

DZ11

8-LINE ASYNCHMUX TESTS
MD-11-DZDZA-B

EP-DZDZA-B-DL-A

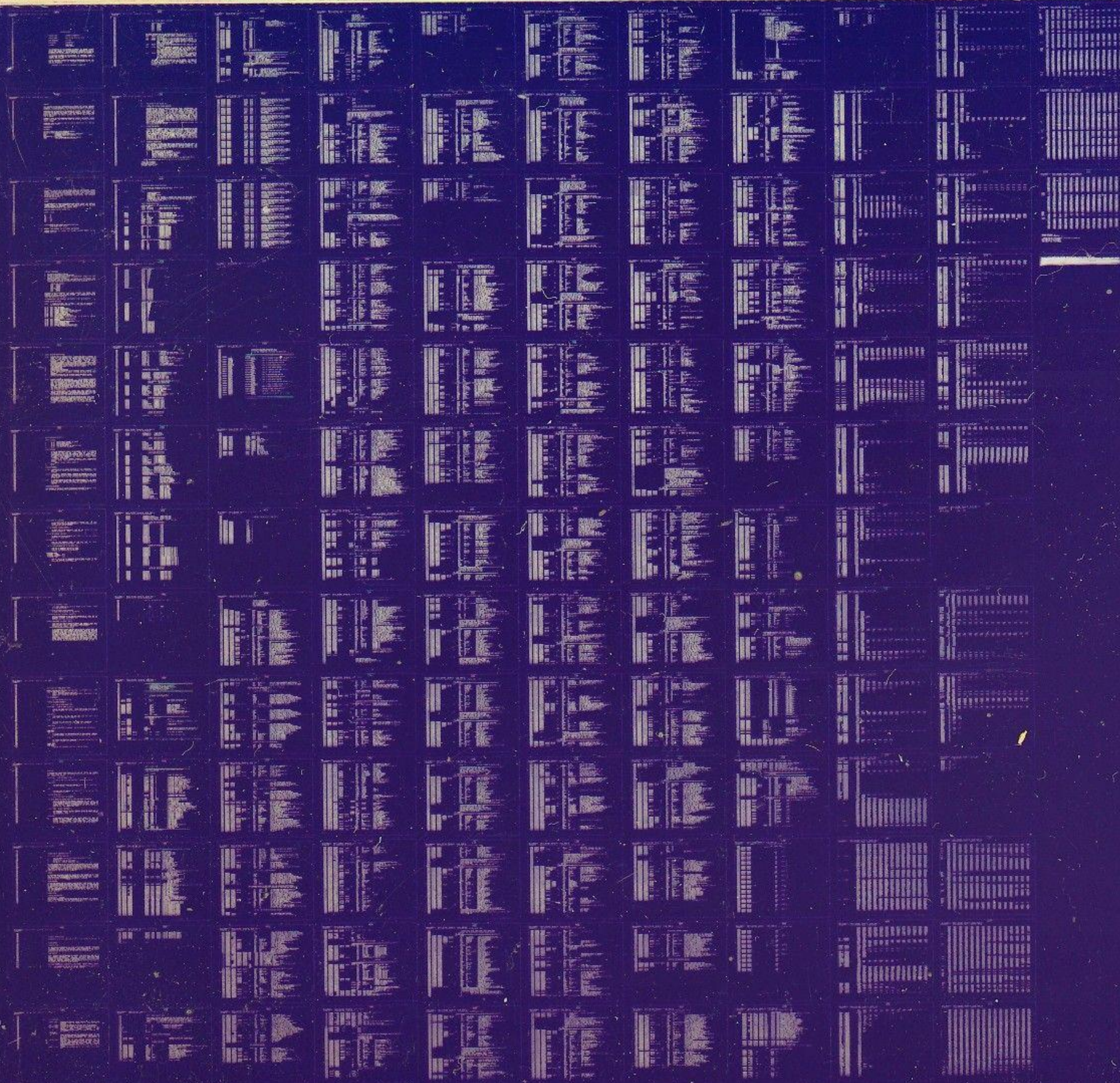
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MADE IN USA



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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDZA-B-D
PRODUCT NAME: DZ11 8 LINE ASYNC MUX TESTS
DATE RELEASED: OCT 1976
MAINTAINER: DIAGNOSTICS
AUTHORS: JOHN EGOLF
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2. REQUIREMENTS

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. 'CONSOLE INPUT MAY BE DONE AT ANY START TIME IF SW00=1.

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

2. REQUIREMENTS

2.1 EQUIPMENT

ANY POP11 FAMILY CPU (WITH MINIMUM 8K MEMORY)
 ASR 33 (OR EQUIVALENT FOR CONSOLE)
 DZ11 INTERFACE MODULE (M7819(EIA), M7814(20MA))
 H327 STAGGERED TURNAROUND CONNECTOR. (IF
 AND BREAK ARE TO BE TESTED.
 H325 CABLE TURNAROUND AND DIST PNL TESTING.
 H315 THIS MAY BE SUBSTITUTED FOR H325.

PARITY

D01

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 (SW00=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 LEAVE OR SET SW00=1 FOR USER INPUT FROM CONSOLE TERMINAL.
 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 160010
 1502 000300
 1504 000005
 1506 000377
 1510 017470
 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" {1G} 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; CLR-DO AUTO SIZE. IF 1ST START OF PROGRAM AFTER LOADING.
SW 06	SET: RESELECT DZ11'S DESIRED ACTIVE
SW 05	SET: RESERVED
SW 04	SET: SELECT DELAY PARAMETER(DEFAULT = 36)
SW 03	SET: EXTRA PARAMETER INPUT
SW 02	SET: LOCK ON SELECTED TEST
SW 01	SET: RESTART PROGRAM AT SELECTED TEST
SW 00	SET: GET USERS PARAMETERS FROM CONSOLE

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 SWITCHS 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 HASS 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 CANN'T BE SINGLED OUT.

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 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 177776.

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4.1.3 SWITCH REGISTER PRIORITYS

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') ON AN ERROR; IF AN '*' IS PRINTED IN FRONT OF THE TEST NO. (EX. *TEST NO. 10) SW09 IS INCORPORATED IN THAT TEST AND THEREFORE SW09 IS *USUALLY* THE BEST SWITCH FOR THE SCOPE LOOP (SW14=0, SW10=0, SW09=1, SW08=0). IF SW09 IS NOT ENABELED; AND THERE IS A *HARD* ERROR (CONSTANT); SW08 IS BEST.
(SW14=1, 0, SW10=0, SW09=0, SW08=1). FOR INTERMITTENT ERRORS; SW14=1 WILL LOOP ON TEST REGARDLESS OF ERROR OR NOT ERROR.
(SW14=1, SW10=0, SW09=0, SW08=1,0)
2. SW 14
3. SW 11

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 EIA 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.

5.1 NORMAL START OF DIAGNOSTIC

ON THE FIRST START OF THE DIAGNOSTIC AT ADDRESS 200: IF AUTO
SIZING IS NOT USED OR WHENEVER SW00=1; THE FOLLOWING QUESTIONS
ARE ASKED AND MUST BE ANSWERED.

"1ST CSR ADDRESS (160000:163700): "

YOU MUST TYPE IN THE FIRST DZ11 CSR IN THE SYSTEM YOU WISH
TESTING TO BEGIN AT. RANGE: 160000:163700

"1ST VECTOR ADDRESS (300:770): "

YOU MUST TYPE IN THE VECTOR OF THE FIRST DZ11 IN THE SYSTEM
UNDER TEST. RANGE 300:770

"BR LEVEL (4:6): "

TYPE IN THE PRIORITY LEVEL OF THE DZ11 THAT THE ABOVE
INFORMATION HAS BEEN GIVEN ABOUT. RANGE 4 OR 5 OR 6.

"TYPE "A" FOR EIA MODULE OR "B" FOR 20MA (A:B): "

TYPE "A" IF RUNNING A DZ11-A,B,E (EIA).
TYPE "B" IF RUNNING A DZ11-C,D,F (20MA).
TYPING A <CR> DEFAULTS TO EIA MODULES.

"MAINTAINCE MODE
[EXTERNAL <H325> (E)]
[INTERNAL <DZCSR03=1> (I)]
[STAGGERED <H327> (S)]

TYPE "E" OR "I" OR "S" DEPENDING ON WHICH MODE YOU WISH TO RUN
IN. IF RUNNING "EXTERNAL"; ALL SELECTED LINES MUST BE
TERMINATED BY A H325 TEST CONNECTOR.

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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> (00:17): "

THIS GIVES THE USER A CHANCE TO CHANGE THE DEFAULT BAUD RATE
USED IN APP. 90% OF THE TEST. NORMAL OPERATION IS A "17"
(19.2K) OR "16" (9.6K). "00"(50 BAUD)- NOT ADVISED.

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.

5.2 HOW TO RUN THE "CABLE/ECHO" TESTS.

NORMAL STARTING FOR THE FIRST TIME WOULD BE: LOAD ADDRESS 210; START WITH THE SWR EQUAL TO 213.

NOTE: SW00=1 ASKS FOR "VECTOR" AND "CSR"
SW01=1 ASKS FOR "WHICH TEST ECHO OR CABLE", "BAUD RATE", "LINE"
UNDER TEST. PROGRAM WILL PRINT OUT:

"VECTOR ADDRESS-"

YOU TYPE VECTOR WITH A <CR>.

"CONTROL REGISTER ADDRESS-"

YOU TYPE IN DZCSR UNDER TEST.

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

LETS DO THE CABLE TEST FIRST. **THIS TEST IS ONLY TO BE DONE ON THE EIA VERSION OF THE DZ11 NOT THE 20MA VERSION". TYPE "C" <CR>

"BAUD RATE- "

TYPE EITHER 50, 110, 135, 150, 300, 600, 1200 1800, 2000, 2400, 3600, 4800, 7200, 9600 FOLLOWED BY <CR>

"LINE: "

YOU TYPE THE LINE WHICH HAS THE H325 TEST CONNECTOR. (TYPE EITHER 0, 1, 2, 3, 4, 5, 6, 7) PROGRAM WILL THEN PRINT:

"CABLE TEST"

AND IF EVERYTHING IS WORKING; THE FOLLOWING WILL BE PRINTED:

"PASS DONE."

"PASS DONE."

ETC.

TO CHANGE LINES: HIT ANY PRINTING KEY ON YOUR CONSOLE TERMINAL WHILE THE PROGRAM IS RUNNING AND THE FOLLOWING WILL BE PRINTED:

"LINE: "

NOW CHANGE THE H325 TEST CONNECTOR TO ANOTHER LINE AND TYPE THE NEW LINE. PROGRAM WILL THEN PRINT:

"CABLE TEST"

"PASS DONE."

"PASS DONE."

CONTINUE THIS OPERATION UNTIL ALL LINES ARE TESTED.

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 212. 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. PROGRAM WILL 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 PROGRAM IS STARTED AT 210. 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; DO LIKE CABLE TEST. HIT PRINTABLE KEY ON CONSOLE TERMINAL. AND CHANGE THE LINE ON WHICH THE TERMINAL IS CONNECTED. AND ENTER THE NEW LINE TO THE PROGRAM.

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5.4 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

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

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

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 'TSTNO' (ADDRESS 1216) 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. (PLEASE)
STATUS TABLE SHOULD BE VERIFIED REGARDLESS OF HOW PROGRAM WAS STARTED. ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH THE INFORMATION PRINTED ON THE TTY TO COMPLETLY 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=2 (DELETE ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION. THE ACTUAL EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION.

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 DZDZA-B CSR: 160010 VEC: 300 PASSES: 000001 ERRORS: 000000

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.

B.4A MORE ON THAT 'STATUS TABLE' (1500-2000)

'MAP OF DZ11 STATUS'

1500	160010
1502	000300
1504	000005
1506	000377
1510	017470
1512	000000

THE ABOVE INFORMATION WILL BE REPEATED FOR EACH OF UP TO 8 DZ11'S IN THE SYSTEM (THESE WILL FOLLOW UNDER THIS TABLE). EXPLANATION:

1500	160010	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 EIA; IF BIT15=1 MODULE SHOULD BE 20MA.
1506	000377	THIS IS THE BINARY REPRESENTATION OF WHAT LINES ARE TO BE TESTED.
1510	017470	THIS IS THE PARAMETER LOCATION USED IS MOST OF THE TESTS. IT INDICATED PARAMETERS OF: RX ON, SPEED SELECT 17 (19.2K 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.
1512	000000	THIS LOCATION WILL CONTAIN EITHER ALL ZEROS INDICATING THAT INTERNAL LOOP WAS SELECTED AS MODE OF OPERATION OR IT WILL CONTAIN 10000 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 160000 AND START 'REFERENCEING' THE ADDRESS IN THE POINTER. IF A NON-EX MEMORY TRAP OCCURS, 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 NXN 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.

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 OCCURS (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% OF THE PARAMETER SETUP WAS DONE BY THE PROGRAM AND 5% BY YOU.

THEREFORE:

- 1) BUS PRIORITY IS SET TO LEVEL5.
 - 2) ALL EIGHT LINES ARE ASSUMED TO BE TESTED.
 - 3) DEFAULT BAUD RATE IS SET TO 17 (19.2 K).
 - 4) MODE OF OPERATION IS "INTERNAL MODE".
 - 5) MODULE IS ASSUMED TO BE "EIA" VERSION.
- SET BIT 15 IN PRIORITY ENTRY OF MAP IF YOU HAVE A 20MA MODULE.

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

TITLE MD-11-DZDZA-B
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*MAYNARD, MASS. 01754

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643      ;*
644      ;*PROGRAM BY JERRYL PAYNE,JOHN EGOLF
645      ;*
646      ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
647      ;*PACKAGE (MAINDEC-11-DZQAC-CO),MAR 21, 1976.
648      ;*
649      ;*
650      ;*
651      ;*
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693      ;*
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695      ;*
696      ;*
697      ;*
698      ;*

```

000001

```

;STN=1
;STARTING PROCEDURE
;LOAD PROGRAM
;LOAD ADDRESS 000200
;PRESS START
;PROGRAM WILL TYPE "MAINDEC-11-DZDZAB/<200>/EIGHT LINE ASYNC MUX TESTS"
;PROGRAM WILL TYPE "RUNNING" TO INDICATE THAT TESTING HAS STARTED
;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
;AND THEN RESUME TESTING

.SBTTL BASIC DEFINITIONS

;*INITIAL ADDRESS OF THE STACK POINTER *** 1120 ***
STACK= 1120
.EQUIV EMT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
.EQUIV IOT,SCOPE      ;;BASIC DEFINITION OF SCOPE CALL

;*MISCELLANEOUS DEFINITIONS
HT= 11                ;;CODE FOR HORIZONTAL TAB
LF= 12                ;;CODE FOR LINE FEED
CR= 15                ;;CODE FOR CARRIAGE RETURN
CRLF= 200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
PS= 177776            ;;PROCESSOR STATUS WORD
.EQUIV PS,PSW
STKLMT= 177774         ;;STACK LIMIT REGISTER
PIRQ= 177772           ;;PROGRAM INTERRUPT REQUEST REGISTER
DSMR= 177570           ;;HARDWARE SWITCH REGISTER
DDISP= 177570          ;;HARDWARE DISPLAY REGISTER

;*GENERAL PURPOSE REGISTER DEFINITIONS
R0= %0                ;;GENERAL REGISTER
R1= %1                ;;GENERAL REGISTER
R2= %2                ;;GENERAL REGISTER
R3= %3                ;;GENERAL REGISTER
R4= %4                ;;GENERAL REGISTER
R5= %5                ;;GENERAL REGISTER
R6= %6                ;;GENERAL REGISTER
R7= %7                ;;GENERAL REGISTER
.EQUIV R6,SP           ;;STACK POINTER
.EQUIV R7,PC           ;;PROGRAM COUNTER

;*PRIORITY LEVEL DEFINITIONS
PR0= 0                ;;PRIORITY LEVEL 0
PR1= 40               ;;PRIORITY LEVEL 1
PR2= 100              ;;PRIORITY LEVEL 2
PR3= 140              ;;PRIORITY LEVEL 3
PR4= 200              ;;PRIORITY LEVEL 4
PR5= 240              ;;PRIORITY LEVEL 5
PR6= 300              ;;PRIORITY LEVEL 6
PR7= 340              ;;PRIORITY LEVEL 7

```

001120

000011

000012

000015

000200

177776

177774

177772

177570

177570

000000

000001

000002

000003

000004

000005

000006

000007

000000

000040

000100

000140

000200

000240

000300

000340

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BASIC DEFINITIONS699
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745
746
747
748
749
750
751
752
753
754100000
040000
020000
010000
004000
002000
001000
000400
000200
000100
000040
000020
000010
000004
000002
000001100000
040000
020000
010000
004000
002000
001000
000400
000200
000100
000040
000020
000010
000004
000002
000001

.*"SWITCH REGISTER" SWITCH DEFINITIONS

SW15= 100000
SW14= 40000
SW13= 20000
SW12= 10000
SW11= 4000
SW10= 2000
SW09= 1000
SW08= 400
SW07= 200
SW06= 100
SW05= 40
SW04= 20
SW03= 10
SW02= 4
SW01= 2
SW00= 1
.EQUIV SW09,SW9
.EQUIV SW08,SW8
.EQUIV SW07,SW7
.EQUIV SW06,SW6
.EQUIV SW05,SW5
.EQUIV SW04,SW4
.EQUIV SW03,SW3
.EQUIV SW02,SW2
.EQUIV SW01,SW1
.EQUIV SW00,SW0

.*DATA BIT DEFINITIONS (BIT00 TO BIT15)

BIT15= 100000
BIT14= 40000
BIT13= 20000
BIT12= 10000
BIT11= 4000
BIT10= 2000
BIT09= 1000
BIT08= 400
BIT07= 200
BIT06= 100
BIT05= 40
BIT04= 20
BIT03= 10
BIT02= 4
BIT01= 2
BIT00= 1
.EQUIV BIT09,BIT9
.EQUIV BIT08,BIT8
.EQUIV BIT07,BIT7
.EQUIV BIT06,BIT6
.EQUIV BIT05,BIT5
.EQUIV BIT04,BIT4
.EQUIV BIT03,BIT3
.EQUIV BIT02,BIT2
.EQUIV BIT01,BIT1
.EQUIV BIT00,BIT0

```

755
756
757      000004
758      000010
759      000014
760      000014
761      000014
762      000020
763      000024
764      000030
765      000034
766      000060
767      000064
768      000240
769
770
771
772
773
774      005746
775      005726
776      010046
777      012600
778      024646
779      022626
780
781
782
783
784
785      000010
786      000020
787      000040
788      000100
789      000200
790      010000
791      020000
792      040000
793      100000
794
795
796
797      000000
798      000400
799      001000
800      001400
801      002000
802      002400
803      003000
804      003400
805
806
807
808
809
810      010000

; *BASIC "CPU" TRAP VECTOR ADDRESSES
ERRVEC= 4      ; TIME OUT AND OTHER ERRORS
RESVEC= 10     ; RESERVED AND ILLEGAL INSTRUCTIONS
TBITVEC=14     ; "T" BIT
TRTVEC= 14     ; TRACE TRAP
BPTVEC= 14     ; BREAKPOINT TRAP (BPT)
IOTVEC= 20     ; INPUT/OUTPUT TRAP (IOT) **SCOPE**
PWRVEC= 24     ; POWER FAIL
EMTVEC= 30     ; EMULATOR TRAP (EMT) **ERROR**
TRAPVEC=34     ; "TRAP" TRAP
TKVEC= 60     ; TTY KEYBOARD VECTOR
TPVEC= 64     ; TTY PRINTER VECTOR
PIRQVEC=240    ; PROGRAM INTERRUPT REQUEST VECTOR

; INSTRUCTION DEFINITIONS
;-----
PUSH1SP=5746   ; DECREMENT PROCESSOR STACK 1 WORD
POP1SP=5726    ; INCREMENT PROCESSOR STACK 1 WORD
PUSHRO=10046   ; SAVE RO ON STACK
POPRO=12600    ; RESTORE RO FROM STACK
PUSH2SP=24646  ; DECREMENT STACK TWICE
POP2SP=22626   ; INCREMENT STACK TWICE

; DZ11 CONTROL AND STATUS REGISTER DEFINITIONS
; (DZCSR) BIT DEFINITIONS
;-----
MAINT = BIT3   ; MAINTENANCE MODE ENABLE
DCLR=BIT4      ; DEVICE CLEAR
MSENAB=BIT5    ; MASTER SCAN ENABLE
RIE=BIT6       ; RECEIVER INTERRUPT ENABLE
RDONE=BIT7     ; RECEIVER DONE
SILOEN= BIT12  ; SILO ALARM ENABLE
SILOAL = BIT13 ; SILO ALARM
TIE=BIT14      ; TRANSMITTER INTERRUPT ENABLE
TRDY=BIT15     ; TRANSMITTER READY

; DZCSR WORD DEFINITIONS
;-----
TL0=0          ; TRANSMIT LINE 0
TL1=BIT8       ; TRANSMIT LINE 1
TL2=BIT9       ; TRANSMIT LINE 2
TL3=BIT9!BIT8  ; TRANSMIT LINE 3
TL4=BIT10      ; TRANSMIT LINE 4
TL5=BIT10!BIT8 ; TRANSMIT LINE 5
TL6=BIT10!BIT9 ; TRANSMIT LINE 6
TL7=BIT10!BIT9!BIT8 ; TRANSMIT LINE 7

; DZRBUF BIT DEFINITIONS
;-----
PARER=BIT12    ; PARITY ERROR

```


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GENERAL DEFINITIONS AND EQUIVALENCES

811	020000	FRMERR=BIT13	:FRAME ERROR
812	040000	OVRRUN=BIT14	:OVERRUN ERROR
813	100000	DVALID=BIT15	:DATA VALID
814			
815			
816			
817			
818	000000	RL0=0	:RECEIVER LINE 0
819	000400	RL1=BIT8	:RECEIVER LINE 1
820	001000	RL2=BIT9	:RECEIVER LINE 2
821	001400	RL3=BIT9!BIT8	:RECEIVER LINE 3
822	002000	RL4=BIT10	:RECEIVER LINE 4
823	002400	RL5=BIT10!BIT8	:RECEIVER LINE 5
824	003000	RL6=BIT10!BIT9	:RECEIVER LINE 6
825	003400	RL7=BIT10!BIT9!BIT8	:RECEIVER LINE 7
826			
827			
828			
829			
830	000000	LP0=0	:LINE PARAMETER 0
831	000001	LP1=BIT0	:LINE PARAMETER 1
832	000002	LP2=BIT1	:LINE PARAMETER 2
833	000003	LP3=BIT1!BIT0	:LINE PARAMETER 3
834	000004	LP4=BIT2	:LINE PARAMETER 4
835	000005	LP5=BIT2!BIT0	:LINE PARAMETER 5
836	000006	LP6=BIT2!BIT1	:LINE PARAMETER 6
837	000007	LP7=BIT2!BIT1!BIT0	:LINE PARAMETER 7
838			
839	000000	FIVE=0	:FIVE BITS/CHAR, 1 STOP BIT
840	000010	SIX=BIT3	:SIX BITS/CHAR, 1 STOP BIT
841	000020	SEVEN=BIT4	:SEVEN BITS/CHAR, 1 STOP BIT
842	000030	EIGHT=BIT4!BIT3	:EIGHT BITS/CHAR, 1 STOP BIT
843	000040	FIVES=BIT5	:FIVE BITS/CHAR, 2 STOP BITS
844	000050	SIXS=BIT5!BIT3	:SIX BITS/CHAR, 2 STOP BITS
845	000060	SEVENS=BIT5!BIT4	:SEVEN BITS/CHAR, 2 STOP BITS
846	000070	EIGHTS=BIT5!BIT4!BIT3	:EIGHT BITS/CHAR, 2 STOP BITS
847			
848	000100	PARITY=BIT6	:PARITY ENABLED
849	000200	ODDPAR=BIT7	:ODD PARITY ENABLED
850	000000	ONESTOP=0	:ONE STOP BIT ENABLED
851	000040	TWOSTOP=BIT5	:TWO STOP BITS ENABLED
852	000000	EVEPAR=0	:EVEN PARITY ENABLED
853	010000	RCVON=BIT12	:ENABLE RECEIVER (RECEIVER ON)
854			
855	000000	S50=0	:SPEED 50 BAUD
856	000400	S75=BIT8	:SPEED 75 BAUD
857	001000	S110=BIT9	:SPEED 110 BAUD
858	001400	S134=BIT9!BIT8	:SPEED 134.5 BAUD
859	002000	S150=BIT10	:SPEED 150 BAUD
860	002400	S300=BIT10!BIT8	:SPEED 300 BAUD
861	003000	S600=BIT10!BIT9	:SPEED 600 BAUD
862	003400	S1200=BIT10!BIT9!BIT8	:SPEED 1200 BAUD
863	004000	S1800=BIT11	:SPEED 1800 BAUD
864	004400	S2000=BIT11!BIT8	:SPEED 2000 BAUD
865	005000	S2400=BIT11!BIT9	:SPEED 2400 BAUD
866	005400	S3600=BIT11!BIT9!BIT8	:SPEED 3600 BAUD

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GENERAL DEFINITIONS AND EQUIVALENCES

867	006000	S4800=BIT11:BIT10	:SPEED 4800 BAUD
868	006400	S7200=BIT11:BIT10:BIT8	:SPEED 7200 BAUD
869	007000	S9600=BIT11:BIT10:BIT9	:SPEED 9600 BAUD
870	007400	S19200=BIT11:BIT10:BIT9:BIT8	:SPEED 19200 BAUD

;DZTCR BIT DEFINITIONS

873	000001	TCR0=BIT0	:TCR0
874	000002	TCR1=BIT1	:TCR1
875	000004	TCR2=BIT2	:TCR2
876	000010	TCR3=BIT3	:TCR3
877	000020	TCR4=BIT4	:TCR4
878	000040	TCR5=BIT5	:TCR5
879	000100	TCR6=BIT6	:TCR6
880	000200	TCR7=BIT7	:TCR7
881	000400	DTR0=BIT8	:DTR0
882	001000	DTR1=BIT9	:DTR1
883	002000	DTR2=BIT10	:DTR2
884	004000	DTR3=BIT11	:DTR3
885	010000	DTR4=BIT12	:DTR4
886	020000	DTR5=BIT13	:DTR5
887	040000	DTR6=BIT14	:DTR6
888	100000	DTR7=BIT15	:DTR7

;DZMSR BIT DEFINITIONS

893	000001	RING0=BIT0	:RING INDICATED ON LINE 0
894	000002	RING1=BIT1	:RING INDICATED ON LINE 1
895	000004	RING2=BIT2	:RING INDICATED ON LINE 2
896	000010	RING3=BIT3	:RING INDICATED ON LINE 3
897	000020	RING4=BIT4	:RING INDICATED ON LINE 4
898	000040	RING5=BIT5	:RING INDICATED ON LINE 5
899	000100	RING6=BIT6	:RING INDICATED ON LINE 6
900	000200	RING7=BIT7	:RING INDICATED ON LINE 7
901	000400	C00=BIT8	:CARRIER PRESENT ON LINE 0
902	001000	C01=BIT9	:CARRIER PRESENT ON LINE 1
903	002000	C02=BIT10	:CARRIER PRESENT ON LINE 2
904	004000	C03=BIT11	:CARRIER PRESENT ON LINE 3
905	010000	C04=BIT12	:CARRIER PRESENT ON LINE 4
906	020000	C05=BIT13	:CARRIER PRESENT ON LINE 5
907	040000	C06=BIT14	:CARRIER PRESENT ON LINE 6
908	100000	C07=BIT15	:CARRIER PRESENT ON LINE 7

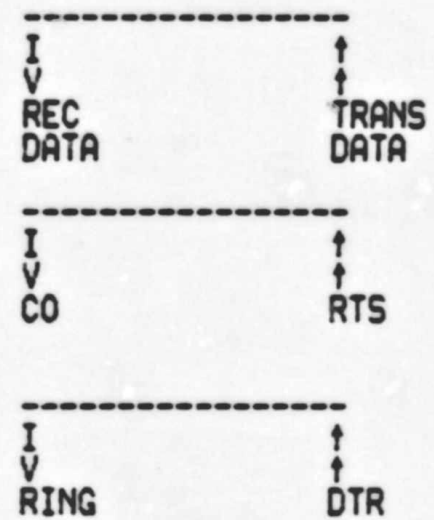
;DZTDR BIT DEFINITIONS

913	000400	BRK0=BIT8	:BREAK FOR LINE 0
914	001000	BRK1=BIT9	:BREAK FOR LINE 1
915	002000	BRK2=BIT10	:BREAK FOR LINE 2
916	004000	BRK3=BIT11	:BREAK FOR LINE 3
917	010000	BRK4=BIT12	:BREAK FOR LINE 4
918	020000	BRK5=BIT13	:BREAK FOR LINE 5
919	040000	BRK6=BIT14	:BREAK FOR LINE 6
920	100000	BRK7=BIT15	:BREAK FOR LINE 7

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;TABLE OF LOOP AROUND FUNCTIONS (H325)



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DZDZAB.P11MACY11 27(732) 03-NOV-76 15:03 PAGE 23
TRAPCATCHER FOR UNEXPECTED INTERRUPTS

