

DZ11

DZ11 ASYNC MUX TEST  
CZDZAH0

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Made In USA

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IDENTIFICATION  
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PRODUCT CODE: AC-8781H-MC  
PRODUCT NAME: CZDZAH0 DZ11 LN ASYNC MUX TSTS  
PRODUCT DATE: JUNE 1984  
MAINTAINER: MK-DIAGNOSTIC ENGINEERING

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1. ABSTRACT

THE FUNCTION OF THE DZ11 DIAGNOSTICS IS TO VERIFY THE OPTION OPERATES ACCORDING TO SPECIFICATIONS. THE DIAGNOSTICS ALSO VERIFY THAT THE DZ11 OPERATES IN ITS ENVIRONMENT SUCH AS THE SYSTEM IN WHICH IT IS INSTALLED.

PARAMETERS MAY BE SUPPLIED TO THE PROGRAM BY EITHER 'AUTO SIZING' OR INPUT FROM THE USER ON THE CONSOLE BY HAVING SW00-1 AT START TIME. AUTO SIZING WILL BE DONE ONLY THE FIRST TIME THE PROGRAM IS STARTED AND SW07-0 AND SW00-0 AND SW03-0. THE AUTOSIZER IS DESIGNED TO DETECT DZ11 DEVICE ADDRESSES AND VECTORS AND TO DETERMINE WHETHER THE DZ11 THAT IS DETECTED IS AN EIA OR 20MA BOARD. ALL REMAINING PARAMETERS DEFAULT TO CERTAIN VALUES (SEE SEC.8.5). CONSOLE INPUT MAY BE CONTROLLED AT ANY START TIME THROUGH THE USE OF SW00, SW03, SW04, AND SW06 (SEE SEC. 4.1.1 FOR A DETAILED DESCRIPTION OF THESE SWITCHES).

CURRENTLY THERE IS ONE STANDALONE DIAGNOSTIC (CZDZA), ONE SYSTEM FOR DEC X/11 (DZAA), AND AN ONLINE OVERLAY FOR DZITA (ITEP) - DZDZB. (ITEP) - DZDZB.

CZDZA WILL TEST ALL PARTS OF THE DZ11 SUCH AS CABLES, DIST PNL.. INTERFACE MODULE ITSELF.

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (WITH MINIMUM 8K MEMORY)  
ASR 33 (OR EQUIVALENT FOR CONSOLE)  
DZ11 INTERFACE MODULE (M7819(EIA), M7814(20MA))  
M3271 STAGGERED TURNAROUND CONNECTOR FOR EIA MODULE.  
M3190 STAGGERED TURNAROUND CONNECTOR FOR 20MA MODULE.  
M325 CABLE TURNAROUND AND DIST PNL TESTING FOR EIA MODULE.  
M315 THIS MAY BE SUBSTITUTED FOR M325.

NOTE: A STAGGERED TURNAROUND CONNECTOR IS NEEDED IN ORDER TO TEST THE PARITY AND BREAK LOGIC.

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2.2 STORAGE

PROGRAM WILL USE ALL 8K OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP LOADER RESIDE. LOCATION 1500 THRU 2000 ARE ESPECIALLY TO BE NOTED AND TO BE UNTOUCHED BY OPERATOR AFTER PARAMETERS HAVE BEEN INPUT FROM CONSOLE (SM00=1); OR AFTER THE 'AUTO SIZING' HAS BEEN DONE. THESE LOCATIONS MAY BE CHANGED IF THE USER UNDERSTANDS THEIR MEANING AND DIFFERENT PARAMETERS ARE REQUIRED.

3. LOADING PROCEEDURE

3.1 METHOD

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

ABSOLUTE LOADER STARTING ADDRESS \*500

MEMORY \* SIZE

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

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

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

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

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## 4. STARTING PROCEEDURE

- A. SET SWITCH REGISTER TO 000200  
 B. DEPRESS 'LOAD ADDRESS' KEY AND RELEASE  
 C. SET SWR TO ZERO FOR 'AUTO SIZING' OR SET SW00=1 FOR USER PARAMETER INPUT FROM CONSOLE TERMINAL. ON FIRST START IF SW07=1 AND SW00=0 THE PROGRAM WILL DEFAULT TO CONSOLE PARAMETER INPUT (SW00=1).  
 D. DEPRESS 'START KEY' AND RELEASE, THE PROGRAM WILL TYPE MAINDEC NAME AND PROGRAM NAME (IF THIS WAS THE FIRST START UP OF THE PROGRAM OR PARAMETERS WERE CHANGED BY SW00=1) AND ALSO THE FOLLOWING:

```
'MAP OF DZ11 STATUS'
1500 160100
1502 000300
1504 000005
1506 000377
1510 017070
1512 000000
```

THE ABOVE IS ONLY AN EXAMPLE! THIS WOULD INDICATE THE STATUS TABLE STARTING AT ADD. 1500 IN THE PROGRAM. THE STATUS TABLE MUST BE VERIFIED BY THE USER IF AUTO SIZING IS DONE. FOR INFORMATION OF STATUS TABLE SEE SECTION 8.4 FOR HELP.  
 THE PROGRAM WILL TYPE "RUNNING" AND PROCEED TO RUN THE DIAGNOSTIC.

## 4.1 CONTROL SWITCH SETTINGS

NOTE: IF THERE IS NO REAL SWR (177570); SWR MAY BE MODIFIED AT LOC:176 OR BY HITTING CONTROL "G" <↑G> ON CONSOLE TERMINAL.

```
SW 15 SET: HALT ON ERROR
SW 14 SET: LOOP ON CURRENT TEST
SW 13 SET: INHIBIT ERROR PRINT OUT
SW 12 SET: INHIBIT **ALL** TYPE OUT/BELL ON ERROR.
SW 11 SET: INHIBIT ITERATIONS. (QUICK PASS)
SW 10 SET: ESCAPE TO NEXT TEST
SW 09 SET: LOOP WITH CURRENT DATA
SW 08 SET: CATCH ERROR AND LOOP ON IT
SW 07 SET: NO AUTO SIZE. IF 1ST START OF PROGRAM AFTER LOADING THE
OPERATOR MUST INPUT ADDRESS AND VECTOR FROM CONSOLE.
SW 06 SET: RESELECT DZ11'S DESIRED ACTIVE
SW 05 SET: RESERVED
SW 04 SET: SELECT DELAY PARAMETER (SEE SEC. 4.1.1)
SW 03 SET: EXTRA PARAMETER INPUT (SEE SEC. 4.1.1)
SW 02 SET: LOCK ON SELECTED TEST
**SW 01 SET: RESTART PROGRAM AT SELECTED TEST
*SW 00 SET: GET USERS PARAMETERS FROM CONSOLE
```

- \* FOR ECHO OR CABLE TESTS (PROGRAM STARTED AT LOC. 210) THIS SWITCH SET TO 1 ALLOWS THE USER TO TYPE IN THE VECTOR AND THE CSR FOR THE DZ11 UNDER TEST.  
 \*\* FOR ECHO OR CABLE TEST THIS SWITCH SET TO 1 ALLOWS THE SELECTION OF EITHER THE ECHO OR CABLE TEST, BAUD RATE, AND THE LINE NUMBER UNDER TEST.

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#### 4.1.1 SWITCH REGISTER CONTROL OF PARAMETER INPUT FROM CONSOLE

- SW 00 GET USERS PARAMETERS FROM CONSOLE. SETTING THIS SWITCH AT START UP TIME ALLOWS THE USER TO INPUT AT THE CONSOLE TERMINAL THE FOLLOWING PARAMETERS: BASE DEVICE ADDRESS, BASE VECTOR ADDRESS, BUS REQUEST LEVEL, DECLARE EIA OR 20MA MODULE, MODE OF OPERATION (EXTERNAL, INTERNAL, OR STAGGERED), AND THE NUMBER OF DZ11'S THAT ARE RUNNING. USING THIS SWITCH ALONE DEFAULTS THE FOLLOWING PARAMETERS: ALL 8 LINES ARE SET TO BE TESTED ON EACH DZ11, THE DEFAULT BAUD RATE IS SET AT 9600 BAUD, AND THE CHARACTER LENGTH FOR THE MAJORITY OF TESTING IS SET AT EIGHT BITS PER CHARACTER WITH TWO STOP BITS.
- SW 03 EXTRA PARAMETER INPUT. SETTING THIS SWITCH AT START UP TIME PROVIDES THE USER WITH THE ABILITY TO SET THE LINES ACTIVE FOR TESTING AND TO SET THE DEFAULT BAUD RATE USED FOR THE MAJORITY OF THE DIAGNOSTIC TESTS. THE DELAY PARAMETER IS AUTOMATICALLY ADJUSTED TO THE BAUD RATE GIVEN BY THE USER.
- SW 04 SELECT DELAY PARAMETER. THE DELAY PARAMETER THIS SWITCH CONTROLS DETERMINES THE LENGTH OF TIME THE PROGRAM STALLS WAITING FOR A CHARACTER TO BE COMPLETELY TRANSMITTED OR RECEIVED. THIS DELAY COUNT IS AUTOMATICALLY SET TO PROVIDE ENOUGH DELAY TIME FOR THE DEFAULT BAUD RATE SPECIFIED WHEN RUNNING THE PROGRAM ON AN 11/45 WITH BIPOLAR MEMORY. WHEN RUNNING THIS PROGRAM ON A FASTER PROCESSOR THE DELAY PARAMETER SHOULD BE ADJUSTED PROPORTIONALLY HIGHER THAN THE FOLLOWING DEFAULTED VALUES:
- |      |            |            |
|------|------------|------------|
| 2450 | ; TIME FOR | 50 BAUD    |
| 1560 | ; TIME FOR | 75 BAUD    |
| 1120 | ; TIME FOR | 110 BAUD   |
| 0750 | ; TIME FOR | 134 BAUD   |
| 0660 | ; TIME FOR | 150 BAUD   |
| 0330 | ; TIME FOR | 300 BAUD   |
| 0150 | ; TIME FOR | 600 BAUD   |
| 0060 | ; TIME FOR | 1200 BAUD  |
| 0040 | ; TIME FOR | 1800 BAUD  |
| 0030 | ; TIME FOR | 2000 BAUD  |
| 0020 | ; TIME FOR | 2400 BAUD  |
| 0010 | ; TIME FOR | 3600 BAUD  |
| 0001 | ; TIME FOR | 4800 BAUD  |
| 0001 | ; TIME FOR | 7200 BAUD  |
| 0001 | ; TIME FOR | 9600 BAUD  |
| 0001 | ; TIME FOR | 19.2 KBAUD |

\*\*\* NOTE \*\*\*

19.2K BAUD IS AN UNSUPPORTED BAUD RATE. IT SHOULD NOT NORMALLY BE USED.  
9600 BAUD IS THE SPECIFIED MAXIMUM.

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#### 4.1.2 SWITCH REGISTER RESTRICTIONS

SW 06 RESELECT DZ11'S DESIRED ACTIVE. PLEASE NOTE THAT A MESSAGE IS TYPED OUT FOR SETTING THE SWITCH REGISTER EQUAL TO DZ11'S ACTIVE. THIS MEANS IF THE SYSTEM HAS FOUR DZ11S, BITS 00,01,02,03 WILL BE SET IN LOC 'DZACTV' FROM THE SWITCH REGISTER. USING THIS SWITCH(SW06) ALTERS THAT LOCATION, THEREFORE IF FOUR DZ11S ARE IN THE SYSTEM \*\*\*DO NOT\*\*\* SET SWITCHES GREATER THAN SW 03 IN THE UP POSITION. THIS WOULD BE A FATAL ERROR. DO NOT SELECT MORE ACTIVE DZ11S THAN HAS BEEN GIVEN INFORMATION ABOUT IN PARAMETER INPUT (SW00=1)

METHOD: A: LOAD ADDRESS 200  
B: START WITH SW 06=1  
C: PROGRAM WILL TYPE MESSAGE  
D: SET THE BINARY NUMBER OF DZ11S DESIRED ACTIVE EXAMPLE: 1=1 DZ11; 3=2 DZ11; 7=3 DZ11; 17=4 DZ11 37=5 DZ11 ETC/AA PRESS CONTINUE.  
E: NUMBER (IF VALID) WILL BE IN DATA LIGHTS (EXCLUDING 11/05)  
F: SET WITH ANY OTHER SWITCH SETTINGS DESIRED. PRESS CONTINUE.

SW 01 RESTART PROGRAM AT SELECTED TEST IT IS STRONGLY SUGGESTED THAT AT LEAST ONE PASS HAS BEEN MADE BEFORE TRYING TO SELECT A TEST THAT IS NOT IN THE ORDER OF SEQUENCE THE REASON BEING IS THAT THE PROGRAM HAS TO CLEAR AREAS AND SET UP PARAMETERS. NOTE: IF RUNNING MULTIPLE DZ11'S, THE DZ11 YOU DESIRE TO BE UNDER TEST MUST BE SELECTED BY THE USE OF SW06 BEFORE LOCKING ON THE TEST. IN OTHER WORDS, EACH TIME THE PROGRAM IS STARTED, THE FIRST DZ11 WILL BE SELECTED TO BE UNDER TEST UNLESS SW06 IS USED TO SELECT ONLY ONE.

SW 09 LOOP ON CURRENT DATA: THIS SWITCH WILL ONLY WORK IF CALL 'SCOPI' IS IN THAT TEST. THE REASON BEING THAT MOST TESTS DEAL WITH BLOCKS OF DIFFERENT DATA TO BE SENT OR RECEIVED ALL AT ONCE THUS IN BLOCK DATA, ONE PATTERN CAN'T BE SINGLED OUT. THIS SWITCH IS DESIGNED TO PROVIDE AN AID FOR A TRAINED TROUBLE-SHOOTER TO SAMPLE VARIOUS SIGNALS ON THE MODULE AND IS NOT MEANT TO BE USED AS A GENERAL USER CONTROL SWITCH.

SW 04 SELECT DELAY PARAMETER; THIS SWITCH SHOULD BE USED WITH CARE AS TOO SHORT A DELAY WILL CAUSE VALID TESTS TO FAIL ON CERTAIN PROCESSORS. IT IS RECOMMENDED THAT THIS SWITCH ONLY BE USED IN CONJUNCTION WITH SCOPE LOOPS, E.G. SW 14,9,4,1 SET; SW 9,4,2,1 SET. THE SHORTEST PARAMETER IS 1; THE LONGEST ACCEPTED IS 17776. (SEE SEC. 4.1.1)

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#### 4.1.3 SWITCH REGISTER PRIORITIES

##### ERROR SWITCHES

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

##### SCOPE SWITCHES

1. SW 09 (IF ENABLED BY 'SCOPI'). IF AN '\*' IS PRINTED IN FRONT OF THE TEST NO. ON AN ERROR REPORT (EX. \*TEST NO. 10) SW09 IS INCORPORATED IN THAT TEST AND THEREFORE SW09 IS \*USUALLY\* THE BEST SWITCH FOR THE SCOPE LOOP (SW14=0, SW10=0, SW09=1, SW08=0) IF THE PROGRAM USER IS TECHNICALLY TRAINED TO ELECTRONICALLY ISOLATE SIGNAL PROBLEMS ON THE DZ11 MODULE. IF SW09 IS NOT ENABLED; AND THERE IS A \*HARD\* ERROR (CONSTANT); SW08 IS BEST.
2. FOR INTERMITTENT ERRORS EITHER START THE PROGRAM WITH SW01 AND SW02 SET WHICH WILL ALLOW THE USER TO LOCK ON A SELECTED TEST, OR ELSE SET SW14 AS AN ERROR IS BEING TYPED OUT ON THE TERMINAL. SW14 WILL CONTINUE TO LOOP ON THAT TEST REGARDLESS OF WHETHER AN ERROR OCCURS.
3. SW 14 LOOP ON CURRENT TEST.

#### 4.2 STARTING ADDRESS

SA 200 - ADDRESS 200 IS FOR NORMAL EXECUTION OF THE DIAGNOSTIC. THIS WILL DO THE MAJOR TESTING NECESSARY FOR VERIFICATION OF HARDWARE.

SA 210 - CABLE/ECHO - TERMINAL TESTS. STARTING AT ADDRESS 210 WILL GIVE THE USER THE OPTION TO VERIFY THE EIA CABLES AT THE DIST PNL OR VERIFY A TRUE LINK TO ANY DEC SUPPORTED TERMINAL SUPPORTED BY THE DZ11.

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY. AFTER \*ALL\* AVAILABLE DZ11'S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

#### 5. OPERATING PROCEDURE

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



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329  
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331 5.1 NORMAL START OF DIAGNOSTIC  
332 ON THE FIRST START OF THE DIAGNOSTIC AT ADDRESS 200, IF AUTO  
333 SIZING IS NOT USED OR WHENEVER SW00=1, THE FOLLOWING QUESTIONS  
334 ARE ASKED AND MUST BE ANSWERED.  
335  
336 "1ST CSR ADDRESS (160000:163700): "  
337  
338 YOU MUST TYPE IN THE FIRST DZ11 CSR IN THE SYSTEM YOU WISH  
339 TESTING TO BEGIN AT. RANGE: 160000:163700  
340  
341 "1ST VECTOR ADDRESS (300:770): "  
342  
343 YOU MUST TYPE IN THE VECTOR OF THE FIRST DZ11 IN THE SYSTEM  
344 UNDER TEST. RANGE 300:770  
345  
346 "BR LEVEL (4:6): "  
347  
348 TYPE IN THE PRIORITY LEVEL OF THE DZ11 THAT THE ABOVE  
349 INFORMATION HAS BEEN GIVEN ABOUT. RANGE 4 OR 5 OR 6.  
350  
351 "TYPE "A" FOR EIA MODULE OR "B" FOR 20MA (A:B): "  
352  
353 TYPE "A" IF RUNNING A DZ11-A,B,E (EIA).  
354 TYPE "B" IF RUNNING A DZ11-C,D,F (20MA).  
355 TYPING A <CR> DEFAULTS TO EIA MODULES.  
356  
357 "MAINTENANCE MODE  
358 [EXTERNAL <H325>-EIA ONLY (E)]  
359 [INTERNAL <DZCSR03=1> (I)]  
360 [STAGGERED <H3271>-EIA ONLY (S)]  
361 [STAGGERED <H3190>-20MA ONLY (S)] :  
362  
363 TYPE "E" OR "I" OR "S" DEPENDING ON WHICH MODE YOU WISH TO RUN  
364 IN. IF RUNNING "EXTERNAL", ALL SELECTED LINES MUST BE  
365 TERMINATED BY AN H325 TEST CONNECTOR.  
366  
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"# OF DZ11'S <IN OCTAL> (1:20): "

TYPE TOTAL NUMBER OF DZ11'S TO BE TESTED IN THE SYSTEM. RANGE IS 1 THRU 20 IN OCTAL.

\*\*\*\*\* IF SW03=1 THEN \*\*\*\*\*  
IF SW03=1 THE FOLLOWING WILL BE PRINTED.

"LINES ACTIVE BY BIT <IN OCTAL> (001:377):"

EACH BIT REPRESENTS A LINE AND ANY COMBINATION OF LINES MAY BE SELECTED (HOWEVER IN STAGGERED MODE TWO ADJACENT LINES MUST BE SELECTED (0-1, 2-3, 4-5, 6-7))..

"DEFAULT BAUD RATE <IN OCTAL> (00:16): "

THIS GIVES THE USER A CHANCE TO CHANGE THE DEFAULT BAUD RATE USED IN APP. 90 PERCENT OF THE TEST. BAUD RATE CHOICES ARE:  
"00"( 50 BAUD), "01"( 75 BAUD), "02"( 110 BAUD), "03"( 134 BAUD),  
"04"( 150 BAUD), "05"( 300 BAUD), "06"( 600 BAUD), "07"(1200 BAUD),  
"10"(1800 BAUD), "11"(2000 BAUD), "12"(2400 BAUD), "13"(3600 BAUD),  
"14"(4800 BAUD), "15"(7200 BAUD), "16"(9600 BAUD), "17"(19.2 KBAUD)  
LOW DEFAULT BAUD RATES ARE NOT SUGGESTED SINCE THEY LENGTHEN THE TIME TO COMPLETE A PROGRAM PASS DRAMATICALLY.

\*\*\* NOTE \*\*\*  
SPEED SELECT CODE 17 CAN BE USED TO SELECT 19.2K BAUD, BUT THIS SPEED IS NOT SPECIFIED BY DEC, AND SHOULD NOT NORMALLY BE USED.

\*\*\*\*\*

IT IS IMPORTANT TO NOTE THAT ALL DZ11'S IN THE SYSTEM MUST BE CONTIGIOUS FOR BOTH ADDRESS AND VECTORS. ALSO ALL THE EXTRA PARAMETERS OTHER THAN CSR AND VECTORS ARE GIVEN TO THE EXISTING DZ11'S IN THE SYSTEM. IF NOT ALL DZ11'S ARE SAME PRIORITY OR IF THE MODE OF OPERATION IS DIFFERENT FOR EACH DZ11; THIS MUST BE "PATCHED" INTO THE CORRECT STATUS MAP ENTRY WHICH IS PRINTED AT START TIME. AN ALTERNATIVE IS TO PUT SW00=1 AT START TIME; ANSWER QUESTIONS ABOUT DZ11 UNDER TEST AND INDICATE ONLY 1 DZ11 IN THE SYSTEM. IF THE STATUS MAP IS TO BE "PATCHED" IT MUST BE DONE AFTER THE QUESTIONS ARE ANSWERED OR AFTER THE AUTO SIZE.

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410  
411 5.2 HOW TO RUN THE "CABLE/ECHO" TESTS.  
412  
413 NORMAL STARTING FOR THE FIRST TIME WOULD BE: LOAD ADDRESS 210; START  
414 WITH THE SWR EQUAL TO 003.  
415 NOTE: SW00=1 ASKS FOR "VECTOR" AND "CSR"  
416 SW01=1 ASKS FOR "WHICH TEST ECHO OR CABLE", "BAUD RATE", "LINE"  
417 UNDER TEST. PROGRAM WILL PRINT OUT:  
418  
419 "VECTOR ADDRESS-"  
420  
421 YOU TYPE VECTOR WITH A <CR>.  
422  
423 "CONTROL REGISTER ADDRESS-"  
424  
425 YOU TYPE IN DZCSR UNDER TEST.  
426  
427 "WHICH TEST ? ECHO OR CABLE (E OR C)"  
428  
429 LETS DO THE CABLE TEST FIRST. \*\*THIS TEST IS ONLY TO BE DONE ON  
430 THE EIA VERSION OF THE DZ11 NOT THE 20MA VERSION". TYPE "C"  
431 <CR>  
432  
433 "BAUD RATE- "  
434  
435 TYPE EITHER 50, 110, 135, 150, 300, 600, 1200 1800, 2000, 2400,  
436 3600, 4800, 7200, 9600 FOLLOWED BY <CR>  
437  
438 "LINE: "  
439  
440 YOU TYPE THE LINE WHICH HAS THE H325 TEST CONNECTOR. (TYPE  
441 EITHER 0, 1, 2, 3, 4, 5, 6, 7) PROGRAM WILL THEN PRINT:  
442  
443 "CABLE TEST"  
444  
445 AND IF EVERYTHING IS WORKING; THE FOLLOWING WILL BE PRINTED:  
446  
447 "PASS DONE."  
448 "PASS DONE."  
449 ETC.  
450 TO CHANGE LINES; HIT ANY PRINTING KEY ON YOUR CONSOLE TERMINAL  
451 WHILE THE PROGRAM IS RUNNING AND THE FOLLOWING WILL BE PRINTED:  
452  
453 "LINE: "  
454  
455 NOW CHANGE THE H325 TEST CONNECTOR TO ANOTHER LINE AND TYPE THE  
456 NEW LINE. PROGRAM WILL THEN PRINT:  
457  
458 "CABLE TEST"  
459 "PASS DONE."  
460 "PASS DONE."  
461 CONTINUE THIS OPERATION UNTIL ALL LINES ARE TESTED.

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5.3 ECHO TEST

IF PROGRAM HAS ALREADY BEEN STARTED AT 210 AND THE VECTOR AND ADDRESS HAVE BEEN TYPED IN; JUST LOAD ADDRESS 210 AND START WITH SWR EQUAL TO 002. PROGRAM WILL PRINT:

"WHICH TEST ? ECHO OR CABLE (E OR C)"

NOW TYPE AN "E" TO DO THE ECHO TEST. PROGRAM WILL PRINT:

"BAUD RATE-"

TYPE BAUD RATE AT WHICH THE TERMINAL IS SET THAT IS CONNECTED TO THE DZ11 DIST PNL. BAUD RATE CHOICES ARE: 50, 75, 110, 135, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600. THE PROGRAM WILL THEN PRINT:

LINE: "

TYPE THE LINE THE TERMINAL IS CONNECTED TO AT THE DIST PNL THEN THE PROGRAM WILL PRINT:

"TERMINAL ECHO TEST"

\*\*\* AT THIS POINT THE MESSAGE:

"THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789"

SHOULD BE PRINTED ON THE TERMINAL CONNECTED TO THE DZ11. IF THIS MESSAGE IS DESIRED TO BE CONTINUOUSLY OUTPUT; SET THE SWR TO 377 (SWR=377) WHILE IT IS BEING OUTPUT OR WHEN THE LINE NO. IS REQUESTED ABOVE. WHEN THIS MESSAGE IS DONE AND THE SWR IS NOT EQUAL TO 377; THE CONSOLE WILL PRINT:

"TYPE A CHAR. ON DZ11 TERMINAL"

ANY PRINTABLE CHAR HIT ON DZ11 TERMINAL SHOULD BE ECHOED BACK ON THE TERMINAL. \*\*IF YOU HIT CNTRL C <+C> ON THE DZ11 TERMINAL THE PROGRAM WILL PRINT:

"PASS DONE."

ON THE CONSOLE TERMINAL AND THE "QUICK BROWN FOX" WILL BE PRINTED ON DZ11 TERMINAL AGAIN AND THE ECHO TEST WILL BE RUNNING. TO CHANGE LINES: TYPE ANY PRINTABLE CHARACTER ON THE CONSOLE TERMINAL (NOT THE DZ11 TERMINAL). THE PROGRAM WILL AGAIN TYPE "LINE: " AND WAIT FOR A RESPONSE.

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19-JUN-84 15:45512  
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## 5.4 PROGRAM AND/OR OPERATOR ACTION

THE VARIETY OF PROGRAM CONTROL SWITCHES PROVIDED IN THIS DIAGNOSTIC PACKAGE IS DESIGNED TO PROVIDE THE USER WITH A WIDE RANGE OF TROUBLE-SHOOTING TECHNIQUES. BEFORE THE USER ATTEMPTS TO RUN THIS DIAGNOSTIC HE SHOULD BECOME FAMILIAR WITH THE USE OF THESE CONTROL SWITCHES AND THEIR RESTRICTIONS. (SEE SEC. 4.1, 4.1.1, 4.1.2, 4.1.3)

WHEN THE PROGRAM DETECTS AN ERROR THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBLY AN ERROR MESSAGE (DEPENDING ON THE PARTICULAR ERROR). IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT THEN LOOK IN THE PROGRAM LISTING FOR THAT TEST NUMBER AND THEN NOTE THE PC OF THE ERROR REPORT. THE REASON FOR THE ERROR REPORT WILL BECOME CLEARER WHEN READING THE COMMENTS IN THE PROGRAM LISTING.

## 6. ERRORS

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

## 6.2 ERROR RECOVERY

IF FOR SOME REASON THE DZ11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR TO REGAIN CONTROL OF CPU. IF THIS SHOULD HAPPEN, LOOK IN LOCATION '#TSTNM' (BYTE 1122) FOR THE NUMBER OF THE TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC ERROR. IN THIS WAY THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DZ11 WAS DOING AT THE TIME OF THE ERROR.

## 7. RESTRICTIONS

## 7.1 STARTING RESTRICTIONS

SEE SECTION 4.1.2  
STATUS TABLE SHOULD BE VERIFIED REGARDLESS OF HOW PROGRAM WAS STARTED. ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH THE INFORMATION PRINTED ON THE TTY TO COMPLETELY ISOLATE PROBLEMS.

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## 7.2 OPERATING RESTRICTIONS

PARAMETER MUST BE INPUT FROM USER OR APT IF "AUTO SIZING" IS NOT USED.

## 8. MISCELLANEOUS

## 8.1 EXECUTION TIME

ALL DZ11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS' MESSAGE (PROVIDING NO ERRORS AND SW12=0) WITHIN 2 MIN. THIS IS ASSUMING SW11=1 (INHIBIT ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION. THE ACTUAL EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION. AN 11/40 WITH CORE MEMORY WILL TAKE AROUND 100 SECONDS TO EXECUTE A PASS WITH NO ITERATIONS AND ABOUT 400 SECONDS TO EXECUTE A FULLY ITERATED PASS. ANY OTHER PDP11 CPU TYPE WILL EXECUTE A PASS IN TIME PROPORTIONAL TO THE EXECUTION SPEED OF THE CPU 'S MEMORY IN RELATION TO THAT OF AN 11/40.

## 8.2 PASS COMPLETE

NOTE: \*EVERY\* TIME THE PROGRAM IS STARTED; THE TESTS WILL RUN AS IF SW11 (DELETE ITERATIONS) WAS UP (=1). THIS IS TO 'VERIFY NO \*HARD\* ERRORS' AS SOON AS POSSIBLE. THEREFORE THE FIRST PASS -EACH TIME PROGRAM IS STARTED- WILL BE A 'QUICK PASS' UNTIL ALL DZ11'S IN SYSTEM ARE TESTED. WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

END PASS CZDZA-H CSR: 160010 VEC: 300 PASSES: 000001 ERRORS:

NOTE: THE NUMBERS FOR CSR AND VEC ARE NOT NECESSARILY THE VALUES FOR THE DEVICE. THEY ARE ONLY FOR THIS EXAMPLE.

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#### 8.4 KEY LOCATIONS

#LPADR (1126) CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.

NEXT (1360) CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PERFORMED.

#TSTNM (1122) CONTAINS THE NUMBER OF THE TEST NOW BEING PERFORMED.

RUN (1406) THE BIT IN 'RUN' ALWAYS POINTS ONE PAST THE DZ11 CURRENTLY BEING TESTED. EXAMPLE: (RUN) 1304/0000000001000000 MEANS THAT DZ11 NO.05 IS THE DZ11 NOW RUNNING.

STATUS MAP (1500)-(2000) THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 16 (DECIMAL) DZ11S SEQUENTIALY. THEY CONTAIN THE CSR,VECTOR AND STATUS CONCERNING THE CONFIGURATION OF EACH DZ11.

DZACTV (1404) EACH BIT SET IN THIS LOCATION INDICATES THAT THE ASSOCIATED DZ11 WILL BE TESTED IN TURN. EXAMPLE: (DZACTV) 1300/0000000000011111 MEANS THAT DZ11 NO. 00,01,02,03,04 WILL BE TESTED. EXAMPLE: (DZACTV) 1300/0000000000010001 MEANS THAT DZ11 NO. 00,04 WILL BE TESTED.

#BASE (1310) CONTAINS THE RECEIVER CSR OF THE CURRENT DZ11 UNDER TEST.

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8.4A MORE ON THAT 'STATUS TABLE' (1500-2000)

'MAP OF DZ11 STATUS'	
1500	160100
1502	000300
1504	000005
1506	000377
1510	017070
1512	000000

THE ABOVE INFORMATION WILL BE REPEATED FOR EACH OF UP TO 16 DZ11'S IN THE SYSTEM (THESE WILL FOLLOW UNDER THIS TABLE). EXPLANATION:

1500	160100	THIS IS THE SYSTEM CONTROL REGISTER FOR THE 1ST DZ11 IN THE SYSTEM.
1502	000300	THIS IS VECTOR 'A' FOR THE FIRST DZ11 IN THE SYSTEM.
1504	000005	THIS REPRESENTS THE BUS INTERRUPT PRIORITY LEVEL OF THE DZ11. BIT15 OF THIS LOCATION INDICATES EITHER EIA OR 20MA. IF BIT15=0 MODULE SHOULD BE AN M7819, IF BIT15=1 MODULE SHOULD BE AN M7814.
1506	000377	THIS IS THE BINARY REPRESENTATION OF WHAT LINES ARE TO BE TESTED.
1510	017070	THIS IS THE PARAMETER LOCATION USED IN MOST OF THE TESTS. IT INDICATES PARAMETERS OF: RX ON, SPEED SELECT 16 (9600 BAUD) EIGHT BITS PER CHAR, AND TWO STOP BITS. THE USER MAY ALTER THE STOP BITS AND THE SPEED, BUT THE REMAINING PARAMETERS SHOULD BE LEFT ALONE. THIS LOCATION IS USED TO LOAD THE DZ11 LINE PARAMETER REGISTER FOR EACH LINE. THE MEANING OF THE BITS SET IN THIS LOCATION IS THE SAME AS THE FUNCTION OF THE RELATED BITS IN THE DEVICE LINE PARAMETER REGISTER.
1512	000000	THIS LOCATION WILL CONTAIN EITHER ALL ZEROS INDICATING THAT INTERNAL LOOP WAS SELECTED AS MODE OF OPERATION OR IT WILL CONTAIN 100000 INDICATING THAT "STAGGERED MODE" WAS SELECTED OR IT WILL CONTAIN 000200 INDICATING THAT "EXTERNAL" WAS THE MODE SELECTED.

THE ABOVE IS REPEATED FOR EACH DZ11 IN THE SYSTEM. THE TABLE IS FILLED BY AUTO SIZING OR BY THE MANUAL PARAMETER INPUT PROGRAM AS DESCRIBED PREVIOUSLY. ALSO IF DESIRED BY USER, THE LOCATIONS MAY BE ALTERED BY HAND (TOGGLED IN) TO SUIT THE SPECIFIC CONFIGURATION.



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8.5 \*\*\* METHOD OF AUTO SIZING \*\*\*

8.5.1 FINDING THE CONTROL STATUS REGISTER.

THE PROGRAM WILL START AT ADDRESS 16C000 AND START 'REFERENCING' THE ADDRESS IN THE POINTER. IF A NON-EX MEMORY TRAP OCCURES, THE POINTER (HOLDING 160000) IS UPDATED BY 10 AND THE ABOVE IS REPEATED UNTIL ADDRESS 163700 IS REACHED. IF A 'SLAVE SYNC RESPONSE' WAS ISSUED BY THE DZ11 (OR ANY OTHER DEVICE) (NO NXM TRAP), "MASTER SCAN ENABLE" IS ATTEMPTED TO BE SET AND THE "TCR" BIT FOR LINE 7 IS SET. "TRDY" IS THEN TESTED TO BE SET AND BOTH "TCR07" AND "MASTER SCAN ENABLE" ARE TESTED TO BE STILL SET. IF ALL OF THIS WORKED, THEN A "DEVICE CLEAR" IS ISSUED TESTING THAT THE BIT CAN BE READ BACK AND THAT AFTER SOME TIME IT SELF CLEARS. IF ALL OF THE ABOVE WORKED, THIS DEVICE IS ASSUMED TO BE A DZ11. IF ANY OF THE ABOVE FAILED, UPDATING OF THE POINTER IS DONE AND THE SEQUENCE IS REPEATED.

NOTE: IF THE PROGRAM DOES NOT FIND YOUR DZ11, SOMETHING IS WRONG AND AUTO SIZING SHOULD NOT BE DONE. AFTER IDENTIFYING A DZ11 THE PROGRAM THEN ATTEMPTS TO SET ALL DTR BITS IN DEVICE REGISTER 4. IF ANY DTR BITS DID SET THE MODULE IS ASSUMED TO BE AN EIA MODULE (M7819) OTHERWISE THE STATUS MAP ENTRY IS SET FOR 20MA (M7814).

8.5.2 FINDING THE VECTOR

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '..2' (NEXT ADDRESS). BIT14 AND BITS (TX INTERRUPT ENABLE AND MSTSCAN ENABLE) ARE SET INTO THE DZCSR. "TCR07" IS THEN SET. A DELAY IS MADE AND IF NO INTERRUPT OCCURES (BECAUSE OF A BAD DZ11) THE PROGRAM ASSUMES VECTOR ADDRESS 300 AND THE PROBLEM SHOULD BE FIXED IN THE DIAGNOSTIC. ONCE THE PROBLEM IS FIXED, THE PROGRAM SHOULD BE RE-SETUP AGAIN TO GET CORRECT VECTOR. IF AN INTERRUPT OCCURRED, THE ADDRESS TO WHICH THE DZ11 INTERRUPTED TO IS PICKED UP AND REPORTED AS THE VECTOR. NOTE: IF THE VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU, THERE IS A PROBLEM AND AUTO SIZING SHOULD NOT BE DONE.

8.5.3 PARAMETER ASSUMPTIONS.

SINCE TOO MUCH HARDWARE WOULD NEED TO BE TURNED ON TO SIZE THE REST OF THE PARAMETERS, THE PROGRAM MUST ASSUME THE REMAINING VARIATIONS. THE RESULT IF NOT TO YOUR SPECIFIC CONFIGURATION MAY BE ALTERED BY HAND (TOGGLE IN) IF DESIRED). IN THIS WAY 95 PERCENT OF THE PARAMETER SETUP WAS DONE BY THE PROGRAM, AND 5 PERCENT BY YOU.

- THEREFORE:
- 1) BUS PRIORITY IS SET TO LEVELS.
  - 2) ALL EIGHT LINES ARE ASSUMED TO BE TESTED.
  - 3) DEFAULT BAUD RATE IS SET TO 16 (9600 BAUD).
  - 4) MODE OF OPERATION IS "INTERNAL MODE".

FOR ALL PARAMETER ADJUSTMENTS PLEASE REFER TO SECTION 8.4A FOR GREATER DETAIL.

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9.0 RUNNING THE DZ11 DIAGNOSTIC UNDER APT

9.1.1 THE APT INTERFACE

CZDZA HAS BEEN REDESIGNED TO BE COMPATIBLE WITH THE APT-AUTOMATED PRODUCT TEST SYSTEM. IT CAN BE RUN AS A STANDALONE DIAGNOSTIC OR IN EITHER OF THE APT MODES. CERTAIN VARIABLES IN THE ORIGINAL APT MODULE WERE REASSIGNED TO THE AREAS SET ASIDE FOR APT INTERFACING. THESE NEW VARIABLES GENERALLY BEGIN WITH A DOLLAR SIGN (\$), E.G., \$DEVH, \$BASE.

9.1.2 SETTING UP THE DIAGNOSTIC USING APT

THE DIAGNOSTIC USES SEVERAL VARIABLES IN THE REGION SUBTITLED 'APT MAILBOX-ETABLE'. THESE VARIABLES ARE:

\$SMREG - USED IF A SOFTWARE SWITCH REGISTER IS DESIRED WHILE UNDER APT

\$VECT1 - USED TO SPECIFY THE INTERRUPT LEVEL AND THE FIRST VECTOR ADDRESS

\$BASE - USED TO INDICATE BOTTOM ADDRESS OF DZ11 UNDER TEST

\$DEVH - A BIT MAP REPRESENTING WHICH DZ11'S WILL BE TESTED

\$CDW1 - USED TO INDICATE WHICH LINES TO RUN ON ALL DZ11'S

\$DDW0 - EACH OF THE \$DDW WORDS DESCRIBES THE PARAMETERS (LPR) FOR A PARTICULAR DZ11, GOING UP TO 16 DZ11'S

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9.1.3 RUNNING UNDER APT

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THE USER SHOULD BE FAMILIAR WITH THE APT SYSTEM. THE APT TIMING PARAMETERS FOR THE DZ11 DIAGNOSTIC WERE BASED ON AN 11/40 PROCESSOR. IT MAY BE NECESSARY TO ADD A FEW MORE SECONDS IF THE DIAGNOSTIC IS OUT ON AN 11/05 PROCESSOR.

ALL OF THE VARIABLES MENTIONED IN SECTION 9.1.2 SHOULD BE SET UP PRIOR TO RUNNING THE DIAGNOSTIC UNDER APT.

NOTE

BE SURE #BASE POINTS TO THE FIRST DZ11 BEFORE RUNNING

BASED ON THESE VALUES, THE DIAGNOSTIC WILL SET UP THE STATUS TABLE. THE USER IS THEN FREE TO MONITOR UNDER APT AS NORMAL.

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770
771
772          10.0  CHANGE HISTORY
773
774          NOTE: HISTORY STARTS WITH REV. FO
775
776          REV          CHANGE DESCRIPTION
777          ---          -----
778
779          FO:          ALTER TRANSMITTER INTERRUPT SERVICE ROUTINE
780                      TO ALLOW MORE TIME FOR THE TCR BIT TO CLEAR BEFORE
781                      LOWERING THE BUS PRIORITY TO ENABLE DZ11 INTERRUPTS.
782
783          GO:          MAY 1981 - INCORPORATE XON/XOFF FEATURES (BY ASSEMBLING WITH
784                      LATEST SYSMAC - C5) AND CHANGE "." CODE MODIFIERS AT END
785                      OF PROGRAM FROM ABSOLUTE ADDRESS MODE TO RELATIVE. ALSO, THE
786                      DEFAULT BAUD RATE WAS CHANGED TO 9600 BAUD, SINCE 19.2K BAUD IS
787                      NOT SUPPORTED, AND TEST 34 WAS CHANGED TO REMOVE 19.2K TESTING.
788
789          HO:          JUNE 1984 - ADDED BAUD RATE TIMING TEST. ADDED IN ORDER
790                      TO TEST CRYSTAL SPEEDS. TRANSMITTS CHARACTERS TO ALL 8 LINES
791                      AT ALL BAUD RATES (EXCEPT 19200 BAUD) FOR 1 SECOND AND IF THE
792                      NUMBER OF CHARACTERS TRANSMITTED IS WITHIN A RANGE, THE TEST
793                      WILL PASS.
794
795
796
797
798
799
800          ; -PRGFRT-----
801          .TITLE CZDZA-HO
802          ;*COPYRIGHT (C) 1976,1984
803          ;*DIGITAL EQUIPMENT CORP.
804          ;*MAYNARD, MASS. 01754
805          ;*
806          ;*
807          ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
808          ;*PACKAGE (MAINDEC-11-DZQAC-C5), JAN. 1981.
809          ;*
810          ;*TN=1
811          ;STARTING PROCEDURE
812          ;LOAD PROGRAM
813          ;LOAD ADDRESS 000200
814          ;PRESS START
815          ;PROGRAM WILL TYPE "CZDZA-HO/<200>/CZDZAHO DZ11 LN ASYNC MUX TSTS "
816          ;PROGRAM WILL TYPE "RUNNING" TO INDICATE THAT TESTING HAS STARTED
817          ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
818          ;AND THEN RESUME TESTING
819
820          .SBTTL BASIC DEFINITIONS
821          ;*INITIAL ADDRESS OF THE STACK POINTER *** 1120 ***
822          STACK= 1120
823          .EQUIV EMT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
824          .EQUIV IOT,SCOPE      ;;BASIC DEFINITION OF SCOPE CALL
825
826          ;*MISCELLANEOUS DEFINITIONS

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826	000011	HT=	11	::	CODE FOR HORIZONTAL TAB
827	000012	LF=	12	::	CODE FOR LINE FEED
828	000015	CR=	15	::	CODE FOR CARRIAGE RETURN
829	000200	CRLF=	200	::	CODE FOR CARRIAGE RETURN-LINE FEED
830	177776	PS=	177776	::	PROCESSOR STATUS WORD
831		.EQUIV	PS,PSW		
832	177774	STKLMT=	177774	::	STACK LIMIT REGISTER
833	177772	PIRQ=	177772	::	PROGRAM INTERRUPT REQUEST REGISTER
834	177570	DSMR=	177570	::	HARDWARE SWITCH REGISTER
835	177570	DDISP=	177570	::	HARDWARE DISPLAY REGISTER
836					
837		; *GENERAL PURPOSE REGISTER DEFINITIONS			
838	000000	R0=	#0	::	GENERAL REGISTER
839	000001	R1=	#1	::	GENERAL REGISTER
840	000002	R2=	#2	::	GENERAL REGISTER
841	000003	R3=	#3	::	GENERAL REGISTER
842	000004	R4=	#4	::	GENERAL REGISTER
843	000005	R5=	#5	::	GENERAL REGISTER
844	000006	R6=	#6	::	GENERAL REGISTER
845	000007	R7=	#7	::	GENERAL REGISTER
846	000006	SP=	#6	::	STACK POINTER
847	000007	PC=	#7	::	PROGRAM COUNTER
848					
849		; *PRIORITY LEVEL DEFINITIONS			
850	000000	PR0=	0	::	PRIORITY LEVEL 0
851	000040	PR1=	40	::	PRIORITY LEVEL 1
852	000100	PR2=	100	::	PRIORITY LEVEL 2
853	000140	PR3=	140	::	PRIORITY LEVEL 3
854	000200	PR4=	200	::	PRIORITY LEVEL 4
855	000240	PR5=	240	::	PRIORITY LEVEL 5
856	000300	PR6=	300	::	PRIORITY LEVEL 6
857	000340	PR7=	340	::	PRIORITY LEVEL 7
858					
859		; *"SWITCH REGISTER" SWITCH DEFINITIONS			
860	100000	SW15=	100000		
861	040000	SW14=	40000		
862	020000	SW13=	20000		
863	010000	SW12=	10000		
864	004000	SW11=	4000		
865	002000	SW10=	2000		
866	001000	SW09=	1000		
867	000400	SW08=	400		
868	000200	SW07=	200		
869	000100	SW06=	100		
870	000040	SW05=	40		
871	000020	SW04=	20		
872	000010	SW03=	10		
873	000004	SW02=	4		
874	000002	SW01=	2		
875	000001	SW00=	1		
876		.EQUIV	SW09,SW9		
877		.EQUIV	SW08,SW8		
878		.EQUIV	SW07,SW7		
879		.EQUIV	SW06,SW6		
880		.EQUIV	SW05,SW5		
881		.EQUIV	SW04,SW4		

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882      .EQUIV SW03,SW3
883      .EQUIV SW02,SW2
884      .EQUIV SW01,SW1
885      .EQUIV SW00,SW0
886
887      ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
888      100000 BIT15= 100000
889      040000 BIT14= 40000
890      020000 BIT13= 20000
891      010000 BIT12= 10000
892      004000 BIT11= 4000
893      002000 BIT10= 2000
894      001000 BIT09= 1000
895      000400 BIT08= 400
896      000200 BIT07= 200
897      000100 BIT06= 100
898      000040 BIT05= 40
899      000020 BIT04= 20
900      000010 BIT03= 10
901      000004 BIT02= 4
902      000002 BIT01= 2
903      000001 BIT00= 1
904      .EQUIV BIT09,BIT9
905      .EQUIV BIT08,BIT8
906      .EQUIV BIT07,BIT7
907      .EQUIV BIT06,BIT6
908      .EQUIV BIT05,BIT5
909      .EQUIV BIT04,BIT4
910      .EQUIV BIT03,BIT3
911      .EQUIV BIT02,BIT2
912      .EQUIV BIT01,BIT1
913      .EQUIV BIT00,BIT0
914
915      ;*BASIC "CPU" TRAP VECTOR ADDRESSES
916      000004 ERRVEC= 4           ;;TIME OUT AND OTHER ERRORS
917      000010 RESVEC= 10        ;;RESERVED AND ILLEGAL INSTRUCTIONS
918      000014 TBITVEC=14       ;; "T" BIT
919      000014 TRTVEC= 14        ;;TRACE TRAP
920      000014 BPTVEC= 14       ;;BREAKPOINT TRAP (BPT)
921      000020 IOTVEC= 20        ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
922      000024 PWRVEC= 24       ;;POWER FAIL
923      000030 EMTVEC= 30       ;;EMULATOR TRAP (EMT) **ERROR**
924      000034 TRAPVEC=34       ;; "TRAP" TRAP
925      000060 TKVEC= 60        ;;TTY KEYBOARD VECTOR
926      000064 TPVEC= 64       ;;TTY PRINTER VECTOR
927      000240 PIRQVEC=240      ;;PROGRAM INTERRUPT REQUEST VECTOR
928
929
930      ;INSTRUCTION DEFINITIONS
931      ;-----
932
933      005746 PUSH1SP=5746      ;DECREMENT PROCESSOR STACK 1 WORD
934      005726 POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
935      010046 PUSHRO=10046    ;SAVE R0 ON STACK
936      012600 POPRO=12600    ;RESTORE R0 FROM STACK
937      024646 PUSH2SP=24646  ;DECREMENT STACK TWICE

