LINE OFFSET FOR RX/TX LINE 1.
.BYTE 0. ;TX/RX LINE OFFSET FOR RX/TX LINE 2.
.BYTE 2. ;TX/RX LINE OFFSET FOR RX/TX LINE 3.
.BYTE 12. ;TX/RX LINE OFFSET FOR RX/TX LINE 4.
.BYTE 14. ;TX/RX LINE OFFSET FOR RX/TX LINE 5.
.BYTE 8. ;TX/RX LINE OFFSET FOR RX/TX LINE 6.
.BYTE 10. ;TX/RX LINE OFFSET FOR RX/TX LINE 7.
.BYTE 20. ;TX/RX LINE OFFSET FOR RX/TX LINE 8.
.BYTE 22. ;TX/RX LINE OFFSET FOR RX/TX LINE 9.
.BYTE 16. ;TX/RX LINE OFFSET FOR RX/TX LINE 10.
.BYTE 18. ;TX/RX LINE OFFSET FOR RX/TX LINE 11.
.BYTE 28. ;TX/RX LINE OFFSET FOR RX/TX LINE 12.
.BYTE 30. ;TX/RX LINE OFFSET FOR RX/TX LINE 13.
.BYTE 24. ;TX/RX LINE OFFSET FOR RX/TX LINE 14.
.BYTE 26. ;TX/RX LINE OFFSET FOR RX/TX LINE 15.
.EVEN ;GUARANTEE THAT NEXT TABLE IS ON WORD BOUNDARY.
    
```

1464 004010  
 004010  
 004010 000000  
 004012 000000  
 004014 000000  
 004016 000000

```

ERRTBL
ERRTYP:: .WORD 0
ERRNBR:: .WORD 0
ERRMSG:: .WORD 0
ERRBLK:: .WORD 0
    
```

1465  
 1466

.EVEN

L\$ERRTBL::

1468  
1469  
1470  
1471  
1472  
1473  
1474  
1475  
1476  
1477  
1478  
1479  
1480  
1481  
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1500  
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```
.SBTTL GPR HANDLING ROUTINES FOR SUBROUTINE CALLS.  
:*****  
:* THERE ARE 4 ROUTINES AND MACRO DEFINITIONS USED FOR THE HANDLING OF  
:* GPR VALUES DURING SUBROUTINE CALLS WITHIN THIS PROGRAM. THE FOUR  
:* ROUTINES/MACRO CALLS HAVE THE FOLLOWING NAMES:  
:*  
:* SAVE - MACRO DEFINITION USED AT THE BEGINNING OF A SUBROUTINE TO  
:* SAVE THE GPR CONTENTS FOR LATER RESTORATION.  
:* PASS MACRO DEFINITION USED AT THE END OF A SUBROUTINE TO RESTORE  
:* THE PREVIOUSLY SAVED GPR CONTENTS AND TO LEAVE THE CONTENTS  
:* OF THE SPECIFIED GPR(S) INTACT (NOT RESTORED).  
:* PREG05 - SUBROUTINE WHICH IS CALLED FROM THE SAVE AND PASS MACRO  
:* EXPANSIONS WHICH ACTUALLY PERFORMS THE ACTIONS ON THE GPRS.  
:*  
:* DURING A SUBROUTINE WHICH USES THESE GPR SAVE ROUTINES THE VALUES  
:* OF THE GPRS ARE STORED ON THE STACK IN THE FOLLOWING STACK FRAME:  
:*  
:* SP -> RET PC INTO PREG05 ROUTINE.  
:* SP+2 -> GPR R0 CONTENTS.  
:* SP+4 -> GPR R1 CONTENTS.  
:* SP+6 -> GPR R2 CONTENTS.  
:* SP+8 -> GPR R3 CONTENTS.  
:* SP+10 -> GPR R4 CONTENTS.  
:* SP+12 -> GPR R5 CONTENTS.  
:* SP+14 -> RET PC INTO CALLER OF SUB'TNE WHICH CALLED PREG05.  
:*  
:* EACH LEVEL OF SUB'TNE CALLING USES 8 WORDS OF STACK OVERHEAD.  
:* THE SAVE AND PASS MACROS CAN ALSO BE USED IN "STRAIGHT LINE CODE"  
:* TO SAVE AND RESTORE THE GPR VALUES. IN ANY CASE, AFTER THE  
:* ISSUING OF A PASS CALL THE GPRS WILL BE RESTORED TO THE VALUES  
:* THEY HAD PRIOR TO THE LAST SAVE CALL (EXCEPT FOR THE EXCEPTED,  
:* OR PASSED INTACT, GPRS SPECIFIED AS PARAMETERS TO THE PASS CALL)  
:* AND THE SP WILL ALSO BE RESTORED TO ITS CONDITION BEFORE THE LAST  
:* SAVE CALL. THE PROGRAMMER MUST BE SURE THAT THE SP HAS THE SAME  
:* VALUE WHEN THE PASS MACRO IS CALLED AS IT HAD IMMEDIATELY AFTER  
:* THE SAVE MACRO WAS CALLED.  
:*****
```

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1520

.SBTTL GPR FRAME ACCESS EQUATES

\*\*\*\*  
;EQUATES THAT ALLOW ACCESS TO THE STACK FRAME. THESE ARE THE  
;OFFSETS INTO THE STACK FOR REGISTERS SAVED DURING THE PREGOS  
;ROUTINE.  
; --  
LPCSLT== 36 ;OFFSET FOR LAST RETURN PC.  
PCSLT== 16 ;OFFSET FOR RETURN PC.  
R5SLOT== 14 ;OFFSET FOR R5.  
R4SLOT== 12 ;OFFSET FOR R4.  
R3SLOT== 10 ;OFFSET FOR R3.  
R2SLOT== 6 ;OFFSET FOR R2.  
R1SLOT== 4 ;OFFSET FOR R1.  
ROSLOT== 2 ;OFFSET FOR R0.

000036  
000016  
000014  
000012  
000010  
000006  
000004  
000002

1522  
1523  
1524  
1525  
1526  
1527  
1528  
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```
.SBTTL GLOBAL MACRO DEFINITION SAVE
;*****
;* THIS MACRO IS USED AT THE BEGINNING OF A SUBROUTINE TO SAVE THE
;* CONTENTS OF THE GPRS R0 THRU R5.
;*
;* INPUTS: SP UNCHANGED SINCE SUBROUTINE WAS ENTERED
;* R5SLOT - OFFSET TO STACK SLOT FOR R5 (EQUATED TO 14 OCTAL)
;*
;* OUTPUTS: GPR SAVE AREA ON THE STACK IS LOADED WITH THE CONTENTS OF GPRS
;* TOP OF STACK LOADED WITH THE RETURN ADDRESS INTO PREG05
;*
;* CALLING SEQUENCE: SAVE
;*
;* COMMENTS: NO ARGUMENTS ARE ALLOWED.
;* THE PASS MACRO SHOULD BE CALLED TO RESTORE THE GPR VALUES.
;*
;* SUBORDINATE ROUTINES CALLED: PREG05.
;*****

.MACRO SAVE
.LIST
        JSR    R5,PREG05        ;CALL REGISTER SAVE SUBRT.
.NLIST
.ENDM SAVE
```

1547  
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```

.SBTTL GLOBAL MACRO DEFINITION - PASS
:*****
:* THIS MACRO IS USED IN CONJUNCTION WITH THE SAVE MACRO. IT IS
:* CALLED AT END OF A SUBROUTINE TO PASS PARAMETERS IN GPRS BACK TO THE
:* CALLING ROUTINE BY ALTERING THE GPR SAVE AREA ON THE STACK AND THEN
:* RETURNING TO PREG05 TO RESTORE THE GPRS TO THEIR SAVED VALUES.
:*
:* INPUTS: ONLY ALLOWED ARGUMENTS ARE "R0" THRU "R5".
:* ROSLOT THRU R5SLOT MUST BE EQUATED TO THEIR RESPECTIVE GPR SAVE
:* SLOT OFFSETS BEFORE CALLING THIS MACRO.
:*
:* OUTPUTS: THE GPR VALUES ARE PUT IN THEIR RESPECTIVE SLOTS ON THE STACK.
:*
:* CALLING SEQUENCE: PASS R0,R1,...
:*
:* COMMENTS: ANY COMBINATION OF GPR ARGUMENTS MAY BE LISTED IN ANY ORDER.
:* FOR EXAMPLE, THE FOLLOWING ARE LEGAL:
:* PASS R1
:* PASS R4,R0,R2
:* THE GPRS LISTED AS ARGUMENTS WILL BE PASSED INTACT TO THE
:* CALLING ROUTINE. ALL OTHER GPRS WILL BE RESTORED.
:* THE SP MUST BE AT ITS ORIGINAL VALUE WHEN PASS IS CALLED.
:*
:* THE MACRO CALL
:* PASS R0,R3
:* EXPANDS INTO THE FOLLOWING ASSEMBLY CODE:
:* MOV R0,ROSLOT(SP) ;PUT R0 IN STACK SLOT.
:* MOV R3,R3SLOT(SP) ;PUT R3 IN STACK SLOT.
:* JSR PC,@(SP)+ ;RETURN TO PREG05 SUBRT.
:* IN THIS EXAMPLE GPRS R1, R2, R4, AND R5 WILL BE RESTORED TO
:* THEIR VALUES CONTAINED IN THE STACK FRAME AND R0 AND R3
:* WILL BE LEFT AT THEIR VALUES PRIOR TO THIS PASS CALL.
:*
:* SUBORDINATE ROUTINES CALLED: (PREGRT - LABEL WITHIN PREG05, VALUE ON STACK.)
:*****
.*MACRO PASS A,B,C,D,E,F
.*IRP X,<A,B,C,D,E,F>
.*IF NB,X
.*LIST
MOV X,X'SLOT(SP) ;PUT X IN STACK SLOT.
.*NLIST
.*ENDC
.*ENDM
.*LIST
JSR PC,@(SP)+ ;RETURN TO PREG05 SUBRT.
.*NLIST
.*ENDM PASS

```

```

1596 .SBTTL GLOBAL SUBROUTINE PREG05 -
1597 :*****
1598 :* PRESERVE REGISTERS R0 THROUGH R5 FOR SUBROUTINE CALLS.
1599 :*
1600 :* INPUTS: THE RETURN ADDRESS BACK INTO THE CALLING ROUTINE MUST BE IN
1601 :* GPR R5. (I.E. MACROS USE "JSR R5,PREG05".)
1602 :*
1603 :* OUTPUTS: REGISTERS R0 THROUGH R5 ARE SAVED ON THE STACK.
1604 :*
1605 :*CALLING SEQUENCE: SAVE ;MACRO EXPANSION CALLS PREG05.
1606 :* [SUBROUTINE CODE]...
1607 :* PASS ;MACRO EXPANSION RECALLS PREG05.
1608 :*
1609 :*COMMENTS: THIS ROUTINE IS RE ENTRANT.
1610 :*
1611 :* PARAMETERS MAY BE PASSED OUT OF A SUBROUTINE BY MODIFYING THE
1612 :* REGISTER SAVE AREA ON THE STACK. USE THE PASS GPRN MACRO
1613 :* TO RETURN GPR VALUES INTACT.
1614 :* USE THE RNSLOT OFFSETS FROM THE SP TO PASS OTHER PARAMETERS.
1615 :* [EXAMPLE: MOV VALUE,ROSLOT(SP) ]
1616 :* MAKE SURE THE SP IS AT ITS ORIGINAL VALUE WHEN YOU DO THIS.
1617 :*
1618 :*SUBORDINATE ROUTINES CALLED: NONE.
1619 :*****
1620
1621 004020 PREG05: ;R5 HAS BEEN LOADED ON THE STACK BY THE SUBROUTINE CALL
1622 004020 010446 MOV R4,-(SP) ;SAVE R4
1623 004022 010346 MOV R3,-(SP) ;SAVE R3
1624 004024 010246 MOV R2,-(SP) ;SAVE R2
1625 004026 010146 MOV R1,-(SP) ;SAVE R1
1626 004030 010046 MOV R0,-(SP) ;SAVE R0
1627 004032 010546 MOV R5,-(SP) ;PUSH RETURN PC ON TOP OF STACK
1628 004034 016605 000014 MOV R5SLOT(SP),R5 ;RESTORE R5 TO VALUE IT HAD BEFORE CALLS
1629
1630 004040 004736 JSR PC,@(SP)+ ;CALL THE SUBROUTINE AT THE RETURN ADDRESS
1631 ;FROM THE PREG05 CALL, PUTTING THE PRESENT
1632 ;PC ON THE STACK AS A RETURN ADDRESS INTO
1633 ;THIS (PREG05) ROUTINE.
1634
1635 ;+++
1636 ;THE FOLLOWING CODE IS EXECUTED WHEN THE CALLING ROUTINE DOES A
1637 ;"RETURN" [JSR PC,@(SP)+] USING THE PC DEPOSITED ON THE STACK ABOVE.
1638 ;---
1639
1640 004042 012605 PREGRT: MOV (SP)+,R5 ;PUT RETURN PC IN R5.
1641 004044 012600 MOV (SP)+,R0 ;RESTORE R0.
1642 004046 012601 MOV (SP)+,R1 ;RESTORE R1.
1643 004050 012602 MOV (SP)+,R2 ;RESTORE R2.
1644 004052 012603 MOV (SP)+,R3 ;RESTORE R3.
1645 004054 012604 MOV (SP)+,R4 ;RESTORE R4.
1646
1647 004056 000205 RTS R5 ;RETURN TO THE SUBROUTINE WHICH CALLED PREG05.
1648 ;RESTORING R5 IN THE PROCESS.

```



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.SBTTL GLOBAL TEXT SECTION

\*\*\*  
; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,  
; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN  
; MORE THAN ONE TEST.  
;

; NAMES OF DEVICES SUPPORTED BY PROGRAM  
;

DEV TYP <DMU 11>

004060  
004060  
004063  
004066

104 110 125  
055 061 061  
000

L\$DVTYP::  
.ASCIZ /DMU 11/

.EVEN

1670  
1676  
1677  
1678  
1679

; TEST DESCRIPTION  
;

DESCRIPT <DMU 11 FUNC TST PART3>

004070  
004070  
004070

104 110 125

L\$DESC::  
.ASCIZ /DMU-11 FUNC TST PAR

T3/

004073 055 061 061  
004076 040 106 125  
004101 116 103 040  
004104 124 123 124  
004107 040 120 101  
004112 122 124 063  
004115 000

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.EVEN

.EVEN

```

1697
1698      .NLIST BIN
1699
1700
1701      ; ***** FORMAT STATEMENTS USED IN PRINT CALLS *****
1702
1703
1704 004116 EF0503:: .ASCIZ /#T#N/
1705 004123 EF1601:: .ASCIZ /#A #T#A, TEST ABORTED #N/
1706 004155 EF7801:: .ASCIZ /#T#A ON LINE #D2#A DECIMAL.#N/
1707 004213 EF8401:: .ASCIZ /#A #T#A FOR LINE #D2#A(D) AFFECTS OTHER MODEM SIGNALS.#N/
1708 004305 EF8402:: .ASCIZ /#A          CHANGING #T#A FOR LINE #D2#A(D) AFFECTED /
1709 004371          .ASCIZ /#T#A FOR LINE #D2#A(D).#N/
1710 004423 EF9301:: .ASCIZ /#A #T#D2#A(D), BMP CODE REPORTED :#03#A(O)#N/
1711 004501 EF9302:: .ASCIZ /#A OVERFLOW OCCURRED (MORE THAN 31 BMP CODES FOUND IN QUEUE)#N/
1712 004601 MFUNIT:: .ASCIZ /#N#A TESTING UNIT :#D4#N/
1713          .EVEN
1714          .LIST BIN

```

```
1723
1724 .NLIST BIN
1725
1726
1727 ;***** GLOBAL ERROR MESSAGES *****
1728
1729 004632 EM0103:: .ASCIZ /DEVICE REGISTER ACCESS ERRORS/
1730 004670 EM1601:: .ASCIZ /TIMEOUT OCCURRED WAITING FOR MASTER RESET TO CLEAR/
1731 004753 EM7801:: .ASCIZ /MODEM CONTROL DTR BIT TEST FAILED/
1732 005015 EM7802:: .ASCIZ / DTR BIT FAULTY/
1733 005035 EM7901:: .ASCIZ /MODEM CONTROL RTS BIT TEST FAILED/
1734 005077 EM7902:: .ASCIZ / RTS BIT FAULTY/
1735 005117 EM8001:: .ASCIZ /DSR MODEM STATUS SIGNAL TEST FAILED/
1736 005163 EM8002:: .ASCIZ / DSR MODEM STATUS SIGNAL DEFECTIVE/
1737 005227 EM8101:: .ASCIZ /RI MODEM STATUS SIGNAL TEST FAILED/
1738 005272 EM8102:: .ASCIZ / RI MODEM STATUS SIGNAL DEFECTIVE/
1739 005335 EM8201:: .ASCIZ /CTS MODEM STATUS SIGNAL TEST FAILED/
1740 005401 EM8202:: .ASCIZ / CTS MODEM STATUS SIGNAL DEFECTIVE/
1741 005445 EM8301:: .ASCIZ /DCD MODEM STATUS SIGNAL TEST FAILED/
1742 005511 EM8302:: .ASCIZ / DCD MODEM STATUS SIGNAL DEFECTIVE/
1743 005555 EM8401:: .ASCIZ /DTR MODEM CONTROL SIGNAL INTERACTIONS TEST FAILED/
1744 005637 EM8402:: .ASCIZ /DTR/
1745 005643 EM8403:: .ASCIZ /DSR/
1746 005647 EM8404:: .ASCIZ /RI/
1747 005652 EM8405:: .ASCIZ /DCD/
1748 005656 EM8406:: .ASCIZ /CTS/
1749 005662 EM8501:: .ASCIZ /RTS MODEM CONTROL SIGNAL INTERACTIONS TEST FAILED/
1750 005744 EM8502:: .ASCIZ /RTS/
1751 005750 EM9301:: .ASCIZ /BMP CODES WERE REPORTED DURING THIS DIAGNOSTIC/
1752 006027 EM9302:: .ASCIZ /BMP CODE FOUND IN TEST /
1753 006057 EM9303:: .ASCIZ /THE LAST BMP CODE WAS FOUND IN TEST /
1754 006124 EM9304:: .ASCIZ /UNEXPECTED BMP CODES FOUND DURING THIS PASS/
1755 .EVEN
1756 .LIST BIN
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.SBTTL GLOBAL ERROR REPORT SECTION

\*\*\*  
; THE GLOBAL ERROR REPORT SECTION CONTAINS MESSAGE PRINTING AREAS  
; USED BY MORE THAN ONE TEST TO OUTPUT ADDITIONAL ERROR INFORMATION. PRINTB  
; (BASIC) AND PRINTX (EXTENDED) CALLS ARE USED TO CALL PRINT SERVICES.  
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006200  
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006200 004567 175614  
006204 012700 000100  
006210 046700 173746  
006214 001036  
006216 032705 000001  
006222 001410  
006224 012746 006316  
006230 012746 000001  
006234 010600  
006236 104414  
006240 062706 000004  
006244 032705 000002  
006250 001410  
006252 012746 006374  
006256 012746 000001  
006262 010600  
006264 104414  
006266 062706 000004  
006272 012746 006453  
006276 012746 000001  
006302 010600  
006304 104415  
006306 062706 000004

```

.SBTTL GLOBAL ERROR REPORTING ROUTINE ER0101 -
;*****
;* THIS IS AN ERROR REPORTING SUBROUTINE WHICH PRINTS ADDITIONAL ERROR
;* INFORMATI'N IF AN ERROR IS DETECTED IN TEST 1 (REGISTER ADDRESS
;* ACCESS TEST). IF THE "EXTENDED ERROR INFO" OPTION HAS BEEN SELECTED
;* THEN THIS SUBROUTINE WILL REPORT THE TYPE OF ACCESS (READ OR WRITE OR
;* BOTH) WHICH CAUSED A BUS TIME-OUT TRAP (004 TRAP).A MESSAGE INDICATING
;* THAT THE DHU MAY BE AT THE WRONG UNIBUS ADDRESS IS ALSO PRINTED.
;*
;* INPUTS: R5 - ERROR FLAG WORD.
;* IF BIT 0 IS SET, A READ ERROR OCCURED.
;* IF BIT 1 IS SET, A WRITE ERROR OCCURED.
;*
;* OUTPUTS: MESSAGES ARE PRINTED AT THE OPERATOR CONSOLE.
;*
;* CALLING SEQUENCE: INCLUDE THE LABEL "ER0101" AS THE MESSAGE POTNTER
;* PARAMETER IN THE DRS ERROR REPORT MACRO CALL.
;*
;* COMMENTS:
;*
;* SUBORDINATE ROUTINES USED: NONE.
;*****
                BGNMSG ER0101
                ER0101::
1799             SAVE                ;SAVE THE GPR CONTENTS.
                JSR R5,PREG05        ;CALL REGISTER SAVE SUBRT.
1801             MOV #BIT06,R0        ;SET-UP THE BIT MAP FOR 'REPORT EXT'D ERROR INFO'
1802             BIC OPTION,R0        ;TRY AND CLEAR THE FLAG.
1803             BNE 6$                ;EXIT IF OPTION NOT SELECTED.
;+
; REPORT EXTENDED ERROR INFOMATION
;-
1808             BIT #BIT0,R5         ;TEST FOR READ ERROR.
1809             BEQ 2$                ;SKIP READ ERROR MSG IF NO READ ERROR.
1810             PRINTB #MSG1         ;PRINT READ ERROR MESSAGE.
                                MOV #MSG1,-(SP)
                                MOV #1,(SP)
                                MOV SP,R0
                                TRAP C$PNTB
                                ADD #4,SP
1811             2$: BIT #BIT1,R5     ;TEST FOR WRITE ERROR.
1812             BEQ 4$                ;SKIP WRITE ERROR MSG IF NO WRITE ERROR.
1813             PRINTB #MSG2         ;PRINT WRITE ERROR MESSAGE.
                                MOV #MSG2,-(SP)
                                MOV #1,-(SP)
                                MOV SP,R0
                                TRAP C$PNTB
                                ADD #4,SP
1814             4$: PRINTX #MSG3      ;SUGGEST THAT DHU MAY BE AT WRONG ADDRESS.
                                MOV #MSG3,-(SP)
                                MOV #1,-(SP)
                                MOV SP,R0
                                TRAP C$PNTX
                                ADD #4,SP

```

```

1815 006312          6$: PASS          ;RESTORE THE GPR CONTENTS.
      006312 004736          JSR          PC,8(SP).          ;RETURN TO PREGOS SUBRT.
1816 006314          ENDMSG
      006314          L10002: TRAP C$MSG
      006314 104423
1817
1818 006316 045 101 102 MSG1:: .ASCIZ /#ABUS TIME-OUT TRAP CAUSED BY READ ATTEMPT.#N/
      006321 125 123 040
      006324 124 111 115
      006327 105 055 117
      006332 125 124 040
      006335 124 122 101
      006340 120 040 103
      006343 101 125 123
      006346 105 104 040
      006351 102 131 040
      006354 122 105 101
      006357 104 040 101
      006362 124 124 105
      006365 115 120 124
      006370 056 045 116
      006373 000
1819 006374 045 101 102 MSG2:: .ASCIZ /#ABUS TIME-OUT TRAP CAUSED BY WRITE ATTEMPT.#N/
      006377 125 123 040
      006402 124 111 115
      006405 105 055 117
      006410 125 124 040
      006413 124 122 101
      006416 120 040 103
      006421 101 125 123
      006424 105 104 040
      006427 102 131 040
      006432 127 122 111
      006435 124 105 040
      006440 101 124 124
      006443 105 115 120
      006446 124 056 045
      006451 116 000
1820 006453 045 101 104 MSG3:: .ASCIZ /#ADHU MAY BE AT THE WRONG UNIBUS ADDRESS.#N#N/
      006456 110 125 040
      006461 115 101 131
      006464 040 102 105
      006467 040 101 124
      006472 040 124 110
      006475 105 040 127
      006500 122 117 116
      006503 107 040 125
      006506 116 111 102
      006511 125 123 040
      006514 101 104 104
      006517 122 105 123
      006522 123 056 045
      006525 116 045 116
      006530 000
1821
1822          .EVEN

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006532 012700 000100  
006536 046700 173420  
006542 001011  
006544  
006544 010146  
006546 012746 004116  
006552 012746 000002  
006556 010600  
006560 104414  
006562 062706 000006  
006566  
006566  
006566 104423

```
.SBTTL GLOBAL ERROR REPORTING ROUTINE - ER0503
;*****
;* THIS IS AN ERROR REPORTING SUBROUTINE WHICH PRINTS AN ADDITIONAL ERROR
;* MESSAGE WHOSE ADDRESS IS PASSED AS AN INPUT PARAMETER, PROVIDED
;* EXTENDED ERROR REPORTING HAS BEEN REQUESTED.
;*
;* INPUTS: R1 ADDRESS OF THE MESSAGE TO PRINT.
;*
;* OUTPUTS: A MESSAGES IS PRINTED AT THE OPERATOR CONSOLE.
;*
;* CALLING SEQUENCE: LOAD THE ADDRESS OF THE MESSAGE IN R1.
;* INCLUDE THE LABEL "ER0503" AS THE MESSAGE POINTER
;* PARAMETER IN THE DIAG SUPER ERROR REPORT MACRO CALL.
;*
;* COMMENTS: THE MESSAGE IS PRINTED AS BASIC ERROR INFORMATION.
;*
;* SUBORDINATE ROUTINES USED: NONE.
;*****
```

BGNMSG ER0503

ER0503::

```
MOV #BIT06,R0 ;TRY TO CLEAR THE
BIC OPTION,R0 ;EXT'D ERROR REPORTING FLAG
BNE 2$ ;EXIT IF FLAG NOT SET.
```

```
PRINTB #EF050? R1 ;PRINT THE MESSAGE.
```

```
MOV R1,-(SP)
MOV #EF0503,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C:PNTB
ADD #6,SP
```

2\$: ENDMSG

L10003:

```
TRAP C:MSG
```

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1876 006570  
006570  
1877 006570  
006570 004567 175224  
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1879 006574 012700 000100  
1880 006600 046700 173356  
1881 006604 001024  
1882  
1883  
1884 006606  
006606 010146  
006610 012746 004116  
006614 012746 000002  
006620 010600  
006622 104414  
006624 062706 000006  
1885  
1886 006630 016702 175160  
1887 006634  
006634 010246  
006636 012746 004123  
006642 012746 000002  
006646 010600  
006650 104414  
006652 062706 000006  
1888  
1889 006656  
006656 004736  
1890 006660  
006660  
006660 104423

```
.SBTTL GLOBAL ERROR REPORTING ROUTINE - ER1603
;*****
;* THIS ERROR REPORTING ROUTINE IS USED TO PRINT OUT A BASIC ERROR
;* MESSAGE, ALONG WITH A MESSAGE INFORMING THE OPERATOR WHICH TEST IS
;* ABOUT TO BE ABORTED, PROVIDED EXTENDED ERROR INFORMATION HAS BEEN
;* REQUESTED. OTHERWISE ONLY A "TEST FAILURE" MESSAGE WILL BE PRINTED
;*
;* INPUTS: R1 CONTAINS THE ADDRESS OF THE MESSAGE TO BE PRINTED.
;* ERRMSG - CONTAINS THE ADDRESS OF THE MESSAGE THAT INDICATES
;* THE TEST THAT IS BEING PERFORMED, EG DMA, BREAK ETC.
;*
;* OUTPUTS. MESSAGES ARE PRINTED AT THE OPERATORS CONSOLE.
;* "TESTNAME TEST ABORTED"
;*
;* CALLING SEQUENCE: INCLUDE THE LABEL "ER1603" AS THE MESSAGE POINTER
;* PARAMETER IN THE DRS ERROR REPORT MACRO CALL.
;*
;* COMMENTS:
;*
;* SUBORDINATE ROUTINES CALLED: NONE.
;*****
BGNMSG ER1603
ER1603::
SAVE ;SAVE THE CONTENTS OF THE GPRS.
JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.

MOV %BIT06,R0 ;TRY TO CLEAR THE
BIC OPTION,R0 ;EXT'D ERROR REPORTING FLAG
BNE 2$ ;EXIT IF FLAG NOT SET.

PRINTB #EF0503,R1 ;PRINT BASIC MESSAGE ON OPERATORS CONSOLE.
MOV R1,-(SP)
MOV #EF0503,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #6,SP

MOV ERRMSG,R2 ;GET THE "TEST MESSAGE".
PRINTB #EF1601,R2 ;PRINT "TEST ABORTED" MESSAGE.
MOV R2,-(SP)
MOV #EF1601,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #6,SP

2$: PASS ;RESTORE THE CONTENTS OF THE GPRS.
JSR PC,@(SP)+ ;RETURN TO PREG05 SUBRT.

ENDMSG
L10004:
TRAP C$MSG
```



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006662  
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006662 032767 000100 173272  
006670 001412  
  
006672  
006672 010346  
006674 010146  
006676 012746 004155  
006702 012746 000003  
006706 010600  
006710 104414  
006712 062706 000010  
  
006716  
006716  
006716 104423

```
.SBTTL GLOBAL ERROR REPORTING ROUTINE ER7801
;*****
;* THIS IS AN ERROR REPORTING SUBROUTINE WHICH PRINTS AN ADDITIONAL ERROR
;* MESSAGE WHOSE ADDRESS IS PASSED AS AN INPUT PARAMETER. A LINE NUMBER
;* IS INCLUDED AT THE END OF THE MESSAGE. THE MESSAGE IS PRINTED ONLY IF
;* EXTENDED ERROR REPORTING IS REQUESTED.
;*
;* INPUTS: R1 ADDRESS OF THE MESSAGE TO PRINT.
;* R3 NUMBER OF LINE ON WHICH ERROR OCCURRED.
;*
;* OUTPUTS: A MESSAGES IS PRINTED AT THE OPERATOR CONSOLE.
;*
;* CALLING SEQUENCE: LOAD THE ADDRESS OF THE MESSAGE IN R1.
;* LOAD THE LINE NUMBER INTO R3.
;* INCLUDE THE LABEL "ER7801" AS THE MESSAGE POINTER
;* PARAMETER IN THE DIAG SUPER ERROR REPORT MACRO CALL.
;*
;* COMMENTS: THE MESSAGE IS PRINTED AS BASIC ERROR INFORMATION.
;*
;* SUBORDINATE ROUTINES USED: NONE.
;*****
```

BGNMSG ER7801

ER7801::

```
;;
;; EXIT IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
;--
BIT #BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
BEQ 2$ ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
;DURING THE SOFTWARE QUESTIONS.
```

PRINTB #EF7801,R1,R3 ;PRINT THE MESSAGE.

```
MOV R3,-(SP)
MOV R1,-(SP)
MOV #EF7801,-(SP)
MOV #3,-(SP)
MOV SP,R0
TRAP C#PNTB
ADD #10,SP
```

2\$: ENDMSG

L10005:

TRAP C#MSG

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1955 006720  
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1956 006720  
006720 004567 175074  
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1961 006724 032767 000100 173230  
1962 006732 001517  
1963  
1964  
1965 006734  
006734 010346  
006736 010146  
006740 012746 004213  
006744 012746 000003  
006750 010600  
006752 104414  
006754 062706 000010  
1966  
1967 006760 010167 000204  
1968 006764 005001  
1969 006766 012704 002610  
1970 006772 010177 173202  
1971 006776 017700 173204  
1972 007002 011405  
1973 007004 040005  
1974 007006 042400

```
.SBTTL GLOBAL ERROR REPORTING ROUTINE ER8401
;*****
;* THIS ERROR REPORTING SUBROUTINE IS INTENDED TO REPORT INTERACTIONS
;* WHICH HAVE BEEN FOUND BETWEEN A MODEM SIGNAL AND OTHER MODEM SIGNALS.
;* IT ANALYZES THE MODEM STATUS WHICH IS STORED IN THE STAT STORAGE AREA
;* AND REPORTS ANY DISCREPANCIES WHICH ARE FOUND BETWEEN THIS STORED DATA
;* AND THE PRESENT STATE OF THE STAT REGISTERS. SPECIFIED BITS ON THE
;* LINE ASSOCIATED WITH THE SPECIFIED LINE ARE IGNORED.
;*
;* INPUTS: R1 - ADDRESS OF SIGNAL NAME MESSAGE.
;* R2 - BIT MAP OF BITS TO IGNORE ON SPECIFIED LINE.
;* R3 - NUMBER OF SPECIFIED LINE.
;* CSRA - CONTAINS THE ADDRESS OF THE DUT CSR.
;* NUMLNS - EQUATED TO THE NUMBER OF LINES ON THE DUT.
;* FLSA - CONTAINS THE ADDRESS OF THE DUT STAT REGISTER.
;* STSTB - LABEL AT BASE OF STAT STORAGE TABLE.
;* TXRLNB - LABEL AT BASE OF TX/RX LINE NUMBER ASSOCIATION TABLE.
;*
;* OUTPUTS: A MESSAGES IS PRINTED AT THE OPERATOR CONSOLE.
;*
;* CALLING SEQUENCE: INCLUDE THE LABEL "ER8401" AS THE MESSAGE POINTER
;* PARAMETER IN THE DIAG SUPER ERROR REPORT MACRO CALL.
;*
;* COMMENTS: THE MESSAGE IS PRINTED AS BASIC AND EXTENDED ERROR INFORMATION.
;*
;* SUBORDINATE ROUTINES USED: NONE.
;*****
BGNMSG ER8401
SAVE ER8401::
JSR R5,PREG05 ;PRESERVE THE CONTENTS OF THE GPRS.
;CALL REGISTER SAVE SUBRT.
;+
; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
;-
BIT #BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
BEQ 60$ ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
;DURING THE SOFTWARE QUESTIONS.
PRINTB #EF8401,R1,R3 ;PRINT THE BASIC MESSAGE.
MOV R3,-(SP)
MOV R1,-(SP)
MOV #EF8401,-(SP)
MOV #3,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #10,SP
2$: MOV R1,44$ ;SAVE THE ADDRESS OF THE SIGNAL NAME MESSAGE.
CLR R1 ;CLEAR THE LINE COUNTER.
MOV #STSTB,R4 ;SET UP STAT STORAGE POINTER TO BASE OF TABLE.
MOV R1,#CSRA ;SET UP THE CSR IND.ADR.REG FIELD.
MOV #FLSA,R0 ;GET THE CONTENTS OF THIS LINE'S STAT REGISTER.
MOV (R4),R5 ;GET THE PREVIOUS CONTENTS FROM STORAGE.
BIC R0,R5
BIC (R4),R0
```

```

1975 007010 050005          BIS      R0,R5          ;XOR PRESENT AND STORED STAT VALUES.
1976 007012 012700 043777  MOV      #43777,R0      ;PREPARE TO MASK OUT UNUSED BITS.
1977 007016 120163 003750  CMPB    R1, TXRLNB(R3)  ;IS THIS LINE ASSOCIATED WITH SPECIFIED LINE?
1978 007022 001002          BNE      4$             ;DON'T MASK OUT SPECIFIED BITS IF IT IS NOT.
1979 007024 056600 000006  BIS      R2SLOT(SP),R0 ;MASK OUT SPECIFIED BITS.
1980 007030 040005          BIC      R0,R5          ;GET BIT MAP OF UNDESIREED CHANGES.
1981 007032 032705 100000 4$:     BIT      #BIT15,R5 ;CHECK FOR DSR SIGNAL INTERACTION.
1982 007036 001404          BEQ      6$             ;SKIP PRINTING LINE IF NO DSR INTERACTION.
1983 007040 012702 005643  MOV      #EM8403,R2     ;SELECT DSR ERROR MESSAGE.
1984 007044 004767 000064  JSR      PC,40$         ;PRINT THE LINE OF THE ERROR MESSAGE.
1985 007050 032705 020000 6$:     BIT      #BIT13,R5 ;CHECK FOR RI SIGNAL INTERACTION.
1986 007054 001404          BEQ      8$             ;SKIP PRINTING LINE IF NO RI INTERACTION.
1987 007056 012702 005647  MOV      #EM8404,R2     ;SELECT RI ERROR MESSAGE.
1988 007062 004767 000046  JSR      PC,40$         ;PRINT THE LINE OF THE ERROR MESSAGE.
1989 007066 032705 010000 8$:     BIT      #BIT12,R5 ;CHECK FOR DCD SIGNAL INTERACTION.
1990 007072 001404          BEQ      10$            ;SKIP PRINTING LINE IF NO DCD INTERACTION.
1991 007074 012702 005652  MOV      #EM8405,R2     ;SELECT DCD ERROR MESSAGE.
1992 007100 004767 000030  JSR      PC,40$         ;PRINT THE LINE OF THE ERROR MESSAGE.
1993 007104 032705 004000 10$:    BIT      #BIT11,R5 ;CHECK FOR CTS SIGNAL INTERACTION.
1994 007110 001404          BEQ      12$            ;SKIP PRINTING LINE IF NO CTS INTERACTION.
1995 007112 012702 005656  MOV      #EM8406,R2     ;SELECT CTS ERROR MESSAGE.
1996 007116 004767 000012  JSR      PC,40$         ;PRINT THE LINE OF THE ERROR MESSAGE.
1997
1998 007122 005201          INC      R1             ;SELECT NEXT LINE.
1999 007124 020127 000020  CMP      R1,#NUMLNS     ;ALL LINES DONE?
2000 007130 002720          BLT      2$             ;LOOP IF NOT ALL LINES DONE.
2001 007132 000417          BR       60$           ;EXIT THIS ROUTINE.
2002
2003 ;*
2004 ; LOCAL ERROR MESSAGE LINE PRINTING ROUTINE.
2005 ;-
2005 007134          40$:    PRINTX #EF8402,44$,R3,R2,R1
      007134 010146
      007136 010246
      007140 010346
      007142 016746 000022
      007146 012746 004305
      007152 012746 000005
      007156 010600
      007160 104415
      007162 062706 000014
      007166 000207
2006 007166 000207
2007 007170 000000
2008 007172          44$:    .WORD    0
      007172 004736          60$:    PASS
2009 007174          ENDMSG
      007174
      007174 104423
      JSR      PC,@(SP)+ ;LOCAL STORAGE FOR ADDRESS OF SIGNAL NAME.
      ;RESTORE ALL THE GPRS TO THE PRESERVED VALUES.
      ;RETURN TO PREG05 SUBRT.
L10006: TRAP    C$MSG

```

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2035 007202 012700 000100  
2036 007206 046700 172750  
2037 007212 001064  
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2039 007214  
007214 010146  
007216 012746 004116  
007222 012746 000002  
007226 010600  
007230 104414  
007232 062706 000006  
2040 007236 012703 002352  
2041 007242 012705 006027  
2042 007246 012301  
2043 007250 012304  
2044 007252 004767 000056  
2045 007256 020302  
2046 007260 103772  
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2053 007262 020227 002546  
2054 007266 001036  
2055 007270 005762 000002  
2056 007274 001433  
2057 007276 012301  
2058 007300 011304  
2059 007302 012705 006057

```
.SBTTL GLOBAL ERROR REPORTING ROUTINE - ER9301
;*****
;* THIS IS AN ERROR REPORTING SUBROUTINE WHICH PRINTS ANY BMP CODES
;* THAT ARE FOUND IN THE BMP CODE QUEUE, TOGETHER WITH THE NUMBER OF
;* THE TEST THAT WAS EXECUTING AT THE TIME THE BMP CODE WAS LOGGED.
;* PROVIDED EXTENDED ERROR REPORTING HAS BEEN ENABLED.
;*
;* INPUTS: R1 THE ADDRESS OF THE FIRST MESSAGE TO BE REPORTED.
;* R2 THE ADDRESS OF THE NEXT EMPTY CELL IN THE QUEUE.
;*
;* OUTPUTS: THE TEST NUMBER FOLLOWED BY THE BMP CODE ARE PRINTED AT THE
;* OPERATOR CONSOLE.
;*
;* CALLING SEQUENCE: INCLUDE THE LABEL "ER9301" AS THE MESSAGE POINTER
;* PARAMETER IN THE DIAG SUPER ERROR REPORT MACRO CALL.
;*
;* COMMENTS: THE MESSAGE IS PRINTED AS BASIC ERROR INFORMATION.
;*
;* SUBORDINATE ROUTINES USED: NONE.
;*****
BGNMSG ER9301
ER9301::
SAVE ;SAVE THE GPRS ON THE STACK.
JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
MOV #BIT06,R0 ;TRY TO CLEAR THE
BIC OPTION,R0 ;EXT'D ERROR REPORTING FLAG
BNE 60$ ;EXIT IF FLAG NOT SET.
PRINTB #EF0503,R1 ;REPORT UNEXPECTED BMP CODES FOUND.
MOV R1,-(SP)
MOV #EF0503,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #6,SP
MOV #BMPQCB,R3 ;GET THE START ADDRESS OF THE BMP CODE QUEUE.
MOV #EM9302,R5 ;GET THE MESSAGE TO BE REPORTED.
2$: MOV (R3)+,R1 ;GET THE NUMBER OF THE TEST THAT WAS EXECUTING.
MOV (R3)+,R4 ;GET BMP CODE THAT WAS REPORTED OFF THE QUEUE.
JSR PC,50$ ;GO REPORT THE BMP CODE.
CMP R3,R2 ;CHECK IF ALL CODES HAVE BEEN REPORTED.
BLO 2$ ;IF IT IS NOT THE LAST BMP CODE THEN LOOP.
;
; CHECK IF OVERFLOW HAS OCCURRED.
; THE CONDITIONS FOR OVERFLOW ARE: THE POINTER CONTAINS THE ADDRESS OF THE
; LAST CELL IN THE QUEUE, AND A BMP CODE HAS ALREADY BEEN WRITTEN INTO THAT
; CELL.
;-
CMP R2,#BMPQCB-4 ;CHECK IF THE POINTER IS AT THE LAST LOCATION.
BNE 60$ ;EXIT IF NOT AT THE LAST LOCATION.
TST 2(R2) ;CHECK FOR A BMP CODE IN THE LAST CELL
BEQ 60$ ;EXIT IF NO OVERFLOW HAS OCCURED, CELL EMPTY.
MOV (R3)+,R1 ;GET THE TEST NUMBER OFF THE QUEUE.
MOV (R3),R4 ;GET THE BMP CODE OFF THE QUEUE.
MOV #EM9303,R5 ;SELECT THE MESSAGE TO BE REPORTED.
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.SBTTL GLOBAL SUBROUTINES SECTION

;  
; \*\*  
; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES  
; THAT ARE USED IN MORE THAN ONE TEST.  
;

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007370 004567 174424  
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2120 007374 010400  
2121 007376 005100  
2122 007400 040002  
2123 007402 016705 172622  
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2130 007406 000241  
2131 007410 006003  
2132 007412 103006  
2133 007414 010577 172560  
2134 007420 011100  
2135 007422 040400  
2136 007424 050200  
2137 007426 010011  
2138 007430 005205  
2139 007432 005703  
2140 007434 001365

```
.SBTTL GLOBAL SUBROUTINE - ALTFLD -
;*****
;* - ALTER DEVICE REGISTER FIELDS ROUTINE -
;* THIS SUBROUTINE ALTERS THE SPECIFIED FIELD OF THE SPECIFIED DEVICE
;* REGISTER FOR THE SPECIFIED LINES. THIS ROUTINE CAN BE USED TO SET
;* OR CLEAR BITS WITHIN SELECTED FIELDS OF SELECTED REGISTERS.
;* USE EXAMPLES: SET RX.BAUD.RATE FIELDS ON LINES 3 AND 6.
;* CLEAR TX.DMA BITS ON ALL LINES.
;*
;* INPUTS: R1 - ADDRESS OF THE REGISTERS TO ALTER.
;* R2 - BIT FIELDS SET TO DESIRED STATES.
;* R3 - BIT MAP OF LINES FOR WHICH TO ALTER REGISTER.
;* R4 MASK OF BITS TO ALTER (1 INDICATES CHANGE BIT).
;* CSRA - CONTAINS THE ADDRESS OF THE DEVICE CSR.
;* IESTAT - SAVED STATES OF THE INTERRUPT ENABLE BITS.
;*
;* OUTPUTS: DEVICE REGISTERS - SPECIFIED REGISTER FIELDS ALTERED.
;* CSR IND.ADR.REG FIELD - DESTROYED.
;*
;* CALLING SEQUENCE: JSR PC,ALTFLD
;*
;* COMMENTS: THIS ROUTINE READS THE SPECIFIED REGISTERS FOR ALL LINES
;* WITH NUMBERS LOWER THAN THE HIGHEST SPECIFIED LINE.
;* THIS ROUTINE DOES NOT READ THE CSR.
;*
;* SUBROUTINES CALLED: NONE.
;*****
ALTFLD:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
; JSR R5,PREGOS ;CALL REGISTER SAVE SUBRT.
;
; SET UP TO LOOP FOR EACH LINE:
; PREPARE THE WORD TO BE ORED INTO THE REGISTER CONTENTS.
; SET UP THE WORD TO WRITE INTO THE IND.ADR.REG FIELD OF THE CSR.
;
; MOV R4,R0 ;CALCULATE THE NEW CONTENTS OF THE
; COM R0 ; REGISTER FIELDS WHICH ARE TO BE
; BIC R0,R2 ; ALTERED BY THIS ROUTINE.
; MOV IESTAT,R5 ;SET UP TO WRITE IND.ADR.REG FIELD TO 0.
;
; LOOP ONCE FOR EACH LINE, ALTERING THE SPECIFIED FIELD IN THE SPECIFIED
; REGISTER IF THE LINE HAS BEEN SELECTED FOR ALTERING.
; EXIT THE LOOP IF NO MORE LINES TO ALTER, OR IF WE HAVE ALTERED THE MAX
; ALLOWABLE NUMBER OF LINES (AS SPECIFIED BY NUMLNS).
;
; CLC ;PREPARE FOR ROTATE, "TST R5" DOES THIS BELOW.
2$: ROR R3 ;GET THE LINE SELECT BIT FOR THIS LINE.
; BCC 4$ ;SKIP SETUP IF LINE IS NOT SELECTED.
; MOV R5,8CSRA ;SET OUT CSR IND.ADR.REG FIELD TO THIS LINE.
; MOV (R1),R0 ;GET THE PRESENT CONTENTS OF THE REG TO ALTER.
; BIC R4,R0 ;CLEAR THE BIT FIELDS WE ARE TO ALTER.
; BIS R2,R0 ;OR IN THE NEW STATES OF THE FIELDS.
; MOV R0,(R1) ;WRITE THE NEW REGISTER CONTENTS TO THE REG.
4$: INC R5 ;SET LINE NUMBER TO THE NEXT LINE.
; TST R3 ;CHECK FOR UNHANDLED LINES, CLEAR CARRY FLAG.
; BNE 2$ ;LOOP IF SELECTED LINE(S) IS NOT HANDLED.
```

2141

2142 007436

007436 004736

2143 007440 000207

609: PASS

RTS PC

JSR

;RESTORE GPRS.

PC,8(SP).

;RETURN TO CALLING ROUTNE.

RETURN TO PREGOS SUBRT.



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2145 .SBTTL GLOBAL SUBROUTINE ASLNTL
2146 : * *****
2147 : * - SETUP ASSOCIATED LINE NUMBER TABLES ROUTINE *****
2148 : * THIS ROUTINE SETS UP THE TWO TABLES WHICH ARE CONTAIN INFORMATION
2149 : * ABOUT THE TX/RX LINE WHICH IS ASSOCIATED WITH A PARTICULAR RX/TX
2150 : * LINE. ONE TABLE IS A TABLE OF WORDS WHICH CONTAINS WORD OFFSET
2151 : * VALUES AND THE OTHER TABLE IS A TABLE OF BYTES WHICH CONTAINS
2152 : * LINE NUMBER VALUES.
2153 : *
2154 : * INPUTS: LOPBCK - STORAGE FOR THE TYPE OF LOOPBACK ON THE DUT.
2155 : * NUMLNS - EQUATED TO THE NUMBER OF LINES ON THE DUT.
2156 : * STGTRB - LABEL AT BASE OF STAGGERED LINE ASSOCIATION TBL.
2157 : * TXRLNB - LABEL AT BASE OF BYTE TX/RX LINE NUMBER TABLE.
2158 : * TXRXLB - LABEL AT BASE OF WORD TX/RX LINE NUMBER TABLE.
2159 : * TXRXLE - LABEL AT END OF WORD TX/RX LINE NUMBER TABLE.
2160 : *
2161 : * OUTPUTS: TXRXL, TXRLN TABLES INITIALIZED FOR SELECTED LOOPBACK.
2162 : *
2163 : * CALLING SEQUENCE: JSR PC,ASLNTL
2164 : *
2165 : * COMMENTS:
2166 : *
2167 : * SUBORDINATE ROUTINES CALLED: NONE.
2168 : * - *****
2169 :
2170 007442 ASLNTL:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
007442 004567 174352 JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
2171 007446 126727 172522 000002 CMPB LOPBCK,#2 ;TEST FOR STAGGERED LOOPBACK.
2172 007454 001411 BEQ 4$ ;GO SET UP STAGGERED TABLE IF STAGGERED LPBCK.
2173 : *
2174 : * SET UP THE WORD TABLE FOR NON STAGGERED LOOPBACK.
2175 : *
2176 007456 005005 CLR R5 ;CLEAR THE LINE COUNTER
2177 007460 010565 0C3710 2$: MOV R5, TXRXLB(R5) ;SET UP A WORD OF THE TABLE.
2178 007464 005205 INC R5
2179 007466 005205 INC R5 ;SET LINE COUNTER TO NEXT LINE OFFSET.
2180 007470 020527 000040 CMP R5,#2*NUMLNS ;TEST FOR ALL LINES DONE.
2181 007474 002771 BLT 2$ ;LOOP UNTIL ALL LINES DONE.
2182 007476 000411 BR 8$ ;GO SET UP THE BYTE TABLE.
2183 : *
2184 : * SET UP THE WORD TABLE FOR STAGGERED LOOPBACK.
2185 : *
2186 007500 012701 003770 4$: MOV #STGTRB,R1 ;SET UP THE SOURCE POINTER.
2187 007504 012702 003710 MOV #TXRXLB,R2 ;SET UP THE DESTINATION POINTER.
2188 007510 112122 6$: MOVB (R1)+,(R2)+ ;MOVE A BYTE INTO THE TABLE.
2189 007512 105022 CLRB (R2)+ ;CLEAR THE UPPER BYTE OF WORD TABLE ENTRY.
2190 007514 020227 003750 CMP R2,#TXRXLE ;COMPARE POINTER WITH END ADR OF TABLE.
2191 007520 002773 BLT 6$ ;LOOP IF NOT AT END YET.
2192 : *
2193 : * SET UP THE BYTE TABLE BASED ON THE WORD ASSOCIATION TABLE.
2194 : *
2195 007522 012701 003710 8$: MOV #TXRXLB,R1 ;SET UP THE SOURCE POINTER.
2196 007526 012702 003750 MOV #TXRLNB,R2 ;SET UP THE DESTINATION POINTER.
2197 007532 012103 10$: MOV (R1)+,R3 ;GET THE WORD OFFSET VALUE FROM WORD TABLE.
2198 007534 006203 ASR R3 ;DIVIDE BY 2 TO GET LINE NUMBER VALUE.
2199 007536 110322 MOVB R3,(R2)+ ;LOAD THE BYTE LINE NUMBER INTO TABLE.
2200 007540 020127 003750 CMP R1,#TXRXLE ;COMPARE SOURCE POINTER WITH ADR OF TABLE END.

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2201 007544 002772          BLT      10$          ;LOOP IF NOT AT END OF TABLE YET.
2202                                     60$:          ;RESTORE GPRS.
2203 007546          PASS          JSR      PC,8(SP)+          ;RETURN TO PREG05 SUBRT.
2204 007550 004736          RTS      PC
```

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2206 .SBTTL GLOBAL SUBROUTINE - CALMSL
2207 ;* *****
2208 ;* - CALIBRATE MILLI SECOND LOOP COUNT SUBROUTINE -
2209 ;* THIS SUBROUTINE CALIBRATES THE TIMING LOOP WHICH IS USED IN THE MSLOOP
2210 ;* ROUTINE. THIS SUBROUTINE CALCULATES A VALUE FOR THE MSLCNT VARIABLE
2211 ;* WHICH IS THE NUMBER OF SOFTWARE LOOPS WHICH TAKES 1 MS TO EXECUTE IN
2212 ;* THE MSLOOP ROUTINE. THIS ROUTINE CALIBRATES THE COUNT BY USING THE
2213 ;* LINE TIME CLOCK (LTC), SO IF NO LTC IS AVAILABLE THE DEFAULT VALUE FOR
2214 ;* THE DELAY COUNT MUST BE USED.
2215 ;*
2216 ;*
2217 ;* INPUTS: MSLCNT - DEFAULT 1 MS DELAY LOOP COUNT VALUE, OR
2218 ;* VALUE FROM PREVIOUS CALIBRATION.
2219 ;* MSTICK - NUMBER OF MS PER LTC CLOCK TICK.
2220 ;* TIMER1 - TIMER COUNTER CHANGED BY LTC INTERRUPT SERVICE RTN.
2221 ;* CLKHRZ - NUMBER OF LTC CLICKS PER SECOND (50 OR 60).
2222 ;*
2223 ;* OUTPUTS: CARRY - SET IF LTC IS AVAILABLE, AND NEW CALIBRATION PERFORMED.
2224 ;* MSLCNT - NEW 1 MS DELAY LOOP COUNT VALUE IF LTC AVAILABLE, OR
2225 ;* UNCHANGED IF NO LTC IS AVAILABLE.
2226 ;*
2227 ;* CALLING SEQUENCE: JSR PC,CALMSL
2228 ;*
2229 ;* COMMENTS:
2230 ;*
2231 ;* SUBORDINATE ROUTINES CALLED: UNSDIV,OOPS.
2232 ;* - *****
2233
2234 007552 CALMSL:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
007552 004567 174242 JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
2235 007556 005067 000210 CLR 62$ ;CLEAR THE 2ND TIME FLAG.
2236 ;*
2237 ; SYNCHRONIZE WITH THE LTC.
2238 ;-
2239 007562 012705 000001 2$: MOV #1,R5 ;SET OUTER LOOP COUNTER TO 1 LOOP.
2240 ;INCREASE THE VALUE LOADED INTO THIS COUNTER IF THE <*&
2241 ;FOLLOWING LOOP FAILS ON FUTURE, FASTER PROCESSORS. <*&
2242 007566 005000 CLR R0 ;CLEAR THE WAIT FOR CLOCK INT COUNTER.
2243 007570 012767 000001 172470 MOV #1,TIMER1 ;SET UP COUNT OF 1 TO SYNCH WITH LTC.
2244 007576 005767 172464 4$: TST TIMER1 ;CHECK FOR COUNTER HAVING GONE TO ZERO.
2245 007602 001410 BEQ 6$ ;JUMP OUT OF LOOP IF LTC HAS INTERRUPTED.
2246 007604 005200 INC R0 ;COUNT THIS ITERATION OF THE INNER LOOP.
2247 007606 001373 BNE 4$ ;LOOP IF COUNTER HAS NOT TURNED OVER.
2248 007610 005305 DEC R5 ;DECREMENT THE INNER LOOP COUNTER.
2249 007612 003371 BGT 4$ ;LOOP IF OUTER LOOP COUNT NOT UP.
2250 ;*
2251 ; IF WE GOT NO LTC INTERRUPT, INDICATE THAT THERE IS NO LTC AVAILABLE.
2252 ; LTC MUST BE FLAKEY, OR NOT REALLY AN LTC AT ALL.
2253 ;-
2254 007614 005067 172444 CLR CLKHRZ ;CLEAR LTC FREQUENCY WORD TO INDICATE NO LTC.
2255 007620 000241 CLC ;INDICATE FAILURE FOR RETURN.
2256 007622 000461 BR 60$ ;BYPASS THE FOLLOWING CALIBRATION PROCEDURES.
2257 ;*
2258 ; WE ARE NOW SYNCHRONIZED WITH THE LTC.
2259 ; SET UP FOR THE CALIBRATION LOOP.
2260 ;
2261 007624 012704 002266 6$: MOV #TIMER1,R4 ;WILL TEST TIMER1 IN THE LOOP BELOW.

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2262 007630 005001          CLR    R1          ;CLEAR THE OUTER LOOP COUNTER.
2263 007632 005002          CLR    R2          ;INDICATE TO CHECK ALL BITS OF TIMER1.
2264 007634 005003          CLR    R3          ;INDICATE TO CHECK FOR TIMER1 CLEAR.
2265 007636 012714 000001    MOV    #1,(R4)     ;LOAD TIMER1 WITH COUNT OF 1.
2266
2267 007642 016705 172432    8$:   MOV    MSLCNT,R5 ;LOAD MS LOOP COUNT.
2268 007646 011400          10$:  MOV    (R4),R0     ;GET THE TIMER1 VALUE.
2269 007650 010067 000120    MOV    R0,64$     ;SAVE WORD (LIKE IN THE REAL LOOP).
2270 007654 040200          BIC    R2,R0      ;LEAVE ALL THE BITS.
2271 007656 020003          CMP    R0,R3      ;COMPARE AGAINST ZERO.
2272 007660 000261          SEC           ;SET CARRY IN CASE OF SUCCESS.
2273 007662 001406          BEQ    12$       ;EXIT LOOP IF TIMER1 HAS CLEARED.
2274 007664 005305          DEC    R5        ;COUNT DOWN THE INSIDE MS LOOP COUNT.
2275 007666 001367          BNE    10$       ;LOOP IF MS NOT UP.
2276 007670 005301          DEC    R1        ;DECREMENT THE MS TIME COUNT.
2277 007672 001363          BNE    8$        ;KEEP LOOPING.
2278 007674 004767 000432    JSR    PC,OOPS    ;WE OVERFLOWED, SOMETHING IS WRONG, ABORT.
2279
2280          ;*
2281          ; WE HAVE NOW HAVE LOOP COUNT INFORMATION FOR ONE CLOCK TICK.
2282          ; WE HAVE NEGATIVE OF NUMBER OF OUTER LOOPS IN R1, EACH IS MSLCNT INNER LOOPS.
2283          ; WE HAVE THE PORTION OF THE LAST OUTER LOOP NOT EXECUTED, IN R5.
2284          ; NOW WE CALCULATE THE TOTAL NUMBER OF INNER LOOPS EXECUTED.
2285
2285 007700 005401          ;*
2286 007702 016702 172372    12$:  NEG    R1        ;GET NUMBER OF OUTER LOOPS.
2287 007706 010203          MOV    MSLCNT,R2 ;GET THE NUMBER OF INNER LOOPS PER OUTER LOOP.
2288 007710 160502          MOV    R2,R3     ;COPY NUMBER OF LOOPS FOR MULTIPLY.
2289 007712 010204          SUB    R5,R2     ;CALC # OF INNER LOOPS DONE IN LAST OUTER LOOP
2290 007714 005005          MOV    R2,R4     ; AND ADD TO ACCUMULATOR LSWORD.
2291 007716 005301          CLR    R5        ;CLEAR ACCUMULATOR MSWORD.
2292 007720 100403          14$:  DEC    R1        ;CHECK R1 FOR 0 CONDITION
2293 007722 060304          BMI    16$      ;SKIP MULTIPLICATION IF ZERO
2294 007724 005505          ADD    R3,R4     ;MULTIPLY NUMBER OF INNER
2295 007726 000773          ADC    R5        ; LOOPS PER OUTER LOOP BY
2296          BR    14$ ;NUMBER OF OUTER LOOPS PERFORMED.
2297
2298          ;*
2299          ; DIVIDE THE TOTAL NUMBER OF INNER LOOPS BY THE NUMBER OF MS PER LTC TICK.
2300
2300 007730 016701 172342    ;*
2301 007734 010403          16$:  MOV    MSTICK,R1 ;# OF MS PER LTC TICK IS DIVISOR.
2302 007740 004767 001200    MOV    R4,R3     ;LSWORD OF LOOP COUNT IS LSWORD OF DIVIDEND.
2303 007744 103402          MOV    R5,R2     ;MSWORD OF LOOP COUNT IS MSWORD OF DIVIDEND.
2304 007746 004767 000360    JSR    PC,UNSDIV ;DIVIDE NUMBER OF LOOPS BY MS PER LTC TICK.
2305 007752 010167 172322    BCS    18$      ;BYPASS OOPS IF WE'RE OK.
2306 007756 005167 000010    JSR    PC,OOPS   ;CLOCK ROUTINES ARE NOT LONG ENOUGH, OR BUG.
2307 007762 001277          18$:  MOV    R1,MSLCNT ;SET NEW VALUE FOR MS LOOP COUNT.
2308 007764 000261          COM    62$      ;SET THE 2ND ITERATION FLAGS IF 1ST ITERATION.
2309          BNE    2$ ;BRANCH IF ONLY ONE ITERATION DONE.
2310          SEC           ;SET THE SUCCESS FLAG FOR EXIT.
2311 007766          60$:  PASS
2312          ;RESTORE GPRS,
2313          ;RTS    PC          ;RETURN TO PREG05 SUBRT.
2314          ;CARRY - SUCCESS FLAG. SET IF SUCCESS.
2315
2315 007772 000000          62$:  .WORD 0
2316 007774 000000          64$:  .WORD 0
2317          ;2ND CALIBRATION ITERATION FLAGS.
2318          ;DUMMY WORD FOR STORAGE OF THE READ WORD.