```

941      ;*****
942      ;-----
943      ;TRAPCATCHER FOR ILLEGAL INTERRUPTS
944      ;THE STANDARD "TRAP CATCHER" IS PLACED
945      ;BETWEEN ADDRESS 0 TO ADDRESS 776.
946      ;IT LOOKS LIKE "PC+2 HALT".
947      ;-----
948      ;*****
949
950      000000      .=0
951
952      ;STANDARD INTERRUPT VECTORS
953      ;-----
954      000010      .=10
955      000012      SET.PS      ;FAKE "MTPS" INSTRUCTION TRAP
956      000012      010620      ;MAKE SURE PS IS PRIORITY 7
957
958      000020      .=20
959      000022      .SCOPE      ;SCOPE LOOP HANDLER
960      000022      000340      PR7      ;HANDLE AT PRIORITY 7
961      000024      $PWRDN      ;POWER FAIL HANDLER
962      000026      000340      340      ;SERVICE AT PRIORITY LEVEL 7
963      000030      006570      $ERROR      ;ERROR HANDLER
964      000032      000340      340      ;SERVICE AT PRIORITY LEVEL 7
965      000034      006462      .TRPSRV      ;GENERAL HANDLER DISPATCH SERVICE
966      000036      000340      340      ;SERVICE AT PRIORITY LEVEL 7
967
968      .SBTTL ACT11 HOOKS
969
970      ;*****
971      ;HOOKS REQUIRED BY ACT11
972      $SVPC=.      ;SAVE PC
973      000046      .=46      ;1)SET LOC.46 TO ADDRESS OF SENDAD IN .SEOP
974      000052      $ENDAD      ;2)SET LOC.52 TO ZERO
975      000052      .WORD 0      ;RESTORE PC
976      000040      .=$SVPC
977
978      000174      .=174
979      000174      000000      DISPREG:0      ;SOFTWARE DISPLAY REGISTER FOR SWITCHLESS 115
980      000176      000000      SWREG: 0      ;SOFTWARE SWITCH REGISTER FOR SWITCHLESS 115
981      000200      000200      .=200
982      000200      000137      002150      JMP .START      ;GO TO START OF PROGRAM
983      000210      000210      .=210
984      000210      000137      023114      JMP XSTART      ;GOTO CABLE TEST/ECHO TEST
985
986
987      001000      001000      .=1000
988      001000      005200      040515      047111      MTITLE: .ASCIZ <200><12>/MAINDEC-11-DZDZAB/<200>/EIGHT LINE ASYNC MUX TESTS/<200>
(2)

```


.SBTTL COMMON TAGS

```
*****  
;THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS  
;USED IN THE PROGRAM.
```

SCMTAG: .-1120

```
STSTNM: .WORD 0  
SERFLG: .BYTE 0  
SICNT: .WORD 0  
SLPADR: .WORD 0  
SLPERR: .WORD 0  
SERTTL: .WORD 0  
SITEMB: .BYTE 0  
SERMAX: .BYTE 1  
SERRPC: .WORD 0  
SGDADR: .WORD 0  
SBDADR: .WORD 0  
SGDDAT: .WORD 0  
SBDDAT: .WORD 0  
SAUTOB: .WORD 0  
SINTAG: .WORD 0  
SWR: .WORD DSWR  
DISPLAY: .WORD DDISP  
STKS: 177560  
STKB: 177562  
STPS: 177564  
STPB: 177566  
SNUL: .BYTE 0  
SFILLS: .BYTE 2  
SFILLC: .BYTE 12  
STPFLG: .BYTE 0  
SREGAD: .WORD 0
```

```
SREGD: .WORD 0  
SREG1: .WORD 0  
SREG2: .WORD 0  
SREG3: .WORD 0  
SREG4: .WORD 0  
SREG5: .WORD 0  
STMP0: .WORD 0  
STMP1: .WORD 0  
STMP2: .WORD 0  
STMP3: .WORD 0  
STIMES: 0  
SQUES: .ASCII /?/  
SCRLF: .ASCII <15>  
SLF: .ASCII <12>
```

.SBTTL APT MAILBOX-ETABLE

;;START OF COMMON TAGS

```
;;CONTAINS THE TEST NUMBER  
;;CONTAINS ERROR FLAG  
;;CONTAINS SUBTEST ITERATION COUNT  
;;CONTAINS SCOPE LOOP ADDRESS  
;;CONTAINS SCOPE RETURN FOR ERRORS  
;;CONTAINS TOTAL ERRORS DETECTED  
;;CONTAINS ITEM CONTROL BYTE  
;;CONTAINS MAX. ERRORS PER TEST  
;;CONTAINS PC OF LAST ERROR INSTRUCTION  
;;CONTAINS ADDRESS OF 'GOOD' DATA  
;;CONTAINS ADDRESS OF 'BAD' DATA  
;;CONTAINS 'GOOD' DATA  
;;CONTAINS 'BAD' DATA  
;;RESERVED--NOT TO BE USED  
;;AUTOMATIC MODE INDICATOR  
;;INTERRUPT MODE INDICATOR  
;;ADDRESS OF SWITCH REGISTER  
;;ADDRESS OF DISPLAY REGISTER  
;;TTY KBD STATUS  
;;TTY KBD BUFFER  
;;TTY PRINTER STATUS REG. ADDRESS  
;;TTY PRINTER BUFFER REG. ADDRESS  
;;CONTAINS NULL CHARACTER FOR FILLS  
;;CONTAINS # OF FILLER CHARACTERS REQUIRED  
;;INSERT FILL CHARS. AFTER A "LINE FEED"  
;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)  
;;CONTAINS THE ADDRESS FROM  
;;WHICH ($REGD) WAS OBTAINED  
;;CONTAINS (($REGAD)+0)  
;;CONTAINS (($REGAD)+2)  
;;CONTAINS (($REGAD)+4)  
;;CONTAINS (($REGAD)+6)  
;;CONTAINS (($REGAD)+10)  
;;CONTAINS (($REGAD)+12)  
;;USER DEFINED  
;;USER DEFINED  
;;USER DEFINED  
;;USER DEFINED  
;;MAX. NUMBER OF ITERATIONS  
;;QUESTION MARK  
;;CARRIAGE RETURN  
;;LINE FEED
```

Line	Address	Value	Field Name	Field Type	Field Description
1045			*****		
1046			..EVEN		
1047	001234		\$MAIL:		APT MAILBOX
1048	001234	000000	\$MSGTY: .WORD	AMSGTY	MESSAGE TYPE CODE
1049	001236	000000	\$FATAL: .WORD	AFATAL	FATAL ERROR NUMBER
1050	001240	000000	\$TESTN: .WORD	ATESTN	TEST NUMBER
1051	001242	000000	\$PASS: .WORD	APASS	PASS COUNT
1052	001244	000000	\$DEVCT: .WORD	ADEVCT	DEVICE COUNT
1053	001246	000000	\$UNIT: .WORD	AUNIT	I/O UNIT NUMBER
1054	001250	000000	\$MSGAD: .WORD	AMSGAD	MESSAGE ADDRESS
1055	001252	000000	\$MSGLG: .WORD	AMSGLG	MESSAGE LENGTH
1056	001254		\$ETABLE:		APT ENVIRONMENT TABLE
1057	001254	000	\$ENV: .BYTE	AENV	ENVIRONMENT BYTE
1058	001255	000	\$ENVN: .BYTE	AENVN	ENVIRONMENT MODE BITS
1059	001256	000000	\$SWREG: .WORD	ASWREG	APT SWITCH REGISTER
1060	001260	000000	\$USWR: .WORD	AUSWR	USER SWITCHES
1061	001262	000000	\$CPUOP: .WORD	ACPUOP	CPU TYPE, OPTIONS
1062			..*		BITS 15-11=CPU TYPE
1063			..*		11/04=01, 11/05=02, 11/20=03, 11/40=04, 11/45=05
1064			..*		11/70=06, PDQ=07, Q=10
1065			..*		BIT 10=REAL TIME CLOCK
1066			..*		BIT 9=FLOATING POINT PROCESSOR
1067			..*		BIT 8=MEMORY MANAGEMENT
1068	001264	000	\$MAMS1: .BYTE	AMAMS1	HIGH ADDRESS, M.S. BYTE
1069	001265	000	\$MTYP1: .BYTE	AMTYP1	MEM. TYPE, BLK#1
1070			..*		MEM. TYPE BYTE -- (HIGH BYTE)
1071			..*		900 NSEC CORE=001
1072			..*		300 NSEC BIPOLAR=002
1073			..*		500 NSEC MOS=003
1074	001266	000000	\$MADR1: .WORD	AMADR1	HIGH ADDRESS, BLK#1
1075			..*		MEM. LAST ADDR.=3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
1076	001270	000	\$MAMS2: .BYTE	AMAMS2	HIGH ADDRESS, M.S. BYTE
1077	001271	000	\$MTYP2: .BYTE	AMTYP2	MEM. TYPE, BLK#2
1078	001272	000000	\$MADR2: .WORD	AMADR2	MEM. LAST ADDRESS, BLK#2
1079	001274	000	\$MAMS3: .BYTE	AMAMS3	HIGH ADDRESS, M.S. BYTE
1080	001275	000	\$MTYP3: .BYTE	AMTYP3	MEM. TYPE, BLK#3
1081	001276	000000	\$MADR3: .WORD	AMADR3	MEM. LAST ADDRESS, BLK#3
1082	001300	000	\$MAMS4: .BYTE	AMAMS4	HIGH ADDRESS, M.S. BYTE
1083	001301	000	\$MTYP4: .BYTE	AMTYP4	MEM. TYPE, BLK#4
1084	001302	000000	\$MADR4: .WORD	AMADR4	MEM. LAST ADDRESS, BLK#4
1085	001304	000000	\$VECT1: .WORD	AVECT1	INTERRUPT VECTOR#1, BUS PRIORITY#1
1086	001306	000000	\$VECT2: .WORD	AVECT2	INTERRUPT VECTOR#2, BUS PRIORITY#2
1087	001310	160010	\$BASE: .WORD	ABASE	BASE ADDRESS OF EQUIPMENT UNDER TEST
1088	001312	000000	\$DEVN: .WORD	ADEVN	DEVICE MAP
1089	001314	000000	\$CDW1: .WORD	ACDW1	CONTROLLER DESCRIPTION WORD#1
1090	001316	000000	\$CDW2: .WORD	ACDW2	CONTROLLER DESCRIPTION WORD#2
1091	001320	000000	\$DDW0: .WORD	ADDW0	DEVICE DESCRIPTOR WORD#0
1092	001322	000000	\$DDW1: .WORD	ADDW1	DEVICE DESCRIPTOR WORD#1
1093	001324	000000	\$DDW2: .WORD	ADDW2	DEVICE DESCRIPTOR WORD#2
1094	001326	000000	\$DDW3: .WORD	ADDW3	DEVICE DESCRIPTOR WORD#3
1095	001330	000000	\$DDW4: .WORD	ADDW4	DEVICE DESCRIPTOR WORD#4
1096	001332	000000	\$DDW5: .WORD	ADDW5	DEVICE DESCRIPTOR WORD#5
1097	001334	000000	\$DDW6: .WORD	ADDW6	DEVICE DESCRIPTOR WORD#6
1098	001336	000000	\$DDW7: .WORD	ADDW7	DEVICE DESCRIPTOR WORD#7
1099	001340	000000	\$DDW8: .WORD	ADDW8	DEVICE DESCRIPTOR WORD#8
1100	001342	000000	\$DDW9: .WORD	ADDW9	DEVICE DESCRIPTOR WORD#9

MO2

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APT MAILBOX-ETABLE

```

1101 001344 000000 $DDW10: .WORD ADDW10 ;;DEVICE DESCRIPTOR WORD#10
1102 001346 000000 $DDW11: .WORD ADDW11 ;;DEVICE DESCRIPTOR WORD#11
1103 001350 000000 $DDW12: .WORD ADDW12 ;;DEVICE DESCRIPTOR WORD#12
1104 001352 000000 $DDW13: .WORD ADDW13 ;;DEVICE DESCRIPTOR WORD#13
1105 001354 000000 $DDW14: .WORD ADDW14 ;;DEVICE DESCRIPTOR WORD#14
1106 001356 000000 $DDW15: .WORD ADDW15 ;;DEVICE DESCRIPTOR WORD#15
1107
1108
1109 001360 $ETEND:
1110

```

```

1111      .SBTTL  ERROR POINTER TABLE
1112
1113      ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
1114      ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
1115      ;*LOCATION SITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
1116      ;*NOTE1:      IF SITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
1117      ;*NOTE2:      EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
1118
1119      ;*      EM      ;;POINTS TO THE ERROR MESSAGE
1120      ;*      DH      ;;POINTS TO THE DATA HEADER
1121      ;*      DT      ;;POINTS TO THE DATA
1122      ;*      DF      ;;POINTS TO THE DATA FORMAT
1123
1124
1125      001360      SERRTB:
1126
1127      ;PROGRAM CONTROL PARAMETERS
1128      ;-----
1129
1130      001360      000000      NEXT:      0      ;ADDRESS OF NEXT TEST TO BE EXECUTED
1131      001362      000000      LOCK:      0      ;ADDRESS FOR LOCK ON CURRENT DATA
1132
1133      ;PROGRAM VARIABLES
1134      ;-----
1135
1136      001364      000377      LINE:      377      ;DEFAULT ALL EIGHT LINES RUNNING
1137      001366      017470      PAR:      17470      ;PARAMETERS: 8 BITS/CHAR, 2 STOP BITS, 19200 BAUD, NO PARIT
1138      001370      000000      MODE:      0      ;DEFAULT MAINTENANCE MODE
1139      001372      000000      SAVLIN: 0      ;LINE NUMBER
1140      001374      000000      XMTLIN: 0      ;TRANSMISSION LINE NUMBER
1141      001376      000000      XMTCNT: 0      ;COUNT OF WORDS IN A TRANSMISSION PATTERN
1142      001400      000000      REGIST: 0      ;DEVICE ADDRESS STORAGE LOCATION
1143      001402      000000      SAVPC: 0      ;PROGRAM COUNTER STORAGE
1144      001404      000001      DZACTV: .BLKW 1      ;*DZ11'S SELECTED ACTIVE.
1145      001406      000001      RUN: 1      ;*POINTER ONE PAST RUNNING DEVICE.
1146      001410      000001      DZNUM: .BLKB 1      ;*OCTAL NUMBER OF DZ11'S.
1147      001411      001      SAVNUM: .BYTE 1      ;*WORKABLE NUMBER.
1148
1149      001412      001500      .EVEN
      ACTIVE: DZ.MAP      ;TABLE POINTER.

```



```

1150
1151
1152
1153
1154 001414 000
1155 001415 000
1156 001416 000
1157 001417 000
1158 001420 000
1159 001422
1160
1161 001422 000000
1162 001424 000000
1163 001426 000000
1164 001430 000000
1165 001432 000000
1166 001434 000000
1167 001436 000000
1168 001440 000000
1169 001442 000000
1170 001444 000000
1171 001446 000000
1172 001450 000000
1173 001452 000000
1174 001454 000000
1175 001456 000000
1176 001460 000000
1177 001462
1178
1179
1180
1181
1182
1183 001462
1184 000024 000024
1185 000024 000200
1186 000044 000044
1187 000044 001462
1188 001462
1189
1190
1191
1192
1193 001462
1194 001462 000000
1195 001464 001234
1196 001466 000132
1197 001470 000137
1198 001472 000137
1199 001474 000052
1200
1201
1202
1203 001500
1204 001500
1205

```

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:
.SBTTL APT PARAMETER BLOCK

;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT

.SX= ; 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.
\$APTHDR ; POINT TO APT HEADER BLOCK
=.SX ; 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)
\$STMT: .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 SETEND-\$MAIL/2 ; LENGTH MAILBOX-ETABLE(WORDS)
;DZ11 STATUS TABLE AND ADDRESS ASSIGNMENTS

=1500
DZ.MAP:

1206	001500	000001	DZCR0:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 0
1207	001502	000001	DZVC0:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 0
1208	001504	000001	DZLV0:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1209	001506	000001	LINE0:	.BLKW	1	:ALL LINES SELECTED
1210	001510	000001	PAR0:	.BLKW	1	:PARAMETERS
1211	001512	000001	MANT0:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1212						
1213	001514	000001	DZCR1:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 1
1214	001516	000001	DZVC1:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 1
1215	001520	000001	DZLV1:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1216	001522	000001	LINE1:	.BLKW	1	:ALL LINES SELECTED
1217	001524	000001	PAR1:	.BLKW	1	:PARAMETERS
1218	001526	000001	MANT1:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1219						
1220	001530	000001	DZCR2:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 2
1221	001532	000001	DZVC2:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 2
1222	001534	000001	DZLV2:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1223	001536	000001	LINE2:	.BLKW	1	:ALL LINES SELECTED
1224	001540	000001	PAR2:	.BLKW	1	:PARAMETERS
1225	001542	000001	MANT2:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1226						
1227	001544	000001	DZCR3:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 3
1228	001546	000001	DZVC3:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 3
1229	001550	000001	DZLV3:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1230	001552	000001	LINE3:	.BLKW	1	:ALL LINES SELECTED
1231	001554	000001	PAR3:	.BLKW	1	:PARAMETERS
1232	001556	000001	MANT3:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1233						
1234	001560	000001	DZCR4:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 4
1235	001562	000001	DZVC4:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 4
1236	001564	000001	DZLV4:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1237	001566	000001	LINE4:	.BLKW	1	:ALL LINES SELECTED
1238	001570	000001	PAR4:	.BLKW	1	:PARAMETERS
1239	001572	000001	MANT4:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1240						
1241	001574	000001	DZCR5:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 5
1242	001576	000001	DZVC5:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 5
1243	001600	000001	DZLV5:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1244	001602	000001	LINE5:	.BLKW	1	:ALL LINES SELECTED
1245	001604	000001	PAR5:	.BLKW	1	:PARAMETERS
1246	001606	000001	MANT5:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1247						
1248	001610	000001	DZCR6:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 6
1249	001612	000001	DZVC6:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 6
1250	001614	000001	DZLV6:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1251	001616	000001	LINE6:	.BLKW	1	:ALL LINES SELECTED
1252	001620	000001	PAR6:	.BLKW	1	:PARAMETERS
1253	001622	000001	MANT6:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1254						
1255	001624	000001	DZCR7:	.BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 7
1256	001626	000001	DZVC7:	.BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 7
1257	001630	000001	DZLV7:	.BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1258	001632	000001	LINE7:	.BLKW	1	:ALL LINES SELECTED
1259	001634	000001	PAR7:	.BLKW	1	:PARAMETERS
1260	001636	000001	MANT7:	.BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1261						

1262	001640	000001	DZCR10: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 10
1263	001642	000001	DZVC10: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 10
1264	001644	000001	DZLV10: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1265	001646	000001	LINE10: .BLKW	1	:ALL LINES SELECTED
1266	001650	000001	PAR10: .BLKW	1	:PARAMETERS
1267	001652	000001	MANT10: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1268					
1269	001654	000001	DZCR11: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 11
1270	001656	000001	DZVC11: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 11
1271	001660	000001	DZLV11: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1272	001662	000001	LINE11: .BLKW	1	:ALL LINES SELECTED
1273	001664	000001	PAR11: .BLKW	1	:PARAMETERS
1274	001666	000001	MANT11: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1275					
1276	001670	000001	DZCR12: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 12
1277	001672	000001	DZVC12: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 12
1278	001674	000001	DZLV12: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1279	001676	000001	LINE12: .BLKW	1	:ALL LINES SELECTED
1280	001700	000001	PAR12: .BLKW	1	:PARAMETERS
1281	001702	000001	MANT12: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1282					
1283	001704	000001	DZCR13: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 13
1284	001706	000001	DZVC13: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 13
1285	001710	000001	DZLV13: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1286	001712	000001	LINE13: .BLKW	1	:ALL LINES SELECTED
1287	001714	000001	PAR13: .BLKW	1	:PARAMETERS
1288	001716	000001	MANT13: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1289					
1290	001720	000001	DZCR14: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 14
1291	001722	000001	DZVC14: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 14
1292	001724	000001	DZLV14: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1293	001726	000001	LINE14: .BLKW	1	:ALL LINES SELECTED
1294	001730	000001	PAR14: .BLKW	1	:PARAMETERS
1295	001732	000001	MANT14: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1296					
1297	001734	000001	DZCR15: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 15
1298	001736	000001	DZVC15: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 15
1299	001740	000001	DZLV15: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1300	001742	000001	LINE15: .BLKW	1	:ALL LINES SELECTED
1301	001744	000001	PAR15: .BLKW	1	:PARAMETERS
1302	001746	000001	MANT15: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1303					
1304	001750	000001	DZCR16: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 16
1305	001752	000001	DZVC16: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 16
1306	001754	000001	DZLV16: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1307	001756	000001	LINE16: .BLKW	1	:ALL LINES SELECTED
1308	001760	000001	PAR16: .BLKW	1	:PARAMETERS
1309	001762	000001	MANT16: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1310					
1311	001764	000001	DZCR17: .BLKW	1	:CONTROL STATUS REGISTER FOR DZ11 NUMBER 17
1312	001766	000001	DZVC17: .BLKW	1	:RECEIVER AND BASE VECTOR FOR DZ11 NUMBER 17
1313	001770	000001	DZLV17: .BLKW	1	:PRIORITY LEVEL AND EIA FLAG SELECTOR
1314	001772	000001	LINE17: .BLKW	1	:ALL LINES SELECTED
1315	001774	000001	PAR17: .BLKW	1	:PARAMETERS
1316	001776	000001	MANT17: .BLKW	1	:MAINTENANCE MODE FOR THIS DEVICE
1317					

E03

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1318 002000 177777

DZ.END: 177777

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