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GENERAL DEFINITIONS AND EQUIVALENCES

```

938      022626      POP2SP=22626      ;INCREMENT STACK TWICE
939
940      ;DZ11 CONTROL AND STATUS REGISTER DEFINITIONS
941      ;(DZCSR)      BIT DEFINITIONS
942      ;-----
943
944      000010      MAINT = BIT3      ;MAINTENANCE MODE ENABLE
945      000020      DCLR=BIT4      ;DEVICE CLEAR
946      000040      MSENAB=BIT5      ;MASTER SCAN ENABLE
947      000100      RIE=BIT6      ;RECEIVER INTERRUPT ENABLE
948      000200      RDONE=BIT7      ;RECEIVER DONE
949      010000      SILOEN= BIT12      ;SILO ALARM ENABLE
950      020000      SILOAL = BIT13      ;SILO ALARM
951      040000      TIE=BIT14      ;TRANSMITTER INTERRUPT ENABLE
952      100000      TRDY=BIT15      ;TRANSMITTER READY
953
954      000021      $XON=21
955      000023      $XOFF=23
956
957      ;DZCSR WORD DEFINITIONS
958      ;-----
959      000000      TLO=0      ;TRANSMIT LINE 0
960      000400      TL1=BIT8      ;TRANSMIT LINE 1
961      001000      TL2=BIT9      ;TRANSMIT LINE 2
962      001400      TL3=BIT9:BIT8      ;TRANSMIT LINE 3
963      002000      TL4=BIT10      ;TRANSMIT LINE 4
964      002400      TL5=BIT10:BIT8      ;TRANSMIT LINE 5
965      003000      TL6=BIT10:BIT9      ;TRANSMIT LINE 6
966      003400      TL7=BIT10:BIT9:BIT8      ;TRANSMIT LINE 7
967
968      ;DZRBUF BIT DEFINITIONS
969      ;-----
970
971
972      010000      PARER=BIT12      ;PARITY ERROR
973      020000      FRMERR=BIT13      ;FRAME ERROR
974      040000      OVERRUN=BIT14      ;OVERRUN ERROR
975      100000      DVALID=BIT15      ;DATA VALID
976
977      ;DZRBUF WORD DEFINITIONS
978      ;-----
979
980      000000      RLO=0      ;RECEIVER LINE 0
981      000400      RL1=BIT8      ;RECEIVER LINE 1
982      001000      RL2=BIT9      ;RECEIVER LINE 2
983      001400      RL3=BIT9:BIT8      ;RECEIVER LINE 3
984      002000      RL4=BIT10      ;RECEIVER LINE 4
985      002400      RL5=BIT10:BIT8      ;RECEIVER LINE 5
986      003000      RL6=BIT10:BIT9      ;RECEIVER LINE 6
987      003400      RL7=BIT10:BIT9:BIT8      ;RECEIVER LINE 7
988
989      ;DZLPR WORD DEFINITIONS
990      ;-----
991
992      000000      LP0=0      ;LINE PARAMETER 0
993      000001      LP1=BIT0      ;LINE PARAMETER 1

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## GENERAL DEFINITIONS AND EQUIVALENCES

994	000002	LP2-BIT1	;LINE PARAMETER 2
995	000003	LP3-BIT1!BIT0	;LINE PARAMETER 3
996	000004	LP4-BIT2	;LINE PARAMETER 4
997	000005	LP5-BIT2!BIT0	;LINE PARAMETER 5
998	000006	LP6-BIT2!BIT1	;LINE PARAMETER 6
999	000007	LP7-BIT2!BIT1!BIT0	;LINE PARAMETER 7
1000			
1001	000000	FIVE=0	;FIVE BITS/CHAR,1 STOP BIT
1002	000010	SIX=BIT3	;SIX BITS/CHAR,1 STOP BIT
1003	000020	SEVEN=BIT4	;SEVEN BITS/CHAR,1 STOP BIT
1004	000030	EIGHT=BIT4!BIT3	;EIGHT BITS/CHAR,1 STOP BIT
1005	000040	FIVES=BIT5	;FIVE BITS/CHAR,2 STOP BITS
1006	000050	SIXS=BIT5!BIT3	;SIX BITS/CHAR,2 STOP BITS
1007	000060	SEVENS=BIT5!BIT4	;SEVEN BITS/CHAR, 2 STOP BITS
1008	000070	EIGHTS=BIT5!BIT4!BIT3	;EIGHT BITS/CHAR, 2 STOP BITS
1009			
1010	000100	PARITY=BIT6	;PARITY ENABLED
1011	000200	ODDPAR=BIT7	;ODD PARITY ENABLED
1012	000000	ONESTOP=0	;ONE STOP BIT ENABLED
1013	000040	TWOSTOP=BIT5	;TWO STOP BITS ENABLED
1014	000000	EVEPAR=0	;EVEN PARITY ENABLED
1015	010000	RCVON=BIT12	;ENABLE RECEIVER (RECEIVER ON)
1016			
1017	000000	S50=0	;SPEED 50 BAUD
1018	000400	S75=BIT8	;SPEED 75 BAUD
1019	001000	S110=BIT9	;SPEED 110 BAUD
1020	001400	S134=BIT9!BIT8	;SPEED 134.5 BAUD
1021	002000	S150=BIT10	;SPEED 150 BAUD
1022	002400	S300=BIT10!BIT8	;SPEED 300 BAUD
1023	003000	S600=BIT10!BIT9	;SPEED 600 BAUD
1024	003400	S1200=BIT10!BIT9!BIT8	;SPEED 1200 BAUD
1025	004000	S1800=BIT11	;SPEED 1800 BAUD
1026	004400	S2000=BIT11!BIT8	;SPEED 2000 BAUD
1027	005000	S2400=BIT11!BIT9	;SPEED 2400 BAUD
1028	005400	S3600=BIT11!BIT9!BIT8	;SPEED 3600 BAUD
1029	006000	S4800=BIT11!BIT10	;SPEED 4800 BAUD
1030	006400	S7200=BIT11!BIT10!BIT8	;SPEED 7200 BAUD
1031	007000	S9600=BIT11!BIT10!BIT9	;SPEED 9600 BAUD
1032	007400	S19200=BIT11!BIT10!BIT9!BIT8	;SPEED 19200 BAUD
1033			
1034			
1035			
1036	000001	TCR0=BIT0	;TCR0
1037	000002	TCR1=BIT1	;TCR1
1038	000004	TCR2=BIT2	;TCR2
1039	000010	TCR3=BIT3	;TCR3
1040	000020	TCR4=BIT4	;TCR4
1041	000040	TCR5=BIT5	;TCR5
1042	000100	TCR6=BIT6	;TCR6
1043	000200	TCR7=BIT7	;TCR7
1044	000400	DTR0=BIT8	;DTR0
1045	001000	DTR1=BIT9	;DTR1
1046	002000	DTR2=BIT10	;DTR2
1047	004000	DTR3=BIT11	;DTR3
1048	010000	DTR4=BIT12	;DTR4
1049	020000	DTR5=BIT13	;DTR5

## ;DZTCR BIT DEFINITIONS



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GENERAL DEFINITIONS AND EQUIVALENCES

1050 040000  
 1051 100000  
 1052  
 1053  
 1054  
 1055 000001  
 1056 000002  
 1057 000004  
 1058 000010  
 1059 000020  
 1060 000040  
 1061 000100  
 1062 000200  
 1063 000400  
 1064 001000  
 1065 002000  
 1066 004000  
 1067 010000  
 1068 020000  
 1069 040000  
 1070 100000

DTR6=BIT14 ;DTR6  
 DTR7=BIT15 ;DTR7  
  
 ;DZMSR BIT DEFINITIONS  
 ;-----  
 RING0=BIT0 ;RING INDICATED ON LINE 0  
 RING1=BIT1 ;RING INDICATED ON LINE 1  
 RING2=BIT2 ;RING INDICATED ON LINE 2  
 RING3=BIT3 ;RING INDICATED ON LINE 3  
 RING4=BIT4 ;RING INDICATED ON LINE 4  
 RING5=BIT5 ;RING INDICATED ON LINE 5  
 RING6=BIT6 ;RING INDICATED ON LINE 6  
 RING7=BIT7 ;RING INDICATED ON LINE 7  
 C00=BIT8 ;CARRIER PRESENT ON LINE 0  
 C01=BIT9 ;CARRIER PRESENT ON LINE 1  
 C02=BIT10 ;CARRIER PRESENT ON LINE 2  
 C03=BIT11 ;CARRIER PRESENT ON LINE 3  
 C04=BIT12 ;CARRIER PRESENT ON LINE 4  
 C05=BIT13 ;CARRIER PRESENT ON LINE 5  
 C06=BIT14 ;CARRIER PRESENT ON LINE 6  
 C07=BIT15 ;CARRIER PRESENT ON LINE 7

1071  
 1072  
 1073  
 1074  
 1075 000400  
 1076 001000  
 1077 002000  
 1078 004000  
 1079 010000  
 1080 020000  
 1081 040000  
 1082 100000

;DZTDR BIT DEFINITIONS  
 ;-----  
 BRK0=BIT8 ;BREAK FOR LINE 0  
 BRK1=BIT9 ;BREAK FOR LINE 1  
 BRK2=BIT10 ;BREAK FOR LINE 2  
 BRK3=BIT11 ;BREAK FOR LINE 3  
 BRK4=BIT12 ;BREAK FOR LINE 4  
 BRK5=BIT13 ;BREAK FOR LINE 5  
 BRK6=BIT14 ;BREAK FOR LINE 6  
 BRK7=BIT15 ;BREAK FOR LINE 7

1083  
 1084  
 1085  
 1086  
 1087  
 1088  
 1089  
 1090  
 1091  
 1092  
 1093  
 1094  
 1095  
 1096  
 1097  
 1098  
 1099  
 1100  
 1101  
 1102

;TABLE OF LOOP AROUND FUNCTIONS (H325)  
 ;  
 ; -----  
 ; I †  
 ; V †  
 ; REC DATA TRANS DATA  
 ; -----  
 ; I †  
 ; V †  
 ; CO RTS  
 ; -----  
 ; I †  
 ; V †  
 ; RING DTR

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TRAPCATCHER FOR UNEXPECTED INTERRUPTS

```

1103 ;:*****
1104 ;-----
1105 ; TRAPCATCHER FOR ILLEGAL INTERRUPTS
1106 ; THE STANDARD "TRAP CATCHER" IS PLACED
1107 ; BETWEEN ADDRESS 0 TO ADDRESS 776.
1108 ; IT LOOKS LIKE "PC+2 HALT".
1109 ;-----
1110 ;:*****
1111
1112 000000 .=0 ; STANDARD INTERRUPT VECTORS
1113 ;-----
1114
1115
1116 000010 .=10 SET.PS ; FAKE "MTPS" INSTRUCTION TRAP
1117 000010 011440 PR7 ; MAKE SURE PS IS PRIORITY 7
1118 000012 000340
1119
1120 000020 .=20
1121 000020 005122 .SCOPE ; SCOPE LOOP HANDLER
1122 000022 000340 PR7 ; HANDLE AT PRIORITY 7
1123 000024 010320 $PWDRN ; POWER FAIL HANDLER
1124 000026 000340 340 ; SERVICE AT PRIORITY LEVEL 7
1125 000030 007230 $ERROR ; ERROR HANDLER
1126 000032 000340 340 ; SERVICE AT PRIORITY LEVEL 7
1127 000034 007122 .TRPSRV ; GENERAL HANDLER DISPATCH SERVICE
1128 000036 000340 340 ; SERVICE AT PRIORITY LEVEL 7
1129 .SBTTL ACT11 HOOKS
1130
1131 ;:*****
1132 ; HOOKS REQUIRED BY ACT11
1133 000040 $SVPC=. ; SAVE PC
1134 000046 .=46
1135 000046 005056 $ENDAD ;:1)SET LOC.46 TO ADDRESS OF $ENDAD IN .#EOP
1136 000052 .=52
1137 000052 000000 .WORD 0 ;:2)SET LOC.52 TO ZERO
1138 000040 .=$SVPC ;: RESTORE PC
1139
1140 .=174
1141 000174 000000 DISPREG:0 ; SOFTWARE DISPLAY REGISTER FOR SWITCHLESS 11S
1142 000176 000000 SMREG: 0 ; SOFTWARE SWITCH REGISTER FOR SWITCHLESS 11S
1143 000200 .=200
1144 000200 000137 002150 JMP .START ; GO TO START OF PROGRAM
1145 000210 000210 .=210
1146 000210 000137 025216 JMP XSTART ; GOTO CABLE TEST/ECHO TEST
1147
1148
1149 001000 .=1000
1150 001000 005200 055103 055104 MTITLE: .ASCIZ <200><12>/CZDZA-MO/<200>/CZDZAH0 DZ11 LN ASYNC MUX TSTS /<200>
(2)

```

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 CZDZAH.P11 19-JUN-84 15:45 COMMON TAGS

```

1151 .SBTTL COMMON TAGS
1152
1153 ;*****
1154 ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
1155 ;*USED IN THE PROGRAM.
1156
1157 001120 .=1120 ;:START OF COMMON TAGS
1158 001120 $CHTAG: .WORD 0 ;:CONTAINS THE TEST NUMBER
1159 001120 000000 $TSTNM: .BYTE 0 ;:CONTAINS ERROR FLAG
1160 001122 000 $ERFLG: .BYTE 0 ;:CONTAINS SUBTEST ITERATION COUNT
1161 001123 000 $ICNT: .WORD 0 ;:CONTAINS SCOPE LOOP ADDRESS
1162 001124 000000 $LPADR: .WORD 0 ;:CONTAINS SCOPE RETURN FOR ERRORS
1163 001126 000000 $LPERR: .WORD 0 ;:CONTAINS TOTAL ERRORS DETECTED
1164 001130 000000 $ERTTL: .WORD 0 ;:CONTAINS ITEM CONTROL BYTE
1165 001132 000000 $ITEMB: .BYTE 0 ;:CONTAINS MAX. ERRORS PER TEST
1166 001134 000 $ERMAX: .BYTE 1 ;:CONTAINS PC OF LAST ERROR INSTRUCTION
1167 001135 001 $ERRPC: .WORD 0 ;:CONTAINS ADDRESS OF 'GOOD' DATA
1168 001136 000000 $GDADR: .WORD 0 ;:CONTAINS ADDRESS OF 'BAD' DATA
1169 001140 000000 $BDADR: .WORD 0 ;:CONTAINS 'GOOD' DATA
1170 001142 000000 $GDDAT: .WORD 0 ;:CONTAINS 'BAD' DATA
1171 001144 000000 $BDDAT: .WORD 0 ;:RESERVED--NOT TO BE USED
1172 001146 000000 .WORD 0
1173 001150 000000 .WORD 0
1174 001152 000000 .WORD 0
1175 001154 000 $AUTOB: .BYTE 0 ;:AUTOMATIC MODE INDICATOR
1176 001155 000 $INTAG: .BYTE 0 ;:INTERRUPT MODE INDICATOR
1177 001156 000000 .WORD 0
1178 001160 177570 $SWR: .WORD DSWR ;:ADDRESS OF SWITCH REGISTER
1179 001162 177570 $DISPLAY: .WORD DDISP ;:ADDRESS OF DISPLAY REGISTER
1180 001164 177560 $TKS: 177560 ;:TTY KBD STATUS
1181 001166 177562 $TKB: 177562 ;:TTY KBD BUFFER
1182 001170 177564 $TPS: 177564 ;:TTY PRINTER STATUS REG. ADDRESS
1183 001172 177566 $TPB: 177566 ;:TTY PRINTER BUFFER REG. ADDRESS
1184 001174 000 $NULL: .BYTE 0 ;:CONTAINS NULL CHARACTER FOR FILLS
1185 001175 002 $FILLS: .BYTE 2 ;:CONTAINS # OF FILLER CHARACTERS REQUIRED
1186 001176 012 $FILLC: .BYTE 12 ;:INSERT FILL CHARS. AFTER A "LINE FEED"
1187 001177 000 $TPFLG: .BYTE 0 ;:"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
1188 001200 000000 $REGAD: .WORD 0 ;:CONTAINS THE ADDRESS FROM
1189 ;:WHICH ($REGO) WAS OBTAINED
1190 001202 000000 $REG0: .WORD 0 ;:CONTAINS (($REGAD)+0)
1191 001204 000000 $REG1: .WORD 0 ;:CONTAINS (($REGAD)+2)
1192 001206 000000 $REG2: .WORD 0 ;:CONTAINS (($REGAD)+4)
1193 001210 000000 $REG3: .WORD 0 ;:CONTAINS (($REGAD)+6)
1194 001212 000000 $REG4: .WORD 0 ;:CONTAINS (($REGAD)+10)
1195 001214 000000 $REG5: .WORD 0 ;:CONTAINS (($REGAD)+12)
1196 001216 000000 $TMP0: .WORD 0 ;:USER DEFINED
1197 001220 000000 $TMP1: .WORD 0 ;:USER DEFINED
1198 001222 000000 $TMP2: .WORD 0 ;:USER DEFINED
1199 001224 000000 $TMP3: .WORD 0 ;:USER DEFINED
1200 001226 000000 $TIMES: 0 ;:MAX. NUMBER OF ITERATIONS
1201 001230 077 $QUES: .ASCII /?/ ;:QUESTION MARK
1202 001231 015 $CRLF: .ASCII <15> ;:CARRIAGE RETURN
1203 001232 000012 $LF: .ASCIZ <12> ;:LINE FEED
1204 ;*****
1205 .SBTTL APT MAILBOX-ETABLE
1206
    
```

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Address	Offset	Value	Field Name	Description
1207			..*****	
1208			.EVEN	
1209	001234		\$MAIL:	;; APT MAILBOX
1210	001234	000000	\$MSGTY: .WORD	;; MESSAGE TYPE CODE
1211	001236	000000	\$FATAL: .WORD	;; FATAL ERROR NUMBER
1212	001240	000000	\$TESTN: .WORD	;; TEST NUMBER
1213	001242	000000	\$PASS: .WORD	;; PASS COUNT
1214	001244	000000	\$DEVCT: .WORD	;; DEVICE COUNT
1215	001246	000000	\$UNIT: .WORD	;; I/O UNIT NUMBER
1216	001250	000000	\$MSGAD: .WORD	;; MESSAGE ADDRESS
1217	001252	000000	\$MSGLG: .WORD	;; MESSAGE LENGTH
1218	001254		\$ETABLE:	;; APT ENVIRONMENT TABLE
1219	001254	000	\$ENV: .BYTE	;; ENVIRONMENT BYTE
1220	001255	000	\$ENVH: .BYTE	;; ENVIRONMENT MODE BITS
1221	001256	000000	\$SMREG: .WORD	;; APT SWITCH REGISTER
1222	001260	000000	\$USMR: .WORD	;; USER SWITCHES
1223	001262	000000	\$CPUOP: .WORD	;; CPU TYPE, OPTIONS
1224			.*	BITS 15-11-CPU TYPE
1225			.*	11/04-01, 11/05-02, 11/20-03, 11/40-04, 11/45-05
1226			.*	11/70-06, PDQ=07, Q=10
1227			.*	BIT 10-REAL TIME CLOCK
1228			.*	BIT 9-FLOATING POINT PROCESSOR
1229			.*	BIT 8-MEMORY MANAGEMENT
1230	001264	000	\$HMS1: .BYTE	;; HIGH ADDRESS, M.S. BYTE
1231	001265	000	\$HTYP1: .BYTE	;; MEM. TYPE, BLK#1
1232			.*	MEM. TYPE BYTE -- (HIGH BYTE)
1233			.*	900 NSEC CORE=001
1234			.*	300 NSEC BIPOLAR=002
1235			.*	500 NSEC MOS=003
1236	001266	000000	\$HADR1: .WORD	;; HIGH ADDRESS, BLK#1
1237			.*	MEM. LAST ADDR. =3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
1238	001270	000	\$HMS2: .BYTE	;; HIGH ADDRESS, M.S. BYTE
1239	001271	000	\$HTYP2: .BYTE	;; MEM. TYPE, BLK#2
1240	001272	000000	\$HADR2: .WORD	;; MEM. LAST ADDRESS, BLK#2
1241	001274	000	\$HMS3: .BYTE	;; HIGH ADDRESS, M.S. BYTE
1242	001275	000	\$HTYP3: .BYTE	;; MEM. TYPE, BLK#3
1243	001276	000000	\$HADR3: .WORD	;; MEM. LAST ADDRESS, BLK#3
1244	001300	000	\$HMS4: .BYTE	;; HIGH ADDRESS, M.S. BYTE
1245	001301	000	\$HTYP4: .BYTE	;; MEM. TYPE, BLK#4
1246	001302	000000	\$HADR4: .WORD	;; MEM. LAST ADDRESS, BLK#4
1247	001304	000000	\$VECT1: .WORD	;; INTERRUPT VECTOR#1, BUS PRIORITY#1
1248	001306	000000	\$VECT2: .WORD	;; INTERRUPT VECTOR#2, BUS PRIORITY#2
1249	001310	160010	\$BASE: .WORD	;; BASE ADDRESS OF EQUIPMENT UNDER TEST
1250	001312	000000	\$DEVH: .WORD	;; DEVICE MAP
1251	001314	000000	\$CDW1: .WORD	;; CONTROLLER DESCRIPTION WORD#1
1252	001316	000000	\$CDW2: .WORD	;; CONTROLLER DESCRIPTION WORD#2
1253	001320	000000	\$DDW0: .WORD	;; DEVICE DESCRIPTOR WORD#0
1254	001322	000000	\$DDW1: .WORD	;; DEVICE DESCRIPTOR WORD#1
1255	001324	000000	\$DDW2: .WORD	;; DEVICE DESCRIPTOR WORD#2
1256	001326	000000	\$DDW3: .WORD	;; DEVICE DESCRIPTOR WORD#3
1257	001330	000000	\$DDW4: .WORD	;; DEVICE DESCRIPTOR WORD#4
1258	001332	000000	\$DDW5: .WORD	;; DEVICE DESCRIPTOR WORD#5
1259	001334	000000	\$DDW6: .WORD	;; DEVICE DESCRIPTOR WORD#6
1260	001336	000000	\$DDW7: .WORD	;; DEVICE DESCRIPTOR WORD#7
1261	001340	000000	\$DDW8: .WORD	;; DEVICE DESCRIPTOR WORD#8
1262	001342	000000	\$DDW9: .WORD	;; DEVICE DESCRIPTOR WORD#9

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1263	001344	000000	#DDW10: .WORD	ADDW10	::DEVICE	DESCRIPTOR	WORD#10
1264	001346	000000	#DDW11: .WORD	ADDW11	::DEVICE	DESCRIPTOR	WORD#11
1265	001350	000000	#DDW12: .WORD	ADDW12	::DEVICE	DESCRIPTOR	WORD#12
1266	001352	000000	#DDW13: .WORD	ADDW13	::DEVICE	DESCRIPTOR	WORD#13
1267	001354	000000	#DDW14: .WORD	ADDW14	::DEVICE	DESCRIPTOR	WORD#14
1268	001356	000000	#DDW15: .WORD	ADDW15	::DEVICE	DESCRIPTOR	WORD#15
1269							
1270							
1271	001360		#ETEND:				
1272							

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CZDZAH.P11MACY11 30A(1052)  
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ERROR POINTER TABLE

```

1273      .SBTTL  ERROR POINTER TABLE
1274
1275      ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
1276      ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
1277      ;*LOCATION #ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
1278      ;*NOTE1:      IF #ITEMB IS 0 THE ONLY PERTINENT DATA IS (#ERRPC).
1279      ;*NOTE2:      EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
1280
1281      ;*      EM      ; POINTS TO THE ERROR MESSAGE
1282      ;*      DM      ; POINTS TO THE DATA HEADER
1283      ;*      DT      ; POINTS TO THE DATA
1284      ;*      DF      ; POINTS TO THE DATA FORMAT
1285
1286
1287      001360      #ERRTB:
1288
1289      ;PROGRAM CONTROL PARAMETERS
1290      ;-----
1291
1292      001360      000000      NEXT: 0      ;ADDRESS OF NEXT TEST TO BE EXECUTED
1293      001362      000000      LOCK: 0      ;ADDRESS FOR LOCK ON CURRENT DATA
1294
1295      ;PROGRAM VARIABLES
1296      ;-----
1297
1298      001364      000377      LINE: 377      ;DEFAULT ALL EIGHT LINES RUNNING
1299      001366      017070      PAR: 17070      ;PARAMETERS: 8 BITS/CHAR,2 STOP BITS. 9600 BAUD.NO PARIT
1300      001370      000000      MODE: 0      ;DEFAULT MAINTENANCE MODE
1301      001372      000000      SAVLIN: 0      ;LINE NUMBER
1302      001374      000000      XMTLIN: 0      ;TRANSMISSION LINE NUMBER
1303      001376      000000      XMTCNT: 0      ;COUNT OF WORDS IN A TRANSMISSION PATTERN
1304      001400      000000      REGIST: 0      ;DEVICE ADDRESS STORAGE LOCATION
1305      001402      000000      SAVPC: 0      ;PROGRAM COUNTER STORAGE
1306      001404      000001      DZACTV: .BLKW 1      ;*DZ11'S SELECTED ACTIVE.
1307      001406      000001      RUN: 1      ;*POINTER ONE PAST RUNNING DEVICE.
1308      001410      000001      DZNUM: .BLKB 1      ;*OCTAL NUMBER OF DZ11'S.
1309      001411      001      SAVNUM: .BYTE 1      ;*WORKABLE NUMBER.
1310
1311      001412      001500      .EVEN
      ACTIVE: DZ.MAP      ;TABLE POINTER.

```

```

1312
1313
1314
1315
1316 001414 000
1317 001415 000
1318 001416 000
1319 001417 000
1320 001420 000
1321 001422
1322
1323 001422 000000
1324 001424 000000
1325 001426 000000
1326 001430 000000
1327 001432 000000
1328 001434 000000
1329 001436 000000
1330 001440 000000
1331 001442 000000
1332 001444 000000
1333 001446 000000
1334 001450 000000
1335 001452 000000
1336 001454 000000
1337 001456 000000
1338 001460 000000
1339 001462
1340
1341
1342
1343
1344
1345
1346 001462
1347 000624
1348 000024 000200
1349 000044
1350 000044 001462
1351 001462
1352
1353
1354
1355
1356 001462
1357 001462 000000
1358 001464 001234
1359 001466 000132
1360 001470 000137
1361 001472 000137
1362 001474 000052
1363
1364
1365
1366 001500
1367 001500

```

```

;PROGRAM CONTROL FLAGS
;-----
EIAFLG: .BYTE 0 ;0-EIA 100000-20MA
INIFLG: .BYTE 0 ;PROGRAM INITIALIZATION FLAG
HDRFLG: .BYTE 0 ;PROGRAM INITIALIZATION FLAG FOR HEADER MAP
MNTFLG: .BYTE 0 ;MAINTENANCE BIT SET FLAG
DONFLG: .BYTE 0 ;TRANSMISSION COMPLETION FLAG
.EVEN
;DATA VARIABLES
TD0: .WORD 0
TD1: .WORD 0
TD2: .WORD 0
TD3: .WORD 0
TD4: .WORD 0
TD5: .WORD 0
TD6: .WORD 0
TD7: .WORD 0
TR0: .WORD 0
TR1: .WORD 0
TR2: .WORD 0
TR3: .WORD 0
TR4: .WORD 0
TR5: .WORD 0
TR6: .WORD 0
TR7: .WORD 0
STOP:
; -- END 0 MACRO -----
.SBTTL APT PARAMETER BLOCK
;*****
;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
;*****
.$X= ;SAVE CURRENT LOCATION
.=24 ;SET POWER FAIL TO POINT TO START OF PROGRAM
200 ;FOR APT START UP
.=44 ;POINT TO APT INDIRECT ADDRESS PNTR.
$APTHOR ;POINT TO APT HEADER BLOCK
.=.$X ;RESET LOCATION COUNTER
;*****
;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
;INTERFACE SPEC.
$APTHD:
$HIBTS: .WORD 0 ;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
$MBADR: .WORD $MAIL ;ADDRESS OF APT MAILBOX (BITS 0-15)
$TSTM: .WORD 90. ;RUN TIM OF LONGEST TEST
$PASTM: .WORD 95. ;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
$UNITH: .WORD 95. ;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
.WORD $ETEND-$MAIL/2 ;LENGTH MAILBOX-ETABLE(WORDS)
;DZ11 STATUS TABLE AND ADDRESS ASSIGNMENTS
;-----
.=1500
DZ.MAP:

```





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```

1424 001610 000001 DZCR6: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 6
1425 001612 000001 DZVC6: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 6
1426 001614 000001 DZLV6: .BLKW 1 ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1427 001616 000001 LINE6: .BLKW 1 ;ALL LINES SELECTED
1428 001620 000001 PAR6: .BLKW 1 ;PARAMETERS
1429 001622 000001 MANT6: .BLKW 1 ;MAINTENANCE MODE FOR THIS DEVICE
1430 ; -- END 0 MACRO -----
1431 ; -JUNK-----
1432
1433 001624 000001 DZCR7: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 7
1434 001626 000001 DZVC7: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 7
1435 001630 000001 DZLV7: .BLKW 1 ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1436 001632 000001 LINE7: .BLKW 1 ;ALL LINES SELECTED
1437 001634 000001 PAR7: .BLKW 1 ;PARAMETERS
1438 001636 000001 MANT7: .BLKW 1 ;MAINTENANCE MODE FOR THIS DEVICE
1439 ; -- END 0 MACRO -----
1440 ; -JUNK-----
1441
1442 001640 000001 DZCR10: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 10
1443 001642 000001 DZVC10: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 10
1444 001644 000001 DZLV10: .BLKW 1 ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1445 001646 000001 LINE10: .BLKW 1 ;ALL LINES SELECTED
1446 001650 000001 PAR10: .BLKW 1 ;PARAMETERS
1447 001652 000001 MANT10: .BLKW 1 ;MAINTENANCE MODE FOR THIS DEVICE
1448 ; -- END 0 MACRO -----
1449 ; -JUNK-----
1450
1451 001654 000001 DZCR11: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 11
1452 001656 000001 DZVC11: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 11
1453 001660 000001 DZLV11: .BLKW 1 ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1454 001662 000001 LINE11: .BLKW 1 ;ALL LINES SELECTED
1455 001664 000001 PAR11: .BLKW 1 ;PARAMETERS
1456 001666 000001 MANT11: .BLKW 1 ;MAINTENANCE MODE FOR THIS DEVICE
1457 ; -- END 0 MACRO -----
1458 ; -JUNK-----
1459
1460 001670 000001 DZCR12: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 12
1461 001672 000001 DZVC12: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 12
1462 001674 000001 DZLV12: .BLKW 1 ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1463 001676 000001 LINE12: .BLKW 1 ;ALL LINES SELECTED
1464 001700 000001 PAR12: .BLKW 1 ;PARAMETERS
1465 001702 000001 MANT12: .BLKW 1 ;MAINTENANCE MODE FOR THIS DEVICE
1466 ; -- END 0 MACRO -----
1467 ; -JUNK-----
1468
1469 001704 000001 DZCR13: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 13
1470 001706 000001 DZVC13: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 13
1471 001710 000001 DZLV13: .BLKW 1 ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1472 001712 000001 LINE13: .BLKW 1 ;ALL LINES SELECTED
1473 001714 000001 PAR13: .BLKW 1 ;PARAMETERS
1474 001716 000001 MANT13: .BLKW 1 ;MAINTENANCE MODE FOR THIS DEVICE
1475 ; -- END 0 MACRO -----
1476 ; -JUNK-----
1477
1478 001720 000001 DZCR14: .BLKW 1 ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 14
1479 001722 000001 DZVC14: .BLKW 1 ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 14

```

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```

1480 001724 000001      DZLV14: .BLKW 1      ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1481 001726 000001      LINE14: .BLKW 1      ;ALL LINES SELECTED
1482 001730 000001      PAR14: .BLKW 1       ;PARAMETERS
1483 001732 000001      MANT14: .BLKW 1      ;MAINTENANCE MODE FOR THIS DEVICE
1484                                     ; -- END 0 MACRO -----
1485                                     ; -JUNK-----
1486
1487 001734 000001      DZCR15: .BLKW 1      ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 15
1488 001736 000001      DZVC15: .BLKW 1      ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 15
1489 001740 000001      DZLV15: .BLKW 1      ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1490 001742 000001      LINE15: .BLKW 1      ;ALL LINES SELECTED
1491 001744 000001      PAR15: .BLKW 1       ;PARAMETERS
1492 001746 000001      MANT15: .BLKW 1      ;MAINTENANCE MODE FOR THIS DEVICE
1493                                     ; -- END 0 MACRO -----
1494                                     ; -JUNK-----
1495
1496 001750 000001      DZCR16: .BLKW 1      ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 16
1497 001752 000001      DZVC16: .BLKW 1      ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 16
1498 001754 000001      DZLV16: .BLKW 1      ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1499 001756 000001      LINE16: .BLKW 1      ;ALL LINES SELECTED
1500 001760 000001      PAR16: .BLKW 1       ;PARAMETERS
1501 001762 000001      MANT16: .BLKW 1      ;MAINTENANCE MODE FOR THIS DEVICE
1502                                     ; -- END 0 MACRO -----
1503                                     ; -JUNK-----
1504
1505 001764 000001      DZCR17: .BLKW 1      ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 17
1506 001766 000001      DZVC17: .BLKW 1      ;RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 17
1507 001770 000001      DZLV17: .BLKW 1      ;PRIORITY LEVEL AND EIA FLAG SELECTOR
1508 001772 000001      LINE17: .BLKW 1      ;ALL LINES SELECTED
1509 001774 000001      PAR17: .BLKW 1       ;PARAMETERS
1510 001776 000001      MANT17: .BLKW 1      ;MAINTENANCE MODE FOR THIS DEVICE
1511                                     ; -- END 0 MACRO -----
1512
1513 002000 177777      DZ.END: 177777

```

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```

1514                                     ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
1515                                     ;POINTERS TO SUBROUTINES CAN BE FOUND
1516                                     ;IN THE TABLE IMMEDIATELY FOLLOWING THE DEFINITIONS
1517
1518                                     ;:*****
1519                                     ;-----
1520 002002 .TRPTAB:
1521       104400 ADVANCE=TRAP+0           ;CALL TO ADVANCE TO NEXT TEST( OR SCOPE THIS ONE)
1522 002002       .ADVANCE
1523           ; -- END 0 MACRO *****
1524       104401 SCOP1=TRAP+1           ;CALL TO LOOP ON CURRENT DATA HANDLER
1525 002004       .SCOP1
1526           ; -- END 0 MACRO *****
1527       104402 TYPE=TRAP+2           ;CALL TO TELETYPE OUTPUT ROUTINE
1528 002006       .TYPE
1529           ; -- END 0 MACRO *****
1530       104403 INSTR=TRAP+3         ;CALL TO ASCII STRING INPUT ROUTINE
1531 002010       .INSTR
1532           ; -- END 0 MACRO *****
1533       104404 INSTER=TRAP+4        ;CALL TO INPUT ERROR HANDLER
1534 002012       .INSTER
1535           ; -- END 0 MACRO *****
1536       104405 PARAM=TRAP+5         ;CALL TO NUMERICAL DATA INPUT ROUTINE
1537 002014       .PARAM
1538           ; -- END 0 MACRO *****
1539       104406 SETFLG=TRAP+6        ;CALL TO SET FLAG ROUTINE
1540 002016       .SETFLG
1541           ; -- END 0 MACRO *****
1542       104407 SAVOS=TRAP+7         ;CALL TO REGISTER SAVE ROUTINE
1543 002020       .SAVOS
1544           ; -- END 0 MACRO *****
1545       104410 RESOS=TRAP+10        ;CALL TO REGISTER RESTORE ROUTINE
1546 002022       .RESOS
1547           ; -- END 0 MACRO *****
1548       104411 CONVRT=TRAP+11       ;CALL TO DATA OUTPUT ROUTINE
1549 002024       .CONVRT
1550           ; -- END 0 MACRO *****
1551       104412 CNVRT=TRAP+12        ;CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF.
1552 002026       .CNVRT
1553           ; -- END 0 MACRO *****
1554       104413 DEVICE.CLR=TRAP+13   ;CALL TO ISSUE A DEVICE CLEAR
1555 002030       .DEVICE.CLR
1556           ; -- END 0 MACRO *****
1557       104414 DELAY=TRAP+14        ;CALL TO DELAY FOR FAST CPU'S
1558 002032       .DELAY
1559           ; -- END 0 MACRO *****
1560       104415 PARM0=TRAP+15       ;CONVERT DECIMAL STRING TO OCTAL
1561 002034       .PARM0

```

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1562  
1563 104416  
1564 002036 027140  
1565  
1566 104417  
1567 002040 007164  
1568  
1569  
1570  
1571

```
; -- END 0 MACRO -----  
PAWCH=TRAP+16 ;SET FLAG ECHO OR CABLE  
 .PAWCH  
; -- END 0 MACRO -----  
DCLASH=TRAP+17 ;CLEAR DEVICE, SET MAINT. BIT IF I MODE  
 .DCLASH  
; -- END 0 MACRO -----  
  
;-----  
;:*****
```

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```

1572                                     ;DZ11 VECTOR AND REGISTER INDIRECT POINTERS
1573                                     ;WORKING AREA
1574
1575 002042 160040      DZCSR: 160040 ;R/W
1576 002044 160041      HDZCSR: 160041 ;R/W
1577 002046 160042      DZRBUF: 160042 ;READ ONLY
1578 002050 160043      HDZRBUF: 160043 ;READ ONLY
1579 002052 160042      DZLPR: 160042 ;WRITE ONLY
1580 002054 160043      HDZLPR: 160043 ;WRITE ONLY
1581 002056 160044      DZTCR: 160044 ;R/W
1582 002060 160045      HDZTCR: 160045 ;R/W
1583 002062 160046      DZMSR: 160046 ;READ ONLY
1584 002064 160047      HDZMSR: 160047 ;READ ONLY
1585 002066 160046      DZTDR: 160046 ;WRITE ONLY
1586 002070 160047      HDZTDR: 160047 ;WRITE ONLY
1587                                     ;DEFAULT DZ VECTORS
1588 002072 000300      DZRIV: 300 ;REC INTR VECTOR
1589 002074 000302      DZRIS: 302 ;REC INTR STATUS
1590 002076 000304      DZTIV: 304 ;XMIT INTR VECTOR
1591 002100 000306      DZTIS: 306 ;XMIT INTR STATUS
1592
1593

```

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1594  
1595  
1596  
1597  
1598 002102  
1599 002102 000000  
1600 002104 000000  
1601 002106 000000  
1602 002110 000000  
1603 002112 000000  
1604 002114 000000  
1605 002116 000000  
1606 002120 000000  
1607 002122 000000  
1608 002124 000000  
1609 002126 000000  
1610 002130 000000  
1611 002132 000000  
1612 002134 000000  
1613 002136 000000  
1614 002140 000000  
1615 002142 000000  
1616 002144 000000  
1617 002146 000000

; TIME TABLE FOR RELATIVE TIMING TESTS

-----

TMTBL:  
T50: 0  
T75: 0  
T110: 0  
T134: 0  
T150: 0  
T300: 0  
T600: 0  
T1200: 0  
T1800: 0  
T2000: 0  
T2400: 0  
T3600: 0  
T4800: 0  
T7200: 0  
T9600: 0  
TEIGHT: 0  
TSEVEN: 0  
TSIX: 0  
TFIVE: 0

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```

1618
1619
1620
1621
1622
1623
1624
1625
1626 002150
1627 002150 000005
1628 002152 012706 001120
1629 002156 106427 000340
1630 002162 012737 010320 000024
1631 002170 012737 005122 000020
1632 002176 012737 000340 000022
1633 002204 012737 007230 000030
1634 002212 012737 000340 000032
1635 002220 012737 007122 000034
1636 002226 012737 000340 000036
1637 002234 012737 010320 000024
1638 002242 012737 000340 000026
1639 002250 113737 001410 001411
1640 002256 005037 001242
1641 002262 105037 001123
1642 002266 012737 001500 001412
1643 002274 012737 000001 001406
1644 002302 005037 001132
1645 002306 005037 001136
1646 002312 005037 001122
1647 002316 012737 002150 001126
1648
1649
1650 002324 013746 000006
1651 002330 013746 000004
1652 002334 012737 002354 000004
1653 002342 022777 177777 176610
1654 002350 001402
1655 002352 000407
1656 002354 022626
1657 002356 012737 000176 001160
1658 002364 012737 000174 001162
1659 002372 012637 000004
1660 002376 012637 000006
1661 002402 105737 001415
1662 002406 001010
1663 002410 023727 000042 005056
1664 002416 001402
1665 002420 104402 001000
1666 002424 105337 001415
1667 002430 105737 001255
1668 002434 100006
1669 002436 004737 012112
1670
1671 002442 000240
1672 002444 000240
1673

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

.START:
RESET ;CLEAR THE WORLD. START NEW ENVIRONMENT
MOV #STACK,SP ;SET UP STACK
MTPS #PR7 ;LOCK OUT INTERRUPTS
MOV #IPWRDN,#024 ;SET UP POWER FAIL VECTOR
MOV #SCOPE,#IOTVEC ;SET VECTOR FOR SCOPE ROUTINE
MOV #340,#IOTVEC+2 ;LEVEL 7
MOV #ERROR,#EHTVEC ;SET VECTOR FOR ERROR ROUTINE
MOV #340,#EHTVEC+2 ;LEVEL 7
MOV #.TRPSR,#TRAPVEC ;SET VECTOR FOR TRAP CALLS
MOV #340,#TRAPVEC+2 ;LEVEL 7
MOV #IPWRDN,#PWRVEC ;SET VECTOR FOR POWER FAIL ROUTINE
MOV #340,#PWRVEC+2 ;LEVEL 7
MOVB DZNUM,SAVNUM ;SAVE NUMBER OF DEVICES IN SYSTEM.
CLR #PASS ;CLEAR PASS COUNT
CLRB #ERFLG ;CLEAR ERROR FLAG
MOV #DZ.MAP,ACTIVE ;GET MAP POINTER.
MOV #1,RUN ;POINT POINTER TO FIRST DEVICE.
CLR #ERTTL ;CLEAR ERROR COUNT
CLR #ERRPC ;CLEAR LAST ERROR POINTER
CLR #TSTNM ;SET UP FOR TEST 1
MOV #.START,#LPADR ;SET UP FOR POWER FAIL BEFORE
;TESTING STARTS
;SET UP FOR SMALL 11 SWITCH REGISTER COMPATIBILITY
MOV 6,-(SP) ;SAVE BUS ERROR PS
MOV 4,-(SP) ;SAVE BUS ERROR PC
MOV #20#4 ;SET UP TO TRAP TO THIS ROUTINE
CMP #-1,#SWR ;CAN 177570 BE REFERENCED?
BEQ 22# ;IF SO AND IT IS -1, TREAT LIKE SWITCHLESS
BR 21# ;IF YES, SKIP AROUND THE SETUP
POP2SP ;REMOVE THE TRAP FROM THE STACK
MOV #SWREG,SWR ;IF NO, TRAP COMES HERE. POINT TO SOFTWARE SWR
MOV #DISPREG,DISPLAY ;POINT TO SOFTWARE DISPLAY REGISTER
MOV (SP)+,4 ;RESTORE THE BUS ERROR VECTOR
MOV (SP)+,6
TSTB INIFLG ;TITLE ALREADY PRINTED?
BNE 29# ;BRANCH IF YES
CMP #042,#ENDAD ;RUNNING UNDER ACT?
BEQ 31# ;IF YES DONT PRINT TITLE
TYPE ,MTITLE ;PRINT THE DIAGNOSTIC'S TITLE
DECB INIFLG ;SET THE ONCE ONLY FLAG
TSTB #ENVH ;DETERMINE WHETHER APT SIZING SHOULD BE DONE
BPL 30# ;IF NOT, GO CHECK FOR AUTO-SIZING
JSR PC,SETAPT ;OTHERWISE, GO DO APT SIZING FROM ETABLE
;REPLACE "CLRB HDRFLG" WITH NOP'S
NOP
NOP
CLRB HDRFLG ;MAKE SURE STATUS TABLE IS PRINTED