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2339 007776  
2340 010002 004567 174016  
2341 010006 011011 172244  
2342 010010 005767 172236  
2343 010014 000261  
2344 010016 001401  
2345 010020 000241  
2346 010022 010022 004736  
2347 010024 000207

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.SBTTL GLOBAL SUBROUTINE                                CKTRAP
:*****
:* CHECK TRAP ROUTINE -
:* THIS SUBROUTINE IS USED TO CHECK FOR A BUS TIME-OUT TRAP (004 TRAP)
:* WHICH IS CAUSED BY AN ACCESS TO A NON-EXISTENT MEMORY OR I/O LOCATION.
:* IF THE TRAP DOES NOT OCCUR, THIS ROUTINE RETURNS A SUCCESS INDICATION.
:*
:* INPUTS:      R0  SOURCE ADDRESS FOR MOVE.
:*              R1  DESTINATION ADDRESS FOR MOVE.
:*              (R0) - SOURCE FOR THE MOVE.
:*
:* OUTPUTS:     (R1) WRITTEN TO THE CONTENTS OF (R0).
:*              CARRY FLAG - SET ON RETURN IF NO 004 TRAP DETECTED.
:*              TP4FLG - NONZERO IF TRAP OCCURRED, CLEARED OTHERWISE.
:*
:* CALLING SEQUENCE:  JSR    PC,CKTRAP
:*
:* COMMENTS:      IF THIS SUBROUTINE CAUSES A TRAP, EITHER THE ADDRESS WHICH
:*                IS LABELED ADRPTR WILL BE THE TRAP PC ADDRESS ON THE STACK.
:*
:* SUBORDINATE ROUTINES CALLED: NONE.
:*****
CKTRAP:: SAVE
                JSR    R5,PREG05 ;SAVE CONTENTS OF GPRS R0 THRU R5.
                ;CALL REGISTER SAVE SUBRT.
                CLR    TP4FLG ;CLEAR THE 004 TRAP FLAGS.
                MOV    (R0),(R1) ;PERFORM THE MOVE IN QUESTION.
ADRPTR:: TST    TP4FLG ;CHECK FOR OCCURENCE OF TRAP.
                SEC    ;INDICATE SUCCESS.
                BEQ    60$ ;EXIT WITH SUCCESS IF TRAP DID NOT OCCUR.
                CLC    ;INDICATE FAILURE.
60$: PASS      ;RESTORE GPRS.
                JSR    PC,@(SP) ;RETURN TO PREG05 SUBRT.
                RTS    PC
    
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2349 .SBTTL GLOBAL SUBROUTINE - CLNRST -
2350 ;*****
2351 ;* - CLEAN RESET OF THE DEVICE UNDER TEST
2352 ;* THIS SUBROUTINE IS USED TO RESET THE DUT TO A KNOWN STATE.
2353 ;* THE DUT'S SELF-TEST IS SKIPPED, AND THE FIFO IS PURGED OF ANY ERROR
2354 ;* CODES, ETC.
2355 ;* IF THE RESET DOES NOT SUCCESSFULLY COMPLETE, THEN THE CARRY BIT IS
2356 ;* PASSED BACK TO THE CALLING ROUTINE (CLEAR).
2357 ;*
2358 ;* INPUTS: CSRA - CONTAINS THE ADDRESS OF THE CSR
2359 ;* TXBFCA - CONTAINS ADDRESS OF DUT DMA BUFFER COUNT REGISTER.
2360 ;* ERRNBR - ERROR NUMBER FOR POSSIBLE ERROR REPORT.
2361 ;* ERRRTBL - ERRRTYP, ERNBR, AND ERRMSG SET UP CORRECTLY.
2362 ;*
2363 ;* OUTPUTS: THE DUT PERFORMS ITS RESET FUNCTION INTO A KNOWN STATE.
2364 ;* CARRY - CLEAR INDICATES THE TEST IS TO BE ABORTED.
2365 ;* ERRTBL - VALUE MAY BE DESTROYED.
2366 ;* IESTAT - TX AND RX INTERRUPT FLAGS ARE CLEARED.
2367 ;* TX AND RX INTERRUPT ENABLE BITS IN THE DUT'S CSR ARE CLEARED.
2368 ;*
2369 ;* CALLING SEQUENCE: JSR PC, CLNRST
2370 ;*
2371 ;* COMMENTS: THIS SUBROUTINE CAN REPORT ERRORS WITH NUMBERS ERRNBR.
2372 ;* THIS ROUTINE DOES NOT DESTROY THE VALUE OF ERRNBR.
2373 ;*
2374 ;* SUBORDINATE ROUTINES CALLED: DELAY, MSLGET, PUFIFO, RESETT.
2375 ;*****
2376
2377 010026 CLNRST:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
010026 004567 173766 JSR R5, PREG05 ;CALL REGISTER SAVE SUBRT.
2378 ;*
2379 ;* RESET THE DUT.
2380 ;* THIS ROUTINE REPORTS ERRORS WITH NUMBERS FROM ERRNBR THRU ERRNBR+2.
2381 ;*
2382 010032 004767 000604 JSR PC, RESETT ;RESET THE DUT TO A KNOWN STATE.
2383 010036 103002 BCC 60$ ;EXIT ROUTINE WITH ABORT TEST INDICATOR.
2384 ;*
2385 ;* PURGE THE FIFO OF ERROR CODES, SAVE ANY BMP CODES FOUND.
2386 ;*
2387 010040 004767 000514 JSR PC, PUFIFO ;PURGE THE FIFO.
2388 ;*
2389 010044 60$: ;EXIT THE TEST USING RESETT OR PUFIFO STATUS.
2390 010044 PASS ;RESTORE GPRS, PASS THE FOLLOWING INTACT:
010044 004736 JSR PC, @SP+ ;RETURN TO PREG05 SUBRT.
2391 ;* CARRY BIT: IF CLEAR, THEN ABORT THE TEST.
2392 010046 000207 RTS PC

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2418 010050  
2419 010050 004567 173744  
2420 010054 005003  
2421 010056 012704 002610  
2422 010062 010377 172112  
2423 010066 017700 172114  
2424 010072 011405  
2425 010074 040005  
2426 010076 042400  
2427 010100 050005  
2428 010102 012700 043777  
2429 010106 120301  
2430 010110 001001  
2431 010112 050200  
2432 010114 040005  
2433 010116 001006  
2434 010120 005203  
2435 010122 020327 000020  
2436 010126 002755  
2437 010130 000261  
2438 010132 000401  
2439 010134 000241  
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2441 010136  
2442 010136 004736  
2442 010140 000207

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.SBTTL GLOBAL SUBROUTINE                                CMPMST -
; * *****
; * - COMPARE MODEM STATUS ROUTINE
; * THIS ROUTINE IS USED TO COMPARE THE PRESENT MODEM STATUS AGAINST THE
; * MODEM STATUS WHICH IS STORED IN THE MODEM STATUS STORAGE TABLE. IT
; * IGNORES THE STATES OF THE SPECIFIED SIGNALS ON A SPECIFIED LINE.
; *
; * INPUTS:      R1  LINE NUMBER OF SPECIFIED LINE.
; *              R2  - BIT MAP OF BITS TO IGNORE ON SPECIFIED LINE.
; *              CSRA - CONTAINS THE ADDRESS OF THE DUT CSR.
; *              NUMLNS EQUATED TO THE NUMBER OF LINES ON THE DUT.
; *              FLSA  - CONTAINS THE ADDRESS OF THE DUT STAT REGISTER.
; *              STSTB - LABEL AT BASE OF STAT STORAGE TABLE.
; *              TXRLNB - LABEL AT BASE OF TX/RX LINE NUMBER ASSOCIATION TABLE.
; *
; * OUTPUTS:     CARRY - SUCCESS FLAG (SET IF NO DISCREPANCIES WERE FOUND).
; *
; * CALLING SEQUENCE:  JSR    PC,CMPMST
; *
; * COMMENTS:
; *
; * SUBORDINATE ROUTINES CALLED: NONE.
; - - *****

CMPMST:: SAVE
;SAVE CONTENTS OF GPRS R0 THRU R5.
;CALL REGISTER SAVE SUBRT.
                CLR    R3
                MOV    #STSTB,R4
;CLEAR THE LINE COUNTER.
;SET UP STAT STORAGE POINTER TO BASE OF TABLE.
2$:             MOV    R3,@CSRA
;SET UP THE CSR IND.ADR.REG FIELD.
                MOV    @FLSA,R0
;GET THE CONTENTS OF THIS LINE'S STAT REGISTER.
                MOV    (R4),R5
;GET THE PREVIOUS CONTENTS FROM STORAGE.
                BIC    R0,R5
                BIC    (R4),R0
                BIS    R0,R5
;XOR PRESENT AND STORED STAT VALUES.
                MOV    #43777,R0
;PREPARE TO MASK OUT UNUSED BITS.
                CMPB   R3,R1
;TEST FOR THIS BEING SPECIFIED LINE.
                BNE    10$
;DON'T MASK OUT SPECIFIED BITS IF IT IS NOT.
                BIS    R2,R0
;MASK OUT SPECIFIED BITS.
10$:           BIC    R0,R5
;GET BIT MAP OF UNDESIRED CHANGES.
                BNE    50$
;EXIT WITH FAILURE IF CHANGES OCCURRED.
                INC    R3
;SELECT NEXT LINE.
                CMP    R3,#NUMLNS
;ALL LINES DONE?
                BLT   2$
;LOOP IF NOT ALL LINES DONE.
                SEC
;INDICATE SUCCESS.
                BR    60$
;EXIT THIS ROUTINE WITH SUCCESS.

50$:          CLC
;INDICATE FAILURE.

60$:          PASS
;RESTORE GPRS.
                JSR    PC,@(SP)
;RETURN TO PREG05 SUBRT.
                RTS   PC
; CARRY - SUCCESS FLAG (SET IF SUCCESS).
```

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2444 .SBTTL GLOBAL SUBROUTINE - DELAY
2445 ;*****
2446 ;* - DELAY SUBROUTINE
2447 ;* THIS SUBROUTINE IS USED TO DELAY A VARIABLE NUMBER OF MILLI SECONDS.
2448 ;*
2449 ;* INPUTS: R4 - CONTAINS THE NUMBER OF MS TO DELAY.
2450 ;* MSLCNT.
2451 ;*
2452 ;* OUTPUTS: NONE.
2453 ;*
2454 ;* CALLING SEQUENCE: JSR PC,DELAY
2455 ;*
2456 ;* COMMENTS: IF NO HARDWARE CLOCK INTERRUPTS ARE OCCURRING, CONTROL CS WILL
2457 ;* NOT BE HONORED FOR THE DURATION OF THE DELAY.
2458 ;*
2459 ;* SUBORDINATE ROUTINES CALLED: NONE.
2460 ;*****
2461
2462 010142 DELAY:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
010142 004567 173652 JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
2463 010146 010401 MOV R4,R1 ;PASS NUMBER OF MS DELAY AS TIME-OUT VALUE.
2464 010150 012702 177777 MOV #1,R2 ;TELL MSLOOP ROUTINE TO CHECK ALL BITS.
2465 010154 005003 CLR R3 ;TELL MSLOOP RTN TO CHECK FOR ALL BITS CLEAR.
2466 010156 012704 010200 MOV #62$,R4 ;TELL MSLOOP TO CHECK DUMMY NON-ZERO WORD.
2467 010162 004767 000130 JSR PC,MSLOOP ;DELAY THE REQUESTED # OF MS.
2468 010166 103002 BCC 60$ ;EXIT ROUTINE IF WE TIMED-OUT.]
2469 010170 004767 000136 JSR PC,OOFS ;IF NO TIME OUT, BAD PROGRAM OR HOST MACHINE.
2470 010174 004736 60$: PASS ;RESTORE GPRS.
010174 000207 JSR PC,OOFS ;RETURN TO PREG05 SUBRT.
2471 010176 000207 RTS PC
2472
2473 010200 177777 62$: .WORD -1 ;DUMMY, NON-ZERO WORD.

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2513 010202  
010202 004567 173612  
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2518 010206 005102  
2519 010210 040203  
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2523 010212 005701  
2524 010214 001011  
2525 010216 011400  
2526 010220 010067 000070  
2527 010224 040200  
2528 010226 020003  
2529 010230 000261  
2530 010232 001420

```
.SBTTL GLOBAL SUBROUTINE - MSLGET
;*****
;* MILLI SECONDS LOOP WHICH RETURNS READ WORD AND REMAINING TIME
;* THIS SUBROUTINE IS A GENERAL PURPOSE TEST LOOP SUBROUTINE. IT IS USED
;* TO VERIFY THAT A CERTAIN ACTION OCCURS BEFORE A TIME OUT PERIOD. THE
;* CALLING ROUTINE PASSES IN WHICH BITS SHOULD BE SET AND CLEARED FOR THE
;* DESIRED CONDITION AND THE TIME-OUT VALUE IN MILLI-SECONDS.
;* THIS ROUTINE CHECKS FOR THE DESIRED CONDITION UPON ENTRANCE INTO THE
;* ROUTINE AND THEN ONCE EACH MILLI-SECOND THERE AFTER.
;* UPON RETURN, THE LAST WORD WHICH WAS READ TO CHECK FOR THE CONDITION
;* IS RETURNED BY THIS SUBROUTINE.
;*
;* INPUTS: R1 - TIME OUT VALUE IN MILLI SECONDS (UP TO 64K MS).
;* R2 - BIT MAP OF BITS TO TEST (1 INDICATES TO TEST THE BIT).
;* R3 - DESIRED STATES OF THE INDICATED FIELDS IN R2.
;* R4 - ADDRESS OF THE WORD TO TEST.
;* MSLCNT - MILLI SECOND SOFTWARE LOOP COUNT.
;*
;* OUTPUTS: R0 - THE LAST WORD WHICH WAS READ TO CHECK FOR THE CONDITION.
;* R1 - REMAINING NUMBER OF MS IN TIME-OUT TIME.
;* CARRY - SUCCESS FLAG (SET IF CONDITION IS MET BEFORE TIME OUT).
;*
;* CALLING SEQUENCE: JSR PC,MSLGET
;*
;* COMMENTS: THIS ROUTINE WORKS WITH OR WITHOUT A HARDWARE CLOCK, BUT THE
;* CALIBRATION IS ONLY GUARENTEED WHEN A LINE CLOCK IS AVAILABLE
;* ON THE SYSTEM.
;* THIS ROUTINE CAN BE USED AS A DELAY ROUTINE, BY SPECIFYING THE
;* DESIRED DELAY AS THE TIME-OUT AND SPECIFYING A CONDITION TO
;* LOOK FOR WHICH WILL NOT BE MET DURING THE DELAY.
;* IF A TIME-OUT VALUE OF 0 IS SPECIFIED, THIS ROUTINE CHECKS FOR
;* THE DESIRED CONDITION BEFORE RETURNING. IT INDICATES SUCCESS
;* IF THE CONDITION IS MET, FAILURE OTHERWISE.
;*
;* SUBORDINATE ROUTINES CALLED: NONE.
;*****
MSLGET:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
; JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
;
; SET UP MASK FOR REMOVING UNUSED BITS IN THE TEST WORD, AND CLEAR UNUSED
; BITS IN THE DESIRED STATE WORD TO ALLOW DIRECT COMPARISON.
;
; COM R2 ;GET MASK OF UNUSED BITS.
; BIC R2,R3 ;MASK OUT UNUSED BITS IN DESIRED STATE WORD.
;
; HANDLE THE TEST AND EXIT IF WE HAVE A 0 TIME-OUT VALUE.
;
; TST R1 ;TEST THE TIME-OUT VALUE FOR ZERO.
; BNE 2$ ;IF NON-ZERO TIME-OUT, GO LOOP AND TEST.
; MOV (R4),R0 ;GET THE WORD TO TEST BEFORE EXITING.
; MOV R0,62$ ;SAVE VALUE SO WE CAN RETURN IT.
; BIC R2,R0 ;MASK OUT UNTESTED BITS OF WORD.
; CMP R0,R3 ;COMPARE AGAINST DESIRED STATE WORD.
; SEC ;INDICATE SUCCESS IN CASE WORDS ARE EQUAL.
; BEQ 6$ ;EXIT WITH SUCCESS IF WORDS ARE EQUAL.
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2531 010234 000241          CLC          ;INDICATE FAILURE (TIME OUT).
2532 010236 000416          BR          6$          ;EXIT WITH FAILURE, WORDS AREN'T EQUAL.
2533                          ;*
2534                          ; NON-ZERO TIME OUT VALUE. LOOP, WAITING FOR CONDITION OR TIME-OUT.
2535                          ;-
2536 010240 016705 172034  2$:      MOV      MSLCNT,R5      ;LOAD MS LOOP COUNT.
2537 010244 011400          4$:      MOV      (R4),R0      ;GET THE WORD TO TEST.
2538 010246 010067 000042  MOV      R0,62$      ;SAVE WORD IN CASE THIS IS THE LAST.
2539 010252 040200          BIC      R2,R0      ;MASK OUT UNTESTED BITS OF WORD.
2540 010254 020003          CMP      R0,R3      ;COMPARE AGAINST DESIRED STATE WORD.
2541 010256 000261          SEC          ;SET CARRY IN CASE OF SUCCESS.
2542 010260 001405          BEQ      6$          ;EXIT WITH SUCCESS IF WORDS ARE EQUAL.
2543 010262 005305          DEC      R5          ;COUNT DOWN THE INSIDE MS LOOP COUNT.
2544 010264 001367          BNE      4$          ;LOOP IF MS NOT UP.
2545 010266 005301          DEC      R1          ;DECREMENT THE MS TIME COUNT.
2546 010270 001363          BNE      2$          ;IF TIME NOT UP, LOOP TO COUNT ANOTHER MS.
2547 010272 000241          CLC          ;CLEAR CARRY, WE TIMED-OUT.
2548                          ;*
2549                          ; HAVE EITHER FOUND CONDITION, OR TIMED-OUT (POSSIBLY FROM 0 TIME OUT VALUE).
2550                          ; RESTORE THE LAST CONTENTS READ FROM THE TEST WORD. EXIT ROUTINE.
2551                          ;-
2552 010274 016700 000014  6$:      MOV      62$,R0      ;PASS OUT THE LAST READ WORD.
2553 010300 010066 000002  60$:     PASS      R0,R1      ;RESTORE GPRS, EXCEPT THE FOLLOWING:
                                MOV      R0,R0SLOT(SP)      ;PUT R0 IN STACK SLOT.
                                MOV      R1,R1SLOT(SP)      ;PUT R1 IN STACK SLOT.
                                JSR      PC,@(SP)+          ;RETURN TO PREG05 SUBRT.
2554                          ;R0 - LAST READ WORD CHECKED FOR CONDITION.
2555                          ;R1 - REMAINING TIME (0 IF TIME-OUT OCCURED).
2556 010312 000207          RTS      PC          ;CARRY SET IF SUCCESS, CLEAR IF TIME-OUT.
2557                          ;*
2558                          ; LOCAL STORAGE.
2559                          ;-
2560 010314 000000          62$:     .WORD  0          ;STORAGE FOR THE LAST READ WORD.

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2562 .SBTTL GLOBAL SUBROUTINE MSLOOP
2563 ;*****
2564 ;* - TEST LOOP SUBROUTINE -
2565 ;* THIS SUBROUTINE IS A GENERAL PURPOSE TEST LOOP SUBROUTINE. IT IS USED
2566 ;* TO VERIFY THAT A CERTAIN ACTION OCCURS BEFORE A TIME-OUT PERIOD. THE
2567 ;* CALLING ROUTINE PASSES IN WHICH BITS SHOULD BE SET AND CLEARED FOR THE
2568 ;* DESIRED CONDITION AND THE TIME-OUT VALUE IN MILLI-SECONDS.
2569 ;* THIS ROUTINE CHECKS FOR THE DESIRED CONDITION UPON ENTRANCE INTO THE
2570 ;* ROUTINE AND THEN ONCE EACH MILLI-SECOND THEREAFTER.
2571 ;*
2572 ;* INPUTS: R1 - TIME-OUT VALUE IN MILLI-SECONDS (UP TO 64K MS).
2573 ;* R2 BIT MAP OF BITS TO TEST (1 INDICATES TO TEST THE BIT).
2574 ;* R3 - DESIRED STATES OF THE INDICATED FIELDS IN R2.
2575 ;* R4 - ADDRESS OF THE WORD TO TEST.
2576 ;* MSLCNT - MILLI SECOND SOFTWARE LOOP COUNT.
2577 ;*
2578 ;* OUTPUTS: CARRY - SUCCESS FLAG (SET IF CONDITION IS MET BEFORE TIME OUT).
2579 ;*
2580 ;* CALLING SEQUENCE: JSR PC,MSLOOP
2581 ;*
2582 ;* COMMENTS: THIS ROUTINE WORKS WITH OR WITHOUT A HARDWARE CLOCK, BUT THE
2583 ;* CALIBRATION IS ONLY GUARENTEED WHEN A LINE CLOCK IS AVAILABLE
2584 ;* ON THE SYSTEM.
2585 ;* THIS ROUTINE CAN BE USED AS A DELAY ROUTINE, BY SPECIFYING THE
2586 ;* DESIRED DELAY AS THE TIME-OUT AND SPECIFYING A CONDITION TO
2587 ;* LOOK FOR WHICH WILL NOT BE MET DURING THE DELAY.
2588 ;* IF A TIME-OUT VALUE OF 0 IS SPECIFIED, THIS ROUTINE CHECKS FOR
2589 ;* THE DESIRED CONDITION BEFORE RETURNING. IT INDICATES SUCCESS
2590 ;* IF THE CONDITION IS MET, FAILURE OTHERWISE.
2591 ;*
2592 ;* SUBORDINATE ROUTINES CALLED: MSLGET.
2593 ;*****
2594
2595 010316 MSLOOP:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
010316 004567 173476 JSR R5,PREGOS ;CALL REGISTER SAVE SUBRT.
2596
2597 ;*
2598 ;* CALLING THE MSLGET ROUTINE FROM THE MSLOOP ROUTINE ISOLATES THE CALLER OF
2599 ;* MSLOOP FROM THE RETURNED TEST WORD AND REMAINING TIME-OUT VALUES.
2600 ;*
2601 010322 004767 177654 JSR PC,MSLGET ;CALL THE MULTI-PURPOSE MS LOOP AND SEARCH RTN.
2602
2603 010326 004736 604: PASS ;RESTORE GPRS.
010326 004736 JSR PC,B(SP). ;RETURN TO PREGOS SUBRT.
2604 010330 000207 RTS PC ;CARRY SET IF SUCCESS. CLEAR IF TIME OUT.

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2625 010332  
010332 004567 173462  
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2627 010336  
010336 104454  
010340 000145  
010342 010376  
010344 000000  
2628  
2629 010346  
010346 012746 010462  
010352 012746 000001  
010356 010600  
010360 104417  
010362 062706 000004  
2630 010366  
010366 104422  
2631 010370 000776  
2632 010372  
010372 004736  
2633 010374 000207  
2634  
2635 010376 110 117 123  
010401 124 040 103  
010404 117 115 120  
010407 125 124 105  
010412 122 040 110  
010415 101 122 104  
010420 127 101 122  
010423 105 040 117  
010426 122 040 123  
010431 117 106 124  
010434 127 101 122  
010437 105 040 102  
010442 125 107 040  
010445 105 116 103  
010450 117 125 116  
010453 124 105 122

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.SBTTL GLOBAL SUBROUTINE OOPS
;*****
;* - PROGRAM ABORT SUBROUTINE -
;* THIS SUBROUTINE IS USED TO ABORT THE PROGRAM WHEN A FATAL ERROR IS
;* DETECTED IN THE PROGRAM OR THE HOST SYSTEM HARDWARE. AN ERROR MESSAGE
;* IS PRINTED GIVING SOME INFORMATION ABOUT THE NATURE OF THE ABORT.
;*
;* INPUTS: R1 - ERROR CODE GIVING REASON FOR ABORT.
;*
;* OUTPUTS: AN ERROR MESSAGE IS PRINTED.
;* A LIST OF RETURN PC VALUES FOR ALL SUBROUTINE CALLS IS PRINTED.
;*
;* CALLING SEQUENCE: JSR PC.OOPS
;*
;* COMMENTS:
;*
;* SUBORDINATE ROUTINES CALLED: NONE.
; - *****

OOPS:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
; JSR R5,PREGOS ;CALL REGISTER SAVE SUBRT.
; REPORT "HOST COMPUTER HARDWARE OR SOFTWARE BUG ENCOUNTERED." ERROR.
ERRSF 101,EM0101

; REPORT "PROGRAM HUNG, WAITING FOR A CONTROL C."
PRINTF @EM0102

MOV @EM0102, (SP)
MOV @1, (SP)
MOV SP,R0
TRAP C:PNTF
ADD @4,SP
TRAP C:BRK

2$: BREAK ;LOOK FOR OPERATOR CONTROL-C INPUT.

60$: BR 2$ ;INFINITE LOOP.
PASS ;DON'T NEED THIS, BUT SOMEBODY MAY CHANGE THIS
; JSR PC,@(SP); RETURN TO PREGOS SUBRT.
; ROUTINE IN THE FUTURE, SO BE CONSISTANT.

EM0101:: .ASCII /HOST COMPUTER HARDWARE OR SOFTWARE BUG ENCOUNTERED.
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	010456	105	104	056
	010461	000		
2636	010462	045	116	045
	010465	101	120	122
	010470	117	107	122
	010473	101	115	040
	010476	110	125	116
	010501	107	054	040
	010504	127	101	111
	010507	124	111	116
	010512	107	040	106
	010515	117	122	040
	010520	101	040	103
	010523	117	116	124
	010526	122	117	114
	010531	055	103	056
	010534	040	074	052
	010537	052	052	052
	010542	052	052	052
	010545	052	052	052
	010550	052	052	052
	010553	045	116	045
2637	010556	116	000	

EM0102:: .ASCIZ /MAPROGRAM HUNG, WAITING FOR A CONTROL C. <\*\*\*\*\*NEN/

.EVEN

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2639 .SBTTL GLOBAL SUBROUTINE PUFIFO
2640 :*****
2641 :* - PURGE THE FIFO
2642 :* THIS ROUTINE TRIES TO REMOVE ALL THE CHARACTERS FROM THE FIFO.
2643 :* ANY BMP CODES THAT ARE FOUND ARE SAVED ON THE BMP CODE QUEUE.
2644 :*
2645 :* INPUTS: RBUFA- CONTAINS THE ADDRESS OF THE RECEIVER.
2646 :*
2647 :*
2648 :* OUTPUTS: CARRY BIT - INDICATES THE STATE OF THE FIFO, SET: = PURGED.
2649 :* BMPCQ - THE CONTENTS OF THE BMP CODE QUEUE MAY BE UPDATED.
2650 :*
2651 :* CALLING SEQUENCE: JSR PC,PUFIFO
2652 :*
2653 :* COMMENTS:
2654 :*
2655 :* SUBORDINATE ROUTINES CALLED: SAVBMP.
2656 :*****
2657
2658 010560 PUFIFO::SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
010560 004567 173234 JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
2659 010564 012701 001000 MOV #512.,R1 ;SET MAXIMUM TRY COUNT OF 512.
2660 010570 016704 171406 MOV RBUFA,R4 ;GET ADDRESS OF THE RECEIVER BUFFER REGISTER.
2661
2662 010574 011402 2$: MOV (R4),R2 ;GET THE CONTENTS OF THE RECEIVER BUFFER REG.
2663 010576 100016 BPL 6$ ;EXIT IF THE FIFO IS EMPTY, DATA_VALID CLR.
2664
2665 ;*
2666 ; CHECK IF THE READ CHARACTER IS ACTUALLY A BMP CODE.
2667 ; IF IT IS, THEN SAVE IT ON THE BMP CODE QUEUE TO BE REPORTED LATER.
2668 010600 012700 070000 ;*
2669 010604 040200 MOV #70000,R0 ;GENERATE A BIT MAP OF CHAR ERROR BITS
2670 010606 001006 BIC R2,R0 ; WHICH ARE NOT SET FOR CHAR.
2671 BNE 4$ ;THROW CHAR AWAY IF NOT BMP OR SELFTEST CODEF.
2672
2673 ;*
2674 ; CHECK IF THE READ DATA IS MODEM STATUS , BMP OR SELFTEST?.
2675 010610 012700 000301 ;*
2676 010614 040200 MOV #301,R0 ; CHECK IF BMP.
2677 010620 004767 000130 BIC R2,R0 ;TRY TO CLEAR BMP FLAGS IN THE READ DATA.
2678 BNE 4$ ;IF IT IS MODEM OR SELFTEST CODE THROW IT AWAY.
2679 010624 005301 JSR PC,SAVBMP ;SAVE BMP CODE ON THE QUEUE.
2680 010626 001362 4$: DEC R1 ;DECREMENT THE TRY COUNT.
2681 010630 000241 BNE 2$ ;LOOP TO TRY AGAIN.
2682 010632 000401 CLC ;CLEAR CARRY, TO INDICATE FIFO NOT PURGED.
2683 010634 000261 BR 60$ ;EXIT WITH CARRY CLEAR.
2684 6$: SEC ;SET CARRY, TO INDICATE FIFO PURGED.
2685 010636 60$: PASS
010636 004736 ;RESTORE GPRS,
2686 JSR PC,@(SP), ;RETURN TO PREG05 SUBRT.
2687 010640 000207 RTS PC ;CARRY BIT, SET INDICATES FIFO PURGED.

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2689 .SBTTL GLOBAL SUBROUTINE RESETT
2690 :*****
2691 :* - RESET DEVICE UNDER TEST *****
2692 :* THIS SUBROUTINE IS USED TO RESET THE DUT TO A KNOWN STATE.
2693 :* IF RESET DOES NOT SUCCESSFULLY COMPLETE, IE. TIME-OUT OCCURS, THEN
2694 :* AN ABORT TEST ERROR MESSAGE IS REPORTED.
2695 :*
2696 :* INPUTS: CSRA - CONTAINS THE ADDRESS OF THE CSR
2697 :* TXBFCA - CONTAINS ADDRESS OF DUT DMA BUFFER COUNT REGISTER.
2698 :* ERRTBL - ERR TYP, ERNBR, AND ERRMSG SET UP CORRECTLY.
2699 :*
2700 :* OUTPUTS: THE DUT PERFORMS ITS RESET FUNCTION INTO A KNOWN STATE.
2701 :* CARRY - CLEAR INDICATES THE TEST IS TO BE ABORTED.
2702 :* ERRBLK - VALUE MAY BE DESTROYED.
2703 :* IESTAT - TX AND RX INTERRUPT FLAGS ARE CLEARED.
2704 :* TX AND RX INTERRUPT ENABLE BITS IN THE DUT'S CSR ARE CLEARED.
2705 :*
2706 :* CALLING SEQUENCE: JSR PC,RESETT
2707 :*
2708 :* COMMENTS: THIS SUBROUTINE CAN REPORT ERRORS WITH NUMBERS INITIAL ERNBR
2709 :* THIS ROUTINE DOES NOT DESTROY THE VALUE OF ERNBR.
2710 :*
2711 :* SUBORDINATE ROUTINES CALLED: DELAY,MSLGET.
2712 :*****
2713
2714 010642 RESETT:: SAVE ;SAVE CONTENTS OF GPRS R0 THRU R5.
010642 004567 173152 ;R5,PREG05 ;CALL REGISTER SAVE SUBRT.
2715 010646 012702 000040 MOV #BIT05,R2 ;SET BIT MASK OF MASTER RESET BIT.
2716
2717 ;*
2718 ; TEST THE STATE OF THE MASTER RESET BIT IN THE CSR.
2719 ; IF MR IS SET THEN WAIT FOR SELF-TEST TO COMPLETE.
2720 ; IF TIME-OUT OCCURS, REPORT THE ERROR AND PASS-OUT ABORT TEST INDICATOR.
2721 010652 016704 171322 ;-
2722 010656 030214 MOV CSRA,R4 ;GET THE ADDRESS OF THE DUT'S CSR.
2723 010660 001406 BIT R2,(R4) ;CHECK STATE OF MASTER RESET BIT.
2724 010662 005003 BEQ 2$ ;DON'T DELAY IF MR IS ALREADY CLEAR.
2725 010664 012701 011610 CLR R3 ;SET UP DESIRED STATE OF MASTER RESET BIT.
2726 010670 004767 177306 MOV #5000.,R1 ;PASS TIME-OUT VALUE OF 5 SECONDS.
2727 010674 103012 JSR PC,MSLGET ;WAIT FOR SELF-TEST TO COMPLETE, MR CLEAR.
2728 BCC 4$ ;GO REPORT ERROR IF TIMEOUT OCCURRED.
2729
2730 ;*
2731 ; SET MASTER RESET BIT IN CSR. CLEAR TX AND RX ENABLE BITS, ETC.
2732 ; SKIP THE SELFTEST.
2733 ; TIME-OUT OF 5 SECS, JUST IN CASE THE SELF-TEST EXECUTES.
2734 010676 010277 171276 ;-
2735 010702 004767 000160 2$: MOV R2,@CSRA ;SET MASTER RESET BIT, DISABLE TX AND RX INTS.
2736 JSR PC,SKPSTS ;TRY TO SKIP THE SELFTEST.
2737
2738 ;*
2739 ; SET SELF-TEST TIME-OUT OF 5 SECONDS, AND WAIT FOR M.R TO CLEAR.
2740 ; IF TIME-OUT OCCURS, THEN REPORT THE FATAL ERROR AND PASS-OUT THE ABORT
2741 ; TEST INDICATOR.
2742 010706 005003 ;-
2743 010710 012701 011610 CLR R3 ;SET UP DESIRED STATE OF MASTER RESET BIT.
2744 010714 004767 177262 MOV #5000.,R1 ;PASS TIME-OUT VALUE OF 5 SECONDS.
2745 010720 103410 JSR PC,MSLGET ;WAIT FOR SELF-TEST TO COMPLETE, MR CLEAR.
2746 BCS 6$ ;SKIP ERROR REPORT IF MR CLEARED IN TIME.