```

*****
-----
TRPTAB:
ADVANCE=TRAP+0      ;CALL TO ADVANCE TO NEXT TEST( OR SCOPE THIS ONE)
      .ADVANCE
SCOPI=TRAP+1        ;CALL TO LOOP ON CURRENT DATA HANDLER
      .SCOPI
TYPE=TRAP+2         ;CALL TO TELETYPE OUTPUT ROUTINE
      .TYPE
INSTR=TRAP+3        ;CALL TO ASCII STRING INPUT ROUTINE
      .INSTR
INSTER=TRAP+4       ;CALL TO INPUT ERROR HANDLER
      .INSTER
PARAM=TRAP+5        ;CALL TO NUMERICAL DATA INPUT ROUTINE
      .PARAM
SETFLG=TRAP+6       ;CALL TO SET FLAG ROUTINE
      .SETFLG
SAVOS=TRAP+7        ;CALL TO REGISTER SAVE ROUTINE
      .SAVOS
RESOS=TRAP+10       ;CALL TO REGISTER RESTORE ROUTINE
      .RESOS
CONVRT=TRAP+11      ;CALL TO DATA OUTPUT ROUTINE
      .CONVRT
CNVRT=TRAP+12       ;CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF.
      .CNVRT
DEVICE.CLR=TRAP+13  ;CALL TO ISSUE A DEVICE CLEAR
      .DEVICE.CLR
DELAY=TRAP+14       ;CALL TO DELAY FOR FAST CPU'S
      .DELAY
PARMD=TRAP+15       ;CONVERT DECIMAL STRING TO OCTAL
      .PARMD
PAWCH=TRAP+16       ;SET FLAG ECHO OR CABLE
      .PAWCH
DCLASM=TRAP+17      ;CLEAR DEVICE, SET MAINT. BIT IF I MODE
      .DCLASM
-----
*****

```

1319
 1320
 1321
 1322
 1323
 1324
 1325 002002 104400
 1326 002002 006556
 1327 002002 104401
 1328 002004 005108
 1329 002004 104402
 1330 002006 005132
 1331 002006 104403
 1332 002010 005662
 1333 002010 104404
 1334 002012 005766
 1335 002012 104405
 1336 002014 006006
 1337 002014 104406
 1338 002016 010332
 1339 002016 104407
 1340 002020 006206
 1341 002020 104410
 1342 002022 006246
 1343 002022 104411
 1344 002024 006300
 1345 002024 104412
 1346 002026 006304
 1347 002026 104413
 1348 002030 006504
 1349 002030 104414
 1350 002032 006536
 1351 002032 104415
 1352 002034 024626
 1353 002034 104416
 1354 002036 025022
 1355 002036 104417
 1356 002040 006524
 1357
 1358
 1359
 1360

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APT PARAMETER BLOCK

1361					
1362					
1363					
1364	002042	160040	DZCSR:	160040	:R/W
1365	002044	160041	HDZCSR:	160041	:R/W
1366	002046	160042	DZRBUF:	160042	:READ ONLY
1367	002050	160043	HDZRBUF:	160043	:READ ONLY
1368	002052	160042	DZLPR:	160042	:WRITE ONLY
1369	002054	160043	HDZLPR:	160043	:WRITE ONLY
1370	002056	160044	DZTCR:	160044	:R/W
1371	002060	160045	HDZTCR:	160045	:R/W
1372	002062	160046	DZMSR:	160046	:READ ONLY
1373	002064	160047	HDZMSR:	160047	:READ ONLY
1374	002066	160046	DZTDR:	160046	:WRITE ONLY
1375	002070	160047	HDZTDR:	160047	:WRITE ONLY
1376					
1377	002072	000300	DZRIV:	300	:REC INTR VECTOR
1378	002074	000302	DZRIIS:	302	:REC INTR STATUS
1379	002076	000304	DZTIV:	304	:XMIT INTR VECTOR
1380	002100	000306	DZTIS:	306	:XMIT INTR STATUS
1381					
1382					

H03

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APT PARAMETER BLOCK

1383
1384
1385
1386
1387 002102
1388 002102 000000
1389 002104 000000
1390 002106 000000
1391 002110 000000
1392 002112 000000
1393 002114 000000
1394 002116 000000
1395 002120 000000
1396 002122 000000
1397 002124 000000
1398 002126 000000
1399 002130 000000
1400 002132 000000
1401 002134 000000
1402 002136 000000
1403 002140 000000
1404 002142 000000
1405 002144 000000
1406 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

Address	Op Code	Op 1	Op 2	Op 3	Op 4	Op 5	Op 6	Op 7	Op 8	Op 9	Op 10	Op 11	Op 12	Op 13	Op 14	Op 15	Op 16	Op 17	Op 18	Op 19	Op 20	Op 21	Op 22	Op 23	Op 24	Op 25	Op 26	Op 27	Op 28	Op 29	Op 30	Op 31	Op 32	Op 33	Op 34	Op 35	Op 36	Op 37	Op 38	Op 39	Op 40	Op 41	Op 42	Op 43	Op 44	Op 45	Op 46	Op 47	Op 48	Op 49	Op 50	Op 51	Op 52	Op 53	Op 54	Op 55	Op 56	Op 57	Op 58	Op 59	Op 60	Op 61	Op 62	Op 63	Op 64	Op 65	Op 66	Op 67	Op 68	Op 69	Op 70	Op 71	Op 72	Op 73	Op 74	Op 75	Op 76	Op 77	Op 78	Op 79	Op 80	Op 81	Op 82	Op 83	Op 84	Op 85	Op 86	Op 87	Op 88	Op 89	Op 90	Op 91	Op 92	Op 93	Op 94	Op 95	Op 96	Op 97	Op 98	Op 99	Op 100	Op 101	Op 102	Op 103	Op 104	Op 105	Op 106	Op 107	Op 108	Op 109	Op 110	Op 111	Op 112	Op 113	Op 114	Op 115	Op 116	Op 117	Op 118	Op 119	Op 120	Op 121	Op 122	Op 123	Op 124	Op 125	Op 126	Op 127	Op 128	Op 129	Op 130	Op 131	Op 132	Op 133	Op 134	Op 135	Op 136	Op 137	Op 138	Op 139	Op 140	Op 141	Op 142	Op 143	Op 144	Op 145	Op 146	Op 147	Op 148	Op 149	Op 150	Op 151	Op 152	Op 153	Op 154	Op 155	Op 156	Op 157	Op 158	Op 159	Op 160	Op 161	Op 162	Op 163	Op 164	Op 165	Op 166	Op 167	Op 168	Op 169	Op 170	Op 171	Op 172	Op 173	Op 174	Op 175	Op 176	Op 177	Op 178	Op 179	Op 180	Op 181	Op 182	Op 183	Op 184	Op 185	Op 186	Op 187	Op 188	Op 189	Op 190	Op 191	Op 192	Op 193	Op 194	Op 195	Op 196	Op 197	Op 198	Op 199	Op 200	Op 201	Op 202	Op 203	Op 204	Op 205	Op 206	Op 207	Op 208	Op 209	Op 210	Op 211	Op 212	Op 213	Op 214	Op 215	Op 216	Op 217	Op 218	Op 219	Op 220	Op 221	Op 222	Op 223	Op 224	Op 225	Op 226	Op 227	Op 228	Op 229	Op 230	Op 231	Op 232	Op 233	Op 234	Op 235	Op 236	Op 237	Op 238	Op 239	Op 240	Op 241	Op 242	Op 243	Op 244	Op 245	Op 246	Op 247	Op 248	Op 249	Op 250	Op 251	Op 252	Op 253	Op 254	Op 255	Op 256	Op 257	Op 258	Op 259	Op 260	Op 261	Op 262	Op 263	Op 264	Op 265	Op 266	Op 267	Op 268	Op 269	Op 270	Op 271	Op 272	Op 273	Op 274	Op 275	Op 276	Op 277	Op 278	Op 279	Op 280	Op 281	Op 282	Op 283	Op 284	Op 285	Op 286	Op 287	Op 288	Op 289	Op 290	Op 291	Op 292	Op 293	Op 294	Op 295	Op 296	Op 297	Op 298	Op 299	Op 300	Op 301	Op 302	Op 303	Op 304	Op 305	Op 306	Op 307	Op 308	Op 309	Op 310	Op 311	Op 312	Op 313	Op 314	Op 315	Op 316	Op 317	Op 318	Op 319	Op 320	Op 321	Op 322	Op 323	Op 324	Op 325	Op 326	Op 327	Op 328	Op 329	Op 330	Op 331	Op 332	Op 333	Op 334	Op 335	Op 336	Op 337	Op 338	Op 339	Op 340	Op 341	Op 342	Op 343	Op 344	Op 345	Op 346	Op 347	Op 348	Op 349	Op 350	Op 351	Op 352	Op 353	Op 354	Op 355	Op 356	Op 357	Op 358	Op 359	Op 360	Op 361	Op 362	Op 363	Op 364	Op 365	Op 366	Op 367	Op 368	Op 369	Op 370	Op 371	Op 372	Op 373	Op 374	Op 375	Op 376	Op 377	Op 378	Op 379	Op 380</
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DZDZAB.P11

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PROGRAM INITIALIZATION AND START UP.

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1463 002434 020027 002000      CMP      RD, #DZ.END      ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
1464 002440 001374              BNE      65$          ;IF NOT, CLEAR THE NEXT LOCATION IN THE TABLE
1465 002442 105337 001415      DECB     INIFLG        ;INSURE NO AUTO SIZING IF QUESTIONS ANSWERED!
1466
1467
1468
1469
1470
1471
1472 002446              33$:      INSTR      ;CALL THE STRING INPUT ROUTINE
1473 002446 104403          66$          ;POINTER TO MESSAGE TO BE PRINTED
1474 002450 003312          PARAM      ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1475 002452 104405          160000      ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1476 002454 160000          163770      ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1477 002456 163770          DZCRO      ;POINTER TO MAP LOCATION TO BE FILLED
1478 002460 001500          .BYTE      7      ;MASK OF INVALID BITS FOR THIS PARAMETER
1479 002462 007            .BYTE      1      ;NUMBER OF PARAMETERS TO STORE
1480 002463 001            MOV      DZCRO, $BASE ;COPY BASE ADDRESS TO ETABLE
1481 002464 013737 001500 001310
1482
1483
1484
1485 002472              34$:      INSTR      ;CALL THE STRING INPUT ROUTINE
1486 002472 104403          67$          ;POINTER TO MESSAGE TO BE PRINTED
1487 002474 003356          PARAM      ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1488 002476 104405          300          ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1489 002500 000300          776          ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1490 002502 000776          DZVCO      ;POINTER TO MAP LOCATION TO BE FILLED
1491 002504 001502          .BYTE      3      ;MASK OF INVALID BITS FOR THIS PARAMETER
1492 002506 003            .BYTE      1      ;NUMBER OF PARAMETERS TO STORE
1493 002507 001            MOV      DZVCO, $VECT1 ;COPY VECTOR TO ETABLE
1494 002510 013737 001502 001304
1495
1496
1497
1498 002516 104403          INSTR      ;CALL THE STRING INPUT ROUTINE
1499 002520 003417          68$          ;POINTER TO MESSAGE TO BE PRINTED
1500 002522 104405          PARAM      ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
1501 002524 000004          4          ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1502 002526 000007          7          ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1503 002530 001504          DZLVO      ;POINTER TO MAP LOCATION TO BE FILLED
1504 002532 000          .BYTE      0      ;MASK OF INVALID BITS FOR THIS PARAMETER
1505 002533 001          .BYTE      1      ;NUMBER OF PARAMETERS TO STORE
1506 002534 113737 001504 001305      MOVB     DZLVO, $VECT1+1 ;GET BUS REQUEST LEVEL INTO ETABLE
1507 002542 106337 001305      ASLB     $VECT1+1 ;ALIGN THE BITS PROPERLY
1508 002546 106337 001305      ASLB     $VECT1+1 ;ALIGN THE BITS PROPERLY
1509 002552 106337 001305      ASLB     $VECT1+1 ;ALIGN THE BITS PROPERLY
1510 002556 106337 001305      ASLB     $VECT1+1 ;ALIGN THE BITS PROPERLY
1511 002562 106337 001305      ASLB     $VECT1+1 ;ALIGN THE BITS PROPERLY
1512
1513
1514
1515 002566 104402 004000      TYPE      74$      ;PRINT EIA MESSAGE
1516 002572 005037 001220      CLR      $TMP1      ;USE $TMP1
1517 002576 105777 176362      TSTB     $STKS      ;IS KEYBOARD DONE?
1518 002602 100375          BPL      80$          ;IF NOT, WAIT FOR IT

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K03

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PROGRAM INITIALIZATION AND START UP.

1519	002604	017746	176356		MOV	@\$TKB, -(SP)	; IF YES, PUT CHARACTER ON STACK
1520	002610	042716	000240		BIC	#240, (SP)	; STRIP DOWN CHARACTER
1521	002614	122726	000015		CMPB	#15, (SP)+	; IS IT ?
1522	002620	001414			BEQ	81\$	; IF SO, GET OUT
1523	002622	014677	176344		MOV	-(SP), @\$TPB	; IF NOT, PRINT CHARACTER
1524	002626	042737	100000	001504	BIC	#BIT15, DZLVO	; CLEAR EIA FLAG
1525	002634	122726	000102		CMPB	#102, (SP)+	; IS IT A B?
1526	002640	001356			BNE	80\$	; IF NOT, GO BACK FOR INPUT
1527	002642	052737	100000	001504	BIS	#BIT15, DZLVO	; IF SO, SET FLAG
1528	002650	000752			BR	80\$	; GET MORE INPUT
1529	002652						
1530							
1531							
1532							
1533	002652	104403			INSTR		; CALL THE STRING INPUT ROUTINE
1534	002654	003630			72\$		; POINTER TO THE MESSAGE TO BE PRINTED
1535	002656	104406			SETFLG		; CALL THE MAINTENANCE FLAG SETUP ROUTINE
1536	002660	001512			MANTO		; THIS IS THE FLAG BEING SETUP
1537							
1538							
1539							
1540	002662	104403			INSTR		; CALL THE STRING INPUT ROUTINE
1541	002664	003566			71\$		; POINTER TO MESSAGE TO BE PRINTED
1542	002666	104405			PARAM		; CALL THE OCTAL TO ASCII CONVERT ROUTINE
1543	002670	000001			1		; LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1544	002672	000020			16.		; HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1545	002674	001220			\$TMP1		; POINTER TO MAP LOCATION TO BE FILLED
1546	002676	000			.BYTE	0	; MASK OF INVALID BITS FOR THIS PARAMETER
1547	002677	001			.BYTE	1	; NUMBER OF PARAMETERS TO STORE
1548							
1549	002700	012737	000377	001506	MOV	#377, LINE0	; SET UP DEFAULT LINES
1550	002706	012737	017470	001510	MOV	#17470, PAR0	; SET UP DEFAULT LPR PARAMETER
1551							; RECEIVER ON; 19.2 KBAUD; 2STOP BITS; 8 BIT/CHAR
1552	002714	032777	000010	176236	BIT	#SW03, JSWR	; DO YOU WANT PARAMETERS?
1553	002722	001402			BEQ	40\$	; IF NO, SKIP THE PARAMETER CALL
1554	002724	004737	003134		JSR	PC, 23\$	; GET PARAMETERS
1555	002730	012737	000001	001312	MOV	#1, \$DEVN	; INITIALIZE ACTIVE DEVICE SELECTION PARAMETER
1556	002736	113737	001220	001410	MOVB	\$TMP1, DZNUM	; COPY THE NUMBER OF DEVICES
1557	002744	113737	001220	001411	MOVB	\$TMP1, SAVNUM	; COPY A BACKUP NUMBER
1558	002752	005337	001220		DEC	\$TMP1	; \$TMP1 CONTAINS THE COUNT OF UNINITIALIZED
1559	002756	001404			BEQ	61\$	; SELECTED DEVICES
1560	002760	000261			SEC		; SET A BIT FLAG TO INDICATE AN ACTIVE DEVICE
1561	002762	006137	001312		ROL	\$DEVN	; POINT TO THE NEXT DEVICE
1562	002766	000771			BR	62\$	; GO DO THIS PROCEDURE AGAIN
1563	002770	013737	001312	001222	MOV	\$DEVN, \$TMP2	; # OF TIMES
1564	002776	013737	001312	001404	MOV	\$DEVN, DZACTV	; COPY THE ACTIVE DEVICE PARAMETER
1565	003004	012700	001500		MOV	#DZCR0, R0	; SET A POINTER TO THE SPECIFIED INFORMATION
1566	003010	012701	001514		MOV	#DZCR1, R1	; POINT R1 TO THE REST OF THE MAP TABLE
1567	003014	012702	001320		MOV	#SDDWD, R2	; POINT TO ETABLE'S DEVICE DESCRIPTOR WORDS
1568	003020	000241			CLC		; INITIALIZE THE "C" BIT FOR A ROTATION
1569	003022	006037	001222		ROR	\$TMP2	; SKIP MAPPING SETUP FOR DEVICE 0- IT'S DONE
1570	003026	006237	001222		ASR	\$TMP2	; ISOLATE A SELECTION FLAG IN THE "C" BIT
1571	003032	103404			BCS	41\$	; IS THIS DEVICE SELECTED? IF YES, GO LOAD TABLE
1572	003034	012711	177777		MOV	#-1, (R1)	; TERMINATE THE LIST
1573	003040	000137	004114		JMP	63\$	; GO TO THE NEXT BLOCK
1574	003044	012011			MOV	(R0)+, (R1)	; ADDRESS

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PROGRAM INITIALIZATION AND START UP.

1575	003046	062721	000010		ADD	#10,(R1)+	;POINT TO THE NEXT DZ11 ADDRESS VALUE	
1576	003052	012011			MOV	(R0)+,(R1)	;VECTOR	
1577	003054	062721	000010		ADD	#10,(R1)+	;POINT TO THE NEXT VECTOR VALUE	
1578	003060	012021			MOV	(R0)+,(R1)+	;LEVEL	
1579	003062	012021			MOV	(R0)+,(R1)+	;LINES	
1580	003064	016012	177774		MOV	-4(R0),(R2)	;GET THE EIA FLAG FROM THE PRIORITY WORD	
1581	003070	042712	077777		BIC	#77777,(R2)	;ISOLATE THAT FLAG	
1582	003074	051022			BIS	(R0),(R2)+	;ADD PARAMETERS TO DEVICE DESCRIPTOR WORD	
1583	003076	012021			MOV	(R0)+,(R1)+	;PARAMETERS	
1584	003100	012021			MOV	(R0)+,(R1)+	;MAINTENANCE MODE	
1585	003102	000751			BR	64\$		
1586	003104	032777	000010	176046	73\$:	BIT	#SW03,2SWR	;ASK PARAMETERS ?
1587	003112	001002			BNE	42\$	;IF NO, GO DO AUTO SIZING	
1588	003114	000137	004114		JMP	63\$	;GO SET UP FOR AUTO SIZING	
1589	003120	004737	003134		42\$:	JSR	PC,23\$	;GO ASK PARAMETERS
1590	003124	105337	001415		DECB	INIFLG	;INSURE NO AUTO SIZE IF QUESTIONS ANSWERED	
1591	003130	000137	004140		JMP	16\$	;GO TO THE NEXT BLOCK	
1592								
1593								
1594								
1595	003134				23\$:			
1596	003134	104403			INSTR		;CALL THE STRING INPUT ROUTINE	
1597	003136	003442			69\$		;POINTER TO MESSAGE TO BE PRINTED	
1598	003140	104405			PARAM		;CALL THE OCTAL TO ASCII CONVERT ROUTINE	
1599	003142	000001			1		;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE	
1600	003144	000377			377		;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE	
1601	003146	001506			LINEO		;POINTER TO MAP LOCATION TO BE FILLED	
1602	003150	000			.BYTE	0	;MASK OF INVALID BITS FOR THIS PARAMETER	
1603	003151	001			.BYTE	1	;NUMBER OF PARAMETERS TO STORE	
1604	003152	105037	001416		CLRB	HDRFLG	;MAKE SURE THE CHANGES ARE PRINTED	
1605								
1606								
1607								
1608								
1609	003156	005737	001512		TST	MANTO	;IS STAGGERED THE MODE OF OPERATION?	
1610	003162	100021			BPL	26\$	;IF NOT, SKIP THIS SEGMENT	
1611	003164	013703	001506		MOV	LINEO,R3	;GET A SCRATCH COPY OF THE ACTIVE LINES	
1612	003170	006003			24\$:	ROR	R3	
1613	003172	103410			BCS	25\$	;GET A LINE SELECTION BIT(EVEN NUMBER LINE)	
1614	003174	001414			BEQ	26\$	;IF IT IS SELECTED, CHECK TO SEE IF THE NEXT IS TOO	
1615	003176	006203			ASR	R3	;IF ALL HAVE BEEN CHECKED, CONTINUE PROCESSING	
1616	003200	103373			BCC	24\$	;IF IT IS 0,CHECK TO SEE IF THE NEXT IS TOO	
1617	003202	104402	001230		27\$:	TYPE	,SQUES	
1618	003206	104402	010256		TYPE	,MBADLN	;THIS IS AN INCORRECT PARAMETER	
1619	003212	000750			BR	23\$	;LET THE USER KNOW ABOUT IT	
1620	003214	001772			25\$:	BEQ	27\$	
1621	003216	006203			ASR	R3	;GO GET THE CORRECT PARAMETER	
1622	003220	103370			BCC	27\$	;IF ANOTHER FLAG ISN'T SET, THERE'S AN ERROR	
1623	003222	000241			CLC		;GET THE NEXT FLAG	
1624	003224	000761			BR	24\$	;IF IT ISN'T SET, THERE'S AN ERROR	
1625							;INITIALIZE THE "C" BIT FOR TESTING OF THE NEXT PAIR	
1626							;GO TEST THE NEXT PAIR OF FLAGS	
1627								
1628	003226				26\$:			
1629	003226	104403			INSTR		;CALL THE STRING INPUT ROUTINE	
1630	003230	003516			70\$		;POINTER TO MESSAGE TO BE PRINTED	

Address	Hex	Hex	Hex	Hex	Hex	Label	Text	Text
1631	003232	104405				PARAM		CALL THE OCTAL TO ASCII CONVERT ROUTINE
1632	003234	000000				0		LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1633	003236	000017				17		HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
1634	003240	001510				PARO		POINTER TO MAP LOCATION TO BE FILLED
1635	003242	000				.BYTE	0	MASK OF INVALID BITS FOR THIS PARAMETER
1636	003243	001				.BYTE	1	NUMBER OF PARAMETERS TO STORE
1637	003244	012702	001506			MOV	#LINEO,R2	POINT TO THE LINE SELECTION PARAMETER
1638	003250	012703	001510			MOV	#PARO,R3	POINT TO THE CHOSEN PARAMETERS
1639	003254	000313				SWAB	(R3)	PLACE IN HIGH BYTE
1640	003256	052713	010070			BIS	#10070,(R3)	PLACE EXTRA PARAMETERS INTO LOC
1641	003262	011262	000014		28\$:	MOV	(R2),14(R2)	LOAD THE LINES
1642	003266	011363	000014			MOV	(R3),14(R3)	LOAD THE PARAMETERS
1643	003272	062702	000014			ADD	#14,R2	POINT TO THE NEXT SET
1644	003276	062703	000014			ADD	#14,R3	... OF BOTH PARAMETERS
1645	003302	020327	001774			CMP	R3,#PAR17	HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
1646	003306	001365				BNE	28\$	IF NOT, GO LOAD SOME MORE PARAMETERS
1647	003310	000207				RTS	PC	RETURN TO CALLING BLOCK
1648	003312	030600	052123	041440	66\$:	.ASCIZ	<200>/1ST CSR ADDRESS (160000:163700): /	
(1)	003356	030600	052123	053040	67\$:	.ASCIZ	<200>/1ST VECTOR ADDRESS (300:770): /	
(1)	003417	200	051102	046040	68\$:	.ASCIZ	<200>/BR LEVEL (4:6): /	
(1)	003442	046200	047111	051505	69\$:	.ASCIZ	<200>/LINES ACTIVE BY BIT <IN OCTAL>(001:377): /	
(1)	003516	042200	043105	052501	70\$:	.ASCIZ	<200>/DEFAULT BAUD RATE <IN OCTAL>(00:17): /	
(1)	003566	021600	047440	020106	71\$:	.ASCIZ	<200>/# OF DZ11'S <IN OCTAL> (1:20): /	
(1)	003630	046600	044501	052116	72\$:	.ASCII	<200>/MAINTENANCE MODE/	
(1)	003651	200	055440	054105		.ASCII	<200>/ [EXTERNAL <H325> (E)]/	
(1)	003705	200	055440	047111		.ASCII	<200>/ [INTERNAL <DZCSR03=1>(I)]/	
(1)	003741	200	055440	052123		.ASCIZ	<200>/ [STAGGERED <H327> (S)]: /	
(1)	004000	052200	050131	020105	74\$:	.ASCIZ	<200>/TYPE "A" FOR EIA MODULE OR "B" FOR 20 MA (A:B): /	
(1)	004062	042600	052116	051105	75\$:	.ASCIZ	<200>/ENTER DELAY PARAMETER: /	
(1)		004114						
(1)	004114				63\$:			
1649	004114	122737	000377	001415		CMPB	#377,INIFLG	ONLY DO AUTO SIZE ON 1ST START
1650	004122	001006				BNE	16\$	
1651	004124	032777	000200	175026		BIT	#BIT7,JSWR	BIT7=1??
1652	004132	001002				BNE	16\$	BR IF NO AUTO SIZE
1653	004134	004737	011432			JSR	PC,AUTO.SIZE	GO DO THE AUTO SIZE
1654	004140	105737	001416		16\$:	TSTB	HDRFLG	HAS THE TABLE BEEN TYPED YET?
1655	004144	001021				BNE	1\$	IF SO, DON'T TYPE IT AGAIN
1656	004146	105337	001416			DECB	HDRFLG	INDICATE THAT THE TABLE WILL BE TYPED
1657	004152	104402	010231			TYPE	XHEAD	TYPE MAP HEADER
1658	004156	012700	001500			MOV	#DZ.MAP,RO	SET POINTER
1659	004162	010037	001220		5\$:	MOV	RO,\$TMP1	POINT TO THE MAP LOCATION
1660	004166	012037	001222					

1715
1716
1717
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004434 005037 001136
004440 105037 001123
004444 104402 007715
004450 104402 010077
004454 104412 004612
004460 104402 010105
004464 104412 004620
004470 005237 001242
004474 104402 010113
004500 104412 004626
004504 005337 001242
004510 104402 010124
004514 104412 004634
004520 105337 001411
004524 001030
004526 113737 001410 001411
004534 005037 001226
004540 005237 001242
004544 042737 100000 001242
004552 005327
004554 000001
004556 003013
004560 012737
004562 000001
004564 004554 000042
004566 013700
004572 001405
004574 000005
004576 004710
004600 000240
004602 000240
004604 000240
004606
004606 000137
004610 010722
004612 000001
004614 006 002
004616 002042
004620 000001
004622 003 002
004624 002072

```

:END OF PASS
:TYPE NAME OF TEST
:UPDATE PASS COUNT
:CHECK FOR EXIT TO ACT-11
:RESTART TEST
.SBTTL  END OF PASS ROUTINE

:*****
:INCREMENT THE PASS NUMBER ($PASS)
:*IF THERES A MONITOR GO TO IT
:*IF THERE ISN'T JUMP TO CYCLE

SEOP:
  SCOPE
  CLR      $ERRPC      :CLEAR LAST ERROR PC
  CLRB     $ERFLG      :CLEAR ERROR FLAG
  TYPE     ,MEPASS     :TYPE END PASS
  TYPE     ,MCSRX      :TYPE CSR
  CNVRT    ,XCSR       :SHOW IT
  TYPE     ,MVECX      :TYPE VECTOR
  CNVRT    ,XVEC       :SHOW IT
  INC      $PASS       :RAISE PASS COUNT
  TYPE     ,MPASSX     :TYPE PASSES
  CNVRT    ,XPASS      :SHOW IT
  DEC      $PASS       :RESTORE PASS COUNT
  TYPE     ,MERRX      :TYPE ERRORS
  CNVRT    ,XERR       :SHOW IT
  DECB     $AVNUM      :ARE ALL DEVICES TESTED?
  BNE      $DOAGN      :BR IF NO.
  MOVB     DZNUM,$AVNUM:RESTORE THE COUNT
  CLR      $TIMES      :ZERO THE NUMBER OF ITERATIONS
  INC      $PASS       :INCREMENT THE PASS NUMBER
  BIC      #100000,$PASS:DON'T ALLOW A NEG. NUMBER
  DEC      (PC)+       :LOOP?
  SEOPCT: .WORD 1
  BGT      $DOAGN      :YES
  MOV      (PC)+,$(PC)+:RESTORE COUNTER
  SENDCT: .WORD 1
  SGET42: MOV 2#42,R0 :GET MONITOR ADDRESS
  BEQ      $DOAGN      :BRANCH IF NO MONITOR
  RESET
  SENDAD: JSR PC,(R0) :CLEAR THE WORLD
  NOP
  NOP
  NOP
  SDOAGN:
  JMP      2(PC)+      :GO TO MONITOR
  SRTNAD: .WORD CYCLE :SAVE ROOM
  XCSR: 1 :FOR
  .BYTE 6,2 :ACT11
  DZCSR
  XVEC: 1 :RETURN
  .BYTE 3,2
  DZRIV

```


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DZDZAB.P11 END OF PASS ROUTINE

1771 004626 000001
1772 004630 006 002
1773 004632 001242
1774 004634 000001
1775 004636 006 002
1776 004640 001132

XPASS: 1
.BYTE 6,2
\$PASS
XERR: 1
.BYTE 6,2
\$ERTTL

;SCOPE LOOP AND ITERATION HANDLER

.SBTTL SCOPE HANDLER ROUTINE

;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=10T

1793 004642
1794 004642 004737 007212
1795 004646 005037 001136
1796 004652 022716 012170
1797 004656 001413
1798 004660 000406
1799 004662 105777 174276
1800 004666 100067
1801 004670 017766 174272 177776
1802 004676 032777 040000 174254
1803 004704 001060
1804
1805 004706 000416
1806
1807 004710 013746 000004
1808 004714 012737 004734 000004
1809 004722 005737 177060
1810 004726 012637 000004
1811 004732 000436
1812 004734 022626
1813 004736 012637 000004
1814 004742 000441
1815 004744
1816 004744 105737 001123
1817 004750 001404
1818 004752 105037 001123
1819 004756 005037 001226
1820 004762 032777 004000 174170
1821 004770 001011
1822 004772 005737 001242
1823 004776 001406
1824 005000 005237 001124
1825 005004 023737 001226 001124
1826 005012 002015

\$SCOPE: JSR PC.SERV.G ;FIND OUT IF <1G> WAS HIT
;SCOPE: 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 \$STKS ;KEYBOARD DONE?
BPL \$OVER ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
MOV \$STKB,-2(SP) ;CLEAR DONE BIT
1\$: BIT \$BIT14,\$SWR ;LOOP ON PRESENT TEST?
BNE \$OVER ;YES IF SW14=1
;*****START OF CODE FOR THE XOR TESTER*****
\$XTSTR: BR 6\$
MOV \$ERRVEC,-(SP) ;IF RUNNING ON THE "XOR" TESTER CHANGE
MOV \$SS,\$ERRVEC ;THIS INSTRUCTION TO A "NOP" (NOP=240)
TST \$177060 ;SAVE THE CONTENTS OF THE ERROR VECTOR
MOV (SP)+,\$ERRVEC ;SET FOR TIMEOUT
BR \$SVLAD ;TIME OUT ON XOR?
5\$: CMP (SP)+,(SP)+ ;RESTORE THE ERROR VECTOR
MOV (SP)+,\$ERRVEC ;GO TO THE NEXT TEST
BR \$OVER ;CLEAR THE STACK AFTER A TIME OUT
6\$;: ;RESTORE THE ERROR VECTOR
;*****END OF CODE FOR THE XOR TESTER*****
2\$: TSTB \$ERFLG ;LOOP ON THE PRESENT TEST
BEQ 3\$;HAS AN ERROR OCCURRED?
4\$: CLRB \$ERFLG ;BR IF NO
CLR \$TIMES ;ZERO THE ERROR FLAG
3\$: BIT \$BIT11,\$SWR ;CLEAR THE NUMBER OF ITERATIONS TO MAKE
BNE 1\$;INHIBIT ITERATIONS?
TST \$PASS ;BR IF YES
BEQ 1\$;IF FIRST PASS OF PROGRAM
INC \$ICNT ;INHIBIT ITERATIONS
CMP \$TIMES,\$ICNT ;INCREMENT ITERATION COUNT
BGE \$OVER ;CHECK THE NUMBER OF ITERATIONS MADE
;BR IF MORE ITERATION REQUIRED

```

1827 005014 012737 000001 001124 1S: MOV #1,SICNT ;:REINITIALIZE THE ITERATION COUNTER
1828 005022 013737 005104 001226      MOV SMXCNT,STIMES ;:SET NUMBER OF ITERATIONS TO DO
1829 005030 105237 001122      $SVLAD: INCB STSTNM ;:COUNT TEST NUMBERS
1830 005034 113737 001122 001240      MOV STSTNM,STESTN ;:SET TEST NUMBER IN APT MAILBOX
1831 005042 011637 001126      MOV (SP),SLPADR ;:SAVE SCOPE LOOP ADDRESS
1832 005046 013777 001122 174106 $OVER: MOV STSTNM,DISP ;:DISPLAY TEST NUMBER
1833 005054 013716 001126      MOV SLPADR,(SP) ;:FUDGE RETURN ADDRESS
1834 005060 105037 001417      3S: CLRB MNTFLG ;:CLEAR THE MAINTENANCE BIT SETTER AFTER EACH TEST
1835 005064 005737 001370      TST MODE ;:HAS THE MODE BEEN CHANGED?
1836 005070 001003      BNE 4S ;:IF NOT INTERNAL, GO DO A TEST
1837 005072 112737 000010 001417      MOV #MAINT,MNTFLG ;:IF INTERNAL MODE NOW, SET THE MAINTENANCE BIT
1838 005100 000002      4S: RTI ;:GO DO THE TEST
1839 005102 000406      BRW: 406
1840 005104 000005      SMXCNT: 5 ;:MAX. NUMBER OF ITERATIONS
1841
1842      ;:CHECK FOR FREEZE ON CURRENT DATA
1843      -----
1844
1845 005106 032777 001000 174044 .SCOP1: BIT #SW09,JSWR ;:IS SW09=1(SET)?
1846 005114 001405      BEQ 1S ;:BR IF NOT SET.
1847 005116 005737 001362      TST LOCK ;:IS THER A TIGHT LOOP SPECIFIED?
1848 005122 001402      BEQ 1S ;:IF NO, RETURN
1849 005124 013716 001362      MOV LOCK,(SP) ;:IF YES, GOTO THE ADDRESS IN LOCK.
1850 005130 000002      1S: RTI ;:GO BACK.
1851
1852 005132      .TYPE:
1853      .SBTTL TYPE ROUTINE
1854
1855      ;:*****
1856      ;:ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
1857      ;:THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
1858      ;:NOTE1: SNUL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
1859      ;:NOTE2: SFILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
1860      ;:NOTE3: SFILLC CONTAINS THE CHARACTER TO FILL AFTER.
1861      ;:
1862      ;:CALL:
1863      ;:1) USING A TRAP INSTRUCTION
1864      ;: TYPE ,MESADR ;:MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
1865      ;:OR
1866      ;: TYPE MESADR
1867      ;:
1868      ;:
1869
1870 005132 105737 001177      STYPE: TSTB STPFLG ;:IS THERE A TERMINAL?
1871 005136 100002      BPL 1S ;:BR IF YES
1872 005140 000000      HALT ;:HALT HERE IF NO TERMINAL
1873 005142 000430      BR 3S ;:LEAVE
1874 005144 010046      1S: MOV RO,-(SP) ;:SAVE RO
1875 005146 017600 000002      MOV 32(SP),RO ;:GET ADDRESS OF ASCIZ STRING
1876 005152 122737 000001 001254      CMPB #APTENV,SENV ;:RUNNING IN APT MODE
1877 005160 001011      BNE 62S ;:NO GO CHECK FOR APT CONSOLE
1878 005162 132737 000100 001255      BITB #APTPOOL,SENV ;:SPOOL MESSAGE TO APT
1879 005170 001405      BEQ 62S ;:NO GO CHECK FOR CONSOLE
1880 005172 010037 005202      MOV RO,61S ;:SETUP MESSAGE ADDRESS FOR APT
1881 005176 004737 005422      JSR PC,SATY3 ;:SPOOL MESSAGE TO APT
1882 005202 000000      61S: .WORD 0 ;:MESSAGE ADDRESS