```

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PROGRAM INITIALIZATION AND START UP.

```

1674 002446 000137 004420          JMP      16$      ;GO PRINT DZ STATUS TABLE
1675 002452 032777 000001 176500 30$: BIT      @SW00,BSWR ;RESELECT ?
1676 002460 001011              BNE      32$      ;IF YES, GO SET UP THE INFORMATION
1677 002462 122737 000377 001415  CMPB    @377,INIFLG ;ON 1ST START, MUST ANSWER QUESTION
1678 002470 001003              BNE      .+10     ;IF NOT ANSWERING QUESTIONS
1679 002472 105777 176462          TSTB    BSWR      ;ARE U AUTO SIZING?
1680 002476 100402              BMI      32$      ;NO AUTO SIZE! NO SW00=1 ON 1ST START!
1681 002500 000137 003244          JMP      73$      ;IF NO, SKIP THE INTERROGATION
1682 002504 012700 001500          32$:  MOV    @DZ.MAP,RO ;POINT TO THE BEGINNING OF THE MAP TABLE
1683 002510 105037 001416          CLRB    HDRFLG    ;MAKE SURE A MAP GETS PRINTED
1684 002514 005020          65$:  CLR    (RO)+    ;CLEAR A TABLE LOCATION
1685 002516 020027 002000          CMP     RO,@DZ.END ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
1686 002522 001374              BNE     65$      ;IF NOT ,CLEAR THE NEXT LOCATION IN THE TABLE
1687 002524 105337 001415          DECB   INIFLG     ;INSURE NO AUTO SIZING IF QUESTIONS ANSWERED!
1688
1689                               ;THE FOLLOWING ARE PARAMETERS USED TO FILL IN THE MAP
1690                               ;TABLE AND SET UP THE DIAGNOSTIC.
1691
1692                               ;GET THE BASE ADDRESS OF THE DZ11'S
1693
1694 002530          33$:
1695                               ; -#GETPAR-----
1696 002530 104403          INSTR    ;CALL THE STRING INPUT ROUTINE
1697 002532 003464          66$      ;POINTER TO MESSAGE TO BE PRINTED
1698 002534 104405          PARAM    ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1699 002536 160000          160000   ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1700 002540 163770          163770   ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1701 002542 001500          DZCRO    ;POINTER TO MAP LOCATION TO BE FILLED
1702 002544      007          .BYTE    7      ;MASK OF INVALID BITS FOR THIS PARAMETER
1703 002545      001          .BYTE    1      ;NUMBER OF PARAMETERS TO STORE
1704                               ; -- END 0 MACRO -----
1705 002546 013737 001500 001310  MOV     DZCRO,@BASE ;COPY BASE ADDRESS TO ETABLE
1706
1707                               ;GET THE BASE VECTOR ADDRESS
1708
1709 002554          34$:
1710                               ; -#GETPAR-----
1711 002554 104403          INSTR    ;CALL THE STRING INPUT ROUTINE
1712 002556 003530          67$      ;POINTER TO MESSAGE TO BE PRINTED
1713 002560 104405          PARAM    ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1714 002562 000300          300      ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1715 002564 000776          776      ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1716 002566 001502          DZVCO    ;POINTER TO MAP LOCATION TO BE FILLED
1717 002570      003          .BYTE    3      ;MASK OF INVALID BITS FOR THIS PARAMETER
1718 002571      001          .BYTE    1      ;NUMBER OF PARAMETERS TO STORE
1719                               ; -- END 0 MACRO -----
1720 002572 013737 001502 001304  MOV     DZVCO,@VECT1 ;COPY VECTOR TO ETABLE
1721
1722                               ;GET THE BUS REQUEST LEVEL
1723
1724
1725 002600 104403          INSTR    ; -#GETPAR-----
1726 002602 003571          68$      ;CALL THE STRING INPUT ROUTINE
1727 002604 104405          PARAM    ;POINTER TO MESSAGE TO BE PRINTED
1728 002606 000004          4        ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1729 002610 000007          7        ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE

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1786 003016 003740          71:      ; POINTER TO MESSAGE TO BE PRINTED
1787 003020 104405          PARAM    ; CALL THE OCTAL TO ASCII CONVERT ROUTINE
1788 003022 000001          1       ; LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1789 003024 000020          16.      ; HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1790 003026 001220          $TMP1   ; POINTER TO MAP LOCATION TO BE FILLED
1791 003030      000        .BYTE   0   ; MASK OF INVALID BITS FOR THIS PARAMETER
1792 003031      001        .BYTE   1   ; NUMBER OF PARAMETERS TO STORE
1793                                     ; -- END 0 MACRO -----
1794
1795 003032 012737 000377 001506      MOV     #377,LINE0  ; SET UP DEFAULT LINES
1796 003040 012737 017070 001510      MOV     #17070,PAR0 ; SET UP DEFAULT LPR PARAMETER
1797                                     ; RECEIVER ON, 9600 BAUD, 2STOP BITS, 8 BIT/CHAR
1798 003046 012737 000001 007214      MOV     #1,DLYCNT  ; INITIALIZE DELAY COUNT
1799 003054 032777 000010 176076      BIT     #SM03,BSMR ; DO YOU WANT PARAMETERS?
1800 003062 001402                                     BEQ     40:        ; IF NO, SKIP THE PARAMETER CALL
1801 003064 004737 003274                                     JSR     PC,23:    ; GET PARAMETERS
1802 003070 012737 000001 001312 40:  MOV     #1,$DEVH   ; INITIALIZE ACTIVE DEVICE SELECTION PARAMETER
1803 003076 113737 001220 001410      MOVSB  $TMP1,DZNUM ; COPY THE NUMBER OF DEVICES
1804 003104 113737 001220 001411      MOVSB  $TMP1,SAVNUM ; COPY A BACKUP NUMBER
1805 003112 075337 001220          62:  DEC     $TMP1      ; $TMP1 CONTAINS THE COUNT OF UNINITIALIZED
1806 003116 001404                                     BEQ     61:        ; SELECTED DEVICES
1807 003120 000261                                     SEC                                     ; SET A BIT FLAG TO INDICATE AN ACTIVE DEVICE
1808 003122 006137 001312          ROL     $DEVH     ; POINT TO THE NEXT DEVICE
1809 003126 000771          BR      62:        ; GO DO THIS PROCEDURE AGAIN
1810 003130 013737 001312 001222 61:  MOV     $DEVH,$TMP2 ; # OF TIMES
1811 003136 013737 001312 001404      MOV     $DEVH,DZACTV ; COPY THE ACTIVE DEVICE PARAMETER
1812 003144 012700 001500          MOV     #DZCR0,R0  ; SET A POINTER TO THE SPECIFIED INFORMATION
1813 003150 012701 001514          MOV     #DZCR1,R1  ; POINT R1 TO THE REST OF THE MAP TABLE
1814 003154 012702 001320          MOV     #DDWO,R2   ; POINT TO ETABLE'S DEVICE DESCRIPTOR WORDS
1815 003160 000241          CLC                                     ; INITIALIZE THE "C" BIT FOR A ROTATION
1816 003162 006037 001222          ROR     $TMP2      ; SKIP MAPPING SETUP FOR DEVICE 0- IT'S DONE
1817 003166 006237 001222          64:  ASR     $TMP2      ; ISOLATE A SELECTION FLAG IN THE "C" BIT
1818 003172 103404          BCS     41:        ; IS THIS DEVICE SELECTED? IF YES, GO LOAD TABLE
1819 003174 012711 177777          MOV     #-1,(R1)   ; TERMINATE THE LIST
1820 003200 000137 004374          JMP     63:        ; GO TO THE NEXT BLOCK
1821 003204 012011          41:  MOV     (R0),,(R1)  ; ADDRESS
1822 003206 062721 000010          ADD     #10,(R1)   ; POINT TO THE NEXT DZ11 ADDRESS VALUE
1823 003212 012011          MOV     (R0),,(R1) ; VECTOR
1824 003214 062721 000010          ADD     #10,(R1)   ; POINT TO THE NEXT VECTOR VALUE
1825 003220 012021          MOV     (R0),,(R1) ; LEVEL
1826 003222 012021          MOV     (R0),,(R1) ; LINES
1827 003224 016012 177774          MOV     -4(R0),(R2) ; GET THE EIA FLAG FROM THE PRIORITY WORD
1828 003230 042712 077777          BIC     #77777,(R2) ; ISOLATE THAT FLAG
1829 003234 051022          BIS     (R0),(R2)  ; ADD PARAMETERS TO DEVICE DESCRIPTOR WORD
1830 003236 012021          MOV     (R0),,(R1) ; PARAMETERS
1831 003240 012021          MOV     (R0),,(R1) ; MAINTENANCE MODE
1832 003242 000731          BR      64:        ;
1833 003244 032777 000010 175706 73:  BIT     #SM03,BSMR ; ASK PARAMETERS ?
1834 003252 001002          BNE     42:        ; IF NO, GO DO AUTO SIZING
1835 003254 000137 004374          JMP     63:        ; GO SET UP FOR AUTO SIZING
1836 003260 004737 003274          42:  JSR     PC,23:    ; GO ASK PARAMETERS
1837 003264 105337 001415          DECB   INIFLG     ; INSURE NO AUTO SIZE IF QUESTIONS ANSWERED
1838 003270 000137 004420          JMP     16:        ; GO TO THE NEXT BLOCK
1839
1840                                     ; GET THE ACTIVE LINES PARAMETER
1841

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1842 003274          231:
1843
1844 003274 104403    INSTR          ; -#GETPAR-----
1845 003276 003614    691          ;CALL THE STRING INPUT ROUTINE
1846 003300 104405    PARAM          ;POINTER TO MESSAGE TO BE PRINTED
1847 003302 000001    1          ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1848 003304 000377    377          ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1849 003306 001506    LINE0        ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1850 003310          000          ;POINTER TO MAP LOCATION TO BE FILLED
1851 003311          001          ;MASK OF INVALID BITS FOR THIS PARAMETER
1852          ; -- END 0 MACRO ----- ;NUMBER OF PARAMETERS TO STORE
1853 003312 105037 001416  CLRB      HDRFLG      ;MAKE SURE THE CHANGES ARE PRINTED
1854
1855          ;THIS SEGMENT CHECKS TO MAKE SURE THE LINE PARAMETER JUST ENTERED
1856          ;IS LEGITIMATE IN STAGGERED MODE OPERATION IF THAT MODE WAS SELECTED
1857
1858 003316 005737 001512    TST      MANTO        ;IS STAGGERED THE MODE OF OPERATION?
1859 003322 100021    BPL      261          ;IF NOT, SKIP THIS SEGMENT
1860 003324 013703 001506    MOV      LINE0,R3     ;GET A SCRATCH COPY OF THE ACTIVE LINES
1861 003330 006003    241:    ROR      R3          ;GET A LINE SELECTION BIT(EVEN NUMBER LINE)
1862 003332 103410    BCS      251          ;IF IT IS SELECTED, CHECK TO SEE IF THE NEXT IS TOO
1863 003334 001414    BEQ      261          ;IF ALL HAVE BEEN CHECKED, CONTINUE PROCESSING
1864 003336 006203    ASR      R3          ;IF IT IS 0,CHECK TO SEE IF THE NEXT IS TOO
1865 003340 103373    BCC      241          ;IF THIS ONE'S 0 TOO, GO CHECK THE NEXT PAIR
1866 003342 104402 001230    TYPE     ,#QUES      ;THIS IS AN INCORRECT PARAMETER
1867 003346 104402 011075    TYPE     ,#BADLN     ;LET THE USER KNOW ABOUT IT
1868 003352 000750    BR       231          ;GO GET THE CORRECT PARAMETER
1869 003354 001772    251:    BEQ      271          ;IF ANOTHER FLAG ISN'T SET, THERE'S AN ERROR
1870 003356 006203    ASR      R3          ;GET THE NEXT FLAG
1871 003360 103370    BCC      271          ;IF IT ISN'T SET, THERE'S AN ERROR
1872 003362 000241    CLC          ;INITIALIZE THE "C" BIT FOR TESTING OF THE NEXT PAIR
1873 003364 000761    BR       241          ;GO TEST THE NEXT PAIR OF FLAGS
1874
1875          ;GET THE LINE PARAMETER REGISTER ARGUMENT
1876
1877 003366          261:
1878
1879 003366 104403    INSTR          ; -#GETPAR-----
1880 003370 003670    701          ;CALL THE STRING INPUT ROUTINE
1881 003372 104405    PARAM          ;POINTER TO MESSAGE TO BE PRINTED
1882 003374 000000    0          ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1883 003376 000017    17          ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1884 003400 001510    PAR0        ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1885 003402          000          ;POINTER TO MAP LOCATION TO BE FILLED
1886 003403          001          ;MASK OF INVALID BITS FOR THIS PARAMETER
1887          ; -- END 0 MACRO ----- ;NUMBER OF PARAMETERS TO STORE
1888 003404 012702 001506    MOV      #LINE0,R2    ;POINT TO THE LINE SELECTION PARAMETER
1889 003410 012703 001510    MOV      #PAR0,R3     ;POINT TO THE CHOSEN PARAMETERS
1890 003414 011304    MOV      (R3),R4      ;USE BAUD RATE AS AN INDEX IN DELAY TABLE
1891 003416 006304    ASL      R4          ;ALIGN INDEX ON WORD BOUNDARY
1892 003420 016437 032416 007214    MOV      DLYTBL(R4),DLYCNT ;SET THE DELAY COUNT FOR THIS BAUD RATE
1893 003426 000313    SWAB     (R3)        ;PLACE IN HIGH BYTE
1894 003430 052713 010070    BIS      #10070,(R3)  ;PLACE EXTRA PARAMETERS INTO LOC
1895 003434 011262 000014    281:    MOV      (R2),14(R2) ;LOAD THE LINES
1896 003440 011363 000014    MOV      (R3),14(R3) ;LOAD THE PARAMETERS
1897 003444 062702 000014    ADD      #14,R2       ;POINT TO THE NEXT SET

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1898 003450 062703 000014      ADD      #14,R3          ; ... OF BOTH PARAMETERS
1899 003454 020327 001774      CMP      R3,#PAR17      ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
1900 003460 001365              BNE      28#            ;IF NOT, GO LOAD SOME MORE PARAMETERS
1901 003462 000207              RTS      PC              ;RETURN TO CALLING BLOCK
1902 003464 030600 052123 041440 66# : .ASCIZ <200>/1ST CSR ADDRESS (160000:163700): /
(1) 003530 030600 052123 053040 67# : .ASCIZ <200>/1ST VECTOR ADDRESS (300:770): /
(1) 003571 200 051102 046040 68# : .ASCIZ <200>/BR LEVEL (4:6): /
(1) 003614 046200 047111 051505 69# : .ASCIZ <200>/LINES ACTIVE BY BIT <IN OCTAL>(001:377): /
(1) 003670 042200 043105 052501 70# : .ASCIZ <200>/DEFAULT BAUD RATE <IN OCTAL>(00:16): /
(1) 003740 021600 047440 020106 71# : .ASCIZ <200>/# OF DZ11'S <IN OCTAL> (1:20): /
(1) 004002 046600 044501 052116 72# : .ASCII <200>/MAINTENANCE MODE/
(1) 004023 200 055440 054105      .ASCII <200>/ [EXTERNAL <H325>-EIA ONLY (E)]/
(1) 004071 200 055440 047111      .ASCII <200>/ [INTERNAL <DZCSR03=1> (I)]/
(1) 004137 200 055440 052123      .ASCII <200>/ [STAGGERED <H3271>-EIA ONLY (S)]: /
(1) 004207 200 055440 052123      .ASCIZ <200>/ [STAGGERED <H3190>-20MA ONLY (S)]: /
(1) 004260 052200 050131 020105 74# : .ASCIZ <200>/TYPE "A" FOR EIA MODULE OR "B" FOR 20 MA (A:B): /
(1) 004342 042600 052116 051105 75# : .ASCIZ <200>/ENTER DELAY PARAMETER: /
(1) 004374 004374              .EVEN
(1) 004374 004374              63# :
1903 004374 122737 000377 001415      CMPB    #377,INIFLG     ;ONLY DO AUTO SIZE ON 1ST START
1904 004402 001006              BNE     16#            ;
1905 004404 032777 000200 174546      BIT     #BIT7,BSWR      ;BIT7=1??
1906 004412 001002              BNE     16#            ;BR IF NO AUTO SIZE
1907 004414 004737 012264              JSR     PC,AUTO.SIZE    ;GO DO THE AUTO SIZE
1908 004420 105737 001416              16# : TSTB    HDRFLG      ;HAS THE TABLE BEEN TYPED YET?
1909 004424 001021              BNE     1#            ;IF SO, DON'T TYPE IT AGAIN
1910 004426 105337 001416      DECB   HDRFLG          ;INDICATE THAT THE TABLE WILL BE TYPED
1911 004432 104402 011050      TYPE   ,XHEAD          ;TYPE MAP HEADER
1912 004436 012700 001500      MOV    #DZ.MAP,RO      ;SET POINTER
1913 004442 010037 001220      5# : MOV    RO,#TMP1        ;POINT TO THE MAP LOCATION
1914 004446 012037 001222      MOV    (RO),#TMP2      ;SET DATA
1915 004452 022737 177777 001222      CMP    #-1,#TMP2       ;END OF LIST?
1916 004460 001403              BEQ    1#            ;BR IF YES
1917 004462 104411              17# : CONVRT   XSTATQ      ;CALL THE OCTAL TO ASCII CONVERSION ROUTINE
1918 004464 011140              XSTATQ              ;CONVERT THE DATA AT THIS ADDRESS
1919 004466 000765              BR     5#            ;GO PRINT THE NEXT PARAMETER
1920 004470 005737 000042      1# : TST    #42           ;IS PROGRAM RUNNING UNDER MONITOR
1921 004474 001026              BNE     3#            ;YES
1922 004476 032777 000100 174454      BIT     #SW06,BSWR     ;DESELECT SPECIFIC DEVICES??
1923 004504 001422              BEQ     3#            ;BR IF NO.
1924 004506 104402 010771      TYPE   ,MNEW          ;TYPE THE MESSAGE.
1925 004512 005000              CLR    RO              ;ZERO DATA DISPLAY
1926 004514 000000              HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
1927 004516 027737 174436 001312      CMP    BSWR,#DEVH      ;IS THE NUMBER VALID?
1928 004524 101404              BLOS   2#            ;BR IF NUMBER IS OK.
1929 004526 104402 010643      TYPE   ,MERR3         ;TELL USER OF INVALID NUMBER.
1930 004532 000000      9# : HALT                    ;STOP EVERY THING.
1931 004534 000776              BR     9#            ;RESTART THE PROGRAM AGAIN.
1932 004536 017737 174416 001404 2# : MOV    BSWR,DZACTV     ;GET NEW DEVICE PATTERN
1933 004544 013700 001404      MOV    DZACTV,RO       ;SHOW THE USER WHAT HE SELECTED.
1934 004550 000000              HALT                    ;CONTINUE DYNAMIC SWITCHES.
1935 004552 032777 000020 174400 3# : BIT     #SW04,BSWR     ;CHECK TO SEE IF DELAY COUNT CHANGES
1936 004560 001407              BEQ    18#           ;IF NOT, GO CLEAR VECTOR AREA
1937 004562 104403              INSTR                   ; -#GETPAR-----
1938 004564 004342              75# : INSTR                   ;CALL THE STRING INPUT ROUTINE
1939 004564 004342              75# : INSTR                   ;POINTER TO MESSAGE TO BE PRINTED

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1973          ;END OF PASS
1974          ;TYPE NAME OF TEST
1975          ;UPDATE PASS COUNT
1976          ;CHECK FOR EXIT TO ACT-11
1977          ;RESTART TEST
1978          .SBTTL  END OF PASS ROUTINE
1979
1980          ;*****
1981          ;*INCREMENT THE PASS NUMBER (#PASS)
1982          ;*IF THERES A MONITOR GO TO IT
1983          ;*IF THERE ISN'T JUMP TO CYCLE
1984
1985          $EOP:
1986
1987          004712          000004          SCOPE
1988          004714          005037          001136          CLR          $ERRPC          ;CLEAR LAST ERROR PC
1989          004720          105037          001123          CLRB         $ERFLG          ;CLEAR ERROR FLAG
1990          004724          104402          010535          TYPE        ,MEPASS        ;TYPE END PASS
1991          004730          104402          010716          TYPE        ,MCSRX         ;TYPE CSR
1992          004734          104412          005072          CNVRT       ,XCSR          ;SHOW IT
1993          004740          104402          010724          TYPE        ,MVECX         ;TYPE VECTOR
1994          004744          104412          005100          CNVRT       ,XVEC           ;SHOW IT
1995          004750          005237          001242          INC         $PASS          ;RAISE PASS COUNT
1996          004754          104402          010732          TYPE        ,MPASSX        ;TYPE PASSES
1997          004760          104412          005106          CNVRT       ,XPASS          ;SHOW IT
1998          004764          005337          001242          DEC         $PASS          ;RESTORE PASS COUNT
1999          004770          104402          010743          TYPE        ,MERRX         ;TYPE ERRORS
2000          004774          104412          005114          CNVRT       ,XERR           ;SHOW IT
2001          005000          105337          001411          DECB       SAVNUM          ;ARE ALL DEVICES TESTED?
2002          005004          001030          BNE         $DOAGN          ;BR IF NO.
2003          005006          113737          001410          001411      MOVB       DZNUM,SAVNUM     ;RESTORE THE COUNT
2004          005014          005037          001226          CLR         $TIMES         ;ZERO THE NUMBER OF ITERATIONS
2005          005020          005237          001242          INC         $PASS          ;INCREMENT THE PASS NUMBER
2006          005024          042737          100000          001242      BIC        @100000,$PASS   ;DON'T ALLOW A NEG. NUMBER
2007          005032          005327          DEC         (PC)+          ;LOOP?
2008          005034          000001          $EOPCT:    .WORD          1
2009          005036          003013          BGT        $DOAGN          ;YES
2010          005040          012737          MOV        (PC)+,B(PC)+   ;RESTORE COUNTER
2011          005042          000001          $ENDCT:    .WORD          1
2012          005044          005034          $EOPCT
2013          005046          013700          000042      $GET42:    MOV        B#42,R0       ;GET MONITOR ADDRESS
2014          005052          001405          BEQ        $DOAGN          ;BRANCH IF NO MONITOR
2015          005054          000005          RESET
2016          005056          004710          $ENDAD:    JSR        PC,(R0)       ;GO TO MONITOR
2017          005060          000240          NOP
2018          005062          000240          NOP
2019          005064          000240          NOP
2020          005066          $DOAGN:
2021          005066          000137          JMP        B(PC)+         ;RETURN
2022          005070          011542          $RTNAD:    .WORD          CYCLE
2023
2024          005072          000001          XCSR:      1
2025          005074          006          0C2        .BYTE      6,2
2026          005076          002042          DZCSR
2027          005100          000001          XVEC:      1
2028          005102          003          002        .BYTE      3,2

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2029 005104 002072  
2030 005106 000001  
2031 005110 006 002  
2032 005112 001242  
2033 005114 000001  
2034 005116 006 002  
2035 005120 001132

DZRIV  
XPASS: 1  
.BYTE 6.2  
\$PASS  
XERR: 1  
.BYTE 6.2  
\$ERTTL

;SCOPE LOOP AND ITERATION HANDLER  
;-----

.SBTTL SCOPE HANDLER ROUTINE

2041  
2042  
2043  
2044  
2045  
2046  
2047  
2048  
2049  
2050  
2051  
2052 005122  
2053  
2054 005122 004737 007652  
2055 005126 005037 001136  
2056 005132 022716 013050  
2057 005136 001417  
2058 005140 000412  
2059 005142 105777 174016  
2060 005146 100073  
2061 005150 127727 174012 000021  
2062 005156 001467  
2063 005160 017766 174002 177776  
2064  
2065 005166 032777 040000 173764  
2066 005174 001060  
2067  
2068 005176 000416  
2069  
2070 005200 013746 000004  
2071 005204 012737 005224 000004  
2072 005212 005737 177060  
2073 005216 012637 000004  
2074 005222 000436  
2075 005224 022626  
2076 005226 012637 000004  
2077 005232 000441  
2078 005234  
2079 005234 105737 001123  
2080 005240 001404  
2081 005242 105037 001123  
2082 005246 005037 001226  
2083 005252 032777 004000 173700  
2084 005260 001011

```
;;*****  
; *THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT  
; *AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)  
; *AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>  
; *THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:  
; *SW14=1 LOOP ON TEST  
; *SW11=1 INHIBIT ITERATIONS  
; *CALL  
; * SCOPE ;:SCOPE=IOT  
  
$SCOPE:  
; -SC-----  
.SCOPE: JSR PC.SERV.G ;FIND OUT IF <?G> WAS HIT  
CLR $ERRPC ;CLEAR LAST ERROR PC.  
CMP $TST1+2,(SP) ;IS THIS THE SCOPE AT THE BEGINNING OF TST1?  
BEQ $XTSTR ;IF SO, DON'T LOOP ON IT  
TTST: BR 1$ ;GOTO 1$ (IF LOCK SW02=1; THIS LOC =240)  
TSTB $TKS ;KEYBOARD DONE?  
BPL $OVER ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)  
CMPB $TKB,$XON ;IS CHAR A RANDOM XON ? ;:DSH  
BEQ $OVER ;BR IF YES ;:DSH  
MOV $TKB,-2(SP)  
; -- END O MACRO -----  
1$: BIT $BIT14,$SWR ;:LOOP ON PRESENT TEST?  
BNE $OVER ;:YES IF SW14=1  
;####START OF CODE FOR THE XOR TESTER####  
$XTSTR: BR 6$ ;:IF RUNNING ON THE "XOR" TESTER CHANGE  
;:THIS INSTRUCTION TO A "NOP" (NOP=240)  
MOV $ERRVEC,-(SP) ;:SAVE THE CONTENTS OF THE ERROR VECTOR  
MOV $5,$ERRVEC ;:SET FOR TIMEOUT  
TST $177060 ;:TIME OUT ON XOR?  
BR $SVLAD ;:RESTORE THE ERROR VECTOR  
;:GO TO THE NEXT TEST  
5$: CMP (SP)+,(SP)+ ;:CLEAR THE STACK AFTER A TIME OUT  
MOV (SP)+,$ERRVEC ;:RESTORE THE ERROR VECTOR  
BR $OVER ;:LOOP ON THE PRESENT TEST  
6:;####END OF CODE FOR THE XOR TESTER####  
2$: TSTB $ERFLG ;:HAS AN ERROR OCCURRED?  
BEQ 3$ ;:BR IF NO  
4$: CLRB $ERFLG ;:ZERO THE ERROR FLAG  
CLR $TIMES ;:CLEAR THE NUMBER OF ITERATIONS TO MAKE  
3$: BIT $BIT11,$SWR ;:INHIBIT ITERATIONS?  
BNE 1$ ;:BR IF YES
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2141 005446 000000          HALT          ;;HALT HERE IF NO TERMINAL
2142 005450 000430          BR           3#          ;;LEAVE
2143 005452 010046          MOV          1#:      RO,-(SP)      ;;SAVE RO
2144 005454 017600 000002  MOV          B2(SP),RO      ;;GET ADDRESS OF ASCIZ STRING
2145 005460 122737 000001 001254  CMPB        #APTENV,#ENV      ;;RUNNING IN APT MODE
2146 005466 001011          BNE         62#          ;;NO,GO CHECK FOR APT CONSOLE
2147 005470 132737 000100 001255  BITB        #APTSPOOL,#ENVM    ;;SPOOL MESSAGE TO APT
2148 005476 001405          BEQ         62#          ;;NO,GO CHECK FOR CONSOLE
2149 005500 010037 005510  MOV          RO,61#          ;;SETUP MESSAGE ADDRESS FOR APT
2150 005504 004737 006012  JSR         PC,#ATY3          ;;SPOOL MESSAGE TO APT
2151 005510 000000          .WORD      0              ;;MESSAGE ADDRESS
2152 005512 132737 000040 001255  BITB        #APTCSUP,#ENVM    ;;APT CONSOLE SUPPRESSED
2153 005520 001003          BNE         60#          ;;YES,SKIP TYPE OUT
2154 005522 112046          MOVB       2#:      (RO)+,-(SP)  ;;PUSH CHARACTER TO BE TYPED ONTO STACK
2155 005524 001005          BNE         4#           ;;BR IF IT ISN'T THE TERMINATOR
2156 005526 005726          TST        (SP)+          ;;IF TERMINATOR POP IT OFF THE STACK
2157 005530 012600          MOV        60#:      (SP)+,RO      ;;RESTORE RO
2158 005532 062716 000002  3#:      ADD         #2,(SP)        ;;ADJUST RETURN PC
2159 005536 000002          RTI                    ;;RETURN
2160 005540 122716 000011  4#:      CMPB        #HT,(SP)        ;;BRANCH IF <HT>
2161 005544 001430          BEQ         8#           ;;BRANCH IF NOT <CRLF>
2162 005546 122716 000200  CMPB        #CRLF,(SP)
2163 005552 001006          BNE         5#           ;;POP <CR><LF> EQUIV
2164 005554 005726          TST        (SP)+          ;;TYPE A CR AND LF
2165 005556 104402          TYPE
2166 005560 001231          #CRLF
2167 005562 105037 006000  CLRB        #CHARCNT        ;;CLEAR CHARACTER COUNT
2168 005566 000755          BR           2#           ;;GET NEXT CHARACTER
2169 005570 004737 005652  5#:      JSR         PC,#TYPEC        ;;GO TYPE THIS CHARACTER
2170 005574 123726 001176  6#:      CMPB        #FILLC,(SP)+      ;;IS IT TIME FOR FILLER CHARS.?
2171 005600 001350          BNE         2#           ;;IF NO GO GET NEXT CHAR.
2172 005602 013746 001174  MOV          #NULL,-(SP)      ;;GET # OF FILLER CHARS. NEEDED
2173                                ;;AND THE NULL CHAR.
2174 005606 105356 000001  7#:      DECB        1(SP)          ;;DOES A NULL NEED TO BE TYPED?
2175 005612 002770          BLT         6#           ;;BR IF NO--GO POP THE NULL OFF OF STACK
2176 005614 004737 005652  JSR         PC,#TYPEC        ;;GO TYPE A NULL
2177 005620 105337 006000  DECB        #CHARCNT        ;;DO NOT COUNT AS A COUNT
2178 005624 000770          BR           7#           ;;LOOP
2179
2180                                ;HORIZONTAL TAB PROCESSOR
2181
2182 005626 112716 000040  8#:      MOVB        #' ,(SP)        ;;REPLACE TAB WITH SPACE
2183 005632 004737 005652  9#:      JSR         PC,#TYPEC        ;;TYPE A SPACE
2184 005636 132737 000007 006000  BITB        #7,#CHARCNT      ;;BRANCH IF NOT AT
2185 005644 001372          BNE         9#           ;;TAB STOP
2186 005646 005726          TST        (SP)+          ;;POP SPACE OFF STACK
2187 005650 000724          BR           2#           ;;GET NEXT CHARACTER
2188 005652                                #TYPEC:
2189 005652 105777 173306  TSTB        #TKS            ;;CHAR IN KYBD BUFFER? ;MJD001
2190 005656 100022          BPL         10#          ;;BR IF NOT ;MJD001
2191 005660 017746 173302  MOV          #TKB,-(SP)      ;;GET CHAR ;MJD001
2192 005664 042716 177600  BIC         #177600,(SP)     ;;STRIP EXTRANEIOUS BITS ;MJD001
2193 005670 122716 000023  CMPB        #XOFF,(SP)     ;;WAS CHAR XOFF ;MJD001
2194 005674 001012          BNE         102#         ;;BR IF NOT ;MJD001
2195                                101#:
2196 005676 105777 173262  TSTB        #TKS            ;;WAIT FOR CHAR ;MJD001
    
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2197 005702 100375          BPL      101#          ;MJD001
2198 005704 117716 173256  MOVB    @TKB,(SP)    ;MJD001
2199 005710 042716 177600  BIC     @177600,(SP) ;MJD001
2200 005714 122716 000021  CMPB    @XON,(SP)   ;MJD001
2201 005720 001366          BNE     101#         ;MJD001
2202                102#:          ;MJD001
2203 005722 005726          TST     (SP)+       ;MJD001
2204 005724                10#:          ;MJD001
2205 005724 105777 173240  TSTB    @TPS        ;MJD001
2206 005730 100375          BPL     10#         ;MJD001
2207 005732 126627 000002 000021  CMPB    2(SP),@XON  ;RAN001
2208 005740 001420          BEQ     $TYPEX      ;RAN001
2209 005742 116677 000002 173222  MOVB    2(SP),@TPB  ;MJD001
2210 005750 122766 000015 000002  CMPB    @CR,2(SP)   ;MJD001
2211 005756 001003          BNE     1#         ;MJD001
2212 005760 105037 006000  CLRB    $CHARCNT    ;MJD001
2213 005764 000406          BR      $TYPEX      ;MJD001
2214 005766 122766 000012 000002 1#:    CMPB    @LF,2(SP)  ;MJD001
2215 005774 001402          BEQ     $TYPEX      ;MJD001
2216 005776 105227          INCB    (PC)+       ;MJD001
2217 006000 000000          $CHARCNT: .WORD    0 ;MJD001
2218 006002 000207          $TYPEX: RTS        PC ;MJD001
2219
2220                .SBTTL  APT COMMUNICATIONS ROUTINE
2221
2222                ;*****
2223 006004 112737 000001 006250  $ATY1:  MOVB    @1,$FFLG ;MJD001
2224 006012 112737 000001 006246  $ATY3:  MOVB    @1,$MFLG ;MJD001
2225 006020 000403          BR      $ATYC       ;MJD001
2226 006022 112737 000001 006250  $ATY4:  MOVB    @1,$FFLG ;MJD001
2227 006030          $ATYC:          ;MJD001
2228 006030 010046          MOV     R0,-(SP)    ;MJD001
2229 006032 010146          MOV     R1,-(SP)    ;MJD001
2230 006034 105737 006246  TSTB    $MFLG       ;MJD001
2231 006040 001450          BEQ     5#         ;MJD001
2232 006042 122737 000001 001254  CMPB    @APTENV,$ENV ;MJD001
2233 006050 001031          BNE     3#         ;MJD001
2234 006052 132737 000100 001255  BITB    @APTPOOL,$ENVM ;MJD001
2235 006060 001425          BEQ     3#         ;MJD001
2236 006062 017600 000004          MOV     @4(SP),R0   ;MJD001
2237 006066 062766 000002 000004  ADD     @2,4(SP)    ;MJD001
2238 006074 005737 001234 1#:    TST     $MSGTYPE   ;MJD001
2239 006100 001375          BNE     1#         ;MJD001
2240 006102 010037 001250  MOV     R0,$MSGAD   ;MJD001
2241 006106 105720                2#:    TSTB    (R0)+     ;MJD001
2242 006110 001376          BNE     2#         ;MJD001
2243 006112 163700 001250  SUB     $MSGAD,R0   ;MJD001
2244 006116 006200          ASR     R0         ;MJD001
2245 006120 010037 001252  MOV     R0,$MSGLGT  ;MJD001
2246 006124 012737 000004 001234  MOV     @4,$MSGTYPE ;MJD001
2247 006132 000413          BR      5#         ;MJD001
2248 006134 017637 000004 006160 3#:    MOV     @4(SP),4#   ;MJD001
2249 006142 062766 000002 000004  ADD     @2,4(SP)    ;MJD001
2250 006150 013746 177776  MOV     177776,-(SP) ;MJD001
2251 006154 004737 005440  JSR     PC,$TYPE    ;MJD001
2252 006160 000000          4#:    .WORD    0

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2253 006162          5#:
2254 006162 105737 006250 10#:  TSTB  #FFLG      ;; SHOULD REPORT FATAL ERROR?
2255 006166 001416          BEQ   12#      ;; IF NOT: BR
2256 006170 005737 001254          TST  #ENV      ;; RUNNING UNDER APT?
2257 006174 001413          BEQ   12#      ;; IF NOT: BR
2258 006176 005737 001234          11#: TST  #MSGTYPE  ;; FINISHED LAST MESSAGE?
2259 006202 001375          BNE   11#      ;; IF NOT: WAIT
2260 006204 017637 000004 001236  MOV  B4(SP),#FATAL ;; GET ERROR #
2261 006212 062766 000002 000004  ADD  #2,4(SP)      ;; BUMP RETURN ADDR.
2262 006220 005237 001234          INC  #MSGTYPE  ;; TELL APT TO TAKE ERROR
2263 006224 105037 006250          12#: CLRB #FFLG      ;; CLEAR FATAL FLAG
2264 006230 105037 006247          CLRB #LFLG      ;; CLEAR LOG FLAG
2265 006234 105037 006246          CLRB #MFLG      ;; CLEAR MESSAGE FLAG
2266 006240 012601          MOV  (SP),R1     ;; POP STACK INTO R1
2267 006242 012600          MOV  (SP),R0     ;; POP STACK INTO R0
2268 006244 000207          RTS   PC        ;; RETURN
2269 006246 000          #MFLG: .BYTE 0  ;; MESSG. FLAG
2270 006247 000          #LFLG: .BYTE 0  ;; LOG FLAG
2271 006250 000          #FFLG: .BYTE 0  ;; FATAL FLAG
2272          006252          .EVEN
2273          000200  APTSIZE=200
2274          000001  APTENV=001
2275          000100  APTSPool=100
2276          000040  APTCSUP=040
2277
2278          ;STRING INPUT ROUTINE
2279          ;-----
2280
2281 006252 010346          .INSTR: MOV  R3,-(SP)  ;SAVE R3 ON STACK
2282 006254 010446          MOV  R4,-(SP)  ;SAVE R4 ON STACK
2283 006256 017637 000004 006274  MOV  B4(SP),.MSG ;GET THE ADDRESS OF THE MESSAGE TO BE PRINTED
2284 006264 062766 000002 000004  ADD  #2,4(SP)  ;POINT TO INSTRUCTION AFTER ADDRESS POINTER
2285 006272 104402          .INST1: TYPE  ;PRINT THE MESSAGE
2286 006274 000000          .MSG: 0       ;MESSAGE IS POINTED TO FROM HERE
2287 006276 012704 011272          MOV  #INBUF,R4 ;POINT R4 TO THE INPUT BUFFER
2288 006302 012703 000007          MOV  #7,R3     ;SET THE MAXIMUM NUMBER OF CHARACTERS ALLOWED
2289 006306 105777 172652          1#:  TSTB  #TKS   ;HAS A CHARACTER BEEN RECEIVED?
2290 006312 100375          BPL   1#       ;IF NO, KEEP WAITING FOR IT
2291 006314 117714 172646          MOVB #TKB,(R4) ;IF YES, SAVE IT IN THE INPUT BUFFER
2292 006320 142714 000200          BICB #200,(R4) ;KEEP ONLY THE 7-BIT ASCII INFORMATION
2293 006324 122714 000023          CMPB #XOFF,(R4) ;IS IT A XOFF?
2294 006330 001014          BNE   83#     ;; DSH-BHL
2295 006332 105777 172626          101#: TSTB  #TKS   ;BR IF NOT ;; DSH
2296 006336 100375          BPL   101#    ;WAIT FOR A CHARACTER ;; DSH-BHL
2297 006340 117714 172622          MOVB #TKB,(R4) ;GET CHARACTER ;; DSH-BHL
2298 006344 142714 000200          BICB #200,(R4) ;STRIP DOWN CHARACTER ;; DSH-BHL
2299 006350 122714 000021          CMPB #XON,(R4) ;WAIT FOR A XON? ;; DSH-BHL
2300 006354 001366          BNE   101#    ;GET NEXT CHAR IF NOT ;; DSH-BHL
2301 006356 105724          TSTB (R4)+    ;POP STACK ;; DSH
2302 006360 000752          BR   1#       ;WAIT FOR A CHAR ;; DSH
2303 006362 122714 000021          83#:  CMPB  #XON,(R4) ;IS IT A RANDOM XON ;; DSH-BHL
2304 006366 001002          BNE   102#    ;BR IF NO ;; DSH-BHL
2305 006370 105724          TSTB (R4)+    ;ELSE, POP STACK ;; DSH-BHL
2306 006372 000745          BR   1#       ;GO GET NEXT CHAR ;; DSH-BHL
2307 006374 122724 000015          102#: CMPB  #15,(R4)+ ;IS IT <CR> ?
2308 006400 001417          BEQ  INSTR2   ;IF SO, TERMINATE THE INPUT SEQUENCE

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2309 006402 105777 172562      24:  TSTB    04TPS      ;IF NOT, CHECK TO SEE IF THE CHARACTER CAN PRINT
2310 006406 100375              BPL      24          ;IF WE CAN'T, WAIT UNTIL WE CAN
2311 006410 017777 172552 172554  MOV      04TKB,04TPB ;ECHO THE CHARACTER BACK
2312 006416 005303              DEC      R3          ;REDUCE THE NUMBER OF CHARACTERS RECEIVED
2313 006420 001332              BNE      14          ;IF WE DON'T HAVE 7, GO GET SOME MORE
2314 006422 012604              MOV      (SP)+,R4    ;IF WE HAVE 7, RESTORE R4
2315 006424 012603              MOV      (SP)+,R3    ;RESTORE R3
2316 006426 010346      .INSTE: MOV      R3,-(SP)    ;SAVE R3 ON THE STACK
2317 006430 010446              MOV      R4,-(SP)    ;SAVE R4 ON THE STACK
2318 006432 104402 001230      TYPE     ,4QUES      ;PRINT A QUESTION MARK... WHAT'S GOING ON?
2319 006436 000715              BR       .INST1      ;GO PRINT THE MESSAGE AGAIN
2320 006440 012604      INSTR2: MOV      (SP)+,R4 ;RESTORE R4
2321 006442 012603              MOV      (SP)+,R3    ;RESTORE R3
2322 006444 000002              RTI                    ;RETURN TO THE MAIN PROCEDURE
2323
2324              ;CONVERT ASCII STRING TO OCTAL
2325              ;-----
2326
2327 006446 010546      .PARAM: MOV      R5,-(SP) ;SAVE R5 ON THE STACK
2328 006450 010446              MOV      R4,-(SP)    ;SAVE R4 ON THE STACK
2329 006452 016605 000004      MOV      4(SP),R5    ;GET THE SETUP INFORMATION POINTER
2330 006456 012537 006636      MOV      (R5)+,LOLIM ;SET THE LOW LIMIT FOR THE INPUT
2331 006462 012537 006640      MOV      (R5)+,HILIM ;SET THE HIGH LIMIT FOR THE INPUT
2332 006466 012537 006642      MOV      (R5)+,DEVADR ;SAVE THE ADDRESS WHERE THE RESULT WILL BE STORED
2333 006472 112537 006644      MOV      (R5)+,LOBITS ;GET THE MASK OF THE INCORRECT BITS
2334 006476 112537 006645      MOV      (R5)+,ADRCNT ;GET THE COUNT OF ITEMS TO BE STORED
2335 006502 010566 000004      MOV      R5,4(SP)    ;POINT TO WHERE MAIN LINE PROGRAM WILL RESUME
2336 006506 005005      PARAM1: CLR      R5    ;INITIALIZE THE ASCII TO OCTAL RESULT WORD
2337 006510 012704 011272      MOV      0INBUF,R4   ;POINT TO THE INPUT BUFFER
2338 006514 122714 000015      CMPB    015,(R4)     ;IS THIS CHARACTER A CARRIAGE RETURN?
2339 006520 001420              BEQ     PARERR       ;IF SO, PRINT THE MESSAGE AGAIN
2340 006522 121427 000060      14:    CMPB    (R4),060    ;IS THIS CHARACTER BELOW THE NUMERIC RANGE?
2341 006526 002415              BLT     PARERR       ;IF SO, GO PRINT THE MESSAGE AGAIN
2342 006530 121427 000067      CMPB    (R4),067    ;IS THIS CHARACTER ABOVE THE NUMERIC RANGE?
2343 006534 003012              BGT     PARERR       ;IF SO, GO PRINT THE MESSAGE AGAIN
2344 006536 142714 000060      BICB    060,(R4)     ;ISOLATE THE NUMBER THE CHARACTER REPRESENTS
2345 006542 152405              BISB    (R4)+,R5    ;CONCATENATE THESE BITS TO THE ALREADY EXISTING STRING
2346 006544 122714 000015      CMPB    015,(R4)     ;IS THE NEXT CHARACTER A CARRIAGE RETURN?
2347 006550 001406              BEQ     LIMITS      ;IF SO, GO SEE IF NUMBER IS WITHIN LIMITS
2348 006552 006305              ASL     R5           ;CLEAR BIT POSITION 0, MOVE EXISTING STRING TO LEFT
2349 006554 006305              ASL     R5           ;CLEAR POSITION 1, MOVE STRING TO LEFT AGAIN
2350 006556 006305              ASL     R5           ;MOVE THE STRING ONE MORE TIME TO MAKE ROOM FOR
2351                          ;NEXT THREE BITS
2352 006560 000760              BR      14          ;GO GET THE NEXT CHARACTER
2353 006562 104404      PARERR: INSTER      ;THERE WAS AN ERROR... GO PRINT MESSAGE AGAIN
2354 006564 000750              BR      PARAM1      ;TRY GETTING THE PARAMETERS AGAIN
2355
2356              ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
2357              ;-----
2358
2359 006566 020537 006640      LIMITS: CMP      R5,HILIM ;DOES RESULT EXCEED ITS MAXIMUM CORRECT VALUE?
2360 006572 101373              BHI     PARERR       ;IF YES, GO PRINT THE MESSAGE AGAIN
2361 006574 020537 006636      CMP      R5,LOLIM    ;IS THE RESULT LOWER THAN ALLOWED?
2362 006600 103770              BLO     PARERR       ;IF YES, GO PRINT THE MESSAGE AGAIN
2363 006602 133705 006644      BITB    LOBITS,R5   ;ARE ANY INCORRECT BITS SET IN THE RESULT?
2364 006606 001365              BNE     PARERR       ;IF SO, GO PRINT THE MESSAGE AGAIN

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2365                                     ;STORE NUMBER AT SPECIFIED ADDRESS
2366
2367
2368 006610 013704 006642                11:  MOV    DEVADR,R4      ;POINT TO THE LOCATION WHERE THE RESULT WILL BE STORED
2369 006614 010524                       MOV    R5,(R4)+     ;STORE THE RESULT
2370 006616 062705 000002                ADD    #2,R5        ;CALCULATE THE NEXT DATUM
2371 006622 105337 006645                DECB   ADRCNT       ;REDUCE COUNT OF STORED RESULTS. IS IT EXCEEDED?
2372 006626 001372                       BNE    11           ;IF NOT, GO STORE THE NEXT DATUM
2373 006630 012604                       MOV    (SP)+,R4     ;RESTORE R4
2374 006632 012605                       MOV    (SP)+,R5     ;RESTORE R5
2375 006634 000002                       RTI                ;RETURN TO THE MAIN PROGRAM
2376
2377 006636 000000                LOLIM: 0            ;LOWEST ACCEPTABLE VALUE
2378 006640 000000                HILIM: 0            ;HIGHEST ACCEPTABLE
2379 006642 000000                DEVADR: 0           ;LOCATION WHERE RESULT WILL BE STORED
2380 006644      000                LOBITS: .BYTE 0    ;INCORRECT BITS MASK
2381 006645      000                ADRCNT: .BYTE 0    ;COUNT OF ITEMS TO BE STORED
2382
2383                                     ;SAVE PC OF TEST THAT FAILED AND R0-R5
2384                                     ;-----
2385
2386 006646 016637 000004 001402  .SAV05: MOV    4(SP),SAVPC    ;SAVE R7 (PC)
2387
2388                                     ;SAVE R0-R5
2389
2390 006654 010537 001214                SV05:  MOV    R5,#REG5    ;SAVE R5
2391 006660 010437 001212                MOV    R4,#REG4    ;SAVE R4
2392 006664 010337 001210                MOV    R3,#REG3    ;SAVE R3
2393 006670 010237 001206                MOV    R2,#REG2    ;SAVE R2
2394 006674 010137 001204                MOV    R1,#REG1    ;SAVE R1
2395 006700 010037 001202                MOV    R0,#REG0    ;SAVE R0
2396 006704 000002                       RTI                ;LEAVE.
2397
2398                                     ;RESTORE R0-R5
2399
2400 006706 013700 001202                .RES05: MOV    #REG0,R0    ;RESTORE R0
2401 006712 013701 001204                MOV    #REG1,R1    ;RESTORE R1
2402 006716 013702 001206                MOV    #REG2,R2    ;RESTORE R2
2403 006722 013703 001210                MOV    #REG3,R3    ;RESTORE R3
2404 006726 013704 001212                MOV    #REG4,R4    ;RESTORE R4
2405 006732 013705 001214                MOV    #REG5,R5    ;RESTORE R5
2406 006736 000002                       RTI                ;LEAVE
2407
2408                                     ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
2409                                     ;-----
2410
2411 006740 104402 001231                .CONVR: TYPE    ,#CRLF    ;PRINT A CARRIAGE RETURN
2412 006744 010046                       .CNVRT: MOV    R0,-(SP)    ;SAVE R0
2413 006746 010146                       MOV    R1,-(SP)    ;SAVE R1
2414 006750 010346                       MOV    R3,-(SP)    ;SAVE R3
2415 006752 010446                       MOV    R4,-(SP)    ;SAVE R4
2416 006754 010546                       MOV    R5,-(SP)    ;SAVE R5
2417 006756 017601 000012                MOV    #12(SP),R1   ;PLACE THE ADDRESS OF THE ARGUMENTS IN R1
2418 006762 062766 000002 000012        ADD    #2,12(SP)    ;POINT TO WHERE MAIN PROGRAM WILL RESUME
2419 006770 012137 007114                MOV    (R1)+,WRDCNT ;GET NUMBER OF WORDS TO BE PRINTED
2420 006774 112105                11:  MOV    (R1)+,R5    ;GET THE NUMBER OF CHARACTERS TO BE PRINTED

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2421 006776 112100          MOVB      (R1),R0          ;GET THE NUMBER OF SPACES TO PRINT
2422 007000 013104          MOV       B(R1),R4        ;COPY THE WORD TO BE CONVERTED
2423 007002 110537 007116   MOVB     R5,CHRCNT       ;COPY THE CHARACTER COUNT
2424 007006 010403          MOV       R4,R3          ;COPY THE ARGUMENT WORD AGAIN
2425 007010 042703 177770   BIC      @+C<7>,R3       ;ISOLATE THREE BITS TO BE TREATED AS A CHARACTER
2426 007014 062703 000060   ADD      @060,R3         ;MAKE AN ASCII CHARACTER OUT OF THEM
2427 007020 110346          MOVB     R3,-(SP)        ;SAVE THAT CHARACTER
2428 007022 006004          ROR      R4              ;MOVE THE NEXT THREE BITS INTO PLACE
2429 007024 006204          ASR      R4              ;MOVE THEM AGAIN
2430 007026 006204          ASR      R4              ;AND FINALLY A THIRD TIME
2431 007030 005305          DEC      R5              ;REDUCE CHARACTER COUNT.ARE ALL CHARACTERS
2432                                ;BUILT?
2433 007032 001365          BNE      3:              ;IF NO, GO BUILD THE NEXT ONE.
2434 007034 012703 011376   MOV      @MDATA,R3       ;NOW POINT TO WHERE NUMBER WILL BE PRINTED FROM
2435 007040 112623          MOVB     (SP),(R3)       ;STORE THE CHARACTER, STARTING WITH THE MOST
2436 007042 105337 007116   DECB    CHRCNT          ;REDUCE COUNT. ARE ALL CHARACTERS TRANSFERRED?
2437 007046 001374          BNE      4:              ;IF NO, GO TRANSFER ANOTHER
2438 007050 105700          TSTB    R0              ;ARE ANY SPACES TO BE PRINTED?
2439 007052 001404          BEQ     5:              ;IF NO, DON'T SET UP ANY
2440 007054 112723 000040   MOVB     @040,(R3)       ;ADD A SPACE TO THE OUTPUT BUFFER
2441 007060 105300          DECB    R0              ;REDUCE THE COUNT. SHOULD WE PRINT MORE?
2442 007062 001374          BNE      5:              ;IF YES, GO ADD ANOTHER SPACE
2443 007064 105013          CLRB    (R3)            ;TERMINATE THE OUTPUT BUFFER WITH A ZERO
2444 007066 104402 011376   TYPE    ,MDATA          ;PRINT THE STRING WE JUST BUILT
2445 007072 005337 007114   DEC     WRDCNT          ;REDUCE THE WORD COUNT. ARE ANY MORE WORDS LEFT?
2446 007076 001336          BNE     1:              ;IF YES, GO CONVERT THEM
2447 007100 012605          MOV     (SP),R5         ;RESTORE R5
2448 007102 012604          MOV     (SP),R4         ;RESTORE R4
2449 007104 012603          MOV     (SP),R3         ;RESTORE R3
2450 007106 012601          MOV     (SP),R1         ;RESTORE R1
2451 007110 012600          MOV     (SP),R0         ;RESTORE R0
2452 007112 000002          RTI                                ;RETURN TO THE MAIN PROGRAM
2453 007114 000000          WRDCNT: 0
2454 007116          000          CHRCNT: .BYTE
2455 007117          000          SPACNT: .BYTE 0
2456
2457 007120 000000          BINMRD: 0
2458
2459
2460                                ;TRAP DISPATCH SERVICE
2461                                ;ARGUMENT OF TRAP IS EXTRACTED
2462                                ;AND USED AS OFFSET TO OBTAIN POINTER
2463                                ;TO SELECTED SUBROUTINE
2464
2465 007122 010046          .TRPSR: MOV     R0,-(SP)    ;SAVE R0. USE R0 TO FIND TRAP ROUTINE
2466 007124 016600 000002   MOV     2(SP),R0        ;GET TRAP ADDRESS
2467 007130 005740          TST     -(R0)           ;GET TRAP
2468 007132 111000          MOVB    (R0),R0         ;GET RIGHT BYTE OF TRAP(TRAP OFFSET)
2469 007134 006300          ASL     R0              ;POSITION OFFSET FOR TABLE INDEXING
2470 007136 016000 002002   MOV     ,TRPTAB(R0),R0  ;PLACE INDEXED ADDRESS OF TABLE IN R0
2471 007142 000200          RTS     R0              ;TRANSFER TO THAT ADDRESS AND RESTORE OLD R0
2472
2473                                ;DEVICE CLEAR ROUTINE
2474                                ;ISSUE A DEVICE CLEAR
2475                                ;-----
2476 007144          .DEVICE.CLR:

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2477 007144 052777 000020 172670      BIS      @DCLR,@DZCSR      ;SET DCLR
2478 007152 032777 000020 172662 10:    BIT      @DCLR,@DZCSR      ;DID IT CLEAR?
2479 007160 001374                      BNE      10              ;BR IF NO
2480 007162 000002                      RTI                          ;EXIT ROUTINE
2481
2482                      ;ROUTINE TO HANDLE MAINTENANCE BIT SETTING WITH DEVICE CLEAR
2483                      ;-----
2484 007164 104413                      .DCLASH:DEVICE.CLR      ;ISSUE A DEVICE CLEAR
2485 007166 153777 001417 172646      BISB     MNTFLG,@DZCSR  ;LOAD THE MAINTENANCE BIT IF IT IS I MODE
2486 007174 000002                      RTI                          ;RETURN TO CALLING ROUTINE
2487
2488                      .DELAY:
2489 007176 010046                      MOV      RO,-(SP)        ;SAVE RO
2490 007200 013700 007214              MOV      DLYCNT,RO      ;SET COUNT
2491 007204 005300                      10:    DEC      RO          ;DELAY
2492 007206 001376                      BNE      10              ;
2493 007210 012600                      MOV      (SP),RO        ;RESTORE RO
2494 007212 000002                      RTI                          ;LEAVE ROUTINE
2495 007214 000001      DLYCNT: .WORD      1      ;PATCHABLE LOC FOR MORE TIME
2496
2497                      ;ADVANCE TO NEXT TEST HANDLER
2498                      ;-----
2499
2500 007216 013716 001360      .ADVANCE:MOV      NEXT,(SP) ;CRUNCH STACK WITH ADDRESS OF SCOPE CALL
2501 007222 005037 001362      CLR      LOCK           ;RESET TIGHT LOOP ADDRESS
2502 007226 000002                      RTI                          ;CHECK TO SEE IF OLD TEST GETS REPEATED
2503
2504                      ;ERROR HANDLER
2505                      ;-----
2506
2507 007230 004737 007652      %ERROR: JSR      PC,SERV.G ;FIND OUT IF <+G> WAS HIT
2508 007234 032777 010000 171716      BIT      @SW12,@SMR     ;BELL ON ERROR?
2509 007242 001406                      BEQ      XBX             ;BR IF NO BELL
2510 007244 105777 171720      TSTB    @ITPS           ;TTY READY.
2511 007250 100003                      BPL      XBX             ;DON'T WAIT IF TTY NOT READY.
2512 007252 112777 000207 171712      MOVB    @207,@ITPB      ;PUSH A BELL AT THE TTY.
2513 007260 032777 020000 171672      XBX:    BIT      @SW13,@SMR ;DELETE ERROR PRINT OUT?
2514 007266 001113                      BNE      HALTS          ;BR IF NO PRINT OUT WANTED.
2515 007270 021637 001136      CMP      (SP),%ERRPC    ;WAS THIS ERROR FOUND LAST TIME?
2516 007274 001404                      BEQ      10              ;BR IF YES
2517 007276 011637 001136      MOV      (SP),%ERRPC    ;RECORD BEING HERE
2518 007302 105037 001123      CLRB    %ERFLG         ;PREPARE HEADER
2519 007306 104407                      10:    SAVO5           ;SAVE ALL PROC REGISTERS
2520 007310 011605                      MOV      (SP),R5        ;GET THE PC OF ERROR
2521 007312 162705 000002      SUB      @2,R5          ;GET ADDRESS OF TRAP CALL
2522 007316 011504                      MOV      (R5),R4        ;GET ERROR INSTRUCTION
2523 007320 110437 001134      MOVB    R4,@ITEMB      ;COPY TEST NUMBER FOR APT HANDLING
2524 007324 006304                      ASL      R4              ;MULT BY TWO
2525 007326 061504                      ADD      (R5),R4        ;DOUBLE IT
2526 007330 006304                      ASL      R4              ;MULT AGAIN
2527 007332 042704 177001      BIC      @177001,R4     ;CLEAR JUNK
2528 007336 062704 030312      ADD      @.ERRTAB,R4    ;GET POINTER
2529 007342 012437 007466      MOV      (R4),%ERRMSG   ;GET ERROR MESSAGE
2530 007346 012437 007500      MOV      (R4),%DATAHD   ;GET DATA HEADRER
2531 007352 011437 007512      MOV      (R4),%DATABP   ;GET DATA TABLE
2532 007356 105737 001123      TSTB    %ERFLG         ;TYPE HEADER

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2533	007362	001403			BEQ	TYPMSG			;BR IF YES
2534	007364	005737	007512		TST	DATABP			;DOES DATA TABLE EXIST?
2535	007370	001044			BNE	TYPDAT			;BR IF YES.
2536	007372	104402	001231		TYPMSG:	TYPE	,#CRLF		;TYPE A CARRIAGE RETURN
2537	007376	104402	001231		TYPE		,#CRLF		;AND TYPE ANOTHER
2538	007402	005737	001362		TST	LOCK			
2539	007406	001402			BEQ	1#			
2540	007410	104402	010766		TYPE	,MASTEK			
2541	007414	104402	010754		1#:	TYPE	,MTSTN		
2542	007420	104412	007644		CNVRT	,XTSTN			;SHOW IT
2543	007424	104402	011043		TYPE	,MERRPC			;TYPE PC.
2544	007430	104412	007636		CNVRT	,ERTABO			;SHOW IT
2545	007434	104402	010716		TYPE	,MCSRX			
2546	007440	104412	005072		CNVRT	,XCSR			
2547	007444	104402	001231		TYPE	,#CRLF			;GIVE A CR/LF
2548	007450	112737	177777	001123	MOV	#-1,#ERFLG			;NO MORE HEADER UNLESS NO DATA TABLE.
2549	007456	005737	007466		TST	ERRMSG			;IS THERE AN ERROR MESSAGE?
2550	007462	001402			BEQ	WTBS.FM			;BR IF NO.
2551	007464	104402			TYPE				;TYPE
2552	007466	000000			ERRMSG:	0			; ERROR MESSAGE
2553	007470				WTBS.FM:				
2554	007470	005737	007500		TST	DATAHD			;DATA HEADER?
2555	007474	001402			BEQ	TYPDAT			;BR IF NO
2556	007476	104402			TYPE				;TYPE
2557	007500	000000			DATAHD:	0			; DATA HEADER
2558	007502	005737	007512		TYPDAT:	TST	DATABP		;DATA TABLE?
2559	007506	001402			BEQ	RESREG			;BR IF NO.
2560	007510	104411			CONVRT				;SHOW
2561	007512	000000			DATABP:	0			; DATA TABLE
2562	007514	104410			RESREG:	RES05			;RESTORE PROC REGISTERS
2563	007516	122737	000001	001254	HALTS:	CMPB	#APTENV,#ENV		;IS APT RUNNING?
2564	007524	001007			BNE	2#			;SKIP APT CALL IF NOT
2565	007526	113737	001134	007540	MOV	#ITEMB,7#			;COPY ERROR NUMBER
2566	007534	004737	006022		JSR	PC,#ATY4			;CALL APT SERVICE
2567	007540	000000			7#:	.WORD	0		;ERROR NUMBER STUCK HERE
2568	007542	000777			8#:	BR	8#		;LOCK UP HERE
2569	007544	022737	005056	000042	2#:	CMP	#ENDAD,8#42		;CHECK TO SEE IF IN ACT-11 MODE
2570	007552	001403			BEQ	1#			;IF SO, HANDLE ACCORDINGLY
2571	007554	005777	171400		TST	BSMR			;HALT ON ERROR?
2572	007560	100004			BPL	EXITER			;BR IF NO HALT ON ERROR
2573	007562	016677	000002	171372	1#:	MOV	2(SP),#DISPLAY		;SHOW ERROR PC IN DATA DISPLAY
2574	007570	000000			HALT				;HALT
2575	007572	005237	001132		EXITER:	INC	#ERTTL		;UPDATE ERROR COUNT
2576	007576	032777	000400	171354	BIT	#SW08,BSMR			;GOTO TOP OF TEST?
2577	007604	001007			BNE	1#			;BR IF YES
2578	007606	032777	002000	171344	BIT	#SW10,BSMR			;GOTO NEXT TEST?
2579	007614	001407			BEQ	2#			;BR IF NO
2580	007616	013737	001360	001126	MOV	NEXT,#LPADR			;SET FOR NEXT TEST
2581	007624	012706	001120		1#:	MOV	#STACK,SP		;RESET SP
2582	007630	000177	171272		2#:	JMP	#LPADR		;GOTO SPECIFIED TEST
2583	007634	000002			RTI				;RETURN
2584	007636	000001			ERTABO:	1			
2585	007640	006	002		.BYTE	6,2			
2586	007642	001402			SAVPC				
2587	007644	000001			XTSTN:	1			
2588	007646	002	002		.BYTE	2,2			