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2745
2746 ; SET UP ERROR MESSAGE TO REPORT "FATAL ERROR FOUND DURING RESET, TEST ABORTED".
2747 ; INDICATE TEST IS TO BE ABORTED BY CLEARING THE CARRY BIT.
2748 ;
2749 010722 012701 004670 4$: MOV #EM1601,R1 ;PASS ERROR MESSAGE TO REPORT.
2750 010726 012767 006570 173062 MOV #ER1603,ERRBLK ;PASS ADDRESS OF ERROR HANDLING ROUTINE.
2751 ;REPORT ERROR "TIME-OUT OCCURRED WAITING FOR MASTER RESET TO CLEAR"
2752 ; "TEST ABORTED"
2753 010734 ERROR ; >>>> ERROR <<<<<
010734 104460 ; TRAP C$ERKOR
2754 010736 000241 CLC ;INDICATE TEST IS TO BE ABORTED.
2755 010740 000403 BR 60$ ;EXIT THIS SUBROUTINE, ABORT TEST INDICATOR.
2756 ;
2757 ; CLEAR TX AND RX INTERRUPT ENABLE STATUS FLAGS IN IESTAT.
2758 ; EXIT WITH CONTINUE TEST INDICATOR SET (IE,CARRY SET).
2759 ;
2760 010742 005067 171262 6$: CLR IESTAT ;CLEAR TX AND RX INTERRUPT STATUS FLAGS.
2761 010746 000261 SEC ;INDICATE SUCCESS, CONTINUE TEST.
2762 ;
2763 010750 60$: PASS ;RESTORE GPRS, PASS THE FOLLOWING INTACT:
010750 004736 JSR PC,@(SP), ;RETURN TO PREG05 SUBRT.
2764 ;CARRY BIT:IF CLEAR,INDICATES ABORT TEST.
2765 010752 000207 RTS PC
2766

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.SBTTL GLOBAL SUBROUTINE - SAVBMP -
; * *****
; * SAVE BMP CODES ROUTINE -
; * THIS ROUTINE SAVES THE PARAMETER PASSED IN, ONTO THE BMP CODE QUEUE
; * TOGETHER WITH THE NUMBER OF THE CURRENTLY EXECUTING TEST.
; *
; * INPUTS: R2 - CONTAINS THE BMP CODE THAT IS TO BE PLACED ON THE QUEUE.
; *          BMPCQP - CONTAINS ADDRESS OF NEXT LOCATION IN THE BMP QUEUE.
; *          BMPCQB - LABEL AT BASE OF THE BMP CODE QUEUE.
; *          BMPCQE - LABEL OF NEXT LOCATION AFTER THE END OF THE BMP QUEUE.
; *          TSTNUM - CONTAINS THE NUMBER OF THE CURRENT TEST.
; *
; * OUTPUTS: BMPCQP - INCREMENTED BY 4.
; *          THE CONTENTS OF THE BMP CODE QUEUE ARE UPDATED.
; *
; * CALLING SEQUENCE: JSR PC,SAVBMP
; *
; * COMMENTS: IF THE OVERFLOW OCCURS THEN THE LAST LOCATION WILL BE
; *            OVERWRITTEN BY ANY SUBSEQUENT ATTEMPTS TO UPDATE THE QUEUE.
; *
; * SUBORDINATE ROUTINES CALLED: NONE.
; -- *****
```

2791 010754  
010754 004567 173040  
2792 010760 016704 171364  
2793 010764 116724 171236  
2794 010770 005204  
2795 010772 042702 177400  
2796 010776 010224  
2797 011000 020427 002552  
2798 011004 103402  
2799 011006 162704 000004  
2800 011012 010467 171332  
2801  
2802 011016  
011016 004736  
2803 011020 000207

```
SAVBMP:: SAVE
;SAVE CONTENTS OF GPRS R0 THRU R5.
R5,PREG05 ;CALL REGISTER SAVE SUBRT.
;GET THE POINTER TO THE NEXT LOCATION IN QUEUE.
MOV BMPCQP,R4 ;SAVE THE CURRENT TEST NUMBER ON THE QUEUE.
MOVB TSTNUM,(R4)+ ;INCREMENT THE POINTER TO GIVE AN EVEN ADDRESS.
INC R4 ;CLEAR THE UNWANTED BITS FROM THE BMP CODE.
BIC #177400,R2 ;SAVE THE BMP CODE ON THE QUEUE.
MOV R2,(R4)+ ;CHECK IF OVERFLOW WILL OCCUR THE NEXT TIME.
CMP R4,#BMPCQE ;GO SAVE THE POINTER IF WE WILL NOT OVERFLOW.
BLO 2$ ;RESET THE POINTER TO THE LAST LOCATION IN QUE.
SUB #4,R4 ;SAVE THE POINTER.
MOV R4,BMPCQP
2$:
60$: PASS
;RESTORE GPRS.
JSR PC,@(SP)+ ;RETURN TO PREG05 SUBRT.
RTS PC JSR
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2839 011062  
2840 011064

011022 004567 172772  
011026 016701 171176  
011032 012702 002610  
011036 012703 000020  
011042 050103  
011044 010177 171130  
011050 017722 171132  
011054 005201  
011056 020103  
011060 002771  
011062 004736  
011064 000207

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.SBTTL GLOBAL SUBROUTINE - SAVMST -
;+ *****
;+ - SAVE MODEM STATUS ROUTINE
;+ THIS ROUTINE SAVES THE PRESENT CONTENTS OF THE DUT STAT REGISTERS IN
;+ THE STAT STORAGE TABLE.
;+
;+ INPUTS: CSRA - CONTAINS THE ADDRESS OF THE DUT CSR.
;+ IESTAT - STATE OF THE DUT CSR INTERRUPT ENABLE BITS.
;+ NUMLNS - EQUATED TO THE NUMBER OF LINES ON THE DUT.
;+ FLSA - CONTAINS THE ADDRESS OF THE DUT STAT REGISTER.
;+ STSTB - LABEL AT BASE OF THE STAT STORAGE TABLE.
;+
;+ OUTPUTS: STST TABLE - OVERWRITTEN WITH PRESENT STAT CONTENTS.
;+ CSR IND.ADR.REG FIELD - DESTROYED.
;+
;+ CALLING SEQUENCE: JSR PC,SAVMST
;+
;+ COMMENTS: IF THE CONTENTS OF IESTAT CHANGES DURING THIS TEST THE CSR
;+ INTERRUPT ENABLE BITS WILL NOT TRACK THE CHANGE.
;+
;+ SUBORDINATE ROUTINES CALLED: NONE.
;-- *****

SAVMST:: SAVE
;SAVE CONTENTS OF GPRS R0 THRU R5.
;CALL REGISTER SAVE SUBRT.
;GET IE STATES FOR UPDATING IND.ADR.REG FIELD.
;SET UP STAT STORAGE POINTER TO BASE OF TABLE.
JSR R5,PREG05
MOV IESTAT,R1
MOV #STSTB,R2
MOV #NUMLNS,R3
BIS R1,R3
;FORM COMPLETION COMPARISON WORD.
2$: MOV R1,@CSRA
;SET UP THE CSR IND.ADR.REG FIELD.
MOV @FLSA,(R2)+
;SAVE CONTENTS OF THIS LINE'S STAT REGISTER.
INC R1
;SET LINE COUNTER TO NEXT LINE.
CMP R1,R3
;CHECK FOR ALL LINES DONE.
BLT 2$
;LOOP IF NOT ALL LINES DONE.

60$: PASS
;RESTORE GPRS.
JSR PC,@(SP)+
;RETURN TO PREG05 SUBRT.

RTS PC

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2842				.SBTTL GLOBAL SUBROUTINE	- SKPSTS
2843				*****	
2844				;	
2845				;	- SKIP SELFTEST ROUTINE
2846				;	THIS SUBROUTINE IS USED TO SKIP THE SELFTEST AFTER A DUT RESET HAS BEEN
2847				;	INITIATED. IT MUST BE ENTERED IMMEDIATELY AFTER SETTING THE DUT MASTER
2848				;	RESET ROUTINE OR AFTER THE EXECUTION OF A BUS RESET (BECAUSE OF TIMING
2849				;	CONSIDERATIONS).
2850				;	
2851				;	INPUTS: CSRA - CONTAINS ADDRESS OF THE DUT CSR.
2852				;	TXBFCA CONTAINS ADDRESS OF DUT DMA BUFFER COUNT REGISTER.
2853				;	
2854				;	OUTPUTS: SKIP SELFTEST CODES ARE WRITTEN TO THE DUT REGISTERS.
2855				;	
2856				;	CALLING SEQUENCE: JSR PC,SKPSTS
2857				;	
2858				;	COMMENTS:
2859				;	
2860				;	SUBORDINATE ROUTINES CALLED: DELAY.
2861				;	*****
2862	011066			SKPSTS:: SAVE	
	011066	004567	172726		;
2863	011072	012704	000012		JSR R5,PREG05 ;SAVE CONTENTS OF GPRS R0 THRU R5.
2864	011076	004767	177040	MOV #10,R4	;
2865				JSR PC,DELAY	;
2866					;
2867					;
2868	011102	012701	000060		;
2869					;
2870					;
2871	011106	012703	052525		;
2872	011112	005301			;
2873	011114	016704	171060	4\$:	;
2874	011120	010124			;
2875	011122	010324			;
2876	011124	020467	171066	6\$:	;
2877	011130	103774			;
2878	011132	032701	000017		;
2879	011136	001365			;
2880					;
2881	011140			60\$:	;
	011140	004736			;
2882	011142	000207			;

```

2884 .SBTTL GLOBAL SUBROUTINE                                UNSDIV -
2885 ;* *****
2886 ;*                               UNSIGNED DIVIDE ROUTINE
2887 ;* THIS SUBROUTINE IS USED TO DIVIDE A 32 BIT UNSIGNED DIVIDEND BY A
2888 ;* 16 BIT UNSIGNED DIVISOR GIVING A 16 BIT QUOTIENT. ALL NUMBERS ARE
2889 ;* CONSIDERED TO BE UNSIGNED. A SUCCESS FLAG IS NOT SET ON RETURN IF
2890 ;* THE QUOTIENT WAS TOO BIG TO BE CONTAINED IN 16 BITS.
2891 ;*
2892 ;* INPUTS:      R1 - THE DIVISOR, UNSIGNED, 16 BITS.
2893 ;*              R2 - MOST SIGNIFICANT WORD OF THE DIVIDEND, UNSIGNED, 16 BITS.
2894 ;*              R3  LEAST SIGNIFICANT WORD OF THE DIVIDEND, UNSIGNED, 16 BITS.
2895 ;*
2896 ;* OUTPUTS:     R1  QUOTIENT, UNSIGNED, 16 BITS (177777 IF OVERFLOW).
2897 ;*              CARRY SUCCESS FLAG, SET IF COMPLETE QUOTIENT FITS IN 16 BITS.
2898 ;*
2899 ;* CALLING SEQUENCE:  JSR    PC,UNSDIV
2900 ;*
2901 ;* COMMENTS:     IF THE DIVISOR IS 0 THE QUOTIENT IS RETURNED AS ALL ONES
2902 ;*               (177777) AND THE CARRY IS CLEAR REGARDLESS OF THE DIVIDEND.
2903 ;*
2904 ;* SUBORDINATE ROUTINES CALLED: NONE.
2905 ;* *****
2906
2907 011144 UNSDIV:: SAVE                                ;SAVE CONTENTS OF GPRS R0 THRU R5.
011144 004567 172650                                JSR    R5,PREG05 ;CALL REGISTER SAVE SUBRT.
2908
2909 ;* CHECK FOR QUOTIENT GREATER THAN 16 BITS CONDITION.
2910 ;*
2911 011150 010204                                MOV    R2,R4 ;GET MSW OF DIVIDEND FOR SUBTRACT.
2912 011152 160104                                SUB    R1,R4 ;SUBTRACT DIVISOR FROM MSW OF DIVIDEND.
2913 011154 103403                                BCS   2$ ;IF IT DIDN'T GO, WE HAVE QUOTIENT < 16 BITS.
2914 011156 012701 177777                        MOV    #1,R1 ;SET QUOTIENT TO ALL ONES (177777).
2915 011162 000442                                BR    60$ ;EXIT WITH CARRY CLEAR.
2916
2917 ;* SET UP COUNTERS AND VARIOUS WORKING GPRS.
2918 ;*
2919 011164 005004                                2$:   CLR    R4 ;CLEAR THE LSW OF THE DIVISOR.
2920 011166 000241                                CLC ;CLEAR CARRY FOR THE SHIFT OF THE DIVISOR.
2921 011170 006001                                ROR    R1 ; DIVISOR BY
2922 011172 006004                                ROR    R4 ; 2(UNSIGNED)
2923 011174 012700 000020                        MOV    #16,,R0 ;SET UP INITIAL SHIFT COUNT TO 16.
2924
2925 ;* THE SUBTRACT AND SHIFT LOOP.
2926 ;*
2927 011200 010246                                4$:   MOV    R2,-(SP) ;SAVE MSWORD OF DIVIDEND.
2928 011202 010346                                MOV    R3,(SP) ;SAVE LSWORD OF DIVIDEND.
2929 011204 160403                                SUB    R4,R3 ;LSWORD DIVIDEND - LSWORD OF DIVISOR.
2930 011206 005602                                SBC   R2 ;MSWORD DIVIDEND - BORROW
2931 011210 103402                                BCS   6$ ;IF BORROW FROM BORROW SUBTRACT, IT DIDN'T GO.
2932 011212 160102                                SUB    R1,R2 ;MSWORD DIVIDEND - MSWORD OF DIVISOR.
2933 011214 103003                                BCC   8$ ;IF NO BORROW, IT WENT, CARRY IS CLEAR.
2934
2935 ;* IT DIDN'T GO, SO WE SHIFT A 1 INTO THE QUOTIENT (COMPLEMENTED LATER).
2936 ;* CARRY IS SET.
2937 ;*
2938 011216 012603                                6$:   MOV    (SP)+,R3 ;RESTORE LSWORD OF DIVIDEND.
2939 011220 012602                                MOV    (SP)+,R2 ;RESTORE MSWORD OF DIVIDEND.

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2940 011222 000401          BR      10$          ;GOTO SHIFT 1 INTO THE QUOTIENT.
2941                      ;*
2942                      ; IT WENT, SO WE RESTORE THE STACK AND SHIFT A 0 INTO QUOTIENT (WILL BE
2943                      ; COMPLEMENTED LATER).  CARRY IS CLEAR.
2944                      ;
2945 011224 012626      8$:  MOV      (SP)+,(SP)+      ;POP THE SAVED DIVIDEND OFF OF THE STACK.
2946                      ;*
2947                      ; SHIFT THE RESULT OF THE SUBTRACT ATTEMPT INTO THE QUOTIENT SHIFT REG.
2948                      ;-
2949 011226 006105      10$:  ROL      R5          ;SHIFT NEXT BIT INTO THE INVERTED QUOTIENT.
2950 011230 000241          CLC          ;DIVIDE THE
2951 011232 006001          ROR      R1          ; DEVISOR BY
2952 011234 006004          ROR      R4          ; 2 (UNSIGNED).
2953 011236 005300          DEC      R0          ;COUNT THIS SHIFT AND SUBTRACT.
2954 011240 001357          BNE      4$          ;LOOP FOR ANOTHER SHIFT & SUB IF NOT DONE.
2955 011242 005105          COM      R5          ;GET QUOTIENT FROM INVERTED QUOTIENT.
2956                      ;*
2957                      ; NOW WE EITHER ROUND UP OR LEAVE QUOTIENT ALONE.
2958                      ;-
2959 011244 000241          CLC          ;CLEAR THE CARRY FOR THE SHIFT OF THE DIVIDEND.
2960 011246 006103          ROL      R3          ;MULTIPLY LSWORD OF DIVIDEND BY 2, MSWORD IS 0.
2961 011250 103402          BCS      12$          ;IF CARRY FROM SHIFT, ROUND UP.
2962 011252 160403          SUB      R4,R3          ;SUBTRACT DIVISOR FROM DIVIDEND.
2963 011254 103403          BCS      14$          ;IF BORROW, DON'T ROUND UP.
2964                      ;*
2965                      ; ROUND UP, EXTRA SUBTRACT WENT.
2966                      ;-
2967 011256 005205      12$:  INC      R5          ;INCREMENT THE QUOTIENT BY ONE.
2968 011260 001001          BNE      14$          ;IF NO OVERFLOW, WE LEAVE THE ROUND UP
2969 011262 005305          DEC      R5          ;DON'T LET ROUNDING CAUSE OVERFLOW.
2970                      ;*
2971                      ; ALL DONE, PASS QUOTIENT AND EXIT.
2972                      ;-
2973 011264 010501      14$:  MOV      R5,R1          ;PASS QUOTIENT BACK IN R1.
2974 011266 000261          SEC          ;INDICATE NO OVERFLOW.
2975                      ;
2976 011270 010501      60$:  PASS      R1          ;RESTORE GPRS, LEAVE THE FOLLOWING INTACT:
                011270 010166 000004          MOV      R1,R1SLOT(SP) ;PUT R1 IN STACK SLOT.
                011274 004736          JSR      PC,@(SP)+ ;RETURN TO PREG05 SUBRT.
2977                      ;R1 - 16 BIT, UNSIGNED QUOTIENT.
2978 011276 000207          RTS      PC          ;CARRY - SET INDICATES NO OVERFLOW (SUCCESS).

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.SBTTL GLOBAL SUBROUTINE WAIBIC
; ** *****
; * - WAIT FOR BIT CLEAR ROUTINE
; * THIS SUBROUTINE WAITS FOR THE SPECIFIED BIT TO BECOME CLEAR. IF THE
; * SPECIFIED BIT GOES TO A CLEAR STATE WITHIN THE SPECIFIED TIME OUT
; * PERIOD A SUCCESS INDICATION IS RETURNED BY THIS ROUTINE.
; * THE LAST VALUE WHICH IS READ LOOKING FOR THE CONDITION IS RETURNED TO
; * ALLOW THE USE OF THIS ROUTINE TO LOOK FOR DESTRUCTIVE READ CONDITIONS.
; *
; * INPUTS: R1 TIME-OUT VALUE AND BIT NUMBER INDICATION:
; * BITS 15 THRU 12 NUMBER OF BIT TO TEST (RANGE 0 THRU 15).
; * BITS 11 THRU 0 - TIME OUT VALUE IN MILLI-SECONDS (4095 MAX).
; * R2 - ADDRESS OF WORD CONTAINING THE BIT TO TEST.
; * MSLCNT.
; *
; * OUTPUTS: R2 - THE LAST WORD WHICH WAS READ TO CHECK FOR THE CONDITION.
; * CARRY - SUCCESS FLAG (CARRY SET IF BIT CLR BEFORE TIME OUT).
; *
; * CALLING SEQUENCE: MOV #130040,R1 ;PASS BIT 11 (13 OCTAL) AND
; * ; 32 (40 OCTAL) MS DELAY.
; * MOV #LABEL,R2 ;TEST BIT IN WORD AT "LABEL".
; * JSR PC,WAIBIC ;WAIT 32 MS FOR BIT 11 TO CLR.
; *
; * COMMENTS:
; *
; * SUBORDINATE ROUTINES CALLED: MSLGET.
; * - - *****
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3008 011300  
011300 004567 172514  
3009 011304 010204  
3010 011306 010102  
3011 011310 042701 170000  
3012 011314 042702 007777  
3013 011320 000302  
3014 011322 006202  
3015 011324 006202  
3016 011326 006202  
3017 011330 016202 002310  
3018 011334 005003  
3019 011336 004767 176640  
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3021 011342 010002  
3022 011344  
011344 010266 000006  
011350 004736  
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3024 011352 000207

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WAIBIC:: SAVE
;SAVE CONTENTS OF GPRS R0 THRU R5.
;CALL REGISTER SAVE SUBRT.
;SET UP THE ADDRESS PARAMETER FOR MSLGET.
JSR R5,PREG05
MOV R2,R4
MOV R1,R2
BIC #170000,R1
BIC #7777,R2
;SEPERATE DELAY COUNT OUT OF PASSED PARAMETER.
;SEPERATE LINE NUMBER FIELD OF PASSED PARAM.
;PUT LINE NUMBER FIELD IN LSBYTE.
SWAB R2
ASR R2
;SHIFT THE LINE NUMBER FIELD INTO THE PROPER
; POSITION TO USE IT AS A WORD TABLE OFFSET
; FOR THE TABLE LOOKUP OF THE LINE BIT MAP.
ASR R2
MOV BITTBL(R2),R2
;GET BIT MAP OF LINE TO TEST FROM TABLE.
CLR R3
;INDICATE THAT THE BIT SHOULD BE CLR.
JSR PC,MSLGET
;WAIT FOR THE BIT TO BE CLR WITHIN TIME-OUT.
; CARRY IS CORRECT UPON MSLGET RETURN.
;PASS LAST VALUE READ AS OUTPUT PARAMETER.
;RESTORE GPRS. EXCEPT THE FOLLOWING:
MOV R2,R2SLOT(SP) ;PUT R2 IN STACK SLOT.
JSR PC,@(SP) ;RETURN TO PREG05 SUBRT.
; R2 - LAST VALUE READ LOOKING FOR CONDITION.
; CARRY - SUCCESS FLAG (SET IF BIT FOUND CLR).
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011360 010204  
011362 010102  
011364 042701 170000  
011370 042702 007777  
011374 000302  
011376 006202  
011400 006202  
011402 006202  
011404 016202 002310  
011410 010203  
011412 004767 176564  
011416 010002  
011420 010266 000006  
011424 004736  
011426 000207

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.SBTTL GLOBAL SUBROUTINE WAIBIS
; * *****
; * - WAIT FOR BIT SET ROUTINE -
; * THIS SUBROUTINE WAITS FOR THE SPECIFIED BIT TO BECOME SET. IF THE
; * SPECIFIED BIT GOES TO A SET STATE WITHIN THE SPECIFIED TIME OUT
; * PERIOD A SUCCESS INDICATION IS RETURNED BY THIS ROUTINE
; * THE LAST VALUE WHICH IS READ LOOKING FOR THE CONDITION IS RETURNED TO
; * ALLOW THE USE OF THIS ROUTINE TO LOOK FOR DESTRUCTIVE READ CONDITIONS.
; *
; * INPUTS: R1 - TIME-OUT VALUE AND BIT NUMBER INDICATION:
; * BITS 15 THRU 12 NUMBER OF BIT TO TEST (RANGE 0 THRU 15).
; * BITS 11 THRU 0 - TIME-OUT VALUE IN MILLI-SECONDS (4095 MAX).
; * R2 - ADDRESS OF WORD CONTAINING THE BIT TO TEST.
; * MSLCNT.
; *
; * OUTPUTS: R2 - THE LAST WORD WHICH WAS READ TO CHECK FOR THE CONDITION.
; * CARRY - SUCCESS FLAG (CARRY SET IF BIT SET BEFORE TIME-OUT).
; *
; * CALLING SEQUENCE: MOV #130040,R1 ;PASS BIT 11 (13 OCTAL) AND
; * ; 32 (40 OCTAL) MS DELAY.
; * MOV #LABEL,R2 ;TEST BIT IN WORD AT "LABEL".
; * JSR PC,WAIBIS ;WAIT 32 MS FOR BIT 11 TO SET.
; *
; * COMMENTS:
; *
; * SUBORDINATE ROUTINES CALLED: MSLGET.
; * - - *****
WAIBIS:: SAVE
;SAVE CONTENTS OF GPRS R0 THRU R5.
JSR R5,PREG05 ;CALL REGISTER SAVE SUBRT.
;SET UP THE ADDRESS PARAMETER FOR MSLGET.
MOV R2,R4
MOV R1,R2
BIC #170000,R1 ;SEPERATE DELAY COUNT OUT OF PASSED PARAMETER.
BIC #7777,R2 ;SEPERATE LINE NUMBER FIELD OF PASSED PARAM.
SWAB R2 ;PUT LINE NUMBER FIELD IN LSBYTE.
ASR R2 ;SHIFT THE LINE NUMBER FIELD INTO THE PROPER
ASR R2 ; POSITION TO USE IT AS A WORD TABLE OFFSET
ASR R2 ; FOR THE TABLE LOOKUP OF THE LINE BIT MAP.
MOV BITTBL(R2),R2 ;GET BIT MAP OF LINE TO TEST FROM TABLE.
MOV R2,R3 ;INDICATE THAT THE BIT SHOULD BE SET.
JSR PC,MSLGET ;WAIT FOR THE BIT TO BE SET WITHIN TIME-OUT.
; CARRY IS CORRECT UPON MSLGET RETURN.
MOV R0,R2 ;PASS LAST VALUE READ AS OUTPUT PARAMETER.
60$: PASS R2 ;RESTORE GPRS, EXCEPT THE FOLLOWING:
MOV R2,R2SLOT(SP) ;PUT R2 IN STACK SLOT.
JSR PC,@(SP)+ ;RETURN TO PREG05 SUBRT.
; R2 - LAST VALUE READ LOOKING FOR CONDITION.
; CARRY - SUCCESS FLAG (SET IF BIT FOUND SET).
```

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3095 011430  
011430 004567 172364  
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3099 011434 016701 170550  
3100 011440 010002  
3101 011442 010503  
3102 011444 012704 177777  
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3106 011450 004767 175714  
3107  
3108 011454  
011454 004736  
3109 011456 000207

```
.SBTTL GLOBAL SUBROUTINE                                WTWLNC
;*****
;* - LINE CONTROL REGISTER SETUP ROUTINE
;* THIS SUBROUTINE IS USED TO SET THE DEVICE UNDER TEST (DUT) LINE
;* CONTROL REGISTERS (LNCTRL) TO THE SPECIFIED STATE. ONLY THE LNCTRLS
;* FOR THE SPECIFIED LINES ARE ALTERED.
;*
;* INPUTS:      R0  NEW LINE PARAMETERS.
;*              R5  BIT MAP OF LINES TO BE ALTERED.
;*              CSRA - CONTAINS ADDRESS OF THE DUT CSR.
;*              IESTAT  CONTAINS THE CURRENT STATE OF THE TX AND RX INTERRUPT
;*                  ENABLE BITS IN THE CSR.
;*              LNCTRA - CONTAINS ADDRESS OF THE DUT LNCTRL REGISTERS.
;*
;* OUTPUTS:     LNCTRL - SPECIFIED DUT LINE CONTROL REGISTERS ARE ALTERED.
;*
;* CALLING SEQUENCE:  JSR    PC,WTWLNC
;*
;* COMMENTS:
;*
;* SUBORDINATE ROUTINES CALLED:  ALTFLD.
;*****
WTWLNC:: SAVE                                ;SAVE CONTENTS OF GPRS R0 THRU R5.
;*              JSR    R5,PREG05            ;CALL REGISTER SAVE SUBRT.
;*
;* SET UP THE PARAMETERS FOR THE CALL TO ALTFLD.
;*
;*              MOV    LNCTRA,R1            ;SET UP THE REGISTER ADDRESS PARAMETER.
;*              MOV    R0,R2              ;SET UP THE DESIRED REGISTER CONTENTS.
;*              MOV    R5,R3              ;SET UP THE BIT MAP OF LINES TO ALTER.
;*              MOV    @-1,R4             ;SELECT ALL REGISTER BITS TO BE ALTERED.
;*
;* CALL THE SUBROUTINE WHICH ALTERS THE REGISTER CONTENTS.
;*
;*              JSR    PC,ALTFLD           ;ALTER THE REGISTER CONTENTS.
;*
608:  PASS
;*              JSR    PC,@(SP)           ;RESTORE GPRS.
;*              ;RETURN TO PREG05 SUBRT.
;*              RTS    PC
```



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3134 011460 005767 170602
3135 011464 001402
3136 011466 005367 170574
3137 011472 005767 170572
3138 011476 001402
3139 011500 005367 170564
3140 011504 005367 170562
3141 011510 001006
3142 011512 016767 170556 170552
3143 011520 010046
3144 011522
      011522 104422
3145 011524 012600
3146 011526 000002

```

```

.SBTTL INTERRUPT SERVICE ROUTINE          CLKINT
;*****
; THIS ROUTINE IS EXECUTED CLKHRZ TIMES PER SECOND. IT DECREASES THE
; TWO TIMER COUNTERS DOWN TO ZERO.
;
; INPUTS:      TIMER1 - TIMER COUNTER #1.
;              TIMER2 - TIMER COUNTER #2.
;              TIMER3 - TIMER COUNTER FOR CALL OF BREAK MACRO.
;
; OUTPUTS:     THE 2 TIMER COUNTERS ARE DECREMENTED IF THEY ARE NOT ZERO.
;
; CALLING SEQUENCE:  PUT #CLKINT IN THE CLOCK INTERRUPT VECTOR SLOT.
;                   PUT THE DESIRED TIME PERIOD (SECONDS TIMES CLKHRZ) IN
;                   EITHER TIMER1 OR TIMER2 AND POLL THE RESPECTIVE TIMER
;                   COUNTER TO DETECT ITS GOING TO 0 ON TIME OUT.
;
; COMMENTS:     THE 2 COUNTERS WILL NOT WRAPAROUND BUT WILL STOP AT 0. THIS
;               ALLOWS THE DETECTION OF A TIME-OUT ANY TIME AFTER THE TIME OUT
;               HAS OCCURRED UNTIL THE TIMER COUNTER IS SET TO ANOTHER VALUE.
;
; SUBORDINATE ROUTINES CALLED: NONE.
;--*****
CLKINT:: TST    TIMER1          ;CHECK FOR TIMER1 AT ZERO.
        BEQ    2$             ;BRANCH TO LEAVE IT AT ZERO IF IT IS ZERO.
        DEC    TIMER1        ;DECREMENT TIME COUNT.
2$:     TST    TIMER2          ;CHECK FOR TIMER2 AT ZERO.
        BEQ    4$             ;BRANCH TO LEAVE IT ALONE IF IT'S ALREADY ZERO.
        DEC    TIMER2        ;DECREMENT TIME COUNT.
4$:     DEC    TIMER3        ;DECREMENT THE BREAK COUNT.
        BNE    60$           ;EXIT IF NOT TIME TO CALL BREAK.
        MOV    BCOUNT,TIMER3 ;SET UP TIME TILL NEXT BREAK.
        MOV    RO,-(SP)      ;SAVE CONTENTS OF RO FROM BREAK MACRO.
        BREAK                ;CHECK FOR OPERATOR CONTROL/C.
                                TRAP    C$BRK
60$:   MOV    (SP),RO        ;RESTORE CONTENTS OF RO.
        RTI

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3172 011530 021627 010010  
3173 011534 001402  
3174 011536 000177 170506  
3175 011542 052767 100000 170502 24:  
3176 011550 000002

```
.SBTTL GLOBAL TRAP SERVICE ROUTINE TP4RTN
;*****
;* BUS TIME-OUT TRAP (004 TRAP) SERVICE ROUTINE
;* THIS ROUTINE DETERMINES IF THE 004 TRAP WAS CAUSED BY
;* AN "EXPECTED" ERROR OR NOT BY EXAMINING THE RETURN PC VALUE ON THE
;* STACK. IF THE TRAP IS UNEXPECTED, THIS ROUTINE JUMPS TO THE NORMAL
;* DIAGNOSTIC SUPERVISOR 004 TRAP HANDLING ROUTINE.
;*
;* INPUTS: SP - POINTS TO THE PC WHERE THE TRAP OCCURED.
;* ADRPTR - LABEL AT THE ADDRESS WHERE "EXPECTED" TRAPS OCCUR.
;* TP4FLG 004 TRAP FLAGS.
;*
;* OUTPUTS: TP4FLG - BIT 15 IS SET IF "EXPECTED" TRAP OCCURED.
;*
;* CALLING SEQUENCE: PUT ADDRESS POINTED TO BY TP4RTN IN 004 VECTOR.
;* OCCURENCE OF 004 TRAP VECTORS TO THIS ROUTINE.
;*
;* COMMENTS: ANY 004 TRAP WHICH OCCURS AT AN ADDRESS OTHER THAN THAT LABELED
;* ADRPTR WILL BE HANDLED BY THE NORMAL 004 TRAP SERVICE ROUTINE.
;*
;* SUBORDINATE ROUTINES CALLED: NONE.
;*****
TP4RTN:: CMP (SP),#ADRPTR ;COMPARE EXPECTED ADR AGAINST TRAP RET PC.
        BEQ 24 ;IF THEY MATCH, CONTINUE THIS ROUTINE.
        JMP @TP4VEC ;IF NOT, JUMP TO NORMAL 004 TRAP SERVICE RTN.
        BIS #BIT15,TP4FLG ;SET THE 004 TRAP OCCURED FLAG.
        RTI ;ALL DONE, GO BACK TO THE TEST.
```

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3193

.SBTTL REPORT CODING SECTION

\*\*\*  
; THE REPORT CODING SECTION CONTAINS THE  
; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.  
;--

3194 011552  
011552  
3195  
3196 011552  
011552 000167  
011554 000000  
3197  
3198  
3199  
3200 011556  
011556  
011556 104425

BGNRPT

EXIT RPT

.EVEN

ENDRPT

L\$RPT::

.WORD J\$JMP  
.WORD L10010-2-

L10010:

TRAP C\$RPT

3202  
 3210  
 3211  
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 3215  
 3216  
 3217 011560  
       011560  
 3218  
 3219 011560 177777  
 3220 011562 177777  
 3221 011564 177777  
 3222  
 3223 011566  
 3224

.SBTTL PROTECTION TABLE

;\*\*  
 ; THIS TABLE IS USED BY THE RUNTIME SERVICES  
 ; TO PROTECT THE LOAD MEDIA.  
 ;

BGNPROT

L\$PROT::

1 ;OFFSET INTO P TABLE FOR CSR ADDRESS  
 -1 ;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS  
 -1 ;OFFSET INTO P-TABLE FOR DRIVE NUMBER

ENDPROT

```

3246
3247
3248 .SBTTL INITIALIZE SECTION
3249 ;**
3250 ;*****
3251 ;* THIS SECTION CONTAINS THE CODE WHICH IS PERFORMED AT THE BEGINNING OF
3252 ;* EACH PASS OR AFTER A CONTINUE COMMAND.
3253 ;* THIS CODE PERFORMS THE FOLLOWING ACTIONS:
3254 ;*
3255 ;* MOVES THE INFORMATION HELD IN THE HARDWARE P TABLE INTO THE GLOBAL
3256 ;* DATA AREA.
3257 ;*
3258 ;*****
3259 ;--
3260 011566 BGNINIT
      011566
3261
3262 011566 ;SEE IF PROGRAM JUST STARTED, BR IF YES          L$INIT::
      011566 012700 000040 READEF @EF.START
      011572 104447
3263 011574 BCOMPLETE NEWSTA
      011574 103416
3264
3265 011576 ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
      011576 012700 000037 READEF @EF.RESTART
      011602 104447
3266 011604 BCOMPLETE NEWRES
      011604 103556
3267
3268 011606 ;SEE IF THIS IS A NEW PASS, BR IF YES
      011606 012700 000035 READEF @EF.NEW
      011612 104447
3269 011614 BCOMPLETE NEWPAS
      011614 103555
3270
3271 011616 ;SEE IF PROGRAM WAS JUST CONTINUED
      011616 012700 000036 READEF @EF.CONTINUE
      011622 104447
3272 011624 BNCOMPLETE GETPRM
      011624 103161
3273 011626 000167 000522 JMP ENDIT
3274 011632 NEWSTA:
3275 011632 104433 BRESET ;RESET THE BUS TO PREVENT ILLEGAL INTERRUPTS.
      011632 104433 TRAP C$RESET
3276
3277 ;*
3278 ; SET UP FOR LINE TIME CLOCK INTERRUPTS.
3279 ;--
      011634
      011634 012700 000114 CLOCK L,R1 ;GET THE CLOCK PARAMETERS.
      011640 104462
      011642 010001
3280 011644 012167 170406 MOV (R1)+,CLKCSR ;STORE CLOCK CSR ADDRESS.
3281 011650 012167 170404 MOV (R1)+,CLKBRL ;STORE CLOCK BUS REQ IN? LEVEL.
3282 011654 012167 170402 MOV (R1)+,CLKVEC ;STORE CLOCK INTERRUPT VECTOR.
3283 011660 012167 170400 MOV (R1)+,CLKHRZ ;STORE CLOCK FREQUENCY.
3284 011664 026727 170374 000062 CMP CLKHRZ,@50. ;TEST FOR 50HZ LINE FREQUENCY.
3285 011672 001004 BNE 2$ ;BRANCH IF CLOCK IS NOT 50HZ.