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TYPE ROUTINE

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1883 005204 132737 000040 001255 62$: BITB #APTC SUP, $ENVM ;; APT CONSOLE SUPPRESSED
1884 005212 001003 BNE 60$ ;; YES, SKIP TYPE OUT
1885 005214 112046 2$: MOVB (RO)+, -(SP) ;; PUSH CHARACTER TO BE TYPED ONTO STACK
1886 005216 001005 BNE 4$ ;; BR IF IT ISN'T THE TERMINATOR
1887 005220 005726 TST (SP)+ ;; IF TERMINATOR POP IT OFF THE STACK
1888 005222 012600 60$: MOV (SP)+, RO ;; RESTORE RO
1889 005224 062716 000002 3$: ADD #2, (SP) ;; ADJUST RETURN PC
1890 005230 000002 RTI ;; RETURN
1891 005232 122716 000011 4$: CMPB #HT, (SP) ;; BRANCH IF <HT>
1892 005236 001430 BEQ 8$
1893 005240 122716 000200 CMPB #CRLF, (SP) ;; BRANCH IF NOT <CRLF>
1894 005244 001006 BNE 5$
1895 005246 005726 TST (SP)+ ;; POP <CR><LF> EQUIV
1896 005250 104402 TYPE ;; TYPE A CR AND LF
1897 005252 001231 SCRLF
1898 005254 105037 005410 CLRB $CHARCNT ;; CLEAR CHARACTER COUNT
1899 005260 000755 BR 2$ ;; GET NEXT CHARACTER
1900 005262 004737 005344 5$: JSR PC, $TYPEC ;; GO TYPE THIS CHARACTER
1901 005266 123726 001176 6$: CMPB $FILLC, (SP)+ ;; IS IT TIME FOR FILLER CHARS.?
1902 005272 001350 BNE 2$ ;; IF NO GO GET NEXT CHAR.
1903 005274 013746 001174 MOV $NULL, -(SP) ;; GET # OF FILLER CHARS. NEEDED
1904 AND THE NULL CHAR.
1905 005300 105366 000001 7$: DECB 1(SP) ;; DOES A NULL NEED TO BE TYPED?
1906 005304 002770 BLT 6$ ;; BR IF NO--GO POP THE NULL OFF OF STACK
1907 005306 004737 005344 JSR PC, $TYPEC ;; GO TYPE A NULL
1908 005312 105337 005410 DECB $CHARCNT ;; DO NOT COUNT AS A COUNT
1909 005316 000770 BR 7$ ;; LOOP
1910
1911 ;HORIZONTAL TAB PROCESSOR
1912
1913 005320 112716 000040 8$: MOVB #' (SP) ;; REPLACE TAB WITH SPACE
1914 005324 004737 005344 9$: JSR PC, $TYPEC ;; TYPE A SPACE
1915 005330 132737 000007 005410 BITB #7, $CHARCNT ;; BRANCH IF NOT AT
1916 005336 001372 BNE 9$ ;; TAB STOP
1917 005340 005726 TST (SP)+ ;; POP SPACE OFF STACK
1918 005342 000724 BR 2$ ;; GET NEXT CHARACTER
1919 005344 105777 173620 $TYPEC: TSTB $STPS ;; WAIT UNTIL PRINTER IS READY
1920 005350 100375 BPL $TYPEC
1921 005352 116677 000002 173612 MOVB 2(SP), $STPB ;; LOAD CHAR TO BE TYPED INTO DATA REG.
1922 005360 122766 000015 000002 CMPB #CR, 2(SP) ;; IS CHARACTER A CARRIAGE RETURN?
1923 005366 001003 BNE 1$ ;; BRANCH IF NO
1924 005370 105037 005410 CLRB $CHARCNT ;; YES--CLEAR CHARACTER COUNT
1925 005374 000406 BR $TYPEX ;; EXIT
1926 005376 122766 000012 000002 1$: CMPB #LF, 2(SP) ;; IS CHARACTER A LINE FEED?
1927 005404 001402 BEQ $TYPEX ;; BRANCH IF YES
1928 005406 105227 INCB (PC)+ ;; COUNT THE CHARACTER
1929 005410 000000 $CHARCNT: .WORD 0 ;; CHARACTER COUNT STORAGE
1930 005412 000207 $TYPEX: RTS PC
1931
1932 .SBTTL APT COMMUNICATIONS ROUTINE
1933
1934 ;*****
1935 005414 112737 000001 005660 $ATY1: MOVB #1, $FFLG ;; TO REPORT FATAL ERROR
1936 005422 112737 000001 005656 $ATY3: MOVB #1, $MFLG ;; TO TYPE A MESSAGE
1937 005430 000403 BR $ATYC
1938 005432 112737 000001 005660 $ATY4: MOVB #1, $FFLG ;; TO ONLY REPORT FATAL ERROR

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1939 005440          SATYC:
1940 005440 010046      MOV      RO,-(SP)      ;; PUSH RO ON STACK
1941 005442 010146      MOV      R1,-(SP)      ;; PUSH R1 ON STACK
1942 005444 105737 005656  TSTB     $MFLG      ;; SHOULD TYPE A MESSAGE?
1943 005450 001450      BEQ      5$           ;; IF NOT: BR
1944 005452 122737 000001 001254  CMPB     $APTENV,$ENV      ;; OPERATING UNDER APT?
1945 005460 001031      BNE      3$           ;; IF NOT: BR
1946 005462 132737 000100 001255  BITB     $APTSPool,$ENVm      ;; SHOULD SPOOL MESSAGES?
1947 005470 001425      BEQ      3$           ;; IF NOT: BR
1948 005472 017600 000004      MOV      24(SP),RO      ;; GET MESSAGE ADDR.
1949 005476 062766 000002 000004  ADD      #2,4(SP)      ;; BUMP RETURN ADDR.
1950 005504 005737 001234      TST      $MSGTYPE      ;; SEE IF DONE W/ LAST XMISSION?
1951 005510 001375      BNE      1$           ;; IF NOT: WAIT
1952 005512 010037 001250      MOV      RO,$MSGAD      ;; PUT ADDR IN MAILBOX
1953 005516 105720      TSTB     (RO)+      ;; FIND END OF MESSAGE
1954 005520 001376      BNE      2$           ;;
1955 005522 163700 001250      SUB      $MSGAD,RO      ;; SUB START OF MESSAGE
1956 005526 006200      ASR      RO      ;; GET MESSAGE LGTH IN WORDS
1957 005530 010037 001252      MOV      RO,$MSGLGt      ;; PUT LENGTH IN MAILBOX
1958 005534 012737 000004 001234  MOV      #4,$MSGTYPE      ;; TELL APT TO TAKE MSG.
1959 005542 000413      BR      5$           ;;
1960 005544 017637 000004 005570 3$:      MOV      24(SP),4$      ;; PUT MSG ADDR IN JSR LINKAGE
1961 005552 062766 000002 000004  ADD      #2,4(SP)      ;; BUMP RETURN ADDRESS
1962 005560 013746 177776      MOV      177776,-(SP)      ;; PUSH 177776 ON STACK
1963 005564 004737 005132      JSR     PC,$TYPE      ;; CALL TYPE MACRO
1964 005570 000000      4$:      .WORD      0
1965 005572      5$:
1966 005572 105737 005660      10$:      TSTB     $FFLG      ;; SHOULD REPORT FATAL ERROR?
1967 005576 001416      BEQ      12$          ;; IF NOT: BR
1968 005600 005737 001254      TST      $ENV      ;; RUNNING UNDER APT?
1969 005604 001413      BEQ      12$          ;; IF NOT: BR
1970 005606 005737 001234      11$:      TST      $MSGTYPE      ;; FINISHED LAST MESSAGE?
1971 005612 001375      BNE      11$          ;; IF NOT: WAIT
1972 005614 017637 000004 001236  MOV      24(SP),$FATAL      ;; GET ERROR #
1973 005622 062766 000002 000004  ADD      #2,4(SP)      ;; BUMP RETURN ADDR.
1974 005630 005237 001234      INC      $MSGTYPE      ;; TELL APT TO TAKE ERROR
1975 005634 105037 005660      12$:      CLRB     $FFLG      ;; CLEAR FATAL FLAG
1976 005640 105037 005657      CLRB     $LFLG      ;; CLEAR LOG FLAG
1977 005644 105037 005656      CLRB     $MFLG      ;; CLEAR MESSAGE FLAG
1978 005650 012601      MOV      (SP)+,R1      ;; POP STACK INTO R1
1979 005652 012600      MOV      (SP)+,RO      ;; POP STACK INTO RO
1980 005654 000207      RTS      PC      ;; RETURN
1981 005656      000      $MFLG: .BYTE      0      ;; MESSG. FLAG
1982 005657      000      $LFLG: .BYTE      0      ;; LOG FLAG
1983 005660      000      $FFLG: .BYTE      0      ;; FATAL FLAG
1984      005662      .EVEN
1985      000200      APTSIZE=200
1986      000001      APTENV=001
1987      000100      APTSPool=100
1988      000040      APTCSUP=040
1989
1990      ;STRING INPUT ROUTINE
1991      -----
1992
1993 005662 010346      .INSTR: MOV      R3,-(SP)      ;; SAVE R3 ON STACK
1994 005664 010446      MOV      R4,-(SP)      ;; SAVE R4 ON STACK

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1995	005666	017637	000004	005704	MOV	34(SP), MSG	: GET THE ADDRESS OF THE MESSAGE TO BE PRINTED
1996	005674	062766	000002	000004	ADD	#2, 4(SP)	: POINT TO INSTRUCTION AFTER ADDRESS POINTER
1997	005702	104402			.INST1: TYPE		: PRINT THE MESSAGE
1998	005704	000000			.MSG: 0		: MESSAGE IS POINTED TO FROM HERE
1999	005706	012704	010452		MOV	#INBUF, R4	: POINT R4 TO THE INPUT BUFFER
2000	005712	012703	000007		MOV	#7, R3	: SET THE MAXIMUM NUMBER OF CHARACTERS ALLOWED
2001	005716	105777	173242		15: TSTB	3STKS	: HAS A CHARACTER BEEN RECEIVED?
2002	005722	100375			BPL	15	: IF NO, KEEP WAITING FOR IT
2003	005724	117714	173236		MOVB	3STKB, (R4)	: IF YES, SAVE IT IN THE INPUT BUFFER
2004	005730	142714	000200		BICB	#200, (R4)	: KEEP ONLY THE 7-BIT ASCII INFORMATION
2005	005734	122427	000015		CMPB	(R4)+, #15	: IS THIS CHARACTER A LINE FEED?
2006	005740	001417			BEQ	INSTR2	: IF SO, TERMINATE THE INPUT SEQUENCE
2007	005742	105777	173222		25: TSTB	3STPS	: IF NOT, CHECK TO SEE IF THE CHARACTER CAN PRINT
2008	005746	100375			BPL	25	: IF WE CAN'T, WAIT UNTIL WE CAN
2009	005750	017777	173212	173214	MOV	3STKB, 3STPB	: ECHO THE CHARACTER BACK
2010	005756	005303			DEC	R3	: REDUCE THE NUMBER OF CHARACTERS RECEIVED
2011	005760	001356			BNE	15	: IF WE DON'T HAVE 7, GO GET SOME MORE
2012	005762	012604			MOV	(SP)+, R4	: IF WE HAVE 7, RESTORE R4
2013	005764	012603			MOV	(SP)+, R3	: RESTORE R3
2014	005766	010346			.INSTE: MOV	R3, -(SP)	: SAVE R3 ON THE STACK
2015	005770	010446			MOV	R4, -(SP)	: SAVE R4 ON THE STACK
2016	005772	104402	001230		TYPE	, \$QUES	: PRINT A QUESTION MARK... WHAT'S GOING ON?
2017	005776	000741			BR	.INST1	: GO PRINT THE MESSAGE AGAIN
2018	006000	012604			INSTR2: MOV	(SP)+, R4	: RESTORE R4
2019	006002	012603			MOV	(SP)+, R3	: RESTORE R3
2020	006004	000002			RTI		: RETURN TO THE MAIN PROCEDURE
2021							
2022							
2023							
2024							
2025	006006	010546			.PARAM: MOV	R5, -(SP)	: SAVE R5 ON THE STACK
2026	006010	010446			MOV	R4, -(SP)	: SAVE R4 ON THE STACK
2027	006012	016605	000004		MOV	4(SP), R5	: GET THE SETUP INFORMATION POINTER
2028	006016	012537	006176		MOV	(R5)+, LOLIM	: SET THE LOW LIMIT FOR THE INPUT
2029	006022	012537	006200		MOV	(R5)+, HILIM	: SET THE HIGH LIMIT FOR THE INPUT
2030	006026	012537	006202		MOV	(R5)+, DEVADR	: SAVE THE ADDRESS WHERE THE RESULT WILL BE STORED
2031	006032	112537	006204		MOVB	(R5)+, LOBIT'S	: GET THE MASK OF THE INCORRECT BITS
2032	006036	112537	006205		MOVB	(R5)+, ADCNT	: GET THE COUNT OF ITEMS TO BE STORED
2033	006042	010566	000004		MOV	R5, 4(SP)	: POINT TO WHERE MAIN LINE PROGRAM WILL RESUME
2034	006046	005005			PARAM1: CLR	R5	: INITIALIZE THE ASCII TO OCTAL RESULT WORD
2035	006050	012704	010452		MOV	#INBUF, R4	: POINT TO THE INPUT BUFFER
2036	006054	122714	000015		CMPB	#15, (R4)	: IS THIS CHARACTER A CARRIAGE RETURN?
2037	006060	001420			BEQ	PARERR	: IF SO, PRINT THE MESSAGE AGAIN
2038	006062	121427	000060		15: CMPB	(R4), #60	: IS THIS CHARACTER BELOW THE NUMERIC RANGE?
2039	006066	002415			BLT	PARERR	: IF SO, GO PRINT THE MESSAGE AGAIN
2040	006070	121427	000067		CMPB	(R4), #67	: IS THIS CHARACTER ABOVE THE NUMERIC RANGE?
2041	006074	003012			BGT	PARERR	: IF SO, GO PRINT THE MESSAGE AGAIN
2042	006076	142714	000060		BICB	#60, (R4)	: ISOLATE THE NUMBER THE CHARACTER REPRESENTS
2043	006102	152405			BISB	(R4)+, R5	: CONCATENATE THESE BITS TO THE ALREADY EXISTING STRING
2044	006104	122714	000015		CMPB	#15, (R4)	: IS THE NEXT CHARACTER A CARRIAGE RETURN?
2045	006110	001406			BEQ	LIMITS	: IF SO, GO SEE IF NUMBER IS WITHIN LIMITS
2046	006112	006305			ASL	R5	: CLEAR BIT POSITION 0, MOVE EXISTING STRING TO LEFT
2047	006114	006305			ASL	R5	: CLEAR POSITION 1, MOVE STRING TO LEFT AGAIN
2048	006116	006305			ASL	R5	: MOVE THE STRING ONE MORE TIME TO MAKE ROOM FOR
2049							: NEXT THREE BITS
2050	006120	000760			BR	15	: GO GET THE NEXT CHARACTER

: CONVERT ASCII STRING TO OCTAL

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2051 006122 104404 PARERR: INSTER ;THERE WAS AN ERROR... GO PRINT MESSAGE AGAIN
2052 006124 000750 BR PARAM1 ;TRY GETTING THE PARAMETERS AGAIN
2053
2054 ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
2055 -----
2056
2057 006126 020537 006200 LIMITS: CMP R5,HILIM ;DOES RESULT EXCEED ITS MAXIMUM CORRECT VALUE?
2058 006132 101373 BHI PARERR ;IF YES, GO PRINT THE MESSAGE AGAIN
2059 006134 020537 006176 CMP R5,LOLIM ;IS THE RESULT LOWER THAN ALLOWED?
2060 006140 103770 BLO PARERR ;IF YES, GO PRINT THE MESSAGE AGAIN
2061 006142 133705 006204 BITB LOBITS,R5 ;ARE ANY INCORRECT BITS SET IN THE RESULT?
2062 006146 001365 BNE PARERR ;IF SO, GO PRINT THE MESSAGE AGAIN
2063
2064 ;STORE NUMBER AT SPECIFIED ADDRESS
2065
2066 006150 013704 006202 1$: MOV DEVADR,R4 ;POINT TO THE LOCATION WHERE THE RESULT WILL BE STORED
2067 006154 010524 MOV R5,(R4)+ ;STORE THE RESULT
2068 006156 062705 000002 ADD #2,R5 ;CALCULATE THE NEXT DATUM
2069 006162 105337 006205 DECB ADRCNT ;REDUCE COUNT OF STORED RESULTS. IS IT EXCEEDED?
2070 006166 001372 BNE 1$ ;IF NOT, GO STORE THE NEXT DATUM
2071 006170 012604 MOV (SP)+,R4 ;RESTORE R4
2072 006172 012605 MOV (SP)+,R5 ;RESTORE R5
2073 006174 000002 RTI ;RETURN TO THE MAIN PROGRAM
2074
2075 006176 000000 LOLIM: 0 ;LOWEST ACCEPTABLE VALUE
2076 006200 000000 HILIM: 0 ;HIGHEST ACCEPTABLE
2077 006202 000000 DEVADR: 0 ;LOCATION WHERE RESULT WILL BE STORED
2078 006204 000 LOBITS: .BYTE 0 ;INCORRECT BITS MASK
2079 006205 000 ADRCNT: .BYTE 0 ;COUNT OF ITEMS TO BE STORED
2080
2081 ;SAVE PC OF TEST THAT FAILED AND R0-R5
2082 -----
2083
2084 006206 016637 000004 001402 .SAV05: MOV 4(SP),SAVPC ;SAVE R7 (PC)
2085
2086 ;SAVE R0-R5
2087
2088 006214 010537 001214 SV05: MOV R5,$REG5 ;SAVE R5
2089 006220 010437 001212 MOV R4,$REG4 ;SAVE R4
2090 006224 010337 001210 MOV R3,$REG3 ;SAVE R3
2091 006230 010237 001206 MOV R2,$REG2 ;SAVE R2
2092 006234 010137 001204 MOV R1,$REG1 ;SAVE R1
2093 006240 010037 001202 MOV R0,$REG0 ;SAVE R0
2094 006244 000002 RTI ;LEAVE.
2095
2096 ;RESTORE R0-R5
2097
2098 006246 013700 001202 .RES05: MOV $REG0,R0 ;RESTORE R0
2099 006252 013701 001204 MOV $REG1,R1 ;RESTORE R1
2100 006256 013702 001206 MOV $REG2,R2 ;RESTORE R2
2101 006262 013703 001210 MOV $REG3,R3 ;RESTORE R3
2102 006266 013704 001212 MOV $REG4,R4 ;RESTORE R4
2103 006272 013705 001214 MOV $REG5,R5 ;RESTORE R5
2104 006276 000002 RTI ;LEAVE
2105
2106 ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER

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2107
2108
2109 006300 104402 001231 .CONVR: TYPE $CRLF ;PRINT A CARRIAGE RETURN
2110 006304 010046 .CNVRT: MOV R0,-(SP) ;SAVE R0
2111 006306 010146 MOV R1,-(SP) ;SAVE R1
2112 006310 010346 MOV R3,-(SP) ;SAVE R3
2113 006312 010446 MOV R4,-(SP) ;SAVE R4
2114 006314 010546 MOV R5,-(SP) ;SAVE R5
2115 006316 017601 000012 MOV @12(SP),R1 ;PLACE THE ADDRESS OF THE ARGUMENTS IN R1
2116 006322 062766 000002 000012 ADD #2,12(SP) ;POINT TO WHERE MAIN PROGRAM WILL RESUME
2117 006330 012137 006454 MOV (R1)+,WRDCNT ;GET NUMBER OF WORDS TO BE PRINTED
2118 006334 112105 1$: MOV (R1)+,R5 ;GET THE NUMBER OF CHARACTERS TO BE PRINTED
2119 006336 112100 MOV (R1)+,R0 ;GET THE NUMBER OF SPACES TO PRINT
2120 006340 013104 MOV @12(SP),R4 ;COPY THE WORD TO BE CONVERTED
2121 006342 110537 006456 MOV R5,CHRCNT ;COPY THE CHARACTER COUNT
2122 006346 010403 3$: MOV R4,R3 ;COPY THE ARGUMENT WORD AGAIN
2123 006350 042703 177770 BIC #1<7>,R3 ;ISOLATE THREE BITS TO BE TREATED AS A CHARACTER
2124 006354 062703 000060 ADD #060,R3 ;MAKE AN ASCII CHARACTER OUT OF THEM
2125 006360 110346 MOV R3,-(SP) ;SAVE THAT CHARACTER
2126 006362 006004 ROR R4 ;MOVE THE NEXT THREE BITS INTO PLACE
2127 006364 006204 ASR R4 ;MOVE THEM AGAIN
2128 006366 006204 ASR R4 ;AND FINALLY A THIRD TIME
2129 006370 005305 DEC R5 ;REDUCE CHARACTER COUNT. ARE ALL CHARACTERS
2130 BNE 3$ ;BUILT?
2131 006372 001365 BNE 3$ ;IF NO, GO BUILD THE NEXT ONE.
2132 006374 012703 010556 MOV #MDATA,R3 ;NOW POINT TO WHERE NUMBER WILL BE PRINTED FROM
2133 006400 112623 4$: MOV (SP)+,(R3)+ ;STORE THE CHARACTER, STARTING WITH THE MOST
2134 006402 105337 006456 DECB CHRCNT ;REDUCE COUNT. ARE ALL CHARACTERS TRANSFERRED?
2135 006406 001374 BNE 4$ ;IF NO, GO TRANSFER ANOTHER
2136 006410 105700 TSTB R0 ;ARE ANY SPACES TO BE PRINTED?
2137 006412 001404 BEQ 6$ ;IF NO, DON'T SET UP ANY
2138 006414 112723 000040 5$: MOV #040,(R3)+ ;ADD A SPACE TO THE OUTPUT BUFFER
2139 006420 105300 DECB R0 ;REDUCE THE COUNT. SHOULD WE PRINT MORE?
2140 006422 001374 BNE 5$ ;IF YES, GO ADD ANOTHER SPACE
2141 006424 105013 6$: CLRB (R3) ;TERMINATE THE OUTPUT BUFFER WITH A ZERO
2142 006426 104402 010556 TYPE ,MDATA ;PRINT THE STRING WE JUST BUILT
2143 006432 005337 006454 DEC WRDCNT ;REDUCE THE WORD COUNT. ARE ANY MORE WORDS LEFT?
2144 006436 001336 BNE 1$ ;IF YES, GO CONVERT THEM
2145 006440 012605 MOV (SP)+,R5 ;RESTORE R5
2146 006442 012604 MOV (SP)+,R4 ;RESTORE R4
2147 006444 012603 MOV (SP)+,R3 ;RESTORE R3
2148 006446 012601 MOV (SP)+,R1 ;RESTORE R1
2149 006450 012600 MOV (SP)+,R0 ;RESTORE R0
2150 006452 000002 RTI ;RETURN TO THE MAIN PROGRAM
2151 006454 000000 WRDCNT: 0 ;NUMBER OF WORDS TO PRINT
2152 006456 000 CHRCNT: .BYTE ;NUMBER OF CHARACTERS TO PRINT
2153 006457 000 SPACNT: .BYTE 0 ;NUMBER OF SPACES TO PRINT
2154
2155 006460 000000 BINWRD: 0
2156
2157
2158 ;TRAP DISPATCH SERVICE
2159 ;ARGUMENT OF TRAP IS EXTRACTED
2160 ;AND USED AS OFFSET TO OBTAIN POINTER
2161 ;TO SELECTED SUBROUTINE
2162

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2163 006462 010046      .TRPSR: MOV      RO,-(SP)      ;SAVE RO. USE RO TO FIND TRAP ROUTINE
2164 006464 016600 000002      MOV      2(SP),RO      ;GET TRAP ADDRESS
2165 006470 005740      TST      -(RO)      ;GET TRAP
2166 006472 111000      MOV      (RO),RO      ;GET RIGHT BYTE OF TRAP(TRAP OFFSET)
2167 006474 006300      ASL      RO      ;POSITION OFFSET FOR TABLE INDEXING
2168 006476 016000 002002      MOV      .TRPTAB(RO),RO      ;PLACE INDEXED ADDRESS OF TABLE IN RO
2169 006502 000200      RTS      RO      ;TRANSFER TO THAT ADDRESS AND RESTORE OLD RO
2170
2171      ;DEVICE CLEAR ROUTINE
2172      ;ISSUE A DEVICE CLEAR
2173      ;-----
2174 006504      .DEVICE.CLR:
2175 006504 052777 000020 173330      BIS      #DCLR,0DZCSR      ;SET DCLR
2176 006512 032777 000020 173322      IS:      BIT      #DCLR,0DZCSR      ;DID IT CLEAR?
2177 006520 001374      BNE      IS      ;BR IF NO
2178 006522 000002      RTI      ;EXIT ROUTINE
2179
2180      ;ROUTINE TO HANDLE MAINTENANCE BIT SETTING WITH DEVICE CLEAR
2181      ;-----
2182 006524 104413      .DCLASM:DEVICE.CLR      ;ISSUE A DEVICE CLEAR
2183 006526 153777 001417 173306      BIS      MNTFLG,0DZCSR      ;LOAD THE MAINTENANCE BIT IF IT IS I MODE
2184 006534 000002      RTI      ;RETURN TO CALLING ROUTINE
2185
2186 006536      .DELAY:
2187 006536 010046      MOV      RO,-(SP)      ;SAVE RO
2188 006540 013700 006554      MOV      DLYCNT,RO      ;SET COUNT
2189 006544 005300      IS:      DEC      RO      ;DELAY
2190 006546 001376      BNE      IS      ;
2191 006550 012600      MOV      (SP)+,RO      ;RESTORE RO
2192 006552 000002      RTI      ;LEAVE ROUTINE
2193 006554 000036      DLYCNT: .WORD      30.      ;PATCHABLE LOC FOR MORE TIME
2194
2195      ;ADVANCE TO NEXT TEST HANDLER
2196      ;-----
2197
2198 006556 013716 001360      .ADVANCE:MOV      NEXT,(SP)      ;CRUNCH STACK WITH ADDRESS OF SCOPE CALL
2199 006562 005037 001362      CLR      LOCK      ;RESET TIGHT LOOP ADDRESS
2200 006566 000002      RTI      ;CHECK TO SEE IF OLD TEST GETS REPEATED
2201
2202      ;ERROR HANDLER
2203      ;-----
2204
2205 006570 004737 007212      $ERROR: JSR      PC,SERV.G      ;FIND OUT IF <IG> WAS HIT
2206 006574 032777 010000 172356      BIT      #SW12,0SWR      ;BELL ON ERROR?
2207 006602 001406      BEQ      XBX      ;BR IF NO BELL
2208 006604 105777 172360      TSTB     0STPS      ;TTY READY.
2209 006610 100003      BPL      XBX      ;DON'T WAIT IF TTY NOT READY.
2210 006612 112777 000207 172352      MOV      #207,0STPB      ;PUSH A BELL AT THE TTY.
2211 006620 032777 020000 172332      XBX:      BIT      #SW13,0SWR      ;DELETE ERROR PRINT OUT?
2212 006626 001113      BNE      HALTS      ;BR IF NO PRINT OUT WANTED.
2213 006630 021637 001136      CMP      (SP),$ERRPC      ;WAS THIS ERROR FOUND LAST TIME?
2214 006634 001404      BEQ      IS      ;BR IF YES
2215 006636 011637 001136      MOV      (SP),$ERRPC      ;RECORD BEING HERE
2216 006642 105037 001123      CLRB     $ERFLG      ;PREPARE HEADER
2217 006646 104407      IS:      SAVOS      ;SAVE ALL PROC REGISTERS
2218 006650 011605      MOV      (SP),R5      ;GET THE PC OF ERROR

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2219	006652	162705	000002		SUB	#2,R5	;GET ADDRESS OF TRAP CALL
2220	006656	011504			MOV	(R5),R4	;GET ERROR INSTRUCTION
2221	006660	110437	001134		MOVB	R4,\$ITEMB	;COPY TEST NUMBER FOR APT HANDLING
2222	006664	006304			ASL	R4	;MULT BY TWO
2223	006666	061504			ADD	(R5),R4	;DOUBLE IT
2224	006670	006304			ASL	R4	;MULT AGAIN
2225	006672	042704	177001		BIC	#177001,R4	;CLEAR JUNK
2226	006676	062704	026174		ADD	#.ERRTAB,R4	;GET POINTER
2227	006702	012437	007026		MOV	(R4)+,ERRMSG	;GET ERROR MESSAGE
2228	006706	012437	007040		MOV	(R4)+,DATAHD	;GET DATA HEADER
2229	006712	011437	007052		MOV	(R4),DATABP	;GET DATA TABLE
2230	006716	105737	001123		TSTB	SERFLG	;TYPE HEADER
2231	006722	001403			BEQ	TYPMSG	;BR IF YES
2232	006724	005737	007052		TST	DATABP	;DOES DATA TABLE EXIST?
2233	006730	001044			BNE	TYPDAT	;BR IF YES.
2234	006732	104402	001231		TYPMSG:	TYPE	;TYPE A CARRIAGE RETURN
2235	006736	104402	001231		TYPE	,SCLF	;AND TYPE ANOTHER
2236	006742	005737	001362		TST	LOCK	
2237	006746	001402			BEQ	IS	
2238	006750	104402	010147		TYPE	,MASTEK	
2239	006754	104402	010135		TYPE	,MTSTN	
2240	006760	104412	007204		CNVRT	,XTSTN	;SHOW IT
2241	006764	104402	010224		TYPE	,MERRPC	;TYPE PC.
2242	006770	104412	007176		CNVRT	,ERTABO	;SHOW IT
2243	006774	104402	010077		TYPE	,MCSRX	
2244	007000	104412	004612		CNVRT	,XCSR	
2245	007004	104402	001231		TYPE	,SCLF	
2246	007010	112737	177777	001123	MOVB	#-1,SERFLG	;GIVE A CR/LF
2247	007016	005737	007026		TST	ERRMSG	;NO MORE HEADER UNLESS NO DATA TABLE.
2248	007022	001402			BEQ	WTBS.FM	;IS THERE AN ERROR MESSAGE?
2249	007024	104402			TYPE		;BR IF NO.
2250	007026	000000			ERRMSG:	0	;TYPE
2251	007030				WTBS.FM:		ERROR MESSAGE
2252	007030	005737	007040		TST	DATAHD	;DATA HEADER?
2253	007034	001402			BEQ	TYPDAT	;BR IF NO
2254	007036	104402			TYPE		;TYPE
2255	007040	000000			DATAHD:	0	DATA HEADER
2256	007042	005737	007052		TYPDAT:	TST	DATA TABLE?
2257	007046	001402			BEQ	DATABP	;BR IF NO.
2258	007050	104411			CONVRT	RESREG	;SHOW
2259	007052	000000			DATABP:	0	DATA TABLE
2260	007054	104410			RESREG:	RESOS	RESTORE PROC REGISTERS
2261	007056	122737	000001	001254	HALTS:	CMPB	IS APT RUNNING?
2262	007064	001007			BNE	#APTENV,SENV	;SKIP APT CALL IF NOT
2263	007066	113737	001134	007100	MOVB	\$ITEMB,7S	;COPY ERROR NUMBER
2264	007074	004737	005432		JSR	PC,\$ATY4	;CALL APT SERVICE
2265	007100	000000			7S:	.WORD	ERROR NUMBER STUCK HERE
2266	007102	000777			8S:	BR	LOCK UP HERE
2267	007104	022737	004576	000042	2S:	CMP	CHECK TO SEE IF IN ACT-11 MODE
2268	007112	001403			BEQ	#SENDAD,\$#42	;IF SO, HANDLE ACCORDINGLY
2269	007114	005777	172040		TST	\$SWR	HALT ON ERROR?
2270	007120	100004			BPL	EXITER	;BR IF NO HALT ON ERROR
2271	007122	016677	000002	172032	1S:	MOV	2(SP),\$DISPLAY
2272	007130	000000			HALT		;SHOW ERROR PC IN DATA DISPLAY
2273	007132	005237	001132		EXITER:	INC	HALT
2274	007136	032777	000400	172014	BIT	\$SERTTL	UPDATE ERROR COUNT
						#SWOB,\$SWR	;GOTO TOP OF TEST?