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2589 007650 001122          |STSTNM
2590 007652 022737 177570 001160 SERV.G: CMP      @177570,SMR      ;IS THE SWITCH REGISTER HARDWIRED?
2591 007660 001002          BNE      99@          ;IF SO, IGNORE *G
2592 007662 000137 010270          JMP      6@          ; ;DSH-BHL
2593 007666 017746 171274          99@:    MOV      @1TKB,-(SP) ;OTHERWISE, GET THE LAST CHARACTER TYPED
2594 007672 042716 177600          BIC      @177600,(SP) ;STRIP CHAR ; ;DSH-BHL
2595 007676 122716 000023          CMPB    @1XOFF,(SP) ;IS IT A XOFF ; ;DSH-BHL
2596 007702 001012          BNE      102@       ;BR IF NO ; ;DSH-BHL
2597
2598 007704 105777 171254          101@:   TSTB    @1TKS      ;WAIT FOR A CHAR ; ;DSH-BHL
2599 007710 100375          BPL      101@       ; ;DSH-BHL
2600 007712 117716 171250          MOVB    @1TKB,(SP) ;GET THE CHAR ; ;DSH-BHL
2601 007716 042716 177600          BIC      @177600,(SP) ;STRIP CHAR ; ;DSH-BHL
2602 007722 122716 000021          CMPB    @1XON,(SP) ;IS IT A XON ; ;DSH-BHL
2603 007726 001366          BNE      101@       ;BR IF NO ; ;DSH-BHL
2604
2605 007730 122716 000021          102@:   CMPB    @1XON,(SP) ;IS IT RANDOM XON ? ; ;DSH
2606 007734 001002          BNE      7@          ;BR IF NOT ; ;DSH
2607 007736 005726          TST     (SP).      ;POP STACK ; ;DSH
2608 007740 000553          BR       6@          ;IGNORE XON CHAR ; ;DSH
2609
2610 007742 122726 000007          7@:    CMPB    @7,(SP).  ;IS IT *G?
2611 007746 001150          BNE      6@          ;IF NOT, IGNORE INPUT
2612 007750 032777 004000 171206          BIT     @4000,@1TKS ;RX BUSY?
2613 007756 001335          BNE      SERV.G    ;BR IF YES
2614 007760 017737 171174 010312          MOV     @SMR,90@   ;SAVE (SMR).
2615 007766 013777 010312 171164 1@:    MOV     90@,@SMR   ;
2616 007774 104402 010272          TYPE    .89@      ;
2617 010000 104412 010304          CNVRT   .88@      ;
2618 010004 104402 010314          TYPE    .91@      ;
2619 010010 105777 171150          9@:    TSTB    @1TKS      ;WAIT FOR DONE.
2620 010014 100375          BPL      .-4        ;
2621 010016 017746 171144          MOV     @1TKB,-(SP) ;
2622 010022 042716 177600          BIC      @177600,(SP) ;STRIP CHAR ; ;DSH-BHL
2623 010026 122716 000023          CMPB    @1XOFF,(SP) ;IS IT A XOFF ; ;DSH-BHL
2624 010032 001012          BNE      112@       ;BR IF NO ; ;DSH-BHL
2625
2626 010034 105777 171124          111@:   TSTB    @1TKS      ;WAIT FOR A CHAR ; ;DSH-BHL
2627 010040 100375          BPL      111@       ; ;DSH-BHL
2628 010042 117716 171120          MOVB    @1TKB,(SP) ;GET THE CHAR ; ;DSH-BHL
2629 010046 042716 177600          BIC      @177600,(SP) ;STRIP CHAR ; ;DSH-BHL
2630 010052 122716 000021          CMPB    @1XON,(SP) ;IS IT A XON ; ;DSH-BHL
2631 010056 001366          BNE      111@       ;BR IF NO ; ;DSH-BHL
2632
2633 010060 122716 000021          112@:   CMPB    @1XON,(SP) ;IS IT RANDOM XON ? ; ;DSH
2634 010064 001002          BNE      8@          ;BR IF NOT ; ;DSH
2635 010066 005726          TST     (SP).      ;POP STACK ; ;DSH
2636 010070 000747          BR       9@          ;IGNORE XON CHAR ; ;DSH
2637
2638 010072 122726 000015          8@:    CMPB    @15,(SP). ;
2639 010076 001472          BEQ     5@          ;
2640 010100 005077 171054          CLR     @SMR       ;
2641 010104 105777 171060          2@:    TSTB    @1TPS      ;
2642 010110 100375          BPL      .-4        ;
2643 010112 016677 177776 171052          MOV     -2(SP),@1TPB ;
2644 010120 000241          CLC

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2645 010122 006177 171032      ROL      BSMR      ;
2646 010126 006177 171026      ROL      BSMR      ;
2647 010132 006177 171022      ROL      BSMR      ;
2648 010136 103713                BCS      1#        ;ERROR
2649 010140 026627 177776 000060  CMP      -2(SP),#60   ;
2650 010146 002707                BLT      1#        ;
2651 010150 026627 177776 000067  CMP      -2(SP),#67   ;
2652 010156 003303                BGT      1#        ;
2653 010160 042766 177770 177776  BIC      #C<7>,-2(SP) ;
2654 010166 056677 177776 170764  BIS      -2(SP),BSMR ;
2655 010174 105777 170764      12# : TSTB     #TKS     ;
2656 010200 100375                BPL      .-4        ;
2657 010202 017746 170760      MOV      #TKB,-(SP) ;
2658 010206 042716 177600      BIC      #177600,(SP) ;STRIP CHAR      ;DSH-BHL
2659 010212 122716 000023      CMPB     #XOFF,(SP) ;IS IT A XOFF    ;DSH-BHL
2660 010216 001012                BNE      122#      ;BR IF NO        ;DSH-BHL
2661
2662 010220 105777 170740      121# : TSTB     #TKS     ;WAIT FOR A CHAR ;DSH-BHL
2663 010224 100375                BPL      121#      ;DSH-BHL
2664 010226 117716 170734      MOVB     #TKB,(SP) ;GET THE CHAR    ;DSH-BHL
2665 010232 042716 177600      BIC      #177600,(SP) ;STRIP CHAR      ;DSH-BHL
2666 010236 122716 000021      CMPB     #XON,(SP)  ;IS IT A XON     ;DSH-BHL
2667 010242 001366                BNE      121#      ;BR IF NO        ;DSH-BHL
2668
2669 010244 122716 000021      122# : CMPB     #XON,(SP) ;IS IT RANDOM XON ? ;DSH
2670 010250 001002                BNE      10#        ;BR IF NOT       ;DSH
2671 010252 005726                TST      (SP)+     ;POP STACK       ;DSH
2672 010254 000747                BR       12#        ;IGNORE XON CHAR ;DSH
2673
2674 010256 122726 000015      10# : CMPB     #15,(SP)+ ;
2675 010262 001310                BNE      2#         ;
2676 010264 104402 001231      5# : TYPE     ,#CRLF   ;
2677 010270 000207      6# : RTS      PC       ;
2678
2679 010272 020200 051450 051127 89# : .ASCIZ   <200>? (SMR)=/? ;
2680 010300 036451 000057      .EVEN
2681
2682 010304 000001      88# : 1
2683 010306 006 000      .BYTE    6,0
2684 010310 010312      90# : 90#
2685 010312 000000      90# : .WORD    0
2686 010314 036457 000057      91# : .ASCIZ   ?/?/?
2687
2688      .EVEN
2689      .SBTTL  POWER DOWN AND UP ROUTINES
2690
2691      ;*****
2692      ;POWER DOWN ROUTINE
2692 010320 012737 010464 000024 #PWRDN: MOV      #ILLUP,#PWRVEC ;SET FOR FAST UP
2693 010326 012737 000340 000026      MOV      #340,#PWRVEC+2 ;PRIO:7
2694 010334 010046                MOV      R0,-(SP)      ;PUSH R0 ON STACK
2695 010336 010146                MOV      R1,-(SP)      ;PUSH R1 ON STACK
2696 010340 010246                MOV      R2,-(SP)      ;PUSH R2 ON STACK
2697 010342 010346                MOV      R3,-(SP)      ;PUSH R3 ON STACK
2698 010344 010446                MOV      R4,-(SP)      ;PUSH R4 ON STACK
2699 010346 010546                MOV      R5,-(SP)      ;PUSH R5 ON STACK
2700 010350 017746 170604      MOV      BSMR,-(SP)    ;PUSH BSMR ON STACK
    
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2701 010354 010637 010470      MOV      SP, $SAVR6      ;;SAVE SP
2702 010360 012737 010372 000024  MOV      @#PWRUP, @#PWRVEC ;;SET UP VECTOR
2703 010366 000000      HALT
2704 010370 000776      BR      -2      ;;HANG UP
2705
2706      ;;*****
2707      ;POWER UP ROUTINE
2708 010372 012737 010464 000024  $PWRUP: MOV      @#ILLUP, @#PWRVEC ;;SET FOR FAST DOWN
2709 010400 013706 010470      MOV      $SAVR6, SP      ;;GET SP
2710 010404 005037 010470      CLR      $SAVR6      ;;WAIT LOOP FOR THE TTY
2711 010410 005237 010470      1$: INC      $SAVR6      ;;WAIT FOR THE INC
2712 010414 001375      BNE      1$      ;;OF WORD
2713 010416 012677 170536      MOV      (SP)+, $SMR      ;;POP STACK INTO $SMR
2714 010422 012605      MOV      (SP)+, R5      ;;POP STACK INTO R5
2715 010424 012604      MOV      (SP)+, R4      ;;POP STACK INTO R4
2716 010426 012603      MOV      (SP)+, R3      ;;POP STACK INTO R3
2717 010430 012602      MOV      (SP)+, R2      ;;POP STACK INTO R2
2718 010432 012601      MOV      (SP)+, R1      ;;POP STACK INTO R1
2719 010434 012600      MOV      (SP)+, R0      ;;POP STACK INTO R0
2720 010436 012737 010320 000024  MOV      @#PWRDN, @#PWRVEC ;;SET UP THE POWER DOWN VECTOR
2721 010444 012737 000340 000026  MOV      @340, @#PWRVEC+2 ;;PRIO:7
2722 010452 104402      TYPE      ;;REPORT THE POWER FAILURE
2723 010454 010472      $PWRMG: .WORD MPFAIL      ;;POWER FAIL MESSAGE POINTER
2724 010456 012716      MOV      (PC)+, (SP)      ;;RESTART AT RESTART
2725 010460 012106      $PWRAD: .WORD RESTART      ;;RESTART ADDRESS
2726 010462 000002      RTI
2727 010464 000000      $ILLUP: HALT      ;;THE POWER UP SEQUENCE WAS STARTED
2728 010466 000776      BR      -2      ;; BEFORE THE POWER DOWN WAS COMPLETE
2729 010470 000000      $SAVR6: 0      ;;PUT THE SP HERE
2730 010472 050200 051127 043040 MPFAIL: .ASCIZ <200>/PWR FAILED. RESTART AT LAST TEST /
(2) 010535 200 047105 020104 MEPASS: .ASCIZ <200>/END PASS CZDZA-H /
(2) 010560 051200 047125 044516 MR: .ASCIZ <200>/RUNNING /
(2) 010574 050200 047522 051107 MERR2: .ASCIZ <200>/PROGRAM INDICATES NO DEVICES PRESENT./
(2) 010643 200 047111 052523 MERR3: .ASCIZ <200>/INSUFFICIENT DATA!/
(2) 010667 200 047514 045503 MLOCK: .ASCIZ <200>/LOCK ON SELECTED TEST/
(2) 010716 051503 035122 000040 MCSR: .ASCIZ /CSR: /
(2) 010724 042526 035103 000040 MVEC: .ASCIZ /VEC: /
(2) 010732 040520 051523 051505 MPASSX: .ASCIZ /PASSES: /
(2) 010743 105 051122 051117 MERRX: .ASCIZ /ERRORS: /
(2) 010754 042524 052123 047040 MTSTN: .ASCIZ /TEST NO: /
(2) 010766 020052 000 MASTEK: .ASCIZ /* /
(2) 010771 200 042523 020124 MNEW: .ASCIZ <200>/SET SWITCH REG TO DZ11'S DESIRED ACTIVE./
(2) 011043 120 035103 000040 MERRPC: .ASCIZ /PC: /
(2) 011050 046600 050101 047440 XHEAD: .ASCIZ <200>/MAP OF DZ11 STATUS/<200>
(2) 011075 200 046111 042514 MBADLN: .ASCIZ <200>/ILLEGAL ENTRY IN STAGGERED MODE/<200>
(2) 011140 011140 .EVEN
(2) 011140 000002 XSTATQ: 2
2731 011142 006 003 .BYTE 6,3
2732 011144 001220 $TMP1
2733 011146 006 002 .BYTE 6,2
2734 011150 001222 $TMP2
2735 .EVEN
2736      ; -#SETFLG-----
2737      ;THIS ROUTINE ESTABLISHES WHICH MAINTENANCE MODE THE DEVICE IS IN
2738      ;-----
2739      ;E=EXTERNAL LOOP BACK

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POWER DOWN AND UP ROUTINES

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2740                                     ;I=INTERNAL LOOP BACK
2741                                     ;S=STAGGERED LOOP BACK
2742 011152 017605 000000 .SETFLG:MOV      8(SP),R5      ;PICK UP ADDRESS OF TAG
2743 011156 042737 000040 011272      BIC      #40,INBUF    ;STRIP LOWER CASE
2744 011164 122737 000105 011272      CMPB     #'E,INBUF    ;IS IT EXTERNAL LOOP BACK ?
2745 011172 001005                BNE      4#          ;NO
2746 011174 013715 011264                MOV      1#,(R5)     ;YES STORE INFO
2747 011200 105037 001417                CLRB    MNTFLG      ;SET MAINT BIT =0
2748 011204 000422                BR       7#          ;GET OUT
2749 011206 122737 000111 011272 4#:   CMPB     #'I,INBUF    ;IS IT INTERNAL LOOP BACK ?
2750 011214 001006                BNE      5#          ;NO
2751 011216 013715 011266                MOV      2#,(R5)     ;YES STORE INFO
2752 011222 112737 000010 001417      MOVB     @MAINT,MNTFLG ;SET UP THE MAINTENANCE FLAG LOADER
2753 011230 000410                BR       7#          ;GET OUT
2754 011232 122737 000123 011272 5#:   CMPB     #'S,INBUF    ;IS IT STAGGERED LOOP BACK ?
2755 011240 001007                BNE      6#          ;WHAT ?
2756 011242 013715 011270                MOV      3#,(R5)     ;YES STORE INFO
2757 011246 105037 001417                CLRB    MNTFLG      ;ZERO BITS
2758 011252 062716 000002                7#:     ADD      #2,(SP) ;POP AROUND
2759 011256 000002                RTI
2760 011260 104404                6#:     INSTER
2761 011262 000733                BR       .SETFLG     ;RETRY
2762 011264 000200                1#:     .WORD    200    ;DITTO
2763 011266 000000                2#:     .WORD    0      ;EXTERNAL = E
2764 011270 100000                3#:     .WORD    100000 ;INTERNAL = I
2765                                     ; -- END 0 MACRO ----- ;STAGGERED = S
2766                                     ; -#BUFFER-----
2767
2768                                     ;BUFFERS FOR INPUT-OUTPUT
2769
2770 011272 000000      INBUF: 0
2771                . = .+40
2772 011334 000000      TEMP:  0
2773                . = .+40
2774 011376 000000      MDATA: 0
2775                . = .+40
2776
2777 011440 011637 011536 SET.PS: MOV      (SP),3#
2778 011444 162737 000002 011536      SUB      #2,3#
2779 011452 017737 000060 011540      MOV      #3#,4#
2780 011460 022737 106427 011540      CMP      #106427,4#
2781 011466 001003                BNE      1#
2782 011470 011637 011536                MOV      (SP),3#
2783 011474 000412                BR       2#
2784 011476 022737 106437 011540 1#:   CMP      #106437,4#
2785 011504 001401                BEQ     .+4
2786 011506 000000                HALT
2787 011510 011637 011536                MOV      (SP),3# ;RESERVED INSTRUCTION NOT "MTPS"
2788 011514 017737 000016 011536      MOV      #3#,3#
2789 011522 062716 000002                2#:     ADD      #2,(SP)
2790 011526 017766 000004 000002      MOV      #3#,2(SP)
2791 011534 000002                RTI
2792 011536 000000                3#:     0
2793 011540 000000                4#:     0

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2794      ; -- END O MACRO -----
2795      ; -@CYCLE-----
2796
2797      ;
2798      ;ROUTINE USED TO "CYCLE" THROUGH UP TO SIXTEEN DZ11'S
2799      ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
2800      ;AND RUNS THE SPECIFIED DZ11'S. THIS ROUTINE *MUST*
2801      ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
2802      ;SETUP NECESSARY.
2803      ;
2804
2805      011542 005737 001404      CYCLE: TST      DZACTV      ;ARE ANY DZ11'S TO BE TESTED?
2806      011546 001004      BNE      1@      ;BR IF OK.
2807      011550 104402 010574      TYPE      ,MERR2      ;NO DZ11'S SELECTED!!
2808      011554 000000      HALT      ;STOP THE SHOW.
2809      011556 000776      BR      ;DISQUALIFY CONT. SW.
2810      011560 013737 005374 001226 1@: MOV      @MXCNT,@TIMES ;RESTORE THE NUMBER OF ITERATIONS TO MAKE
2811      011566 033737 001406 001404 BIT      RUN,DZACTV ;IS THIS ONE "ACTIVE"
2812      011574 001020      BNE      2@      ;BR IF GOOD ONE FOUND.
2813      011576 000241      CLC
2814      011600 006137 001406      ROL      RUN      ;UPDATE POINTER
2815      011604 005537 001406      ADC      RUN      ;CATCH CARRY FROM RUN
2816      011610 062737 000014 001412 ADD      @14,ACTIVE ;UPDATE ADDRESS POINTER.
2817      011616 022737 002000 001412 CMP      @DZ.END,ACTIVE ;HAVE WE PASSED THE END OF THE MAP?
2818      011624 001355      BNE      1@      ;IF NO, KEEP GOING, NOT ALL TESTED FOR.
2819      011626 012737 001500 001412 MOV      @DZ.MAP,ACTIVE ;RESET ADDRESS POINTER.
2820      011634 000751      BR      1@      ;KEEP LOOKING FOR ACTIVE DZ11
2821      011636 000241      2@: CLC
2822      011640 006137 001406      ROL      RUN      ;UPDATE POINTER.
2823      011644 005537 001406      ADC      RUN      ;CATCH CARRY.
2824      011650 013700 001412      MOV      ACTIVE,R0 ;GET ADDRESS POINTER.
2825      011654 062737 000014 001412 ADD      @14,ACTIVE ;UPDATE.
2826      011662 022737 002000 001412 CMP      @DZ.END,ACTIVE
2827
2828      011670 001003      BNE      3@      ;ALL DONE?
2829      011672 012737 001500 001412 MOV      @DZ.MAP,ACTIVE ;BR IF NO.
2830      011700 012037 001310      3@: MOV      (R0)+,@BASE ;RESTORE POINTER.
2831      011704 012037 002072      MOV      (R0)+,DZRIV ;LOAD SYSTEM CTRL. REG
2832      011710 012037 030306      MOV      (R0)+,DZPRT ;LOAD VECTOR
2833      011714 113737 030307 001414 MOVVB   DZPRT+1,EIAFLG ;LOAD PRIORITY
2834      011722 042737 100000 030306 BIC      @BIT15,DZPRT ;EIA OR 30MA
2835      011730 012037 001364      MOV      (R0)+,LINE ;CLEAR FLAG
2836      011734 012037 001366      MOV      (R0)+,PAR ;SET UP LINE DZ LINES ACTIVE
2837      011740 012037 001370      MOV      (R0)+,MODE ;SET UP PARAMETERIZATION
2838      011744 004737 030100      JSR      PC,DZLEV ;SET UP MAINTENANCE MODE
2839      011750 005737 000042      TST      @@42 ;SET UP
2840      011754 001051      BNE      4@      ;ARE WE UNDER MONITOR CONTROL?
2841      011756 032777 000002 167174 BIT      @SW01,BSWR ;IF YES, SKIP THIS SETUP
2842      011764 001445      BEQ      4@      ;IF SW01=1, GET STARTING TEST @
2843      011766 104402 001231      7@: TYPE      ,@CRLF ;BR IF NO TEST IS TO BE INPUTTED
2844
2845      011772 104403      INSTR
2846      011774 010754      MTSTN
2847      011776 104405      PARAM
2848      012000 000001      1
2849      012002 001000      1000
; -@GETPAR-----
;CALL THE STRING INPUT ROUTINE
;POINTER TO MESSAGE TO BE PRINTED
;CALL THE OCTAL TO ASCII CONVERT ROUTINE
;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE

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2850 012004 001122          #TSTNM          ; POINTER TO MAP LOCATION TO BE FILLED
2851 012006          000          .BYTE 0          ; MASK OF INVALID BITS FOR THIS PARAMETER
2852 012007          001          .BYTE 1          ; NUMBER OF PARAMETERS TO STORE
2853                                     ; -- END 0 MACRO -----
2854 012010 012700 013046      MOV          #TST1,R0
2855 012014 022710 000004      5#: CMP          #4,(R0)
2856 012020 001020          BNE          6#
2857 012022 022760 012737 000002  CMP          #12737,2(R0)
2858 012030 001014          BNE          6#
2859 012032 023760 001122 000004  CMP          #TSTNM,4(R0) ; IS THIS THE TEST ?
2860 012040 001010          BNE          6# ; IF NOT, DON'T PROCESS NUMBER
2861 012042 010037 001126      MOV          R0,#LPADR ; SAVE PC
2862 012046 062737 000002 001126  ADD          #2,#LPADR ; POP OVER SCOPE
2863 012054 104402 001231      TYPE          ,#CRLF
2864 012060 000412          BR           8#
2865 012062 005720          6#: TST          (R0),
2866 012064 020027 023740      CMP          R0,#TLAST+10
2867 012070 001351          BNE          5#
2868 012072 104402 001230      TYPE          ,#QUES
2869 012076 000733          BR           7#
2870 012100 012737 013046 001126 4#: MOV          #TST1,#LPADR ; PREPARE TEST ADDRESS
2871 012106          8#:
2872 012106 000177 167014      RESTART:JMP        8#LPADR ; GO START TESTING.***WARNING!****
2873                                     ; THIS JUMP IS USED BY POWER UP ROUTINE!!!!
2874

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2875 ; -ROUTINE USED TO SET UP THE DIAGNOSTIC VIA APT.
2876 ; IF BIT7 IN THE ENVIRONMENT MODE (#ENVM) BYTE IS SET,
2877 ; THE PROGRAM WILL LOAD ITS PARAMETERS FROM THE ETABLE.
2878
2879 012112 012700 001500 SETAPT: MOV #DZ.MAP,R0 ;POINT TO THE DEVICE MAP TABLE
2880 012116 013701 001310 MOV #BASE,R1 ;BUILD DEVICE ADDRESSES IN R1
2881 012122 013702 001304 MOV #VECT1,R2 ;BUILD DEVICE VECTORS IN R2
2882 012126 042702 177007 BIC #C<770>,R2 ;STRIP AWAY OTHER INFORMATION
2883
2884 012132 113703 001305 MOVB #VECT1+1,R3 ;LOAD THE INTERRUPT PRIORITY FROM R3
2885 012136 106003 RORB R3 ;ALIGN THE NUMBER
2886 012140 106003 RORB R3 ;ALIGN THE NUMBER
2887 012142 106003 RORB R3 ;ALIGN THE NUMBER
2888 012144 106003 RORB R3 ;ALIGN THE NUMBER
2889 012146 106003 RORB R3 ;ALIGN THE NUMBER
2890 012150 042703 177770 BIC #C<7>,R3 ;REMOVE ALL BUT BUS LEVEL NUMBER
2891 012154 012704 001320 MOV #DDWO,R4 ;POINT TO THE BEGINNING OF DEVICE PARAMETERS
2892 012160 013705 001312 MOV #DEVM,R5 ;GET THE MAP OF ACTIVE DEVICES
2893 012164 010537 001404 MOV R5,DZACTV ;SAVE THE BIT MAP
2894 012170 006005 1#: ROR R5 ;GET A DEVICE SELECTION BIT
2895 012172 103407 BCS 3# ;IF IT IS SELECTED, GO SET UP A MAP
2896 012174 001425 BEQ 5# ;IF NO MORE ARE SELECTED, GET OUT OF SETUP
2897 012176 005724 TST (R4)+ ;POINT TO NEXT DEVICE DESCRIPTOR
2898 012200 062701 000010 2#: ADD #10,R1 ;SET UP THE NEXT ADDRESS
2899 012204 062702 000010 ADD #10,R2 ;SET UP THE NEXT VECTOR GROUP
2900 012210 000767 BR 1# ;GO SEE IF MORE DEVICES REMAIN
2901 012212 010120 3#: MOV R1,(R0)+ ;LOAD DEVICE ADDRESS
2902 012214 010220 MOV R2,(R0)+ ;LOAD THE VECTOR ADDRESS
2903 012216 010320 MOV R3,(R0)+ ;LOAD THE INTERRUPT PRIORITY LEVEL
2904 012220 013720 001314 MOV #CDW1,(R0)+ ;GET THE NUMBER OF LINES IN OPERATION
2905 012224 012420 MOV (R4)+,(R0)+ ;LOAD DEVICE PARAMETERS
2906 012226 100006 BPL 4# ;IF 20MA MODE SELECTED, SET IT UP
2907 012230 052760 100000 177772 BIS #100000,-6(R0) ;SET THE 20MA FLAG IN DZLVN
2908 012236 042760 100000 177776 BIC #100070,-2(R0) ;CLEAR THE FLAG IN DZPARN
2909 012244 005020 4#: CLR (R0)+ ;DEFAULT OPERATION TO INTERNAL MAINTENANCE MODE
2910 012246 000754 BR 2# ;GO BUILD THE NEXT ADDRESS
2911 012250 012710 177777 5#: MOV #-1,(R0) ;TERMINATE THE DEVICE MAP
2912 012254 012737 001256 001160 MOV #SMREG,SMR ;SET TO SOFTWARE APT SWITCH REGISTER
2913 012262 000207 RTS PC ;RETURN TO PRINT STATUS TABLE
2914
2915
2916 ;*ROUTINE USED TO "AUTO SIZE" THE DZ11
2917 ;*CSR AND VECTOR.
2918 ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
2919 ;* ADDRESS RANGE (160000:163700)
2920 ;* AND THE VECTOR MAY BE ANY WHERE IN THE
2921 ;* FLOATING VECTOR RANGE (300:770)
2922 ;*
2923
2924 AUTO.SIZE:
2925 012264 000005 RESET ;INSURE A BUS INIT.
2926 012266 105337 001415 DECB INIFLG ;SHOW THAT I WAS HERE
2927 012272 012702 001500 CSRMAP: MOV #DZ.MAP,R2 ;LOAD MAP POINTER.
2928 012276 012703 001320 MOV #DDWO,R3 ;POINT TO ETABLE DEVICE DESCRIPTOR WORDS
2929 012302 005022 1#: CLR (R2)+ ;ZERO ENTIRE MAP
2930 012304 022702 002000 CMP #DZ.END,R2 ;ALL DONE?

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2931	012310	001374			BNE	10		;BR IF NO
2932	012312	105037	001410		CLRB	DZNUM		;SET OCTAL NUMBER OF DZ11'S TO 0
2933	012316	012702	001500		MOV	@DZ.MAP,R2		
2934	012322	012701	160000		MOV	@160000,R1		;SET FOR FIRST ADDRESS TO BE TESTED
2935	012326	012737	012646	000004	MOV	@60,B04		;SET FOR NON-EXISTENT DEVICE TIME OUT
2936	012334	052711	000040	20:	BIS	@BIT5,(R1)		;TRY TO SET MASTER SCAN ENABLE
2937	012340	052761	000200	000004	BIS	@BIT7,4(R1)		;TRY TO TRANSMIT ON LINE 7
2938	012346	005000			CLR	RO		;USE RO AS A COUNTER
2939	012350	005711		70:	TST	(R1)		;HAS TRANSMITTER READY COME UP?
2940	012352	100403			BMI	00		;IF SO, GO GET A FINAL CHECK
2941	012354	005300			DEC	RO		;REDUCE COUNT. TIME UP?
2942	012356	001374			BNE	70		;IF NOT, KEEP WAITING
2943	012360	000463			BR	00		;ASSUME IT'S NOT A DZ11
2944	012362	032761	000200	000004	BIT	@BIT7,4(R1)	80:	;IS LINE 7 ENABLE STILL SET? IT SHOULD BE
2945	012370	001457			BEQ	00		;IF IT'S NOT, ASSUME IT'S NOT A DZ11
2946	012372	032711	000040		BIT	@BIT5,(R1)		;IS MASTER SCAN ENABLE STILL SET?
2947	012376	001454			BEQ	00		;IF NOT, ASSUME IT'S NOT A DZ11
2948	012400	005000			CLR	RO		
2949	012402	052711	000020		BIS	@20,(R1)		;SET DEVICE CLEAR
2950	012406	032711	000020		BIT	@20,(R1)		;SHOULD STAY SET FOR A WHILE IF DZ
2951	012412	001446			BEQ	00		;BR IF NOT DZ11
2952	012414	032711	000020		BIT	@20,(R1)		;WAIT FOR BIT TO CLEAR
2953	012420	001404			BEQ	.-12		;BR WHEN CLEARED
2954	012422	104414			DELAY			
2955	012424	005200			INC	RO		
2956	012426	001372			BNE	.-12		
2957	012430	000437			BR	00		;BIT NOT CLEARED! MUST NOT BE DZ11
2958	012432	005011			CLR	(R1)		;GET RID OF MASTER SCAN ENABLE
2959	012434	005061	000004		CLR	4(R1)		;GET RID OF LINE 7 ENABLE
2960								;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DZ11 CSR ADDRESS.
2961	012440	010122			MOV	R1,(R2)+		;STORE CSR IN CORE TABLE.
2962	012442	005722			TST	(R2)+		;POP OVER VECTOR STORE AREA
2963	012444	012722	000005		MOV	@5,(R2)+		;SET THE DEFAULT BUS LEVEL
2964	012450	052761	177400	000004	BIS	@177400,4(R1)		;TRY TO SET ALL DTR BITS
2965	012456	032761	177400	000004	BIT	@177400,4(R1)		;IF ANY SET ASSUME EIA BOARD
2966	012464	001003			BNE	90		;IF NONE SET ASSUME BOARD IS
2967	012466	052762	100000	177776	BIS	@BIT15,-2(R2)		;20 MA, SET 20 MA FLAG
2968	012474	012722	000377	90:	MOV	@377,(R2)+		;SET THE DEFAULT LINE SELECTION PARAMETER
2969	012500	012712	017070		MOV	@17070,(R2)		;SET THE DEFAULT PARAMETERS
2970	012504	012223			MOV	(R2)+,(R3)+		;COPY PARAMETERS INTO ETABLE DESCRIPTOR
2971	012506	005022			CLR	(R2)+		;SET THE DEFAULT MODE OF OPERATION
2972	012510	012712	177777		MOV	@-1,(R2)		;TERMINATE LIST
2973	012514	105237	001410		INCB	DZNUM		;UPDATE DEVICE COUNTER
2974	012520	122737	000020	001410	CMPB	@20,DZNUM		;ARE MAX. NO. OF DEV FOUND?
2975	012526	001405			BEQ	1000		;YES DCN'T LOOK FOR ANY MORE.
2976	012530	062701	000010	30:	ADD	@10,R1		;UPDATE CSR POINTER ADDRESS
2977	012534	022701	163700		CMP	@163700,R1		
2978	012540	001275			BNE	20		;BR IF MORE ADDRESS TO CHECK.
2979	012542			1000:				
2980	012542	105737	001410		TSTB	DZNUM		;WERE ANY DZ11'S FOUND AT ALL?
2981	012546	001432			BEQ	50		;ERROR AUTO SIZER FOUND NO DZ11'S IN THIS SYS.
2982	012550	113701	001410		MOVB	DZNUM,R1		
2983	012554	110137	001411		MOVB	R1,SAVNUM		;SAVE NUMBER OF DEVICES
2984	012560	012737	000001	001404	MOV	@1,DZACTV		
2985	012566	005301		40:	DEC	R1		
2986	012570	001404			BEQ	900		



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2987 012572 000261          SEC
2988 012574 006137 001404   ROL    DZACTV
2989 012600 000772          BR      4#
2990 012602 013737 001500 001310 98#:  MOV    DZCRO,#BASE ;POINT TO THE ADDRESS OF FIRST DEVICE
2991 012610 013737 001512 001314   MOV    MANT0,#CDW1 ;INDICATE TO ETABLE WHAT MODE IS BEING USED
2992 012616 012737 000006 000004 99#:  MOV    #6,#M4 ;RESTORE TRAP VECTOR
2993 012624 013737 001404 001312   MOV    DZACTV,#DEVM ;SAVE ACTIVE REGISTER
2994 012632 000410          BR      VECMAP ;GO FIND THE VECTOR NOW.
2995 012634 104402 010574      5#:  TYPE  #MERR2 ;NOTIFY OPR THAT NO DZ11'S FOUND.
2996 012640 005000          CLR    RO ;MAKE DATA DISPLAY ZERO
2997 012642 000000          HALT ;STOP THE SHOW
2998 012644 000776          BR      #-2 ;DISABLE CONT. SW.
2999 012646 012716 012530      6#:  MOV    #3#,(SP) ;ENTERED BY NON-EXISTENT TIME-OUT
3000 012652 000002          RTI ;RETURN TO MAINSTREAM
3001
3002 012654 012737 000340 000022 VECMAP: MOV    #340,#022 ;SET IOT TRAP PRIORITY TO 7
3003 012662 012737 013000 000020   MOV    #4#,#020 ;SET IOT TRAP VECTOR
3004 012670 012702 001500          MOV    #02.MAP,R2 ;SET SOFTWARE POINTER
3005 012674 012700 000300          MOV    #300,R0 ;FLOATING VECTORS START HERE.
3006 012700 012701 000302          MOV    #302,R1 ;PC OF IOT INSTR.
3007 012704 010120          1#:  MOV    R1,(R0)+ ;START FILLING VECTOR AREA
3008 012706 012721 000004          MOV    #4,(R1)+ ;WITH #-2; IOT
3009 012712 022021          CMP    (R0)+,(R1)+ ;ADD 2 TO R0 +R1
3010 012714 020127 001000          CMP    R1,#1000 ;HAS THE VECTOR AREA BEEN EXCEEDED?
3011 012720 101771          BLOS  1# ;BR IF MORE TO FILL
3012 012722 013704 001404          MOV    DZACTV,R4 ;STORE TEMPORARILY
3013 012726 000241          2#:  CLC ;
3014 012730 006004          ROR    R4 ;BRING OUT A BIT
3015 012732 103036          BCC  5# ;BR IF ALL DONE
3016 012734 106427 000000          HTPS  #0 ;ZERO CPU PRIO
3017 012740 012772 040040 000000   MOV    #BIT14+BIT5,#(R2)
3018 012746 011201          MOV    (R2),R1 ;GET CSR
3019 012750 112761 000200 000004   MOVB  #BIT7,4(R1) ;SET THE TCR BIT!
3020          ;ATTEMPT TO FORCE AN INTERRUPT
3021 012756 005200          INC    RO ;STALL
3022 012760 001376          BNE  #-2 ;
3023 012762 012762 000300 000002   MOV    #300,2(R2) ;FOR TIME TO INTERRUPT
3024 012770 000005          3#:  RESET ;NO INTERRUPT ASSUME 300 AND FIX DZ11 LATER
3025 012772 062702 000014          ADD    #14,R2 ;INIT
3026 012776 000753          BR      2# ;POP SOFTWARE POINTER
3027 013000 011662 000002          4#:  MOV    (SP),2(R2) ;KEEP GOING
3028 013004 162762 000010 000002   SUB    #10,2(R2) ;GET VECTOR ADDRESS
3029 013012 042762 000007 000002   BIC    #7,2(R2) ;POINT BACK TO THE CORRECT VECTOR
3030 013020 022626          POP2SP ;CLEAR JUNK
3031 013022 012716 012770          MOV    #3#,(SP) ;POP IOT JUNK OFF STACK
3032 013026 000002          RTI ;SET FOR RETURN
3033 013030 013737 001502 001304 5#:  MOV    DZVCO,#VECT1 ;COPY VECTOR OF FIRST DEVICE INTO ETABLE
3034 013036 012737 005122 000020   MOV    #.SCOPE,IOTVEC ;RESTORE THE SCOPE TRAP
3035 013044 000207          RTS    PC ;ALL DONE WITH "AUTO SIZING"
3036
3037          ; -- END 0 MACRO -----

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CZDZA DZ11 DEVICE DIAGNOSTICS.

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3038
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3045
3046
3047
3048 013046 000004
3049 013050 012737 000001 001122
3050
3051 013056 012737 013236 001360
3052 013064 012737 013224 000004
3053 013072 012737 000340 000006
3054 013100 012737 013106 001362
3055 013106 013700 002042
3056 013112 011001
3057 013114 000240
3058 013116 005010
3059 013120 000240
3060 013122 012737 013130 001362
3061 013130 013700 002046
3062 013134 011001
3063 013136 000240
3064 013140 005010
3065 013142 000240
3066 013144 012737 013152 001362
3067 013152 013700 002056
3068 013156 011001
3069 013160 000240
3070 013162 005010
3071 013164 000240
3072 013166 012737 013174 001362
3073 013174 013700 002062
3074 013200 011001
3075 013202 000240
3076 013204 005010
3077 013206 000240
3078 013210 012737 000006 000004
3079 013216 005037 000006
3080 013222 104400
3081 013224 011601
3082 013226 022626
3083 013230 104001
3084 013232 104401
3085 013234 000111
3086
3087
3088
3089
3090
3091
3092
3093

; -#UNIBUS-----
; -#XZ-----
;***** TEST 1 *****
;*THIS TEST PROVES THE SLAVE SYNC RESPONSE
;*DURING A READ OR WRITE TO THE FOLLOWING ADDRESS:
;*   DZCSR, DZRBUF, DZTCR, DZMSR
; -#XZ-----

;:* TEST 1
;*****
TST1: SCOPE
      MOV     #1,#TSTNM      ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
      MOV     #TST2,NEXT    ;POINT TO THE START OF THE NEXT TEST
      MOV     #5# ,4        ;SET TRAP VECTOR
      MOV     #PR7,6        ;SET PRIORITY TO LEVEL 7
      MOV     #1# ,LOCK     ;SET RETURN IF SW09=11
1#:   MOV     DZCSR,RO      ;SET ADDRESS TO TEST
      MOV     (RO),R1       ;READ THE ADDRESS
      NOP
      CLR     (RO)          ;WRITE THE ADDRESS
      NOP
      MOV     #2# ,LOCK     ;SET RETURN ADDRESS FOR SW09
2#:   MOV     DZRBUF,RO    ;SET ADDRESS TO TEST
      MOV     (RO),R1       ;READ THE ADDRESS
      NOP
      CLR     (RO)          ;WRITE THE ADDRESS
      NOP
      MOV     #3# ,LOCK     ;SET RETURN ADDRESS FOR SW09
3#:   MOV     DZTCR,RO    ;SET ADDRESS TO TEST
      MOV     (RO),R1       ;READ THE ADDRESS
      NOP
      CLR     (RO)          ;WRITE THE ADDRESS
      NOP
      MOV     #4# ,LOCK     ;SET RETURN ADDRESS
4#:   MOV     DZMSR,RO    ;SET ADDRESS TO TEST
      MOV     (RO),R1       ;READ FROM ADDRESS
      NOP
      CLR     (RO)          ;WRITE THE ADDRESS
      NOP
      MOV     #6,4          ;SET TRAP CATCHER BACK TO NORMAL
      CLR     6
      ADVANCE
5#:   MOV     (SP),R1       ;SCOPE THIS TEST
      CMP     (SP)+,(SP)+  ;SAVE PC OF TRAP
      ERROR  1             ;POP TRAP OFF STACK
      SCOP1  1             ;*NO SLAVE SYNC RESPONSE.
      JMP     (R1)         ;SW09=1?
                          ;RTI
; -- END 0 MACRO -----
; -#XZ-----
;***** TEST 2 *****
;*THIS TEST PROVES THAT BIT "DCLR"
;*CAN BE SET AND THAT IT WILL CLEAR
;*BY ITSELF AFTER A PERIOD OF TIME.
; -#XZ-----

;:* TEST 2

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3094
3095 013236 000004
3096 013240 012737 000002 001122
3097
3098 013246 012737 013322 001360
3099 013254 013700 002042
3100 013260 012705 000020
3101 013264 010510
3102 013266 011004
3103 013270 020504
3104 013272 001401
3105 013274 104002
3106
3107 013276 005002
3108 013300 005005
3109 013302 005003
3110 013304 011004
3111 013306 001405
3112 013310 005203
3113
3114
3115 013312 001374
3116 013314 005302
3117 013316 001372
3118 013320 104002
3119 013322
3120
3121
3122
3123
3124
3125
3126
3127
3128
3129
3130
3131 013322 000004
3132 013324 012737 000003 001122
3133
3134 013332 012737 013414 001360
3135 013340 013700 002042
3136 013344 012705 000010
3137 013350 010510
3138 013352 011004
3139 013354 020504
3140 013356 001401
3141 013360 104002
3142 013362 040510
3143 013364 011004
3144 013366 001404
3145 013370 010546
3146 013372 005005
3147 013374 104002
3148 013376 012605
3149 013400 010510

;*****
TST2: SCOPE
MOV #2, #TSTNM ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
MOV #TST3, NEXT ;POINT TO THE START OF THE NEXT TEST
MOV DZCSR, R0 ;SET POINTER
MOV #DCLR, R5 ;SET DCLR
MOV R5, (R0) ;WRITE DCLR INTO DZCSR
MOV (R0), R4 ;READ BACK DZCSR
CMP R5, R4 ;DZCSR OK?
BEQ 10 ;IF IT IS SET SKIP THE ERROR CALL
ERROR 2 ;DCLR SHOULD BE SET..MOMENTARILY
;NOW LETS WATCH IT DISAPPEAR
10: CLR R2 ;SET COUNTER TO 0
CLR R5 ;SET EXPECTED TO 0
CLR R3 ;DUAL LOOP COUNTER
20: MOV (R0), R4 ;IS DCLR CLEAR?
BEQ 30 ;IF YES, GO TO THE NEXT TEST
INC R3 ;IF NO, COUNT 1 OF 65535 TICKS
;THE WORD CREATED BY THE IMMEDIATE 0 WILL BE
;THE COUNTER
BNE 20 ;HAS THE TIME EXPIRED? IF NO, GO TEST BIT AGAIN
DEC R2 ;HAS THE TOTAL TIME EXPIRED?
BNE 20 ;IF NO, CHECK THE BIT AGAIN
ERROR 2 ;DCLR FAILED TO CLEAR
30:
; -#RRW-----
; -#XZ-----
;***** TEST 3 *****
;TEST TO VERIFY THAT BIT "MAINT" CAN
;BE SET. THEN VERIFY THAT BIT "MAINT" CAN
;BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
;VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
;CLEARED BY A "DEVICE CLEAR"
; -#XZ-----
;: TEST 3
;*****
TST3: SCOPE
MOV #3, #TSTNM ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
MOV #TST4, NEXT ;POINT TO THE START OF THE NEXT TEST
MOV DZCSR, R0 ;GET BASE ADDRESS
MOV #MAINT, R5 ;SET BIT
MOV R5, (R0) ;SET SET IN DEVICE
MOV (R0), R4 ;READ THE BIT FROM DEVICE
CMP R5, R4 ;WAS BIT SET?
BEQ 10 ;BR IF YES
ERROR 2 ;BIT R/W FAILURE
10: BIC R5, (R0) ;CLEAR THE BIT.
MOV (R0), R4 ;READ DEVICE
BEQ 20 ;BR IF BITS WERE CLEARED.
MOV R5, -(SP) ;SAVE THE BIT
CLR R5 ;SET EXPECTED RESULTS TO 0
ERROR 2 ;BIT FAILED TO CLEAR
MOV (SP), R5 ;RESTORE THE BIT.
20: MOV R5, (R0) ;SET THE BIT AGAIN
    
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3150 013402 104413  
 3151 013404 011004  
 3152 013406 001402  
 3153 013410 005005  
 3154 013412 104002  
 3155 013414  
 3156  
 3157  
 3158  
 3159  
 3160  
 3161  
 3162  
 3163  
 3164  
 3165  
 3166  
 3167  
 3168  
 3169 013414 000004  
 3170 013416 012737 000004 001122  
 3171  
 3172 013424 012737 013506 001360  
 3173 013432 013700 002042  
 3174 013436 012705 000040  
 3175 013442 010510  
 3176 013444 011004  
 3177 013446 020504  
 3178 013450 001401  
 3179 013452 104002  
 3180 013454 040510  
 3181 013456 011004  
 3182 013460 001404  
 3183 013462 010546  
 3184 013464 005005  
 3185 013466 104002  
 3186 013470 012605  
 3187 013472 010510  
 3188 013474 104413  
 3189 013476 011004  
 3190 013500 001402  
 3191 013502 005005  
 3192 013504 104002  
 3193 013506  
 3194  
 3195  
 3196  
 3197  
 3198  
 3199  
 3200  
 3201  
 3202  
 3203  
 3204  
 3205

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      DEVICE.CLR          ;ISSUE DEVICE CLEAR
      MOV      (R0),R4    ;READ THE BIT.
      BEQ     30          ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
      CLR     R5          ;SET EXPECTED TO ZERO
      ERROR   2          ;BIT NOT CLEARED BY DEVICE CLEAR

30:
; -- END 0 MACRO .....
; -- END 0 MACRO .....
; -@MRRW-.....
; -@XZ-.....
;..... TEST 4 .....
;TEST TO VERIFY THAT BIT "MSENAB" CAN
;BE SET. THEN VERIFY THAT BIT "MSENAB" CAN
;BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
;VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
;CLEARED BY A "DEVICE CLEAR"
; -@XZ-.....

;: TEST 4
;.....
TST4: SCOPE
      MOV     @4,@TSTNM    ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO .....
      MOV     @TST5,NEXT   ;POINT TO THE START OF THE NEXT TEST
      MOV     DZCSR,R0     ;GET BASE ADDRESS
      MOV     @MSENAB,R5   ;SET BIT
      MOV     R5,(R0)      ;SET SET IN DEVICE
      MOV     (R0),R4      ;READ THE BIT FROM DEVICE
      CMP     R5,R4        ;WAS BIT SET?
      BEQ     10           ;BR IF YES
      ERROR   2           ;BIT R/W FAILURE
      BIC     R5,(R0)      ;CLEAR THE BIT.
      MOV     (R0),R4      ;READ DEVICE
      BEQ     20           ;BR IF BITS WERE CLEARED.
      MOV     R5,-(SP)     ;SAVE THE BIT
      CLR     R5          ;SET EXPECTED RESULTS TO 0
      ERROR   2           ;BIT FAILED TO CLEAR
      MOV     (SP),R5      ;RESTORE THE BIT.
20:   MOV     R5,(R0)      ;SET THE BIT AGAIN
      DEVICE.CLR          ;ISSUE DEVICE CLEAR
      MOV     (R0),R4      ;READ THE BIT.
      BEQ     30          ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
      CLR     R5          ;SET EXPECTED TO ZERO
      ERROR   2          ;BIT NOT CLEARED BY DEVICE CLEAR

30:
; -- END 0 MACRO .....
; -- END 0 MACRO .....
; -@MRRW-.....
; -@XZ-.....
;..... TEST 5 .....
;TEST TO VERIFY THAT BIT "SILOEN" CAN
;BE SET. THEN VERIFY THAT BIT "SILOEN" CAN
;BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
;VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
;CLEARED BY A "DEVICE CLEAR"
; -@XZ-.....