```

```

3286 011674 012767 000024 170374      MOV    #20.,MSTICK      ;INDICATE 20MS PER CLOCK TICK.
3287 011702 000403                    BR     4$
3288 011704 012767 000021 170364 2$:  MOV    #17.,MSTICK      ;INDICATE 17 MS PER CLOCK TICK.
3289 011712 012767 000021 170364 4$:  SETVEC CLKVEC,#CLKINT,#PRI06 ;INITIALIZE CLOCK INTERRUPT VECTOR.
                                MOV    #PRI06,-(SP)
                                MOV    #CLKINT,-(SP)
                                MOV    CLKVEC,-(SP)
                                MOV    #3,-(SP)
                                TRAP   C$SVEC
                                ADD    #10,SP
3290 011740 016700 170320      MOV    CLKHRZ,RO      ;INITIALIZE THE BREAK COUNT
3291 011744 006300                    PSL    RO              ; TO CAUSE A BREAK
3292 011746 010067 170322      MOV    RO,BCOUNT     ; EVERY 2 SECONDS.
3293 011752 012700 000240      SETPRI #PRI05        ;ALLOW CLOCK INTERRUPTS DISABLE OTHERS.
                                MOV    #PRI05,RO
                                TRAP   C$SPRI
3294
3295 ;*
3296 ; ENABLE THE LINE TIME CLOCK (LTC) CHECKING TO MAKE SURE THAT THE CSR
3297 ; IS ACCESSABLE.
3298 ; FIRST SET UP TO CATCH ANY 004 TRAPS WHICH OCCUR:
3299 011760 016767 166020 170262      MOV    4,TP4VEC      ;SAVE THE EXISTING 004 TRAP VECTOR.
3300 011766 012767 011530 166010      MOV    #TP4RTN,4     ;SET 004 TRAP VECTOR TO OUR SERVICE RTN ADR.
3301
3302 ;*
3303 ; ENABLE LTC CHECKING FOR 004 TRAP IN CASE CSR IS NOT THERE.
3304 011774 005067 170252      CLR    TP4FLG        ;CLEAR THE 004 TRAP FLAG.
3305 012000 012767 000100 170246      MOV    #BIT6,WORD1   ;SET UP TO SET BIT6 OF THE LTC CSR.
3306 012006 012700 002254      MOV    #WORD1,RO     ;SET UP WORD1 AS THE CKTRAP MOVE SOURCE.
3307 012012 016701 170240      MOV    CLKCSR,R1    ;SET UP LTC CSR AS DESTINATION FOR CKTRAP MOVE.
3308 012016 004767 175754      JSR    PC,CKTRAP     ;MOVE AND CHECK FOR TRAP.
3309 012022 016767 170222 165754      MOV    TP4VEC,4     ;RESTORE THE NORMAL 004 TRAP VECTOR.
3310 012030 103403                    BCS   6$             ;IF NO TRAP, LTC IS THERE SO CONTINUE.
3311 012032 005067 170226      CLR    CLKHRZ       ;CLEAR LTC FREQUENCY WORD TO INDICATE NO LTC.
3312 012036 000402                    BR     8$             ;BYPASS THE FOLLOWING CALIBRATION PROCEDURES.
3313
3314 ;*
3315 ; CALIBRATE THE DELAY ROUTINE MILLI-SECOND DELAY COUNT VALUE.
3316 012040 004767 175506      6$:  JSR    PC,CALMSL
3317
3318 ;*
3319 ; CHECK FOR MEMORY MANAGEMENT PRESENT ON THIS MACHINE.
3320 ; IF MEM MGT IS PRESENT, DISABLE IT.
3321 012044 016767 165734 170176      8$:  MOV    4,TP4VEC      ;SAVE THE EXISTING 004 TRAP VECTOR.
3322 012052 012767 011530 165724      MOV    #TP4RTN,4     ;SET 004 TRAP VECTOR TO OUR SERVICE RTN ADR.
3323 012060 005067 170166      CLR    TP4FLG        ;CLEAR THE 004 TRAP FLAG.
3324 012064 005067 170164      CLR    WORD1         ;PREPARE TO CLEAR THE MEM MGT SRO REGISTER.
3325 012070 012700 002254      MOV    #WORD1,RO     ;SELECT CLEARED WORD AS CKTRAP RTN SOURCE.
3326 012074 016701 170202      MOV    MMSRO,R1     ;SELECT MEM MGT SRO REGISTER AS DESTINATION.
3327 012100 005067 170200      CLR    MMPRES        ;INDICATE NO MEM MGT PRESENT IN CASE IT ISN'T.
3328 012104 005067 170176      CLR    MMENAB        ;INDICATE MEM MGT IS NOT ENABLED.
3329 012110 004767 175662      JSR    PC,CKTRAP     ;CLEAR THE MEM MGT SRO REG AND CHECK FOR TRAP.
3330 012114 016767 170130 165662      MOV    TP4VEC,4     ;RESTORE THE NORMAL 004 TRAP VECTOR.
3331 012122 103003                    BCC   10$            ;SKIP INDICATING MEM MGT PRESENT IF IT ISN'T.
3332 012124 012767 000001 170152      MOV    #1,MMPRES     ;INDICATE THAT MEM MGT IS PRESENT.
3333 012132 005067 170100      10$: CLR    PASCNT      ;CLR COUNTER USED IN REPORTING ROM VERSION #.
3334 012136 000167 000006      JMP    NEWPAS        ;SKIP AROUND THE BUS RESET, IT'S BEEN DONE.

```

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3335
3336 012142          NEWRES: BRESET                ;RESET THE BUS TO PREVENT ILLEGAL INTERRUPTS.
      012142 104433          ;TRAP C$RESET
3337 012144 005067 170066          CLR PASCNT                ;CLR COUNTER USED IN REPORTING ROM VERSION #.
3338 012150          NEWPAS:
3339 012150 012767 177777 170020  MOV # 1,UNITN          ;RESET LOGICAL DEVICE TO -1
3340
3341          ;*
3342          ; INCREMENT THE PASS COUNTER, CORRECT FOR ANY OVERFLOW.
3343          ; THIS COUNTER IS USED IN THE ROM VERSION TEST.
3344 012156 005267 170054          INC PASCNT                ;INCREMENT THE PASS COUNTER.
3345 012162 001002          BNE GETPRM            ;BRANCH IF WE HAVE NOT YET! OVERFLOWED.
3346 012164 005367 170046          DEC PASCNT                ;SET PASS COUNT TO 177777 OCTAL.
3347
3348          ; GET THE HARDWARE PARAMETERS FOR THIS UNIT.
3349 012170          GETPRM:
3350 012170 005267 170002          INC UNITN                ;INCREMENT LOGICAL DEVICE NUMBER
3351 012174 026767 167776 167610  CMP UNITN,L$UNIT        ;SEE IF MAXIMUM UNIT NO. EXCEEDED
3352 012202 002362          BGE NEWPAS            ;BR IF YES
3353
3354 012204          GPHARD UNITN,R1              ;GET P TABLE POINTER INTO R1
      012204 016700 167766
      012210 104442
      012212 010001
3355 012214          BCOMPLETE 30$              ;BR IF DEVICE AVAILABLE
      012214 103401
3356 012216 000764          BR GETPRM            ;SKIP THIS DEVICE
3357
3358
3359          ;***** HARDWARE PARAMETER MOVING CODE *****
3360 012220 012167 167754          30$: MOV (R1)+,CSRA          ;STORE DHU-11 CSR ADDRESS IN DEV.REG.ADDRESS TABLE
3361 012224 012167 167742          MOV (R1)+,ACTLNS        ;STORE DHU-11 ACTIVE LINE BIT MAP
3362 012230 111167 167740          MOVB (R1),LOPBCK       ;STORE DHU 11 LOOPBACK MODE
3363
3364          ;*
3365          ; CALCULATE DEVICE REGISTER ADDRESSES,AND PUT THEM IN THE
3366          ; DEVICE REGISTER ADDRESS TABLE.
3367 012234 016701 167740          MOV CSRA,R1            ;COPY CSR ADDRESS
3368 012240 005201          INC R1                ;INCREMENT CSR ADDRESS
3369 012242 005201          INC R1                ; COPY BY 2.
3370 012244 012703 000007          MOV #7,R3            ;SET UP REGISTER COUNT
3371 012250 012702 002202          MOV #RBUFA,R2        ;GET LOCATION WHERE RBUF ADDRESS GOES IN TABLE
3372 012254 010122          12$: MOV R1,(R2)+          ;STORE REGISTER ADDRESS IN TABLE
3373 012256 005201          INC R1                ;INCREMENT REGISTER ADDRESS
3374 012260 005201          INC R1                ; BY 2,FOR THE NEXT DEVICE REGISTER.
3375 012262 005303          DEC R3                ;DECREMENT REGISTER COUNT
3376 012264 001373          BNE 12$              ;LOOP IF NOT DONE
3377
3378          ;*
3379          ; INITIALISE THE BMP CODE QUEUE.
3380
3381 012266 012700 002352          MOV #BMPCQB,R0        ;GET THE START ADDRESS OF THE QUEUE.
3382 012272 012701 002552          MOV #BMPCQE,R1        ;GET THE END ADDRESS OF THE QUEUE.
3383 012276 010067 170046          MOV R0,BMPCQP        ;SET THE POINTER TO THE START OF THE QUEUE.
3384 012302 005020          14$: CLR (R0)+          ;CLEAR OUT THE CONTENTS OF THE QUEUE.
3385 012304 020001          CMP R0,R1            ;CHECK IF END OF QUEUE HAS BEEN REACHED.
3386 012306 103775          BLO 14$              ;LOOP IF NOT ALL DONE.

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U7

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3391 012310 032767 000020 167644
3392 012316 001416
3393 012320 026727 167466 000001
3394 012326 003412
3395 012330
    012330 016746 167642
    012334 012746 004601
    012340 012746 000002
    012344 010600
    012346 104417
    012350 062706 000006
3396 012354
3397
3398 012354 005067 167642
3399
3400
3401
3402 012360
    012360 012700 000340
    012364 104441
3403 012366
    012366
    012366 104411
3404
3405 000000

; *
; REPORT THE UNIT NUMBER IF THE SOFTWARE P TABLE QUESTION WAS ANSWERED YES.
; AND THE MAXIMUM UNIT NUMBER IS GREATER THAN 1.
; -
    BIT    #BIT4,OPTION ;CHECK IF THE QUESTION WAS ANSWERED YES.
    BEQ    16$          ;SKIP REPORTING UNIT NUMBER IF IT IS DISABLED.
    CMP    L$UNIT,#1   ;CHECK MAXIMUM NUMBER OF UNITS SELECTED.
    BLE    16$          ;DO NOT REPORT UNIT NUMBER IF MAX NUMBER < 1.
    PRINTF #MFUNIT,UNITN ;REPORT UNIT NUMBER.
                                MOV    UNITN,-(SP)
                                MOV    #MFUNIT,(SP)
                                MOV    #2,(SP)
                                MOV    SP,R0
                                TRAP   C$PNTF
                                ADD    #6,SP
16$:
ENDIT: CLR    CTRLCF    ;CLR THE CTRL C TEST ABORT FLAG.
; *
; SET THE PROCESSOR PRIORITY TO DISABLE ALL INTERRUPTS.
; -
    SETPRI #PRI07      ;SET PROCESSOR PRIORITY TO 7.
                                MOV    #PRI07,R0
                                TRAP   C$SPRI
                                L10012:
                                TRAP   C$INIT
TNUM == 0 ;INITIALIZE THE ASSEMBLER TEST NUMBER VARIABLE.
    
```



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3435

012370  
012370  
  
012370  
012370  
012370 104461

.SBTTL AUTODROP SECTION

\*\*\*  
: THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF  
: THE "ADR" FLAG WAS SET. THE UNIT(S) UNDER TEST ARE CHECKED TO  
: SEE IF THEY WILL RESPOND. THOSE THAT DON'T ARE IMMEDIATELY  
: DROPPED FROM TESTING.  
:-

BGNAUTO

L\$AUTO::

ENDAUTO

L10013: TRAP C\$AUTO

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 3451  
 3452  
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 3482  
 3483  
 3484  
 3485

012372  
 012372  
 012372 005767 167624  
 012376 001401  
 012400  
 012400 104433  
 012402  
 012402  
 012402 104432  
 012404 000002  
 012406  
 012406  
 012406 104412

.SBTTL CLEANUP CODING SECTION

\*\*\*  
 ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED  
 ; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.  
 ;--

BGNCLN

L\$CLEAN::

TST CTRLCF  
 BEQ 2\$  
 BRESET

;DID WE GET HERE BY CTRL-C FROM TEST?  
 ;CTRL-C FROM TEST? NO, SKIP BUS RESET.  
 ;YES, CLR ANY DMAS OR OUTSTANDING INTERRUPTS.  
 TRAP C\$RESET

2\$:

EXIT CLN

TRAP C\$EXIT  
 .WORD L10014

.EVEN

ENDCLN

L10014:  
 TRAP C\$CLEAN

3494  
3495  
3496  
3497  
3498  
3499  
3500  
3501  
3502

.SBTTL DROP UNIT SECTION

\*\*\*  
; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE  
; TO NO LONGER BE TESTED.  
;

3503 012410  
012410

BGNDU

L\$DU::

3504  
3505

012410 010046  
012410 012746 012434  
012416 012746 000002  
012422 010600  
012424 104417  
012426 062706 000006

PRINTF #DROP,RO

;REPORT UNIT THAT HAS BEEN DROPPED.

MOV RO,-(SP)  
MOV #DROP,-(SP)  
MOV #2,(SP)  
MOV SP,RO  
TRAP C\$PNTF  
ADD #6,SP

3506  
3507

012432 000427

BR EDROP

;BRANCH AROUND THE MESSAGE.

3508

012434 045 101 040  
012437 125 116 111  
012442 124 045 104  
012445 066 045 101  
012450 040 104 122  
012453 117 120 120  
012456 105 104 040  
012461 106 122 117  
012464 115 040 106  
012467 125 122 124  
012472 110 105 122  
012475 040 124 105  
012500 123 124 111  
012503 116 107 056  
012506 045 116 000

DROP: .ASCIZ/##A UNIT#D6##A DROPPED FROM FURTHER TESTING.#N/

3509  
3510

012512

EDROP: .EVEN

3511  
3512

012512 000167  
012514 000000

EXIT DU

.WORD J\$JMP  
.WORD L10015-2-

3513  
3514

3515

012516  
012516  
012516 104453

FNDDU

L10015:

TRAP C\$DU

3524  
3525  
3526  
3527  
3528  
3529  
3530  
3531  
3532  
3533  
3534 012520  
012520  
3535  
3536 012520  
012520 000167  
012522 000000  
3537  
3538  
3539  
3540  
3541 012524  
012524  
012524 104452  
3542

.SBTTL ADD UNIT SECTION

\*\*\*  
; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES  
; TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK  
; TO THE TEST CYCLE.  
---

BGNAU

L\$AU::

EXIT AU

.WORD J\$JMP  
.WORD L10016-2-.

.EVEN

ENDAU

L10016:  
TRAP C\$AU

```

3544
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3554
3555
3556
3557
3558 012526
      012526
3559      000001
3560 012526 012767 000001 167472
3561 012534 012767 177777 167460
3562 012542 012767 000145 171242
3563 012550 012767 004632 171236
3564 012556 012767 006200 171232
3565
3566
3567
3568 012564 016767 165214 167456
3569 012572 012767 011530 165204
3570 012600 005005
3571
3572
3573
3574
3575
3576 012602 016700 167372
3577 012606 012701 013000
3578 012612 004767 175160
3579 012616 103402
3580 012620 052705 100001
3581 012624 042767 000017 000146
3582 012632 010100
3583 012634 016701 167340
3584 012640 004767 175132
3585 012644 103403
3586 012646 052705 100002
3587 012652 000434
3588
3589
3590
3591 012654 012702 000010
3592 012660 016767 167314 000110
3593 012666 016700 000104
3594 012672 012701 013000
3595 012676 004767 175074
3596 012702 103402
3597 012704 052705 100001
3598 012710 010100
3599 012712 016701 000060
  
```

```

.SBTTL  HARDWARE TEST          - ADRA
;
;*****
;
;          - REGISTER ADDRESS TEST -
;
; THIS TEST VERIFIES THAT THE DEVICE REGISTERS WILL RESPOND TO THE PROPER
; UNIBUS HANDSHAKING SIGNALS WHEN ACCESSED. IF THE DMU11 DOES NOT RESPOND
; TO THE ACCESS ATTEMPTS (IF THE DMU11 IS AT THE WRONG ADDRESS, FOR EXAMPLE)
; THE 004 BUS TIME-OUT TRAP IS DETECTED BY THIS ROUTINE AND AN ERROR
; IS REPORTED. THIS TEST IS PERFORMED ON LINE 0 ONLY.
;*****
;
;
;          BGNTST
;
;          T1::
;          TNUM ** TNUM + 1      ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
;          MOV      @TNUM,TSTNUM ;SET UP THE TEST NUMBER. (1)
;          MOV      @-1,CTRLCF   ;INDICATE THAT WE ARE IN A TEST.
;          MOV      @101,ERRNBR  ;SET THE TEST ERROR NUMBER IN THE TABLE.
;          MOV      @EM0103,ERRMSG ;SET UP THE TEST FAILURE MESSAGE IN THE TABLF.
;          MOV      @ER0101,ERRBLK ;SET-UP THE ERROR ROUTINE IN THE ERROR TABLE.
;
; SET UP TO CATCH ANY 004 TRAPS WHICH OCCUR:
;
;          MOV      4,TP4VEC     ;SAVE THE EXISTING 004 TRAP VECTOR.
;          MOV      @TP4RTN,4    ;SET 004 TRAP VECTOR TO OUR SERVICE RTN ADR.
;          CLR      R5           ;CLEAR THE ERROR FLAGS.
;
; HERE BEGINS THE LOOP TO TEST THE REGISTERS FOR A LINE.
; FIRST TEST THE CSR AND SET THE IND.ADR.REG (I.A.R) FIELD.
;
;          MOV      CSRA,R0      ;SET UP CSR AS THE CKTRAP MOVE SOURCE.
;          MOV      @52,R1       ;SET UP DESTINATION LOCATION FOR CKTRAP MOVE.
;          JSR      PC,CKTRAP    ;MOVE AND CHECK FOR TRAP.
;          BCS      4#          ;IF NO TRAP, BYPASS ERROR.
;          BIS      @100001,R5   ;SET FATAL READ ERROR FLAGS.
;          BIC      @17,52#     ;CLEAR THE I.A.R FIELD OF THE CSR DATA.
;          MOV      R1,R0       ;USE OLD DESTINATION FOR SOURCE OF CKTRAP MOVE.
;          MOV      CSRA,R1     ;SET UP CSR AS THE CKTRAP MOVE DESTINATION.
;          JSR      PC,CKTRAP    ;MOVE AND CHECK FOR TRAP.
;          BCS      6#          ;IF NO TRAP, BYPASS ERROR.
;          BIS      @100002,R5   ;SET FATAL WRITE ERROR FLAGS.
;          BR       40#         ;EXIT AND REPORT FATAL ERROR.
;
; NOW, WE TEST EACH REGISTER FOR THIS LINE.
;
;          6#:  MOV      @8,R2    ;INIT REGISTER COUNTER TO 8.
;          MOV      CSRA,50#     ;INITIALIZE THE REGISTER POINTER.
;          8#:  MOV      50#,R0   ;SET UP REGISTER AS THE SOURCE FOR CKTRAP MOVE.
;          MOV      @52,R1       ;SET UP LOCAL STORAGE AS THE DES FOR CKTRAP.
;          JSR      PC,CKTRAP    ;PERFORM THE MOVE, CHECK FOR TRAP.
;          BCS      10#         ;IF NO TRAP, BYPASS THE SETTING OF ERROR FLAGS.
;          BIS      @100001,R5   ;SET FATAL READ ERROR FLAGS.
;          10#: MOV      R1,R0    ;USE OLD DEST AS SRC FOR CKTRAP MOVE.
;          MOV      50#,R1      ;SET UP REGISTER AS THE DEST FOR CKTRAP MOVE.
  
```

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3600 012716 004767 175054      JSR      PC,CKTRAP      ;PERFORM THE MOVE, CHECK FOR TRAP.
3601 012722 103402              BCS      12$           ;IF NO TRAP, BYPASS THE SETTING OF ERROR FLAGS.
3602 012724 052705 100002      BIS      @100002,R5    ;SET FATAL WRITE ERROR FLAGS.
3603 012730 005267 000042      12$:    INC      50$           ;INCREMENT THE REGISTER
3604 012734 005267 000036      INC      50$           ; POINTER BY 2.
3605 012740 005302              DEC      R2            ;COUNT THE REGISTER.
3606 012742 001351              BNE      8$            ;LOOP TO TEST THE NEXT REGISTER ADDRESS.
3607
3608
3609                          ;*
3610                          ; DONE CHECKING DEVICE REGISTER ADDRESSES.
3611                          ; REPORT ANY ERRORS AND EXIT.
3612                          ;-
3613 012744 016767 167300 165032 40$:    MOV      TP4VEC,4      ;RESTORE THE NORMAL 004 TRAP VECTOR.
3614 012752 005705              TST      R5            ;CHECK THE ERROR FLAGS.
3615 012754 100012              BPL      60$           ;EXIT ROUTINE IF NO ERRORS.
3616
3617                          ;*
3618                          ; REPORT "DEVICE REGISTER ACCFSS TEST FAILED"
3619                          ;-
3619 012756 104460              ERROR
3620
3621
3622                          DODU    UNITN      ;DROP THIS UNIT FROM FUTHER TESTING.
3623 012760 016700 167212              MOV      UNITN,RO     ;
3624 012764 104451              TRAP    C$DODU
3625 012766 005067 167230              CLR      CTRLCF      ;INDICATE NO CTRL-C ABORT FROM TEST.
3626 012772 104444              DOCLN   ;ABORT THIS SUB PASS.
3627 012774 000402              BR      60$           ;
3628
3628 012776 000000              ;***** LOCAL STORAGE. *****
3629 013000 000000      50$:    .WORD 0          ;STORAGE FOR THE SOURCE OR DEST OF THE CKTRAP MOVE.
3630
3631      52$:    .WORD 0          ;STORAGE FOR THE SOURCE OR DEST OF THE CKTRAP MOVE.
3632
3632 013002 005067 167214      60$:    CLR      CTRLCF      ;INDICATE THAT WE ARE NOT WITHIN A TEST.
3633 013006
3633 013006
3633 013006 104401              L10017: TRAP    C$ETST

```

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3641
3642
3643
3644
3645
3646
3647 013010
      013010
3648
3649
3650
3651 013010 032767 000002 167156
3652 013016 001002
3653 013020 000167 000504
3654 013024
      013024 012700 000240
      013030 104441
      000002
3655
3656 013032 012767 000002 167166
3657 013040 012767 177777 167154
3658 013046 012767 000001 170734
3659 013054 012767 017171 170730
3660 013062 012767 004753 170724
3661
3662
3663
3664
3665
3666 013070 004767 174732
3667 013074 103402
3668 013076 000167 000426
3669
3670
3671
3672 013102 004767 174334
3673
3674
3675
3676
3677
3678
3679 013106 005003
3680 013110 010300
3681 013112 006300
3682 013114 036067 002310 167050
3683 013122 001471
3684
3685
3686
3687 013124 005000
3688 013126 012705 177777

```

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.SBTTL  HARDWARE TEST          - DTRMCS
;*****
; - DATA TERMINAL READY MODEM CONTROL SIGNAL TEST
;
; THIS TEST VERIFIES THAT THE DTR MODEM CONTROL SIGNAL IS WORKING
; CORRECTLY. IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED
; LOOPBACK IS SPECIFIED. THIS TEST USES THE LOOPED BACK SIGNALS RI
; AND DSR TO TEST THE DTR SIGNAL. THIS TEST IS PERFORMED ON ALL
; ACTIVE LINES.
;*****
;-----
;
; BGNTST
;
; T2::
; ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
;
; BIT  #BIT1,LOPBCK  ;CHECK TYPE OF LOOPBACK MODE SELECTED.
; BNE  2$
; JMP  60$           ;EXIT THIS TEST IF IN INTERNAL LOOPBACK.
2$: SETPRI #PRIOS    ;ALLOW LTC INTERRUPTS.
;
; MOV  #PRIOS,R0
; TRAP C$SPRI
; TNUM == TNUM + 1   ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
; MOV  #TNUM,TSTNUM ;SET UP THE TEST NUMBER. (78)
; MOV  #-1,CTRLCF   ;INDICATE THAT WE ARE IN A TEST.
; MOV  #1,ERRTYP    ;SET ERROR TYPE IN ERROR TABLE.
; MOV  #7801,ERRNBR ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
; MOV  #EM7801,ERRMSG ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
;
; RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
; CLEAR TX AND RX INTERRUPT ENABLE BITS.
; THIS SUBROUTINE REPORTS ERROR >>>> 7801 <<<<<.
;
; JSR  PC,CLNRST    ;RESET THE DUT.
; BCS  4$
; JMP  60$           ;ABORT THE TEST IF FATAL ERROR FOUND IN RESET.
;
; SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
;
; JSR  PC,ASLNTL    ;SET UP THE ASSOCIATED LINE TABLES.
;
; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
; THIS LOOP CLEARS ALL THE DTRS AND THEN SETS THEM INDIVIDUALLY AND WAITS FOR
; A RESPONSE ON THE ASSOCIATED RI AND DSR SIGNALS.
; THIS LOOP WILL CLEAR THE TX,IE AND R,IE BITS IF THEY ARE SET.
;
; CLR  R3           ;CLEAR THE LINE COUNTER.
6$: MOV  R3,R0
; ASL  R0
; BIT  BITTBL(R0),ACTLNS
; BEQ  12$         ;DON'T TEST IF NOT ACTIVE LINE.
;
; CLEAR ALL THE DUT LNCTRL REGISTERS DTR BITS.
;
; CLR  R0
; MOV  #MAPLNS,R5  ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
;                   ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.

```

```

3689 013132 004767 176272      JSR    PC,WTWLNCR          ;CLEAR ALL THE DUT DTR BITS.
3690 013136 012704 000074      MOV    #60.,R4
3691 013142 004767 174774      JSR    PC,DELAY           ;DELAY FOR 60 MS TO ALLOW SIGNALS TO SETTLE.
3692
3693      ;*
3694      ; CHECK THAT AT LEAST ONE OF ASSOCIATED DSR OR RI IS CLEAR AND RECORD STATES.
3695 013146 116304 003750      MOV    TXRLNB(R3),R4      ;GET THE ASSOCIATED LINE NUMBER.
3696 013152 010477 167022      MOV    R4,@CSRA          ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3697 013156 017705 167024      MOV    @FSLSA,R5         ;GET THE STATE OF THE ASSOCIATED DSR, RI BITS.
3698 013162 012700 120000      MOV    @BIT15!BIT13,R0
3699 013166 040500      BIC    R5,R0             ;CHECK FOR BOTH DSR AND RI SET.
3700 013170 001431      BEQ    10$              ;GO REPORT DTR IS BAD IF BOTH ARE SET.
3701
3702      ;*
3703      ; SET THE DTR FOR THE SELECTED LINE AND WAIT FOR EITHER DSR OR RI TO SET.
3704 013172 010377 167002      MOV    R3,@CSRA          ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
3705 013176 052777 001000 167004  BIS    @BIT9,@LNCTRA      ;SET THE SELECTED LINE DTR.
3706 013204 012701 150074      MOV    @150074,R1        ;SPECIFY TO WAIT UP TO 60 MS FOR RI TO SET.
3707 013210 032705 100000      BIT    @BIT15,R5         ;CHECK PREVIOUS STATE OF DSR BIT.
3708 013214 001002      BNE    8$               ;GO USE RI IF DSR BIT WAS NOT CLEAR.
3709 013216 012701 170074      MOV    @170074,R1        ;SPECIFY TO WAIT UP TO 60 MS FOR DSR SET.
3710 013222 016702 166760 8$:    MOV    FLSA,R2           ;SPECIFY TO LOOK IN STAT REG FOR BIT TO SET.
3711 013226 010477 166746      MOV    R4,@CSRA          ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3712 013232 004767 176116      JSR    PC,WAIBIS         ;WAIT UP TO 60 MS FOR SIGNAL TO GO SET.
3713 013236 103423      BCS    12$              ;SELECT NEXT LINE AND LOOP IF SIGNAL IS SET.
3714 013240 017700 166742      MOV    @FSLSA,R0         ;GET THE STATUS REGISTER CONTENTS.
3715 013244 042700 057777      BIC    @57777,R0         ;REMOVE ALL BUT THE DSR AND RI BITS.
3716 013250 040500      BIC    R5,R0             ;TEST FOR SIGNAL ONCE CLEAR, BUT NOW SET.
3717 013252 001015      BNE    12$              ;GO LOOP IF SIGNAL HAS GONE FROM CLR TO SET.
3718 013254
3719 013254 012767 017172 170530 10$:  ;REPORT DTR MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
3720 013262 012767 006662 170526      MOV    @7802.,ERRNBR     ;SELECT THE ERROR NUMBER.
3721 013270 012701 005015      MOV    @ER7801,ERRBLK    ;SELECT THE ERROR PRINT ROUTINE.
3722 013274      MOV    @EM7802,R1        ;SELECT THE ERROR MESSAGE.
3723      ERROR
3724
3725      ;*
3726 013276 032767 000100 166656      ;EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
3727 013304 001511      BIT    @BIT06,OPTION     ;EXIT WITH TEST FAILURE MESSAGE IF
3728      BEQ    60$            ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
3729 013306 005203      ;DURING THE SOFTWARE QUESTIONS.
3730 013310 020327 000020 12$:  INC    R3                ;SELECT THE NEXT LINE NUMBER.
3731 013314 002675      CMP    R3,@NUMLNS        ;TEST FOR ALL LINES DONE.
3732      BLT    6$            ;LOOP IF NOT ALL LINES DONE.
3733
3734      ;*
3735      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
3736      ; THIS LOOP SETS ALL THE DTRS AND THEN CLEARS THEM INDIVIDUALLY AND WAITS FOR
3737      ; A RESPONSE ON THE ASSOCIATED RI AND DSR SIGNALS.
3738      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
3739 013316 005003      ;*
3740 013320 010300 14$:  CLR    R3                ;CLEAR THE LINE COUNTER.
3741 013322 006300      MOV    R3,R0
3742 013324 036067 002310 166640  ASL    R0
3743 013332 001472      BIT    BITBL(R0),ACTLNS
3744      BEQ    20$            ;DON'T TEST IF NOT ACTIVE LINE.
3745
3746      ;*
3747      ; SET ALL THE DUT LNCTRL REGISTERS DTR BITS.