2275	007144	001007		BNE	1\$	;BR IF YES
2276	007146	032777	002000	BIT	#SW10,@SWR	;GOTO NEXT TEST?
2277	007154	001407		BEQ	2\$	;BR IF NO
2278	007156	013737	001360	MOV	NEXT,\$LPADR	;SET FOR NEXT TEST
2279	007164	012706	001120	MOV	#STACK,SP	;RESET SP
2280	007170	000177	171732	JMP	@SLPADR	;GOTO SPECIFIED TEST
2281	007174	000002		RTI		;RETURN
2282	007176	000001		ERTABO:	1	
2283	007200	006	002	.BYTE	6,2	
2284	007202	001402		SAVPC		
2285	007204	000001		XTSTN:	1	
2286	007206	002	002	.BYTE	2,2	
2287	007210	001122		\$TSTNM		
2288	007212	022737	177570	SERV.G:	CMP #177570,SWR	;IS THE SWITCH REGISTER HARDWIRED?
2289	007220	001513		BEQ	6\$	;IF SO, IGNORE ↑G
2290	007222	017746	171740	MOV	@STKB,-(SP)	;OTHERWISE, GET THE LAST CHARACTER TYPED
2291	007226	042716	000200	BIC	#BIT7,(SP)	;STRIP PARITY(EIGHTH) BIT
2292	007232	122726	000007	CMPB	#7,(SP)+	;IS IT ↑G?
2293	007236	001104		BNE	6\$	;IF NOT, IGNORE INPUT
2294	007240	032777	004000	BIT	#4000,@STKS	;RX BUSY?
2295	007246	001361		BNE	SERV.G	;BR IF YES
2296	007250	017737	171704	MOV	@SWR,90\$	;SAVE (SWR).
2297	007256	013777	007472	MOV	90\$,@SWR	
2298	007264	104402	007452	TYPE	,89\$	
2299	007270	104412	007464	CNVRT	,88\$	
2300	007274	104402	007474	TYPE	,91\$	
2301	007300	105777	171660	TSTB	@STKS	;WAIT FOR DONE.
2302	007304	100375		BPL	-4	
2303	007306	017746	171654	MOV	@STKB,-(SP)	
2304	007312	042716	000200	BIC	#BIT7,(SP)	
2305	007316	122726	000015	CMPB	#15,(SP)+	
2306	007322	001450		BEQ	5\$	
2307	007324	005077	171630	CLR	@SWR	
2308	007330	105777	171634	2\$: TSTB	@STPS	
2309	007334	100375		BPL	-4	
2310	007336	016677	177776	MOV	-2(SP),@STPB	
2311	007344	000241		CLC		
2312	007346	006177	171606	ROL	@SWR	
2313	007352	006177	171602	ROL	@SWR	
2314	007356	006177	171576	ROL	@SWR	
2315	007362	103735		BCS	1\$	ERROR
2316	007364	026627	177776	CMP	-2(SP),#60	
2317	007372	002731		BLT	1\$	
2318	007374	026627	177776	CMP	-2(SP),#67	
2319	007402	003325		BGT	1\$	
2320	007404	042766	177770	BIC	#↑C<7>,-2(SP)	
2321	007412	056677	177776	BIS	-2(SP),@SWR	
2322	007420	105777	171540	TSTB	@STKS	
2323	007424	100375		BPL	-4	
2324	007426	017746	171534	MOV	@STKB,-(SP)	
2325	007432	042716	000200	BIC	#BIT7,(SP)	
2326	007436	122726	000015	CMPB	#15,(SP)+	
2327	007442	001332		BNE	2\$	
2328	007444	104402	001231	5\$: TYPE	\$CRLF	
2329	007450	000207		6\$: RTS	PC	
2330						

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2331 007452 020200 051450 051127 89$: .ASCIZ <200>? (SWR)=/?
2332 007460 036451 000057
2333 .EVEN
2334 007464 000001 88$: 1
2335 007466 006 000 .BYTE 6,0
2336 007470 007472 90$: .WORD 0
2337 007472 000000 91$: .ASCIZ ?/=/?
2338 007474 036457 000057
2339 .EVEN
2340 .SBTTL POWER DOWN AND UP ROUTINES
2341
2342 ::*****
2343 :POWER DOWN ROUTINE
2344 007500 012737 007644 000024 $PWRDN: MOV $SILLUP, $PWRVEC ;; SET FOR FAST UP
2345 007506 012737 000340 000026 MOV $340, $PWRVEC+2 ;; PRIO:7
2346 007514 010046 MOV R0, -(SP) ;; PUSH R0 ON STACK
2347 007516 010146 MOV R1, -(SP) ;; PUSH R1 ON STACK
2348 007520 010246 MOV R2, -(SP) ;; PUSH R2 ON STACK
2349 007522 010346 MOV R3, -(SP) ;; PUSH R3 ON STACK
2350 007524 010446 MOV R4, -(SP) ;; PUSH R4 ON STACK
2351 007526 010546 MOV R5, -(SP) ;; PUSH R5 ON STACK
2352 007530 017746 171424 MOV $SWR, -(SP) ;; PUSH $SWR ON STACK
2353 007534 010637 007650 MOV SP, $SAVR6 ;; SAVE SP
2354 007540 012737 007552 000024 MOV $PWRUP, $PWRVEC ;; SET UP VECTOR
2355 007546 000000 HALT
2356 007550 000776 BR -.2 ;; HANG UP
2357
2358 ::*****
2359 :POWER UP ROUTINE
2360 007552 012737 007644 000024 $PWRUP: MOV $SILLUP, $PWRVEC ;; SET FOR FAST DOWN
2361 007560 013706 007650 MOV $SAVR6, SP ;; GET SP
2362 007564 005037 007650 CLR $SAVR6 ;; WAIT LOOP FOR THE TTY
2363 007570 005237 007650 1$: INC $SAVR6 ;; WAIT FOR THE INC
2364 007574 001375 BNE 1$ ;; OF WORD
2365 007576 012677 171356 MOV (SP)+, $SWR ;; POP STACK INTO $SWR
2366 007602 012605 MOV (SP)+, R5 ;; POP STACK INTO R5
2367 007604 012604 MOV (SP)+, R4 ;; POP STACK INTO R4
2368 007606 012603 MOV (SP)+, R3 ;; POP STACK INTO R3
2369 007610 012602 MOV (SP)+, R2 ;; POP STACK INTO R2
2370 007612 012601 MOV (SP)+, R1 ;; POP STACK INTO R1
2371 007614 012600 MOV (SP)+, R0 ;; POP STACK INTO R0
2372 007616 012737 007500 000024 MOV $PWRDN, $PWRVEC ;; SET UP THE POWER DOWN VECTOR
2373 007624 012737 000340 000026 MOV $340, $PWRVEC+2 ;; PRIO:7
2374 007632 104402 TYPE ;; REPORT THE POWER FAILURE
2375 007634 007652 $PWRMG: .WORD MPFAIL ;; POWER FAIL MESSAGE POINTER
2376 007636 012716 MOV (PC)+, (SP) ;; RESTART AT RESTART
2377 007640 011254 $PWRAD: .WORD RESTART ;; RESTART ADDRESS
2378 007642 000002 RTI
2379 007644 000000 $SILLUP: HALT ;; THE POWER UP SEQUENCE WAS STARTED
2380 007646 000776 BR -.2 ;; BEFORE THE POWER DOWN WAS COMPLETE
2381 007650 000000 $SAVR6: 0 ;; PUT THE SP HERE
2382 007652 050200 051127 043040 MPFAIL: .ASCIZ <200>/PWR FAILED. RESTART AT LAST TEST /
(2) 007715 200 047105 020104 MEPASS: .ASCIZ <200>/END PASS DZDZA-B /
(2) 007741 200 052522 047116 MR: .ASCIZ <200>/RUNNING /
(2) 007755 200 051120 043517 MERR2: .ASCIZ <200>/PROGRAM INDICATES NO DEVICES PRESENT./
(2) 010024 044600 051516 043125 MERR3: .ASCIZ <200>/INSUFFICIENT DATA!/

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(2) 010050 046200 041517 020113 MLOCK: .ASCIZ <200>/LOCK ON SELECTED TEST/
(2) 010077 103 051123 020072 MCSRX: .ASCIZ /CSR: /
(2) 010105 126 041505 020072 MVECX: .ASCIZ /VEC: /
(2) 010113 120 051501 042523 MPASSX: .ASCIZ /PASSES: /
(2) 010124 051105 047522 051522 MERRX: .ASCIZ /ERRORS: /
(2) 010135 124 051505 020124 MTSTN: .ASCIZ /TEST NO: /
(2) 010147 052 000040 MASTEK: .ASCIZ /* /
(2) 010152 051600 052105 051440 MNEW: .ASCIZ <200>/SET SWITCH REG TO DZ11'S DESIRED ACTIVE./
(2) 010224 041520 020072 000 MERRPC: .ASCIZ /PC: /
(2) 010231 200 040515 020120 XHEAD: .ASCIZ <200>/MAP OF DZ11 STATUS/<200>
(2) 010256 044600 046114 043505 MBADLN: .ASCIZ <200>/ILLEGAL ENTRY IN STAGGERED MODE/<200>
(2) 010320 000002 XSTATQ: 2
2383 010322 006 003 .BYTE 6,3
2384 010324 001220 STMP1
2385 010326 006 002 .BYTE 6,2
2386 010330 001222 STMP2
2387 .EVEN
2388 ;THIS ROUTINE ESTABLISHES WHICH MAINTENANCE MODE THE DEVICE IS IN
2389 -----
2390 ;E=EXTERNAL LOOP BACK
2391 ;I=INTERNAL LOOP BACK
2392 ;S=STAGGERED LOOP BACK
2393 010332 017605 000000 .SETFLG: MOV 3(SP),R5 ;PICK UP ADDRESS OF TAG
2394 010336 042737 000040 010452 BIC #40,INBUF ;STRIP LOWER CASE
2395 010344 122737 000105 010452 CMPB #'E,INBUF ;IS IT EXTERNAL LOOP BACK ?
2396 010352 001005 BNE 4$ ;NO
2397 010354 013715 010444 MOV 15,(R5) ;YES STORE INFO
2398 010360 105037 001417 CLRB MNTFLG ;SET MAINT BIT =0
2399 010364 000422 BR 7$ ;GET OUT
2400 010366 122737 000111 010452 4$: CMPB #'I,INBUF ;IS IT INTERNAL LOOP BACK ?
2401 010374 001006 BNE 5$ ;NO
2402 010376 013715 010446 MOV 25,(R5) ;YES STORE INFO
2403 010402 112737 000010 001417 MOVB #MAINT,MNTFLG ;SET UP THE MAINTENANCE FLAG LOADER
2404 010410 000410 BR 7$ ;GET OUT
2405 010412 122737 000123 010452 5$: CMPB #'S,INBUF ;IS IT STAGGERED LOOP BACK ?
2406 010420 001007 BNE 6$ ;WHAT ?
2407 010422 013715 010450 MOV 35,(R5) ;YES STORE INFO
2408 010426 105037 001417 CLRB MNTFLG ;ZERO BITS
2409 010432 062716 000002 7$: ADD #2,(SP) ;POP AROUND
2410 010436 000002 RTI
2411 010440 104404 6$: INSTER ;RETRY
2412 010442 000733 BR .SETFLG ;DITTO
2413 010444 000200 1$: .WORD 200 ;EXTERNAL = E
2414 010446 000000 2$: .WORD 0 ;INTERNAL = I
2415 010450 100000 3$: .WORD 100000 ;STAGGERED = S
2416
2417 ;BUFFERS FOR INPUT-OUTPUT
2418
2419 010452 000000 INBUF: 0
2420 010514 .+.40
2421 010514 000000 TEMP: 0
2422 010556 .+.40
2423 010556 000000 MDATA: 0
2424 010620 .+.40
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DZDZAB.P11

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POWER DOWN AND UP ROUTINES

2426	010620	011637	010716	SET.PS:	MOV	(SP), 3S	
2427	010624	162737	000002	010716	SUB	#2, 3S	
2428	010632	017737	000060	010720	MOV	23S, 4S	
2429	010640	022737	106427	010720	CMP	#106427, 4S	
2430	010646	001003			BNE	1S	
2431	010650	011637	010716		MOV	(SP), 3S	
2432	010654	000412			BR	2S	
2433	010656	022737	106437	010720	CMP	#106437, 4S	
2434	010664	001401			BEQ	.+4	
2435	010666	000000			HALT		; RESERVED INSTRUCTION NOT "MTPS"
2436	010670	011637	010716		MOV	(SP), 3S	
2437	010674	017737	000016	010716	MOV	23S, 3S	
2438	010702	062716	000002		ADD	#2, (SP)	
2439	010706	017766	000004	000002	MOV	23S, 2(SP)	
2440	010714	000002			RTI		
2441	010716	000000			O		
2442	010720	000000			O		

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010722 005737 001404
010726 001004
010730 104402 007755
010734 000000
010736 000776
010740 013737 005104 001226
010746 033737 001406 001404
010754 001017
010756 006137 001406
010762 005537 001406
010766 062737 000014 001412
010774 022737 002000 001412
011002 001356
011004 012737 001500 001412
011012 000752
011014 006137 001406
011020 005537 001406
011024 013700 001412
011030 062737 000014 001412
011036 022737 002000 001412
011044 001003
011046 012737 001500 001412
011054 012037 001310
011060 012037 002072
011064 012037 026170
011070 113737 026171 001414
011076 042737 100000 026170
011104 012037 001364
011110 012037 001366
011114 012037 001370
011120 004737 025762
011124 005737 000042
011130 001046
011132 032777 000002 170020
011140 001442
011142 104402 001231
011146 104403
011150 010135
011152 104405
011154 000001
011156 001000
011160 001122
011162 000
011163 001
011164 012700 012166
011170 022710 000004

CYCLE:

15:

25:

35:

75:

55:

ROUTINE USED TO "CYCLE" THROUGH UP TO SIXTEEN DZ11'S
 THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
 AND RUNS THE SPECIFIED DZ11'S. THIS ROUTINE *MUST*
 BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
 SETUP NECESSARY.

TST DZACTV
 BNE 15
 TYPE ,MERR2
 HALT
 BR -2
 MOV \$MXCNT,STINES
 BIT RUN,DZACTV
 BNE 25
 ROL RUN
 ADC RUN
 ADD #14,ACTIVE
 CMP #DZ.END,ACTIVE
 BNE 15
 MOV #DZ.MAP,ACTIVE
 BR 15
 ROL RUN
 ADC RUN
 MOV ACTIVE,RO
 ADD #14,ACTIVE
 CMP #DZ.END,ACTIVE
 BNE 35
 MOV #DZ.MAP,ACTIVE
 (RO)+,\$BASE
 MOV (RO)+,DZRV
 MOV (RO)+,DZPRT
 MOV DZPRT+1,EIAFLG
 BIC #BIT15,DZPRT
 MOV (RO)+,LINE
 MOV (RO)+,PAR
 MOV (RO)+,MODE
 JSR PC,DZLEV
 TST #42
 BNE 45
 BIT #SW01,JSWR
 BEQ 45
 TYPE ,SCRLF
 INSTR
 MTSTN
 PARAM
 1
 1000
 STSTNM
 .BYTE 0
 .BYTE 1
 MOV #TST1,RO
 CMP #4,(RO)

ARE ANY DZ11'S TO BE TESTED?
 BR IF OK.
 NO DZ11'S SELECTED!!
 STOP THE SHOW.
 DISQUALIFY CONT. SW.
 RESTORE THE NUMBER OF ITERATIONS TO MAKE
 IS THIS ONE "ACTIVE"
 BR IF GOOD ONE FOUND.
 UPDATE POINTER
 CATCH CARRY FROM RUN
 UPDATE ADDRESS POINTER.
 HAVE WE PASSED THE END OF THE MAP?
 IF NO, KEEP GOING; NOT ALL TESTED FOR.
 RESET ADDRESS POINTER.
 KEEP LOOKING FOR ACTIVE DZ11
 UPDATE POINTER.
 CATCH CARRY.
 GET ADDRESS POINTER.
 UPDATE.
 ALL DONE?
 BR IF NO.
 RESTORE POINTER.
 LOAD SYSTEM CTRL. REG
 LOAD VECTOR
 LOAD PRIORITY
 EIA OR 20MA
 CLEAR FLAG
 SET UP LINE DZ LINES ACTIVE
 SET UP PARAMETERIZATION
 SET UP MAINTENANCE MODE
 SET UP
 ARE WE UNDER MONITOR CONTROL?
 IF YES, SKIP THIS SETUP
 IF SW01=1, GET STARTING TEST #
 BR IF NO TEST IS TO BE INPUTTED
 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
 POINTER TO MAP LOCATION TO BE FILLED
 MASK OF INVALID BITS FOR THIS PARAMETER
 NUMBER OF PARAMETERS TO STORE

D05

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2499	011174	001015			BNE	6S	
2500	011176	022760	012737	000002	CMP	#12737,2(R0)	
2501	011204	001011			BNE	6S	
2502	011206	023760	001122	000004	CMP	\$TSTNM,4(R0)	: IS THIS THE TEST ?
2503	011214	001005			BNE	6S	: IF NOT, DON'T PROCESS NUMBER
2504	011216	010037	001126		MOV	R0,\$LPADR	: SAVE PC
2505	011222	104402	001231		TYPE	\$CRLF	
2506	011226	000412			BR	8S	
2507	011230	005720		6S:	TST	(R0)+	
2508	011232	020027	022130		CMP	R0,\$TLAST+10	
2509	011236	001354			BNE	5S	
2510	011240	104402	001230		TYPE	\$QUES	
2511	011244	000736			BR	7S	
2512	011246	012737	012166	001126	4S: MOV	\$TST1,\$LPADR	: PREPARE TEST ADDRESS
2513	011254				8S:		
2514	011254	000177	167646		RESTART: JMP	\$LPADR	: GO START TESTING.***WARNING!***
2515							: THIS JUMP IS USED BY POWER UP ROUTINE!!!!
2516							

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2517      ;--ROUTINE USED TO SET UP THE DIAGNOSTIC VIA APT.
2518      ; IF BIT7 IN THE ENVIRONMENT MODE ($ENVN) BYTE IS SET,
2519      ; THE PROGRAM WILL LOAD ITS PARAMETERS FROM THE ETABLE.
2520
2521      011260 012700 001500      SETAPT: MOV      #DZ.MAP,R0      ;POINT TO THE DEVICE MAP TABLE
2522      011264 013701 001310      MOV      $BASE,R1      ;BUILD DEVICE ADDRESSES IN R1
2523      011270 013702 001304      MOV      $VECT1,R2      ;BUILD DEVICE VECTORS IN R2
2524      011274 042702 177007      BIC      #1C<770>,R2      ;STRIP AWAY OTHER INFORMATION
2525
2526      011300 113703 001305      MOV      $VECT1+1,R3      ;LOAD THE INTERRUPT PRIORITY FROM R3
2527      011304 106003              RORB     R3              ;ALIGN THE NUMBER
2528      011306 106003              RORB     R3              ;ALIGN THE NUMBER
2529      011310 106003              RORB     R3              ;ALIGN THE NUMBER
2530      011312 106003              RORB     R3              ;ALIGN THE NUMBER
2531      011314 106003              RORB     R3              ;ALIGN THE NUMBER
2532      011316 042703 177770      BIC      #1C<7>,R3      ;REMOVE ALL BUT BUS LEVEL NUMBER
2533      011322 012704 001320      MOV      #SDDWD,R4      ;POINT TO THE BEGINNING OF DEVICE PARAMETERS
2534      011326 013705 001312      MOV      $DEVN,R5      ;GET THE MAP OF ACTIVE DEVICES
2535      011332 010537 001404      MOV      R5,DZACTV      ;SAVE THE BIT MAP
2536      011336 006005              1S:     ROR      R5      ;GET A DEVICE SELECTION BIT
2537      011340 103407              BCS      3S      ;IF IT IS SELECTED, GO SET UP A MAP
2538      011342 001425              BEQ      5S      ;IF NO MORE ARE SELECTED, GET OUT OF SETUP
2539      011344 005724              TST      (R4)+      ;POINT TO NEXT DEVICE DESCRIPTOR
2540      011346 062701 000010      2S:     ADD      #10,R1      ;SET UP THE NEXT ADDRESS
2541      011352 062702 000010      ADD      #10,R2      ;SET UP THE NEXT VECTOR GROUP
2542      011356 000767              BR       1S      ;GO SEE IF MORE DEVICES REMAIN
2543      011360 010120      3S:     MOV      R1,(R0)+      ;LOAD DEVICE ADDRESS
2544      011362 010220              MOV      R2,(R0)+      ;LOAD THE VECTOR ADDRESS
2545      011364 010320              MOV      R3,(R0)+      ;LOAD THE INTERRUPT PRIORITY LEVEL
2546      011366 013720 001314      MOV      $CDWL,(R0)+      ;GET THE NUMBER OF LINES IN OPERATION
2547      011372 012420              MOV      (R4)+,(R0)+      ;LOAD DEVICE PARAMETERS
2548      011374 100406              BMI      4S      ;IF 20MA MODE SELECTED, SET IT UP
2549      011376 052760 100000 177772      BIS      #100000,-6(R0)      ;SET THE 20MA FLAG IN DZLVN
2550      011404 042760 100000 177776      BIC      #100000,-2(R0)      ;CLEAR THE FLAG IN DZPARN
2551      011412 005020      4S:     CLR      (R0)+      ;DEFAULT OPERATION TO INTERNAL MAINTENANCE MODE
2552      011414 000754              BR       2S      ;GO BUILD THE NEXT ADDRESS
2553      011416 012710 177777      5S:     MOV      #-1,(R0)      ;TERMINATE THE DEVICE MAP
2554      011422 012737 001256 001160      MOV      #SSWREG,SWR      ;SET TO SOFTWARE APT SWITCH REGISTER
2555      011430 000207              RTS      PC      ;RETURN TO PRINT STATUS TABLE
2556
2557
2558      ;#ROUTINE USED TO "AUTO SIZE" THE DZ11
2559      ;#CSR AND VECTOR.
2560      ;#NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
2561      ;# ADDRESS RANGE (160000:163700)
2562      ;# AND THE VECTOR MAY BE ANY WHERE IN THE
2563      ;# FLOATING VECTOR RANGE (300:770)
2564      ;#
2565
2566      011432              AUTO.SIZE:
2567      011432 000005              RESET
2568      011434 105337 001415      DECB     INIFLG      ;INSURE A BUS INIT.
2569      011440 012702 001500      CSRMAP: MOV      #DZ.MAP,R2      ;SHOW THAT I WAS HERE
2570      011444 012703 001320      MOV      #SDDWD,R3      ;LOAD MAP POINTER.
2571      011450 005022              1S:     CLR      (R2)+      ;POINT TO ETABLE DEVICE DESCRIPTOR WORDS
2572      011452 022702 002000      CMP      #DZ.END,R2      ;ZERO ENTIRE MAP

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;ALL DONE?

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POWER DOWN AND UP ROUTINES

2573	011456	001374		BNE	1\$		;BR IF NO
2574	011460	105037	001410	CLRB	DZNUM		;SET OCTAL NUMBER OF DZ11'S TO 0
2575	011464	012702	001500	MOV	#DZ.MAP,R2		
2576	011470	012701	160000	MOV	#160000,R1		;SET FOR FIRST ADDRESS TO BE TESTED
2577	011474	012737	011770	MOV	#6\$,3#4		;SET FOR NON-EXISTENT DEVICE TIME OUT
2578	011502	052711	000040	BIS	#BIT5,(R1)	2\$:	;TRY TO SET MASTER SCAN ENABLE
2579	011506	052761	000200	BIS	#BIT7,4(R1)	000004	;TRY TO TRANSMIT ON LINE 7
2580	011514	005000		CLR	RO		;USE RO AS A COUNTER
2581	011516	005711		TST	(R1)	7\$:	;HAS TRANSMITTER READY COME UP?
2582	011520	100403		BMI	8\$		;IF SO, GO GET A FINAL CHECK
2583	011522	005300		DEC	RO		;REDUCE COUNT. TIME UP?
2584	011524	001374		BNE	7\$		;IF NOT, KEEP WAITING
2585	011526	000451		BR	3\$		;ASSUME IT'S NOT A DZ11
2586	011530	032761	000200	BIT	#BIT7,4(R1)	8\$:	;IS LINE 7 ENABLE STILL SET? IT SHOULD BE
2587	011536	001445		BEQ	3\$		;IF IT'S NOT, ASSUME IT'S NOT A DZ11
2588	011540	032711	000040	BIT	#BIT5,(R1)		;IS MASTER SCAN ENABLE STILL SET?
2589	011544	001442		BEQ	3\$		;IF NOT, ASSUME IT'S NOT A DZ11
2590	011546	005000		CLR	RO		
2591	011550	052711	000020	BIS	#20,(R1)		;SET DEVICE CLEAR
2592	011554	032711	000020	BIT	#20,(R1)		;SHOULD STAY SET FOR A WHILE IF DZ
2593	011560	001434		BEQ	3\$		;BR IF NOT DZ11
2594	011562	032711	000020	BIT	#20,(R1)		;WAIT FOR BIT TO CLEAR
2595	011566	001404		BEQ	.+12		;BR WHEN CLEARED
2596	011570	104414		DELAY			
2597	011572	005200		INC	RO		
2598	011574	001372		BNE	.-12		
2599	011576	000425		BR	3\$		;BIT NOT CLEARED! MUST NOT BE DZ11
2600	011600	005011		CLR	(R1)		;GET RID OF MASTER SCAN ENABLE
2601	011602	005061	000004	CLR	4(R1)		;GET RID OF LINE 7 ENABLE
2602							;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DZ11 CSR ADDRESS.
2603	011606	010122		MOV	R1,(R2)+		;STORE CSR IN CORE TABLE.
2604	011610	005722		TST	(R2)+		;POP OVER VECTOR STORE AREA
2605	011612	012722	000005	MOV	#5,(R2)+		;SET THE DEFAULT BUS LEVEL
2606	011616	012722	000377	MOV	#377,(R2)+		;SET THE DEFAULT LINE SELECTION PARAMETER
2607	011622	012712	017470	MOV	#17470,(R2)		;SET THE DEFAULT PARAMETERS
2608	011626	012223		MOV	(R2)+,(R3)+		;COPY PARAMETERS INTO ETABLE DESCRIPTOR
2609	011630	005022		CLR	(R2)+		;SET THE DEFAULT MODE OF OPERATION
2610	011632	012712	177777	MOV	#-1,(R2)		;TERMINATE LIST
2611	011636	105237	001410	INCB	DZNUM		;UPDATE DEVICE COUNTER
2612	011642	122737	000020	CMPB	#20,DZNUM		;ARE MAX. NO. OF DEV FOUND?
2613	011650	001405		BEQ	100\$		;YES DON'T LOOK FOR ANY MORE.
2614	011652	062701	000010	ADD	#10,R1	3\$:	;UPDATE CSR POINTER ADDRESS
2615	011656	022701	163700	CMP	#163700,R1		
2616	011662	001307		BNE	2\$		;BR IF MORE ADDRESS TO CHECK.
2617	011664					100\$:	
2618	011664	105737	001410	TSTB	DZNUM		;WERE ANY DZ11'S FOUND AT ALL?
2619	011670	001432		BEQ	5\$		;ERROR AUTO SIZER FOUND NO DZ11'S IN THIS SYS.
2620	011672	113701	001410	MOVB	DZNUM,R1		
2621	011676	110137	001411	MOVB	R1,SAVNUM		;SAVE NUMBER OF DEVICES
2622	011702	012737	000001	MOV	#1,DZACTV		
2623	011710	005301		DEC	R1	4\$:	
2624	011712	001404		BEQ	98\$		
2625	011714	000261		SEC			
2626	011716	006137	001404	ROL	DZACTV		
2627	011722	000772		BR	4\$		
2628	011724	013737	001500	MOV	DZCRO,\$BASE	98\$:	;POINT TO THE ADDRESS OF FIRST DEVICE