;: TEST 5

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3206
3207 013506 000004
3208 013510 012737 000005 001122
3209
3210 013516 012737 013600 001360
3211 013524 013700 002042
3212 013530 012705 010000
3213 013534 010510
3214 013536 011004
3215 013540 020504
3216 013542 001401
3217 013544 104002
3218 013546 040510
3219 013550 011004
3220 013552 001404
3221 013554 010546
3222 013556 005005
3223 013560 104002
3224 013562 012605
3225 013564 010510
3226 013566 104413
3227 013570 011004
3228 013572 001402
3229 013574 005005
3230 013576 104002
3231 013600
3232
3233
3234
3235
3236
3237
3238
3239
3240
3241
3242
3243
3244
3245 013600 000004
3246 013602 012737 000006 001122
3247
3248 013610 012737 013672 001360
3249 013616 013700 002042
3250 013622 012705 000100
3251 013626 010510
3252 013630 011004
3253 013632 020504
3254 013634 001401
3255 013636 104002
3256 013640 040510
3257 013642 011004
3258 013644 001404
3259 013646 010546
3260 013650 005005
3261 013652 104002

;*****
TSYS: SCOPE
MOV #5, #TSTNM ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
MOV #TST6, NEXT ;POINT TO THE START OF THE NEXT TEST
MOV DZCSR, R0 ;GET BASE ADDRESS
MOV #SILOEN, R5 ;SET BIT
MOV R5, (R0) ;SET SET IN DEVICE
MOV (R0), R4 ;READ THE BIT FROM DEVICE
CMP R5, R4 ;WAS BIT SET?
BEQ 1# ;BR IF YES
ERROR 2 ;*BIT R/W FAILURE
1#: BIC R5, (R0) ;CLEAR THE BIT.
MOV (R0), R4 ;READ DEVICE
BEQ 2# ;BR IF BITS WERE CLEARED.
MOV R5, -(SP) ;SAVE THE BIT
CLR R5 ;SET EXPECTED RESULTS TO 0
ERROR 2 ;*BIT FAILED TO CLEAR
MOV (SP)+, R5 ;RESTORE THE BIT.
2#: MOV R5, (R0) ;SET THE BIT AGAIN
DEVICE.CLR ;ISSUE DEVICE CLEAR
MOV (R0), R4 ;READ THE BIT.
BEQ 3# ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
CLR R5 ;SET EXPECTED TO ZERO
ERROR 2 ;*BIT NOT CLEARED BY DEVICE CLEAR
3#:
; -- END 0 MACRO -----
; -- END 0 MACRO -----
; -#MRRW-----
; -#XZ-----
;***** TEST 6 *****
;*TEST TO VERIFY THAT BIT "RIE" CAN
;*BE SET. THEN VERIFY THAT BIT "RIE" CAN
;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
;*CLEARED BY A "DEVICE CLEAR"
; -#XZ-----
;* TEST 6
;*****
TST6: SCOPE
MOV #6, #TSTNM ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
MOV #TST7, NEXT ;POINT TO THE START OF THE NEXT TEST
MOV DZCSR, R0 ;GET BASE ADDRESS
MOV #RIE, R5 ;SET BIT
MOV R5, (R0) ;SET SET IN DEVICE
MOV (R0), R4 ;READ THE BIT FROM DEVICE
CMP R5, R4 ;WAS BIT SET?
BEQ 1# ;BR IF YES
ERROR 2 ;*BIT R/W FAILURE
1#: BIC R5, (R0) ;CLEAR THE BIT.
MOV (R0), R4 ;READ DEVICE
BEQ 2# ;BR IF BITS WERE CLEARED.
MOV R5, -(SP) ;SAVE THE BIT
CLR R5 ;SET EXPECTED RESULTS TO 0
ERROR 2 ;*BIT FAILED TO CLEAR

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3262 013654 012605
3263 013656 010510
3264 013660 104413
3265 013662 011004
3266 013664 001402
3267 013666 005005
3268 013670 104002
3269 013672
3270
3271
3272
3273
3274
3275
3276
3277
3278
3279
3280
3281
3282
3283 013672 000004
3284 013674 012737 000007 001122
3285
3286 013702 012737 013764 001360
3287 013710 013700 002042
3288 013714 012705 040000
3289 013720 010510
3290 013722 011004
3291 013724 020504
3292 013726 001401
3293 013730 104002
3294 013732 040510
3295 013734 011004
3296 013736 001404
3297 013740 010546
3298 013742 005005
3299 013744 104002
3300 013746 012605
3301 013750 010510
3302 013752 104413
3303 013754 011004
3304 013756 001402
3305 013760 005005
3306 013762 104002
3307 013764
3308
3309
3310
3311
3312
3313
3314
3315
3316
3317

20:  MOV      (SP),R5      ;RESTORE THE BIT.
      MOV      R5,(R0)    ;SET THE BIT AGAIN
      DEVICE.CLR          ;ISSUE DEVICE CLEAR
      MOV      (R0),R4    ;READ THE BIT.
      BEQ      30         ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
      CLR      R5         ;SET EXPECTED TO ZERO
      ERROR    2         ;*BIT NOT CLEARED BY DEVICE CLEAR

30:  ; -- END 0 MACRO -----
      ; -- END 0 MACRO -----
      ; -MRRW-----
      ; -XZ-----
      ;***** TEST 7 *****
      ;*TEST TO VERIFY THAT BIT "TIE" CAN
      ;*BE SET. THEN VERIFY THAT BIT "TIE" CAN
      ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
      ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
      ;*CLEARED BY A "DEVICE CLEAR"
      ; -XZ-----

;:* TEST 7
;*****
TST7: SCOPE
      MOV      #7,#TSTNM  ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
      MOV      #TST10,NEXT ;POINT TO THE START OF THE NEXT TEST
      MOV      DZCSR,R0   ;GET BASE ADDRESS
      MOV      #TIE,R5   ;SET BIT
      MOV      R5,(R0)   ;SET SET IN DEVICE
      MOV      (R0),R4   ;READ THE BIT FROM DEVICE
      CMP      R5,R4     ;WAS BIT SET?
      BEQ      10       ;BR IF YES
      ERROR    2         ;*BIT R/W FAILURE
10:  BIC      R5,(R0)    ;CLEAR THE BIT.
      MOV      (R0),R4   ;READ DEVICE
      BEQ      20       ;BR IF BITS WERE CLEARED.
      MOV      R5,-(SP)  ;SAVE THE BIT
      CLR      R5         ;SET EXPECTED RESULTS TO 0
      ERROR    2         ;*BIT FAILED TO CLEAR
      MOV      (SP),R5   ;RESTORE THE BIT.
20:  MOV      R5,(R0)    ;SET THE BIT AGAIN
      DEVICE.CLR          ;ISSUE DEVICE CLEAR
      MOV      (R0),R4   ;READ THE BIT.
      BEQ      30         ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
      CLR      R5         ;SET EXPECTED TO ZERO
      ERROR    2         ;*BIT NOT CLEARED BY DEVICE CLEAR

30:  ; -- END 0 MACRO -----
      ; -- END 0 MACRO -----
      ; -TCR-----
      ; -XZ-----
      ;***** TEST 10 *****
      ;*THIS TESTS THAT ALL OF THE FOLLOWING
      ;*BITS CAN BE: SET, CLEARED, CLEARED BY "DEVICE CLEAR "
      ;*BITS TESTED ARE:
      ;* TCR0, TCR1, TCR2, TCR3, TCR4, TCR5, TCR6, TCR7
      ; -XZ-----

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3318      ;:* TEST 10
3319      ;*****
3320      TST10: SCOPE
3321      MOV      @10,@TSTNM      ;LOAD THE NUMBER OF THIS TEST
3322      ; -- END 0 MACRO -----
3323      MOV      @TST11,NEXT     ;POINT TO THE START OF THE NEXT TEST
3324      MOV      DZTCR,R0        ;SET DEVICE ADDRESS
3325      MOV      @TCR,R5         ;SET EXPECTED RESULTS
3326      MOV      @1@,LOCK        ;SET FOR SW09
3327      1@:     MOV      R5,(R0)   ;SET THE BIT
3328      MOV      (R0),R4         ;READ THE BIT FROM THE DEVICE
3329      BIC      @+C<377>,R4     ;CLEAR HIGH BYTE
3330      CMP      R5,R4           ;WAS BIT OK?
3331      BEQ      2@              ;BR IF YES
3332      ERROR   2                ;*BIT FAILED TO SET.
3333      2@:     BIC      R5,(R0)   ;CLEAR THE BIT
3334      MOV      (R0),R4         ;READ THE REGISTER
3335      BIC      @+C<377>,R4     ;CLEAR HIGH BYTE
3336      TST      R4              ;BITS CLEAR?
3337      BEQ      3@              ;BR IF YES
3338      MOV      R5,-(SP)        ;SAVE GOOD RESULTS
3339      CLR      R5              ;SET EXPECTED TO 0
3340      ERROR   2                ;*REPORT BIT NOT CLEAR
3341      MOV      (SP)+,R5        ;RESTORE R5
3342      3@:     MOV      R5,(R0)   ;SET THE BIT AGAIN.
3343      DEVICE.CLR              ;ISSUE DEVICE CLEAR
3344      MOV      (R0),R4         ;READ THE REGISTER
3345      BIC      @+C<377>,R4     ;CLEAR HIGH BYTE
3346      TST      R4              ;BITS CLEAR?
3347      BEQ      4@              ;BR IF YES
3348      MOV      R5,-(SP)        ;SAVE GOOD RESULTS
3349      CLR      R5              ;SET EXPECTED TO 0
3350      ERROR   2                ;*REPORT BIT NOT CLEAR
3351      MOV      (SP)+,R5        ;RESTORE R5
3352      4@:     SCOPE1              ;LOCK ON BIT? SET SW09=1
3353      ASLB     R5              ;CHANGE TO NEXT BIT
3354      BNE      1@              ;CONTINUE TESTING
3355      CLR      LOCK            ;MAKE SURE TIGHT LOOP IS CLEANED UP
3356      ; -- END 0 MACRO -----
3357      ; -+TCR-----
3358      ; -+XZ-----
3359      ;***** TEST 11 *****
3360      ;*THIS TESTS THAT ALL OF THE FOLLOWING
3361      ;*BITS CAN BE: SET, CLEARED, CLEARED BY "RESET INSTR *NOT* DEVICE CLEAR "
3362      ;*BITS TESTED ARE:
3363      ;* DTR0, DTR1, DTR2, DTR3, DTR4, DTR5, DTR6, DTR7
3364      ;*THIS TEST IS NOT DONE IF MODULE IS 20MA VERSION
3365      ; -+XZ-----
3366      ;:* TEST 11
3367      ;*****
3368      TST11: SCOPE
3369      MOV      @11,@TSTNM      ;LOAD THE NUMBER OF THIS TEST
3370      ; -- END 0 MACRO -----
3371      MOV      @TST12,NEXT     ;POINT TO THE START OF THE NEXT TEST
3372      MOV      DZTCR,R0        ;SET DEVICE ADDRESS
3373      MOV      @DTR0,R5        ;SET EXPECTED RESULTS
    
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3374 014150 012737 014166 001362      MOV      #10,LOCK      ;SET FOR SMO9
3375 014156 105737 001414              TSTB     EIAFLG       ;20MA OR EIA
3376 014162 100001                      BPL      10           ;BR IF EIA
3377 014164 104400                      ADVANCE                    ;EXIT TEST
3378 014166 010510      10:      MOV      R5,(R0)       ;SET THE BIT
3379 014170 011004      MOV      (R0),R4      ;READ THE BIT FROM THE DEVICE
3380 014172 105004      CLRB    R4           ;CLEAR LOW BYTE
3381 014174 020504      CMP     R5,R4       ;WAS BIT OK?
3382 014176 001401      BEQ     20           ;BR IF YES
3383 014200 104002      ERROR   2           ;*BIT FAILED TO SET.
3384 014202 040510      20:      BIC     R5,(R0)       ;CLEAR THE BIT
3385 014204 011004      MOV      (R0),R4      ;READ THE REGISTER
3386 014206 105004      CLRB    R4           ;CLEAR LOW BYTE
3387 014210 005704      TST     R4           ;BITS CLEAR?
3388 014212 001404      BEQ     30           ;BR IF YES
3389 014214 010546      MOV      R5,-(SP)     ;SAVE GOOD RESULTS
3390 014216 005005      CLR     R5           ;SET EXPECTED TO 0
3391 014220 104002      ERROR   2           ;*REPORT BIT NOT CLEAR
3392 014222 012605      MOV      (SP),R5     ;RESTORE R5
3393 014224 010510      30:      MOV      R5,(R0)       ;SET THE BIT AGAIN.
3394 014226 104413      DEVICE.CLR          ;ISSUE DEVICE CLEAR
3395 014230 011004      MOV      (R0),R4      ;READ THE REGISTER
3396 014232 105004      CLRB    R4           ;CLEAR LOW BYTE
3397 014234 030510      BIT     R5,(R0)       ;WAS BIT CLEARED BY DEVICE.CLR?
3398 014236 001001      BNE     40           ;BR IF NO (IT SHOULDN'T BE CLEAR)
3399 014240 104002      ERROR   2           ;*BIT CLEARED BY DEVICE.CLR
3400 014242 104401      40:      SCOP1                    ;LOCK ON BIT? SMO9=1
3401 014244 006305      ASL     R5           ;CHANGE TO NEXT BIT
3402 014246 001347      BNE     10           ;IF NOT DONE LOOP
3403 014250 012710 177400      MOV      #177400,(R0) ;SET ALL DTR BITS
3404 014254 005005      CLR     R5           ;CLEAR LOCATION FOR ERROR PRINTOUT
3405 014256 005227 000000      50:      INC     #0           ;ACT DELAY LOOP FOR
3406 014262 001375      BNE     50           ;RESET INSTRUCTION
3407 014264 000005      RESET                    ;ISSUE A BUS INIT
3408 014266 011004      MOV      (R0),R4      ;READ REGISTER
3409 014270 105004      CLRB    R4           ;CLEAR LOW BYTE
3410 014272 005704      TST     R4           ;DTR BITS CLEAR?
3411 014274 001401      BEQ     .+4          ;IF YES CONTINUE
3412 014276 104002      ERROR   2           ;IF NO PRINT ERROR
3413 014300 005037 001362      CLR     LOCK         ;MAKE SURE TIGHT LOOP IS CLEANED UP
3414 ; -- END 0 MACRO -----
3415 ; #MRR-----
3416 ; -#XZ-----
3417 ;***** TEST 12 *****
3418 ;*THIS TEST PERFORMS RESET TESTING &
3419 ;*TESTING OF WRITE ONLY OR READ ONLY BIT
3420 ;* TEST BITS "RDONE, BIT11, BIT10, BIT9, BIT8, BIT2, BIT1
3421 ;* BIT0, SILOAL" ARE READ ONLY AND THAT TRDY IS
3422 ;* ZERO UNTIL A LINE IS SELECTED AND MSENAB IS SET.
3423 ;*
3424 ; -#XZ-----
3425 ;:* TEST 12
3426 ;*****
3427 014304 000004      TST12: SCOPE
3428 014306 012737 000012 001122      MOV      #12,#TSTNM   ;LOAD THE NUMBER OF THIS TEST
3429 ; -- END 0 MACRO -----

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3430 014314 012737 014422 001360      MOV    #TST13,NEXT      ;POINT TO THE START OF THE NEXT TEST
3431 014322 013700 002042      MOV    DZCSR,R0        ;SET ADDRESS TO R0
3432 014326 005005              CLR    R5               ;SET EXPECTED TO 0
3433 014330 012710 027607      MOV    @RDONE+BIT11+BIT10+BIT9+BIT8+BIT2+BIT1+BIT0+SILOAL,(R0)
3434                                ;WRITE THE BITS
3435 014334 011004              MOV    (R0),R4         ;READ BACK THE BITS
3436 014336 001401              BEQ    1#              ;BR IF NONE ARE SET.
3437 014340 104002              ERROR  2              ;*BITS WERE SET.
3438 014342 012710 100000      1#:   MOV    @TRDY,(R0)   ;ATTEMPT TO WRITE TRDY
3439 014346 011004              MOV    (R0),R4         ;READ TRDY
3440 014350 001401              BEQ    2#              ;BR IF NOT SET
3441 014352 104002              ERROR  2              ;*
3442 014354 012705 100000      2#:   MOV    @TRDY,R5      ;SET EXPECTED BIT
3443 014360 005077 165466      CLR    @DZLPR          ;LOAD LINE 0
3444 014364 052777 000001 165464  BIS    @TCR0,@DZTCR    ;SET TCR BIT
3445 014372 052710 000040      BIS    @MSENAB,(R0)   ;
3446 014376 052705 000040      BIS    @MSENAB,R5     ;SET SCAN ENABLE
3447 014402 005002              CLR    R2              ;SET COUNTER TO ZERO
3448 014404 011004              3#:   MOV    (R0),R4         ;READ THE REGISTER
3449 014406 020504              CMP    R5,R4           ;BIT SET?
3450 014410 001404              BEQ    4#              ;BR IF YES
3451 014412 104414              DELAY  4#              ;STALL TIME
3452 014414 005202              INC    R2              ;UPDATE COUNTER
3453 014416 001372              BNE   3#              ;BR IF COUNTER NOT DONE.
3454 014420 104002              ERROR  2              ;*TRDY NOT SET!
3455 014422      4#:
3456      ; -- END 0 MACRO -----
3457                                ; -#XZ-----
3458                                ;***** TEST 13 *****
3459                                ;*THIS TEST PERFORMS RESET TESTING AND
3460                                ;*TESTING OF READ ONLY AND WRITE ONLY BITS
3461                                ;* IN REGISTER DZCSR
3462                                ;*VERIFY THAT "TIE", "SILOEN", "RIE", "MSENAB", "MAINT"
3463                                ;*ARE THE ONLY R/W BITS IN THE DZCSR.
3464                                ;*THEN VERIFY THAT A RESET WILL CLEAR THESE BITS
3465                                ;*THIS TEST ALSO CHECKS BYTE OPERATIONS ON THE CSR
3466                                ; -#XZ-----
3467                                ;::* TEST 13
3468                                ;*****
3469 014422 000004      TST13: SCOPE
3470 014424 012737 000013 001122      MOV    #13,@TSTNM     ;LOAD THE NUMBER OF THIS TEST
3471      ; -- END 0 MACRO -----
3472 014432 012737 014552 001360      MOV    @TST14,NEXT    ;POINT TO THE START OF THE NEXT TEST
3473 014440 104413      DEVICE.CLR
3474 014442 013700 002042      MOV    DZCSR,R0       ;SET UP FOR ERROR MESSAGE
3475 014446 012710 177757      MOV    @C<DCLR>,(R0)  ;TRY TO WRITE
3476 014452 012705 050150      MOV    @TIE!SILOEN!RIE!MSENAB!MAINT,R5 ;MAKE EXPECTED
3477 014456 011004      MOV    (R0),R4        ;ACTUAL
3478 014460 020405      CMP    R4,R5          ;CMP EXPECTED VS ACTUAL
3479 014462 001401      BEQ    1#             ;YES
3480 014464 104002      ERROR  2             ;*NO
3481 014466 105010      1#:   CLRB  (R0)          ;CLEAR LOWER BYTE OF CSR
3482 014470 105005      CLRB  R5             ;SET EXPECTED
3483 014472 011004      MOV    (R0),R4        ;READ CSR BITS
3484 014474 020405      CMP    R4,R5          ;COMPARE ACTUAL TO EXPECTED
3485 014476 001401      BEQ    3#             ;BRANCH IF SAME

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3486 014500 104002
3487 014502 012710 177757
3488 014506 105077 165332
3489 014512 012705 000150
3490
3491 014516 011004
3492 014520 020405
3493 014522 001401
3494 014524 104002
3495 014526 012710 177757
3496 014532 005005
3497 014534 005227 000000
3498 014540 001375
3499 014542 000005
3500 014544 011004
3501 014546 001401
3502 014550 104002
3503 014552
3504
3505
3506
3507
3508
3509
3510
3511
3512
3513 014552 000004
3514 014554 012737 000014 001122
3515
3516 014562 012737 014642 001360
3517 014570 104413
3518 014572 013700 002046
3519 014576 011005
3520 014600 012777 177777 165244
3521 014606 011004
3522 014610 042705 104000
3523 014614 020405
3524 014616 001401
3525 014620 104002
3526 014622 010403
3527 014624 005103
3528 014626 010377 165220
3529 014632 011004
3530 014634 020405
3531 014636 001401
3532 014640 104002
3533 014642
3534
3535
3536
3537
3538
3539
3540
3541

30:  ERROR 2 ; OTHERWISE PRINT ERROR
      MOV 0+C<DCLR>,(R0) ; RESET CSR BITS
      CLRB @DZCSR ; CLEAR HIGH BYTE OF CSR
      MOV @RIE!MSENAB!MAINT,R5 ; SET R5 TO EXPECTED RESULTS
      MOV (R0),R4 ; READ CSR
      CMP R4,R5 ; ACTUAL = EXPECTED?
      BEQ 40 ; BRANCH IF SAME
      ERROR 2 ; OTHERWISE PRINTOUT ERROR
40:  MOV 0+C<DCLR>,(R0) ; RESET CSR BITS
      CLR R5 ; SET R5 TO EXPECTED RESULTS
50:  INC 00 ; DELAY TIMER FOR
      BNE 50 ; ACT-11 COMPATIBILITY
      RESET ; ISSUE BUS INIT
      MOV (R0),R4 ; READ CSR REGISTER
      BEQ 20 ; BRANCH IF CSR IS CLEAR
      ERROR 2 ; IF NOT PRINT ERROR

20:  ; -#MRMD-----
      ; -#XZ-----
      ; ***** TEST 14 *****
      ; *THIS TEST PERFORMS RESET TESTING AND
      ; *TESTING OF READ ONLY REGISTER DZRBUF
      ; *AND TESTING OF WRITE ONLY REGISTER DZLPR
      ; -#XZ-----
      ; * TEST 14
      ; *****
      TST14: SCOPE
      MOV #14,@TSTNM ; LOAD THE NUMBER OF THIS TEST
      ; -- END 0 MACRO -----
      MOV @TST15,NEXT ; POINT TO THE START OF THE NEXT TEST
      DEVICE.CLR ; CLEAR DZ11
      MOV DZRBUF,R0 ; SET UP FOR ERROR MESSAGE
      MOV (R0),R5 ; SET EXPECTED
      MOV #-1,@DZLPR ; TRY TO WRITE ALL 1'S
      MOV (R0),R4 ; ACTUAL
      BIC @DVALID!BIT11,R5 ; DITTO
      CMP R4,R5 ; CMP ACTUAL VS EXPECTED
      BEQ 10 ; IF YES,GO CONTINUE PROCESSING
      ERROR 2 ; *ERROR- BIT PATTERN NOT CORRECT
10:  MOV R4,R3 ; GET A COPY OF THE ACTUAL BIT PATTERN
      COM R3 ; GET THE LOGICAL INVERSE OF THE BIT PATTERN
      MOV R3,@DZLPR ; TRY TO WRITE
      MOV (R0),R4 ; ACTUAL
      CMP R4,R5 ; CMP ACTUAL VS EXPECTED
      BEQ 20 ; IF YES, GET OUT OF THIS TEST
      ERROR 2 ; *NO

20:  ; -- END 0 MACRO -----
      ; -#MRMD-----
      ; -#XZ-----
      ; ***** TEST 15 *****
      ; *THIS TEST PERFORMS RESET TESTING AND
      ; *TESTING OF READ ONLY REGISTER DZMSR
      ; *AND TESTING OF WRITE ONLY REGISTER DZTDR
      ; -#XZ-----

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3542      ;:* TEST 15
3543      ;*****
3544 014642 000004      TST15: SCOPE
3545 014644 012737 000015 001122      MOV #15,#TSTNM ;LOAD THE NUMBER OF THIS TEST
3546      ; -- END 0 MACRO -----
3547 014652 012737 014726 001360      MOV #TST16,NEXT ;POINT TO THE START OF THE NEXT TEST
3548 014660 104413      DEVICE.CLR ;CLEAR DZ11
3549 014662 013700 002062      MOV DZMSR,R0 ;SET UP FOR ERROR MESSAGE
3550 014666 011005      MOV (R0),R5 ;SET EXPECTED
3551 014670 012777 177777 165170      MOV #-1,#DZTDR ;TRY TO WRITE ALL 1'S
3552 014676 011004      MOV (R0),R4 ;ACTUAL
3553 014700 020405      CMP R4,R5 ;CMP ACTUAL VS EXPECTED
3554 014702 C01401      BEQ 1# ;IF YES,GO CONTINUE PROCESSING
3555 014704 104002      ERROR 2 ;*ERROR- BIT PATTERN NOT CORRECT
3556 014706 010403 1# : MOV R4,R3 ;GET A COPY OF THE ACTUAL BIT PATTERN
3557 014710 005103      COM R3 ;GET THE LOGICAL INVERSE OF THE BIT PATTERN
3558 014712 010377 165150      MOV R3,#DZTDR ;TRY TO WRITE
3559 014716 011004      MOV (R0),R4 ;ACTUAL
3560 014720 020405      CMP R4,R5 ;CMP ACTUAL VS EXPECTED
3561 014722 001401      BEQ 2# ;IF YES, GET OUT OF THIS TEST
3562 014724 104002      ERROR 2 ;*NO
3563 014726      2# :
3564      ; -- END 0 MACRO -----
3565
3566      ; -#XZ-----
3567      ;***** TEST 16 *****
3568      ;*VERIFY THAT IF WE ARE IN "STAGGERED" MODE
3569      ;*THAT SETTING "DTR" FOR A LINE WILL
3570      ;*BRING UP "RING" AND "CARRIER" FOR THE
3571      ;*ASSOCIATED LINE IN WHICH WE ARE STAGGERED!
3572      ;* LINE0 DTR= LINE1 RING AND CARRIER
3573      ;* LINE1 DTR= LINE0 RING AND CARRIER
3574      ;* LINE2 DTR= LINE3 RING AND CARRIER
3575      ;* LINE3 DTR= LINE 4 RING AND CARRIER
3576      ;*
3577      ;* ETC...
3578      ; -#XZ-----
3579
3580      ;:* TEST 16
3581      ;*****
3582 014726 000004      TST16: SCOPE
3583 014730 012737 000016 001122      MOV #16,#TSTNM ;LOAD THE NUMBER OF THIS TEST
3584      ; -- END 0 MACRO -----
3585 014736 012737 015122 001360      MOV #TST17,NEXT ;POINT TO THE START OF THE NEXT TEST
3586 014744 012737 015016 001362      MOV #1#,#LOCK ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
3587 014752 105737 001414      TSTB EIAFLG ;EIA OR 20MA?
3588 014756 100001      BPL 10# ;BR IF EIA
3589 014760 104400      ADVANCE ;EXIT TEST
3590 014762 013700 002062 10# : MOV DZMSR,R0 ;SET REGISTER
3591 014766 104413      DEVICE.CLR ;INIT DZ11
3592 014770 005003      CLR R3 ;ZERO LINE NUMBER
3593 014772 012702 000001      MOV #1,R2 ;SET POINTER
3594 014776 005737 001370      TST MODE ;ARE WE IN STAGGERED MODE?
3595 015002 100405      BMI 1# ;YES WE ARE!
3596 015004 013737 001360 001126      MOV NEXT,#LPADR ;LEAVE THIS TEST! NOT STAGGERED
3597 015012 000177 164110      JMP B#LPADR ;EXIT

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3598 015016 130237 001364      1#: BITB      R2,LINE      ;TEST THIS LINE?
3599 015022 001004              BNE          3#          ;YES
3600 015024 005203      2#: INC          R3          ;LINE #
3601 015026 106302              ASLB         R2          ;GET NEXT LINE
3602 015030 103372              BCC          1#          ;KEEP TESTING
3603 015032 104400              ADVANCE     ;ADVANCE THIS TEST
3604 015034 010204      3#: MOV          R2,R4      ;SAVE BINARY BIT FOR LINE #
3605 015036 032703 000001      BIT          @BIT0,R3    ;GET STAGGERED COMPANION LINE
3606 015042 001402              BEQ          4#          ;BR IF LINE EVEN
3607 015044 006204              ASR          R4          ;ADJUST LINE
3608 015046 000401              BR          5#          ;
3609 015050 006304      4#: ASL          R4          ;ADJUST LINE
3610 015052 005005      5#: CLR          R5          ;SET EXPECTED
3611 015054 150405              BISB        R4,R5      ;
3612 015056 000305              SWAB        R5          ;
3613 015060 150405              BISB        R4,R5      ;
3614 015062 150277 164772      BISB        R2,@DZTCR   ;SET DTR
3615 015066 104414              DELAY      ;CABLE DELAY
3616 015070 011004              MOV          (R0),R4    ;READ MSR REGISTER
3617 015072 020504              CMP          R5,R4      ;OK?
3618 015074 001401              BEQ          6#          ;YES
3619 015076 104002              ERROR      2           ;*ERROR IN RING OR CARRIER
3620 015100 140277 164754      6#: BICB        R2,@DZTCR ;CLEAR DTR
3621 015104 104414              DELAY      ;CABLE DELAY
3622 015106 011004              MOV          (R0),R4    ;READ MSR
3623 015110 001402              BEQ          7#          ;BR IF THEY CLEARED
3624 015112 005005              CLR          R5          ;SET EXPECTED TO 0
3625 015114 104002              ERROR      2           ;*BITS NOT CLEARED
3626 015116 104401      7#: SCOP1      ;LOCK ON SIGNAL?
3627 015120 000741              BR          2#          ;CONTINUE TEST
3628
3629
3630
3631
3632
3633
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3635
3636
3637
3638
3639
3640
3641
3642
3643 015122 000004
3644 015124 012737 000017 001122
3645
3646 015132 012737 015260 001360
3647 015140 012737 015174 001362
3648 015146 105737 001370
3649 015152 100401
3650 015154 104400      1#: ADVANCE
3651 015156 105737 001414      2#: TSTB        EIAFLG
3652 015162 100774              BMI          1#          ;YOU BETTER BE IN
3653 015164 013700 002062              MOV          DZMSR,R0   ;EIA MODE FOR THIS TEST.
                          ;SET REGISTER

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; -#XZ-----  
;\*\*\*\*\* TEST 17 \*\*\*\*\*  
;\*TEST TO VERIFY THAT IF IN "EXTERNAL"  
;\*MODE; SETTING DTR FOR SELECTED LINES  
;\*WILL BRING UP "CARRIER" AND "RING"  
;\*FOR THAT SAME LINE. NOTE: IF YOU HAVE  
;\*SELECTED MODE AS "EXTERNAL"; THE H325 TEST CONNECTER  
;\*MUST BE USED ON ALL SPECIFIED LINES.  
;\*LINES MAY BE SPECIFIED BY SWR03=1  
;\*AND SWR00=1 AT START TIME OR ALTERING  
;\*STATUS MAP.  
; -#XZ-----

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;:* TEST 17
;*****
TST17: SCOPE
      MOV          #17,@TSTNM      ;LOAD THE NUMBER OF THIS TEST
; -- END O MACRO -----
      MOV          @TST20,NEXT     ;POINT TO THE START OF THE NEXT TEST
      MOV          #3@,LOCK       ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
      TSTB        MODE           ;EXTERNAL?
      BMI          2#            ;BR IF YES
      ADVANCE     ;EXIT TEST
      TSTB        EIAFLG         ;YOU BETTER BE IN
      BMI          1#            ;EIA MODE FOR THIS TEST.
      MOV          DZMSR,R0      ;SET REGISTER

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3654 015170 012702 000001      MOV      #1,R2      ;SET LINE POINTER
3655 015174 130237 001364      3#: BITB      R2,LINE ;LINE SELECTED?
3656 015200 001003              BNE      5#         ;BR IF YES
3657 015202 106302              4#: ASLB      R2      ;NEXT LINE
3658 015204 103373              BCC      3#         ;CONTINUE TEST
3659 015206 104400              ADVANCE ;ADVANCE THIS TEST
3660 015210 005005              5#: CLR      R5      ;SET EXPECTED
3661 015212 150205              BISB     R2,R5      ;
3662 015214 000305              SWAB     R5         ;
3663 015216 150205              BISB     R2,R5      ;
3664 015220 150277 164634      BISB     R2,BNDZTCR ;SET DTR
3665 015224 104414              DELAY    ;CABLE DELAY
3666 015226 011004              MOV      (R0),R4    ;READ MSR
3667 015230 020504              CMP      R5,R4      ;BITS OK?
3668 015232 001401              BEQ      6#         ;BR IF YES
3669 015234 104002              ERROR   2          ;CARRIER OR RING ERROR
3670 015236 140277 164616      6#: BICB     R2,BNDZTCR ;CLEAR DTR
3671 015242 104414              DELAY    ;CABLE DELAY
3672 015244 011004              MOV      (R0),R4    ;READ MSR
3673 015246 001402              BEQ      7#         ;BR IF BITS CLEARED
3674 015250 005005              CLR      R5         ;CLEAR EXPECTED LOC.
3675 015252 104002              ERROR   2          ;BITS NOT CLEARED.
3676 015254 104401              7#: SCOP1 ;LOCK ON LINE?
3677 015256 000751              BR      4#         ;CONTINUE TEST
3678
3679 ; -#TLINE-----
3680 ; -#XZ-----
3681 ;***** TEST 20 *****
3682 ;* THIS TEST VERIFIES THAT TRDY IS SET WHEN A LINE
3683 ;* IS READY TO BE LOADED, AND THAT THE LINE SPECI-
3684 ;* FIED IN BITS 8-10 OF DZCSR CORRESPOND
3685 ;* TO THE LINE SELECTED IN DZTCR
3686 ; -#XZ-----
3687 ;:* TEST 20
3688 ;*****
3689 015260 000004      TST20: SCOPE
3690 015262 012737 000020 001122      MOV      #20,#TSTNM ;LOAD THE NUMBER OF THIS TEST
3691 ; -- END 0 MACRO -----
3692 015270 012737 015404 001360      MOV      #TST21,NEXT ;POINT TO THE START OF THE NEXT TEST
3693 015276 104413              DEVICE.CLR ;ISSUE A "DEVICE CLEAR" (RESET)
3694 015300 013700 002042      MOV      DZCSR,R0   ;SET POINTER
3695 015304 012705 100040      MOV      #MSENAB!TRDY,R5 ;START THE EXPECTED LINE NUMBER AT 0
3696 015310 005037 001372      CLR      SAVLIN     ;SET UP FOR ERROR PRINTOUTS
3697 015314 012702 000001      MOV      #1,R2      ;USING R2 AS A BIT POINTER, POINT TO LINE 0
3698 015320 130237 001364      1#: BITB     R2,LINE ;IS THIS LINE SELECTED?
3699 015324 001420              BEQ      5#         ;IF NO, SKIP THE STARTUP
3700 015326 050277 164524      2#: BIS      R2,BNDZTCR ;SET THE GO BIT FOR THIS LINE
3701 015332 052710 000040      BIS      #MSENAB,(R0) ;START THE SCANNER
3702 015336 005004              CLR      R4         ;SET FOR DELAY
3703 015340 032710 100000      3#: BIT      #TRDY,(R0) ;TX READY?
3704 015344 001004              BNE      4#         ;BR IF YES
3705 015346 104414              DELAY    ;DELAY
3706 015350 005204              INC      R4         ;COUNTER
3707 015352 001372              BNE      3#         ;BR IF <>0!
3708 015354 104003              ERROR   3          ;*TX NOT READY!
3709 015356 011004      4#: MOV      (R0),R4 ;GET THE LINE POINTED TO BY THE SCANNER

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3710 015360 020405          CMP      R4,R5          ;IS THE LINE NUMBER WHAT IT SHOULD BE?
3711 015362 001401          BEQ      50             ;IF YES,GO WORK ON THE NEXT LINE
3712 015364 104002          ERROR    2             ;*LINE NUMBER DID NOT MATCH TCR BIT
3713 015366 062705 000400 50:  ADD      #400,R5       ;POINT TO THE NEXT EXPECTED LINE
3714 015372 104413          DEVICE.CLR          ;ISSUE A "DEVICE CLEAR" (RESET)
3715 015374 005237 001372  INC      SAVLIN       ;ADJUST FOR NEXT LINE
3716 015400 106302          ASLB     R2           ;POINT TO THE NEXT LINE.ARE ALL LINES TESTED?
3717 015402 103346          BCC      10          ;IF NOT, GO DO THE NEXT LINE
3718 015404
3719
3720          ; -- END 0 MACRO -----
3721          ; ***** TEST 21 *****
3722          ;*TEST TO TRANSMIT ONE CHAR AND
3723          ;*RECEIVE ONE CHAR ON ONE LINE
3724          ;*AT A TIME. THE CHAR IS "252" AND
3725          ;*ALL SELECTED LINES WILL BE TURNED ON
3726          ;*ONE AT A TIME. THIS IS THE FIRST TIME ANY
3727          ;*DATA IS CHECKED IN THE RECEIVER.
3728          ;*USING SWITCH NINE WITH THIS TEST CREATES A TIGHT SCOPE LOOP
3729          ;*WHICH TRANSMITS A STEADY STREAM OF CHARACTERS.
3730          ; -#XZ-----
3731          ;:* TEST 21
3732          ;*****
3733 015404 000004          TST21: SCOPE
3734 015406 012737 000021 001122  MOV      #21,#TSTNM    ;LOAD THE NUMBER OF THIS TEST
3735          ; -- END 0 MACRO -----
3736 015414 012737 015742 001360  MOV      #TST22,NEXT   ;POINT TO THE START OF THE NEXT TEST
3737 015422 012737 015720 001362  MOV      #160,LOCK     ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
3738          ;#LINEUP-----
3739          ; -#RESET-----
3740 015430 104417          DCLASH              ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
3741          ; -- END 0 MACRO -----
3742 015432 013701 001366          MOV      PAR,R1       ;PICK UP PARAMETERS
3743 015436 012702 000001          MOV      #1,R2       ;PICK UP INIT POINTER
3744 015442 030237 001364          10:  BIT      R2,LINE     ;SHOULD THIS LINE BE SET UP ?
3745 015446 001402          BEQ      20           ;NO
3746 015450 010177 164376          MOV      R1,#DZLPR    ;SET UP LINE PARAMETERS
3747 015454 005201          20:  INC      R1       ;POSITION POINTER TO THE NEXT LINE
3748 015456 106302          ASLB     R2           ;GOT 'EM ALL ?
3749 015460 103370          BCC      10          ;IF NO, GO SET UP THE NEXT LINE
3750 015462 005037 001372  CLR      SAVLIN       ;CLEAR LINE # INDICATOR
3751          ; -- END 0 MACRO -----
3752 015466 012702 000001          MOV      #1,R2       ;LINE POINTER
3753 015472 052777 000040 164342  BIS      #MSENAB,#DZCSR ;START SCANNER
3754 015500 030237 001364          30:  BIT      R2,LINE     ;VALID LINE ?
3755 015504 001462          BEQ      10          ;NO SET UP NEXT LINE
3756 015506 010277 164344          MOV      R2,#DZTCR   ;SET TCR BIT
3757 015512 032777 000200 164322  40:  BIT      #RDONE,#DZCSR ;IS REC DONE = 0 ?
3758 015520 001401          BEQ      50           ;IF YES, ALLOW TIME FOR TRDY TO SET
3759 015522 104020          ERROR    20         ;*REC DONE SHOULD = 0
3760 015524 005005          50:  CLR      R5
3761 015526 032777 100000 164306  60:  BIT      #TRDY,#DZCSR
3762 015534 001004          BNE      70
3763 015536 104414          DELAY
3764 015540 105205          INCB     R5
3765 015542 001371          BNE      60

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3766 015544 104003          ERROR 3          ;*TRDY FAILED TO SET!
3767 015546 112777 000252 164312 7#: MOVB #252, BDZTDR ;LOAD CHARACTER
3768 015554 013705 001372          MOV SAVLIN, R5 ;MAKE EXPECTED LINE #
3769          ; -#STAG-----
3770 015560 105737 001371          TSTB MODE+1 ;IS THIS TEST IN STAGGERED MODE?
3771 015564 001406          BEQ 10# ;IF NOT, SKIP STAGGERED SETUP
3772          ;
3773          ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3774          ;
3775 015566 006205          ASR R5 ;GET THE LAST BIT INTO THE CARRY BIT
3776 015570 103402          BCS 8# ;IF IT IS SET, GO CLEAR IT
3777 015572 000261          SEC ;IF IT IS CLEAR SET IT HERE
3778 015574 000401          BR 9# ;SKIP THE CLEARING
3779 015576 000241 8#: CLC ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3780 015600 006105 9#: ROL R5 ;GET THE NEW BIT BACK INTO R5
3781          ; -- END 0 MACRO -----
3782 015602 000305 10#: SWAB R5 ;MOVE THE LINE NUMBER TO THE UPPER BYTE
3783 015604 152705 000252 DISB #252, R5 ;ADD CHARACTER
3784 015610 052705 100000 BIS #DVALID, R5 ;ADD DATA VALID
3785 015614 005003          CLR R3
3786 015616 032777 000200 164216 11#: BIT #RDONE, BDZCSR
3787 015624 001004          BNE 12#
3788 015626 104414          DELAY
3789 015630 005203          INC R3
3790 015632 001371          BNE 11#
3791 015634 104004          ERROR 4 ;*RDONE FAILED TO SET!
3792 015636 017704 164204 12#: MOV BDZRBUF, R4 ;LOAD THE VALUE ACTUALLY RECEIVED
3793 015642 020405          CMP R4, R5 ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
3794 015644 001401          BEQ 13# ;IF YES, GO DO THE NEXT LINE
3795 015646 104006          ERROR 6 ;*NO DATA/CONTENTS DID NOT COMPARE
3796 015650 104401 13#: SCOP1 ;CHECK TO SEE IF SWITCH NINE IS SET
3797 015652 040277 164200 14#: BIC R2, BDZTCR ;CLEAR TCR BIT FOR THAT LINE.
3798 015656 005237 001372 15#: INC SAVLIN ;INC EXPECTED LINE
3799 015662 013700 001372          MOV SAVLIN, R0 ;SET UP CHARACTER OFFSET
3800 015666 006300          ASL R0 ;MAKE THE OFFSET A POWER OF TWO
3801 015670 106302          ASLB R2 ;SHIFT THE LINE POINTER. ARE WE ALL DONE?
3802 015672 103302          BCC 3# ;IF NO, GO AROUND AGAIN FOR NEXT LINE
3803 015674 005003          CLR R3 ;THIS CODE HAS BEEN INSERTED
3804 015676 104414 17#: DELAY ;TO DETECT A PROBLEM FOUND IN FAULT
3805 015700 105203          INCB R3 ;INSERTION. IF AN ERROR OCCURS MORE
3806 015702 001375          BNE 17# ;THAN ONE WORD WAS RECIEVED ON
3807 015704 032777 000200 164130          BIT #RDONE, BDZCSR ;LINE 7.
3808 015712 001401          BEQ 18#
3809 015714 104020          ERROR 20
3810 015716 104400 18#: ADVANCE ;GO TO NEXT TEST
3811          ;
3812          ;TIGHT SCOPE LOOP FOR THIS TEST. LOOP TRANSMITS CHARACTERS ONLY
3813          ;
3814 015720 032777 100000 164114 16#: BIT #TRDY, BDZCSR ;IS TRANSMITTER READY?
3815 015726 001774          BEQ 16# ;IF NOT, WAIT FOR IT
3816 015730 112777 000252 164130          MOVB #252, BDZTDR ;LOAD THE CHARACTER
3817 015736 104401          SCOP1 ;LOOP AGIN IF SW09=1
3818 015740 000744          BR 14# ;OTHERWISE, GO PICK UP THE TEST NORMALLY
3819          ;
3820          ; -#XZ-----
3821          ;***** TEST 22 *****

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3822                                     ; THIS TEST PROVES THAT THE TRANSMITTER TRANSMITS
3823                                     ; CHARACTERS (FLAG MODE) AND THE RECEIVER RECEIVES (FLAG MODE)
3824                                     ; (ONE LINE AT A TIME BASED UPON VALID LINES)
3825                                     ; THIS IS THE FIRST TIME THAT ALL DATA IS CHECKED
3826                                     ; -IXZ-----
3827                                     ;: TEST 22
3828                                     ;:-----
3829 015742 000004 TST22: SCOPE
3830 015744 012737 000022 001122      MOV     #22, #TSTNM      ;LOAD THE NUMBER OF THIS TEST
3831                                     ; -- END 0 MACRO -----
3832 015752 012737 016270 001360      MOV     #TST23, NEXT    ;POINT TO THE START OF THE NEXT TEST
3833 015760 012737 016074 001362      MOV     #41, LOCK       ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
3834                                     ;LINEUP-----
3835                                     ; -IMRESET-----
3836 015766 104417      DCLASH      ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
3837                                     ; -- END 0 MACRO -----
3838 015770 013701 001366      MOV     PAR, R1         ;PICK UP PARAMETERS
3839 015774 012702 000001      MOV     #1, R2         ;PICK UP INIT POINTER
3840 016000 030237 001364      10:    BIT     R2, LINE   ;SHOULD THIS LINE BE SET UP ?
3841 016004 001402      BEQ     20              ;NO
3842 016006 010177 164040      MOV     R1, #DZLPR     ;SET UP LINE PARAMETERS
3843 016012 005201      20:    INC     R1         ;POSITION POINTER TO THE NEXT LINE
3844 016014 106302      ASLB   R2              ;GOT 'EM ALL ?
3845 016016 103370      BCC    10              ;IF NO, GO SET UP THE NEXT LINE
3846 016020 005037 001372      CLR     SAVLIN         ;CLEAR LINE # INDICATOR
3847                                     ; -- END 0 MACRO -----
3848 016024 012700 001422      MOV     #TDO, R0       ;POINT TO THE DATA AREA
3849 016030 005020      CLR     (R0)          ;CLEAR A DATA WORD
3850 016032 022700 001462      CMP     #STOP, R0     ;FINISHED ?
3851 016036 001374      BNE    -6             ;NO
3852 016040 005000      CLR     R0            ;CLEAR OFFSET
3853 016042 013737 002046 001400      MOV     DZBUF, REGIST  ;SAVE FOR ERROR MSG
3854 016050 012702 000001      MOV     #1, R2         ;LINE POINTER
3855 016054 052777 000040 163760      BIS     #MSENAB, #DZCSR ;START SCANNER
3856 016062 030237 001364      30:    BIT     R2, LINE   ;VALID LINE ?
3857 016066 001465      BEQ    140            ;NO SET UP NEXT LINE
3858 016070 010277 163762      MOV     R2, #DZTCR    ;SET TCR BIT
3859 016074 052777 000200 163740 40:    BIT     #RDONE, #DZCSR ;IS REC DONE = 0 ?
3860 016102 001401      BEQ    50              ;IF YES, ALLOW TIME FOR TRDY TO SET
3861 016104 104020      ERROR  20            ;REC DONE SHOULD = 0
3862 016106 005005      CLR     R5            ;
3863 016110 032777 100000 163724 60:    BIT     #TRDY, #DZCSR
3864 016116 001004      BNE    70              ;
3865 016120 104414      DELAY
3866 016122 105205      INCB   R5            ;
3867 016124 001371      BNE    60              ;
3868 016126 104003      ERROR  3              ;
3869 016130 116077 001422 163730 70:    MOVB   TDO(R0), #DZTCR ;TRDY FAILED TO SET!
3870 016136 013705 001372      MOV     SAVLIN, R5     ;LOAD CHARACTER
3871                                     ; MAKE EXPECTED LINE #
3872 016142 105737 001371      TSTB   MODE+1         ; -ISTAG-----
3873 016146 001406      BEQ    100            ;IS THIS TEST IN STAGGERED MODE?
3874                                     ;IF NOT, SKIP STAGGERED SETUP
3875                                     ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3876                                     ;
3877 016150 006205      ASR    R5             ;GET THE LAST BIT INTO THE CARRY BIT

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3878 016152 103402          BCS      81      ;IF IT IS SET, GO CLEAR IT
3879 016154 000261          SEC              ;IF IT IS CLEAR SET IT HERE
3880 016156 000401          BR       91      ;SKIP THE CLEARING
3881 016160 000241          81:      CLC              ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3882 016162 006105          91:      ROL      R5      ;GET THE NEW BIT BACK INTO R5
3883                          ; -- END 0 MACRO -----
3884 016164 000305          101:     SWAB      R5      ;MOVE THE LINE NUMBER TO THE UPPER BYTE
3885 016166 156005 001422    BISB     TDO(R0),R5    ;ADD CHARACTER
3886 016172 052705 100000    BIS     @DVALID,R5    ;ADD DATA VALID
3887 016176 005003          CLR      R3
3888 016200 032777 000200 163634 111:     BIT     @RDONE,@DZCSR
3889 016206 001004          BNE     121
3890 016210 104414          DELAY
3891 016212 005203          INC     R3
3892 016214 001371          BNE     111
3893 016216 104004          ERROR   4
3894 016220 017704 163622    121:     MOV     @DZRBUF,R4    ;RDONE FAILED TO SET!
3895 016224 020405          CMP     R4,R5        ;LOAD THE VALUE ACTUALLY RECEIVED
3896 016226 001401          BEQ     131          ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
3897 016230 104006          ERROR   6
3898 016232 104401          131:     SCOP1
3899 016234 105260 001422    INCB    TDO(R0)      ;IF YES, GO DO THE NEXT LINE
3900 016240 001315          BNE     41           ;NO DATA/CONTENTS DID NOT COMPARE
3901 016242 040277 163610    41:      BIC     R2,@DZTCR    ;CHECK TO SEE IF SWITCH NINE IS SET
3902 016246 005237 001372    141:     INC     SAVLIN   ;INCREMENT BINARY PATTERN FOR THIS LINE
3903 016252 013700 001372    151:     MOV     SAVLIN,R0   ;GO 'ROUND AGAIN FOR NEXT CHARACTER
3904 016256 006300          ASL     R0           ;CLEAR TCR BIT FOR THAT LINE.
3905 016260 106302          ASLB   R2           ;INC EXPECTED LINE
3906 016262 103277          BCC    31           ;SET UP CHARACTER OFFSET
3907 016264 005037 001362    CLR     LOCK        ;MAKE THE OFFSET A POWER OF TWO
3908                          ;SHIFT THE LINE POINTER. ARE WE ALL DONE?
3909                          ;IF NO, GO AROUND AGAIN FOR NEXT LINE
3910                          ;MAKE SURE LOCK IS CLEAR FOR NEXT TEST
3911                          ; -#XZ-----
3912                          ;***** TEST 23 *****
3913                          ;*THIS TEST WILL PROVE THAT EACH RECEIVING LINE CAN
3914                          ;*BE DISABLED BY SETTING THE RCVON BIT TO ZERO
3915                          ;*FOR EACH LINE IN THE LPR REGISTER. IT ALSO
3916                          ;*VERIFIES THAT MASTER CLEAR WILL ZERO DVALID FOR
3917                          ;*CHARACTERS STORED IN THE SILO.
3918                          ; -#XZ-----
3919                          ;* TEST 23
3920 016270 000004          ;*****
3921 016272 012737 000023 001122  TST23:  SCOPE
3922                          ; -- END 0 MACRO -----
3923 016300 012737 016622 001360    MOV     @23,@TSTNM   ;LOAD THE NUMBER OF THIS TEST
3924 016306 105037 001420    ; -- END 0 MACRO -----
3925 016312 005037 001372    MOV     @TST24,NEXT  ;POINT TO THE START OF THE NEXT TEST
3926 016316 104417          CLRB   DONFLG       ;INITIALIZE FOR FIRST TEST LOOP
3927 016320 013701 001366    CLR     SAVLIN       ;ZERO LINE NO. FOR ERROR REPORT
3928 016324 042701 010000    DCLASH
3929 016330 012702 000001          MOV     PAR,R1       ;EXECUTE MASTER CLEAR
3930 016334 010177 163512    11:     MOV     @RCVON,R1    ;STORE DEFAULT PARAMETERS
3931 016340 005201          21:     MOV     @1,R2        ;CLEAR RCVON BIT
3932 016342 106302          21:     MOV     R1,@DZLPR   ;INIT LINE POINTER
3933 016344 103373          INC     R1           ;LOAD LINE PARAMETER REGISTER
                          ;SET R1 FOR NEXT LINE
                          ;SHIFT R2 TO NEXT LINE
                          ;ALL LINES LOADED?