```



```

3745
3746 013334 012700 001000      ;
3747 013340 012705 177777      MOV    #BIT9,R0      ;SPECIFY THAT DTR BITS ARE TO BE SET.
3748 013344 004767 176060      MOV    #MAPLNS,R5    ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
3749 013350 012704 000074      JSR    PC,WTWLNLC    ;SET ALL THE DUT DTR BITS.
3750 013354 004767 174562      MOV    #60.,R4
3751                                JSR    PC,DELAY      ;DELAY FOR 60 MS TO ALLOW SIGNALS TO SETTLE.
3752                                ;+
3753                                ; CHECK THAT AT LEAST ONE OF ASSOCIATED DSR OR RI IS SET AND RECORD STATES.
3754 013360 116304 003750      ;-
3755 013364 010477 166610      MOV    TXRLNB(R3),R4 ;GET THE ASSOCIATED LINE NUMBER.
3756 013370 017705 166612      MOV    R4,@CSRA     ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3757 013374 010500            MOV    @FSLSA,R5    ;GET THE STATE OF THE ASSOCIATED DSR, RI BITS.
3758 013376 042700 057777      MOV    R5,R0
3759 013402 001431            BIC    #57777,R0    ;CHECK FOR BOTH DSR AND RI CLEAR.
3760                                BEQ    18$          ;GO REPORT DTR IS BAD IF BOTH ARE CLEAR.
3761                                ;+
3762                                ; CLEAR THE DTR FOR THE SELECTED LINE AND WAIT FOR EITHER DSR OR RI TO CLEAR.
3763 013404 010377 166570      ;-
3764 013410 042777 001000 166572 MOV    R3,@CSRA     ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
3765 013416 012701 150074      BIC    #BIT9,@LNCTRA ;CLEAR THE SELECTED LINE DTR.
3766 013422 032705 100000      MOV    #150074,R1   ;SPECIFY TO WAIT UP TO 60 MS FOR RI TO CLEAR.
3767 013426 001402            BIT    #BIT15,R5    ;CHECK PREVIOUS STATE OF DSR BIT.
3768 013430 012701 170074      BEQ    16$          ;GO USE RI IF DSR BIT WAS NOT SET.
3769 013434 016702 166546      MOV    #170074,R1   ;SPECIFY TO WAIT UP TO 60 MS FOR DSR CLEAR.
3770 013440 010477 166534 16$: MOV    FSLSA,R2     ;SPECIFY TO LOOK IN STAT REG FOR BIT TO CLR.
3771 013444 004767 175630      MOV    R4,@CSRA     ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3772 013450 103423            JSR    PC,WAIBIC    ;WAIT UP TO 60 MS FOR SIGNAL TO GO CLEAR.
3773 013452 017700 166530      BCS    20$          ;SELECT NEXT LINE AND LOOP IF SIGNAL IS CLEAR.
3774 013456 042705 057777      MOV    @FSLSA,R0    ;GET THE STATUS REGISTER CONTENTS.
3775 013462 040005            BIC    #57777,R5
3776 013464 001015            BIC    R0,R5
3777 013466            BNE    20$          ;TEST FOR SIGNAL ONCE SET, BUT NOW CLEAR.
3778 013466 012767 017173 170316 18$: ;REPORT DTR MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
3779 013474 012767 006662 170314 MOV    #7803.,ERRNBR ;SELECT THE ERROR NUMBER.
3780 013502 012701 005015      MOV    #ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
3781 013506            MOV    #EM7802,R1   ;SELECT THE ERROR MESSAGE.
3782                                TRAP    C$ERROR
3783                                ;+
3784                                ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
3785 013510 032767 000100 166444 ;
3786 013516 001404            BIT    #BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
3787                                BEQ    60$          ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
3788 013520 005203            ;DURING THE SOFTWARE QUESTIONS.
3789 013522 020327 000020 20$: INC    R3           ;SELECT THE NEXT LINE NUMBER.
3790 013526 002674            CMP    R3,@NUMLNS   ;TEST FOR ALL LINES DONE.
3791 013530 005067 166466      BLT    14$          ;LOOP IF NOT ALL LINES DONE.
3792 013534            CLR    CTRLCF       ;INDICATE THAT WE ARE NOT WITHIN A TEST.
3793 013542            SETPRI  #PRI07    ;DISABLE ALL INTERRUPTS.
3793 013542            MOV    #PRI07,R0
3793 013542            TRAP    C$SPRI
3793 013542 104401            L10020:
3793 013542            TRAP    C$ETST

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3849 013672 012704 000074      MOV      #60.,R4
3850 013676 004767 174240      JSR      PC,DELAY      ;DELAY FOR 60 MS TO ALLOW SIGNALS TO SETTLE.
3851
3852      ;*
3853      ; CHECK THAT AT LEAST ONE OF ASSOCIATED DCD OR CTS IS CLEAR AND RECORD STATES.
3854 013702 116304 003750      MOV      TXRLNB(R3),R4 ;GET THE ASSOCIATED LINE NUMBER.
3855 013706 010477 166266      MOV      R4,@CSRA     ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3856 013712 017705 166270      MOV      @FSLSA,R5    ;GET THE STATE OF THE ASSOCIATED DCD, CTS BITS.
3857 013716 012700 014000      MOV      @BIT12:BIT11,R0
3858 013722 040500      BIC      R5,R0        ;CHECK FOR BOTH DCD AND CTS SET.
3859 013724 001431      BEQ      6$           ;GO REPORT RTS IS BAD IF BOTH ARE SET.
3860
3861      ;*
3862      ; SET THE RTS FOR THE SELECTED LINE AND WAIT FOR EITHER DCD OR CTS TO SET.
3863 013726 010377 166246      MOV      R3,@CSRA     ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
3864 013732 052777 010000 166250  BIC      @BIT12,@LNCTRA ;SET THE SELECTED LINE RTS.
3865 013740 012701 130074      MOV      #130074,R1   ;SPECIFY TO WAIT UP TO 60 MS FOR CTS TO SET.
3866 013744 032705 010000      BIT      @BIT12,R5    ;CHECK PREVIOUS STATE OF DCD BIT.
3867 013750 001002      BNE      4$           ;GO USE CTS IF DCD BIT WAS NOT CLEAR.
3868 013752 012701 140074      MOV      #140074,R1   ;SPECIFY TO WAIT UP TO 60 MS FOR DCD SET.
3869 013756 016702 166224 4$:      MOV      FSLSA,R2     ;SPECIFY TO LOOK IN STAT REG FOR BIT TO SET.
3870 013762 010477 166212      MOV      R4,@CSRA     ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3871 013766 004767 175362      JSR      PC,WAIBIS    ;WAIT UP TO 60 MS FOR SIGNAL TO GO SET.
3872 013772 103423      BCS      8$           ;SELECT NEXT LINE AND LOOP IF SIGNAL IS SET.
3873 013774 017700 166206      MOV      @FSLSA,R0    ;GET THE STATUS REGISTER CONTENTS.
3874 014000 042700 163777      BIC      @163777,R0   ;REMOVE ALL BUT THE DCD AND CTS BITS.
3875 014004 040500      BIC      R5,R0        ;TEST FOR SIGNAL ONCE CLEAR, BUT NOW SET.
3876 014006 001015      BNE      8$           ;GO LOOP IF SIGNAL HAS GONE FROM CLR TO SET.
3877 014010 6$:      ;REPORT RTS MODEM CONTROL SIGNAL DEFECTIVE ON LINE MN.
3878 014010 012767 017336 167774  MOV      #7902.,ERRNBR ;SELECT THE ERROR NUMBER.
3879 014016 012767 006662 167772  MOV      @ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
3880 014024 012701 005077      MOV      @EM7902,R1   ;SELECT THE ERROR MESSAGE.
3881 014030 104460      ERROR      ;
3882      ;*
3883      ; TRAP C$ERROR
3884      ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
3885 014032 032767 000100 166122  BIT      @BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
3886 014040 001511      BEQ      60$         ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
3887
3888 014042 005203 8$:      INC      R3           ;DURING THE SOFTWARE QUESTIONS.
3889 014044 020327 000020      CMP      R3,@NUMLNS  ;SELECT THE NEXT LINE NUMBER.
3890 014050 002675      BLT      2$           ;TEST FOR ALL LINES DONE.
3891
3892      ;*
3893      ; LOOP IF NOT ALL LINES DONE.
3894      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
3895      ; THIS LOOP SETS ALL THE RTSS AND THEN CLEARS THEM INDIVIDUALLY AND WAITS FOR
3896      ; A RESPONSE ON THE ASSOCIATED CTS AND DCD SIGNALS.
3897      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
3897 014052 005003      CLR      R3           ;CLEAR THE LINE COUNTER.
3898 014054 010300 10$:      MOV      R3,R0
3899 014056 006300      ASL      R0
3900 014060 036067 002310 166104  BIT      BITTBL(R0),ACTLNS
3901 014066 001472      BEQ      16$         ;DON'T TEST IF NOT ACTIVE LINE.
3902
3903      ;*
3904      ; SET ALL THE DUT LNCTRL REGISTERS RTS BITS.

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3905 014070 012700 010000      MOV    #BIT12,R0      ;SPECIFY THAT RTS BITS ARE TO BE SET.
3906 014074 012705 177777      MOV    #MAPLNS,R5    ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
3907 014100 004767 175324      JSR    PC,WTWLNLC    ;SET ALL THE OUT RTS BITS.
3908 014104 012704 000074      MOV    #60.,R4
3909 014110 004767 174026      JSR    PC,DELAY      ;DELAY FOR 60 MS TO ALLOW SIGNALS TO SETTLE.
3910
3911      ;
3912      ; CHECK THAT AT LEAST ONE OF ASSOCIATED DCD OR CTS IS SET AND RECORD STATES.
3913 014114 116304 003750      MOV    TXRLNB(R3),R4 ;GET THE ASSOCIATED LINE NUMBER.
3914 014120 010477 166054      MOV    R4,@CSRA      ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3915 014124 017705 166056      MOV    @FSLSA,R5     ;GET THE STATE OF THE ASSOCIATED DCD. CTS BITS.
3916 014130 010570
3917 014132 042700 163777      MOV    R5,R0
3918 014136 001431      BIC    #163777,R0    ;CHECK FOR BOTH DCD AND CTS CLEAR.
3919      BEQ    14$        ;GO REPORT RTS IS BAD IF BOTH ARE CLEAR.
3920      ;
3921      ; CLEAR THE RTS FOR THE SELECTED LINE AND WAIT FOR EITHER DCD OR CTS TO CLEAR.
3922 014140 010377 166034      MOV    R3,@CSRA      ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
3923 014144 042777 010000 166036  BIC    #BIT12,@LNCTRA ;CLEAR THE SELECTED LINE RTS.
3924 014152 012701 130074      MOV    #130074,R1    ;SPECIFY TO WAIT UP TO 60 MS FOR CTS TO CLEAR.
3925 014156 032705 010000      BIT    #BIT12,R5     ;CHECK PREVIOUS STATE OF DCD BIT.
3926 014162 001402      BEQ    12$          ;GO USE CTS IF DCD BIT WAS NOT SET.
3927 014164 012701 140074      MOV    #140074,R1    ;SPECIFY TO WAIT UP TO 60 MS FOR DCD CLEAR.
3928 014170 016702 166012 12$:  MOV    FSLSA,R2      ;SPECIFY TO LOOK IN STAT REG FOR BIT TO CLR.
3929 014174 010477 166000      MOV    R4,@CSRA      ;SELECT ASSOCIATED LINE IND.ADR.REG FIELD.
3930 014200 004767 175074      JSR    PC,WAIBIC    ;WAIT UP TO 60 MS FOR SIGNAL TO GO CLEAR.
3931 014204 103423      BCS    16$          ;SELECT NEXT LINE AND LOOP IF SIGNAL IS CLEAR.
3932 014206 017700 165774      MOV    @FSLSA,R0     ;GET THE STATUS REGISTER CONTENTS.
3933 014212 042705 163777      BIC    #163777,R5
3934 014216 040005      BIC    R0,R5
3935 014220 001015      BNE    16$          ;TEST FOR SIGNAL ONCE SET, BUT NOW CLEAR.
3936 014222      ;
3937 014222 012767 017337 167562 14$:  ;REPORT RTS MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
3938 014230 012767 006662 167560      MOV    #7903.,ERRNBR ;SELECT THE ERROR NUMBER.
3939 014236 012701 005077      MOV    #ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
3940 014242      MOV    #EM7902,R1    ;SELECT THE ERROR MESSAGE.
3941      ERROR      ;
3942      ;
3943      ;
3944 014244 032767 000100 165710      ;
3945 014252 001404      ;
3946      ;
3947 014254 005203 16$:  INC    R3            ;EXIT WITH TEST FAILURE MESSAGE IF
3948 014256 020327 000020      CMP    R3,@NUMLNS    ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
3949 014262 002674      ;DURING THE SOFTWARE QUESTIONS.
3950 014264 005067 165732 60$:  BLT    10$          ;SELECT THE NEXT LINE NUMBER.
3951 014270      ;TEST FOR ALL LINES DONE.
3952 014270 012700 000340      CLR    CTRLCF       ;LOOP IF NOT ALL LINES DONE.
3953 014274 104441      SETPRI #PRI07      ;INDICATE THAT WE ARE NOT WITHIN A TEST.
3954 014276      ;DISABLE ALL INTERRUPTS.
3955 014276 104401      ENDTST
                                MOV    #PRI07,RJ
                                TRAP   C$SPRI
                                L10021:
                                TRAP   C$E$T

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3963
3964
3965
3966 014300
      014300
3967
3968
3969
3970 014300 032767 000002 165666
3971 014306 001002
3972 014310 000167 000420
3973 014314
      014314 012700 000240
      014320 104441
3974      000004
3975 014322 012767 000004 165676
3976 014330 012767 177777 165664
3977 014336 012767 000001 167444
3978 014344 012767 017501 167440
3979 014352 012767 005117 167434
3980
3981
3982
3983
3984
3985 014360 004767 173442
3986 014364 103402
3987 014366 000167 000342
3988
3989
3990
3991 014372 004767 173044
3992
3993
3994
3995
3996
3997
3998 014376 005003
3999 014400 010300
4000 014402 006300
4001 014404 036067 002310 165560
4002 014412 001454
4003
4004
4005
4006 014414 005000
4007 014416 012705 177777
    
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.SBTTL  HARDWARE TEST          DSRMS
;*****
;*          - DATA SET READY MODEM SIGNAL TEST
;*
;*          THIS TEST VERIFIES THAT THE DSR MODEM STATUS SIGNAL IS WORKING
;*          CORRECTLY.  IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED
;*          LOOPBACK IS SPECIFIED.  THIS TEST USES THE LOOPED BACK DTR SIGNALS
;*          TO TEST THE DSR SIGNAL.  THIS TEST IS PERFORMED ON ALL THE ACTIVE
;*          LINES.
;*****
          BGNTST
;*****
;*
;*          T4:
;*          ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
;*
;*          BIT      @BIT1,LOPBCK      ;CHECK TYPE OF LOOPBACK MODE SELECTED.
;*          BNE      2$
;*          JMP      60$
;*          SETPRI   @PRIOS            ;EXIT THIS TEST IF IN INTERNAL LOOPBACK.
;*                                     ;ALLOW LTC INTERRUPTS.
;*
;*          TNUM == TNUM + 1          ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
;*          MOV      @TNUM,ISTNUM     ;SET UP THE TEST NUMBER. (80)
;*          MOV      @-1,CTRLCF       ;INDICATE THAT WE ARE IN A TEST.
;*          MOV      @1,ERRTYP        ;SET ERROR TYPE IN ERROR TABLE.
;*          MOV      @8001,ERRNBR     ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
;*          MOV      @EM8001,ERRMSG   ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
;*
;*          RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
;*          CLEAR TX AND RX INTERRUPT ENABLE BITS.
;*          THIS SUBROUTINE REPORTS ERROR >>>> 8001 <<<<<.
;*
;*          JSR      PC,CLNRST        ;RESET THE DUT.
;*          BCS      4$
;*          JMP      60$
;*                                     ;ABORT THE TEST IF FATAL ERROR FOUND IN RESET.
;*
;*          SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
;*
;*          JSR      PC,ASLNTL        ;SET UP THE ASSOCIATED LINE TABLES.
;*
;*          SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
;*          THIS LOOP CLEARS ALL THE DTRS AND THEN SETS THEM INDIVIDUALLY AND WAITS FOR
;*          A RESPONSE ON THE ASSOCIATED DSR SIGNAL.
;*          THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
;*
;*          CLR      R3                ;CLEAR THE LINE COUNTER.
;*          MOV      R3,R0
;*          ASL      R0
;*          BIT      BITTBL(R0),ACTLNS
;*          BEQ      10$
;*                                     ;DON'T TEST IF NOT ACTIVE LINE.
;*
;*          CLEAR ALL THE DUT LNCTRL REGISTERS DTR BITS.
;*
;*          CLR      R0
;*          MOV      @MAPLNS,R5       ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
;*                                     ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
    
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4008 014422 004767 175002      JSR    PC,WTWLNCR      ;CLEAR ALL THE DUT DTR BITS.
4009 014426 012704 000050      MOV    #40.,R4
4010 014432 004767 173504      JSR    PC,DELAY        ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4011
4012      ;*
4013      ; CHECK THAT THE SPECIFIED DSR IS CLEAR.
4014 014436 010377 165536      MOV    R3,@CSRA       ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4015 014442 032777 100000 165536  BIT    #BIT15,@FSLSA
4016 014450 001020      BNE    8$              ;GO REPORT DSR IS BAD IF BIT IS NOT CLEAR.
4017
4018      ;*
4019      ; SFT THE DTR FOR THE ASSOCIATED LINE.
4020      ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, DTR WILL NOT HAVE BEEN TESTED
4021      ; IN THE DTR TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4022 014452 116304 003750      MOV    TXRLNB(R3),R4   ;GET THE ASSOCIATED LINE NUMBER.
4023 014456 010477 165516      MOV    R4,@CSRA       ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4024 014462 052777 001000 165520  BIS    #BIT9,@LNCTRA   ;SET THE ASSOCIATED LINE DTR.
4025
4026      ;*
4027      ; CHECK THAT THE SELECTED LINE DSR IS ACTIVE.
4028 014470 010377 165504      MOV    R3,@CSRA       ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4029 014474 012701 170050      MOV    #170050,R1     ;PASS TIMEOUT OF 40 MILLI-SEC, AND BIT TO TEST.
4030 014500 016702 165502      MOV    FSLSA,R2       ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4031 014504 004767 174644      JSR    PC,WAIBIS      ;WAIT FOR DSR TO BECOME SET OR TIMEOUT.
4032 014510 103415      BCS    10$            ;SKIP ERROR REPORT IF SELECTED DSR IS SET.
4033
4034
4035 014512      8$:      ;REPORT DSR MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4036 014512 012767 017502 167272  MOV    #8002.,ERRNBR  ;SELECT THE ERROR NUMBER.
4037 014520 012767 006662 167270  MOV    #ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4038 014526 012701 005163      MOV    #EM8002,R1     ;SELECT THE ERROR MESSAGE.
4039 014532      ERROR
4040      ;*
4041      ; TRAP C$ERROR
4042
4043      ;*
4044      ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4045 014534 032767 000100 165420  BIT    #BIT06,OPTION
4046 014542 001474      BEQ    60$            ;EXIT WITH TEST FAILURE MESSAGE IF
4047      ; NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4048      ; DURING THE SOFTWARE QUESTIONS.
4049 014544 005203      10$:      INC    R3              ;SELECT THE NEXT LINE NUMBER.
4050 014546 020327 000020      CMP    R3,#NUMLNS     ;TEST FOR ALL LINES DONE.
4051 014552 002712      BLT    6$              ;LOOP IF NOT ALL LINES DONE.
4052
4053      ;*
4054      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4055      ; THIS LOOP SETS ALL THE DTRS AND THEN CLEARS THEM INDIVIDUALLY AND WAITS FOR
4056      ; A RESPONSE ON THE SELECTED DSR SIGNAL.
4057      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4058 014554 005003      ;
4059 014556 010300      12$:      CLR    R3              ;CLEAR THE LINE COUNTER.
4060 014560 006300      MOV    R3,R0
4061 014562 036067 002310 165402  ASL    R0
4062 014570 001455      BIT    BITBL(R0),ACTLNS
4063      BEQ    16$            ;DON'T TEST IF NOT ACTIVE LINE.
; SET ALL THE DUT LNCTRL REGISTERS DTR BITS.

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4064
4065 014572 012700 001000      ;
4066 014576 012705 177777      MOV    #BIT9,R0      ;SPECIFY THAT DTR BITS ARE TO BE SET.
4067 014602 004767 174622      MOV    #MAPLNS,R5   ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
4068 014606 012704 000050      JSR    PC,WTWLNLC   ;SET ALL THE OUT DTR BITS.
4069 014612 004767 173324      MOV    #40.,R4
4070                               JSR    PC,DELAY     ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4071                               ;+
4072                               ; CHECK THAT THE SPECIFIED DSR IS SET.
4073 014616 010377 165356      ;-
4074 014622 032777 100000 165356 MOV    R3,#CSRA     ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4075 014630 001420                               BIT    #BIT15,#FSLSA
4076                               BEQ    14$           ;GO REPORT DSR IS BAD IF BIT IS NOT SET.
4077                               ;+
4078                               ; CLEAR THE DTR FOR THE ASSOCIATED LINE.
4079                               ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, DTR WILL NOT HAVE BEEN TESTED
4080                               ; IN THE DTR TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4081 014632 116304 003750      ;-
4082 014636 010477 165336      MOVB   TXRLNB(R3),R4 ;GET THE ASSOCIATED LINE NUMBER.
4083 014642 042777 001000 165340 MOV    R4,#CSRA     ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4084                               BIC    #BIT9,#LNCTRA  ;CLEAR THE ASSOCIATED LINE DTR.
4085                               ;+
4086                               ; CHECK THAT THE SELECTED LINE DSR IS CLEAR.
4087 014650 010377 165324      ;-
4088 014654 012701 170050      MOV    R3,#CSRA     ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4089 014660 016702 165322      MOV    #170050,R1   ;PASS TIMEOUT OF 40 MILLI-SEC, AND BIT TO TEST.
4090 014664 004767 174410      MOV    FSLSA,R2     ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4091 014670 103415                               JSR    PC,WAIBIC    ;WAIT FOR DSR TO BECOME CLEAR OR TIMEOUT.
4092                               BCS    16$           ;SKIP ERROR REPORT IF SELECTED DSR IS CLEAR.
4093 014672                               14$: ;REPORT DSR MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4094 014672 012767 017503 167112 MOV    #8003.,ERRNBR ;SELECT THE ERROR NUMBER.
4095 014700 012767 006662 167110 MOV    #ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4096 014706 012701 005163      MOV    #EM8002,R1   ;SELECT THE ERROR MESSAGE.
4097 014712                               ERROR
4098                               TRAP    C$ERROR
4099
4100                               ;+
4101                               ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4102 014714 032767 000100 165240 ;-
4103 014722 001404                               BIT    #BIT06,OPTION
4104                               BEQ    60$           ;EXIT WITH TEST FAILURE MESSAGE IF
4105                               ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4106                               ;DURING THE SOFTWARE QUESTIONS.
4107 014724 005203 000020      16$: INC    R3           ;SELECT THE NEXT LINE NUMBER.
4108 014726 020327 000020      CMP    R3,#NUMLNS   ;TEST FOR ALL LINES DONE.
4109 014732 002711                               BLT    12$           ;LOOP IF NOT ALL LINES DONE.
4110 014734 005067 165262      60$: CLR    CTRLCF       ;INDICATE THAT WE ARE NOT WITHIN A TEST.
4111 014740                               SETPRI #PRI07       ;DISABLE ALL INTERRUPTS.
4112                               MOV    #PRI07,R0
4113 014746                               TRAP  C$SPRI
4114 014746                               ;
4115 014746 104401                               L10022:
4116                               TRAP  C$ETST

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4115 .SBTTL HARDWARE TEST - RINGI
4116 :*****
4117 :* - RING INDICATOR MODEM SIGNAL TEST
4118 :*
4119 :* THIS TEST VERIFIES THAT THE RI MODEM STATUS SIGNAL IS WORKING
4120 :* CORRECTLY. IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED
4121 :* LOOPBACK IS SPECIFID. THIS TEST USES THE LOOPED BACK DTR SIGNALS
4122 :* TO TEST THE RI SIGNAL. THIS TEST IS PERFORMED ON ALL THE ACTIVE
4123 :* LINES.
4124 :*
4125 :-----*****
4126 :
4127 014750 BGNTST
014750
4128
4129 :* TS:
4130 : ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
4131 014750 032767 000002 165216
4132 014756 001002
4133 014760 000167 000420
4134 014764 2$: SETPRI #PRIOS ;ALLOW LTC INTERRUPTS.
014764 012700 000240
014770 104441
4135 000005 ; INCREMENT THE ASSEMBLY TIME TEST COUNTER.
4136 014772 012767 000005 165226 MOV #TNUM,TSTNUM ;SET UP THE TEST NUMBER. (81)
4137 015000 012767 177777 165214 MOV #-1,CTRLCF ;INDICATE THAT WE ARE IN A TEST.
4138 015006 012767 000001 166774 MOV #1,ERRTYP ;SET ERROR TYPE IN ERROR TABLE.
4139 015014 012767 017645 166770 MOV #8101,ERRNBR ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
4140 015022 012767 005227 166764 MOV #EM8101,ERRMSG ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
4141
4142 :*
4143 : RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
4144 : CLEAR TX AND RX INTERRUPT ENABLE BITS.
4145 : THIS SUBROUTINE REPORTS ERROR >>>> 8101 <<<<<.
4146 015030 004767 172772
4147 015034 103402
4148 015036 000167 000342
4149
4150 :*
4151 : SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
4152 015042 004767 172374 4$: JSR PC,ASLNTL ;SET UP THE ASSOCIATED LINE TABLES.
4153
4154 :*
4155 : SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4156 : THIS LOOP CLEARS ALL THE DTRS AND THEN SETS THEM INDIVIDUALLY AND WAITS FOR
4157 : A RESPONSE ON THE ASSOCIATED RI SIGNAL.
4158 : THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4159 015046 005003
4160 015050 010300
4161 015052 006300
4162 015054 036067 002310 165110
4163 015062 001454
4164
4165 :*
4166 : CLEAR ALL THE DUT LNCTRL REGISTERS DTR BITS.
4167 015064 005000
4168 015066 012705 177777
CLR R0 ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
MOV #MAPLNS,R5 ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.

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4169 015072 004767 174332      JSR    PC,WTWLNCR          ;CLEAR ALL THE DUT DTR BITS.
4170 015076 012704 000050      MOV    #40.,R4
4171 015102 004767 173034      JSR    PC,DELAY           ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4172
4173      ;+
4174      ; CHECK THAT THE SPECIFIED RI IS CLEAR.
4175 015106 010377 165066      MOV    R3,@CSRA          ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4176 015112 032777 020000 165066  BI1    #BIT13,@FSLSA
4177 015120 001020      BNE    8$                ;GO REPORT RI IS BAD IF BIT IS NOT CLEAR.
4178
4179      ;+
4180      ; SET THE DTR FOR THE ASSOCIATED LINE.
4181      ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, DTR WILL NOT HAVE BEEN TESTED
4182      ; IN THE DTR TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4183 015122 116304 003750      MOV    TXRLNB(R3),R4     ;GET THE ASSOCIATED LINE NUMBER.
4184 015126 010477 165046      MOV    R4,@CSRA          ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4185 015132 052777 001000 165050  BIS    #BIT9,@LNCTRA     ;SET THE ASSOCIATED LINE DTR.
4186
4187      ;+
4188      ; CHECK THAT THE SELECTED LINE RI IS ACTIVE.
4189 015140 010377 165034      MOV    R3,@CSRA          ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4190 015144 012701 150050      MOV    #150050,R1        ;PASS TIMEOUT OF 40 MILLI-SEC, AND BIT TO TEST.
4191 015150 016702 165032      MOV    FLSA,R2           ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4192 015154 004767 174174      JSR    PC,WAIBIS         ;WAIT FOR RI TO BECOME SET OR TIMEOUT.
4193 015160 103415      BCS    10$              ;SKIP ERROR REPORT IF SELECTED RI IS SET.
4194
4195
4196 015162      8$:      ;REPORT RI MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4197 015162 012767 017646 166622  MOV    #8102.,ERRNBR     ;SELECT THE ERROR NUMBER.
4198 015170 012767 006662 166620  MOV    #ER7801,ERRBLK    ;SELECT THE ERROR PRINT ROUTINE.
4199 015176 012701 005272      MOV    #EM8102,R1        ;SELECT THE ERROR MESSAGE.
4200 015202      ERROR
4201      TRAP    C$ERROR
4202
4203      ;+
4204      ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4205 015204 032767 000100 164750  BIT    #BIT06,OPTION     ;EXIT WITH TEST FAILURE MESSAGE IF
4206 015212 001474      BEQ    60$              ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4207      ; DURING THE SOFTWARE QUESTIONS.
4208
4209 015214 005203      10$:      INC    R3                ;SELECT THE NEXT LINE NUMBER.
4210 015216 020327 000020      CMP    R3,#NUMLNS        ;TEST FOR ALL LINES DONE.
4211 015222 002712      BLT    6$                ;LOOP IF NOT ALL LINES DONE.
4212
4213      ;+
4214      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4215      ; THIS LOOP SETS ALL THE DTRS AND THEN CLEARS THEM INDIVIDUALLY AND WAITS FOR
4216      ; A RESPONSE ON THE SELECTED RI SIGNAL.
4217      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4218 015224 005003      ;-
4219 015226 010300      CLR    R3                ;CLEAR THE LINE COUNTER.
4220 015230 006300      12$:      MOV    R3,R0
4221 015232 036067 002310 164732  ASL    R0
4222 015240 001455      BIT    BITTBL(R0),ACTLNS
4223      BEQ    16$              ;DON'T TEST IF NOT ACTIVE LINE.
4224      ;+
4224      ; SET ALL THE DUT LNCTRL REGISTERS DTR BITS.

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4225
4226 015242 012700 001000      ;
4227 015246 012705 177777      MOV    #BIT9,R0      ;SPECIFY THAT DTR BITS ARE TO BE SET.
4228 015252 004767 174152      MOV    #MAPLNS,R5    ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
4229 015256 012704 000050      JSR    PC,WTM.NC     ;SET ALL THE DUT DTR BITS.
4230 015262 004767 172654      MOV    #40.,R4
4231                                JSR    PC,DELAY      ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4232
4233                                ;*
4234                                ; CHECK THAT THE SPECIFIED RI IS SET.
4235 015266 010377 164706      MOV    R3,BCSRA      ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4236 015272 032777 020000 164706 BIT    #BIT13,#FSLSA
4237                                BEQ    14$           ;GO REPORT RI IS BAD IF BIT IS NOT SET.
4238                                ;*
4239                                ; CLEAR THE DTR FOR THE ASSOCIATED LINE.
4240                                ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, DTR WILL NOT HAVE BEEN TESTED
4241                                ; IN THE DTR TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4242 015302 116304 003750      MOVB   TXRLNB(R3),R4 ;GET THE ASSOCIATED LINE NUMBER.
4243 015306 010477 164666      MOV    R4,BCSRA      ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4244 015312 042777 001000 164670 BIC    #BIT9,#LNCTRA ;CLEAR THE ASSOCIATED LINE DTR.
4245                                ;*
4246                                ; CHECK THAT THE SELECTED LINE RI IS CLEAR.
4247                                ;*
4248 015320 010377 164654      MOV    R3,BCSRA      ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4249 015324 012701 150050      MOV    #150050,R1    ;PASS TIMEOUT OF 40 MILLI-SEC, AND BIT TO TEST.
4250 015330 016702 164652      MOV    FLSA,R2       ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4251 015334 004767 173740      JSR    PC,WAIBIC     ;WAIT FOR RI TO BECOME CLEAR OR TIMEOUT.
4252 015340 103415              BCS    16$           ;SKIP ERROR REPORT IF SELECTED RI IS CLEAR.
4253
4254 015342              14$: ;REPORT RI MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4255 015342 012767 017647 166442 MOV    #8103.,ERRNBR ;SELECT THE ERROR NUMBER.
4256 015350 012767 006662 166440 MOV    #ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4257 015356 012701 005272      MOV    #EM8102,R1    ;SELECT THE ERROR MESSAGE.
4258 015362              ERROR
4259                                TRAP    C$ERROR
4260
4261                                ;*
4262                                ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4263 015364 032767 000100 164570 BIT    #BIT06,OPTION
4264 015372 001404              BEQ    60$           ;EXIT WITH TEST FAILURE MESSAGE IF
4265                                ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4266                                ;DURING THE SOFTWARE QUESTIONS.
4267 015374 005203              16$: INC    R3           ;SELECT THE NEXT LINE NUMBER.
4268 015376 020327 000020      CMP    R3,#NUMLNS    ;TEST FOR ALL LINES DONE.
4269 015402 002711              BLT    12$           ;LOOP IF NOT ALL LINES DONE.
4270
4271 015404 005067 164612      60$: CLR    CTRLCF        ;INDICATE THAT WE ARE NOT WITHIN A TEST.
4272 015410              SETPRI #PRI07        ;DISABLE ALL INTERRUPTS.
4273                                MOV    #PRI07,R0
4274 015416              TRAP    C$SPRI
4275 015416              ENDTST
4276 015416 104401              L10023: TRAP    C$ETST

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4288 015420
      015420
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4291
4292 015420 032767 000002 164546
4293 015426 001002
4294 015430 000167 000420
4295 015434
      015434 012700 000240
      015440 104441
      000006
4296
4297 015442 012767 000006 164556
4298 015450 012767 177777 164544
4299 015456 012767 000001 166324
4300 015464 012767 020011 166320
4301 015472 012767 005335 166314
4302
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4307 015500 004767 172322
4308 015504 103402
4309 015506 000167 000342
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4313 015512 004767 171724
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4320 015516 005003
4321 015520 010300
4322 015522 006300
4323 015524 036067 002310 164440
4324 015532 001454
4325
4326
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4328 015534 005000
4329 015536 012705 177777
    
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```

.SBTTL  HARDWARE TEST          - CTSMS
;-----
;          - CLEAR TO SEND MODEM SIGNAL TEST
;
; THIS TEST VERIFIES THAT THE CTS MODEM STATUS SIGNAL IS WORKING
; CORRECTLY.  IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED
; LOOPBACK IS SPECIFIED.  THIS TEST USES THE LOOPED BACK RTS SIGNALS
; TO TEST THE CTS SIGNAL.  THIS TEST IS PERFORMED ON ALL THE ACTIVE
; LINES.
;-----
      BGNTST
;
;-----
;          T6::
; ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
;-----
      BIT    #BIT1,LOPBCK      ;CHECK TYPE OF LOOPBACK MODE SELECTED.
      BNE    2$
      JMP    60$
2$:      SETPRI #PRIOS          ;EXIT THIS TEST IF IN INTERNAL LOOPBACK.
;ALLOW LTC INTERRUPTS.
;
;          MOV    #PRIOS,R0
;          TRAP  C$SPRI
      TNUM  = TNUM + 1        ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
      MOV    #TNUM,TSTNUM    ;SET UP THE TEST NUMBER. (82)
      MOV    #-1,CTRLCF      ;INDICATE THAT WE ARE IN A TEST.
      MOV    #1,ERRTYP       ;SET ERROR TYPE IN ERROR TABLE.
      MOV    #8201,ERRNBR    ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
      MOV    #EM8201,ERRMSG  ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
;
; RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
; CLEAR TX AND RX INTERRUPT ENABLE BITS.
; THIS SUBROUTINE REPORTS ERROR >>>> 8201 <<<<<.
;-----
      JSR    PC,CLNRST       ;RESET THE DUT.
      BCS    4$
      JMP    60$            ;ABORT THE TEST IF FATAL ERROR FOUND IN RESET.
;
; SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
;-----
4$:      JSR    PC,ASLNTL    ;SET UP THE ASSOCIATED LINE TABLES.
;
; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
; THIS LOOP CLEARS ALL THE RTS'S AND THEN SETS THEM INDIVIDUALLY AND WAITS FOR
; A RESPONSE ON THE ASSOCIATED CTS SIGNAL.
; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
;-----
6$:      CLR    R3           ;CLEAR THE LINE COUNTER.
      MOV    R3,R0
      ASL    R0
      BIT    BITBL(R0),ACTLNS
      BEQ    10$            ;DON'T TEST IF NOT ACTIVE LINE.
;
; CLEAR ALL THE DUT LNCTRL REGISTERS RTS BITS.
;-----
      CLR    R0
      MOV    #MAPLNS,R5    ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
    
```