PC	OP	OP2	OP3	OP4	OP5	OP6	OP7	OP8	OP9	OP10	OP11	OP12	OP13	OP14	OP15	OP16	OP17	OP18	OP19	OP20	OP21	OP22	OP23	OP24	OP25	OP26	OP27	OP28	OP29	OP30	OP31	OP32	OP33	OP34	OP35	OP36	OP37	OP38	OP39	OP40	OP41	OP42	OP43	OP44	OP45	OP46	OP47	OP48	OP49	OP50	OP51	OP52	OP53	OP54	OP55	OP56	OP57	OP58	OP59	OP60	OP61	OP62	OP63	OP64	OP65	OP66	OP67	OP68	OP69	OP70	OP71	OP72	OP73	OP74	OP75	OP76	OP77	OP78	OP79	OP80	OP81	OP82	OP83	OP84	OP85	OP86	OP87	OP88	OP89	OP90	OP91	OP92	OP93	OP94	OP95	OP96	OP97	OP98	OP99	OP100	OP101	OP102	OP103	OP104	OP105	OP106	OP107	OP108	OP109	OP110	OP111	OP112	OP113	OP114	OP115	OP116	OP117	OP118	OP119	OP120	OP121	OP122	OP123	OP124	OP125	OP126	OP127	OP128	OP129	OP130	OP131	OP132	OP133	OP134	OP135	OP136	OP137	OP138	OP139	OP140	OP141	OP142	OP143	OP144	OP145	OP146	OP147	OP148	OP149	OP150	OP151	OP152	OP153	OP154	OP155	OP156	OP157	OP158	OP159	OP160	OP161	OP162	OP163	OP164	OP165	OP166	OP167	OP168	OP169	OP170	OP171	OP172	OP173	OP174	OP175	OP176	OP177	OP178	OP179	OP180	OP181	OP182	OP183	OP184	OP185	OP186	OP187	OP188	OP189	OP190	OP191	OP192	OP193	OP194	OP195	OP196	OP197	OP198	OP199	OP200	OP201	OP202	OP203	OP204	OP205	OP206	OP207	OP208	OP209	OP210	OP211	OP212	OP213	OP214	OP215	OP216	OP217	OP218	OP219	OP220	OP221	OP222	OP223	OP224	OP225	OP226	OP227	OP228	OP229	OP230	OP231	OP232	OP233	OP234	OP235	OP236	OP237	OP238	OP239	OP240	OP241	OP242	OP243	OP244	OP245	OP246	OP247	OP248	OP249	OP250	OP251	OP252	OP253	OP254	OP255	OP256	OP257	OP258	OP259	OP260	OP261	OP262	OP263	OP264	OP265	OP266	OP267	OP268	OP269	OP270	OP271	OP272	OP273	OP274	OP275	OP276	OP277	OP278	OP279	OP280	OP281	OP282	OP283	OP284	OP285	OP286	OP287	OP288	OP289	OP290	OP291	OP292	OP293	OP294	OP295	OP296	OP297	OP298	OP299	OP300	OP301	OP302	OP303	OP304	OP305	OP306	OP307	OP308	OP309	OP310	OP311	OP312	OP313	OP314	OP315	OP316	OP317	OP318	OP319	OP320	OP321	OP322	OP323	OP324	OP325	OP326	OP327	OP328	OP329	OP330	OP331	OP332	OP333	OP334	OP335	OP336	OP337	OP338	OP339	OP340	OP341	OP342	OP343	OP344	OP345	OP346	OP347	OP348	OP349	OP350	OP351	OP352	OP353	OP354	OP355	OP356	OP357	OP358	OP359	OP360	OP361	OP362	OP363	OP364	OP365	OP366	OP367	OP368	OP369	OP370	OP371	OP372	OP373	OP374	OP375	OP376	OP377	OP378	OP379	OP380	OP381	OP382	OP383	OP384	OP385	OP386	OP387	OP388	OP389	OP390	OP391	OP392	OP393	OP394	OP395	OP396	OP397	OP398	OP399	OP400	OP401	OP402	OP403	OP404	OP405	OP406	OP407	OP408	OP409	OP410	OP411	OP412	OP413	OP414	OP415	OP416	OP417	OP418	OP419
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DZDZAB.P11

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012166	000004		
012170	012737	000001	001122
012176	012737	012356	001360
012204	012737	012344	000004
012212	012737	000340	000006
012220	012737	012226	001362
012226	013700	002042	
012232	011001		
012234	000240		
012236	005010		
012240	000240		
012242	012737	012250	001362
012250	013700	002046	
012254	011001		
012256	000240		
012260	005010		
012262	000240		
012264	012737	012272	001362
012272	013700	002056	
012276	011001		
012300	000240		
012302	005010		
012304	000240		
012306	012737	012314	001362
012314	013700	002062	
012320	011001		
012322	000240		
012324	005010		
012326	000240		
012330	012737	000006	000004
012336	005037	000006	
012342	104400		
012344	011601		
012346	022626		
012350	104001		
012352	104401		
012354	000111		

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***** TEST 1 *****
*THIS TEST PROVES THE SLAVE SYNC RESPONSE
*DURING A READ OR WRITE TO THE FOLLOWING ADDRESS:
*  DZCSR, DZRBUR, DZTCR, DZMSR

::* TEST 1
*****
TST1:  SCOPE
      MOV  #1, STSTNM      ;LOAD THE NUMBER OF THIS TEST
      MOV  #TST2, NEXT    ;POINT TO THE START OF THE NEXT TEST
      MOV  #55, 4         ;SET TRAP VECTOR
      MOV  #PR7, 6        ;SET PRIORITY TO LEVEL 7
      MOV  #15, LOCK      ;SET RETURN IF SW09=11
15:    MOV  DZCSR, R0      ;SET ADDRESS TO TEST
      MOV  (R0), R1       ;READ THE ADDRESS
      NOP                ;WASTE TIME
      CLR  (R0)           ;WRITE THE ADDRESS
      NOP                ;WASTE TIME
      MOV  #25, LOCK      ;SET RETURN ADDRESS FOR SW09
25:    MOV  DZRBUR, R0    ;SET ADDRESS TO TEST
      MOV  (R0), R1       ;READ THE ADDRESS
      NOP                ;
      CLR  (R0)           ;WRITE THE ADDRESS
      NOP                ;WASTE TIME
      MOV  #35, LOCK      ;SET RETURN ADDRESS FOR SW09
35:    MOV  DZTCR, R0    ;SET ADDRESS TO TEST
      MOV  (R0), R1       ;READ THE ADDRESS
      NOP                ;
      CLR  (R0)           ;WRITE THE ADDRESS
      NOP                ;
      MOV  #45, LOCK      ;SET RETURN ADDRESS
45:    MOV  DZMSR, R0    ;SET ADDRESS TO TEST
      MOV  (R0), R1       ;READ FROM ADDRESS
      NOP                ;
      CLR  (R0)           ;WRITE THE ADDRESS
      NOP                ;
      MOV  #6, 4          ;SET TRAP CATCHER BACK TO NORMAL
      CLR  6
      ADVANCE             ;SCOPE THIS TEST
55:    MOV  (SP), R1      ;SAVE PC OF TRAP
      CMP  (SP)+, (SP)+  ;POP TRAP OFF STACK
      ERROR 1             ;*NO SLAVE SYNC RESPONSE.
      SCOP1              ;SW09=1?
      JMP  (R1)          ;RTI
***** TEST 2 *****
*THIS TEST PROVES THAT BIT "DCLR"
*CAN BE SET AND THAT IT WILL CLEAR
*BY ITSELF AFTER A PERIOD OF TIME.

::* TEST 2
*****
TST2:  SCOPE
      MOV  #2, STSTNM      ;LOAD THE NUMBER OF THIS TEST
      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

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2730 012406 011004      MOV      (R0),R4      ;READ BACK DZCSR
2731 012410 020504      CMP      R5,R4      ;DZCSR OK?
2732 012412 001401      BEQ      1$          ;IF IT IS SET SKIP THE ERROR CALL
2733 012414 104002      ERROR    2          ;*DCLR SHOULD BE SET..MOMENTARILY
2734                                ;NOW LETS WATCH IT DISAPPEAR
2735 012416 005002      1$:  CLR      R2          ;SET COUNTER TO 0
2736 012420 005005      CLR      R5          ;SET EXPECTED TO 0
2737 012422 005003      CLR      R3          ;DUAL LOOP COUNTER
2738 012424 011004      2$:  MOV      (R0),R4      ;IS DCLR CLEAR?
2739 012426 001405      BEQ      3$          ;IF YES, GO TO THE NEXT TEST
2740 012430 005203      INC      R3          ;IF NO,COUNT 1 OF 65535 TICKS
2741                                ;THE WORD CREATED BY THE IMMEDIATE 0 WILL BE
2742                                ;THE COUNTER
2743 012432 001374      BNE      2$          ;HAS THE TIME EXPIRED? IF NO, GO TEST BIT AGAIN
2744 012434 005302      DEC      R2          ;HAS THE TOTAL TIME EXPIRED?
2745 012436 001372      BNE      2$          ;IF NO, CHECK THE BIT AGAIN
2746 012440 104002      ERROR    2          ;*DCLR FAILED TO CLEAR
2747 012442
2748      3$:
2749      ;***** TEST 3 *****
2750      ;*TEST TO VERIFY THAT BIT "MAINT" CAN
2751      ;*BE SET. THEN VERIFY THAT BIT "MAINT" CAN
2752      ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
2753      ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
2754      ;*CLEARED BY A "DEVICE CLEAR"
2755      ;:* TEST 3
2756      ;*****
2757 012442 000004      TST3:  SCOPE
2758 012444 012737      MOV      #3,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
2759 012452 012737      MOV      $TST4,NEXT    ;POINT TO THE START OF THE NEXT TEST
2760 012460 013700      MOV      DZCSR,R0      ;GET BASE ADDRESS
2761 012464 012705      MOV      #MAINT,R5      ;SET BIT
2762 012470 010510      MOV      R5,(R0)        ;SET SET IN DEVICE
2763 012472 011004      MOV      (R0),R4      ;READ THE BIT FROM DEVICE
2764 012476 001401      CMP      R5,R4        ;WAS BIT SET?
2765 012500 104002      BEQ      1$          ;BR IF YES
2766 012502 040510      ERROR    2          ;*BIT R/W FAILURE
2767 012504 011004      BIC      R5,(R0),R4    ;CLEAR THE BIT.
2768 012506 001404      MOV      (R0),R4      ;READ DEVICE
2769 012510 010546      BEQ      2$          ;BR IF BITS WERE CLEARED.
2770 012512 005005      MOV      R5,-(SP)      ;SAVE THE BIT
2771 012514 104002      CLR      R5          ;SET EXPECTED RESULTS TO 0
2772 012516 012605      ERROR    2          ;*BIT FAILED TO CLEAR
2773 012520 010510      MOV      (SP)+,R5      ;RESTORE THE BIT.
2774 012522 104413      MOV      R5,(R0)      ;SET THE BIT AGAIN
2775 012524 011004      DEVICE.CLR ;ISSUE DEVICE CLEAR
2776 012526 001402      MOV      (R0),R4      ;READ THE BIT.
2777 012530 005005      BEQ      3$          ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
2778 012532 104002      CLR      R5          ;SET EXPECTED TO ZERO
2779 012534      ERROR    2          ;*BIT NOT CLEARED BY DEVICE CLEAR
2780      3$:
2781      ;***** TEST 4 *****
2782      ;*TEST TO VERIFY THAT BIT "MSENAB" CAN
2783      ;*BE SET. THEN VERIFY THAT BIT "MSENAB" CAN
2784      ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
2785      ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
2786      ;*CLEARED BY A "DEVICE CLEAR"

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2788 012534 000004
2789 012536 012737 000004 001122
2790 012544 012737 012626 001360
2791 012552 013700 002042
2792 012556 012705 000040
2793 012562 010510
2794 012564 011004
2795 012566 020504
2796 012570 001401
2797 012572 104002
2798 012574 040510
2799 012576 011004
2800 012600 001404
2801 012602 010546
2802 012604 005005
2803 012606 104002
2804 012610 012605
2805 012612 010510
2806 012614 104413
2807 012616 011004
2808 012620 001402
2809 012622 005005
2810 012624 104002
2811 012626
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2820 012626 000004
2821 012630 012737 000005 001122
2822 012636 012737 012720 001360
2823 012644 013700 002042
2824 012650 012705 010000
2825 012654 010510
2826 012656 011004
2827 012660 020504
2828 012662 001401
2829 012664 104002
2830 012666 040510
2831 012670 011004
2832 012672 001404
2833 012674 010546
2834 012676 005005
2835 012700 104002
2836 012702 012605
2837 012704 010510
2838 012706 104413
2839 012710 011004
2840 012712 001402
2841 012714 005005

;:* TEST 4
;*****
TST4: SCOPE
MOV #4,STSTNM ;LOAD THE NUMBER OF THIS TEST
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 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
2$: MOV (SP)+,R5 ;RESTORE THE BIT.
MOV R5,(R0) ;SET THE BIT AGAIN
DEVICE.CLR ;ISSUE DEVICE CLEAR
MOV (R0),R4 ;READ THE BIT.
BEQ 3$ ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
CLR R5 ;SET EXPECTED TO ZERO
ERROR 2 ;*BIT NOT CLEARED BY DEVICE CLEAR
3$:

;***** 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"

;:* TEST 5
;*****
TST5: SCOPE
MOV #5,STSTNM ;LOAD THE NUMBER OF THIS TEST
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
2$: MOV (SP)+,R5 ;RESTORE THE BIT.
MOV R5,(R0) ;SET THE BIT AGAIN
DEVICE.CLR ;ISSUE DEVICE CLEAR
MOV (R0),R4 ;READ THE BIT.
BEQ 3$ ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
CLR R5 ;SET EXPECTED TO ZERO
3$:

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2842 012716 104002          ERROR 2          ;*BIT NOT CLEARED BY DEVICE CLEAR
2843 012720
2844
2845          ;***** TEST 6 *****
2846          ;*TEST TO VERIFY THAT BIT "RIE" CAN
2847          ;*BE SET. THEN VERIFY THAT BIT "RIE" CAN
2848          ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
2849          ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
2850          ;*CLEARED BY A "DEVICE CLEAR"
2851          ;:* TEST 6
2852          ;*****
2852 012720 000004          TST6: SCOPE
2853 012722 012737 000006 001122      MOV #6,STSTNM          ;LOAD THE NUMBER OF THIS TEST
2854 012730 012737 013012 001360      MOV #TST7,NEXT        ;POINT TO THE START OF THE NEXT TEST
2855 012736 013700 002042          MOV DZCSR,R0          ;GET BASE ADDRESS
2856 012742 012705 000100          MOV #RIE,R5 ;SET BIT
2857 012746 010510          MOV R5,(R0)          ;SET SET IN DEVICE
2858 012750 011004          MOV (R0),R4          ;READ THE BIT FROM DEVICE
2859 012752 020504          CMP R5,R4          ;WAS BIT SET?
2860 012754 001401          BEQ 1$          ;BR IF YES
2861 012756 104002          ERROR 2          ;*BIT R/W FAILURE
2862 012760 040510          1$: BIC R5,(R0)          ;CLEAR THE BIT.
2863 012762 011004          MOV (R0),R4          ;READ DEVICE
2864 012764 001404          BEQ 2$          ;BR IF BITS WERE CLEARED.
2865 012766 010546          MOV R5,-(SP)          ;SAVE THE BIT
2866 012770 005005          CLR R5          ;SET EXPECTED RESULTS TO 0
2867 012772 104002          ERROR 2          ;*BIT FAILED TO CLEAR
2868 012774 012605          MOV (SP)+,R5          ;RESTORE THE BIT.
2869 012776 010510          2$: MOV R5,(R0)          ;SET THE BIT AGAIN
2870 013000 104413          DEVICE.CLR          ;ISSUE DEVICE CLEAR
2871 013002 011004          MOV (R0),R4          ;READ THE BIT.
2872 013004 001402          BEQ 3$          ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
2873 013006 005005          CLR R5          ;SET EXPECTED TO ZERO
2874 013010 104002          ERROR 2          ;*BIT NOT CLEARED BY DEVICE CLEAR
2875 013012
2876          ;***** TEST 7 *****
2877          ;*TEST TO VERIFY THAT BIT "TIE" CAN
2878          ;*BE SET. THEN VERIFY THAT BIT "TIE" CAN
2879          ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
2880          ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
2881          ;*CLEARED BY A "DEVICE CLEAR"
2882          ;:* TEST 7
2883          ;*****
2884 013012 000004          TST7: SCOPE
2885 013014 012737 000007 001122      MOV #7,STSTNM          ;LOAD THE NUMBER OF THIS TEST
2886 013022 012737 013104 001360      MOV #TST10,NEXT        ;POINT TO THE START OF THE NEXT TEST
2887 013030 013700 002042          MOV DZCSR,R0          ;GET BASE ADDRESS
2888 013034 012705 040000          MOV #TIE,R5 ;SET BIT
2889 013040 010510          MOV R5,(R0)          ;SET SET IN DEVICE
2890 013042 011004          MOV (R0),R4          ;READ THE BIT FROM DEVICE
2891 013044 020504          CMP R5,R4          ;WAS BIT SET?
2892 013046 001401          BEQ 1$          ;BR IF YES
2893 013050 104002          ERROR 2          ;*BIT R/W FAILURE
2894 013052 040510          1$: BIC R5,(R0)          ;CLEAR THE BIT.
2895 013054 011004          MOV (R0),R4          ;READ DEVICE
2896 013056 001404          BEQ 2$          ;BR IF BITS WERE CLEARED.
2897 013060 010546          MOV R5,-(SP)          ;SAVE THE BIT
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2898 013062 005005          CLR      R5          ;SET EXPECTED RESULTS TO 0
2899 013064 104002          ERROR    2          ;*BIT FAILED TO CLEAR
2900 013066 012605          MOV      (SP)+,R5      ;RESTORE THE BIT.
2901 013070 010510          2$:      MOV      R5,(R0)      ;SET THE BIT AGAIN
2902 013072 104413          DEVICE.CLR ;ISSUE DEVICE CLEAR
2903 013074 011004          MOV      (R0),R4        ;READ THE BIT.
2904 013076 001402          BEQ       3$          ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
2905 013100 005005          CLR      R5          ;SET EXPECTED TO ZERO
2906 013102 104002          ERROR    2          ;*BIT NOT CLEARED BY DEVICE CLEAR
2907 013104
2908
2909          ;***** TEST 10 *****
2910          ;*THIS TESTS THAT ALL OF THE FOLLOWING
2911          ;*BITS CAN BE: SET, CLEARED, CLEARED BY "DEVICE CLEAR "
2912          ;*BITS TESTED ARE:
2913          ;* TCR0, TCR1, TCR2, TCR3, TCR4, TCR5, TCR6, TCR7
2914          ;:* TEST 10
2915          ;*****
2916 013104 000004          TST10:  SCOPE
2917 013106 012737 000010 001122      MOV      #10,STSTNM      ;LOAD THE NUMBER OF THIS TEST
2918 013114 012737 013242 001360      MOV      #TST11,NEXT    ;POINT TO THE START OF THE NEXT TEST
2919 013122 013700 002056              MOV      DZTCR,R0      ;SET DEVICE ADDRESS
2920 013132 012737 013140 001362      MOV      #TCR0,R5      ;SET EXPECTED RESULTS
2921 013140 010510          MOV      #1$,LOCK      ;SET FOR SW09
2922 013142 011004          1$:      MOV      R5,(R0)      ;SET THE BIT
2923 013144 042704 177400          MOV      (R0),R4        ;READ THE BIT FROM THE DEVICE
2924 013150 020504          BIC      #1C<377>,R4      ;CLEAR HIGH BYTE
2925 013152 001401          CMP      R5,R4          ;WAS BIT OK?
2926 013154 104002          BEQ      2$          ;BR IF YES
2927 013156 040510          ERROR    2          ;*BIT FAILED TO SET.
2928 013160 011004          2$:      BIC      R5,(R0)      ;CLEAR THE BIT
2929 013162 042704 177400          MOV      (R0),R4        ;READ THE REGISTER
2930 013166 005704          BIC      #1C<377>,R4      ;CLEAR HIGH BYTE
2931 013170 001404          TST      R4          ;BITS CLEAR?
2932 013172 010546          BEQ      3$          ;BR IF YES
2933 013174 005005          MOV      R5,-(SP)      ;SAVE GOOD RESULTS
2934 013176 104002          CLR      R5          ;SET EXPECTED TO 0
2935 013200 012605          ERROR    2          ;*REPORT BIT NOT CLEAR
2936 013202 010510          3$:      MOV      (SP)+,R5      ;RESTORE R5
2937 013204 104413          MOV      R5,(R0)      ;SET THE BIT AGAIN.
2938 013206 011004          DEVICE.CLR ;ISSUE DEVICE CLEAR
2939 013210 042704 177400          MOV      (R0),R4        ;READ THE REGISTER
2940 013214 005704          BIC      #1C<377>,R4      ;CLEAR HIGH BYTE
2941 013216 001404          TST      R4          ;BITS CLEAR?
2942 013220 010546          BEQ      4$          ;BR IF YES
2943 013222 005005          MOV      R5,-(SP)      ;SAVE GOOD RESULTS
2944 013224 104002          CLR      R5          ;SET EXPECTED TO 0
2945 013226 012605          ERROR    2          ;*REPORT BIT NOT CLEAR
2946 013230 104401          4$:      MOV      (SP)+,R5      ;RESTORE R5
2947 013232 106305          SCOP1   R5          ;LOCK ON BIT? SET SW09=1
2948 013234 001341          ASLB     R5          ;CHANGE TO NEXT BIT
2949 013236 005037 001362          BNE     1$          ;CONTINUE TESTING
2950          CLR      LOCK      ;MAKE SURE TIGHT LOOP IS CLEANED UP
2951          ;***** TEST 11 *****
2952          ;*THIS TESTS THAT ALL OF THE FOLLOWING
2953          ;*BITS CAN BE: SET, CLEARED, CLEARED BY "RESET INSTR *NOT* DEVICE CLEAR "
2954          ;*BITS TESTED ARE:

```

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```

2954      ;* DTR0, DTR1, DTR2, DTR3, DTR4, DTR5, DTR6, DTR7
2955      ;*THIS TEST IS NOT DONE IF MODULE IS 20MA VERSION
2956      ;:* TEST 11
2957      ;*****
2958      TST11: SCOPE
2959      MOV      #11,STSTNM      ;LOAD THE NUMBER OF THIS TEST
2960      MOV      #TST12,NEXT    ;POINT TO THE START OF THE NEXT TEST
2961      MOV      DZTCR,R0      ;SET DEVICE ADDRESS
2962      MOV      #DTR0,R5      ;SET EXPECTED RESULTS
2963      MOV      #1$,LOCK      ;SET FOR SW09
2964      TSTB     EIAFLG        ;20MA OR EIA
2965      BPL      1$            ;BR IF EIA
2966      ADVANCE  1$            ;EXIT TEST
2967      1$:     MOV      R5,(R0) ;SET THE BIT
2968      MOV      (R0),R4        ;READ THE BIT FROM THE DEVICE
2969      CLRB     R4             ;CLEAR LOW BYTE
2970      CMP      R5,R4         ;WAS BIT OK?
2971      BEQ      2$            ;BR IF YES
2972      2$:     ERROR      2    ;*BIT FAILED TO SET.
2973      BIC      R5,(R0)       ;CLEAR THE BIT
2974      MOV      (R0),R4        ;READ THE REGISTER
2975      CLRB     R4             ;CLEAR LOW BYTE
2976      TST      R4            ;BITS CLEAR?
2977      BEQ      3$            ;BR IF YES
2978      MOV      R5,-(SP)       ;SAVE GOOD RESULTS
2979      CLR      R5            ;SET EXPECTED TO 0
2980      ERROR      2          ;*REPORT BIT NOT CLEAR
2981      MOV      (SP)+,R5       ;RESTORE R5
2982      3$:     MOV      R5,(R0) ;SET THE BIT AGAIN.
2983      DEVICE.CLR ;ISSUE DEVICE CLEAR
2984      MOV      (R0),R4        ;READ THE REGISTER
2985      CLRB     R4             ;CLEAR LOW BYTE
2986      BIT      R5,(R0)       ;WAS BIT CLEARED BY DEVICE.CLR?
2987      BNE      .+4            ;BR IF NO (IT SHOULDN'T BE CLEAR)
2988      ERROR      2          ;*BIT CLEARED BY DEVICE.CLR
2989      RESET
2990      MOV      (R0),R4        ;ISSUE A BUS INIT
2991      CLRB     R4             ;READ REGISTER
2992      TST      R4            ;CLEAR LOW BYTE
2993      BEQ      4$            ;BITS CLEAR?
2994      MOV      R5,-(SP)       ;BR IF YES
2995      CLR      R5            ;SAVE GOOD RESULTS
2996      ERROR      2          ;SET EXPECTED TO 0
2997      MOV      (SP)+,R5       ;*REPORT BIT NOT CLEAR
2998      4$:     SCOP1
2999      ASLB     R5            ;RESTORE R5
3000      BNE     1$            ;LOCK ON BIT? SET SW09=1
3001      CLR      LOCK          ;CHANGE TO NEXT BIT
3002      ;***** TEST 12 ***** ;CONTINUE TESTING
3003      ;*THIS TEST PERFORMS RESET TESTING & ;MAKE SURE TIGHT LOOP IS CLEANED UP
3004      ;*TESTING OF WRITE ONLY OR READ ONLY BIT
3005      ;* TEST BITS "RDONE, BIT11, BIT10, BIT9, BIT8, BIT2, BIT1
3006      ;*      BIT0, SILOAL" ARE READ ONLY AND THAT TRDY IS
3007      ;*      ZERO UNTIL A LINE IS SELECTED AND MSENAB IS SET.
3008      ;*
3009      ;:* TEST 12

```


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3010
3011 013416 000004
3012 013420 012737 000012 001122
3013 013426 012737 013534 001360
3014 013434 013700 002042
3015 013440 005005
3016 013442 012710 027607
3017
3018 013446 011004
3019 013450 001401
3020 013452 104002
3021 013454 012710 100000 1$:
3022 013460 011004
3023 013462 001401
3024 013464 104002
3025 013466 012705 100000 2$:
3026 013472 005077 166354
3027 013476 052777 000001 166352
3028 013504 052710 000040
3029 013510 052705 000040
3030 013514 005002
3031 013516 011004 3$:
3032 013520 020504
3033 013522 001404
3034 013524 104414
3035 013526 005202
3036 013530 001372
3037 013532 104002
3038 013534 4$:
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3048 013534 000004
3049 013536 012737 000013 001122
3050 013544 012737 013620 001360
3051 013552 104413
3052 013554 013700 002042
3053 013560 012710 177757
3054 013564 012705 050150
3055 013570 011004
3056 013572 020405
3057 013574 001401
3058 013576 104002
3059 013600 012705 000020 1$:
3060
3061
3062 013604 052710 000020
3063 013610 011004
3064 013612 020405
3065 013614 001401

::*****
TST12: SCOPE
MOV #12,$TSTNM ;LOAD THE NUMBER OF THIS TEST
MOV #TST13,NEXT ;POINT TO THE START OF THE NEXT TEST
MOV DZCSR,R0 ;SET ADDRESS TO R0
CLR R5 ;SET EXPECTED TO 0
MOV #RDONE+BIT11+BIT10+BIT9+BIT8+BIT2+BIT1+BIT0+$ILOAL,(R0) ;WRITE THE BITS
MOV (R0),R4 ;READ BACK THE BITS
BEQ 1$ ;BR IF NONE ARE SET.
ERROR 2 ;*BITS WERE SET.
MOV #TRDY,(R0) ;ATTEMPT TO WRITE TRDY
MOV (R0),R4 ;READ TRDY
BEQ 2$ ;BR IF NOT SET
ERROR 2 ;*
MOV #TRDY,R5 ;SET EXPECTED BIT
CLR @DZLPR ;LOAD LINE 0
BIS #TCRD,@DZTCR ;SET TCR BIT
BIS #MSENAB,(R0) ;SET SCAN ENABLE
BIS #MSENAB,R5 ;SET COUNTER TO ZERO
CLR R2 ;READ THE REGISTER
MOV (R0),R4 ;BIT SET?
CMP R5,R4 ;BR IF YES
BEQ 4$ ;STALL TIME
DELAY R2 ;UPDATE COUNTER
INC R2 ;BR IF COUNTER NOT DONE.
BNE 3$ ;*TRDY NOT SET!
ERROR 2

::***** TEST 13 *****
;THIS TEST PERFORMS RESET TESTING AND
;TESTING OF READ ONLY AND WRITE ONLY BITS
;* IN REGISTER DZCSR
;*VERIFY THAT "TIE", "SILOEN", "RIE", "MSENAB", "MAINT"
;*ARE THE ONLY R/W BITS IN THE DZCSR.
;*THEN SET "DCLR" AND VERIFY THEY ARE CLEARED
::* TEST 13
::*****
TST13: SCOPE
MOV #13,$TSTNM ;LOAD THE NUMBER OF THIS TEST
MOV #TST14,NEXT ;POINT TO THE START OF THE NEXT TEST
MOV DEVICE.CLR
MOV DZCSR,R0 ;SET UP FOR ERROR MESSAGE
MOV #TC<DCLR>,(R0) ;TRY TO WRITE
MOV #TIE!SILOEN!RIE!MSENAB!MAINT,R5 ;MAKE EXPECTED
MOV (R0),R4 ;ACTUAL
CMP R4,R5 ;CMP EXPECTED VS ACTUAL
BEQ 1$ ;YES
ERROR 2 ;*NO
MOV #DCLR,R5 ;EXPECTED...NOTE THAT DCLR REMAINS
;SET LONG ENOUGH TO READ IT....HOWEVER
;IF YOU EXAMINE THIS BIT IT SHOULD BE CLEAR.
BIS #DCLR,(R0) ;DEVICE MASTER RESET
MOV (R0),R4 ;ACTUAL
CMP R4,R5 ;CMP ACTUAL VS EXPECTED
BEQ 2$ ;YES

```

3066 013616 104002
3067 013620

ERROR 2 ;#NO

25:

```

***** TEST 14 *****
*THIS TEST PERFORMS RESET TESTING AND
*TESTING OF READ ONLY REGISTER DZRBUF
*AND TESTING OF WRITE ONLY REGISTER DZLPR

```

::# TEST 14

```

*****
TST14: SCOPE

```

```

MOV #14,STSTNM ;LOAD THE NUMBER OF THIS TEST
MOV #TST15,NEXT ;POINT TO THE START OF THE NEXT TEST
DEVICE.CLR ;CLEAR DZ11
MOV DZRBUF,R0 ;SET UP FOR ERROR MESSAGE
MOV #1,DZLPR ;TRY TO WRITE ALL 1'S
MOV (R0),R4 ;ACTUAL
MOV R4,R5 ;MAKE EXPECTED
BIC #DVALID:BIT11,R5 ;DITTO
CMP R4,R5 ;CMP ACTUAL VS EXPECTED
BEQ 15 ;IF YES,GO CONTINUE PROCESSING
ERROR 2 ;*ERROR- BIT PATTERN NOT CORRECT
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 25 ;IF YES, GET OUT OF THIS TEST
ERROR 2 ;#NO

```

15:

25:

```

***** TEST 15 *****
*THIS TEST PERFORMS RESET TESTING AND
*TESTING OF READ ONLY REGISTER DZMSR
*AND TESTING OF WRITE ONLY REGISTER DZTDR

```

::# TEST 15

```

*****
TST15: SCOPE

```

```

MOV #15,STSTNM ;LOAD THE NUMBER OF THIS TEST
MOV #TST16,NEXT ;POINT TO THE START OF THE NEXT TEST
DEVICE.CLR ;CLEAR DZ11
MOV DZMSR,R0 ;SET UP FOR ERROR MESSAGE
MOV #1,DZTDR ;TRY TO WRITE ALL 1'S
MOV (R0),R4 ;ACTUAL
MOV R4,R5 ;MAKE EXPECTED
CMP R4,R5 ;CMP ACTUAL VS EXPECTED
BEQ 15 ;IF YES,GO CONTINUE PROCESSING
ERROR 2 ;*ERROR- BIT PATTERN NOT CORRECT
MOV R4,R3 ;GET A COPY OF THE ACTUAL BIT PATTERN
COM R3 ;GET THE LOGICAL INVERSE OF THE BIT PATTERN
MOV R3,DZTDR ;TRY TO WRITE
MOV (R0),R4 ;ACTUAL
CMP R4,R5 ;CMP ACTUAL VS EXPECTED
BEQ 25 ;IF YES, GET OUT OF THIS TEST
ERROR 2 ;#NO

```

15:

25:

```

***** TEST 16 *****
*VERIFY THAT IF WE ARE IN "STAGGERED" MODE

```

```

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3100 013710 000004
3101 013712 012737 000015 001122
3102 013720 012737 013774 001360
3103 013726 104413
3104 013730 013700 002062
3105 013734 012777 177777 166124
3106 013742 011004
3107 013744 010405
3108 013746 020405
3109 013750 001401
3110 013752 104002
3111 013754 010403
3112 013756 005103
3113 013760 010377 166102
3114 013764 011004
3115 013766 020405
3116 013770 001401
3117 013772 104002
3118 013774
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013774	000004		
013776	012737	000016	001122
014004	012737	014164	001360
014012	012737	014064	001362
014020	105737	001414	
014024	100005		
014026	104400		
014030	013700	002062	
014034	104413		
014036	005003		
014040	012702	000001	
014044	005737	001370	
014050	100405		
014052	013737	001360	001126
014060	000177	165042	
014064	130237	001364	
014070	001004		
014072	005203		
014074	106302		
014076	103372		
014100	104400		
014102	010204		
014104	032703	000001	
014110	001402		
014112	006204		
014114	000401		
014116	006304		
014120	005005		
014122	150405		
014124	000305		
014126	150405		
014130	150277	165724	
014134	011004		
014136	020504		
014140	001401		
014142	104002		
014144	140277	165710	
014150	011004		
014152	001402		
014154	005005		
014156	104002		
014160	104401		
014162	000743		

```

: * THAT SETTING "DTR" FOR A LINE WILL
: * BRING UP "RING" AND "CARRIER" FOR THE
: * ASSOCIATED LINE IN WHICH WE ARE STAGGERED!
: * LINE0 DTR= LINE1 RING AND CARRIER
: * LINE1 DTR= LINE0 RING AND CARRIER
: * LINE2 DTR= LINE3 RING AND CARRIER
: * LINE3 DTR= LINE4 RING AND CARRIER
: *
: * ETC...

```

::* TEST 16

```

TST16: SCOPE
MOV      #16, STSTNM      ; LOAD THE NUMBER OF THIS TEST
MOV      #TST17, NEXT     ; POINT TO THE START OF THE NEXT TEST
MOV      #15, LOCK        ; USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
TSTB     EIAFLG           ; EIA OR 20MA?
BPL      .+14             ; BR IF EIA
ADVANCE   .+14            ; EXIT TEST
MOV      DZMSR, R0        ; SET REGISTER
DEVICE.CLR R3             ; INIT DZ11
CLR      R3               ; ZERO LINE NUMBER
MOV      #1, R2           ; SET POINTER
TST      MODE             ; ARE WE IN STAGGERED MODE?
BMI      1$               ; YES WE ARE!
MOV      NEXT, SLPADR     ; LEAVE THIS TEST! NOT STAGGERED
JMP      2$SLPADR         ; EXIT
1$: BITB  R2, LINE        ; TEST THIS LINE?
BNE      3$               ; YES
2$: INC   R3              ; LINE #
ASLB     R2               ; GET NEXT LINE
BCC      1$               ; KEEP TESTING
ADVANCE  .+14            ; ADVANCE THIS TEST
MOV      R2, R4           ; SAVE BINARY BIT FOR LINE #
BIT      #BIT0, R3        ; GET STAGGERED COMPANION LINE
BEQ      4$               ; BR IF LINE EVEN
ASR      R4               ; ADJUST LINE
BR       5$              ;
4$: ASL   R4              ; ADJUST LINE
5$: CLR   R5              ; SET EXPECTED
BISB     R4, R5           ;
SWAB     R5               ;
BISB     R4, R5           ;
BISB     R2, 2HOZTCR      ; SET DTR
MOV      (R0), R4         ; READ MSR REGISTER
CMP      R5, R4           ; OK?
BEQ      6$               ; YES
ERROR    2                ; *ERROR IN RING OR CARRIER
BICB     R2, 2HOZTCR      ; CLEAR DTR
MOV      (R0), R4         ; READ MSR
BEQ      7$               ; BR IF THEY CLEARED
CLR      R5               ; SET EXPECTED TO 0
ERROR    2                ; *BITS NOT CLEARED
7$: SCOP1 2$              ; LOCK ON SIGNAL?
BR       2$               ; CONTINUE TEST