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3934	016346	012701	000252		MOV	#252,R1	:LOAD TRANSMITTING CHARACTER
3935	016352	013702	001364		MOV	LINE,R2	:COPY ACTIVE LINE BITS
3936	016356	010277	163474		MOV	R2,BDZTCR	:LOAD TCR BITS
3937	016362	052777	000040	163452	BIS	#MSENAB,BDZCSR	:SET SCANNER
3938	016370	005005		30:	CLR	R5	:INIT DELAY COUNTER
3939	016372	005777	163444	40:	TST	BDZCSR	:TRDY SET?
3940	016376	100404			BMI	50	:IF YES BRANCH
3941	016400	104414			DELAY		:IF NOT THEN WAIT
3942	016402	005205			INC	R5	:INCREMENT DELAY COUNTER
3943	016404	001372			BNE	40	:DELAY DONE?
3944	016406	104003			ERROR	3	:IF YES TRDY FAILED TO SET
3945	016410	117705	163430	50:	MOVB	#BDZCSR,R5	:MOVE LINE NO. INTO R5
3946	016414	012703	000001		MOV	#1,R3	:INIT TCR POINTER
3947	016420	042705	177770		BIC	#C<7>,R5	:ISOLATE LINE NO.
3948	016424	001403			BEQ	210	:IF LINE 0 GO TEST TRANSM. FLAG
3949	016426	106303		200:	ASLB	R3	:POINT R3 TO NEXT TCR BIT
3950	016430	005305			DEC	R5	:DECREMENT R5 UNTIL R3 POINTS
3951	016432	001375			BNE	200	:TO CORRECT TCR BIT
3952	016434	030302		210:	BIT	R3,R2	:HAS THIS LINE BEEN SERVICED?
3953	016436	001007			BNE	60	:IF NOT GO SEND CHARACTER
3954	016440	140377	163412		BICB	R3,BDZTCR	:IF YES CLEAR TCR BIT
3955	016444	001351			BNE	30	:IF MORE LINES SET BRANCH
3956	016446	105737	001420		TSTB	DONFLG	:IF ALL LOADED IS THIS SECOND PASS
3957	016452	001040			BNE	120	:IF YES BRANCH TO SECOND PART OF TEST
3958	016454	000404			BR	70	:OTHERWISE CONTINUE WITH FIRST PART
3959	016456	110177	163404	60:	MOVB	R1,BDZTCR	:TRANSMIT CHARACTER
3960	016462	040302			BIC	R3,R2	:CLEAR FLAG FOR THIS LINE
3961	016464	000741			BR	30	:GO WAIT FOR NEXT LINE
3962	016466	005077	163364	70:	CLR	BDZTCR	:CLEAR TCR BITS
3963	016472	005005			CLR	R5	:CLEAR DELAY COUNTER
3964	016474	104414		80:	DELAY		:WAIT FOR LAST CHARACTER
3965	016476	005205			INC	R5	:INCREMENT DELAY COUNTER
3966	016500	001375			BNE	80	:IF NOT FINISHED CONTINUE WAITING
3967	016502	105777	163334		TSTB	BDZCSR	:RDONE BIT SET?
3968	016506	100003			BPL	100	:IF NO CONTINUE
3969	016510	005037	001372		CLR	SAVLIN	:IF YES SET LINE NO. TO ZERO
3970	016514	104020			ERROR	20	:AND PRINT ERROR
3971	016516	017704	163324	100:	MOV	BDZRBUF,R4	:READ SILO
3972	016522	100007			BPL	110	:IF DVALID IS ZERO BRANCH
3973	016524	000304			SWAB	R4	:IF SET THEN
3974	016526	042704	177770		BIC	#C<7>,R4	:ISOLATE LINE NO. IN R4
3975	016532	010437	001372		MOV	R4,SAVLIN	:SET SAVLIN FOR ERROR REPORT
3976	016536	104017			ERROR	17	:DATA VALID SHOULD NOT BE SET
3977	016540	000766			BR	100	:GO READ SILO AGAIN
3978	016542	105237	001420	110:	INCB	DONFLG	:PREPARE FOR SECOND PART OF TEST
3979	016546	013701	001366		MOV	PAR,R1	:MOVE DEFAULT PARAMETERS TO R1
3980	016552	000666			BR	10	:GO LOAD LPR REGISTER
3981	016554	005005		120:	CLR	R5	:INIT DELAY COUNTER
3982	016556	104414		130:	DELAY		:WAIT FOR LAST CHARACTER
3983	016560	005205			INC	R5	:TO BE RECEIVED
3984	016562	001375			BNE	130	:DELAY FINISHED?
3985	016564	104413			DEVICE.CLR		:IF YES EXECUTE MASTER CLEAR
3986	016566	000240			NOP		
3987	016570	000240			NOP		
3988	016572	105777	163244		TSTB	BDZCSR	:RDONE SET?
3989	016576	100003			BPL	140	:IF NOT BRANCH

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3990 016600 005037 001372          CLR      SAVLIN          ;IF YES THEN PRINT OUT
3991 016604 104020          ERROR    20              ;REPORT
3992 016606 017704 163234    14:      MOV      @DZRBUF,R4      ;READ SILO
3993 016612 100003          BPL      15:             ;DATA VALID SET?
3994 016614 005037 001372          CLR      SAVLIN          ;IF YES THEN PRINT OUT
3995 016620 104017          ERROR    17              ;ERROR REPORT
3996 016622    15:
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4010 016622 000004          ; ***** TEST 24 *****
4011 016624 012737 000024 001122    TST24: SCOPE
4012
4013 016632 012737 017100 001360    ; -- END 0 MACRO -----
4014 016640 012737 016736 001362    MOV      @24,@TSTNM      ;LOAD THE NUMBER OF THIS TEST
4015 016646 005737 001370          ; -- END 0 MACRO -----
4016 016652 001510          MOV      @TST25,NEXT     ;POINT TO THE START OF THE NEXT TEST
4017
4018 016654 104417          MOV      @3@,LOCK        ;SET FOR LOOP
4019
4020 016656 013701 001366          TST     MODE             ;ARE WE RUNNING IN INTERNAL MODE?
4021 016662 052701 000300          BEQ     12:             ;IF SO, SKIP THIS TEST
4022 016666 012700 000001          ; -#RESET-----
4023 016672 030037 001364          DCLASH                    ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4024 016676 001402          ; -- END 0 MACRO -----
4025 016700 010177 163146          MOV      PAR,R1          ;PICK UP PARAMETERS
4026 016704 005201          BIS     @ODDPAR!PARITY,R1 ;FORCE ODD PARITY
4027 016706 106300          MOV     @1,R0            ;PICK UP INIT POINTER
4028 016710 103370          1:      BIT     R0,LINE      ;SHOULD THIS LINE BE SET UP ?
4029 016712 005037 001372          BEQ     2:              ;IF NOT,DON'T SET IT UP
4030 016716 012702 000001          MOV     R1,@DZLPR       ;OTHERWISE, SET UP LINE PARAMETERS
4031 016722 052777 000040 163112    2:      INC     R1
4032 016730 013737 002046 001400    ASLB    R0                ;GOT 'EM ALL ?
4033 016736 030237 001364          BCC     1:             ;NO
4034 016742 001446          CLR     SAVLIN          ;CLEAR LINE #
4035 016744 010277 163106          MOV     @1,R2            ;LINE POINTER
4036 016750 110277 163114          BIS     @#SENAB,@DZCSR   ;SET MASTER SCAN ENABLE
4037 016754 112777 000377 163104    MOV     DZRBUF,REGIST    ;SAVE FOR ERRR MESSAGE
4038 016762 013705 001372          3:      BIT     R2,LINE
4039
4040 016766 105737 001371          BEQ     11:           ;SET TCR BIT
4041 016772 001406          MOV     R2,@DZTCR       ;SET BREAK BIT
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4045 016774 006205          MOV     @377,@DZTDR     ;LOAD CHARACTER
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4046 016776 103402          BCS      5#          ;IF IT IS SET, GO CLEAR IT
4047 017000 000261          SEC              ;IF IT IS CLEAR SET IT HERE
4048 017002 000401          BR        6#          ;SKIP THE CLEARING
4049 017004 000241          5#: CLC              ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
4050 017006 006105          6#: ROL      R5          ;GET THE NEW BIT BACK INTO R5
4051          ; -- END 0 MACRO -----
4052 017010 000305          7#: SWAB     R5          ;PUT LINE NUMBER IN UPPER BYTE
4053 017012 052705 130000   BIS      @DVALID!PARER!FMERR,R5 ;ADD EXPECTED
4054 017016 005004          CLR      R4
4055 017020 032777 000200 163014 8#: BIT      @RDONE,@DZCSR
4056 017026 001004          BNE     9#
4057 017030 104414          DELAY
4058 017032 005204          INC     R4
4059 017034 001371          BNE     8#
4060 017036 104004          ERROR  4          ;@RDONE FAILED TO SET!
4061 017040 017704 163002   9#: MOV      @DZRBUF,R4    ;ACTUAL
4062 017044 020405          CMP     R4,R5      ;CMP ACTUAL VS EXPECTED. DO THEY MATCH?
4063 017046 001401          BEQ    10#         ;IF YES, GO CLEAN UP
4064 017050 104006          ERROR  6          ;@DATA/CONTENTS FAILED TO COMPARE
4065 017052 105077 163012 10#: CLRB    @DZTDR      ;CLEAR BREAK BITS
4066 017056 104401          SCOP1
4067 017060 005237 001372 11#: INC     SAVLIN     ;INC LINE #
4068 017064 040277 162766   BIC     R2,@DZTCR  ;CLEAR TCR BIT
4069 017070 106302          ASLB   R2
4070 017072 103321          BCC    3#
4071 017074 005037 001362 12#: CLR     LOCK        ;MAKE SURE LOCK IS CLEAR FOR NEXT TEST
4072          ; -@LVLST-----
4073          ; -@XZ-----
4074          ;***** TEST 25 *****
4075          ;* THIS TEST VERIFIES THAT THE DEVICE DOES NOT INTERRUPT
4076          ;*WHILE THE PROCESSOR STATUS IS SET EXACTLY
4077          ;*TO WHAT THE DZ11 PRIORITY IS SET TO.
4078          ;*DEFAULT PRIORITY IS AT 5 (240).
4079          ; -@XZ-----
4080          ;:* TEST 25
4081          ;*****
4082 017100 000004          TST25: SCOPE
4083 017102 012737 000025 001122   MOV     @25,@TSTNM  ;LOAD THE NUMBER OF THIS TEST
4084          ; -- END 0 MACRO -----
4085 017110 012737 017410 001360   MOV     @TST26,NEXT ;POINT TO THE START OF THE NEXT TEST
4086          ;@LINEUP-----
4087          ; -@MRESET-----
4088 017116 104417          DCLASH
4089          ; -- END 0 MACRO -----
4090 017120 013701 001366          MOV     PAR,R1      ;PICK UP PARAMETERS
4091 017124 012702 000001          MOV     @1,R2       ;PICK UP INIT POINTER
4092 017130 030237 001364          1#: BIT     R2,LINE    ;SHOULD THIS LINE BE SET UP ?
4093 017134 001402          BEQ    2#           ;NO
4094 017136 010177 162710          MOV     R1,@DZLPR   ;SET UP LINE PARAMETERS
4095 017142 005201          2#: INC     R1         ;POSITION POINTER TO THE NEXT LINE
4096 017144 106302          ASLB   R2           ;GOT 'EM ALL ?
4097 017146 103370          BCC    1#           ;IF NO, GO SET UP THE NEXT LINE
4098 017150 005037 001372          CLR     SAVLIN     ;CLEAR LINE # INDICATOR
4099          ; -- END 0 MACRO -----
4100 017154 106437 030306          MTPS   @DZPRT      ;SET CPU STATUS TO DZ11 PRIO.
4101 017160 113777 001364 162670   MOVB   LINE,@DZTCR ;ENABLE THE VALID LINES

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4102 017166          30:
4103
4104 017166 012777 017256 162702      MOV    #60,8DZTIV      ; -#INTSET-----
4105 017174 012777 017264 162670      MOV    #70,8DZRIV      ;SET UP THE TRANSMITTER INTERRUPT VECTOR
4106 017202 013777 030306 162664      MOV    DZPRT,8DZ RIS   ;SET UP THE RECEIVER INTERRUPT VECTOR
4107 017210 013777 030306 162662      MOV    DZPRT,8DZTIS    ;SET THE INTERRUPT VECTOR STATUS
4108 017216 052777 040040 162616      BIS    #TIE!MSENAB,8DZCSR ;SET TRANSMITTER INTERRUPT PRIORITY
4109          ; -- END 0 MACRO -----
4110 017224 005005          CLR    R5
4111 017226 032777 100000 162606 40:   BIT    #TRDY,8DZCSR
4112 017234 001403          BEQ    50
4113 017236 000240          NOP
4114 017240 000240          NOP
4115 017242 000412          BR     80
4116 017244 104414          50:   DELAY
4117 017246 005205          INC    R5
4118 017250 001366          BNE    40
4119 017252 104003          ERROR  3              ;*TRDY NOT SET!
4120 017254 000405          BR     80
4121 017256 104010          60:   ERROR 10
4122 017260 022626          CMP    (SP)+,(SP)+    ;*TRANSMITTER SHOULD NOT INTERRUPT
4123 017262 000402          BR     80              ;POP FOR FAKE RTI
4124 017264 104012          70:   ERROR 12
4125 017266 022626          CMP    (SP)+,(SP)+    ;CONTINUE TEST
4126 017270 042777 040000 162544 80:   BIC    #TIE,8DZCSR     ;*RECEIVER SHOULD NOT INTERRUPT
4127          ; -- END 0 MACRO -----
4128 017276 012777 017374 162572      MOV    #110,8DZTIV     ;POP FOR FAKE RTI
4129 017304 012777 017402 162560      MOV    #120,8DZRIV     ;RESET TRANSMITTER INTERRUPT ENABLE
4130 017312 013777 030306 162554      MOV    DZPRT,8DZ RIS   ; -#INTSET-----
4131 017320 013777 030306 162552      MOV    DZPRT,8DZTIS    ;SET UP THE TRANSMITTER INTERRUPT VECTOR
4132 017326 052777 000140 162506      MOV    #120,8DZRIV     ;SET UP THE RECEIVER INTERRUPT VECTOR
4133          ; -- END 0 MACRO -----
4134 017334 113777 001422 162524      MOVB  TDO,8DZTDR       ;SET THE INTERRUPT VECTOR STATUS
4135 017342 005005          CLR    R5              ;SET TRANSMITTER INTERRUPT PRIORITY
4136 017344 032777 000200 162470 90:   BIT    #RDONE,8DZCSR   ;ENABLE THE DEVICE
4137 017352 001403          BEQ    100
4138 017354 000240          NOP
4139 017356 000240          NOP
4140 017360 000412          BR     130
4141 017362 104414          100:  DELAY
4142 017364 005205          INC    R5
4143 017366 001366          BNE    90
4144 017370 104004          ERROR  4              ;*NO RX DONE! (NOT SET)
4145 017372 000405          BR     130            ;CONTINUE TEST
4146 017374 104010          110:  ERROR 10
4147 017376 022626          CMP    (SP)+,(SP)+    ;*TRANSMITTER SHOULD NOT INTERRUPT
4148 017400 000402          BR     130            ;POP FOR FAKE RTI
4149 017402 104012          120:  ERROR 12
4150 017404 022626          CMP    (SP)+,(SP)+    ;CONT TEST
4151 017406          130:
4152 017406 104413          DEVICE.CLR           ;*RECEIVER SHOULD NOT INTERRUPT
4153          ; -- END 0 MACRO -----
4154          ; -- END 0 MACRO -----
4155          ; -#LVL TST-----
4156          ; -#XZ-----
4157          ;***** TEST 26 *****

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4158                                     ;* THIS TEST VERIFIES THAT THE DEVICE DOES INTERRUPT
4159                                     ;*WHILE THE PROCESSOR STATUS IS SET TO EXACTLY
4160                                     ;*ONE LEVEL LOWER THAN THE DZ11. DZ11 PRIORITY
4161                                     ;*DEFAULT TO LEVEL 5 MINUS ONE LEVEL IS LEVEL 4.
4162                                     ; -#XZ-----
4163                                     ;::* TEST 26
4164                                     ;*****
4165 017410 000004 TST26: SCOPE
4166 017412 012737 000026 001122      MOV     #26,#TSTNM      ;LOAD THE NUMBER OF THIS TEST
4167                                     ; -- END 0 MACRO -----
4168 017420 012737 017736 001360      MOV     #TST27,NEXT    ;POINT TO THE START OF THE NEXT TEST
4169                                     ;#LINEUP-----
4170                                     ; -#MRESET-----
4171 017426 104417                                     ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4172                                     ; -- END 0 MACRO -----
4173 017430 013701 001366      MOV     PAR,R1          ;PICK UP PARAMETERS
4174 017434 012702 000001      MOV     #1,R2          ;PICK UP INIT POINTER
4175 017440 030237 001364      1#:   BIT     R2,LINE    ;SHOULD THIS LINE BE SET UP ?
4176 017444 001402                                     BEQ     2#              ;NO
4177 017446 010177 162400      MOV     R1,#DZLPR     ;SET UP LINE PARAMETERS
4178 017452 005201      2#:   INC     R1          ;POSITION POINTER TO THE NEXT LINE
4179 017454 106302      ASLB   R2              ;GOT 'EM ALL ?
4180 017456 103370      BCC    1#              ;IF NO, GO SET UP THE NEXT LINE
4181 017460 005037 001372      CLR     SAVLIN        ;CLEAR LINE # INDICATOR
4182                                     ; -- END 0 MACRO -----
4183 017464 106437 030310      MTPS   #MLESS1       ;MAKE CPU ONE LEVEL LOWER THAN DZ11
4184 017470 113777 001364 162360      MOVB   LINE,#DZTCR   ;ENABLE THE VALID LINES
4185 017476                                     3#:
4186                                     ; -#INTSET-----
4187 017476 012777 017570 162372      MOV     #6#,#DZTIV    ;SET UP THE TRANSMITTER INTERRUPT VECTOR
4188 017504 012777 017606 162360      MOV     #7#,#DZRIV    ;SET UP THE RECEIVER INTERRUPT VECTOR
4189 017512 013777 030306 162354      MOV     DZPRT,#DZCRIS ;SET THE INTERRUPT VECTOR STATUS
4190 017520 013777 030306 162352      MOV     DZPRT,#DZTIS  ;SET TRANSMITTER INTERRUPT PRIORITY
4191 017526 052777 040040 162306      BIS    #TIE!MSENAB,#DZCSR ;ENABLE THE DEVICE
4192                                     ; -- END 0 MACRO -----
4193 017534 005005      CLR     R5
4194 017536 032777 100000 162276      4#:   BIT     #TRDY,#DZCSR
4195 017544 001404      BEQ     5#
4196 017546 000240      NOP
4197 017550 000240      NOP
4198 017552 104007      ERROR  7              ;*TRANSMITTER FAILED TO INTERRUPT
4199 017554 000416      BR     8#
4200 017556 104414      5#:   DELAY
4201 017560 005205      INC     R5
4202 017562 001365      BNE    4#
4203 017564 104003      ERROR  3              ;*TRDY NOT SET!
4204 017566 000411      BR     8#
4205 017570 022626      6#:   POP2SP
4206 017572 042777 040000 162242      BIC    #TIE,#DZCSR
4207 017600 106437 030310      MTPS   #MLESS1
4208 017604 000402      BR     8#
4209 017606 104012      7#:   ERROR  12
4210 017610 022626      CMP    (SP)+,(SP)+
4211 017612 042777 040000 162222      8#:   BIC    #TIE,#DZCSR
4212                                     ; -#INTSET-----
4213 017620 012777 017720 162250      MOV     #11#,#DZTIV   ;SET UP THE TRANSMITTER INTERRUPT VECTOR

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4214 017626 012777 017726 162236      MOV    #120,SDZRIV      ;SET UP THE RECEIVER INTERRUPT VECTOR
4215 017634 013777 030306 162232      MOV    DZPRT,SDZRIS    ;SET THE INTERRUPT VECTOR STATUS
4216 017642 013777 030306 162230      MOV    DZPRT,SDZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
4217 017650 052777 000140 162164      BIS    #RIE!MSENAB,SDZCSR ;ENABLE THE DEVICE
4218                                     ; -- END 0 MACRO -----
4219 017656 113777 001422 162202      MOVB   TDO,SDZTDR      ;PUT ANY RANDOM CHARACTER IN TRANSMITTER BUFFER
4220 017664 005005                                     CLR    R5
4221 017666 032777 000200 162146 90:   BIT    #RDONE,SDZCSR
4222 017674 001404                                     BEQ    100
4223 017676 000240                                     NOP
4224 017700 000240                                     NOP
4225 017702 104011                                     ERROR  11                ;*RECEIVER FAILED TO INTERRUPT
4226 017704 000413                                     BR     130
4227 017706 104414 100:   DELAY
4228 017710 005205                                     INC    R5
4229 017712 001365                                     BNE   90
4230 017714 104004                                     ERROR  4                ;*NO RX DONE! (NOT SET)
4231 017716 000406                                     BR     130                ;CONTINUE TEST
4232 017720 104010 110:   ERROR  10                ;*TRANSMITTER SHOULD NOT INTERRUPT
4233 017722 022626                                     CMP    (SP),.(SP).      ;POP FOR FAKE RTI
4234 017724 000403                                     BR     130                ;CONT TEST
4235 017726 022626 120:   POP2SP      ;REMOVE THE INTERRUPT FROM THE STACK
4236 017730 005077 162106      CLR    SDZCSR          ;DON'T ALLOW ANY MORE INTERRUPTS
4237 017734 104413 130:   DEVICE.CLR      ;ISSUE DEVICE CLEAR (RESET)
4238 017734 104413
4239                                     ; -- END 0 MACRO -----
4240                                     ; -- END 0 MACRO -----
4241
4242                                     ; -#XZ-----
4243                                     ;***** TEST 27 *****
4244                                     ;*THIS TEST VERIFIES THAT THE RECEIVER WILL
4245                                     ;*INTERRUPT BEFORE THE TRANSMITTER EVEN
4246                                     ;*THOUGH THE TRANSMITTER WAS ENABLED
4247                                     ;*FIRST. SET PS TO LEVEL 7;
4248                                     ;*GET RDONE AND TRY TO SET;
4249                                     ;*SET TX IE AND RX IE;
4250                                     ;*CLEAR PS AND EXPECT RX TO INTERRUPT FIRST
4251                                     ; -#XZ-----
4252                                     ;:* TEST 27
4253                                     ;*****
4254 017736 000004 TST27: SCOPE
4255 017740 012737 000027 001122      MOV    #27,STSTNM      ;LOAD THE NUMBER OF THIS TEST
4256                                     ; -- END 0 MACRO -----
4257 017746 012737 020370 001360      MOV    #TST30,NEXT     ;POINT TO THE START OF THE NEXT TEST
4258                                     ;#LINEUP-----
4259                                     ; -#HRESET-----
4260 017754 104417 DCLASH      ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4261                                     ; -- END 0 MACRO -----
4262 017756 013701 001366      MOV    PAR,R1          ;PICK UP PARAMETERS
4263 017762 012702 000001      MOV    #1,R2          ;PICK UP INIT POINTER
4264 017766 030237 001364 10:   BIT    R2,LINE        ;SHOULD THIS LINE BE SET UP ?
4265 017772 001402                                     BEQ    20                ;NO
4266 017774 010177 162052      MOV    R1,SDZLPR      ;SET UP LINE PARAMETERS
4267 020000 005201 20:   INC    R1            ;POSITION PCINTER TO THE NEXT LINE
4268 020002 106302                                     ASLB  R2                ;GOT 'EM ALL ?
4269 020004 103370                                     BCC   10                ;IF NO, GO SET UP THE NEXT LINE

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4270 020006 075037 001372          CLR      SAVLIN          ;CLEAR LINE # INDICATOR
4271          ; -- END 0 MACRO -----
4272 020012 012777 020242 162052    MOV      #01,&DZRIV      ;SETUP INTERRUPT STUFF
4273 020020 013777 030306 162046    MOV      DZPRT,&DZRIS    ;
4274 020026 012777 020332 162042    MOV      #12,&DZTIV     ;
4275 020034 013777 030306 162036    MOV      DZPRT,&DZTIS    ;
4276 020042 052777 000040 161772    BIS      #MSENAB,&DZCSR  ;
4277 020050 012702 000001          MOV      #1,R2          ;LINE POINTER
4278 020054 030237 001364          3#:    BIT      R2,LINE    ;VALID LINE ?
4279 020060 001004          BNE      4#
4280 020062 005237 001372          INC      SAVLIN
4281 020066 106302          ASLB     R2
4282 020070 000771          BR       3#
4283 020072 106427 000340          4#:    MTPS     #PR7
4284 020076 000240          NOP
4285 020100 000240          NOP
4286 020102 110277 161750          MOVB    R2,&DZTCR      ;SET TCR BIT
4287 020106 005777 161734          TST     &DZRBUF      ;VALID DATA?
4288 020112 100001          BPL     .+4          ;IT BETTER NOT BE SET
4289 020114 104017          ERROR   17          ;DATA VALID SHOULD NOT BE SET
4290 020116 105777 161720          5#:    TSTB    &DZCSR    ;RECEIVER DONE ?
4291 020122 100001          BPL     .+4
4292 020124 104020          ERROR   20          ;RECEIVER DONE BIT SHOULD NOT BE SET
4293 020126 005005          CLR     R5
4294 020130 005004          CLR     R4
4295 020132 005777 161704          99#:   TST     &DZCSR    ;WAIT FOR TRDY
4296 020136 100404          BMI     100#        ;BR IF READY
4297 020140 104414          DELAY   ;STALL TIME
4298 020142 005204          INC     R4
4299 020144 001372          BNE     99#
4300 020146 104003          ERROR   3           ;TRDY FAILED TO SET
4301 020150 105077 161712          100#:  CLRB    &DZTDR
4302 020154 005004          CLR     R4
4303 020156 032777 000200 161656    6#:    BIT     #RDONE,&DZCSR
4304 020164 001004          BNE     7#
4305 020166 104414          DELAY
4306 020170 005204          INC     R4
4307 020172 001371          BNE     6#
4308 020174 104004          ERROR   4           ;#RDONE FAILED TO SET!
4309 020176 005777 161640          7#:    TST     &DZCSR    ;TRANS DONE BIT = 1 ?
4310 020202 100401          BMI     .+4          ;YES
4311 020204 104003          ERROR   3           ;#NO TRANS DONE FAILED TO SET
4312          ;NOW THAT BOTH TRANSMITTER AND RECEIVER DONE BIT =1
4313          ;SET INTERRUPT ENABLES AND WATCH THE FUR FLY
4314 020206 052777 040000 161626    BIS     #TIE,&DZCSR
4315 020214 052777 000100 161620    BIS     #RIE,&DZCSR
4316 020222 106427 000000          MTPS    #0
4317 020226 000240          NOP
4318 020230 000240          NOP
4319 020232 104007          ERROR   7           ;#TRANSMITTER FAILED TO INTERRUPT
4320 020234 104011          ERROR   11          ;#RECEIVER FAILED TO INTERRUPT
4321          ;CHECK BR LEVEL
4322 020236 060137 020336          JMP     13#          ;GET OUT
4323
4324          ;RECEIVER INTERRUPT ROUTINE
4325 020242 017704 161600          8#:    MOV     &DZRBUF,R4          ;ACTUAL
    
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4326 020246 010403      MOV    R4,R3
4327 020250 000303      SWAB   R3
4328 020252 042703 177770 BIC    @C<7>,R3      ;STRIP JUNK
4329                                     ; -#STAG-----
4330 020256 105737 001371 TSTB   MODE+1        ;IS THIS TEST IN STAGGERED MODE?
4331 020262 001406      BEQ    11@           ;IF NOT, SKIP STAGGERED SETUP
4332
4333                                     ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
4334
4335 020264 006203      ASR    R3            ;GET THE LAST BIT INTO THE CARRY BIT
4336 020266 103402      BCS   9@           ;IF IT IS SET, GO CLEAR IT
4337 020270 000261      SEC                    ;IF IT IS CLEAR SET IT HERE
4338 020272 000401      BR    10@          ;SKIP THE CLEARING
4339 020274 000241 9@:   CLC                    ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
4340 020276 006103 10@:  ROL    R3            ;GET THE NEW BIT BACK INTO R3
4341                                     ; -- END O MACRO -----
4342 020300 020337 001372 11@:  CMP    R3,SAVLIN      ;IS THIS A VALID LINE
4343 020304 001401      BEQ    .+4          ;YES
4344 020306 104015      ERROR  15          ;*INVALID LINE
4345 020310 042704 177400 BIC    @C<377>,R4    ;STRIP JUNK
4346 020314 120504      CMPB  R5,R4        ;DATA COMPARE ?
4347 020316 001401      BEQ    .+4          ;YES
4348 020320 104005      ERROR  5           ;*DATA DOES NOT COMPARE
4349 020322 040277 161530 BIC    R2,@DZTCR     ;CLEAR TCR BIT
4350 020326 022626      POP2SP              ;REMOVE ME INTERRUPT VECTOR FROM THE STACK
4351 020330 000402      BR    13@          ;GO GET OUT OF INTERRUPT MODE
4352                                     ;TRANSMITTER INTERRUPT SVC ROUTINE
4353 020332 104011 12@:  ERROR  11          ;THE RECEIVER INTERRUPT FAILED
4354                                     ;TO OVERRIDE THE TRANSMITTER
4355 020334 022626      POP2SP              ;REMOVE THE INTERRUPT VECTOR FROM THE STACK
4356 020336 042777 040100 161476 13@:  BIC    @TIE!RIE,@DZCSR ;CLEAR INTERRUPT ENABLES
4357 020344 013777 002074 161520 MOV    DZRIS,@DZRIV ;RESTORE TRAPCATCHER
4358 020352 005077 161516 CLR    @DZRIS
4359 020356 013777 002100 161512 MOV    DZTIS,@DZTIV
4360 020364 005077 161510 CLR    @DZTIS
4361                                     ; -#XZ-----
4362                                     ;***** TEST 30 *****
4363                                     ;*TEST TO VERIFY THAT 'RDONE DOES NOT SET
4364                                     ;*IF THE SCANNER IS DISABLED.
4365                                     ;*TURN ON SCANNER, WAIT FOR TRDY.
4366                                     ;*TURN OFF SCANNER, TRANSMIT A CHARACTER
4367                                     ;*'RDONE SHOULD NOT SET.
4368                                     ; -#XZ-----
4369                                     ;:* TEST 30
4370                                     ;*****
4371 020370 000004 TST30: SCOPE
4372 020372 012737 000030 001122 MOV    @30,@TSTNM    ;LOAD THE NUMBER OF THIS TEST
4373                                     ; -- END O MACRO -----
4374 020400 012737 020556 001360 MOV    @TST31,NEXT   ;POINT TO THE START OF THE NEXT TEST
4375                                     ;#LINEUP-----
4376                                     ; -#MRESET-----
4377 020406 104417      DCLASH              ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4378                                     ; -- END O MACRO -----
4379 020410 013701 001366 MOV    PAR,R1        ;PICK UP PARAMETERS
4380 020414 012702 000001 MOV    @1,R2         ;PICK UP INIT POINTER
4381 020420 030237 001364 1@:   BIT    R2,LINE      ;SHOULD THIS LINE BE SET UP ?

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4382 020424 001402          BEQ      2#          ;NO
4383 020426 010177 161420   MOV      R1,BDZLPR   ;SET UP LINE PARAMETERS
4384 020432 005201          2#:    INC      R1      ;POSITION POINTER TO THE NEXT LINE
4385 020434 106302          ASLB    R2          ;GOT 'EM ALL ?
4386 020436 103370          DCC     1#          ;IF NO, GO SET UP THE NEXT LINE
4387 020440 005037 001372   CLR     SAVLIN      ;CLEAR LINE # INDICATOR
4388          ; -- END 0 MACRO -----
4389 020444 052777 000040 161370  BIS     #MSENAB,BDZCSR ;TURN ON SCANNER
4390 020452 012702 000001     MOV     #1, R2      ;INIT LINE COUNTER
4391 020456 030237 001364   3#:    BIT     R2, LINE ;FIND A VALID LINE
4392 020462 001004          BNE     4#          ;IF WE FOUND ONE GO TO TEST
4393 020464 005237 001372   INC     SAVLIN      ;IF NOT
4394 020470 106302          ASLB    R2          ;KEEP LOOKING
4395 020472 000771          BR      3#          ;
4396 020474 110277 161356   4#:    MOVB   R2, BDZTCR ;SET TCR BIT
4397 020500 005005          CLR     R5          ;
4398 020502 005777 161334   5#:    TST     BDZCSR    ;IS TRDY SET
4399 020506 100404          BMI     6#          ;CON'T TESTING IF IT IS
4400 020510 104414          DELAY   ;IF IT NOT WAIT A WHILE
4401 020512 005205          INC     R5          ;
4402 020514 001372          BNE     5#          ;
4403 020516 104003          ERROR  3           ;WE WAITED LONG ENOUGH-ERROR
4404 020520 042777 000040 161314  6#:    BIC     #MSENAB, BDZCSR ;TURN OFF SCANNER
4405 020526 105077 161334   CLRB   BDZTCR      ;TRANSMIT A CHARACTER
4406 020532 005005          CLR     R5          ;CLEAR COUNTER
4407 020534 104414          7#:    DELAY   ;WAIT SUFFICIENT TIME FOR
4408 020536 005205          INC     R5          ;RDONE TO SET
4409 020540 001375          BNE     7#          ;
4410 020542 032777 000200 161272  BIT     #RDONE, BDZCSR ;RDONE SET
4411 020550 001401          BEQ     8#          ;IT SHOULDN'T BE-CONTINUE
4412 020552 104020          ERROR  20          ;IF IT IS THERE'S AN ERROR
4413 020554 104400          8#:    ADVANCE
4414          ; -#XZ-----
4415          ;***** TEST 31 *****
4416          ;*THIS TEST VERIFIES OVERRUN AND SILO ALARM
4417          ;*ONE LINE AT A TIME - BASED UPON VALID LINES
4418          ;*AS EACH OF THE FIRST 16 CHARS ARE SENT; SILO ALARM IS
4419          ;*TESTED TO BE CLEARED. ON THE 16TH CHAR THE PROGRAM THEN
4420          ;*EXPECTS SILO ALARM TO SET. THEN THE ENTIRE
4421          ;*SILO IS FILLED AND AN OVERRUN IS EXPECTED ON THE 65TH
4422          ;*CHAR PULLED OUT OUT THE SILO.
4423          ;*USING SWITCH NINE FOR THIS TEST SENDS 20. CHARACTERS
4424          ;*ON DZ LINE PREVIOUSLY SELECTED CONTINUOUSLY WHILE SW09=1.
4425          ;*USED TO SCOPE SILO ALARM PULSES, ETC.
4426          ; -#XZ-----
4427          ;:* TEST 31
4428          ;*****
4429 020556 000004          TST31: SCOPE
4430 020560 012737 000031 001122   MOV     #31,#TSTNM  ;LOAD THE NUMBER OF THIS TEST
4431          ; -- END 0 MACRO -----
4432 020566 012737 021304 001360   MOV     #TST32,NEXT ;POINT TO THE START OF THE NEXT TEST
4433 020574 012737 021210 001362   MOV     #18#,LOCK   ;SET FOR LOOP
4434          ;#LINEUP-----
4435          ; -#MRESET-----
4436 020602 104417          DCLASH ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4437          ; -- END 0 MACRO -----

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4438 020604 013701 001366      MOV      PAR,R1      ;PICK UP PARAMETERS
4439 020610 012702 000001      MOV      #1,R2      ;PICK UP INIT POINTER
4440 020614 030237 001364      1#: BIT      R2,LINE  ;SHOULD THIS LINE BE SET UP ?
4441 020620 001402                BEQ      2#          ;NO
4442 020622 010177 161224      MOV      R1,BDZLPR  ;SET UP LINE PARAMETERS
4443 020626 005201      2#: INC      R1      ;POSITION POINTER TO THE NEXT LINE
4444 020630 106302                ASLB     R2          ;GOT 'EM ALL ?
4445 020632 103370                BCC     1#          ;IF NO, GO SET UP THE NEXT LINE
4446 020634 005037 001372      CLR      SAVLIN     ;CLEAR LINE # INDICATOR
4447                ; -- END 0 MACRO -----
4448 020640 012700 001422      MOV      #TDO,R0    ;POINT TO THE DATA AREA
4449 020644 005020                CLR     (R0)        ;CLEAR A DATA WORD
4450 020646 022700 001462      CMP      #STOP,R0   ;FINISHED ?
4451 020652 001374                BNE     .-6         ;NO
4452 020654 005000                CLR     R0          ;CLEAR OFFSET
4453 020656 012702 000001      MOV      #1,R2      ;LINE POINTER
4454 020662 052777 010040 161152 3#: BIS      #MSENAB!SILOEN,BDZCSR ;START SCANNER & SET SILO ENABLE
4455 020670 030237 001364      BIT      R2,LINE    ;VALID LINE?
4456 020674 001002                BNE     .+6         ;YES
4457 020676 000137 021172      JMP      22#        ;TRY NEXT LINE
4458 020702 013700 001372      MOV      SAVLIN,R0  ;MAKE OFFSET
4459 020706 006300                ASL     R0          ;MAKE POWER OF TWO
4460 020710 010277 161142      MOV      R2,BDZTCR  ;SET TCR BIT
4461 020714 105777 161122      4#: TSTB     BDZCSR   ;REC DONE = 1 ?
4462 020720 100001                BPL     .+4         ;
4463 020722 104020                ERROR   20          ;REC DONE SHOULD NOT = 1
4464 020724 005003                CLR     R3          ;SET CHARACTER COUNT
4465 020726 005004      5#: CLR     R4          ;
4466 020730 032777 100000 161104 6#: BIT      #TRDY,BDZCSR
4467 020736 001004                BNE     7#          ;
4468 020740 104414                DELAY
4469 020742 105204                INCB   R4          ;
4470 020744 001371                BNE     6#          ;
4471 020746 104003                ERROR   3          ;#TRDY FAILED TO SET
4472 020750 116077 001422 161110 7#: MOVB     TDO(R0),BDZTDR ;LOAD A CHARACTER
4473 020756 005260 001422      INC      TDO(R0)    ;SET UP NEXT CHARACTER
4474 020762 020327 000017      CMP      R3,#15.   ;16 CHARACTERS ?
4475 020766 103006                BHIS   8#          ;
4476 020770 032777 020000 161044  BIT      #SILOAL,BDZCSR ;SILO ALARM = 0 ?
4477 020776 001401                BEQ     .+4         ;YES
4478 021000 104013                ERROR   13         ;#SILO ALARM SHOULD NOT = 1
4479                ;UNTIL 16. DATA CHARACTERS
4480 021002 000411                BR     10#         ;
4481 021004 005004      8#: CLR     R4          ;
4482 021006 032777 020000 161026 9#: BIT      #SILOAL,BDZCSR
4483 021014 001004                BNE     10#        ;
4484 021016 104414                DELAY
4485 021020 005204                INC     R4          ;
4486 021022 001371                BNE     9#         ;
4487 021024 104014                ERROR   14         ;#SILO ALARM FAILED TO SET!
4488                ;SILO ALARM SHOULD =1 AFTER 16.
4489                ;DATA CHARACTERS
4490 021026 005203      10#: INC     R3          ;INC CHAR COUNT
4491 021030 022703 000102      CMP     #66.,R3    ;FINISHED SENDING CHARACTERS ?
4492 021034 001334                BNE     5#         ;NO
4493 021036 005004                CLR     R4

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4494 021040 104414      DELAY
4495 021042 105204      INCB    R4
4496 021044 001375      BNE     .-4
4497                      ;NOW LETS READ THE SILO
4498 021046 013705 001372  MOV     SAVLIN,R5      ;MAKE EXPECTED LINE #
4499                      ; -#STAG-----
4500 021052 105737 001371  TSTB   MODE+1         ;IS THIS TEST IN STAGGERED MODE?
4501 021056 001406      BEQ     13#           ;IF NOT, SKIP STAGGERED SETUP
4502
4503                      ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
4504
4505 021060 006205      ASR     R5            ;GET THE LAST BIT INTO THE CARRY BIT
4506 021062 103402      BCS    11#          ;IF IT IS SET, GO CLEAR IT
4507 021064 000261      SEC
4508 021066 000401      BR     12#          ;IF IT IS CLEAR SET IT HERE
4509 021070 000241      BR     12#          ;SKIP THE CLEARING
4510 021072 006105      11#:   CLC           ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
4511                      12#:   ROL     R5            ;GET THE NEW BIT BACK INTO R5
4512                      ; -- END O MACRO -----
4512 021074 000305      13#:   SWAB    R5            ;PUT IN UPPER BYTE
4513 021076 052705 100000  BIS    #DVALID,R5     ;ADD DATA VALID
4514 021102 017704 160740  14#:   MOV     #DZRBUF,R4 ;ACTUAL
4515 021106 020405      CMP    R4,R5         ;ACTUAL VS. EXPECTED
4516 021110 001401      BEQ    15#          ;YES
4517 021112 104006      ERROR 6             ;*DATA/CONTENTS DID NOT COMPARE
4518 021114 032777 020000 160720 15#:   BIT    #SILOAL,#DZCSR ;SILO ALARM= 0 ?
4519 021122 001401      BEQ    16#          ;YES
4520 021124 104016      ERROR 16           ;READING DZRBUF DID NOT CLEAR SILO ALARM
4521 021126 005205      16#:   INC     R5            ;UP CHARACTER
4522 021130 120527 000077  CMPB   R5,#63.       ;LAST SILO CHAR ?...64TH CHAR
4523 021134 101762      BLOS   14#
4524 021136 005205      INC    R5            ;ADD 1 MORE FOR THE CLOBBERED CHAR
4525 021140 052705 040000  BIS    #OVRRUN,R5     ;ADD OVERRUN TO EXPECTED
4526 021144 120527 000101  CMPB   R5,#65.       ;LAST CHARACTER ?
4527 021150 001754      BEQ    14#
4528 021152 017704 160670  MOV     #DZRBUF,R4   ;FOR GOOD MEASURE
4529 021156 005704      TST    R4            ;DATA VALID SHOULD = 0
4530 021160 100001      BPL    17#          ;YES
4531 021162 104017      ERROR 17           ;DATA VALID SHOULD = 0
4532 021164 040277 160666  17#:   BIC    R2,#DZTCR   ;CLR TCR BIT
4533 021170 104401      SCOPI
4534 021172 005237 001372  22#:   INC     SAVLIN     ;INC EXPECTED LINE
4535 021176 106302      ASLB   R2            ;NEXT LINE
4536 021200 103402      BCS    .+6           ;NO
4537 021202 000137 020670  JMP     3#           ;YES
4538 021206 104400      ADVANCE             ;GO TO NEXT TEST
4539
4540                      ;TIGHT SCOPE LOOP FOR THIS TEST. SENDS 20. CHARACTERS
4541                      ;ON DZ LINE PREVIOUSLY SELECTED CONTINUOUSLY WHILE SW09=1.
4542                      ;USED TO SCOPE SILO ALARM PULSES, ETC.
4543
4544 021210 052777 010040 160624 18#:   BIS    #MSENAB!SILOEN,#DZCSR ;SETUP DEVICE
4545 021216 012777 021274 160652  MOV     #20,#DZTIV   ;SETUP TRANSMITTER VECTOR
4546 021224 012737 000024 001216  MOV     #20.,#TMP0   ;TEMPORARY COUNT OF CHARACTER BURST
4547 021232 050277 160620  BIS    R2,#DZTCR   ;ENABLE LINE
4548 021236 052777 040000 160576  BIS    #TIE,#DZCSR  ;ENABLE INTERRUPTS
4549 021244 106427 000000  MTPS   #0           ;LOWER PRIORITY
    
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4550 021250 000001          191:  WAIT          ;ALLOW INTERRUPTS
4551 021252 005337 001216    DEC          #TMP0      ;REDUCE COUNT. ALL CHARACTERS SENT?
4552 021256 001374          BNE          191       ;IF NO, WAIT FOR MORE
4553 021260 042777 050040 160554 BIC          #SILOEN!MSENAB!TIE, #DZCSR ;RESET SILO COUNTER, CLEAR STROBE
4554 021266 104401          SCOP1        ;LOOP AGAIN?
4555 021270 000137 021164    JMP          171       ;IF NOT, RETURN TO WHERE YOU LEFT OFF
4556 021274 112777 000232 160564 201:  MOVB        #252, #DZTDR ;SEND A CHARACTER
4557 021302 000002          RTI           ;ALLOW MORE CHARACTERS TO COME
4558                                     ; -#XZ-----
4559                                     ;***** TEST 32 *****
4560                                     ;*THIS TEST THAT "SILO ENABLE" WILL INHIBIT
4561                                     ;*RECEIVER INTERRUPTS AND THAT ON THE
4562                                     ;*16TH CHAR THAT "SILO ALARM" WILL CAUSE AN
4563                                     ;*INTERRUPT WITH "RIE" SET.
4564                                     ;*THIS WILL DO ALL SELECTED LINES ONE AT A TIME.
4565                                     ; -#XZ-----
4566                                     ;:* TEST 32
4567                                     ;*****
4568 021304 000004          TST32:  SCOPE
4569 021306 012737 000032 001122    MOV          #32, #TSTM      ;LOAD THE NUMBER OF THIS TEST
4570                                     ; -- END 0 MACRO -----
4571 021314 012737 021666 001360    MOV          #TST33, NEXT    ;POINT TO THE START OF THE NEXT TEST
4572 021322 012737 021410 001362    MOV          #31, LOCK      ;SET FOR LOOP
4573                                     ;#LINEUP-----
4574                                     ; -#RESET-----
4575 021330 104417          DCLASH
4576                                     ; -- END 0 MACRO -----
4577 021332 013701 001366    MOV          PAR, R1         ;PICK UP PARAMETERS
4578 021336 012702 000001    MOV          #1, R2         ;PICK UP INIT POINTER
4579 021342 030237 001364    14:  BIT          R2, LINE       ;SHOULD THIS LINE BE SET UP ?
4580 021346 001402          BEQ          21           ;NO
4581 021350 010177 160476    MOV          R1, #DZLPR     ;SET UP LINE PARAMETERS
4582 021354 005201    24:  INC          R1           ;POSITION POINTER TO THE NEXT LINE
4583 021356 106302          ASLB        R2           ;GOT 'EM ALL ?
4584 021360 103370          BCC          11           ;IF NO, GO SET UP THE NEXT LINE
4585 021362 005037 001372    CLR          SAVLIN        ;CLEAR LINE # INDICATOR
4586                                     ; -- END 0 MACRO -----
4587 021366 012700 001422    MOV          #TDO, RO       ;POINT TO THE DATA AREA
4588 021372 005020          CLR          (RO)         ;CLEAR A DATA WORD
4589 021374 022700 001462    CMP          #STOP, RO      ;FINISHED ?
4590 021400 001374          BNE          -6           ;NO
4591 021402 005000          CLR          RO           ;CLEAR OFFSET
4592 021404 012702 000001    MOV          #1, R2         ;LINE POINTER
4593 021410 012777 021630 160454 34:  MOV          #111, #DZRIV   ;SET FOR UNEXPECTED INTER.
4594 021416 012777 000340 160450    MOV          #PR7, #DZRIS   ;SET PRIO.
4595 021424 052777 010140 160410    BIS          #MSENAB!SILOEN!RIE, #DZCSR ;START SCANNER & SET SILO ENABLE
4596                                     ;VALID LINE?
4597 021432 030237 001364    BIT          R2, LINE
4598 021436 001002          BNE          -6           ;YES
4599 021440 000137 021646    JMP          221          ;TRY NEXT LINE
4600 021444 005777 160376    TST        #DZRBUF        ;EMPTY THE SILO
4601 021450 100775          BMI          -4           ;BR IF DATA VALID IS SET!
4602 021452 106427 000000    MTPS       #0            ;SET PROCESSOR PRIORITY TO 0
4603 021456 013700 001372    MOV          SAVLIN, RO     ;MAKE OFFSET
4604 021462 006300          ASL          RO           ;MAKE POWER OF TWO
4605 021464 010277 160366    MOV          R2, #DZTCR    ;SET TCR BIT

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4606	021470	005004			58:	CLM	R4	
4607	021472	032777	100000	160342	68:	RIT	#TRDY, BDZCSR	
4608	021500	001004				BNE	78	
4609	021502	104414				DELAY		
4610	021504	005204				INC	R4	
4611	021506	001371				BNE	68	
4612	021510	104003				ERROR	3	;TRDY FAILED TO SET
4613	021512	116077	001422	160346	78:	MOVB	TDO(RO), BDZTDR	;LOAD A CHARACTER
4614	021520	005260	001422			INC	TDO(RO)	;SET UP NEXT CHARACTER
4615	021524	022760	000017	001422		CMF	#15., TDO(RO)	;15 CHARS YET?
4616	021532	001406				BEQ	88	
4617	021534	032777	020000	160300		BIT	#SILOAL, BDZCSR	;SILO ALARM = 0 ?
4618	021542	001401				BEQ	.4	;YES
4619	021544	104013				ERROR	13	;SILO ALARM SHOULD NOT = 1
4620								;UNTIL 16. DATA CHARACTERS
4621	021546	000750				BR	58	
4622	021550	012777	021636	160314	88:	MOV	#128, BDZRIV	;SET NEW VECTOR
4623	021556	032777	100000	160256		BIT	#TRDY, BDZCSR	;READY FOR 16TH CHAR
4624	021564	001774				BEQ	.6	
4625	021566	016077	001422	160272		MOV	TDO(RO), BDZTDR	;LOAD THE 16TH CHAR.
4626	021574	005004				CLR	R4	
4627	021576	032777	020000	160236	98:	BIT	#SILOAL, BDZCSR	
4628	021604	001005				BNE	108	
4629	021606	104414				DELAY		
4630	021610	005204				INC	R4	
4631	021612	001371				BNE	98	
4632	021614	104014				ERROR	14	;SILO ALARM FAILED TO SET!
4633	021616	000410				BR	178	;SILO ALARM SHOULD =1 AFTER 16.
4634								;DATA CHARACTERS
4635	021620	000240			108:	NOP		;STALL
4636	021622	000240				NOP		
4637	021624	104000				ERROR		;SILO ALARM NOT INTERRUPTING.
4638	021626	000404				BR	178	;CONTINUE TEST.
4639	021630	022626			118:	CMF	(SP), (SP).	;FAKE RTI
4640	021632	104012				ERROR	12	;RX SHOULD NOT INTERRUPT
4641	021634	000401				BR	178	;CONTINUE
4642	021636	022626			128:	CMF	(SP), (SP).	;GOOD INTERRUPT TO HERE.
4643	021640	040277	160212		178:	BIC	R2, BDZTCR	;CLR TCR BIT
4644	021644	104401				SCOP1		;LOOP?
4645	021646	005237	001372		228:	INC	SAVLIN	;INC EXPECTED LINE
4646	021652	106302				ASLB	R2	;NEXT LINE
4647	021654	103402				BCS	.6	;NO
4648	021656	000137	021410			JMP	38	;YES
4649	021662	005037	001362			CLR	LOCK	;CLEAR TIGHT LOOP FOR NEXT TEST



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4706 022116 005777 157720 TXSVC: TST BDZCSR ;TRANS INTR ?
4707 022122 100401 BMI .+4 ;
4708 022124 104003 ERROR 3 ;*TRANSMITTER FAILED
4709 022126 117703 157712 MOVB BDZCSR,R3 ;SAVE IT
4710 ;NOW TEST FOR LINE # ETC
4711 022132 042703 177770 BIC @+C<7>,R3 ;STRIP JUNK
4712 022136 010304 MOV R3,R4 ;SAVE
4713 022140 010337 001372 MOV R3,SAVLIN ;ADJUST LOCATION FOR ERROR PRINTOUT
4714 022144 012702 000001 MOV @1,R2 ;SET UP POSITION POINTER
4715 022150 105303 34: DECB R3 ;IS IT THIS LINE ?
4716 022152 100402 BMI 44 ;YES
4717 022154 006302 ASL R2 ;UP THE LINE #
4718 022156 000774 BR 34 ;GO 'ROUND AGAIN
4719 022160 030237 001364 44: BIT R2,LINE ;VALID LINE?
4720 022164 001001 BNE .+4 ;YES
4721 022166 104010 ERROR 10 ;NO,INVALID LINE!!!!
4722 022170 006304 ASL R4 ;MAKE POWER OF 2
4723 022172 116477 001422 157666 MOVB TDO(R4),BDZTDR ;LOAD CHARACTER
4724 022200 105264 001422 INCB TDO(R4) ;SET UP NEXT CHARACTER
4725 022204 001002 BNE 54 ;LAST CHARACTER ?
4726 022206 040277 157644 BIC R2,BDZTCR ;YES .CLEAR TCR BIT
4727 022212 000002 54: RTI
4728
4729
4730 ;REC INTR SVC ROUTINE
4731 022214 105777 157622 RXSVC: TSTB BDZCSR ;REC DONE ?
4732 022220 100401 BMI .+4 ;YES
4733 022222 104004 ERROR 4 ;FALSE INTERRUPT
4734 022224 017704 157616 MOV BDZRBUF,R4 ;SAVE IT
4735 022230 010403 MOV R4,R3
4736 022232 000303 SWAB R3
4737 022234 042703 177770 BIC @+C<7>,R3 ;STRIP JUNK
4738 022240 010337 001372 MOV R3,SAVLIN ;SAVE LINE NUMBER
4739 022244 032777 020000 157570 BIT @SILOAL,BDZCSR ;SILO ALARM?
4740 022252 001401 BEQ .+4 ;NO
4741 022254 104000 ERROR ;SILO ALARM SHOULD NOT =1
4742 022256 005704 TST R4 ;DATA VALID SET?
4743 022260 100401 BMI .+4 ;YES
4744 022262 104023 ERROR 23 ;YOU LOSE ...DATA VALID WAS'NT SET
4745 022264 032704 070000 BIT @OVRUN!FRMERR!PARER,R4
4746 022270 001401 BEQ .+4
4747 022272 104000 ERROR ;RECEIVER ERROR FLAG/S WERE SET
4748 022274 012702 000001 MOV @1,R2 ;SET UP POSITION POINTER
4749 022300 105303 54: DECB R3
4750 022302 100402 BMI 64
4751 022304 006302 ASL R2 ;RE POSITION POINTER
4752 022306 000774 BR 54 ;GO 'ROUND AGAIN
4753 022310 030237 001364 64: BIT R2,LINE ;LINE VALID ?
4754 022314 001001 BNE .+4 ;YES
4755 022316 104011 ERROR 11 ;INVALID LINE #
4756 022320 013703 001372 MOV SAVLIN,R3 ;GET THE LINE NUMBER AGAIN
4757 022324 006303 ASL R3 ;USE R3 AS A POINTER IN THE DATA TABLE
4758 022326 126304 001442 CMPB TRO(R3),R4 ;DOES THE DATA CHARACTER COMPARE ?
4759 022332 001405 BEQ 24 ;YES
4760 022334 016305 001442 MOV TRO(R3),R5 ;SAVE EXPECTED
4761 022340 042704 177400 BIC @+C<377>,R4 ;CLEAR JUNK

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4762
4763
4764
4765 022344 104005
4766 022346 005263 001442
4767 022352 105763 001442
4768 022356 001002
4769 022360 040237 022472
4770 022364 012716 022044
4771 022370 000002
4772
4773
4774
4775 022372 106427 000340
4776 022376 104413
4777 022400 005003
4778 022402 005037 001372
4779 022406 012702 000001
4780 022412 030237 001364
4781 022416 001405
4782 022420 022763 000400 001442
4783 022426 001401
4784 022430 104027
4785
4786 022432 005237 001372
4787 022436 005723
4788 022440 106302
4789 022442 103363
4790 022444
4791 022444 013777 002074 157420
4792 022452 005077 157416
4793 022456 013777 002100 157412
4794 022464 005077 157410
4795 022470 104400
4796 022472 000000
4797
4798
4799
4800
4801
4802
4803
4804
4805
4806
4807
4808
4809
4810
4811
4812
4813
4814
4815
4816
4817

;R2 = LINE # BY BIT POSITION
;R4 = ACTUAL DATA
;R5 = EXPECTED DATA
;NO, DATA DOES NOT COMPARE
;SET UP FOR NEXT CHARACTER
;ALL CHARS DONE?
;ZERO LINE DONE INDICATOR.
;RESET THE BACKGROUND TIMING LOOP

;FINISH UP ROUTINE
OUT: MTPS #PR7 ;STOP ALL INTERRUPTS
      DEVICE.CLR ;CLEAR ALL INTERRUPTS AWAY
      CLR R3
      CLR SAVLIN
      MOV #1,R2
16: BIT R2,LINE ;VALID LINE ?
     BEQ 21 ;NO
     CMP #400,TRO(R3) ;RECEIVED A BINARY COUNT PATTERN ?
     BEQ .,4 ;YES
     ERROR 27 ;THE LINE FAILED TO RECEIVE A FULL
               ;BINARY COUNT PATTERN
24: INC SAVLIN ;SET UP FOR NEXT LINE
     TST (R3)+ ;ADD 2
     ASLB R2 ;SET UP NEXT LINE POINTER
     BCC 16 ;FINISHED ?