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4330 015542 004767 173662      JSR    PC,WTWLNLC      ;CLEAR ALL THE DUT RTS BITS.
4331 015546 012704 000050      MOV    #40.,R4
4332 015552 004767 172364      JSR    PC,DELAY        ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4333
4334      ;*
4335      ; CHECK THAT THE SPECIFIED CTS IS CLEAR.
4336 015556 010377 164416      MOV    R3,DCSRA        ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4337 015562 032777 004000 164416  BIT    #BIT11,DFLSA
4338 015570 001020                BNE    #            ;GO REPORT CTS IS BAD IF BIT IS NOT CLEAR.
4339
4340      ;*
4341      ; SET THE RTS FOR THE ASSOCIATED LINE.
4342      ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, RTS WILL NOT HAVE BEEN TESTED
4343      ; IN THE RTS TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4344 015572 116304 003750      MOV    TXRLNB(R3),R4   ;GET THE ASSOCIATED LINE NUMBER.
4345 015576 010477 164376      MOV    R4,DCSRA        ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4346 015602 052777 010000 164400  BIS    #BIT12,DLNCTRA  ;SET THE ASSOCIATED LINE RTS.
4347
4348      ;*
4349      ; CHECK THAT THE SELECTED LINE CTS IS ACTIVE.
4350 015610 010377 164364      MOV    R3,DCSRA        ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4351 015614 012701 130050      MOV    #130050,R1      ;PASS TIMEOUT OF 40 MILLI SEC, AND BIT TO TEST.
4352 015620 016702 164362      MOV    FLSA,R2         ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4353 015624 004767 173524      JSR    PC,WAIBIS       ;WAIT FOR CTS TO BECOME SET OR TIMEOUT.
4354 015630 103415                BCS    10#            ;SKIP ERROR REPORT IF SELECTED CTS IS SET.
4355
4356
4357 015632                8#:    ;REPORT CTS MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4358 015632 012767 020012 166152  MOV    #8202.,ERRNBR   ;SELECT THE ERROR NUMBER.
4359 015640 012767 006662 166150  MOV    #ER7801,ERRBLK  ;SELECT THE ERROR PRINT ROUTINE.
4360 015646 012701 005401                MOV    #EM8202,R1      ;SELECT THE ERROR MESSAGE.
4361 015652                ERROR
4362                                TRAP    C#ERROR
4363
4364      ;*
4365      ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4366 015654 032767 000100 164300  BIT    #BIT06,OPTION   ;EXIT WITH TEST FAILURE MESSAGE IF
4367 015662 001474                BEQ    60#            ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4368                                ;DURING THE SOFTWARE QUESTIONS.
4369
4370 015664 005203                10#:   INC    R3            ;SELECT THE NEXT LINE NUMBER.
4371 015666 020327 000020      CMP    R3,#NUMLNS     ;TEST FOR ALL LINES DONE.
4372 015672 002712                BLT    6#            ;LOOP IF NOT ALL LINES DONE.
4373
4374      ;*
4375      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4376      ; THIS LOOP SETS ALL THE RTSS AND THEN CLEARS THEM INDIVIDUALLY AND WAITS FOR
4377      ; A RESPONSE ON THE SELECTED CTS SIGNAL
4378      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4379 015674 005003                ;
4380 015676 010300                12#:   CLR    R3            ;CLEAR THE LINE COUNTER.
4381 015700 006300                MOV    R3,R0
4382 015702 036067 002310 164262  ASL    R0
4383 015710 001455                BIT    BITTBL(R0),ACTLNS
4384                                BEQ    16#            ;DON'T TEST IF NOT ACTIVE LINE.
4385      ;*
4385      ; SET ALL THE DUT LNCTRL REGISTERS RTS BITS.

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4386
4387 015712 012700 010000      ;
4388 015716 012705 177777      MOV    #BIT12,R0      ;SPECIFY THAT RTS BITS ARE TO BE SET.
4389 015722 004767 173502      MOV    #MAPLNS,R5     ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
4390 015726 012704 000050      JSR    PC,WTW,NC      ;SET ALL THE DUT RTS BITS.
4391 015732 004767 172204      MOV    #40.,R4
4392                                JSR    PC,DELAY        ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4393                                ;*
4394                                ; CHECK THAT THE SPECIFIED CTS IS SET.
4395 015736 010377 164236      MOV    R3,#CSRA       ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4396 015742 032777 004000 164236 BIT    #BIT11,#FSLSA
4397 015750 001420                                BEQ    14$            ;GO REPORT CTS IS BAD IF BIT IS NOT SET.
4398                                ;*
4399                                ; CLEAR THE RTS FOR THE ASSOCIATED LINE.
4400                                ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, RTS WILL NOT HAVE BEEN TESTED
4401                                ; IN THE RTS TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4402                                ;-
4403 015752 116304 003750      MOVB   TXRLNB(R3),R4   ;GET THE ASSOCIATED LINE NUMBER.
4404 015756 010477 164216      MOV    R4,#CSRA       ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4405 015762 042777 010000 164220 BIC    #BIT12,#LNCTRA ;CLEAR THE ASSOCIATED LINE RTS.
4406                                ;*
4407                                ; CHECK THAT THE SELECTED LINE CTS IS CLEAR.
4408                                ;-
4409 015770 010377 164204      MOV    R3,#CSRA       ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4410 015774 012701 130050      MOV    #130050,R1     ;PASS TIMEOUT OF 40 MILLI-SEC. AND BIT TO TEST.
4411 016000 016702 164202      MOV    FSLSA,R2       ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4412 016004 004767 173270      JSR    PC,WAIBIC      ;WAIT FOR CTS TO BECOME CLEAR OR TIMEOUT.
4413 016010 103415      BCS    16$            ;SKIP ERROR REPORT IF SELECTED CTS IS CLEAR.
4414
4415 016012                                14$: ;REPORT CTS MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4416 016012 012767 020013 165772 MOV    #8203.,ERRNBR  ;SELECT THE ERROR NUMBER
4417 016020 012767 006662 165770 MOV    #ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4418 016026 012701 005401      MOV    #EM8202,R1     ;SELECT THE ERROR MESSAGE.
4419 016032                                ERROR
4420                                TRAP    C:EPROR
4421
4422                                ;*
4423                                ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4424 016034 032767 000100 164120 BIT    #BIT06,OPTION
4425 016042 0C1404                                BEQ    60$            ;EXIT WITH TEST FAILURE MESSAGE IF
4426                                ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4427                                ;DURING THE SOFTWARE QUESTIONS.
4428 016044 005203                                16$: INC    R3            ;SELECT THE NEXT LINE NUMBER.
4429 016046 020327 000020      CMP    R3,#NUMLNS    ;TEST FOR ALL LINES DONE.
4430 016052 002711                                BLT    12$            ;LOOP IF NOT ALL LINES DONE.
4431
4432 016054 005067 164142                                60$: CLR    CTRLCF        ;INDICATE THAT WE ARE NOT WITHIN A TEST.
4433 016060                                SETPRI #PRI07        ;DISABLE ALL INTERRUPTS.
4434                                MOV    #PRI07,R0
4435 016066                                TRAP  C:SPRI
4435 016066                                ENDTST
4435 016066 104401                                L10024: TRAP  C:ETST

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4437 .SBTTL HARDWARE TEST - DCDMS
4438 ;*****
4439 ;*
4440 ;* - DATA CARRIER DETECTED MODEM SIGNAL TEST
4441 ;*
4442 ;* THIS TEST VERIFIES THAT THE DCD MODEM STATUS SIGNAL IS WORKING
4443 ;* CORRECTLY. IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED
4444 ;* LOOPBACK IS SPECIFIED. THIS TEST USES THE LOOPED BACK RTS SIGNALS
4445 ;* TO TEST THE DCD SIGNAL. THIS TEST IS PERFORMED ON ALL THE ACTIVE
4446 ;* LINES.
4447 ;*
4448 ;*****
4449 016070 BGNTST
016070
4450 T7::
4451 ;*
4452 ;* ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
4453 016070 032767 000002 164076 ;
4454 016076 001002 ; BIT #BIT1,LOPBCK ;CHECK TYPE OF LOOPBACK MODE SELECTED.
4455 016100 000167 000420 ; BNE 2$
4456 016104 012700 000240 2$: JMP 60$ ;EXIT THIS TEST IF IN INTERNAL LOOPBACK.
016104 104441 ; SETPRI #PRI05 ;ALLOW LTC INTERRUPTS.
016110 000007 ; MOV #PRI05,R0
4457 016112 012767 000007 164106 ; TRAP C$SPRI
4458 016120 012767 177777 164074 ; TNUM == TNUM + 1 ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
4459 016126 012767 000001 165654 ; MOV #TNUM,TSTNUM ;SET UP THE TEST NUMBER. (83)
4460 016134 012767 020155 165650 ; MGV #-1,CTRLCF ;INDICATE THAT WE ARE IN A TEST.
4461 016142 012767 005445 165644 ; MOV #1,ERRTP ;SET ERROR TYPE IN ERROR TABLE.
4462 ; MOV #8301,ERRNBR ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
4463 ; MOV #EM8301,ERRMSG ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
4464 ;*
4465 ;* RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
4466 ;* CLEAR TX AND RX INTERRUPT ENABLE BITS.
4467 ;* THIS SUBROUTINE REPORTS ERROR >>>> 8301 <<<<<.
4468 016150 004767 171652 ;
4469 016154 103402 ; JSR PC,CLNRST ;RESET THE DUT.
4470 016156 000167 000342 ; BCS 4$
4471 ; JMP 60$ ;ABORT THE TEST IF FATAL ERROR FOUND IN RESET.
4472 ;*
4473 ;* SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
4474 016162 004767 171254 4$: JSR PC,ASLNTL ;SET UP THE ASSOCIATED LINE TABLES.
4475 ;*
4476 ;* SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4477 ;* THIS LOOP CLEARS ALL THE RTSS AND THEN SETS THEM INDIVIDUALLY AND WAITS FOR
4478 ;* A RESPONSE ON THE ASSOCIATED DCD SIGNAL.
4479 ;* THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4480 ;*
4481 016166 005003 ;
4482 016170 010300 6$: CLR R3 ;CLEAR THE LINE COUNTER.
4483 016172 006300 ; MOV R3,R0
4484 016174 036067 002310 163770 ; ASL R0
4485 016202 001454 ; BIT BITBL(R0),ACTLNS
4486 ; BEQ 10$ ;DON'T TEST IF NOT ACTIVE LINE.
4487 ;*
4488 ;* CLEAR ALL THE DUT LNCTRL REGISTERS RTS BITS.
4489 016204 005000 ;
4490 016206 012705 177777 ; CLR R0 ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
; MOV #MAPLNS,R5 ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
    
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4491 016212 004767 173212      JSR    PC,WTLNC      ;CLEAR ALL THE DUT RTS BITS.
4492 016216 012704 000050      MOV    #40.,R4
4493 016222 004767 171714      JSR    PC,DELAY      ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4494
4495      ;*
4496      ; CHECK THAT THE SPECIFIED DCD IS CLEAR.
4497 016226 010377 163746      MOV    R3,@CSRA      ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4498 016232 032777 010000 163746 BIT    @BIT12,@FSLSA
4499 016240 001020                BNE    8$            ;GO REPORT DCD IS BAD IF BIT IS NOT CLEAR.
4500
4501      ;*
4502      ; SET THE RTS FOR THE ASSOCIATED LINE.
4503      ; NOTE: IF THE ASSOCIATED LINE IS NOT SELECTED, RTS WILL NOT HAVE BEEN TESTED
4504      ; IN THE RTS TEST (ONLY AN ISSUE IN STAGGERED LOOPBACK).
4505 016242 116304 003750      MOV    TXRLNB(R3),R4 ;GET THE ASSOCIATED LINE NUMBER.
4506 016246 010477 163726      MOV    R4,@CSRA      ;SET IND.ADR.REG FIELD TO ASSOCIATED LINE.
4507 016252 052777 010000 163730 BIS    @BIT12,@LNCTRA ;SET THE ASSOCIATED LINE RTS.
4508
4509      ;*
4510      ; CHECK THAT THE SELECTED LINE DCD IS ACTIVE.
4511 016260 010377 163714      MOV    R3,@CSRA      ;SET IND.ADR.REG FIELD TO SELECTED LINE.
4512 016264 012701 140050      MOV    #140050,R1    ;PASS TIMEOUT OF 40 MILLI-SEC. AND BIT TO TEST.
4513 016270 016702 163712      MOV    FLSA,R2       ;PASS THE ADDRESS OF THE REGISTER TO TEST.
4514 016274 004767 173054      JSR    PC,WAIBIS     ;WAIT FOR DCD TO BECOME SET OR TIMEOUT.
4515 016300 103415                BCS    10$          ;SKIP ERROR REPORT IF SELECTED DCD IS SET.
4516
4517
4518 016302                8$: ;REPORT DCD MODEM CONTROL SIGNAL DEFECTIVE ON LINE NN.
4519 016302 012767 020156 165502 MOV    #8302.,ERRNBR ;SELECT THE ERROR NUMBER.
4520 016310 012767 006662 165500 MOV    @ER7801,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4521 016316 012701 005511      MOV    @EM8302,R1    ;SELECT THE ERROR MESSAGE.
4522 016322
4523 016322 104460                ERROR
4524
4525
4526      ;*
4527 016324 032767 000100 163630 ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4528 016332 001474                BIT    @BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
4529                        BEQ    60$ ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4530                        ;DURING THE SOFTWARE QUESTIONS.
4531 016334 005203                10$: INC    R3            ;SELECT THE NEXT LINE NUMBER.
4532 016336 020327 000020      CMP    R3,@NUMLNS    ;TEST FOR ALL LINES DONE.
4533 016342 002712                BLT    6$            ;LOOP IF NOT ALL LINES DONE.
4534
4535      ;*
4536      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4537      ; THIS LOOP SETS ALL THE RTSS AND THEN CLEARS THEM INDIVIDUALLY AND WAITS FOR
4538      ; A RESPONSE ON THE SELECTED DCD SIGNAL.
4539      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4540 016344 005003                ;*
4541 016346 010300                12$: CLR    R3            ;CLEAR THE LINE COUNTER.
4542 016350 006300                MOV    R3,R0
4543 016352 036067 002310 163612 ASL    R0
4544 016360 001455                BIT    BITTBL(R0),ACTLNS
4545                        BEQ    16$ ;DON'T TEST IF NOT ACTIVE LINE.
4546
4547      ;*
4548      ; SET ALL THE DUT LNCTRL REGISTERS RTS BITS.

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4598 .SBTTL HARDWARE TEST DTRINT
4599 ;*****
4600 ; DATA TERMINAL READY SIGNAL INTERACTIONS TEST
4601 ;*
4602 ;*
4603 ;* THIS TEST VERIFIES THAT THE DTR SIGNAL (AND THE LOOPED BACK DSR AND
4604 ;* RI STATUS SIGNALS) DO NOT INTERACT WITH ANY OTHER MODEM STATUS SIGNALS.
4605 ;* IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED LOOPBACK IS
4606 ;* SPECIFIED. THIS TEST IS PERFORMED ON ALL ACTIVE LINES.
4607 ;*
4608 ;*****
4609 016540 BGNTST
      016540
4610 ;*
4611 ;* ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
4612 ;*
4613 016540 032767 000002 163426 ; BIT #BIT1,LOPBCK ;CHECK TYPE OF LOOPBACK MODE SELECTED.
4614 016546 001002 ; BNE 2$
4615 016550 000167 000400 ; JMP 60$ ;EXIT THIS TEST IF IN INTERNAL LOOPBACK.
4616 016554 2$: SETPRI #PRI05 ;ALLOW LTC INTERRUPTS.
      016554 012700 000240
      016560 104441
      000010 ; MOV #PRI05,R0
      000010 ; TPAP C$SPRI
4617 016562 012767 000010 163436 ; TNUM == TNUM + 1 ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
4618 016570 012767 177777 163424 ; MOV #TNUM,TSTNUM ;SET UP THE TEST NUMBER. (84)
4619 016576 012767 000001 165204 ; MOV #1,CTRLCF ;INDICATE THAT WE ARE IN A TEST.
4620 016604 012767 020321 165200 ; MOV #1,ERRTYP ;SET ERROR TYPE IN ERROR TABLE.
4621 016612 012767 005555 165174 ; MOV #8401,ERRNBR ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
4622 ; MOV #EM8401,ERRMSG ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
4623 ;*
4624 ; RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
4625 ; CLEAR TX AND RX INTERRUPT ENABLE BITS.
4626 ; THIS SUBROUTINE REPORTS ERROR >>>> 8401 <<<<<.
4627 ;
4628 016620 004767 171202 ; JSR PC,CLNRST ;RESET THE DUT.
4629 016624 103402 ; BCS 4$
4630 016626 000167 000322 ; JMP 60$ ;ABORT THE TEST IF FATAL ERROR FOUND IN RESET.
4631 ;*
4632 ; SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
4633 ;*
4634 016632 004767 170604 4$: JSR PC,ASLNTL ;SET UP THE ASSOCIATED LINE TABLES.
4635 ;*
4636 ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4637 ; THIS LOOP CLEARS ALL THE DTRS AND THEN SETS THEM INDIVIDUALLY AND CHECKS
4638 ; FOR ANY RESPONSES ON SIGNALS OTHER THAN THE ASSOCIATED RI AND DSR SIGNALS.
4639 ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4640 ;*
4641 016636 005003 ; CLR R3 ;CLEAR THE LINE COUNTER.
4642 016640 010300 6$: MOV R3,R0
4643 016642 006300 ASL R0
4644 016644 036067 002310 163320 BIT BITTBL(R0),ACTLNS
4645 016652 001450 BEQ 8$ ;DON'T TEST IF NOT ACTIVE LINE.
4646 ;*
4647 ; CLEAR ALL THE DUT LNCTRL REGISTERS DTR BITS.
4648 ;
4649 016654 005000 ; CLR R0 ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
4650 016656 012705 177777 ; MOV #MAPLNS,R5 ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
4651 016662 004767 172542 ; JSR PC,WTWLNLC ;CLEAR ALL THE DUT DTR BITS.
    
```

```

4652 016666 012704 000050      MOV    #40.,R4
4653 016672 004767 171244      JSR    PC,DELAY      ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4654
4655      ;*
4656      ; RECORD THE STATES OF THE MODEM STATUS SIGNALS.
4657 016676 004767 172120      JSR    PC,SAVMST     ;SAVE THE PRESENT MODEM STATUS STATES.
4658
4659      ;*
4660      ; SET THE DTR FOR THE SELECTED LINE.
4661 016702 010377 163272      MOV    R3,@CSRA     ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
4662 016706 052777 001000 163274  BIS    #BIT9,@LNCTRA ;SET THE SELECTED LINE DTR.
4663 016714 012704 000050      MOV    #40.,R4
4664 016720 004767 171216      JSR    PC,DELAY     ;ALLOW 40 MS FOR STATUS SIGNALS TO STABILIZE.
4665
4666      ;*
4667      ; CHECK THE PRESENT DUT STAT REGISTER CONTENTS AGAINST PREVIOUS.
4668      ; IF ANY UNDESIRED CHANGES HAVE TAKEN PLACE, REPORT THE ERRORS.
4669 016724 116301 003750      MOVB   TXRLNB(R3),R1 ;SELECT SPECIAL TREATMENT FOR ASSOCIATED LINE.
4670 016730 012702 120000      MOV    #BIT15:BIT13,R2 ;IGNORE DSR AND RI ON ASSOCIATED LINE.
4671 016734 004767 171110      JSR    PC,CMPMST    ;COMPARE OLD AND NEW STAT CONTENTS.
4672 016740 103415      BCS    8$           ;SKIP ERROR REPORT IF NO DISCREPANCIES FOUND.
4673      ;REPORT INTERACTIONS FOUND BETWEEN DTR FOR LINE NN AND THE FOLLOWING SIGNALS:
4674 016742 012767 020322 165042  MOV    #8402.,ERRNBR ;SELECT THE ERROR NUMBER.
4675 016750 012767 006720 165040  MOV    #ER8401,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4676 016756 012701 005637      MOV    #EM8402,R1   ;SELECT THE DTR ERROR MESSAGES.
4677 016762      ERROR          ;ER8401 USES R1, R2, AND R3 VALUES.
4678      TRAP    C$ERROR
4679
4680      ;*
4681      ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4682 016764 032767 000100 163170  BIT    #BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
4683 016772 001470      BEQ    60$         ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4684      ;DURING THE SOFTWARE QUESTIONS.
4685
4686      ;*
4687      ; SELECT THE NEXT LINE AND LOOP IF NOT ALL POSSIBLE LINES HAVE BEEN HANDLED.
4688 016774 005203      ;*
4689 016776 020327 000020 8$:   INC    R3           ;SELECT THE NEXT LINE NUMBER.
4690 017002 002716      CMP    R3,@NUMLNS  ;TEST FOR ALL LINES DONE.
4691      BLT    6$           ;LOOP IF NOT ALL LINES DONE.
4692
4693      ;*
4694      ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4695      ; THIS LOOP SETS ALL THE DTRS AND THEN CLEARS THEM INDIVIDUALLY AND CHECKS
4696      ; FOR ANY RESPONSES ON SIGNALS OTHER THAN THE ASSOCIATED RI AND DSR SIGNALS.
4697      ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4698 017004 005003      ;*
4699 017006 010300 10$:   CLR    R3           ;CLEAR THE LINE COUNTER.
4700 017010 006300      MOV    R3,R0
4701 017012 036067 002310 163152  ASL    R0
4702      BIT    BITTBL(R0),ACTLNS
4703      BEQ    12$         ;DON'T TEST IF NOT ACTIVE LINE.
4704
4705      ;*
4706      ; SET ALL THE DUT LNCTRL REGISTERS DTR BITS.
4707 017022 012700 001000      MOV    #BIT9,R0     ;SPECIFY THAT DTR BITS ARE TO BE SET.
4708 017026 012705 177777      MOV    #MAPLNS,R5   ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
4709 017032 004767 172372      JSR    PC,WTWLNLC  ;SET ALL THE DUT DTR BITS.

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```

4708 017036 012704 000050      MOV    #40.,R4
4709 017042 004767 171074      JSR    PC,DELAY      ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4710
4711      ;+
4712      ; RECORD THE STATES OF THE MODEM STATUS SIGNALS.
4713 017046 004767 171750      JSR    PC,SAVMST     ;SAVE THE PRESENT MODEM STATUS STATES.
4714
4715      ;+
4716      ; CLEAR THE DTR FOR THE SELECTED LINE.
4717 017052 010377 163122      MOV    R3,@CSRA     ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
4718 017056 042777 001000 163124 BIC    #BIT9,@LNCTRA ;CLEAR THE SELECTED LINE DTR.
4719 017064 012704 000050      MOV    #40.,R4
4720 017070 004767 171046      JSR    PC,DELAY     ;ALLOW 40 MS FOR STATUS SIGNALS TO STABILIZE.
4721
4722      ;+
4723      ; CHECK THE PRESENT DUT STAT REGISTER CONTENTS AGAINST PREVIOUS.
4724      ; IF ANY UNDESIRED CHANGES HAVE TAKEN PLACE, REPORT THE ERRORS.
4725 017074 116301 003750      MOVB   TXRLNB(R3),R1 ;SELECT SPECIAL TREATMENT FOR ASSOCIATED LINE.
4726 017100 012702 120000      MOV    #BIT15:BIT13,R2 ;IGNORE DSR AND RI ON ASSOCIATED LINE.
4727 017104 004767 170740      JSR    PC,CMPMST    ;COMPARE OLD AND NEW STAT CONTENTS.
4728 017110 103415      BCS    12$          ;SKIP ERROR REPORT IF NO DISCREPANCIES FOUND.
4729      ;REPORT INTERACTIONS FOUND BETWEEN DTR FOR LINE NN AND THE FOLLOWING SIGNALS:
4730 017112 012767 020323 164672 MOV    #8403.,ERRNBR ;SELECT THE ERROR NUMBER.
4731 017120 012767 006720 164670 MOV    #ER8401,ERRBLK ;SELECT THE ERROR PRINT ROUTINE.
4732 017126 012701 005637      MOV    #EM8402,R1   ;SELECT THE DTR ERROR MESSAGES.
4733 017132      ERROR          ;ER8401 USES R1, R2, AND R3 VALUES.
4734      TRAP    C$ERROR
4735
4736      ;+
4737      ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4738 017134 032767 000100 163020 BIT    #BIT06,OPTION ;EXIT WITH TEST FAILURE MESSAGE IF
4739 017142 001404      BEQ    60$          ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4740      ;DURING THE SOFTWARE QUESTIONS.
4741
4742      ;+
4743      ; SELECT THE NEXT LINE AND LOOP IF NOT ALL POSSIBLE LINES HAVE BEEN HANDLED.
4744      ;-
4745 017144 005203      12$: INC    R3          ;SELECT THE NEXT LINE NUMBER.
4746 017146 020327 000020      CMP    R3,#NUMLNS  ;TEST FOR ALL LINES DONE.
4747 017152 002715      BLT    10$          ;LOOP IF NOT ALL LINES DONE.
4748
4749 017154 005067 163042      60$: CLR    CTRLCF     ;INDICATE THAT WE ARE NOT WITHIN A TEST.
4750 017160      SETPRI #PRI07     ;DISABLE ALL INTERRUPTS.
4751      MOV    #PRI07,R0
4752 017166      TRAP    C$SPRI
4753 017166      ENDTST
4754 017166 104401      L10026: TRAP    C$ETST

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4754 .SBTTL  HARDWARE TEST          RISINT
4755 ;*****
4756 ;*                               - REQUEST TO SEND SIGNAL INTERACTIONS TEST -
4757 ;*
4758 ;*   THIS TEST VERIFIES THAT THE RTS SIGNAL (AND THE LOOPED BACK DCD AND CTS
4759 ;*   STATUS SIGNALS) DO NOT INTERACT WITH ANY OTHER MODEM STATUS SIGNALS.
4760 ;*   IT WILL ONLY BE PERFORMED IF EITHER 25 PIN OR STAGGERED LOOPBACK IS
4761 ;*   SPECIFIED. THIS TEST IS PERFORMED ON ALL ACTIVE LINES.
4762 ;*
4763 ;*
4764 ;*****
4765 017170          BGNTST
      017170
4766 ;*
4767 ;*
4768 ;*   ONLY PERFORM THIS TEST IF THE DUT IS IN EXTERNAL OR STAGGERED LOOPBACK MODE.
4769 017170 032767 000002 162776          BIT    #BIT1,LCPBCK    ;CHECK TYPE OF LOOPBACK MODE SELECTED.
4770 017176 001002          BNE     2$
4771 017200 000167 000400          JMP     60$
4772 017204          2$: SETPRI  #PRI05    ;EXIT THIS TEST IF IN INTERNAL LOOPBACK.
      017204 012700 000240          ;ALLOW LTC INTERRUPTS.
      017210 104441          MOV     #PRI05,R0
      000011          TRAP   C$SPRI
4773          TNUM == TNUM + 1    ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
4774 017212 012767 000011 163006          MOV     #TNUM,TSTNUM    ;SET UP THE TEST NUMBER. (85)
4775 017220 012767 177777 162774          MOV     #-1,CTRLCF    ;INDICATE THAT WE ARE IN A TEST.
4776 017226 012767 000001 164554          MOV     #1,ERRTYP    ;SET ERROR TYPE IN ERROR TABLE.
4777 017234 012767 020465 164550          MOV     #8501,ERRNBR ;SET THE FIRST ERROR NUMBER IN ERROR TABLE.
4778 017242 012767 005662 164544          MOV     #EM8501,ERRMSG ;SET ERROR MESSAGE ADDRESS IN ERROR TABLE.
4779 ;*
4780 ;*   RESET THE DUT TO A KNOWN STATE, REMOVE STATUS CODES FROM THE FIFO.
4781 ;*   CLEAR TX AND RX INTERRUPT ENABLE BITS.
4782 ;*   THIS SUBROUTINE REPORTS ERROR >>>> 8501 <<<<<.
4783 ;*
4784 017250 004767 170552          JSR     PC,CLNRST    ;RESET THE DUT.
4785 017254 103402          BCS     4$
4786 017256 000167 000322          JMP     60$
4787 ;*
4788 ;*   SET UP THE TX/RX ASSOCIATED LINE NUMBER TABLE.
4789 ;*
4790 017262 004767 170154          4$: JSR     PC,ASLNTL    ;SET UP THE ASSOCIATED LINE TABLES.
4791 ;*
4792 ;*   SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4793 ;*   THIS LOOP CLEARS ALL THE RTSS AND THEN SETS THEM INDIVIDUALLY AND CHECKS
4794 ;*   FOR ANY RESPONSES ON SIGNALS OTHER THAN THE ASSOCIATED DCD AND CTS SIGNALS.
4795 ;*   THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4796 ;*
4797 017266 005003          ;*
4798 017270 010300          6$: CLR     R3    ;CLEAR THE LINE COUNTER.
4799 017272 006300          MOV     R3,R0
4800 017274 036067 002310 162670          ASL     R0
4801 017302 001450          BIT     BITTBL(R0),ACTLNS
4802          BEQ     8$    ;DON'T TEST IF NOT ACTIVE LINE.
4803 ;*
4804 ;*   CLEAR ALL THE DUT LNCTRL REGISTERS RTS BITS.
4805 017304 005000          ;*
4806 017306 012705 177777          CLR     R0    ;SPECIFY THAT ALL LNCTRL BITS TO BE CLEARED.
4807 017312 004767 172112          MOV     #MAPLNS,R5  ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
          JSR     PC,WTWLCN ;CLEAR ALL THE DUT RTS BITS.