FINI: MOV DZTRIS,SDZTRIV ;RESTORE TRAPCATCHER
      CLR SDZTRIS
      MOV DZTIS,SDZTIV
      CLR SDZTIS
      ADVANCE ;GO TO THE NEXT TEST
RXTCR: 0 ;RX IMAGE OF TCR BITS

; -#XZ-----
;***** TEST 34 *****
;DZ11 RELATIVE TIMING TEST.
;EACH SELECTED LINE WILL IN TURN RUN 16. CHARS
;AT ALL BAUD RATES AND THEN THE HIGHEST BAUD
;WITH ALL CHAR LENGTHS. EACH NEW PARAMETER SHOULD
;DECREASE IN TIME FROM THE PREVIOUS PARAMETERS SELECTED.
;THE TIME IS CHECKED AGAINST THE LAST PARAMETER USED
;AND A LOWER TIME IS EXPECTED ON THE CURRENT PARAMETER.
;PARAMETERS ARE:
;* EIGHT BITS/PER/CHAR - TWO STOP BITS AT
;* 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000
;* 2400, 3600, 4800, 7200, 9600 BAUD.
;* THEN, 9600 BAUD - TWO STOP BITS AT
;* SEVEN, SIX, FIVE BITS/PER/CHAR.
;AFTER EACH LINE HAS FINISHED ALL THE ABOVE PARAMETERS
;THE NEXT SELECTED LINE IS THE TESTED.
; -#XZ-----

;: TEST 34

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4818
4819 022474 000004
4820 022476 012737 000034 001122
4821
4822 022504 012737 000002 001226
4823 022512 012737 023204 001360
4824 022520 012737 022644 001362
4825 022526 005037 025214
4826 022532 005037 001372
4827 022536 005037 001374
4828 022542 012737 000001 001216
4829 022550 012737 010070 023202
4830 022556 033737 001216 001364 10:
4831 022564 001027
4832 022566 012737 010070 023202 20:
4833 022574 012700 001422
4834 022600 005020
4835 022602 022700 001462
4836 022606 001374
4837 022610 005237 001374
4838 022614 042737 000007 023202
4839 022622 053737 001374 023202
4840 022630 005037 025214
4841 022634 106337 001216
4842 022640 103346
4843 022642 104400
4844 022644
4845
4846 022644 104417
4847
4848 022646 042737 010000 023202
4849 022654 013777 023202 157170
4850 022662 005737 001370
4851 022666 100011
4852 022670 000241
4853 022672 006037 023202
4854 022676 103002
4855 022700 000241
4856 022702 000401
4857 022704 000261
4858 022706 006137 023202
4859 022712 052737 010000 023202
4860 022720 013777 023202 157124
4861 022726 013737 023202 001372
4862 022734 042737 177770 001372
4863 022742 042737 000007 023202
4864 022750 053737 001374 023202
4865 022756 013737 023202 001400
4866 022764 012700 001422
4867 022770 005020
4868 022772 022700 001462
4869 022776 001374
4870 023000 005002
4871 023002 005003
4872 023004 005037 001220
4873 023010 005037 001224

;*****
TST34: SCOPE
MOV #34,#TSTNM ;LOAD THE NUMBER OF THIS TEST
; -- END 0 MACRO -----
MOV #2,#TIMES
MOV #TST35,NEXT ;POINT TO THE START OF THE NEXT TEST
MOV #30,LOCK ;SET FOR LOOP
CLR OFFSET ;RESET THIS VARIABLE
CLR SAVLIN ;RESET LINE NUMBER INDICATOR
CLR XMTLIN ;USE THIS WORD TO TELL WHAT LINE TRANSMITTED
MOV #1,#TMP0 ;USE #TMP0 AS A BIT POINTER
MOV #RCVON!550!EIGHT!TWOSTOP,70 ;BUILD TEMPORARY PARAMETERS
10: BIT #TMP0,LINE ;IS THIS LINE ACTIVE?
BNE 30 ;IF SO, GO GET STARTED
20: MOV #RCVON!550!EIGHT!TWOSTOP,70 ;LOAD PARAMETERS TEMPORARILY
MOV #TDO,RO ;POINT TO THE DATA AREA
CLR (RO) ;CLEAR A DATA WORD
CMP #STOP,RO ;FINISHED ?
BNE .-6 ;NO
INC XMTLIN ;POINT TO THE NEXT LINE TO TRANSMIT
BIC #7,70 ;MAKE SURE TEMPORARY PARAMETERS POINT TO 0
BIS XMTLIN,70 ;ADD DESIRED LINE NUMBER
CLR OFFSET
ASLB #TMP0 ;POINT TO THE NEXT LINE
BCC 10 ;PROCESS THE NEXT LINE
ADVANCE ;TEST TO SEE IF THIS TEST GETS REPEATED
30:
; -#RESET-----
; CLEAR DEVICE AND SET MAINT BIT IF I MODE
; -- END 0 MACRO -----
DCLASH
BIC #RCVON,70 ;ZERO PARAMTERS FOR TX LINE
MOV 70,#DZLPR ;LOAD PARAMTERS FOR TX
TST MODE ;STAGGERED?
BPL 1000 ;BR IF NO
CLC ;SET UP LINE
ROR 70 ;
BCC 980 ;BR IF LINE WAS EVEN
CLC ;PREPARE TO MAKE LINE EVEN
BR 990 ;CONTINUE
980: SEC ;PREPARE TO MAKE LINE ODD
990: ROL 70 ;SET ALTERED LINE
1000: BIS #RCVON,70 ;SET RX ON
MOV 70,#DZLPR ;LOAD RX PARAMETERS
MOV 70,SAVLIN ;ADJUST LUCATION FOR ERROR PRINTOUT
BIC #C<7>,SAVLIN ;STRIP JUNK
BIC #7,70 ;CLEAR OLD LINE #
BIS XMTLIN,70 ;SET LINE UP AGAIN
MOV 70,REGIST ;SAVE PARAMETERS FOR PRINTOUT
MOV #TDO,RO ;POINT TO THE DATA AREA
CLR (RO) ;CLEAR A DATA WORD
CMP #STOP,RO ;FINISHED ?
BNE .-6 ;NO
CLR R2 ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
CLR R3 ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
CLR #TMP1 ;INITIALIZE THE TIMER
CLR #TMP3 ;INITIALIZE THESE BITS ALSO

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4874 023014 012737 000020 001376      MOV      #20,XMTCNT      ;SET HOW MANY CHARACTERS TO TRANSMIT
4875 023022 012777 02463C 157046      MOV      @XMTSRV,@DZTIV
4876 023030 012777 025002 157034      MOV      @RXISR1,@DZRIV
4877 023036 013777 030306 157030      MOV      DZPRT,@DZTRIS
4878 023044 013777 030306 157026      MOV      DZPRT,@DZTIS
4879 023052 113777 001216 156776      MOV      @TMP0,@DZTCR      ;START THE VALID LINE
4880 023060 052777 040140 156754      BIS      @TIE!@RIE!@MSENAB,@DZCSR
4881 023066 106427 000000      MTPS     #0              ;LOWER THE PRIORITY TO ALLOW INTERRUPTS
4882 023072 032777 000100 156742 4#:      BIT      @RIE,@DZCSR      ;IS ROUTINE DONE?
4883 023100 001407      BEQ      #1              ;WHEN ALL IS DONE RX IE IS CLEARED IN ISR.
4884 023102 005237 001220      INC      @TMP1           ;COUNT TIME
4885 023106 001371      BNE      #1              ;CONTINUE TEST
4886 023110 105237 001224      INCB     @TMP3           ;DOUBLE COUNT
4887 023114 001366      BNE      #1              ;CONTINUE TEST
4888 023116 104011      ERROR    11             ;INTERRUPTS NOT FINISHED
4889 023120 004737 007652      JSR      PC,SERV.G      ;<TG>?
4890 023124 104401      SCOP1    ;LOOP?
4891 023126 062737 000002 025214      ADD      #2,OFFSET
4892 023134 013700 023202      MOV      7#,R0
4893 023140 042700 170377      BIC      @+C<17*400>,R0
4894 023144 022700 007000      CMP      @<16*400>,R0
4895 023150 001010      BNE      #1
4896 023152 032737 000030 023202      BIT      @BIT4*BIT3,7#
4897 023160 001602      BEQ      #1
4898 023162 162737 000010 023202      SUB      @BIT3,7#
4899 023170 000625      BR       #1
4900 023172 062737 000400 023202 6#:      ADD      #400,7#
4901 023200 000621      BR       #1
4902 023202 000000      7#:      0

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4903 ; -@PARTST-----
4904 ; -@XZ-----
4905 ;***** TEST 35 *****
4906 ;* THIS TEST VERIFIES THAT EVEN PARITY WORKS
4907 ;* FOR ALL ODD LINES SELECTED AND THAT ODD PARITY WORKS FOR ALL
4908 ;* EVEN LINES SELECTED.
4909 ;*THE MAIN FUNCTION OF THIS TEST IS TO VERIFY
4910 ;*THAT "PE" (PARITY ERROR) CAN BE FLAGGED BY
4911 ;*THE UARTS. THIS TEST WILL NOT BE DONE UNLESS
4912 ;*YOU ARE IN "STAGGERED" MODE.
4913 ;*40(8) CHARS ARE USED FOR THIS TEST.
4914 ;*ALL SELECTED LINES WILL BE ENABLED
4915 ;*AT THE SAME TIME!
4916 ; -@XZ-----

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4917 ;:* TEST 35
4918 ;*****
4919 023204 000004      TST35: SCOPE
4920 023206 012737 000035 001122      MOV      #35,@TSTNM      ;LOAD THE NUMBER OF THIS TEST
4921 ; -- END O MACRO -----
4922 023214 012737 023456 001360      MOV      @TST36,NEXT     ;POINT TO THE START OF THE NEXT TEST
4923 023222 005737 001370      TST      MODE            ;IS THIS STAGGERED MODE?
4924 023226 100112      BPL      #1              ;IF NOT, DON'T DO THIS TEST
4925 ; -@MRESET-----
4926 023230 104417      DCLASH                    ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4927 ; -- END O MACRO -----
4928 023232 013701 001366      MOV      PAR,R1          ;USE R1 TO BUILD PARAMETERS TO BE LOADED
4929 023236 042701 000200      BIC      @ODDPAR,R1      ;MAKE SURE ODD PARITY ISN'T SET

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4930 023242 052701 000100      BIS      #PARITY,R1      ;MAKE SURE PARITY IS TURNED ON
4931 023246 012702 000001      MOV      #1,R2        ;USE R2 AS A LINE POINTER
4932 023252 030237 001364      14:     BIT      R2,LINE     ;IS THIS A VALID LINE?
4933 023256 001411              BEQ      34           ;IF NOT, SKIP TO THE NEXT LINE
4934 023260 032701 000001      BIT      #BIT0,R1     ;IS THIS LINE AN ODD LINE?
4935 023264 001002              BNE      24           ;IF IT'S ODD, USE EVEN PARITY
4936 023266 052701 000200      BIS      #ODDPAR,R1   ;IF IT'S EVEN, USE ODD PARITY
4937 023272 010177 156554      24:     MOV      R1,#DZLPR   ;LOAD THE LINE PARAMETER REGISTER
4938 023276 042701 000200      BIC      #ODDPAR,R1   ;SET UP THE NEXT PARITY TO EVEN
4939 023302 005201      34:     INC      R1        ;POINT TO THE NEXT LINE
4940 023304 106302              ASLB     R2          ;MOVE THE BIT POINTER IN R2 TO THE NEXT LINE
4941 023306 103361              BCC      14           ;IF WE'RE NOT DONE, GO CHECK THE NEXT LINE
4942 023310 005037 001372      CLR      SAVLIN      ;CLEAR THE LINE NUMBER INDICATOR
4943 023314 005002              CLR      R2          ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
4944 023316 005037 024632      CLR      COUNT0      ; 2-10-84 ECB REV I
4945 023322 005037 024634      CLR      COUNT1      ; 2-10-84 ECB REV I
4946 023326 005003              CLR      R3          ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
4947 023330 012737 000040 001376      MOV      #40,XMTCNT   ;TRANSMIT A BINARY COUNT PATTERN(00-40)
4948 023336 012700 001422      MOV      #TDO,R0      ;POINT TO THE DATA AREA
4949 023342 005020              CLR      (R0)+       ;CLEAR A DATA WORD
4950 023344 022700 001462      CMP      #STOP,R0     ;FINISHED ?
4951 023350 001374              BNE      -6          ;NO
4952 023352 005000              CLR      R0          ;CLEAR OFFSET
4953                                ; -INTSET-----
4954 023354 012777 024636 156514      MOV      #XMTSRV,#DZTIV ;SET UP THE TRANSMITTER INTERRUPT VECTOR
4955 023362 012777 024460 156502      MOV      #PARESE,#DZRIV ;SET UP THE RECEIVER INTERRUPT VECTOR
4956 023370 013777 030306 156476      MOV      DZPRT,#DZ RIS ;SET THE INTERRUPT VECTOR STATUS
4957 023376 013777 030306 156474      MOV      DZPRT,#DZTIS  ;SET TRANSMITTER INTERRUPT PRIORITY
4958 023404 052777 040140 156430      BIS      #RIE!TIE!MSENAB,#DZCSR ;ENABLE THE DEVICE
4959                                ; -- END 0 MACRO -----
4960 023412 113777 001364 156436      MOV      LINE,#DZTCR  ;ENABLE ALL SELECTED LINES
4961 023420 106427 000000              MTPS     #0          ;ALLOW INTERRUPTS
4962 023424 032777 000100 156410      54:     BIT      #RIE,#DZCSR ;WHEN RX DONE, RIE WILL =0
4963 023432 001410              BEQ      64           ;BR IF ALL DONE
4964 023434 104414              DELAY                    ; 2-10-84 ECB REV I
4965 023436 005237 024632      INC      COUNT0
4966 023442 102770              BVS     54           ;
4967 023444 105237 024634      INCB    COUNT1
4968 023450 100365              BPL     54           ;
4969 023452 104011              ERROR   11          ;*RX FAILED TO FINISH (INTERRUPT)
4970 023454 104400      64:     ADVANCE                    ;ADVANCE LOOP
4971                                ; -- END 0 MACRO -----
4972                                ; -PARTST-----
4973                                ; -XZ-----
4974                                ;***** TEST 36 *****
4975                                ;*THIS TEST VERIFIES THAT ODD PARITY WORKS FOR ALL ODD LINES
4976                                ;* SELECTED AND THAT EVEN PARITY WORKS FOR ALL EVEN LINES SELECTED
4977                                ;*THE MAIN FUNCTION OF THIS TEST IS TO VERIFY
4978                                ;*THAT "PE" (PARITY ERROR) CAN BE FLAGGED BY
4979                                ;*THE UARTS. THIS TEST WILL NOT BE DONE UNLESS
4980                                ;*YOU ARE IN "STAGGERED" MODE.
4981                                ;*40(8) CHARS ARE USED FOR THIS TEST.
4982                                ;*ALL SELECTED LINES WILL BE ENABLED
4983                                ;*AT THE SAME TIME!
4984                                ; -XZ-----
4985                                ;:* TEST 36

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4986 ;*****
4987 023456 000004 TST36: SCOPE
4988 023460 012737 000036 001122     MOV     #36,#TSTNM      ;LOAD THE NUMBER OF THIS TEST
4989 ; -- END 0 MACRO -----
4990 023466 012737 023730 001360     MOV     #TST37,NEXT    ;POINT TO THE START OF THE NEXT TEST
4991 023474 005737 001370             TST     MODE           ;IS THIS STAGGERED MODE?
4992 023500 100112             BPL     6#             ;IF NOT, DON'T DO THIS TEST
4993 ; -#RESET-----
4994 023502 104417             DCLASH                ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4995 ; -- END 0 MACRO -----
4996 023504 013701 001366     MOV     PAR,R1         ;USE R1 TO BUILD PARAMETERS TO BE LOADED
4997 023510 042701 000200     BIC     #ODDPAR,R1     ;MAKE SURE ODD PARITY ISN'T SET
4998 023514 052701 000100     BIS     #PARITY,R1     ;MAKE SURE PARITY IS TURNED ON
4999 023520 012702 000001     MOV     #1,R2          ;USE R2 AS A LINE POINTER
5000 023524 030237 001364     1# :   BIT     R2,LINE    ;IS THIS A VALID LINE?
5001 023530 001411             BEQ     3#             ;IF NOT, SKIP TO THE NEXT LINE
5002 023532 032701 000001     BIT     #BIT0,R1       ;IS THIS LINE AN ODD LINE?
5003 023536 001402             BEQ     2#             ;IF IT'S EVEN, USE EVEN PARITY
5004 023540 052701 000200     BIS     #ODDPAR,R1     ;IF IT'S ODD, USE ODD PARITY
5005 023544 010177 156302     2# :   MOV     R1,#DZLPR ;LOAD THE LINE PARAMETER REGISTER
5006 023550 042701 000200     BIC     #ODDPAR,R1     ;SET UP THE NEXT PARITY TO EVEN
5007 023554 005201     3# :   YNC     R1          ;POINT TO THE NEXT LINE
5008 023556 106302             ASLB    R2             ;MOVE THE BIT POINTER IN R2 TO THE NEXT LINE
5009 023560 103361             BCC     1#             ;IF WE'RE NOT DONE, GO CHECK THE NEXT LINE
5010 023562 005037 001372     CLR     SAVLIN         ;CLEAR THE LINE NUMBER INDICATOR
5011 023566 005002             CLR     R2             ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
5012 023570 005037 024632     CLR     COUNT0         ; 2-10-84 ECB REV I
5013 023574 005037 024634     CLR     COUNT1         ; 2-10-84 ECB REV I
5014 023600 005003             CLR     R3             ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
5015 023602 012737 000040 001376     MOV     #40,XMTCNT     ;TRANSMIT A BINARY COUNT PATTERN(00-40)
5016 023610 012700 001422     MOV     #TDO,R0        ;POINT TO THE DATA AREA
5017 023614 005020             CLR     (R0)+          ;CLEAR A DATA WORD
5018 023616 022700 001462     CMP     #STOP,R0       ;FINISHED ?
5019 023622 001374             BNE     .-6            ;NO
5020 023624 005000             CLR     R0             ;CLEAR OFFSET
5021 ; -#INTSET-----
5022 023626 012777 024636 156242     MOV     #XMTSRV,#DZTIV ;SET UP THE TRANSMITTER INTERRUPT VECTOR
5023 023634 012777 024460 156230     MOV     #PARESE,#DZRIV ;SET UP THE RECEIVER INTERRUPT VECTOR
5024 023642 013777 030306 156224     MOV     DZPRT,#DZRIS  ;SET THE INTERRUPT VECTOR STATUS
5025 023650 013777 030306 156222     MOV     DZPRT,#DZTIS  ;SET TRANSMITTER INTERRUPT PRIORITY
5026 023656 052777 040140 156156     BIS     #RIE!TIE!MSENAB,#DZCSR ;ENABLE THE DEVICE
5027 ; -- END 0 MACRO -----
5028 023664 113777 001364 156164     MOV     LINE,#DZTCR    ;ENABLE ALL SELECTED LINES
5029 023672 106427 000000             MTPS    #0             ;ALLOW INTERRUPTS
5030 023676 032777 000100 156136     5# :   BIT     #RIE,#DZCSR ;WHEN RX DONE, RIE WILL =0
5031 023704 001410             BEQ     6#             ;BR IF ALL DONE
5032 023706 104414             DELAY                                ; 2-10-84 ECB REV I
5033 023710 005237 024632             INC     COUNT0
5034 023714 102770             BVS     5#
5035 023716 105237 024634             INCB   COUNT1
5036 023722 100365             BPL     5#
5037 023724 104011             ERROR   11             ;RX FAILED TO FINISH (INTERRUPT)
5038 023726 104400     6# :   ADVANCE                ;ADVANCE LOOP
5039 ; -- END 0 MACRO -----
    
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5040                                     ; -#XZ-----
5041                                     ;***** TEST 37 *****
5042                                     ;*
5043                                     ;* ECB 21-FEB-84
5044                                     ;* BAUD RATE TIMING TEST. THIS TEST ADDED IN ORDER TO TEST CRYSTAL
5045                                     ;* SPEEDS. IT LOOKS FOR EITHER A KW11L OR KW11P. IF EITHER IS AVAIL.
5046                                     ;* THEN THE TEST IS RAN. IF NEITHER AVAILABLE, THEN TEST IS NOT RAN.
5047                                     ;*
5048                                     ;* KR 18-JUN-84
5049                                     ;* ADDED NUMBERS IN TTABLE AND NOW TEST ALL LINES AT ALL BAUD RATES
5050                                     ;* INSTEAD OF JUST LINE 0 AT ALL BAUD RATES.
5051                                     ;*
5052                                     ; -#XZ-----
5053                                     ;:* TEST 37
5054                                     ;*****
5055 023730 000004 TST37: SCOPE
5056 023732 012737 000037 001122      MOV #37,#TSTNM ;LOAD THE NUMBER OF THIS TEST
5057                                     ; -- END 0 MACRO -----
5058 023740 012737 004712 001360      MOV #EOP,NEXT ;POINT TO THE END-OF-PASS HANDLER
5059
5060 023746 106427 000000      HTPS #0 ;DROP PRIORITY TO 0
5061 023752 013700 000004      MOV #4,RO ;SAVE CONTENTS OF LOCATION 4.
5062 023756 012737 024022 000004      MOV #10,#4 ;SET TO TRAP IF NOT KW11L
5063 023764 012701 177546      MOV #177546,R1 ;GET KW11L ADDRESS.
5064 023770 012737 024076 000100      MOV #CLKSRV,#100 ;SET FOR INTERRUPT.
5065 023776 012737 000340 000102      MOV #340,#102 ;PRIORITY 7 ON INTERRUPT.
5066 024004 005037 024106      CLR BCOUNT ;OUR OWN CLOCK TICK COUNTER
5067 024010 005037 024104      CLR CCOUNT ;CHAR SENT COUNTER
5068 024014 012711 000100      MOV #100,(R1) ;THIS WILL CAUSE A BOMB TO OCCUR IF
5069                                     ;THE KW11L DOES NOT EXIST
5070                                     ;BUT IF ITS THERE, THEN WE'RE STARTED.
5071 024020 000472      BR TCCONT ;START TEST
5072
5073 024022 022626      100: CMP (SP), (SP) ;READJUST STACK
5074 024024 012737 024066 000004      MOV #200,#4 ;SET TO TRAP IF NO KW11P
5075 024032 012737 024076 000104      MOV #CLKSRV,#104 ;SET FOR INTERRUPT.
5076 024040 012737 000340 000106      MOV #340,#106 ;PRIORITY 7 ON INTERRUPT.
5077 024046 012701 172540      MOV #172540,R1 ;KW11P ADDRESS.
5078 024052 012761 177777 000002      MOV #-1.2,(R1) ;SET THE # OF COUNTS FOR INTERRUPT (1)
5079                                     ;NOTE, IF KW11P DOES NOT EXIST, THEN
5080                                     ;WE WILL BOMB FROM THIS PLACE.
5081 024060 012711 000133      MOV #133,(R1) ;SET INTERRUPT ENABLE,UP COUNT,REPEATED
5082                                     ;INTERRUPT,LF CLOCK, AND RUN.
5083 024064 000450      BR TCCONT ;START TEST.
5084
5085 024066 022626      200: CMP (SP), (SP) ;READJUST STACK, NO CLOCKS AT ALL!
5086 024070 010037 000004      MOV RO,#4 ;RESTORE LOCATION 4
5087 024074 104400      ADVANCE ;GET OUT.
5088
5089 024076 005237 024104      CLKSrv: INC CCOUNT ;CLOCK INTERRUPTS TO HERE, UPDATE COUNT.
5090 024102 000002      RTI ;THEN EXIT.
5091
5092 024104 000000      CCOUNT: .WORD 0 ;INCREMENTED BY CLKSrv. #CLOCK TICKS.
5093 024106 000000      BCOUNT: .WORD 0 ;USED BY TCCONT AS TIMER.
5094 024110 000000      DCOUNT: .WORD 0 ;USED BY TCCONT AS TIMER.
5095

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5125 024112 000005 000007
5126 024116 000007 000014
5127 024122 000013 000021
5128 024126 000015 000024
5129 024132 000017 000025
5130
5131 024136 000035 000050
5132 024142 000073 000114
5133 024146 000167 000224
5134 024152 000263 000334
5135 024156 000307 000364
5136
5137 024162 000357 000444
5138 024166 000547 000664
5139 024172 000737 001104
5140 024176 001317 001544
5141 024202 001677 002204
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5148 024206 010037 000004
5149 024212 005037 024104
5150 024216 012737 177750 024106
5151