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```

4808 017316 012704 000050          MOV    #40.,R4
4809 017322 004767 170614          JSR    PC,DELAY          ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4810                                     ;*
4811                                     ; RECORD THE STATES OF THE MODEM STATUS SIGNALS.
4812                                     ;-
4813 017326 004767 171470          JSR    PC,SAVMST        ;SAVE THE PRESENT MODEM STATUS STATES.
4814                                     ;*
4815                                     ; SET THE RTS FOR THE SELECTED LINE.
4816                                     ;-
4817 017332 010377 162642          MOV    R3,@CSRA        ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
4818 017336 052777 010000 162644  BIS    #BIT12,@LNCTRA  ;SET THE SELECTED LINE RTS.
4819 017344 012704 000050          MOV    #40.,R4
4820 017350 004767 170566          JSR    PC,DELAY        ;ALLOW 40 MS FOR STATUS SIGNALS TO STABILIZE.
4821                                     ;*
4822                                     ; CHECK THE PRESENT DUT STAT REGISTER CONTENTS AGAINST PREVIOUS.
4823                                     ; IF ANY UNDESIRED CHANGES HAVE TAKEN PLACE, REPORT THE ERRORS.
4824                                     ;-
4825 017354 116301 003750          MOV    TXRLNB(R3),R1   ;SELECT SPECIAL TREATMENT FOR ASSOCIATED LINE.
4826 017360 012702 014000          MOV    #BIT12!BIT11,R2 ;IGNORE DCD AND CTS ON ASSOCIATED LINE.
4827 017364 004767 170460          JSR    PC,CMPMST       ;COMPARE OLD AND NEW STAT CONTENTS.
4828 017370 103415                    BCS    8$              ;SKIP ERROR REPORT IF NO DISCREPANCIES FOUND.
4829                                     ;REPORT INTERACTIONS FOUND BETWEEN RTS FOR LINE NN AND THE FOLLOWING SIGNALS:
4830 017372 012767 020466 164412  MOV    #8502.,ERRNBR   ;SELECT THE ERROR NUMBER.
4831 017400 012767 006720 164410  MOV    #ER8401,ERRBLK  ;SELECT THE ERROR PRINT ROUTINE.
4832 017406 012701 005744          MOV    #EM8502,R1     ;SELECT THE RTS ERROR MESSAGES.
4833 017412 104460                    ERROR                   ;ER1901 USES R1, R2, AND R3 VALUES.
4834                                     TRAP   C$ERROR
4835                                     ;*
4836                                     ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4837                                     ;-
4838 017414 032767 000100 162540  BIT    #BIT06,OPTION   ;EXIT WITH TEST FAILURE MESSAGE IF
4839 017422 001470                    BEQ    60$              ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4840                                     ;DURING THE SOFTWARE QUESTIONS.
4841                                     ;*
4842                                     ; SELECT THE NEXT LINE AND LOOP IF NOT ALL POSSIBLE LINES HAVE BEEN HANDLED.
4843                                     ;-
4844 017424 005203                    8$: INC    R3            ;SELECT THE NEXT LINE NUMBER.
4845 017426 020327 000020          CMP    R3,#NUMLNS     ;TEST FOR ALL LINES DONE.
4846 017432 002716                    BLT    6$              ;LOOP IF NOT ALL LINES DONE.
4847                                     ;*
4848                                     ; SET UP A LOOP WHICH HANDLES ONE LINE PER ITERATION.
4849                                     ; THIS LOOP SETS ALL THE RTSS AND THEN CLEARS THEM INDIVIDUALLY AND CHECKS
4850                                     ; FOR ANY RESPONSES ON SIGNALS OTHER THAN THE ASSOCIATED DCD AND CTS SIGNALS.
4851                                     ; THIS LOOP WILL CLEAR THE TX.IE AND RX.IE BITS IF THEY ARE SET.
4852                                     ;-
4853 017434 005003                    10$: CLR    R3            ;CLEAR THE LINE COUNTER.
4854 017436 010300                    MOV    R3,R0
4855 017440 006300                    ASL    R0
4856 017442 036067 002310 162522  BIT    BITTBL(R0),ACTLNS
4857 017450 001451                    BEQ    12$              ;DON'T TEST IF NOT ACTIVE LINE.
4858                                     ;*
4859                                     ; SET ALL THE DUT LNCTRL REGISTERS RTS BITS.
4860                                     ;-
4861 017452 012700 010000          MOV    #BIT12,R0      ;SPECIFY THAT RTS BITS ARE TO BE SET.
4862 017456 012705 177777          MOV    #MAPLNS,R5    ;SPECIFY THAT ALL LNCTRLS ARE TO BE CHANGED.
4863 017462 004767 171742          JSR    PC,WTWLNLC    ;SET ALL THE DUT RTS BITS.

```

```

4864 017466 012704 000050      MOV    #40.,R4
4865 017472 004767 170444      JSR    PC,DELAY                ;DELAY FOR 40 MS TO ALLOW SIGNALS TO SETTLE.
4866                                     ;+
4867                                     ; RECORD THE STATES OF THE MODEM STATUS SIGNALS.
4868                                     ;-
4869 017476 004767 171320      JSR    PC,SAVMST                ;SAVE THE PRESENT MODEM STATUS STATES.
4870                                     ;+
4871                                     ; CLEAR THE RTS FOR THE SELECTED LINE.
4872                                     ;-
4873 017502 010377 162472      MOV    R3,#CSRA                ;SELECT THE SELECTED LINE IND.ADR.REG FIELD.
4874 017506 042777 010000      BIC    #BIT12,#LNCTRA          ;CLEAR THE SELECTED LINE RTS.
4875 017514 012704 000050      MOV    #40.,R4
4876 017520 004767 170416      JSR    PC,DELAY                ;ALLOW 40 MS FOR STATUS SIGNALS TO STABILIZE.
4877                                     ;+
4878                                     ; CHECK THE PRESENT DUT STAT REGISTER CONTENTS AGAINST PREVIOUS.
4879                                     ; IF ANY UNDESIRED CHANGES HAVE TAKEN PLACE, REPORT THE ERRORS.
4880                                     ;-
4881 017524 116301 003750      MOVB   TXRLNB(R3),R1           ;SELECT SPECIAL TREATMENT FOR ASSOCIATED LINE.
4882 017530 012702 014000      MOV    #BIT12!BIT11,R2        ;IGNORE DCD AND CTS ON ASSOCIATED LINE.
4883 017534 004767 170310      JSR    PC,CMPMST              ;COMPARE OLD AND NEW STAT CONTENTS.
4884 017540 103415                BCS    12$                     ;SKIP ERROR REPORT IF NO DISCREPANCIES FOUND.
4885                                     ;REPORT INTERACTIONS FOUND BETWEEN RTS FOR LINE NN AND THE FOLLOWING SIGNALS:
4886 017542 012767 020467      MOV    #8503.,ERRNBR          ;SELECT THE ERROR NUMBER.
4887 017550 012767 006720      MOV    #ER8401,ERRBLK         ;SELECT THE ERROR PRINT ROUTINE.
4888 017556 012701 005744      MOV    #EM8502,R1             ;SELECT THE RTS ERROR MESSAGES.
4889 017562 104460                ERROR                          ;ER1901 USES R1, R2, AND R3 VALUES.
4890                                     TRAP   C$ERROR
4891                                     ;+
4892                                     ; EXIT THE TEST IF EXTENDED ERROR REPORTING HAS NOT BEEN ENABLED
4893                                     ;-
4894 017564 032767 000100      BIT    #BIT06,OPTION          ;EXIT WITH TEST FAILURE MESSAGE IF
4895 017572 001404                BEQ    60$                     ;NO EXTENDED ERROR REPORTING HAS BEEN REQUESTED
4896                                     ;DURING THE SOFTWARE QUESTIONS.
4897                                     ;+
4898                                     ; SELECT THE NEXT LINE AND LOOP IF NOT ALL POSSIBLE LINES HAVE BEEN HANDLED.
4899                                     ;-
4900 017574 005203                12$: INC    R3                  ;SELECT THE NEXT LINE NUMBER.
4901 017576 020327 000020      CMP    R3,#NUMLNS             ;TEST FOR ALL LINES DONE.
4902 017602 002715                BLT    10$                     ;LOOP IF NOT ALL LINES DONE.
4903                                     ;-
4904 017604 005067 162412      60$: CLR    CTRLCF              ;INDICATE THAT WE ARE NOT WITHIN A TEST.
4905 017610                SETPRI #PRI07                 ;DISABLE ALL INTERRUPTS.
4906                                     MOV    #PRI07,RO
4907 017616                TRAP   C$SPRI
017616                L10027: TRAP   C$ETST
017616 104401

```

4909  
4910  
4911  
4912  
4913  
4914  
4915  
4916  
4917  
4918  
4919 017620  
017620  
4920  
4921 017620 000012  
4922 017626 012767 000012 162400  
4923 017634 012767 177777 162366  
4924 017634 016702 162510  
4925 017640 012703 002352  
4926 017644 020203  
4927 017646 001411  
4928  
4929  
4930  
4931  
4932 017650 012701 006124  
4933 017654  
017654 104455  
017656 022125  
017660 005750  
017662 007176  
4934  
4935 017664 012767 002352 162456  
4936  
4937 017672 005067 162324  
4938 017676  
017676  
017676 104401

```

.SBTTL  HARDWARE TEST          - REP8MP
;*****
;*   REPORT ANY BMP CODES IN THE QUEUE
;*   THIS IS A PSEUDO-TEST USED TO REPORT ANY BMP CODES THAT WERE FOUND
;*   IN THE OUT'S FIFO DURING PREVIOUS TEST, AND LOGGED IN THE BMP CODE
;*   QUEUE.
;*   IT IS UNLIKELY THAT RUNNING THIS PSEUDO-TEST ALONE WILL PRODUCE ANY
;*   ERROR REPORTS.
;*****
BGNTST
                                T10::
TNUM -- TNUM + 1                ;INCREMENT THE ASSEMBLY TIME TEST COUNTER.
MOV  #TNUM,TSTNUM                ;SET UP THE TEST NUMBER. (93)
MOV  #-1,CTRLCF                  ;INDICATE THAT WE ARE IN A TEST.
MOV  BMPCQP,R2                   ;GET THE CONTENTS OF THE POINTER.
MOV  #BMPCQB,R3                  ;GET THE START ADDRESS OF THE QUEUE.
CMP  R2,R3                       ;SEE IF THE POINTER HAS MOVED FROM THE BASE.
BEQ  60$                          ;EXIT NO CODES IN THE QUEUE.
;
; THERE IS AT LEAST ONE BMP CODE IN THE QUEUE. REPORT THE ERROR.
;
;REPORT ERROR BMP CODE FOUND IN TEST NN, BMP CODE:NNNNNN"
MOV  #EM9304,R1                  ;PASS THE FIRST MESSAGE TO BE REORTED.
ERRDF 9301,EM9301,ER9301 ;
                                >>>> ERROR #9301 <<<<<.
                                TRAP  C$ERDF
                                .WORD 9301
                                .WORD EM9301
                                .WORD ER9301
60$: CLR  CTRLCF                  ;INDICATE THAT WE ARE NOT WITHIN A TEST.
      ENDTST
                                L10030:
                                TRAP  C$ETST

```

4947  
 4948  
 4949  
 4950  
 4951  
 4952  
 4953  
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 4956  
 4957  
 4958  
 4959  
 4960  
 4961  
 4962 017700  
 017700 000016  
 017702  
 4963  
 4973  
 4974 017702  
 017702 000031  
 017704 017736  
 017706 160000  
 017710 177776  
 4975  
 4976 017712  
 017712 001032  
 017714 017754  
 017716 177777  
 017720 000000  
 017722 177777  
 4977  
 4978 017724  
 017724 002032  
 017726 020002  
 017730 000377  
 017732 000001  
 017734 000003  
 4979  
 4980  
 4981 017736  
 017736  
 4982  
 4989  
 4990 017736 103 123 122  
 017741 040 101 104  
 017744 104 122 105  
 017747 123 123 072  
 017752 040 000  
 4991 017754 101 103 124  
 017757 111 126 105  
 017762 040 114 111  
 017765 116 105 040  
 017770 102 111 124  
 017773 040 115 101

.SBTTL HARDWARE PARAMETER CODING SECTION

```

***
; THE HARDWARE 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.
;--
    
```

BGNHRD

.WORD L10031-L\$HARD/2  
 L\$HARD::

```

;DEVICE CSR ADDRESS QUESTION:
GPRMA HWPTQ1,0,0,160000,177776,YES
    
```

.WORD T\$CODE  
 .WORD HWPTQ1  
 .WORD T\$LOLIM  
 .WORD T\$HILIM

```

;ACTIVE LINES BIT MAP QUESTION:
GPRMD HWPTQ2,2,0,MAPLNS,0,177777,YES
    
```

.WORD T\$CODE  
 .WORD HWPTQ2  
 .WORD MAPLNS  
 .WORD T\$LOLIM  
 .WORD T\$HILIM

```

;TYPE OF LOOPBACK QUESTION:
GPRMD HWPTQ3,4,0,377,1,3,YES
    
```

.WORD T\$CODE  
 .WORD HWPTQ3  
 .WORD 377  
 .WORD T\$LOLIM  
 .WORD T\$HILIM

ENDHRD

.EVEN  
 L10031:

HWPTQ1: .ASCIZ /CSR ADDRESS: /

HWPTQ2: .ASCIZ /ACTIVE LINE BIT MAP: /



017776 120 072 040  
 020001 000  
 4992 020002 124 131 120  
 020003 105 040 117  
 020010 106 040 114  
 020013 117 117 120  
 020016 102 101 103  
 020021 113 040 050  
 020024 061 075 111  
 020027 116 124 105  
 020032 122 116 101  
 020035 114 054 040  
 020040 062 075 110  
 020043 063 060 062  
 020046 071 040 117  
 020051 122 040 110  
 020054 063 062 067  
 020057 067 054 040  
 020062 063 075 110  
 020065 063 062 065  
 020070 051 072 000  
 4993  
 4994

MWPTQ3: .ASCIZ /TYPE OF LOOPBACK (1=INTERNAL, 2=M3029 OR M3277, 3=M325):/

.EVEN

5003  
5004  
5005  
5006  
5007  
5008  
5009  
5010  
5011  
5012  
5013  
5014  
5015  
5016 020074  
020074 000014  
020076  
5017  
5026  
5027 020076  
020076 000130  
020100 020126  
020102 000020  
5028  
5029 020104  
020104 000130  
020106 020202  
020110 000100  
5030  
5031  
5032  
5033 020112  
020112 006044  
5034  
5035  
5036 020114  
020114 000052  
020116 020235  
020120 177777  
020122 000000  
020124 177777  
5037  
5038  
5039  
5040 020126  
020126  
5041  
5042  
5049 020126 122 105 120  
020131 117 122 124  
020134 040 125 116  
020137 111 124 040  
020142 116 125 115  
020145 102 105 122  
020150 040 101 123  
020153 040 105 101  
020156 103 110 040

.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.  
;

BGNSFT

.WORD L10032 L\$SOFT/2  
L\$SOFT:.

;UNIT NUMBER PRINTOUT QUESTION:  
GPRML SWPTQ1,0,20,YES

.WORD T\$CODE  
.WORD SWPTQ1  
.WORD 20

;EXTENDED ERROR REPORTING QUESTION:  
GPRML SWPTQ2,0,100,YES

.WORD T\$CODE  
.WORD SWPTQ2  
.WORD 100

;;  
; IF EXTENDED ERROR REPORTING IS NOT REQUIRED THEN SKIP THE NEXT QUESTION.  
;;

XFERF ENDD

.WORD T\$CODE

;NUMBER OF INDIVIDUAL DATA ERRORS TO REPORT ON A LINE QUESTION:  
GPRMD SWPTQ3,2,D,177777,0,177777,YES

.WORD T\$CODE  
.WORD SWPTQ3  
.WORD 177777  
.WORD T\$LOLIM  
.WORD T\$HILIM

.EVEN

ENDD: ENDSFT

.EVEN  
L10032:

SWPTQ1: .ASCIZ /REPORT UNIT NUMBER AS EACH UNIT IS TESTED: /

	020161	125	116	111
	020164	124	040	111
	020167	123	040	124
	020172	105	123	124
	020175	105	104	072
	020200	040	000	
5050	020202	105	130	124
	020205	105	116	104
	020210	105	104	040
	020213	105	122	122
	020216	117	122	040
	020221	122	105	120
	020224	117	122	124
	020227	111	116	107
	020232	072	040	000
5051	020235	116	125	115
	020240	102	105	122
	020243	040	117	106
	020246	040	111	116
	020251	104	111	126
	020254	111	104	125
	020257	101	114	040
	020262	104	101	124
	020265	101	040	105
	020270	122	122	117
	020273	122	123	040
	020276	124	117	040
	020301	122	105	120
	020304	117	122	124
	020307	040	117	116
	020312	040	101	040
	020315	114	111	116
	020320	105	072	040
5052	020323	000		

SWPTQ2: .ASCIZ /EXTENDED ERROR REPORTING: /

SWPTQ3: .ASCIZ /NUMBER OF INDIVIDUAL DATA ERRORS TO REPORT ON A LINE: /

.EVEN

5061  
5062  
5063  
5064  
5065  
5072  
5073  
5074  
5075  
5076  
  
5077  
5078  
5079  
5080  
5081  
5082  
5083  
5084  
5085

020324  
020324  
  
  
  
  
020374  
020374 000000  
020376 000000  
020400  
020400  
  
  
  
000001

\$PATCH::  
    .BLKW 24  
  
LASTAD  
  
L\$LAST::  
    ENDMOD  
  
  
  
    .END

.EVEN  
.WORD 0  
.WORD 0

ACTLNS 002172 G	C\$AUTO= 000061	EDROP 012512	EVL = 000004 G	IES T 002230 G
ADR = 000020 G	C\$BRK = 000022	EF.CON= 000036 G	EXOERR 002224 G	ISR = 000100 G
ADRPTR 010010 G	C\$BSEG= 000004	EF.NEW= 000035 G	E\$END = 002100	IXE = 004000 G
ALTFLD 007370 G	C\$BSUB= 000002	EF.PWR= 000034 G	E\$LOAD= 000035	I\$AU = 000041
ASLNTL 007442 G	C\$CEFG= 000045	EF.RES= 000037 G	FDATA 002206 G	I\$AUTO= 000041
ASSEMB= 000010	C\$CLCK= 000062	EF.STA= 000040 G	FDATO = 000006 G	I\$CLN = 000041
BCOUNT 002274 G	C\$CLEA= 000012	EF0503 004116 G	FSLSA 002206 G	I\$DU = 000041
BITTBL 002310 G	C\$CLOS= 000035	EF1601 004123 G	FSLSO = 000006 G	I\$HRD = 000041
BIT0 = 000001 G	C\$CLP1= 000006	EF7801 004155 G	F\$AU = 000015	I\$INIT= 000041
BIT00 = 000001 G	C\$CVEC= 000036	EF8401 004213 G	F\$AUTO= 000020	I\$MOD = 000041
BIT01 = 000002 G	C\$DCLN= 000044	EF8402 004305 G	F\$BGN = 000040	I\$MSG = 000041
BIT02 = 000004 G	C\$DDDU= 000051	EF9301 004423 G	F\$CLEA= 000007	I\$PROT= 000040
BIT03 = 000010 G	C\$DRPT= 000024	EF9302 004501 G	F\$DU = 000016	I\$PTAB= 000041
BIT04 = 000020 G	C\$DU = 000053	EM0101 010376 G	F\$END = 000041	I\$PWR = 000041
BIT05 = 000040 G	C\$EDIT= 000003	EM0102 010462 G	F\$HARD= 000004	I\$RPT = 000041
BIT06 = 000100 G	C\$ERDF= 000055	EM0103 004632 G	F\$HW = 000013	I\$SEG = 000041
BIT07 = 000200 G	C\$ERHR= 000056	EM1601 004670 G	F\$INIT= 000006	I\$SETU= 000041
BIT08 = 000400 G	C\$ERRO= 000060	EM7801 004753 G	F\$JMP = 000050	I\$SFT = 000041
BIT09 = 001000 G	C\$ERSF= 000054	EM7802 005015 G	F\$MOD = 000000	I\$SRV = 000041
BIT1 = 000002 G	C\$ERSO= 000057	EM7901 005035 G	F\$MSG = 000011	I\$SUB = 000041
BIT10 = 002000 G	C\$ESCA= 000010	EM7902 005077 G	F\$PROT= 000021	I\$TST = 000041
BIT11 = 004000 G	C\$ESEG= 000005	EM8001 005117 G	F\$PWR = 000017	J\$JMP = 000167
BIT12 = 010000 G	C\$ESUB= 000003	EM8002 005163 G	F\$RPT = 000012	LGRP1M 002232 G
BIT13 = 020000 G	C\$ETST= 000001	EM8101 005227 G	F\$SEG = 000003	LGRP2M 002234 G
BIT14 = 040000 G	C\$EXIT= 000032	EM8102 005272 G	F\$SOFT= 000005	LNCTRA 002210 G
BIT15 = 100000 G	C\$GETB= 000026	EM8201 005335 G	F\$SRV = 000010	LNCTRO= 000010 G
BIT2 = 000004 G	C\$GETW= 000027	EM8202 005401 G	F\$SUB = 000002	LOE = 040000 G
BIT3 = 000010 G	C\$GMAN= 000043	EM8301 005445 G	F\$SW = 000014	LOPBCK 002174 G
BIT4 = 000020 G	C\$GPHR= 000042	EM8302 005511 G	F\$TEST= 000001	LOT = 000010 G
BIT5 = 000040 G	C\$GPLO= 000030	EM8401 005555 G	GETPRM 012170	LPCSLT= 000036 G
BIT6 = 000100 G	C\$GPRI= 000040	EM8402 005637 G	G\$CNTO= 000200	LPRA = 002204 G
BIT7 = 000200 G	C\$INIT= 000011	EM8403 005643 G	G\$DELM= 000372	LPRO = 000004 G
BIT8 = 000400 G	C\$INLP= 000020	EM8404 005647 G	G\$DISP= 000003	L\$ACP 002110 G
BIT9 = 001000 G	C\$MANI= 000050	EM8405 005652 G	G\$EXCP= 000400	L\$APT 002036 G
BMPCQB 002352 G	C\$MEM = 000031	EM8406 005656 G	G\$HILI= 000002	L\$AU 012520 G
BMPCQE 002552 G	C\$MSG = 000023	EM8501 005662 G	G\$LOLI= 000001	L\$AUT 002070 G
BMPCQP 002350 G	C\$OPEN= 000034	EM8502 005744 G	G\$NO = 000000	L\$AUTO 012370 G
BOE = 000400 G	C\$PNTB= 000014	EM9301 005750 G	G\$OFFS= 000400	L\$CCP 002106 G
BRLEVL 002175 G	C\$PNTF= 000017	EM9302 006027 G	G\$OFISI= 000376	L\$CLEA 012372 G
BUFBAS 002650 G	C\$PNTS= 000016	EM9303 006057 G	G\$PRMA= 000001	L\$CO 002032 G
BUFEND 003650 G	C\$PNTX= 000015	EM9304 006124 G	G\$PRMD= 000002	L\$DEPO 002011 G
BUF MID 003250 G	C\$QIO = 000377	ENDD 020126	G\$PRML= 000000	L\$DESC 004070 G
BUF PTR 002220 G	C\$RDBU= 000007	ENDET B 003650 G	G\$RADA= 000140	L\$DESP 002076 G
BUF3QT 003450 G	C\$REFG= 000047	ENDIT 012354	G\$RADB= 000000	L\$DEVP 002060 G
CALMSL 007552 G	C\$RESE= 000033	ERCNTB 002554 G	G\$RADD= 000040	L\$DISP 002124 G
CKTRAP 007776 G	C\$REVI= 000003	ERLTBL 002650 G	G\$RADL= 000120	L\$DLY 002116 G
CLKBRL 002260 G	C\$RFLA= 000021	ERRBLK 004016 G	G\$RADO= 000020	L\$DTP 002040 G
CLKCSR 002256 G	C\$RPT = 000025	ERRMSG 004014 G	G\$XFER= 000004	L\$DTYP 002034 G
CLKHRZ 002264 G	C\$SEFG= 000046	ERRNBR 004012 G	G\$YES = 000010	L\$DU 012410 G
CLKINT 011460 G	C\$SPRI= 000041	ERRTYP 004010 G	HELP = 000000	L\$DUT 002072 G
CLKVEC 002262 G	C\$SVEC= 000037	ERSMRF 002552 G	HOE = 100000 G	L\$DVTY 004060 G
CLNRST 010026 G	C\$TPRI= 000013	ER0101 006200 G	HWPTQ1 017736	L\$EF 002052 G
CMPHST 010050 G	DELAY 010142 G	ER0503 006532 G	HWPTQ2 017754	L\$ENVI 002044 G
CSRA = 002200 G	DFPTBL 002152 G	ER1603 006570 G	HWPTQ3 020002	L\$ERRT 004010 G
CSRO = 000000 G	DIAGMC= 000000	ER7801 006662 G	IBE = 010000 G	L\$ETP 002102 G
CTRLCF 002222 G	DRADRT 002200 G	ER8401 006720 G	IDU = 000040 G	L\$EXP1 002046 G
C\$AU = 000052	DROP 012434	ER9301 007176 G	IER = 020000 G	L\$EXP4 002064 G

L\$XP5	002066	G	L10017	013006	G	PNT	=	001000	G	SWPTQ1	020126	T\$SUBN	=	000000			
L\$HARD	017702	G	L10020	013542	G	PREGRT	=	004042	G	SWPTQ2	020202	T\$TAGL	=	177777			
L\$HIME	002120	G	L10021	014276	G	PREG05	=	004020	G	SWPTQ3	020235	T\$TAGN	=	010033			
L\$MPCP	002016	G	L10022	014746	G	PRI	=	002000	G	S\$LSYM	=	010000	T\$TEMP	=	000000		
L\$MPTP	002022	G	L10023	015416	G	PRI00	=	000000	G	TIMER1	002266	T\$TEST	=	000012			
L\$HW	002152	G	L10024	016066	G	PRI01	=	000040	G	TIMER2	002270	T\$TSTM	=	177777			
L\$ICP	002104	G	L10025	016536	G	PRI02	=	000100	G	TIMER3	002272	T\$TSTS	=	000001			
L\$INIT	011566	G	L10026	017166	G	PRI03	=	000140	G	TNUM	=	000012	T\$\$AU	=	010016		
L\$LADP	002026	G	L10027	017616	G	PRI04	=	000200	G	TP4FLG	002252	T\$\$AUT	=	010013			
L\$LAST	020400	G	L10030	017676	G	PRI05	=	000240	G	TP4RTN	011530	T\$\$CLE	=	010014			
L\$LOAD	002100	G	L10031	017736	G	PRI06	=	000300	G	TP4VEC	002250	T\$\$DU	=	010015			
L\$LUN	002074	G	L10032	020126	G	PRI07	=	000340	G	TSTNUM	002226	T\$\$HAR	=	010031			
L\$MREV	002050	G	MAPLNS	=	177777	G	PUFIFO	=	010560	G	TXAD1A	002212	T\$\$HW	=	010000		
L\$NAME	002000	G	MFUNIT	=	004601	G	RBUFA	=	002202	G	TXAD10	=	000012	T\$\$INI	=	010012	
L\$PRIO	002042	G	MMENAB	=	002306	G	RBUFO	=	000002	G	TXAD2A	002214	T\$\$MSG	=	010007		
L\$PROT	011560	G	MMPRES	=	002304	G	RESETT	=	010642	G	TXAD20	=	000014	T\$\$PRO	=	010011	
L\$PRT	002112	G	MMSRO	=	002302	G	RXBCTX	=	000030	G	TXBFCA	002216	T\$\$RPT	=	010010		
L\$REPP	002062	G	MSG1	=	006316	G	RXBCTX	=	000020	G	TXBFCO	=	000016	T\$\$SOF	=	010032	
L\$REV	002010	G	MSG2	=	006374	G	RXBFUL	=	000100	G	TXJNTC	002244	T\$\$SW	=	010001		
L\$RPT	011552	G	MSG3	=	006453	G	RXINTC	=	002240	G	TXINTF	002246	T\$\$TES	=	010030		
L\$SOFT	020076	G	MSLCNT	=	002300	G	RXINTF	=	002242	G	TXRLNB	003750	T1	=	012526	G	
L\$SPC	002056	G	MSLGET	=	010202	G	RXTIMO	=	000002	G	TXRLNE	003770	T10	=	017620	G	
L\$SPCP	002020	G	MSLOOP	=	010316	G	RXTMA	=	002202	G	TXRXLB	003710	T2	=	013010	G	
L\$SPTP	002024	G	MSTICK	=	002276	G	RXVECA	=	002166	G	TXRXLE	003750	T3	=	013544	G	
L\$STA	002030	G	NDERPT	=	002164	G	ROSLOT	=	000002	G	TXVECA	002170	T4	=	014300	G	
L\$SW	002162	G	NEWPAS	=	012150	G	R1SLOT	=	000004	G	T\$ARGC	=	000002	T5	=	014750	G
L\$TEST	002114	G	NEWRES	=	012142	G	R2SLOT	=	000006	G	T\$CODE	=	001052	T6	=	015420	G
L\$TIML	002014	G	NEWSTA	=	011632	G	R3SLOT	=	000010	G	T\$ERRN	=	022125	T7	=	016070	G
L\$UNIT	002012	G	NUMLNS	=	000020	G	R4SLOT	=	000012	G	T\$EXCP	=	000000	T8	=	016540	G
L10000	002160	G	OOPS	=	010332	G	R5SLOT	=	000014	G	T\$FLAG	=	000050	T9	=	017170	G
L10001	002166	G	OPTION	=	002162	G	SAVBMP	=	010754	G	T\$GMAN	=	000000	UAM	=	000200	G
L10002	006314	G	O\$APTS	=	000000	G	SAVMST	=	011022	G	T\$HILI	=	177777	UNITN	=	002176	G
L10003	006566	G	O\$AU	=	000000	G	SFPTBL	=	002162	G	T\$LAST	=	000001	UNSDIV	=	011144	G
L10004	006660	G	O\$BGNR	=	000001	G	SKPSTS	=	011066	G	T\$LOLI	=	000000	WAIBIC	=	011300	G
L10005	006716	G	O\$BGNS	=	000001	G	STGTRB	=	003770	G	T\$LSYM	=	010000	WAIBIS	=	011354	G
L10006	007174	G	O\$DU	=	000001	G	STSTB	=	002610	G	T\$LTNO	=	000012	WORD1	=	002254	G
L10007	007366	G	O\$ERRT	=	000001	G	STSTE	=	002650	G	T\$NEST	=	177777	WTWLC	=	011430	G
L10010	011556	G	O\$GNSW	=	000001	G	SVCGBL	=	000000	G	T\$NSO	=	000000	X\$ALWA	=	000000	G
L10012	012366	G	O\$POIN	=	000001	G	SVCINS	=	000001	G	T\$NS1	=	000005	X\$FALS	=	000040	G
L10013	012370	G	O\$SETU	=	000000	G	SVCSUB	=	000001	G	T\$PTNU	=	000000	X\$OFFS	=	000400	G
L10014	012406	G	PASCNT	=	002236	G	SVCTAG	=	000001	G	T\$SAVL	=	177777	X\$TRUE	=	000020	G
L10015	012516	G	PCSL0T	=	000016	G	SVCTST	=	000001	G	T\$SEGL	=	177777	\$PATCH	=	020324	G
L10016	012524	G															

. ABS. 020400 000  
000000 001  
ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 28661 WORDS ( 112 PAGES)  
DYNAMIC MEMORY: 20060 WORDS ( 77 PAGES)  
ELAPSED TIME: 00:02:41  
CZDHWBO.BIN,CZDHWBO.LST/-SP=SVC34R/ML,CZDHWBO.P11