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; *
; THESE NUMBER WERE WORKING GREAT ON A PDP-11/24 RUNNING AT 60 HERTZ
;
; TTABLE: .WORD 5.. 7. ;COUNT OF CHARS OUT FOR 50 BAUD
; .WORD 7.. 9. ;COUNT OF CHARS OUT FOR 75 BAUD
; .WORD 11.. 13. ;COUNT OF CHARS OUT FOR 110 BAUD
; .WORD 13.. 15. ;COUNT OF CHARS OUT FOR 134.5 BAUD
; .WORD 15.. 17. ;COUNT OF CHARS OUT FOR 150 BAUD
;
; .WORD 29.. 32. ;COUNT OF CHARS OUT FOR 300 BAUD
; .WORD 59.. 62. ;COUNT OF CHARS OUT FOR 600 BAUD
; .WORD 119.. 122. ;COUNT OF CHARS OUT FOR 1200 BAUD
; .WORD 179.. 182. ;COUNT OF CHARS OUT FOR 1800 BAUD
; .WORD 199.. 202. ;COUNT OF CHARS OUT FOR 2000 BAUD
;
; .WORD 239.. 242. ;COUNT OF CHARS OUT FOR 2400 BAUD
; .WORD 359.. 362. ;COUNT OF CHARS OUT FOR 3600 BAUD
; .WORD 479.. 482. ;COUNT OF CHARS OUT FOR 4800 BAUD
; .WORD 719.. 722. ;COUNT OF CHARS OUT FOR 7200 BAUD
; .WORD 959.. 962. ;COUNT OF CHARS OUT FOR 9600 BAUD
; -
; *
; THESE NUMBER WERE MODIFIED SO THEY WOULD WORK ON A
; 50 HERTZ MACHINE (TESTED ON PDP-11/70) AS WELL AS 60 HERTZ.
; AT 9600 BAUD THERE IS ABOUT 17% ERROR.
; THE LOWER THE BAUD RATE THE LESS THE ERROR.
; -
; TTABLE: .WORD 5.. 7. ;COUNT OF CHARS OUT FOR 50 BAUD
; .WORD 7.. 12. ;COUNT OF CHARS OUT FOR 75 BAUD
; .WORD 11.. 17. ;COUNT OF CHARS OUT FOR 110 BAUD
; .WORD 13.. 20. ;COUNT OF CHARS OUT FOR 134.5 BAUD
; .WORD 15.. 21. ;COUNT OF CHARS OUT FOR 150 BAUD
;
; .WORD 29.. 40. ;COUNT OF CHARS OUT FOR 300 BAUD
; .WORD 59.. 76. ;COUNT OF CHARS OUT FOR 600 BAUD
; .WORD 119.. 148. ;COUNT OF CHARS OUT FOR 1200 BAUD
; .WORD 179.. 220. ;COUNT OF CHARS OUT FOR 1800 BAUD
; .WORD 199.. 244. ;COUNT OF CHARS OUT FOR 2000 BAUD
;
; .WORD 239.. 292. ;COUNT OF CHARS OUT FOR 2400 BAUD
; .WORD 359.. 436. ;COUNT OF CHARS OUT FOR 3600 BAUD
; .WORD 479.. 580. ;COUNT OF CHARS OUT FOR 4800 BAUD
; .WORD 719.. 868. ;COUNT OF CHARS OUT FOR 7200 BAUD
; .WORD 959.. 1156. ;COUNT OF CHARS OUT FOR 9600 BAUD
; ENDTTB =. ;END OF TTABLE
;
; CHECK OUT THE CLOCK
;
; TCCONT: MOV R0,B#4 ;RESTORE LOCATION 4.
; CLR CCOUNT ;START WITH LINE CLOCK AT ZERO COUNT
; MOV #30,BCOUNT ;30-18MS LOOPS TO WAIT

```

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5152 024224 005737 024104      100:  TST      CCOUNT      ;WAIT FOR COUNT TO GO TO 1 TO AVOID
5153 024230 001010                BNE      200      ;USING THAT DANGEROUS FIRST COUNT!
5154 024232 005237 024110      INC      DCOUNT      ;BUT AS A SAFE GUARD,
5155 024236 001372                BNE      100      ;DON'T HANG HERE
5156 024240 005237 024106      INC      BCOUNT
5157 024244 001367                BNE      100
5158 024246 005011                CLR      (R1)      ;CLEAR CLOCK
5159 024250 104400                ADVANCE          ;CLOCK NOT WORKING RIGHT- ABORT TEST
5160                                     ;NOT THE FAULT OF THE DZ!
5161
5162                                     ;
5163                                     ; START XMITTING CHARACTERS TO ALL 8 LINES AT ALL BAUD RATES.
5164                                     ; IF THE NUMBER OF CHARACTERS TRANSMITTED IS BETWEEN THE
5165                                     ; TWO NUMBERS IN TTABLE THEN THE LINE IS OK, ELSE ERROR
5166                                     ;
5167
5168 024252 012777 000050 155562 200:  MOV      #50,8DZCSR      ;SET MSE AND MAINT.
5169 024260 012700 000030                MOV      #30,R0        ;SET BAUD RATE 50, 8 BIT CHAR LEN
5170 024264 012703 000001                MOV      #1,R3        ;HOLDS CURRENT LINE, START AT LINE 0
5171
5172 024270 110377 155562      300:  MOVB     R3,8DZTCR      ;ENABLE THE NEXT LINE TO XMIT
5173 024274 012702 024112      MOV      @TTABLE,R2    ;GET TABLE OF EXPECTED RESULTS
5174
5175 024300 010077 155546      400:  MOV      R0,8DZLPR      ;UPDATE THE BAUD RATE AND NEXT LINE
5176 024304 005037 024106      CLR      BCOUNT        ;REUSE TIMER AS XMIT CHAR COUNTER
5177 024310 005037 024104      CLR      CCOUNT        ;CLEAR CLOCK INTERRUPT COUNTER
5178
5179 024314 022737 000074 024104 500:  CMP      #60.,CCOUNT    ;DO THIS LOOP FOR 60 CLOCK TICKS
5180 024322 001413                BEQ      600          ;EXIT WHEN THAT OCCURS.
5181 024324 005777 155512      TST      8DZCSR        ;READY TO XMIT A CHAR?
5182 024330 100371                BPL      500          ;NO, THEN WAIT
5183 024332 112777 000101 155526  MOVB     #101,8DZTDR    ;XMIT A CHAR
5184 024340 005237 024106      INC      BCOUNT        ;UPDATE XMIT COUNT, SHOULD NOT OVERFLOW.
5185 024344 102363                BVC      500          ;IF NO OVERFLOW, CONTINUE
5186 024346 005011                CLR      (R1)        ;IF OVERFLOW, CLOCK COULD BE BAD, CLEAR IT
5187 024350 104400                ADVANCE          ;ABORT THIS TEST IF CLOCK 10-2.'
5188
5189 024352 023712 024106      600:  CMP      BCOUNT,(R2)    ;IF COUNT < LOW
5190 024356 103422                BLO      700          ; THEN ERROR
5191 024360 023762 024106 000002  CMP      BCOUNT,2(R2)  ;IF COUNT > HI
5192 024366 101016                BHI      700          ; THEN ERROR
5193 024370 062700 000400      ADD      #400,R0        ;NEXT BAUD RATE
5194 024374 062702 000004      ADD      #4,R2         ;GET NEXT PAIR OF NUMBERS
5195 024400 022702 024206      CMP      @ENDTTB,R2    ;HIT END OF TTABLE?
5196 024404 001335                BNE      400          ;NO, CONTINUE TESTING THIS LINE
5197 024406 042700 007400      BIC      #7400,R0      ;BRING THE BAUD RATE BACK TO 50
5198 024412 005200                INC      R0           ;AND GET NEXT LINE NUMBER
5199 024414 106303                ASLB     R3           ;MOVE ONTO THE NEXT LINE
5200 024416 103324                BCC      300          ;IF NOT DONE WITH ALL LINES THEN CONTINUE
5201 024420 005011                CLR      (R1)        ;ELSE STOP CLOCK
5202 024422 104400                ADVANCE          ;AND DO THE NEXT TEST
5203
5204
5205                                     ;
5206                                     ; ERROR - COUNTER NOT IN THE RANGE OF THE NUMBERS IN TTABLE
5207                                     ;

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5208 024424 005011          704:  CLR      (R1)          ;STOP CLOCK.
5209 024426 011237 024104    MOV      (R2),CCOUNT    ;MOVE LOW COUNT FOR ERROR MESSAGE
5210 024432 016237 000002 024110  MOV      2(R2),DCOUNT   ;MOVE HIGH COUNT FOR ERROR MESSAGE
5211 024440 042700 177770    BIC      @+C<7>,R0      ;STRIP EVERYTHING BUT LINE NUMBER
5212 024444 010037 001372    MOV      R0,SAVLIN     ;MOVE LINE NUMBER FOR ERROR MESSAGE
5213 024450 104030          ERROR    30            ;COUNT TOO HIGH OR LOW
5214 024452 004737 007652    JSR      PC,SERV.G     ;<?G?>
5215 024456 104400          ADVANCE          ;DO NEXT TEST
5216
5217
5218          ;RECEIVER SERVICE ROUTINE(PARITY TEST ONLY)
5219          ;
5220
5221 024460 017704 155362    PARESE: MOV      @DZRBUF,R4    ;GET THE CHARACTER
5222 024464 010401          MOV      R4,R1          ;COPY THE RECEIVED INFORMATION
5223 024466 000301          SWAB     R1            ;GET THE LINE NUMBER IN THE LOWER BYTE
5224 024470 042700 177770    BIC      @+C<7>,R1      ;ISOLATE THE LINE NUMBER
5225 024474 010137 001372    MOV      R1,SAVLIN     ;FILL LOC. FOR ERROR PRINTOUT
5226 024500 005704          TST      R4            ;WAS DATA VALID?
5227 024502 100401          BMI     104           ;BRANCH IF YES
5228 024504 104023          ERROR    23          ;ERROR - DATA VALID NOT SET!
5229 024506 006301          104:  ASL      R1            ;ALIGN IT ON A WORD BOUNDARY
5230 024510 032704 010000    BIT      @PARER,R4      ;PARITY ERROR SHOULD BE SET. IS IT?
5231 024514 001013          BNE     114           ;IF SO, GO CHECK CHARACTER
5232 024516 013737 002046 001400  MOV      @DZRBUF,REGIST ;SET UP FOR THE ERROR MESSAGE
5233 024524 010405          MOV      R4,R5
5234 024526 042705 000377    BIC      @377,R5
5235 024532 156105 001442    BISB    TRO(R1),R5     ;GET THE CORRECT CHARACTER
5236 024536 052705 110000    BIS     @DVALID!PARER,R5 ;BUILD WHAT WAS EXPECTED
5237 024542 104006          ERROR    6            ;ERROR- DID NOT GET CORRECT INFORMATION
5238 024544 126104 001442    114:  CMPB    TRO(R1),R4     ;CHECK THE CHARACTER. IS IT CORRECT?
5239 024550 001407          BEQ     124           ;IF SO, GO SET UP NEXT CHARACTER
5240 024552 116105 001442    MOVB    TRO(R1),R5     ;LOAD THE CHARACTER FOR ERROR REPORTING
5241 024556 042705 177400    BIC      @+C<377>,R5    ;CLEAR SIGN EXTEND
5242 024562 042704 177400    BIC      @+C<377>,R4    ;REMOVE THE JUNK FROM R4, THE ACTUAL CHARACTER
5243 024566 104005          ERROR    5            ;DATA ERROR
5244 024570 005261 001442    124:  INC      TRO(R1)       ;SET UP THE NEXT CHARACTER
5245 024574 005203          INC      R3            ;ADD TO THE TOTAL RECEIVED COUNT
5246 024576 005037 024632    CLR     COUNT0         ;RESET COUNTERS TO NEXT
5247 024602 005037 024634    CLR     COUNT1         ;RECIEVER INTERRUPT
5248 024606 032777 040000 155226  BIT     @TIE,@DZCSR    ;ARE TRANSMISSIONS DONE?
5249 024614 001005          BNE     134           ;IF NO, GO RECEIVE SOME MORE
5250 024616 020203          CMP     R2,R3          ;ARE ALL CHARACTERS RECEIVED?
5251 024620 001003          BNE     134           ;IF NO, GO RECEIVE SOME MORE
5252 024622 042777 000100 155212  BIC     @RIE,@DZCSR    ;DISABLE RECEIVER INTERRUPTS
5253 024630 000002          134:  RTI                    ;GO BACK TO RECEIVER WAIT LOOP
5254 024632 000000          COUNT0: 0
5255 024634 000000          COUNT1: 0
5256
5257
5258          ;TRANSMITTER INTERRUPT SERVICE
5259          ;-----
5260
5261 024636 117701 155202    XMTSRV: MOVB    @MDZCSR,R1    ;GET THE LINE NUMBER. IS THE TRANSMITTER
5262 024642 100411          BMI     14            ;REALLY READY? IF SO, GO LOAD THE CHARACTER
5263 024644 013700 001372    MOV     SAVLIN,R0      ;ADJUST LOCATION SAVLIN

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5264 024650 042701 177770      BIC      0+C<7>,R1      ;ISOLATE THE LINE NUMBER
5265 024654 010137 001372      MOV      R1,SAVLIN     ;FOR ERROR PRINTOUT
5266 024660 104003              ERROR     3             ;TRANSMITTER NOT READY- FALSE INTERRUPT
5267 024662 010037 001372      MOV      R0,SAVLIN     ;RESET SAVLIN TO PREVIOUS VALUE
5268 024666 042701 177770      10:     BIC      0+C<7>,R1      ;ISOLATE THE LINE NUMBER
5269 024672 006301              ASL      R1             ;MAKE SURE IT REFERENCES A WORD BOUNDARY
5270 024674 116177 001422 155164  MOVB     TDO(R1),BDZTDR ;LOAD THE CURRENT CHARACTER FOR THIS LINE
5271 024702 005261 001422      INC      TDO(R1)       ;SET UP NEXT CHARACTER FOR THIS LINE
5272
5273
5274
5275
5276 024706 023761 001376 001422      CMP      XPTCNT,TDO(R1) ;HAVE WE DONE ALL PATTERNS ON THIS LINE?
5277 024714 001015              BNE      40             ;IF NOT, KEEP ON TRANSMITTING
5278 024716 012700 000001      MOV      01,R0         ;SET UP A DeseLECTION POINTER
5279 024722 006201              ASR      R1             ;GET THE LINE NUMBER AGAIN
5280 024724 100402              20:     DEC      R1             ;REDUCE THE COUNT, WAS THIS THE LINE?
5281 024726 100402              BMI      30             ;IF SO, GO DISABLE THE ENABLE BIT FOR IT
5282 024730 006300              ASL      R0             ;MOVE THE POINTER TO THE NEXT LINE
5283 024732 000774              BR       20             ;GO CHECK THE NEXT LINE
5284 024734 140077 155116      30:     BICB     R0,BDZTCR     ;DISABLE THE LINE POINTED TO BY R0
5285 024740 001003              BNE      40             ;IF MORE LINES ARE ACTIVE, GO CONTINUE TRANSMIT
5286 024742 042777 040000 155072      BIC      *TIE,BDZCSR    ;IF NOT, DISABLE TRANSMITTER INTERRUPTS
5287 024750 005202              40:     INC      R2             ;UP THE NUMBER OF TRANSMISSIONS (REV. F0)
5288
5289 024752 000002              RTI                       ;RETURN TO THE TIMING LOOP
5290
5291
5292
5293
5294 024754 012737 000004 001222  BUILD:  MOV      04,*TMP2      ;ROTATE 4 BITS BACK INTO *TMP1
5295 024762 006037 001224      10:     ROR      *TMP3      ;GET THE BITS FROM *TMP3, THE HIGH BYTE
5296 024766 006037 001220      ROR      *TMP1          ;OF THE RELATIVE TIME COUNTER. PUT THEM BACK
5297 024772 005337 001222      DEC      *TMP2          ;INTO *TMP1 USING THE CARRY BIT WITH
5298
5299 024776 001371              BNE      10             ;ROTATE INSTRUCTIONS
5300 025000 000207              RTS      PC             ;REDUCE COUNT. ALL BITS BACK? IF NOT, GET MORE
5301

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RECEIVER SERVICE ROUTINE

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5302
5303
5304 025002 105777 155034 RXISR1: TSTB BDZCSR ;IS THE RECEIVER REALLY READY?
5305 025006 100401 BMI 10 ;IF SO, GO SERVICE IT
5306 025010 104004 ERROR 4 ;ERROR- RECEIVER DONE FLAG ISN'T SET
5307 025012 017704 155030 10: MOV BDZBUF,R4 ;SAVE THE RECEIVER INFORMATION
5308 025016 100401 BMI 20 ;IF IT WAS VALID, GO PROCESS IT
5309 025020 104023 ERROR 23 ;ERROR- DATA VALID WASN'T SET
5310 025022 032704 070000 20: BIT @OVRUN!FMERR!PARER,R4 ;ARE ANY ERROR FLAGS SET?
5311 025026 001403 BEQ 30 ;IF NOT, GO CONTINUE PROCESSING
5312 025030 013700 002046 MOV DZBUF,R0 ;SET UP FOR ERROR REPORTING
5313 025034 104002 ERROR 2 ;ERROR- RECEIVER ERROR FLAG SET
5314 025036 010401 30: MOV R4,R1 ;COPY THE RECEIVER INFORMATION
5315 025040 000301 SWAB R1 ;GET THE LINE NUMBER IN THE LOWER BYTE
5316 025042 042701 177770 BIC @'C<7>',R1 ;ISOLATE THE LINE NUMBER
5317 025046 006301 ASL R1 ;ALIGN IT ON A WORD BOUNDARY
5318 025050 120461 001442 CMPB R4,TRO(R1) ;IS THE CHARACTER WHAT IT SHOULD BE?
5319 025054 001413 BEQ 40 ;IF SO,GO CONTINUE PROCESSING
5320 025056 116105 001442 MOVB TRO(R1),R5 ;GET WHAT WAS EXPECTED FOR ERROR REPORTING
5321 025062 042705 177400 BIC @'C<377>',R5 ;ELIMINATE PROPAGATED SIGN
5322 025066 042704 177400 BIC @'C<377>',R4 ;ISOLATE THE ACTUAL CHARACTER
5323 025072 010137 001372 MOV R1,SAVLIN ;GET THE LINE NUMBER OF THE RECEIVER ERROR
5324 025076 006237 001372 ASR SAVLIN ;ALIGN IT CORRECTLY FOR REPORTING
5325 025102 104005 ERROR 5 ;DATA ERROR
5326 025104 005261 001442 40: INC TRO(R1) ;SET UP THE NEXT EXPECTED CHARACTER
5327 025110 005203 INC R3 ;INCREMENT THE COUNT OF RECEIVED CHARACTERS
5328 025112 032761 000020 001442 BIT @20,TRO(R1) ;HAVE ALL CHARACTERS BEEN RECEIVED?
5329 025120 001402 BEQ 50 ;IF NOT, GO RECEIVE SOME MORE
5330 025122 020203 CMP R2,R3 ;HAVE WE RECEIVED ALL CHARACTERS?
5331 025124 001401 BEQ 60 ;IF SO,GO DETERMINE THE TIMING
5332 025126 000002 50: RTI ;GO CONTINUE TIMING AND ALLOW INTERRUPTS
5333 025130 004737 024754 60: JSR PC,BUILD ;GET THE RELATIVE TIME (SIGNIFICANT BITS)
5334
5335 025134 013700 025214 MOV OFFSET,R0 ;GET POINTER
5336 025140 013760 001220 002102 MOV @TMP1,THTBL(R0) ;SAVE THIS TEST'S TIME
5337 025146 005737 025214 TST OFFSET ;FIRST TEST?
5338 025152 001414 BEQ 70 ;IF NOT, GO CHECK THE TIME
5339 025154 005740 TST -(R0) ;POINT TO THE PREVIOUS TIME TAKEN
5340 025156 026037 002102 001220 CMP THTBL(R0),@TMP1 ;IS THIS TIME WHAT IT SHOULD BE?
5341 025164 101007 BMI 70 ;IF SO, GO TO THE NEXT TEST
5342 025166 016005 002102 MOV THTBL(R0),R5 ;PLACE WHAT WAS EXPECTED IN R5
5343 025172 010137 001372 MOV R1,SAVLIN ;GET THE LINE NUMBER OF THE RECEIVER
5344 025176 006237 001372 ASR SAVLIN ;MAKE SURE IT'S THE LINE NUMBER
5345 025202 104021 ERROR 21 ;TIMING ERROR
5346 025204 042777 000140 154630 70: BIC @RIE!MSENAB,BDZCSR ;DISABLE THE DEVICE
5347 025212 000002 RTI ;RETURN TO THE PROGRAM
5348 025214 000000 OFFSET: 0

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!DZ11 ECHO/CABLE TEST

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5349
5350
5351      !*STARTING PROCEDURE
5352      !*LOAD PROGRAM
5353      !*LOAD ADDRESS 000210
5354      !*PRESS START
5355      !*PROGRAM WILL TYPE DZ11 ECHO/CABLE TEST
5356      !*PROGRAM WILL TYPE WHICH TEST- ECHO OR CABLE
5357      !*TYPE IN E OR C RESPECTIVELY
5358      !*PROGRAM WILL TYPE "VECTOR ADDRESS-"
5359      !*TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
5360      !*FOR THE DZ11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
5361      !*PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
5362      !*TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
5363      !*FOR THE DZ11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
5364      !*PROGRAM WILL TYPE "LINE NUMBER-"
5365      !*TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
5366      !*,FOLLOWED BY <CARRIAGE RETURN>
5367      !*PROGRAM WILL TYPE "BAUD RATE-"
5368      !*TYPE IN THE BAUD RATE OF THE DZ11 TERMINAL
5369      !*,FOLLOWED BY <CARRIAGE RETURN>
5370      !*THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL
5371      !*          50
5372      !*          75
5373      !*          110
5374      !*          135      (ROUNDED OFF 134.5)
5375      !*          150
5376      !*          300
5377      !*          600
5378      !*          1200
5379      !*          1800
5380      !*          2000
5381      !*          2400
5382      !*          3600
5383      !*          4800
5384      !*          7200
5385      !*          9600
5386      !*ALL OTHERS ARE REJECTED
5387
5388      !*PROGRAM WILL TYPE "ECHO" OR "CABLE TEST" TO INDICATE THAT TESTING HAS STARTE
5389
5390
5391      !PROGRAM INITIALIZATION
5392      !LOCK OUT INTERRUPTS
5393      !SET UP PROCESSOR STACK
5394      !SET UP POWER FAIL VECTOR
5395      !CLEAR PROGRAM FLAGS AND COUNTS
5396
5397      025216 012706 001120      XSTART: MOV      #STACK,SP      !SET UP PROCESSOR STACK
5398      025222 106427 000340      MTPS,   #PR7      !LOCK OUT INTERRUPTS
5399      025226 012737 025216 001126  MOV,    #XSTART,#LPADR !SET UP IN CASE OF POWER FAIL
5400      025234 005037 027412      CLR     STFLG      !CLEAR TEST START FLAG
5401      025240 005037 001242      CLR     #PASS      !CLEAR PASS COUNT
5402      025244 005037 001132      CLR     #ERTTL     !CLEAR ERROR COUNT
5403      025250 105037 001123      CLRB   #ERFLG     !CLEAR ERROR FLAG
5404      025254 005037 027416      CLR     LAST      !CLEAR LAST ERROR PC

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5405	025260	032777	000001	153672	VEC1:	BIT	#SW00,BSWR	;IF SW00=1, GET NEW VECTOR
5406	025266	001465				BEG	OTHER	;AND CSR
5407	025270	012701	000300		VEC2:	MOV	#300,R1	
5408	025274	012702	000302			MOV	#302,R2	
5409	025300	010221			1#:	MOV	R2,(R1)+	;RESTORE TRAPCATCHER
5410	025302	005022				CLR	(R?)+	;IN FLOATING VECTOR AREA
5411	025304	022122				CMP	(R1)+,(R2)+	;UPDATE THE POINTERS
5412	025306	020127	001000			CMP	R1,#1000	
5413	025312	001372				BNE	1#	
5414	025314	104403				INSTR		;INPUT ADDRESS OF DEVICE VECTOR
5415	025316	027444				MVECTOR		;MESSAGE "VECTOR ADDRESS-"
5416	025320	104405				PARAM		;CONVERT STRING TO OCTAL
5417	025322	000300				300		;LOW LIMIT
5418	025324	000770				770		;HIGH LIMIT
5419	025326	002072				DZRIV		;LOCATIONS TO BE FILLED
5420	025330	003			.BYTE	3		;LSB MASK
5421	025331	004			.BYTE	4		;NUMBER OF LOCATIONS
5422	025332	104403				INSTR		;INPUT ADDRESS OF DEVICE CSR
5423	025334	027466				MREGAD		;MESSAGE "CONTROL REGISTER ADDRESS-"
5424	025336	104405				PARAM		;CONVERT STRING TO OCTAL
5425	025340	160000				160000		;LOW LIMIT
5426	025342	163700				163700		;HIGH LIMIT
5427	025344	002042				DZCSR		;LOCATIONS TO BE FILLED
5428	025346	007			.BYTE	7		;LSB MASK
5429	025347	001			.BYTE	1		;NUMBER OF LOCATIONS
5430	025350	013737	002042	002046		MOV	DZCSR,DZRBUF	;BEGIN BUILDING DEVICE ADDRESSES
5431	025356	062737	000002	002046		ADD	#2,DZRBUF	;FORM THE READ BUFFER ADDRESS
5432	025364	013737	002046	002052		MOV	DZRBUF,DZLPR	;REMEMBER THAT THIS IS ALSO LINE PARAMETER REG.
5433	025372	013737	002046	002056		MOV	DZRBUF,DZTCR	;BEGIN BUILDING TRANSMITTER CONTROL REGISTER
5434	025400	062737	000002	002056		ADD	#2,DZTCR	;FORM THE TRANSMITTER CONTROL REGISTER POINTER
5435	025406	013737	002056	002060		MOV	DZTCR,MDZTCR	
5436	025414	005237	002060			INC	MDZTCR	
5437	025420	013737	002056	002066		MOV	DZTCR,DZTDR	;BEGIN FORMING TRANSMITTER DATA REGISTER
5438	025426	062737	000002	002066		ADD	#2,DZTDR	;FORM THE TRANSMITTER DATA REGISTER
5439	025434	013737	002066	002062		MOV	DZTDR,DZMSR	
5440	025442	032777	000002	153510	OTHER:	BIT	#SW01,BSWR	;RESELECT OF TEST?
5441	025450	001427				BEG	XBEGIN	;IF NOT, SKIP ASKING WHICH ONE
5442	025452	104403				INSTR		;INPUT WHICH TEST YOU ARE RUNNING
5443	025454	027652				MMICH		;ECHO OR CABLE
5444	025456	104416				PAMCH		;SET FLAG
5445	025460	027410				WCHFLG		;THIS FLAG
5446	025462	104403			BAUD:	INSTR		;INPUT BAUD RATE
5447	025464	027574				MSPEED		;MESSAGE "BAUD RATE-"
5448	025466	104415				PARMD		;CONVERT DECIMAL STRING TO OCTAL
5449	025470	000062				50.		;LOW LIMIT
5450	025472	022600				9600.		;HIGH LIMIT
5451	025474	027426				LINESP		;LOCATION TO BE FILLED
5452	025476	000			.BYTE	0		;LSB MASK
5453	025477	001			.BYTE	1		;NUMBER OF LOCATIONS
5454	025500	104413			LINEX:	DEVICE.CLR		;CLEAR DEVICE
5455	025502	005037	027412			CLR	STFLG	;CLEAR PROGRAM START FLAG
5456	025506	104403				INSTR		;INPUT LINE NUMBER
5457	025510	027564				MLINE		;MESSAGE "LINE NUMBER-"
5458	025512	104405				PARAM		;CONVERT STRING TO OCTAL
5459	025514	000000				0		;LOW LIMIT
5460	025516	000007				7		;HIGH LIMIT

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5461	025520	001372				SAVLIN		;LOCATION TO BE FILLED
5462	025522	000			.BYTE	0		;LSB MASK
5463	025523	001			.BYTE	1		;NUMBER OF LOCATIONS
5464	025524	004537	027214		JSR	RS,SET		
5465								
5466	025530	106427	000340		XBEGIN:	H7PS	#PR7	;LOCK OUT INTERRUPTS
5467	025534	012706	001120			MOV	#STACK,SP	;SET UP PROCESSOR STACK
5468	025540	005037	027414			CLR	LOCKUP	;CLEAR TIMEOUT
5469	025544	005737	027410			TST	WCHFLG	;ECHO OR CABLE TEST ?
5470	025550	001413				BEG	2#	;ECHO
5471	025552	012737	026266	001126		MOV	#TEST2,#LPADR	;CABLE TEST
5472	025560	005737	027412			TST	STFLG	;ARE YOU LOOPING ?
5473	025564	001017				BNE	1#	;YES
5474	025566	005137	027412			COM	STFLG	;NO
5475	025572	104402	027745			TYPE	,MCABLE	;TYPE CABLE TEST
5476	025576	000412				BR	1#	
5477	025600	012737	025630	001126	2#:	MOV	#TEST1,#LPADR	;SET UP ECHO TEST
5478	025606	005737	027412			TST	STFLG	;ARE YOU LOOPING ?
5479	025612	001004				BNE	1#	;YES
5480	025614	005137	027412			COM	STFLG	;NO
5481	025620	104402	027720			TYPE	,MTERM	;TYPE ECHO TEST
5482	025624	000177	153276		1#:	JMP	#LPADR	;START TESTING
5483								;THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
5484								; (IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER.
5485								;ONE LINE AT A TIME, ANY LINE 0 THRU 7 (OCTAL)
5486								
5487	025630	104413			TEST1:	DEVICE.CLR		;CLEAR DZ11
5488	025632	012737	000001	001122		MOV	#1,#TSTNM	
5489	025640	013777	027434	154210		MOV	NUMTCR,#DZTCR	;SET TCR BIT
5490	025646	013737	027432	001366		MOV	NUMLIN,PAR	;SET PARAMETERS
5491	025654	053737	027430	001366		BIS	SPEED,PAR	;SET BAUD RATE
5492	025662	013777	001366	154162		MOV	PAR,#DZLPR	;LOAD PARAM.
5493	025670	012777	000040	154144		MOV	#MSENAB,#DZCSR	;SET SCANN ENABLE
5494	025676	005004				CLR	R4	
5495	025700	012705	027762			MOV	#MQUICK,R5	;SET MESSAGE BUFFER
5496	025704	005777	154132		3#:	TST	#DZCSR	;TRDY?
5497	025710	100404				BMI	2#	;BR IF YES
5498	025712	104414				DELAY		;WAIT
5499	025714	005304				DEC	R4	
5500	025716	001372				BNE	3#	
5501	025720	104003				ERROR	3	;NO TRDY SET! WHY?
5502	025722	005004			2#:	CLR	R4	;RESET COUNTER TO 0
5503	025724	112577	154136			MOVB	(R5)+,#DZTDR	;LOAD CHAR
5504	025730	001365				BNE	3#	
5505	025732	004737	007652			JSR	PC,SERV.G	; <G>?
5506	025736	122777	000377	153214		CMPB	#377,#SMR	;RE-DO QUICK BROWN?
5507	025744	001731				BEG	TEST1	;BR IF REPEAT PATTERN
5508	025746	104413				DEVICE.CLR		
5509	025750	106427	000340			H7PS	#PR7	;LOCK OUT INTERRUPTS
5510	025754	012737	026724	001360		MOV	#XEOP,NEXT	
5511	025762	104413				DEVICE.CLR		
5512	025764	013737	027432	001366		MOV	NUMLIN,PAR	;SELECT LINE # & SET INTERRUPT ENABLE
5513	025772	053737	027430	001366		BIS	SPEED,PAR	;SET LINE SPEED AND
5514								;CHARACTER LENGTH (TRANS. & REC.)
5515	026000	052737	010000	001366		BIS	#RCVON,PAR	;MAKE SURE RECEIVER IS TURNED ON
5516	026006	013777	001366	154036		MOV	PAR,#DZLPR	;LOAD THE LINE PARAMETER REGISTER

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5517 026014 012777 026070 154050      MOV      @INTSVC, @DZRV      ;SET UP INTERRUPT SERVICE
5518 026022 013777 027436 154044      MOV      @DZRV, @DZRV      ;AND LEVEL
5519 026030 106437 030310              MTPS     @DZRV, @DZRV      ;ALLOW INTERRUPTS
5520 026034 012777 000140 154000      MOV      @DZRV, @DZRV      ;SET RECEIVER INTERRUPT ENABLE
5521 026042 104402 027612              TYPE     ,MCHAR            ;TYPE "ANY CHARACTER"
5522 026046 105777 153112      10:     TSTB     @DZRV      ;IF SOMEBODY HITS A KEY- GET NEW LINE #
5523 026052 100375              BPL      10                ;LOOP HERE
5524 026054 005777 153106      TST     @DZRV      ;CLEAR CHAR
5525 026060 004737 007652      JSR     PC, SERV.G        ;MAKE SURE IT WASN'T <+G>
5526 026064 000137 025500      JMP     LINEX             ;
5527
5528
5529
5530 026070 105777 153746      INTSVC: ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
5531 026074 100401              TSTB     @DZCSR            ;TEST REC. FLAG
5532 026076 104004              BMI     .+4                ;ERROR - INTERRUPT NOT CAUSED BY FLAG
5533 026100 017737 153742 027440      MOV     @DZRV, @DZRV      ;
5534 026106 100401              BMI     .+4                ;
5535 026110 104023              ERROR   23                ;NON- VALID CHARACTER
5536 026112 032737 020000 027440      BIT     @BIT13, @DZCSR    ;CHECK FOR FRAMING ERROR
5537 026120 001401              BEQ     .+4                ;OR IF NO ERROR
5538 026122 104025              ERROR   25                ;EITHER SOMEBODY HIT THE
5539
5540 026124 113737 027440 027442      MOV     @DZRV, @DZRV      ;"BREAK KEY" OR YOU HAVE AN ERROR!
5541 026132 113737 027440 011272      MOV     @DZRV, @DZRV      ;MOVE CHARACTER TO OUTPUT AREA
5542 026140 042737 177600 011272      BIC     @DZRV, @DZRV      ;MOVE CHARACTER TO CHECK FOR +C
5543 026146 042737 174377 027440      BIC     @DZRV, @DZRV      ;STRIP JUNK PLUS PARITY
5544 026154 000337 027440              SWAB    @DZRV              ;SAVE ONLY LINE NUMBER
5545 026160 023737 001372 027440      CMP     @DZRV, @DZRV      ;DOES THE LINE # COMPARE?
5546 026166 001401              BEQ     .+4                ;
5547 026170 104015              ERROR   15                ;WRONG LINE NUMBER
5548 026172 012777 000040 153642      MOV     @DZRV, @DZRV      ;START THE TRANSMITTERS SCANNER
5549 026200 123727 011272 000003      CMPB   @DZRV, @DZRV      ;IS IT A +C ?
5550 026206 001004              BNE     10                ;NO
5551 026210 104413              DEVICE. CLR                ;
5552 026212 012716 026724              MOV     @DZRV, @DZRV      ;CRUNCH STACK
5553 026216 000002              RTI
5554 026220 005003      10:     CLR     R3            ;INITIALIZE DELAY
5555 026222 013777 027434 153626      MOV     @DZRV, @DZRV      ;ENABLE THE LINE
5556 026230 005777 153606      100:    TST     @DZRV      ;TRANSMITTER READY?
5557 026234 100403              BMI     20                ;IF YES BRANCH
5558 026236 005203              INC     R3                ;INCREMENT DELAY
5559 026240 001373              BNE     100               ;DELAY DONE?
5560 026242 104003              ERROR   3                ;TRANSMIT READY NOT SET!
5561 026244 113777 027442 153614 20:     MOV     @DZRV, @DZRV      ;TRANSMIT THE CHARACTER
5562 026252 012777 000140 153562      MOV     @DZRV, @DZRV      ;RESTART THE RECEIVER
5563 026260 005077 153572      CLR     @DZRV              ;CLEAR TCR BIT
5564 026264 000002              RTI
5565
5566
5567
5568
5569
5570 026266 106427 000340      ;THIS TEST TRANSMITS A BINARY COUNT PATTERN
5571 026272 012737 000002 001122      ;VIA INTERRUPT MODE TO THE RECEIVER
5572 026300 012737 026724 001360      ;...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
TEST2: MTPS     @PR7          ;DISABLE INTERRUPTS
        MOV     @DZRV, @DZRV
        MOV     @DZRV, @DZRV

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5573 026306 104413          DEVICE.CLR
5574                                ;*TEST TO VERIFY THAT SETTING DTR FOR A GIVEN LINE
5575                                ;*WILL BRING UP "CO" AND "RING" FOR THE SAME LINE
5576                                ;*THE DIST PNL MUST HAVE JUMPER FROM DTR TO RQST TO SEND
5577                                ;*IN ORDER FOR THIS TEST TO WORK!
5578 026310 012737 026316 001362      MOV    #10,LOCK      ;LOOP
5579 026316 113777 027434 153534 10:  MOVB   NUMTCR, @DZTCR ;SET DTR
5580 026324 005005                                CLR    R5
5581 026326 153705 027434          BISB   NUMTCR,R5      ;BUILD EXPECTED
5582 026332 000305                                SWAB   R5            ;PUT IN HIGH BYTE
5583 026334 153705 027434          BISB   NUMTCR,R5
5584 026340 104414                                DELAY
5585 026342 017704 153514          MOV    @DZMSR,R4     ;WAIT FOR CABLE DELAY
5586 026346 020504                                CMP    R5,R4         ;READY MODEM BITS
5587 026350 001401                                BEQ    20            ;ARE THEY OK?
5588 026352 104022                                ERROR  22           ;BR IF YES
5589                                ;IS THE TEST CONNECTOR ON?
5590                                ;HAS RIGHT LINE BEEN SELECTED?
5591                                ;IF SO- YOU HAVE A PROBLEM!
5592 026354 104401          20:      SCOP1
5593 026356 104413          30:      DEVICE.CLR
5594 026360 013737 027430 001366      MOV    SPEED,PAR    ;INIT DZ11
5595 026366 053737 027432 001366      BIS    NUMLIN,PAR   ;SET LINE SPEED
5596 026374 052737 010000 001366      BIS    @RCVON,PAR   ;SELECT LINE # & REC. INTERRUPT ENABLE
5597 026402 052777 040140 153432      BIS    @TIE!RIE!MSENAB,@DZCSR ;ENABLE THE RECEIVER FOR THIS LINE
5598 026410 012777 026524 153454      MOV    @INTREC,@DZRIV ;SET TRANSMITTER INTERRUPT ENABLE
5599 026416 013777 027436 153450      MOV    PRIO,@DZRIV  ;SET UP INTR SERVICE
5600 026424 012777 026704 153444      MOV    @INTRAN,@DZTIV ;SET UP LEVEL
5601 026432 013777 027436 153440      MOV    PRIO,@DZTIS  ;SET UP INTR SERVICE
5602 026440 005001                                CLR    R1            ;SET UP LEVEL
5603 026442 005002                                CLR    R2            ;RX DATA POINTER- SET TO 0
5604 026444 013777 001366 153400      MOV    PAR,@DZLPR   ;TX DATA POINTER- SET TO 0
5605 026452 106437 030310          MTPS   @MLESS1      ;SET THE PARAMETERS AND TURN ON RECEIVER
5606 026456 013777 027434 153372      MOV    NUMTCR,@DZTCR ;ALLOW INTERRUPTS
5607                                ;SET UP TCR BIT
5608                                ;YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
5609 026464 105777 152474          SPIN:  TSTB   @TKS
5610 026470 100006                                BPL    10
5611 026472 005777 152470          TST    @TKB
5612 026476 004737 007652          JSR    PC,SERV.G
5613 026502 000137 025500          JMP    LINEX
5614 026506 005237 027414          10:   INC    LOCKUP
5615 026512 001364                                BNE    SPIN
5616 026514 104011                                ERROR  11
5617 026516 104413          QUIT:  DEVICE.CLR
5618 026520 000137 026724          JMP    XEOP
5619 026524 005037 027414          INTREC: CLR   LOCKUP
5620 026530 105777 153306          TSTB   @DZCSR
5621 026534 100401                                BMI    .+4
5622 026536 104004                                ERROR  4
5623 026540 017737 153302 027440      MOV    @DZRBUF,RECDAT ;CALL FOR END OF PASS
5624 026546 100401                                BMI    .+4
5625 026550 104023                                ERROR  23
5626 026552 032737 040000 027440      BIT    @BIT14,RECDAT ;CLEAR TIMEOUT FLAG
5627 026560 001401                                BEQ    .+4
5628 026562 104024                                ERROR  24
5628                                ;TEST REC DONE
5628                                ;YES
5628                                ;*FALSE INTERRUPT
5628                                ;SAVE WORD
5628                                ;NON VALID CHARACTER
5628                                ;DATA OVERRUN ?
5628                                ;NO
5628                                ;*YES

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5629	026564	032737	020000	027440	BIT	#BIT13,RECDAT	;FRAMING ERROR ?
5630	026572	001401			BEQ	..4	;NO
5631	026574	104025			ERROR	25	;*YES
5632	026576	032737	010000	027440	BIT	#BIT12,RECDAT	;PARITY ERROR ?
5633	026604	001401			BEQ	..4	;NO
5634	026606	104026			ERROR	26	;*YES
5635	026610	110105			MOVB	R1,R5	;SET EXPECTED
5636	026612	042705	177400		BIC	#C<377>,R5	;CLEAR HIGH BYTE
5637	026616	113704	027440		MOVB	RECDAT,R4	;GET FOUND
5638	026622	042704	177400		BIC	#C<377>,R4	;CLEAR HIGH BYTE
5639	026626	020504			CMF	R5,R4 ;OK?	
5640	026630	001401			BEQ	..4	
5641	026632	104005			ERROR	5	;DATA ERROR
5642	026634	042737	174377	027440	BIC	#174377,RECDAT	;SAVE ONLY LINE NUMBER
5643	026642	000337	027440		SWAB	RECDAT	
5644	026646	023737	001372	027440	CMF	SAVLIN,RECDAT	;DOES THE LINE # COMPARE ?
5645	026654	001401			BEQ	..4	;YES
5646	026656	104015			ERROR	15	;*WRONG LINE #
5647	026660	120127	000377		CMFB	R1,#377	;LAST CHARACTER ?
5648	026664	001003			BNE	1#	;NO
5649	026666	012716	026516		MOV	#QUITS,(SP)	;CRUNCH STACK
5650	026672	000403			BR	2#	
5651	026674	105201			1#:	INCB R1	;UPDATE EXPECTED DATA
5652	026676	012716	026464		MOV	#SPIN,(SP)	;CRUNCH STACK
5653	026702	000002			2#:	RTI	
5654							
5655	026704	005777	153132		INTRAN:	TST #DZCSR ;TEST TRANSMIT FLAG	
5656	026710	100401			BMI	..4	
5657	026712	104003			ERROR	3	;*FALSE INTERRUPT
5658	026714	110277	153146		MOVB	R2,#DZTDR	;TRANSMIT A CHARACTER
5659	026720	105202			INCB	R2	;UPDATE TX DATA
5660	026722	000002			RTI	;RETURN	

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5661
5662
5663
5664
5665 026724 104402
5666 026726 027522
5667 026730 005037 027416
5668 026734 105037 001123
5669 026740 000137 025530
5670
5671
5672 026744 011605
5673 026746 012537 027130
5674 026752 012537 027132
5675 026756 012537 027134
5676 026762 112537 027136
5677 026766 112537 027137
5678 026772 010516
5679 026774 005005
5680 026776 012704 011272
5681 027002 122714 000015
5682 027006 001424
5683 027010 121427 000060
5684 027014 002421
5685 027016 121427 000071
5686 027022 003016
5687 027024 142714 000060
5688 027030 005002
5689 027032 152402
5690 027034 060205
5691 027036 122714 000015
5692 027042 001410
5693 027044 006305
5694 027046 010502
5695 027050 006305
5696 027052 006305
5697 027054 060205
5698 027056 000754
5699 027060 104404
5700 027062 000744
5701
5702
5703
5704 027064 020537 027132
5705 027070 101373
5706 027072 020537 027130
5707 027076 103770
5708 027100 133705 027136
5709 027104 001365
5710
5711
5712
5713 027106 013704 027134
5714 027112 010524
5715 027114 062705 000002
5716 027120 105337 027137

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;END OF PASS  
 ;RESTART TEST  
 XEOP: TYPE ;TYPE NAME OF TEST  
 MPASS  
 CLR LAST ;CLEAR LAST ERROR PC  
 CLRB \$ERFLG ;CLEAR ERROR FLAG  
 RSTRT: JMP XBEGIN  
 .PARMD: ;CONVERT DECIMAL ASCII STRING TO OCTAL  
 MOV (SP),R5  
 MOV (R5)+,6#  
 MOV (R5)+,7#  
 MOV (R5)+,8#  
 MOVB (R5)+,9#  
 MOVB (R5)+,10#  
 MOV R5,(SP)  
 2#: CLR R5  
 MOV @INBUF,R4  
 CMPB @15,(R4)  
 BEQ 3#  
 1#: CMPB (R4),#0  
 BLT 3#  
 CMPB (R4),#9  
 BGT 3#  
 BICB #0,(R4)  
 CLR R2  
 BISB (R4)+,R2  
 ADD R2,R5  
 CMPB @15,(R4)  
 BEQ 4#  
 ASL R5 ;X2  
 MOV R5,R2 ;SAVE X2  
 ASL R5 ;X4  
 ASL R5 ;X8  
 ADD R2,R5 ;TIMES 10  
 BR 1#  
 3#: INSTER  
 BR 2#  
 ;TEST TO SEE IF NUMBER IS WITHIN LIMITS  
 4#: CMP R5,7#  
 BHI 3#  
 CMP R5,6#  
 BLO 3#  
 BITB 9#,R5  
 BNE 3#  
 ;STORE NUMBER AT SPECIFIED ADDRESS  
 5#: MOV 8#,R4  
 MOV R5,(R4)+  
 ADD #2,R5  
 DECB 10#

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5717 027124 001372          BNE      5#
5718 027126 000002          RTI
5719 027130 000000          6#:    0
5720 027132 000000          7#:    0
5721 027134 000000          8#:    0
5722 027136      000          9#:    .BYTE 0
5723 027137      000          10#:   .BYTE 0
5724
5725
5726          ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
5727          ;BUFFER TO THE CHARACTERS "E" AND "C".
5728          ;IF THE CHARACTER IS "E" CLEAR THE FLAG
5729          ;IF THE CHARACTER IS "C" SET THE FLAG
5730
5731 027140 017605 000000      .PAWCH:MOV  @ (SP),R5
5732 027144 142737 000040 011272      BICB    @40,INBUF      ;SET FOR LOWER CASE INPUT
5733 027152 122737 000105 011272      CMPB    @'E,INBUF      ;IS IT "E" ?
5734 027160 001002          BNE     1#
5735 027162 105015          CLRB    (R5)           ;000
5736 027164 000406          BR      2#
5737 027166 122737 000103 011272 1#:    CMPB    @'C,INBUF      ;IS IT "C" ?
5738 027174 001005          BNE     3#
5739 027176 112715 177777      MOVB    @-1,(R5)       ;3177
5740 027202 062716 000002      2#:    ADD    @2,(SP)
5741 027206 000002          RTI
5742 027210 104404          3#:    INSTER          ;RETRY
5743 027212 000752          BR      .PAWCH
5744
5745
5746
5747          ;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
5748          ;LINE NUMBER (SAVLIN) FOR DZLPR, DZTCR AND DZCSR
5749          ;REGISTER USAGE.
5750
5751 027214 013737 001372 027432      SET:    MOV    SAVLIN,NUMLIN ;SAVE SAVLIN
5752 027222 013700 001372          XTCRO:  MOV    SAVLIN,R0    ;COPY THE LINE NUMBER FOR LOOP CONTROL
5753 027226 005037 027434          CLR     NUMTCR          ;SET A DEFAULT OF LINE 0 OR NO LINES
5754 027232 012702 000001          MOV    @1,R2           ;SET A BIT POINTER TO THE FIRST LINE
5755 027236 005300          XTCR1:  DEC    R0           ;REDUCE THE INDICATOR.IS IT MINUS YET?
5756 027240 100402          BMI    SET1           ;IF SO, R2 POINTS TO THE RIGHT LINE
5757 027242 006302          ASL    R2             ;IF NOT, MOVE THE POINTER TO THE NEXT LINE
5758 027244 000774          BR     XTCR1          ;GO SEE IF THIS LINE IS THE ONE
5759 027246 012701 027310          SET1:  MOV    @TABLE2,R1 ;COPY THE CORRECT BIT POINTER
5760 027252 010237 027434          MOV    R2,NUMTCR
5761 027256 022137 027426          1#:    CMP    (R1)+,LINESP
5762 027262 001407          BEQ    2#
5763 027264 005721          TST    (R1)+          ;IS IT THE END OF TABLE?
5764 027266 001373          BNE    1#             ;NO
5765 027270 104402 027536          TYPE   ,MINVAL        ;INVALID BAUD RATE,BEGIN AGAIN
5766 027274 012705 025462          MOV    @BAUD,R5       ;JUMP TO BAUD THRU R5
5767 027300 000402          BR     3#
5768 027302 011137 027430          2#:    MOV    (R1),SPEED    ;SET UP BAUD RATE
5769 027306 000205          3#:    RTS    R5
5770
5771
5772

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5773  
5774 027310 000062  
5775 027312 010070  
5776 027314 000113  
5777 027316 010470  
5778 027320 000156  
5779 027322 011070  
5780 027324 000207  
5781 027326 011470  
5782 027330 000226  
5783 027332 012070  
5784 027334 000454  
5785 027336 012430  
5786 027340 001130  
5787 027342 013030  
5788 027344 002250  
5789 027346 013430  
5790 027350 003410  
5791 027352 014030  
5792 027354 003720  
5793 027356 014430  
5794 027360 004540  
5795 027362 015030  
5796 027364 007020  
5797 027366 015430  
5798 027370 011300  
5799 027372 016030  
5800 027374 016040  
5801 027376 016430  
5802 027400 022600  
5803 027402 017070  
5804 027404 177777 000000  
5805  
5806  
5807 027410 000000  
5808 027412 000000  
5809 027414 000000  
5810 027416 000000  
5811 027420 000000  
5812 027422 000000  
5813 027424 000000  
5814 027426 000156  
5815 027430 006307  
5816  
5817 027432 000100  
5818  
5819 027434 000001  
5820 027436 000240  
5821 027440 000000  
5822 027442 000000  
5823 027444 053200 041505 047524  
027466 041600 047117 051124  
027522 050200 051501 020123  
027536 044600 053116 046101  
027564 046200 047111 035105  
027574 041200 052501 020104

TABLE2: THE FOLLOWING IS A TABLE OF LEGAL BAUD RATES (8 BITS/CHAR)  
.WORD 50. ;50 BAUD  
.WORD 10070 ;  
.WORD 75. ;75 BAUD  
.WORD 10470 ;  
.WORD 110. ;110 BAUD  
.WORD 11070 ;TWO STOP BITS  
.WORD 135. ;134.5 BAUD  
.WORD 11470 ;TWO STOP BITS  
.WORD 150. ;150 BAUD  
.WORD 12070 ;TWO STOP BITS  
.WORD 300. ;300 BAUD  
.WORD 12430 ;ONE STOP BIT  
.WORD 600. ;600 BAUD  
.WORD 13030 ;ONE STOP BIT  
.WORD 1200. ;1200 BAUD  
.WORD 13430 ;ONE STOP BIT  
.WORD 1800. ;1800 BAUD  
.WORD 14030 ;ONE STOP BIT  
.WORD 2000. ;2000 BAUD  
.WORD 14430 ;ONE STOP BIT  
.WORD 2400. ;2400 BAUD  
.WORD 15030 ;ONE STOP BIT  
.WORD 3600. ;3600 BAUD  
.WORD 15430 ;ONE STOP BIT  
.WORD 4800. ;4800 BAUD  
.WORD 16030 ;ONE STOP BIT  
.WORD 7200. ;7200 BAUD  
.WORD 16430 ;ONE STOP BIT  
.WORD 9600. ;9600 BAUD  
.WORD 17070 ;  
.WORD -1.0 ;TABLE TERMINATOR

WCHFLG: 0 ;ECHO OR CABLE FLAG  
STFLG: 0 ;PROGRAM START FLAG  
LOCKUP: 0 ;TIMEOUT FLAG  
LAST: 0 ;LAST ERROR PC  
TDATA: 0  
RDATA: 0  
BYTCNT: 0  
LINE SP: 110. ;DEFAULT BAUD RATE  
SPEED: 6307 ;DEFAULT 110 BAUD, 8 BITS/CHAR.  
;FDX, 2 STOP BITS  
NUMLIN: 100 ;DEFAULT VALUE, REC. INTERRUPT ENABLED  
NUMTCR: 1 ;DEFAULT VALUE, TCR BIT 0  
PRIO: 240 ;DEFAULT DEVICE PRIORITY 5  
RECDAT: 0  
TBUF: 0  
MVECTO: .ASCIZ <200>/VECTOR ADDRESS - /  
MREGAD: .ASCIZ <200>/CONTROL REGISTER ADDRESS - /  
MPASS: .ASCIZ <200>/PASS DONE./  
MINVAL: .ASCIZ <200>/INVALID BAUD RATE - /  
MLINE: .ASCIZ <200>/LINE: /  
MSPEED: .ASCIZ <200>/BAUD RATE - /

CZDZA-MO  
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CZDZA DZ11 DEVICE DIAGNOSTICS.

027612	052200	050131	020105
027652	053600	044510	044103
027720	052200	051105	044515
027745	200	040503	046102
027762	006777	177777	177412
027771	124	042510	050440
030066	006777	177777	177412
	030100		

```

MCHAR: .ASCIZ <200>/TYPE A CHAR. ON DZ11 TERMINAL /
MMICH: .ASCIZ <200>/WHICH TEST ? ECHO OR CABLE (E OR C) /
MTERM: .ASCIZ <200>/TERMINAL ECHO TEST /
MCABLE: .ASCIZ <200>/CABLE TEST /
MQUICK: .ASCII <377><15><377><377><12><377><377>
        .ASCII /THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789/
        .ASCII <377><15><377><377><12><377><377><377><0>

```

```

.EVEN
;*****
;UTILITIES
;*****

```

5824  
5825  
5826  
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5869

```

;THIS UTILITY CALCULATES PRIORITY LEVEL,SETS UP CSR'S,SETS UP VECTORS.
DZLEV: ASL      DZPRT      ;BUILD PRIORITY IN THIS LOCATION
        ASL      DZPRT      ;USING ARITHMETIC SHIFTS, ROTATE
        ASL      DZPRT      ; THE PRIORITY LEVEL PAST
        ASL      DZPRT      ; THE BIT POSITIONS CORRE-
        ASL      DZPRT      ; SPONDING TO THE CONDITION CODES
        MOV      DZPRT,LESS1 ;MOVE THIS TO LESS1
        SUB      #1,LESS1    ;CREATE THE NEXT LOWEST PRIORITY
        BIC      #37,LESS1   ;INSURE THAT THE TNZVC BITS ARE CLEAR
        MOV      DZRIV,RO    ;PLACE THE BASE VECTOR ADDRESS IN RO
        ADD      #2,RO       ;CALCULATE THE RECEIVER INTERRUPT STATUS ADDR.
        MOV      RO,DZ RIS   ;STORE IT HERE
        ADD      #2,RO       ;CALCULATE THE TRANSMITTER INTERRUPT VECTOR
        MOV      RO,DZTIV   ;STORE IT HERE
        ADD      #2,RO       ;CALCULATE THE TRANSMITTER VECTOR STATUS ADDRESS
        MOV      RO,DZTIS   ;STORE IT HERE

```

```

;THIS SEGMENT SETS UP POINTERS FOR THE GIVEN DZ11. #BASE IS THE BASE ADDRESS
;OF THE DEVICE

```

```

        MOV      #BASE,RO    ;COPY THE ADDRESS BEING LOADED
        MOV      RO,DZCSR    ;XXX0
        INC      RO
        MOV      RO,HDZCSR   ;XXX1
        INC      RO
        MOV      RO,DZRBUF   ;XXX2
        MOV      RO,DZLPR    ;XXX2
        INC      RO
        MOV      RO,HDZRBUF  ;XXX3
        MOV      RO,HDZLPR   ;XXX3
        INC      RO
        MOV      RO,DZTCR    ;XXX4
        INC      RO
        MOV      RO,HDZTCR   ;XXX5
        INC      RO
        MOV      RO,DZMSR    ;XXX6
        MOV      RO,DZTDR    ;XXX6
        INC      RO
        MOV      RO,HDZMSR   ;XXX7
        MOV      RO,HDZTDR   ;XXX7
        RTS      PC
DZPRT: PR5
LESS1: PR4 ;LEVEL TO ALLOW INTERRUPTS

```

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 CZDZAH.P11       19-JUN-84 15:45           CZDZA DZ11 DEVICE DIAGNOSTICS.

			;ERROR ERROR TABLE	
	.ERRTAB:			;ERROR
5870				
5871	030312	000000	0	0
5872	030314	000000	0	
5873	030316	000000	0	
5874				
5875	030320	030540	EM1	;ERROR
5876	030322	032045	DM1	
5877	030324	032276	DT1	
5878				
5879	030326	030613	EM2	;ERROR 2
5880	030330	032070	DM2	
5881	030332	032310	DT2	
5882				
5883	030334	030641	EM3	;ERROR 3
5884	030336	032123	DM3	
5885	030340	032326	DT3	
5886				
5887	030342	030700	EM4	;ERROR 4
5888	030344	032123	DM3	
5889	030346	032326	DT3	
5890				
5891	030350	030727	EM5	;ERROR 5
5892	030352	032135	DM4	
5893	030354	032334	DT4	
5894				
5895	030356	030756	EM6	;ERROR 6
5896	030360	032135	DM4	
5897	030362	032334	DT4	
5898				
5899	030364	031014	EM7	;ERROR 7
5900	030366	032123	DM3	
5901	030370	032326	DT3	
5902				
5903	030372	031055	EM8	;ERROR 10
5904	030374	032123	DM3	
5905	030376	032326	DT3	
5906				
5907	030400	031117	EM9	;ERROR 11
5908	030402	032123	DM3	
5909	030404	032326	DT3	
5910				
5911	030406	031155	EM10	;ERROR 12
5912	030410	032123	DM3	
5913	030412	032326	DT3	
5914				
5915	030414	031214	EM13	;ERROR 13
5916	030416	032123	DM3	
5917	030420	032326	DT3	
5918				
5919	030422	031245	EM14	;ERROR 14
5920	030424	032123	DM3	
5921	030426	032326	DT3	
5922				
5923	030430	031277	EM15	;ERROR 15
5924	030432	000000	0	
5925	030434	000000	0	

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 CZDZAH.P11 19-JUN-84 15:45 CZDZA 0211 DEVICE DIAGNOSTICS.

5926				
5927	030436	031341	EM16	
5928	030440	032123	DM3	
5929	030442	032326	DT3	
5930				
5931	030444	031412	EM17	ERROR 17
5932	030446	032123	DM3	
5933	030450	032326	DT3	
5934				
5935	030452	031450	EM20	
5936	030454	032123	DM3	
5937	030456	032326	DT3	
5938				
5939	030460	031511	EM21	ERROR 21
5940	030462	032164	DM3	
5941	030464	032352	DT3	
5942				
5943	030466	031541	EM22	ERROR 22
5944	030470	032135	DM4	
5945	030472	032334	DT4	
5946				
5947	030474	031603	EM23	ERROR 23
5948	030476	032123	DM3	
5949	030500	032326	DT3	
5950				
5951	030502	031633	EM24	
5952	030504	032123	DM3	
5953	030506	032326	DT3	
5954				
5955	030510	031661	EM25	
5956	030512	032123	DM3	
5957	030514	032326	DT3	
5958				
5959	030516	031711	EM26	
5960	030520	032123	DM3	
5961	030522	032326	DT3	
5962				
5963	030524	031740	EM27	
5964	030526	032123	DM3	
5965	030530	032326	DT3	
5966				
5967	030532	032010	EM30	
5968	030534	032243	DM6	
5969	030536	032374	DT6	
5970				

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 CZDZAM.P11 19-JUN-84 15:45 CZDZA DZ11 DEVICE DIAGNOSTICS.

5971  
 5972

030540	047200	020117	046123	EM1:	.ASCIZ	<200>/NO SLAVE SYNC RESPONSE FROM DZ11 REGISTER/
030613	200	042522	044507	EM2:	.ASCIZ	<200>/REGISTER R/W FAILURE?
030641	200	051124	047101	EM3:	.ASCIZ	<200>/TRANSMIT READY (TROY) NOT SET/
030700	051200	041505	044505	EM4:	.ASCIZ	<200>/RECEIVER DONE NOT SET/
030727	200	040504	040524	EM5:	.ASCIZ	<200>/DATA COMPARISON ERROR/
030756	042200	030532	020061	EM6:	.ASCIZ	<200>/DZ11 «RECEIVER BUFFER» ERROR/
031014	052200	040522	051516	EM7:	.ASCIZ	<200>/TRANSMITTER FAILED TO INTERRUPT/
031055	200	047125	054105	EM8:	.ASCIZ	<200>/UNEXPECTED TRANSMITTER INTERRUPT/
031117	200	042522	042503	EM9:	.ASCIZ	<200>/RECEIVER FAILED TO INTERRUPT/
031155	200	047125	054105	EM10:	.ASCIZ	<200>/UNEXPECTED RECEIVER INTERRUPT/
031214	051600	046111	020117	EM13:	.ASCIZ	<200>/SILO ALARM SET TOO SOON/
031245	200	044523	047514	EM14:	.ASCIZ	<200>/SILO ALARM FAILED TO SET/
031277	200	041501	044524	EM15:	.ASCIZ	<200>/ACTION DETECTED ON INVALID LINE./
031341	200	042522	042101	EM16:	.ASCIZ	<200>/READING DZ1BUF DID NOT CLEAR SILO ALARM/
031412	042200	052101	020101	EM17:	.ASCIZ	<200>/DATA VALID SHOULD NOT BE SET/
031450	051200	041505	044505	EM20:	.ASCIZ	<200>/RECEIVER DONE SHOULD NOT BE SET/
031511	200	042522	040514	EM21:	.ASCIZ	<200>/RELATIVE TIMING ERROR./
031541	200	047515	042504	EM22:	.ASCIZ	<200>/MODEM SIGNAL ERROR ON CABLE TEST/
031603	200	040504	040524	EM23:	.ASCIZ	<200>/DATA VALID IS NOT SET!//
031633	200	040504	040524	EM24:	.ASCIZ	<200>/DATA OVERRUN IS SET!//
031661	200	051106	046501	EM25:	.ASCIZ	<200>/FRAMING ERROR OCCURRED/
031711	200	040520	044522	EM26:	.ASCIZ	<200>/PARITY ERROR OCCURRED/
031740	043200	046125	020114	EM27:	.ASCIZ	<200>/FULL BINARY COUNT PATTERN NOT RECEIVED/
032010	041200	052501	020104	EM30:	.ASCIZ	<200>/BAUD RATE TIMING TEST ERROR/
032045	200	051124	050101	DM1:	.ASCIZ	<200>/TRAP PC DZ11 REG/
032070	042600	050130	041505	DM2:	.ASCIZ	<200>/EXPECTED FOUND REGISTER/
032123	200	044514	042516	DM3:	.ASCIZ	<200>/LINE NO./
032135	200	054105	042520	DM4:	.ASCIZ	<200>/EXPECTED FOUND LINE/
032164	052200	020130	044514	DM5:	.ASCIZ	<200>/TX LINE PREVIOUS TIME ACTUAL TIME PARAMETER/
032243	200	044510	044107	DM6:	.ASCIZ	<200>/HIGH LOW COUNT LINE/

.EVEN

DATA TABLES FOR ERROR MESSAGES

032276	000002		DT1:	2	
032300	006	003		.BYTE	6.3
032302	001204			REG1	
032304	006	001		.BYTE	6.1
032306	001202			REG0	
032310	000003		DT2:	3	
032312	006	004		.BYTE	6.4
032314	001214			REG5	
032316	006	001		.BYTE	6.1
032320	001212			REG4	
032322	006	001		.BYTE	6.1
032324	001202			REG0	
032326	000001		DT3:	1	
032330	003	001		.BYTE	3.1
032332	001372			SAVLIN	
032334	000003		DT4:	3	
032336	006	004		.BYTE	6.4
032340	001214			REG5	
032342	006	001		.BYTE	6.1
032344	001212			REG4	



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CZDZAH.P11 19-JUN-84 15:45 CZDZA DZ11 DEVICE DIAGNOSTICS.

032346	003	001	.BYTE	3.1	
032350	001372		SAVLIN		
032352	000004		DT5:	4	
032354	003	005	.BYTE	3.5	
032356	001372		SAVLIN		
032360	006	011	.BYTE	6.9.	
032362	001214		#REG5		
032364	006	007	.BYTE	6.7	
032366	001220		#TMP1		
032370	006	001	.BYTE	6.1	
032372	001400		REGIST		
032374	000004		DT6:	4	;FOR BAUD RATE ERROR MESSAGE
032376	006	001	.BYTE	6.1	
032400	024110		DCOUNT		;HIGH COUNTER
032402	006	001	.BYTE	6.1	
032404	024104		CCOUNT		;LOW COUNTER
032406	006	001	.BYTE	6.1	
032410	024106		BCOUNT		;ACTUAL XMIT COUNT
032412	001	001	.BYTE	1.1	
032414	001372		SAVLIN		;THE LINE NUMBER ERROR OCCURED ON

TABLE OF DELAY TIMES FOR INDIVIDUAL BAUD RATES

032416	002450	DLYTBL:	2450	;TIME FOR	50 BAUD
032420	001560		1560	;TIME FOR	75 BAUD
032422	001120		1120	;TIME FOR	110 BAUD
032424	000750		750	;TIME FOR	134 BAUD
032426	000660		660	;TIME FOR	150 BAUD
032430	000330		330	;TIME FOR	300 BAUD
032432	000150		150	;TIME FOR	600 BAUD
032434	000060		60	;TIME FOR	1200 BAUD
032436	000040		40	;TIME FOR	1800 BAUD
032440	000030		30	;TIME FOR	2000 BAUD
032442	000020		20	;TIME FOR	2400 BAUD
032444	000010		10	;TIME FOR	3600 BAUD
032446	000001		1	;TIME FOR	4800 BAUD
032450	000001		1	;TIME FOR	7200 BAUD
032452	000001		1	;TIME FOR	9600 BAUD
032454	000001		1	;TIME OF DELAY FOR	19200 BAUD

DELAYS WERE COMPUTED TO ALLOW MAXIMUM TIME AT EACH BAUD RATE  
FOR ALL TESTS TO FUNCTION CORRECTLY ON A PDP11/45 WITH BIPOLAR  
MEMORY. THE TIMES WERE ALSO TESTED ON AN 11/40 AND 11/10.

032456		CORMAX:	
001512	001512		.-MANTO
	100000		100000
	000001		.END







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 CZDZAH.P11 19-JUN-84 15:45 CROSS REFERENCE TABLE -- USER SYMBOLS

DZCR1	001514	1379*	1813												
DZCR10	001640	1442*													
DZCR11	001654	1451*													
DZCR12	001670	1460*													
DZCR13	001704	1469*													
DZCR14	001720	1478*													
DZCR15	001734	1487*													
DZCR16	001750	1496*													
DZCR17	001764	1505*													
DZCR2	001530	1388*													
DZCR3	001544	1397*													
DZCR4	001560	1406*													
DZCR5	001574	1415*													
DZCR6	001610	1424*													
DZCR7	001624	1433*													
DZCSR	002042	1575*	2026	2477*	2478	2485*	3055	3099	3135	3173	3211	3249	3287	3431	
		3474	3694	3753*	3757	3761	3786	3807	3814	3855*	3859	3863	3888	3937*	
		3939	3967	3988	4031*	4055	4108*	4111	4126*	4132*	4136	4191*	4194	4206*	
		4211*	4217*	4221	4236*	4276*	4290	4295	4303	4309	4314*	4315*	4356*	4389*	
		4398	4404*	4410	4454*	4461	4466	4476	4482	4518	4544*	4548*	4553*	4595*	
		4607	4617	4623	4627	4683*	4684*	4685*	4706	4731	4739	4880*	4882	4958*	
		4962	5026*	5030	5168*	5181	5248	5252*	5285*	5304	5346*	5427	5430	5493*	
		5496	5520*	5530	5548*	5556	5562*	5597*	5620	5655	5847*				
DZLEV	030100	2838	5828*												
DZLPR	002052	1579*	3443*	3520*	3528*	3746*	3842*	3930*	4025*	4094*	4177*	4266*	4383*	4442*	
		4581*	4671*	4849*	4860*	4937*	5005*	5175*	5432*	5492*	5516*	5604*	5852*		
DZLV0	001504	1372*	1730	1734	1766*	1769*									
DZLV1	001520	1381*													
DZLV10	001644	1444*													
DZLV11	001660	1453*													
DZLV12	001674	1462*													
DZLV13	001710	1471*													
DZLV14	001724	1480*													
DZLV15	001740	1489*													
DZLV16	001754	1498*													
DZLV17	001770	1507*													
DZLV2	001534	1390*													
DZLV3	001550	1399*													
DZLV4	001564	1408*													
DZLV5	001600	1417*													
DZLV6	001614	1426*													
DZLV7	001630	1435*													
DZMSR	002062	1583*	3073	3549	3590	3653	5439*	5585	5861*						
DZNUM	001410	1308*	1639	1803*	2003	2932*	2973*	2974	2980	2982					
DZPRT	030306	2832*	2833	2834*	4100*	4106	4107	4130	4131	4189	4190	4215	4216	4273	
		4275	4877	4878	4956	4957	5024	5025	5828*	5829*	5830*	5831*	5832*	5833	
		5867*													
DZRBUF	002046	1577*	3061	3518	3792	3853	3894	3971	3992	4032	4061	4287	4325	4514	
		4528	4600	4734	5221	5232	5307	5312	5430*	5431*	5432	5433	5533	5623	
		5851*													
DZRIS	002074	1589*	4106*	4130*	4189*	4215*	4273*	4357	4358*	4594*	4680*	4791	4792*	4877*	
		4956*	5024*	5518*	5599*	5838*									
DZRIV	002072	1588*	2029	2831*	4105*	4129*	4188*	4214*	4272*	4357*	4593*	4622*	4679*	4791*	
		4876*	4955*	5023*	5419	5517*	5598*	5836							
DZTCR	002056	1581*	3067	3324	3372	3444*	3700*	3756*	3797*	3858*	3901*	3936*	3954*	3962*	
		4035*	4068*	4101*	4184*	4286*	4349*	4396*	4460*	4532*	4547*	4605*	4643*	4686*	





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LINE7	001632	1436#												
LOBITS	006644	2333*	2363	2380#										
LOCK	001362	1293#	2112	2114	2501*	2538	3054*	3060*	3066*	3072*	3326*	3355*	3374*	3413*
		3586*	3647*	3737*	3833*	3907*	4014*	4071*	4433*	4572*	4649*	4824*	5578*	
LOCKUP	027414	5468*	5614*	5619*	5809#									
LOLIM	006636	2330*	2361	2377#										
LP0	= 000000	992#												
LP1	= 000001	993#												
LP2	= 000002	994#												
LP3	= 000003	995#												
LP4	= 000004	996#												
LP5	= 000005	997#												
LP6	= 000006	998#												
LP7	= 000007	999#												
MAINT	= 000010	944#	2101	2752	3136	3476	3489							
MANT0	001512	1375#	1779	1858	2991	5972								
MANT1	001526	1384#												
MANT10	001652	1447#												
MANT11	001666	1456#												
MANT12	001702	1465#												
MANT13	001716	1474#												
MANT14	001732	1483#												
MANT15	001746	1492#												
MANT16	001762	1501#												
MANT17	001776	1510#												
MANT2	001542	1393#												
MANT3	001556	1402#												
MANT4	001572	1411#												
MANT5	001606	1420#												
MANT6	001622	1429#												
MANT7	001636	1438#												
MATEK	010766	2540	2730#											
MBADLN	011075	1867	2730#											
MCABLE	027745	5475	5823#											
MCHAR	027612	5521	5823#											
MCSRX	010716	1991	2545	2730#										
MDATA	011376	2434	2444	2774#										
MEPASS	010535	1990	2730#											
MERRPC	011043	2543	2730#											
MERRX	010743	1999	2730#											
MERR2	010574	2730#	2807	2995										
MERR3	010643	1929	2730#											
MINVAL	027536	5765	5823#											
MLINE	027564	5457	5823#											
MLOCK	010667	1964	2730#											
MNEW	010771	1924	2730#											
MNTFLG	001417	1319#	2098*	2101*	2485	2747*	2752*	2757*						
MODE	001370	1300#	2099	2837*	3594	3648	3770	3872	4015	4040	4330	4500	4850	4923
		4991												
MPASS	027522	5666	5823#											
MPASSX	010732	1996	2730#											
MPFAIL	010472	2723	2730#											
MQUICK	027762	5495	5823#											
MR	010560	1969	2730#											
MREGAD	027466	5423	5823#											
MSENAB	= 000040	946#	3174	3445	3446	3476	3489	3695	3701	3753	3855	3937	4031	4108





















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\$RTNAD	005070	2022#												
\$SAVR6	010470	2701*	2709	2710*	2711*	2729#								
\$SCOPE	005122	1631	2052#											
\$SETUP	000000	2004	2053											
\$SVLAD	005320	2074	2092#											
\$SVPC	000040	1133#	1138											
\$SMR	164000	796#	808	1200	1201	1982	2004	2015	2021	2023	2046	2047	2048	2049
		2065	2077	2079	2080	2081	2082	2083	2095	2105	2726	3049	3096	3132
		3170	3208	3246	3284	3321	3369	3428	3470	3514	3545	3583	3644	3690
		3734	3830	3921	4011	4083	4166	4255	4372	4430	4569	4660	4820	4920
		4988	5056											
\$SMREG	001256	1221#	2912											
\$SMRPK	000000	2049												
\$TESTN	001240	1212#	2093*											
\$TIMES	001226	1200#	2004*	2082*	2088	2091*	2105	2810*	4822*					
\$TKB	001166	1181#	1747	1753	2061	2063	2191	2198	2220	2291	2297	2311	2593	2600
		2621	2628	2657	2664	5524	5611							
\$TKS	001164	1180#	1745	1751	2059	2189	2196	2220	2289	2295	2598	2612	2619	2626
		2655	2662	5522	5609									
\$TMP0	001216	1196#	4546*	4551*	4828*	4830	4841*	4879						
\$TMP1	001220	1197#	1744*	1790	1803	1804	1805*	1913*	2732	4872*	4884*	5296*	5336	5340
		5972												
\$TMP2	001222	1198#	1810*	1816*	1817*	1914*	1915	2734	5294*	5297*				
\$TMP3	001224	1199#	4873*	4886*	5295*									
\$TN	000040	808#	3047	3049#	3094	3096#	3130	3132#	3168	3170#	3206	3208#	3244	3246#
		3282	3284#	3319	3321#	3367	3369#	3426	3428#	3468	3470#	3512	3514#	3543
		3545#	3581	3583#	3642	3644#	3688	3690#	3732	3734#	3828	3830#	3919	3921#
		4009	4011#	4081	4083#	4164	4166#	4253	4255#	4370	4372#	4428	4430#	4567
		4569#	4658	4660#	4818	4820#	4918	4920#	4986	4988#	5054	5056#		
\$TPB	001172	1183#	1765*	2209*	2220	2311*	2512*	2643*						
\$TPFLG	001177	1187#	2139	2220										
\$TPS	001170	1182#	2205	2220	2309	2510	2641							
\$TSTM	001466	1359#												
\$TSTM	001122	1160#	1646*	2045	2092*	2093	2095	2106	2589	2850	2859	3049*	3096*	3132*
		3170*	3208*	3246*	3284*	3321*	3369*	3428*	3470*	3514*	3545*	3583*	3644*	3690*
		3734*	3830*	3921*	4011*	4083*	4166*	4255*	4372*	4430*	4569*	4660*	4820*	4920*
		4988*	5056*	5488*	5571*									
\$TYPE	005440	2139#	2251											
\$TYPEC	005652	2169	2176	2183	2188#									
\$TYPEX	006002	2208	2213	2215	2218#									
\$UNIT	001246	1215#												
\$UNITM	001472	1361#												
\$USMR	001260	1222#												
\$VECT1	001304	1247#	1720*	1734*	1735*	1736*	1737*	1738*	1739*	2881	2884	3033*		
\$VECT2	001306	1248#												
\$XOFF	000023	955#	1749	2193	2220	2293	2595	2623	2659					
\$XON	000021	954#	1755	1759	2061	2200	2207	2220	2299	2303	2602	2605	2630	2633
		2666	2669											
\$XTSTR	005176	2057	2068#											
\$Y	000020	1514#	1521	1523#	1524	1526#	1527	1529#	1530	1532#	1533	1535#	1536	1538#
		1539	1541#	1542	1544#	1545	1547#	1548	1550#	1551	1553#	1554	1556#	1557
		1559#	1560	1562#	1563	1565#	1566	1568#						
\$GET4	000000	2015#												
\$40CAT	***** U	2065												
.	001514	1112#	1113	1116#	1120#	1133	1134#	1136#	1138#	1140#	1143#	1145#	1149#	1157#
		1204	1306#	1308#	1321#	1346	1347#	1349#	1351#	1366#	1370#	1371#	1372#	1373#







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. ABS. 032456 000

ERRORS DETECTED: 0

CZDZAH,CZDZAH/CRF/SOL/NL:TOC=CZDZAH.P11  
RUN-TIME: 24 19 2 SECONDS  
RUN-TIME RATIO: 132/46=2.8  
CORE USED: 38K (75 PAGES)