```

***** TEST 17 *****

```

3178                                     : *TEST TO VERIFY THAT IF IN "EXTERNAL"
3179                                     : *MODE; SETTING DTR FOR SELECTED LINES
3180                                     : *WILL BRING UP "CARRIER" AND "RING"
3181                                     : *FOR THAT SAME LINE. NOTE: IF YOU HAVE
3182                                     : *SELECTED MODE AS "EXTERNAL"; THE H325 TEST CONNECTER
3183                                     : *MUST BE USED ON ALL SPECIFIED LINES.
3184                                     : *LINES MAY BE SPECIFIED BY SWRO3=1
3185                                     : *AND SWRO0=1 AT START TIME OR ALTERING
3186                                     : *STATUS MAP.
3187                                     : : * TEST 17
3188                                     : : *****
3189 014164 000004 TST17: SCOPE
3190 014166 012737 000017 001122 MOV #17,STSTNM ;LOAD THE NUMBER OF THIS TEST
3191 014174 012737 014322 001360 MOV #TST20,NEXT ;POINT TO THE START OF THE NEXT TEST
3192 014202 012737 014236 001362 MOV #35,LOCK ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
3193 014210 105737 001370 TSTB MODE ;EXTERNAL?
3194 014214 100401 BMI 25 ;BR IF YES
3195 014216 104400 15: ADVANCE ;EXIT TEST
3196 014220 105737 001414 25: TSTB EIAFLG ;YOU BETTER BE IN
3197 014224 100774 BMI 15 ;EIA MODE FOR THIS TEST.
3198 014226 013700 002062 MOV DZMSR,R0 ;SET REGISTER
3199 014232 012702 000001 MOV #1,R2 ;SET LINE POINTER
3200 014236 130237 001364 35: BITB R2,LINE ;LINE SELECTED?
3201 014242 001003 BNE 55 ;BR IF YES
3202 014244 106302 45: ASLB R2 ;NEXT LINE
3203 014246 103373 BCC 35 ;CONTINUE TEST
3204 014250 104400 ADVANCE ;ADVANCE THIS TEST
3205 014252 005005 55: CLR R5 ;SET EXPECTED
3206 014254 150205 BISB R2,R5
3207 014256 000305 SWAB R5
3208 014260 150205 BISB R2,R5
3209 014262 150277 165572 BISB R2,2NDZTCR
3210 014266 104414 DELAY ;SET DTR
3211 014270 011004 MOV (R0),R4 ;CABLE DELAY
3212 014272 020504 CMP R5,R4 ;READ MSR
3213 014274 001401 BEQ 65 ;BITS OK?
3214 014276 104002 ERROR 2 ;BR IF YES
3215 014300 140277 165554 65: BICB R2,2NDZTCR ;CARRIER OR RING ERROR
3216 014304 104414 DELAY ;CLEAR DTR
3217 014306 011004 MOV (R0),R4 ;CABLE DELAY
3218 014310 001402 BEQ 75 ;READ MSR
3219 014312 005005 CLR R5 ;BR IF BITS CLEARED
3220 014314 104002 ERROR 2 ;CLEAR EXPECTED LOC.
3221 014316 104401 75: SCOP1 ;BITS NOT CLEARED.
3222 014320 000751 BR 45 ;LOCK ON LINE?
3223                                     ;CONTINUE TEST
3224                                     : ***** TEST 20 *****
3225                                     : * THIS TEST VERIFIES THAT TROY IS SET WHEN A LINE
3226                                     : * IS READY TO BE LOADED, AND THAT THE LINE SPECI-
3227                                     : * FIED IN BITS 8-10 OF DZCSR CORRESPOND
3228                                     : * TO THE LINE SELECTED IN DZTCR.
3229                                     : : * TEST 20
3230                                     : : *****
3231 014322 000004 TST20: SCOPE
3232 014324 012737 000020 001122 MOV #20,STSTNM ;LOAD THE NUMBER OF THIS TEST
3233 014332 012737 014436 001360 MOV #TST21,NEXT ;POINT TO THE START OF THE NEXT TEST

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3234	014340	104413			DEVICE.CLR	ISSUE A "DEVICE CLEAR" (RESET)
3235	014342	013700	002042		MOV DZCSR, R0	SET POINTER
3236	014346	012705	100040		MOV #MSENAB!TRDY, R5	START THE EXPECTED LINE NUMBER AT 0
3237	014352	012702	000001		MOV #1, R2	USING R2 AS A BIT POINTER, POINT TO LINE 0
3238	014356	130237	001364	15:	BIT R2, LINE	IS THIS LINE SELECTED?
3239	014362	001420			BEQ 55	IF NO, SKIP THE STARTUP
3240	014364	050277	165466	25:	BIS R2, J0ZTCR	SET THE GO BIT FOR THIS LINE
3241	014370	052710	000040		BIS #MSENAB, (R0)	START THE SCANNER
3242	014374	005004			CLR R4	SET FOR DELAY
3243	014376	032710	100000	35:	BIT #TRDY, (R0)	TX READY?
3244	014402	001004			BNE 45	BR IF YES
3245	014404	104414			DELAY	DELAY
3246	014406	005204			INC R4	COUNTER
3247	014410	001372			BNE 35	BR IF <>0!
3248	014412	104002			ERROR 2	*TX NOT READY!
3249	014414	011004		45:	MOV (R0), R4	GET THE LINE POINTED TO BY THE SCANNER
3250	014416	020405			CMP R4, R5	IS THE LINE NUMBER WHAT IT SHOULD BE?
3251	014420	001401			BEQ 55	IF YES, GO WORK ON THE NEXT LINE
3252	014422	104002			ERROR 2	*LINE NUMBER DID NOT MATCH TCR BIT
3253	014424	062705	000400	55:	ADD #400, R5	POINT TO THE NEXT EXPECTED LINE
3254	014430	104413			DEVICE.CLR	ISSUE A "DEVICE CLEAR" (RESET)
3255	014432	106302			ASLB R2	POINT TO THE NEXT LINE. ARE ALL LINES TESTED?
3256	014434	103350			BCC 15	IF NOT, GO DO THE NEXT LINE
3257	014436			65:		
3258						***** TEST 21 *****
3259						*TEST TO TRANSMIT ONE CHAR AND
3260						*RECEIVE ONE CHAR ON ONE LINE
3261						*AT A TIME. THE CHAR IS "252" AND
3262						*ALL SELECTED LINES WILL BE TURNED ON
3263						*ONE AT A TIME. THIS IS THE FIRST TIME ANY
3264						*DATA IS CHECKED IN THE RECEIVER.
3265						::# TEST 21
3266						*****
3267	014436	000004			TST21: SCOPE	
3268	014440	012737	000021	001122	MOV #21, STSTNM	LOAD THE NUMBER OF THIS TEST
3269	014446	012737	014754	001360	MOV #TST22, NEXT	POINT TO THE START OF THE NEXT TEST
3270	014454	012737	014732	001362	MOV #165, LOCK	USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
3271	014462	104417			DCLASH	CLEAR DEVICE AND SET MAINT BIT IF I MODE
3272	014464	013701	001366		MOV PAR, R1	PICK UP PARAMETERS
3273	014470	012702	000001		MOV #1, R2	PICK UP INIT POINTER
3274	014474	030237	001364	15:	BIT R2, LINE	SHOULD THIS LINE BE SET UP ?
3275	014500	001402			BEQ 25	NO
3276	014502	010177	165344		MOV R1, J0ZLPR	SET UP LINE PARAMETERS
3277	014506	005201		25:	INC R1	POSITION POINTER TO THE NEXT LINE
3278	014510	106302			ASLB R2	GOT 'EM ALL ?
3279	014512	103370			BCC 15	IF NO, GO SET UP THE NEXT LINE
3280	014514	005037	001372		CLR SAVLIN	CLEAR LINE # INDICATOR
3281	014520	012702	000001		MOV #1, R2	LINE POINTER
3282	014524	052777	000040	165310	BIS #MSENAB, J0ZCSR	START SCANNER
3283	014532	030237	001364	35:	BIT R2, LINE	VALID LINE ?
3284	014536	001463			BEQ 145	NO SET UP NEXT LINE
3285	014540	010277	165312		MOV R2, J0ZTCR	SET TCR BIT
3286	014544	032777	000200	165270	45:	BIT #RDONE, J0ZCSR
3287	014552	001401			BEQ 55	IS REC DONE = 0 ?
3288	014554	104020			ERROR 20	IF YES, ALLOW TIME FOR TRDY TO SET
3289	014556	005005		55:	CLR R5	*REC DONE SHOULD = 0

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3290 014560 032777 100000 165254 6$: BIT #TRDY, 2DZCSR
3291 014566 001004 BNE 7$
3292 014570 104414 DELAY
3293 014572 105205 INCB R5
3294 014574 001371 BNE 6$
3295 014576 104003 ERROR 3 ;*TRDY FAILED TO SET!
3296 014600 112777 000252 165260 7$: MOV #252, 2DZTDR ;LOAD CHARACTER
3297 014606 013705 001372 MOV SAVLIN, R5 ;MAKE EXPECTED LINE #
3298 014612 105737 001371 TSTB MODE+1 ;IS THIS TEST IN STAGGERED MODE?
3299 014616 001406 BEQ 10$ ;IF NOT, SKIP STAGGERED SETUP
3300
;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3302
3303 014620 006205 ASR R5 ;GET THE LAST BIT INTO THE CARRY BIT
3304 014622 103402 BCS 8$ ;IF IT IS SET, GO CLEAR IT
3305 014624 000261 SEC ;IF IT IS CLEAR SET IT HERE
3306 014626 000401 BR 9$ ;SKIP THE CLEARING
3307 014630 000241 8$: CLC ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3308 014632 006105 9$: ROL R5 ;GET THE NEW BIT BACK INTO R5
3309 014634 000305 10$: SWAB R5 ;MOVE THE LINE NUMBER TO THE UPPER BYTE
3310 014636 152705 000252 BISB #252, R5 ;ADD CHARACTER
3311 014642 104400 ADVANCE ;ADVANCE TO THE NEXT TEST
3312 014644 052705 100000 BIS #DVALID, R5 ;ADD DATA VALID
3313 014650 005003 CLR R3
3314 014652 032777 000200 165162 11$: BIT #RDONE, 2DZCSR
3315 014660 001004 BNE 12$
3316 014662 104414 DELAY
3317 014664 105203 INCB R3
3318 014666 001371 BNE 11$
3319 014670 104004 ERROR 4 ;*RDONE FAILED TO SET!
3320 014672 017704 165150 12$: MOV 2DZRBUFF, R4 ;LOAD THE VALUE ACTUALLY RECEIVED
3321 014676 020405 CMP R4, R5 ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
3322 014700 001401 BEQ 13$ ;IF YES, GO DO THE NEXT LINE
3323 014702 104006 ERROR 6 ;*NO DATA/CONTENTS DID NOT COMPARE
3324 014704 104401 13$: SCOP1 ;CHECK TO SEE IF SWITCH NINE IS SET
3325 014706 040277 165144 14$: BIC R2, 2DZTCR ;CLEAR TCR BIT FOR THAT LINE.
3326 014712 005237 001372 15$: INC SAVLIN ;INC EXPECTED LINE
3327 014716 013700 001372 MOV SAVLIN, R0 ;SET UP CHARACTER OFFSET
3328 014722 006300 ASL R0 ;MAKE THE OFFSET A POWER OF TWO
3329 014724 106302 ASLB R2 ;SHIFT THE LINE POINTER. ARE WE ALL DONE?
3330 014726 103301 BCC 3$ ;IF NO, GO AROUND AGAIN FOR NEXT LINE
3331 014730 104400 ADVANCE ;GO TO NEXT TEST
3332
;TIGHT SCOPE LOOP FOR THIS TEST. LOOP TRANSMITS CHARACTERS ONLY
3333 ;THANKS TO JOHN MCINTYRE AND WESTMINSTER STAFF...
3334
3335
3336 014732 032777 100000 165102 16$: BIT #TRDY, 2DZCSR ;IS TRANSMITTER READY?
3337 014740 001774 BEQ 16$ ;IF NOT, WAIT FOR IT
3338 014742 112777 000252 165116 MOV #252, 2DZTDR ;LOAD THE CHARACTER
3339 014750 104401 SCOP1 ;LOOP AGAIN IF SW09=1
3340 014752 000755 BR 14$ ;OTHERWISE, GO PICK UP THE TEST NORMALLY
3341
;***** TEST 22 *****
3342 ;* THIS TEST PROVES THAT THE TRANSMITTER TRANSMITS
3343 ;* CHARACTERS (FLAG MODE) AND THE RECEIVER RECEIVES (FLAG MODE)
3344 ;* (ONE LINE AT A TIME BASED UPON VALID LINES)
3345

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3346                                     ;*THIS IS THE FIRST TIME THAT ALL DATA IS CHECKED
3347                                     ;:* TEST 22
3348                                     ;*****
3349 014754 000004 TST22: SCOPE
3350 014756 012737 000022 001122 MOV #22,STSTNM ;LOAD THE NUMBER OF THIS TEST
3351 014764 012737 015302 001360 MOV #TST23,NEXT ;POINT TO THE START OF THE NEXT TEST
3352 014772 012737 015106 001362 MOV #4$,LOCK ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
3353 015000 104417 DCLASM ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
3354 015002 013701 001366 MOV PAR,R1 ;PICK UP PARAMETERS
3355 015006 012702 000001 MOV #1,R2 ;PICK UP INIT POINTER
3356 015012 030237 001364 1$: BIT R2,LINE ;SHOULD THIS LINE BE SET UP ?
3357 015016 001402 BEQ 2$ ;NO
3358 015020 010177 165026 MOV R1,JDZLPR ;SET UP LINE PARAMETERS
3359 015024 005201 2$: INC R1 ;POSITION POINTER TO THE NEXT LINE
3360 015026 106302 ASLB R2 ;GOT 'EM ALL ?
3361 015030 103370 BCC 1$ ;IF NO, GO SET UP THE NEXT LINE
3362 015032 005037 001372 CLR SAVLIN ;CLEAR LINE # INDICATOR
3363 015036 012700 001422 MOV #TDO,R0 ;POINT TO THE DATA AREA
3364 015042 005020 CLR (R0)+ ;CLEAR A DATA WORD
3365 015044 022700 001462 CMP #STOP,R0 ;FINISHED ?
3366 015050 001374 BNE -6 ;NO
3367 015052 005000 CLR R0 ;CLEAR OFFSET
3368 015054 013737 002046 001400 MOV DZRBUFF,REGIST ;SAVE FOR ERROR MSG
3369 015062 012702 000001 MOV #1,R2 ;LINE POINTER
3370 015066 052777 000040 164746 BIS #MSENAB,JDZCSR ;START SCANNER
3371 015074 030237 001364 3$: BIT R2,LINE ;VALID LINE ?
3372 015100 001465 BEQ 14$ ;NO SET UP NEXT LINE
3373 015102 010277 164750 MOV R2,JDZTCR ;SET TCR BIT
3374 015106 032777 000200 164726 4$: BIT #RDONE,JDZCSR ;IS REC DONE = 0 ?
3375 015114 001401 BEQ 5$ ;IF YES, ALLOW TIME FOR TRDY TO SET
3376 015116 104020 ERROR 20 ;*REC DONE SHOULD = 0
3377 015120 005005 5$: CLR R5
3378 015122 032777 100000 164712 6$: BIT #TRDY,JDZCSR
3379 015130 001004 BNE 7$
3380 015132 104414 DELAY
3381 015134 105205 INCB R5
3382 015136 001371 BNE 6$
3383 015140 104003 ERROR 3
3384 015142 116077 001422 164716 7$: MOVB TDO(R0),JDZTOR ;*TRDY FAILED TO SET!
3385 015150 013705 001372 MOV SAVLIN,R5 ;LOAD CHARACTER
3386 015154 105737 001371 TSTB MODE+1 ;MAKE EXPECTED LINE #
3387 015160 001406 BEQ 10$ ;IS THIS TEST IN STAGGERED MODE?
3388                                     ;IF NOT, SKIP STAGGERED SETUP
3389                                     ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3390
3391 015162 006205 ASR R5 ;GET THE LAST BIT INTO THE CARRY BIT
3392 015164 103402 BCS 8$ ;IF IT IS SET, GO CLEAR IT
3393 015166 000261 SEC ;IF IT IS CLEAR SET IT HERE
3394 015170 000401 BR 9$ ;SKIP THE CLEARING
3395 015172 000241 8$: CLC ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3396 015174 006105 9$: ROL R5 ;GET THE NEW BIT BACK INTO R5
3397 015176 000305 10$: SWAB R5 ;MOVE THE LINE NUMBER TO THE UPPER BYTE
3398 015200 156005 001422 BISB TDO(R0),R5 ;ADD CHARACTER
3399 015204 052705 100000 BIS #DVALID,R5 ;ADD DATA VALID
3400 015210 005003 CLR R3
3401 015212 032777 000200 164622 11$: BIT #RDONE,JDZCSR

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3402	015220	001004			BNE	12S	
3403	015222	104414			DELAY		
3404	015224	005204			INC	R4	
3405	015226	001371			BNE	11S	
3406	015230	104004			ERROR	4	
3407	015232	017704	164610	12S:	MOV	JDZRBUFF,R4	;*RDONE FAILED TO SET!
3408	015236	020405			CMP	R4,R5	:LOAD THE VALUE ACTUALLY RECEIVED
3409	015240	001401			BEQ	13S	:COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
3410	015242	104006			ERROR	6	:IF YES, GO DO THE NEXT LINE
3411	015244	104401		13S:	SCOP1		:*NO DATA/CONTENTS DID NOT COMPARE
3412	015246	105260	001422		INCB	TDO(RO)	:CHECK TO SEE IF SWITCH NINE IS SET
3413	015252	001315			BNE	4S	:INCREMENT BINARY PATTERN FOR THIS LINE
3414	015254	040277	164576	14S:	BIC	R2,JDZTCR	:GO 'ROUND AGAIN FOR NEXT CHARACTER
3415	015260	005237	001372	15S:	INC	SAVLIN	:CLEAR TCR BIT FOR THAT LINE.
3416	015264	013700	001372		MOV	SAVLIN,R0	:INC EXPECTED LINE
3417	015270	006300			ASL	R0	:SET UP CHARACTER OFFSET
3418	015272	106302			ASLB	R2	:MAKE THE OFFSET A POWER OF TWO
3419	015274	103277			BCC	3S	:SHIFT THE LINE POINTER. ARE WE ALL DONE?
3420	015276	005037	001362		CLR	LOCK	:IF NO, GO AROUND AGAIN FOR NEXT LINE
3421							:MAKE SURE LOCK IS CLEAR FOR NEXT TEST

***** TEST 23 *****

:THIS TEST WILL PROVE THAT:
 :* 1) THE TRANSMITTER "BREAK BIT" WORKS
 :* 2) THE RECEIVER CAN FLAG "FRAMING ERRORS"
 :* 3) THE RECEIVER CAN FLAG "PARITY ERRORS"
 :*ONLY ONE LINE AT A TIME WILL BE EXERCISED.
 :THIS TEST WILL NOT BE EXERCISED UNLESS
 :*CONNECTED BY EXTERNAL PLUG.

::* TEST 23

3433	015302	000004			TST23:	SCOPE	
3434	015304	012737	000023	001122	MOV	#23,\$TSTNM	:LOAD THE NUMBER OF THIS TEST
3435	015312	012737	015560	001360	MOV	#TST24,NEXT	:POINT TO THE START OF THE NEXT TEST
3436	015320	012737	015416	001362	MOV	#3S,LOCK	:SET FOR LOOP
3437	015326	005737	001370		TST	MODE	:ARE WE RUNNING IN INTERNAL MODE?
3438	015332	001510			BEQ	12S	:IF SO, SKIP THIS TEST
3439	015334	104417			DCLASM		:CLEAR DEVICE AND SET MAINT BIT IF I MODE
3440	015336	013701	001366		MOV	PAR,R1	:PICK UP PARAMETERS
3441	015342	052701	000300		BIS	#00DPAR!PARITY,R1	:FORCE ODD PARITY
3442	015346	012700	000001		MOV	#1,R0	:PICK UP INIT POINTER
3443	015352	030037	001364	1S:	BIT	R0,LINE	:SHOULD THIS LINE BE SET UP ?
3444	015356	001402			BEQ	2S	:IF NOT,DON'T SET IT UP
3445	015360	010177	164466		MOV	R1,JDZLPR	:OTHERWISE, SET UP LINE PARAMETERS
3446	015364	005201		2S:	INC	R1	
3447	015366	106300			ASLB	R0	:GOT 'EM ALL ?
3448	015370	103370			BCC	1S	:NO
3449	015372	005037	001372		CLR	SAVLIN	:CLEAR LINE #
3450	015376	012702	000001		MOV	#1,R2	:LINE POINTER
3451	015402	052777	000040	164432	BIS	#MSENAB,JDZCSR	:SET MASTER SCAN ENABLE
3452	015410	013737	002046	001400	MOV	DZRBUFF,REGIST	:SAVE FOR ERRR MESSAGE
3453	015416	030237	001364	3S:	BIT	R2,LINE	
3454	015422	001443			BEQ	10S	
3455	015424	010277	164426		MOV	R2,JDZTCR	:SET TCR BIT
3456	015430	110277	164434		MOVB	R2,JDZTDR	:SET BREAK BIT
3457	015434	112777	000377	164424	MOVB	#377,JDZTDR	:LOAD CHARACTER

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3458 015442 013705 001372      MOV      SAVLIN,R5      ;MAKE EXPECTED DATA
3459 015446 105737 001371      TSTB     MODE+1      ;IS THIS TEST IN STAGGERED MODE?
3460 015452 001406              BEQ       7$           ;IF NOT, SKIP STAGGERED SETUP
3461
3462                               ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3463
3464 015454 006205      ASR       R5           ;GET THE LAST BIT INTO THE CARRY BIT
3465 015456 103402      BCS       5$           ;IF IT IS SET, GO CLEAR IT
3466 015460 000261      SEC              ;IF IT IS CLEAR SET IT HERE
3467 015462 000401      BR        6$           ;SKIP THE CLEARING
3468 015464 000241      CLC              ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3469 015466 006105      ROL       R5           ;GET THE NEW BIT BACK INTO R5
3470 015470 000305      SWAB     R5           ;PUT LINE NUMBER IN UPPER BYTE
3471 015472 052705 130000      BIS     #DVALID:PARER:FMERR,R5 ;ADD EXPECTED
3472 015476 005004      CLR       R4
3473 015500 032777 000200 164334 8$: BIT     #RDONE,JDZCSR
3474 015506 001004      BNE       9$
3475 015510 104414      DELAY
3476 015512 005204      INC       R4
3477 015514 001371      BNE       8$
3478 015516 104004      ERROR     4           ;RDONE FAILED TO SET!
3479 015520 017704 164322 9$:  MOV     JDZRBUF,R4      ;ACTUAL
3480 015524 020405      CMP      R4,R5      ;CMP ACTUAL VS EXPECTED. DO THEY MATCH?
3481 015526 001401      BEQ      10$      ;IF YES, GO CLEAN UP
3482 015530 104006      ERROR     6           ;DATA/CONTENTS FAILED TO COMPARE
3483 015532 105077 164332 10$: CLRB     JDZTDR      ;CLEAR BREAK BITS
3484 015536 104401      SCOP1
3485 015540 005237 001372 11$: INC      SAVLIN      ;INC LINE #
3486 015544 040277 164306      BIC     R2,JDZTCR      ;CLEAR TCR BIT
3487 015550 106302      ASLB     R2
3488 015552 103321      BCC      3$
3489 015554 005037 001362 12$: CLR      LOCK      ;MAKE SURE LOCK IS CLEAR FOR NEXT TEST
3490
3491      ;***** TEST 24 *****
3492      ;* THIS TEST VERIFIES THAT THE DEVICE DOES NOT INTERRUPT
3493      ;*WHILE THE PROCESSOR STATUS IS SET EXACTLY
3494      ;*TO WHAT THE DZ11 PRIORITY IS SET TO.
3495      ;*DEFAULT PRIORITY IS AT 5 (240).
3496
3497      ;: TEST 24
3498      ;*****
3499      ;*****
3500      ;*****
3501      ;*****
3502      ;*****
3503      ;*****
3504      ;*****
3505      ;*****
3506      ;*****
3507      ;*****
3508      ;*****
3509      ;*****
3510      ;*****
3511      ;*****
3512      ;*****
3513      ;*****

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3514	015654	012777	015742	164210	MOV	#75,ADZRV	;	SET UP THE RECEIVER INTERRUPT VECTOR
3515	015662	013777	026170	164204	MOV	DZPRT,ADZRV	;	SET THE INTERRUPT VECTOR STATUS
3516	015670	013777	026170	164202	MOV	DZPRT,ADZTV	;	SET TRANSMITTER INTERRUPT PRIORITY
3517	015676	052777	040040	164136	BIS	#TIE:ASENAB,ADZCSR	;	ENABLE THE DEVICE
3518	015704	005005			CLR	R5		
3519	015706	032777	100000	164126	45:	BIT	#TRDY,ADZCSR	
3520	015714	001403			BEQ	55		
3521	015716	000240			NOP			
3522	015720	000240			NOP			
3523	015722	000411			BR	85		
3524	015724	104414			55:	DELAY		
3525	015726	005205			INC	R5		
3526	015730	001366			BNE	45		
3527	015732	104003			ERROR	3		;
3528	015734	104010			65:	ERROR	10	;
3529	015736	022626			CMP	(SP)+,(SP)+		;
3530	015740	000402			BR	85		;
3531	015742	104012			75:	ERROR	12	;
3532	015744	022626			CMP	(SP)+,(SP)+		;
3533	015746	042777	040000	164066	85:	BIC	#TIE,ADZCSR	;
3534	015754	113777	001422	164104	MOVB	TDO,ADZTDR		;
3535	015762	012777	016052	164106	MOV	#115,ADZTV		;
3536	015770	012777	016060	164074	MOV	#125,ADZRV		;
3537	015776	013777	026170	164070	MOV	DZPRT,ADZRV		;
3538	016004	013777	026170	164066	MOV	DZPRT,ADZTV		;
3539	016012	052777	000140	164022	BIS	#RIE:ASENAB,ADZCSR	;	ENABLE THE DEVICE
3540	016020	005005			CLR	R5		
3541	016022	032777	000200	164012	95:	BIT	#RDONE,ADZCSR	
3542	016030	001403			BEQ	105		
3543	016032	000240			NOP			
3544	016034	000240			NOP			
3545	016036	000412			BR	135		
3546	016040	104414			105:	DELAY		
3547	016042	005205			INC	R5		
3548	016044	001366			BNE	95		
3549	016046	104004			ERROR	4		;
3550	016050	000405			BR	135		;
3551	016052	104010			115:	ERROR	10	;
3552	016054	022626			CMP	(SP)+,(SP)+		;
3553	016056	000402			BR	135		;
3554	016060	104012			125:	ERROR	12	;
3555	016062	022626			CMP	(SP)+,(SP)+		;
3556	016064				135:			;
3557	016064	104413			DEVICE.CLR			;
3558								ISSUE DEVICE CLEAR (RESET)
3559								***** TEST 25 *****
3560								;
3561								;
3562								;
3563								;
3564								;
3565	016066	000004			15:	SCOPE		;
3566	016070	012737	000025	001122	MOV	#25,\$TSTNM		;
3567	016076	012737	016422	001360	MOV	#TST26,NEXT		;
3568	016104	104417			DCLASM			;
3569	016106	013701	001366		MOV	PAR,R1		;

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3570	016112	012702	000001		MOV	#1,R2	;PICK UP INIT POINTER
3571	016116	030237	001364	1\$:	BIT	R2,LINE	;SHOULD THIS LINE BE SET UP ?
3572	016122	001402			BEQ	2\$	;NO
3573	016124	010177	163722		MOV	R1,DZLPR	;SET UP LINE PARAMETERS
3574	016130	005201		2\$:	INC	R1	;POSITION POINTER TO THE NEXT LINE
3575	016132	106302			ASLB	R2	;GOT 'EM ALL ?
3576	016134	103370			BCC	1\$	;IF NO, GO SET UP THE NEXT LINE
3577	016136	005037	001372		CLR	SAVLIN	;CLEAR LINE # INDICATOR
3578	016142	106437	026170		MTPS	DZPRT	;SET CPU STATUS TO DZ11 PRIO.
3579	016146	106437	026172		MTPS	DZLESS1	;MAKE CPU ONE LEVEL LOWER THAN DZ11
3580	016152	113777	001364	163676	MOVB	LINE,DZTCR	;ENABLE THE VALID LINES
3581	016160			3\$:			
3582	016160	012777	016250	163710	MOV	#6\$,DZTIV	;SET UP THE TRANSMITTER INTERRUPT VECTOR
3583	016166	012777	016272	163676	MOV	#7\$,DZRIV	;SET UP THE RECEIVER INTERRUPT VECTOR
3584	016174	013777	026170	163672	MOV	DZPRT,DZCRIS	;SET THE INTERRUPT VECTOR STATUS
3585	016202	013777	026170	163670	MOV	DZPRT,DZTIS	;SET TRANSMITTER INTERRUPT PRIORITY
3586	016210	052777	040040	163624	BIS	#TIE!MSENAB,DZCSR	;ENABLE THE DEVICE
3587	016216	005277			CLR	R5	
3588	016220	032777	100000	163614	4\$:	BIT	#TRDY,DZCSR
3589	016226	001404			BEQ	5\$	
3590	016230	000240			NOP		
3591	016232	000240			NOP		
3592	016234	104007			ERROR	7	;*TRANSMITTER FAILED TO INTERRUPT
3593	016236	000417			BR	8\$	
3594	016240	104414		5\$:	DELAY		
3595	016242	005205			INC	R5	
3596	016244	001365			BNE	4\$	
3597	016246	104003			ERROR	3	;*TRDY NOT SET!
3598	016250	022626		6\$:	POP2SP		;REMOVE THE INTERRUPT FROM THE STACK
3599	016252	042777	040000	163562	BIC	#TIE,DZCSR	;DON'T LET ANY MORE INTERRUPTS OCCUR
3600	016260	106437	026170		MTPS	DZPRT	;SET CPU STATUS TO DZ11 PRIORITY
3601	016264	106437	026172		MTPS	DZLESS1	;MAKE CPU ONE LEVEL LOWER THAN DZ11
3602	016270	000402			BR	8\$	;RETURN TO THE NORMAL FLOW
3603	016272	104012		7\$:	ERROR	12	;*RECEIVER SHOULD NOT INTERRUPT
3604	016274	022626			CMP	(SP)+,(SP)+	;POP FOR FAKE RTI
3605	016276	042777	040000	163536	8\$:	BIC	#TIE,DZCSR
3606	016304	113777	001422	163554	MOVB	TDO,DZTDR	;RESET TRANSMITTER INTERRUPT ENABLE
3607	016312	012777	016404	163556	MOV	#11\$,DZTIV	;PUT ANY RANDOM CHARACTER IN TRANSMITTER BUFFER
3608	016320	012777	016412	163544	MOV	#12\$,DZRIV	;SET UP THE TRANSMITTER INTERRUPT VECTOR
3609	016326	013777	026170	163540	MOV	DZPRT,DZCRIS	;SET UP THE RECEIVER INTERRUPT VECTOR
3610	016334	013777	026170	163536	MOV	DZPRT,DZTIS	;SET THE INTERRUPT VECTOR STATUS
3611	016342	052777	000140	163472	MOV	DZPRT,DZTIS	;SET TRANSMITTER INTERRUPT PRIORITY
3612	016350	005005			BIS	#RIE!MSENAB,DZCSR	;ENABLE THE DEVICE
3613	016352	032777	000200	163462	9\$:	CLR	R5
3614	016360	001404			BIT	#RDONE,DZCSR	
3615	016362	000240			BEQ	10\$	
3616	016364	000240			NOP		
3617	016366	104011			NOP		
3618	016370	000413			ERROR	11	;*RECEIVER FAILED TO INTERRUPT
3619	016372	104414		10\$:	BR	13\$	
3620	016374	005205			DELAY		
3621	016376	001365			INC	R5	
3622	016400	104004			BNE	9\$	
3623	016402	000406			ERROR	4	;*NO RX DONE! (NOT SET)
3624	016404	104010		11\$:	BR	13\$	;CONTINUE TEST
3625	016406	022626			ERROR	10	;*TRANSMITTER SHOULD NOT INTERRUPT
					CMP	(SP)+,(SP)+	;POP FOR FAKE RTI

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3626	016410	000403		BR	13\$	;CONT TEST
3627	016412	022626		POP2SP		;REMOVE THE INTERRUPT FROM THE STACK
3628	016414	005077	163422	CLR	3DZCSR	;DON'T ALLOW ANY MORE INTERRUPTS
3629	016420			13\$:		
3630	016420	104413		DEVICE.CLR		;ISSUE DEVICE CLEAR (RESET)
3631						
3632						;***** TEST 26 *****
3633						;*THIS TEST VERIFIES THAT THE RECEIVER WILL
3634						;*INTERRUPT BEFORE THE TRANSMITTER EVEN
3635						;*THOUGH THE TRANSMITTER WAS ENABLED
3636						;*FIRST, SET PS TO LEVEL 7;
3637						;*GET RDONE AND TRDY TO SET;
3638						;*SET TX IE AND RX IE;
3639						;*CLEAR PS AND EXPECT RX TO INTERRUPT FIRST
3640				::*	TEST 26	
3641				::*	*****	
3642	016422	000004		TST26:	SCOPE	
3643	016424	012737	000026 001122	MOV	#26,\$TSTNM	;LOAD THE NUMBER OF THIS TEST
3644	016432	012737	017054 01360	MOV	#TST27,NEXT	;POINT TO THE START OF THE NEXT TEST
3645	016440	104417		DCLASM		;CLEAR DEVICE AND SET MAINT BIT IF I MODE
3646	016442	013701	001366	MOV	PAR,R1	;PICK UP PARAMETERS
3647	016446	012702	000001	MOV	#1,R2	;PICK UP INIT POINTER
3648	016452	030237	001364	1\$:	BIT R2,LINE	;SHOULD THIS LINE BE SET UP ?
3649	016456	001402		BEG	2\$	;NO
3650	016460	010177	163366	MOV	R1,3DZLPR	;SET UP LINE PARAMETERS
3651	016464	005201		2\$:	INC R1	;POSITION POINTER TO THE NEXT LINE
3652	016466	106302		ASLB	R2	;GOT 'EM ALL ?
3653	016470	103370		BCC	1\$	;IF NO, GO SET UP THE NEXT LINE
3654	016472	005037	001372	CLR	SAVLIN	;CLEAR LINE # INDICATOR
3655	016476	012777	016726 163366	MOV	#8\$,3DZRIV	;SETUP INTERRUPT STUFF
3656	016504	013777	026170 163362	MOV	DZPRT,3DZRIS	
3657	016512	012777	017016 163356	MOV	#12\$,3DZTIV	
3658	016520	013777	026170 163352	MOV	DZPRT,3DZTIS	
3659	016526	052777	000040 163306	BIS	#MSENAB,3DZCSR	
3660	016534	012702	000001	MOV	#1,R2	;LINE POINTER
3661	016540	030237	001364	3\$:	BIT R2,LINE	;VALID LINE ?
3662	016544	001004		BNE	4\$	
3663	016546	005237	001372	INC	SAVLIN	
3664	016552	106302		ASLB	R2	
3665	016554	000771		BR	3\$	
3666	016556	106427	000340	4\$:	MTPS #PR7	
3667	016562	000240		NOP		
3668	016564	000240		NOP		
3669	016566	110277	163264	MOVB	R2,3DZTCR	;SET TCR BIT
3670	016572	005777	163250	TST	3DZRBUF	;VALID DATA?
3671	016576	100001		BPL	.+4	;IT BETTER NOT BE SET
3672	016600	104017		ERROR	17	;DATA VALID SHOULD NOT BE SET
3673	016602	105777	163234	5\$:	TSTB 3DZCSR	;RECEIVER DONE ?
3674	016606	100001		BPL	.+4	
3675	016610	104020		ERROR	20	;RECEIVER DONE BIT SHOULD NOT BE SET
3676	016612	005005		CLR	R5	
3677	016614	005004		CLR	R4	
3678	016616	005777	163220	99\$:	TST 3DZCSR	;WAIT FOR TRDY
3679	016622	100404		BMI	100\$	;BR IF READY
3680	016624	104414		DELAY		;STALL TIME
3681	016626	005204		INC	R4	

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3682 016630 001372      BNE      99$
3683 016632 104003      ERROR      3      ;TRDY FAILED TO SET
3684 016634 105077 163226 100$: CLR      2DZTDR
3685 016640 005004      CLR      R4
3686 016642 032777 000200 163172 6$: BIT      #RDONE,2DZCSR
3687 016650 001004      BNE      7$
3688 016652 104414      DELAY
3689 016654 005204      INC      R4
3690 016656 001371      BNE      6$
3691 016660 104004      ERROR      4      ;*RDONE FAILED TO SET!
3692 016662 005777 163154 7$: TST      2DZCSR      ;TRANS DONE BIT = 1 ?
3693 016666 100401      BMI      +4      ;YES
3694 016670 104003      ERROR      3      ;*NO TRANS DONE FAILED TO SET
3695      ;NOW THAT BOTH TRANSMITTER AND RECEIVER DONE BIT =1
3696      ;SET INTERRUPT ENABLES AND WATCH THE FUR FLY
3697 016672 052777 040000 163142 BIS      #TIE,2DZCSR
3698 016700 052777 000100 163134 BIS      #RIE,2DZCSR
3699 016706 106427 000000      MTPS      #0
3700 016712 000240      NOP
3701 016714 000240      NOP
3702 016716 104007      ERROR      7      ;*TRANSMITTER FAILED TO INTERRUPT
3703 016720 104011      ERROR      11     ;*RECEIVER FAILED TO INTERRUPT
3704      ;CHECK BR LEVEL
3705 016722 000137 017022      JMP      13$      ;GET OUT
3706
3707      ;RECEIVER INTERRUPT ROUTINE
3708 016726 017704 163114 8$: MOV      2DZRBUF,R4      ;ACTUAL
3709 016732 010403      MOV      R4,R3
3710 016734 000303      SWAB      R3
3711 016736 042703 177770      BIC      #1C<7>,R3      ;STRIP JUNK
3712 016742 105737 001371      TSTB      MODE+1      ;IS THIS TEST IN STAGGERED MODE?
3713 016746 001406      BEQ      11$      ;IF NOT, SKIP STAGGERED SETUP
3714
3715      ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3716
3717 016750 006203      ASR      R3      ;GET THE LAST BIT INTO THE CARRY BIT
3718 016752 103402      BCS      9$      ;IF IT IS SET, GO CLEAR IT
3719 016754 000261      SEC      ;IF IT IS CLEAR SET IT HERE
3720 016756 000401      BR      10$      ;SKIP THE CLEARING
3721 016760 000241 9$: CLC      ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3722 016762 006103 10$: ROL      R3      ;GET THE NEW BIT BACK INTO R3
3723 016764 020337 001372 11$: CMP      R3,SAVLIN      ;IS THIS A VALID LINE
3724 016770 001401      BEQ      +4      ;YES
3725 016772 104015      ERROR      15     ;*INVALID LINE
3726 016774 042704 177400      BIC      #1C<377>,R4      ;STRIP JUNK
3727 017000 120504      CMPB      R5,R4      ;DATA COMPARE ?
3728 017002 001401      BEQ      +4      ;YES
3729 017004 104005      ERROR      5      ;*DATA DOES NOT COMPARE
3730 017006 040277 163044      BIC      R2,2DZTCR      ;CLEAR TCR BIT
3731 017012 022626      POP2SP      ;REMOVE THE INTERRUPT VECTOR FROM THE STACK
3732 017014 000402      BR      13$      ;GO GET OUT OF INTERRUPT MODE
3733      ;TRANSMITTER INTERRUPT SVC ROUTINE
3734 017016 104011 12$: ERROR      11     ;THE RECEIVER INTERRUPT FAILED
3735      ;TO OVERRIDE THE TRANSMITTER
3736 017020 022626      POP2SP      ;REMOVE THE INTERRUPT VECTOR FROM THE STACK
3737 017022 042777 040100 163012 13$: BIC      #TIE!RIE,2DZCSR ;CLEAR INTERRUPT ENABLES

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3738 017030 013777 002074 163034      MOV    DZRI5,ADZRI5      ;RESTORE TRAPCATCHER
3739 017036 005077 163032      CLR     ADZRI5
3740 017042 013777 002100 163026      MOV    DZTI5,ADZTI5
3741 017050 005077 163024      CLR     ADZTI5
3742                                     ;***** TEST 27 *****
3743                                     ;THIS TEST VERIFYS OVERRUN AND SILO ALARM
3744                                     ;ONE LINE AT A TIME - BASED UPON VALID LINES
3745                                     ;AS EACH OF THE FIRST 16 CHARS ARE SENT; SILO ALARM IS
3746                                     ;TESTED TO BE CLEARED. ON THE 16TH CHAR THE PROGRAM THEN
3747                                     ;EXPECTS SILO ALARM TO SET. THEN THE ENTIRE
3748                                     ;SILO IS FILLED AND AN OVERRUN IS EXPECTED ON THE 65TH
3749                                     ;CHAR PULLED OUT OUT THE SILO.
3750                                     ;:* TEST 27
3751                                     ;*****
3752 017054 000004      TST27: SCOPE
3753 017056 012737 000027 001122      MOV    #27,STSTNM      ;LOAD THE NUMBER OF THIS TEST
3754 017064 012737 017602 001360      MOV    #TST30,NEXT    ;POINT TO THE START OF THE NEXT TEST
3755 017072 012737 017506 001362      MOV    #18$,LOCK      ;SET FOR LOOP
3756 017100 104417      DCLASM      ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
3757 017102 013701 001366      MOV    PAR,R1      ;PICK UP PARAMETERS
3758 017106 012702 000001      MOV    #1,R2      ;PICK UP INIT POINTER
3759 017112 030237 001364      1$: BIT    R2,LINE      ;SHOULD THIS LINE BE SET UP ?
3760 017116 001402      BEQ     2$      ;NO
3761 017120 010177 162726      MOV    R1,ADZLPR      ;SET UP LINE PARAMETERS
3762 017124 005201      2$: INC     R1      ;POSITION POINTER TO THE NEXT LINE
3763 017126 106302      ASLB     R2      ;GOT 'EM ALL ?
3764 017130 103370      BCC     1$      ;IF NO, GO SET UP THE NEXT LINE
3765 017132 005037 001372      CLR     SAVLIN      ;CLEAR LINE # INDICATOR
3766 017136 012700 001422      MOV    #TDO,R0      ;POINT TO THE DATA AREA
3767 017142 005020      CLR     (R0)+      ;CLEAR A DATA WORD
3768 017144 022700 001462      CMP     #STOP,R0      ;FINISHED ?
3769 017150 001374      BNE     -6      ;NO
3770 017152 005000      CLR     R0      ;CLEAR OFFSET
3771 017154 012702 000001      MOV    #1,R2      ;LINE POINTER
3772 017160 052777 010040 162654      BIS    #MENAB!SILOEN,ADZCSR      ;START SCANNER & SET SILO ENABLE
3773 017166 030237 001364      3$: BIT    R2,LINE      ;VALID LINE?
3774 017172 001002      BNE     +6      ;YES
3775 017174 000137 017462      JMP     17$      ;TRY NEXT LINE
3776 017200 013700 001372      MOV    SAVLIN,R0      ;MAKE OFFSET
3777 017204 006300      ASL     R0      ;MAKE POWER OF TWO
3778 017206 010277 162644      MOV    R2,ADZTCR      ;SET TCR BIT
3779 017212 105777 162624      4$: TSTB   ADZCSR      ;REC DONE = 1 ?
3780 017216 100001      BPL     +4      ;
3781 017220 104020      ERROR    20      ;REC DONE SHOULD NOT = 1
3782 017222 005003      CLR     R3      ;SET CHARACTER COUNT
3783 017224 005004      CLR     R4      ;
3784 017226 032777 100000 162606      5$: BIT    #TRDY,ADZCSR      6$:
3785 017234 001004      BNE     7$      ;
3786 017236 104414      DELAY      ;
3787 017240 105204      INCB     R4      ;
3788 017242 001371      BNE     6$      ;
3789 017244 104003      ERROR    3      ;*TRDY FAILED TO SET
3790 017246 116077 001422 162612 7$: MOVB   TDO(R0),ADZTDR      ;LOAD A CHARACTER
3791 017254 005260 001422      INC     TDO(R0)      ;SET UP NEXT CHARACTER
3792 017260 020327 000017      CMP     R3,#15.      ;16 CHARACTERS ?
3793 017264 103006      BHIS    8$

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3794	017266	032777	020000	162546		BIT	#SILOAL,JDZCSR	:SILO ALARM = 0 ?
3795	017274	001401				BEQ	+4	:YES
3796	017276	104013				ERROR	13	:#SILO ALARM SHOULD NOT = 1
3797								:UNTIL 16. DATA CHARACTERS
3798	017300	000411				BR	10\$	
3799	017302	005004			8\$:	CLR	R4	
3800	017304	032777	020000	162530	9\$:	BIT	#SILOAL,JDZCSR	
3801	017312	001004				BNE	10\$	
3802	017314	104414				DELAY		
3803	017316	005204				INC	R4	
3804	017320	001371				BNE	9\$	
3805	017322	104014				ERROR	14	:#SILO ALARM FAILED TO SET!
3806								:SILO ALARM SHOULD =1 AFTER 16.
3807								:DATA CHARACTERS
3808	017324	005203			10\$:	INC	R3	:INC CHAR COUNT
3809	017326	022703	000102			CMP	#66.,R3	:FINISHED SENDING CHARACTERS ?
3810	017332	001334				BNE	5\$	:NO
3811	017334	005004				CLR	R4	
3812	017336	104414				DELAY		
3813	017340	105204				INCB	R4	
3814	017342	001375				BNE	-4	
3815								:NOW LETS READ THE SILO
3816	017344	013705	001372			MOV	SAVLIN,R5	:MAKE EXPECTED LINE #
3817	017350	105737	001371			TSTB	MODE+1	:IS THIS TEST IN STAGGERED MODE?
3818	017354	001406				BEQ	13\$	:IF NOT, SKIP STAGGERED SETUP
3819								
3820								:WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
3821								
3822	017356	006205				ASR	R5	:GET THE LAST BIT INTO THE CARRY BIT
3823	017360	103402				BCS	11\$	:IF IT IS SET, GO CLEAR IT
3824	017362	000261				SEC		:IF IT IS CLEAR SET IT HERE
3825	017364	000401				BR	12\$	:SKIP THE CLEARING
3826	017366	000241			11\$:	CLC		:CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
3827	017370	006105			12\$:	ROL	R5	:GET THE NEW BIT BACK INTO R5
3828	017372	000305			13\$:	SWAB	R5	:PUT IN UPPER BYTE
3829	017374	052705	100000			BIS	#DVALID,R5	:ADD DATA VALID
3830	017400	017704	162442		14\$:	MOV	JDZRBUF,R4	:ACTUAL
3831	017404	020405				CMP	R4,R5	:ACTUAL VS. EXPECTED
3832	017406	001401				BEQ	15\$	:YES
3833	017410	104006				ERROR	6	:#DATA/CONTENTS DID NOT COMPARE
3834	017412	032777	020000	162422	15\$:	BIT	#SILOAL,JDZCSR	:SILO ALARM= 0 ?
3835	017420	001401				BEQ	16\$	:YES
3836	017422	104016				ERROR	16	:READING DZRBUF DID NOT CLEAR SILO ALARM
3837	017424	005205			16\$:	INC	R5	:UP CHARACTER
3838	017426	120527	000077			CMPB	R5,#63.	:LAST SILO CHAR ?....64TH CHAR
3839	017432	101762				BLOS	14\$	
3840	017434	005205				INC	R5	:ADD 1 MORE FOR THE CLOBBED CHAR
3841	017436	052705	040000			BIS	#OVRUN,R5	:ADD OVERRUN TO EXPECTED
3842	017442	120527	000101			CMPB	R5,#65.	:LAST CHARACTER ?
3843	017446	001754				BEQ	14\$	
3844	017450	017704	162372			MOV	JDZRBUF,R4	:FOR GOOD MEASURE
3845	017454	005704				TST	R4	:DATA VALID SHOULD = 0
3846	017456	100001				BPL	17\$	:YES
3847	017460	104017				ERROR	17	:DATA VALID SHOULD = 0
3848	017462	040277	162370		17\$:	BIC	R2,JDZTCR	:CLR TCR BIT
3849	017466	104401				SCOP1		:LOOP?

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3850 017470 005237 001372      INC      SAVLIN      ;INC EXPECTED LINE
3851 017474 106302      ASLB      R2          ;NEXT LINE
3852 017476 103402      BCS      +6          ;NO
3853 017500 000137 017166    JMP      3$          ;YES
3854 017504 104400      ADVANCE      ;GO TO NEXT TEST
3855
3856      ;TIGHT SCOPE LOOP FOR THIS TEST. SENDS 20. CHARACTERS
3857      ;ON DZ LINE PREVIOUSLY SELECTED CONTINUOUSLY WHILE SW09=1.
3858      ;USED TO SCOPE SILO ALARM PULSES, ETC.
3859      ;SPECIAL THANKS TO WALT BYSKO FOR THIS TEST
3860
3861 017506 052777 010040 162326 18$: BIS      #MSENAB!SILOEN, 20ZCSR ;SETUP DEVICE
3862 017514 012777 017572 162354    MOV      #20$, 20ZTIV ;SETUP TRANSMITTER VECTOR
3863 017522 012737 000024 001216    MOV      #20$, STMP0 ;TEMPORARY COUNT OF CHARACTER BURST
3864 017530 050277 162322      BIS      R2, 20ZTCR ;ENABLE LINE
3865 017534 052777 040000 162300    BIS      #TIE, 20ZCSR ;ENABLE INTERRUPTS
3866 017542 106427 000000      MTPS      #0 ;LOWER PRIORITY
3867 017546 000001      19$: WAIT ;ALLOW INTERRUPTS
3868 017550 005337 001216    DEC      STMP0 ;REDUCE COUNT. ALL CHARACTERS SENT?
3869 017554 001374      BNE      19$ ;IF NO, WAIT FOR MORE
3870 017556 042777 050040 162256    BIC      #SILOEN!MSENAB!TIE, 20ZCSR ;RESET SILO COUNTER, CLEAR STROBE
3871 017564 104401      SCOP1 ;LOOP AGAIN?
3872 017566 000137 017462      JMP      17$ ;IF NOT, RETURN TO WHERE YOU LEFT OFF
3873 017572 112777 000252 162266 20$: MOVB      #252, 20ZTDR ;SEND A CHARACTER
3874 017600 000002      RTI ;ALLOW MORE CHARACTERS TO COME
3875      ;***** TEST 30 *****
3876      ;*THIS TEST THAT "SILO ENABLE" WILL INHIBIT
3877      ;*RECEIVER INTERRUPTS AND THAT ON THE
3878      ;*16TH CHAR THAT "SILO ALARM" WILL CAUSE AN
3879      ;*INTERRUPT WITH "RIE" SET.
3880      ;*THIS WILL DO ALL SELECTED LINES ONE AT A TIME.
3881      ;::* TEST 30
3882      ;*****
3883 017602 000004      TST30: SCOPE
3884 017604 012737 000030 001122    MOV      #30, STSTNM ;LOAD THE NUMBER OF THIS TEST
3885 017612 012737 020164 001360    MOV      #TST31, NEXT ;POINT TO THE START OF THE NEXT TEST
3886 017620 012737 017714 001362    MOV      #3$, LOCK ;SET FOR LOOP
3887 017626 104417      DCLASM ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
3888 017630 013701 001366      MOV      PAR, R1 ;PICK UP PARAMETERS
3889 017634 012702 000001      MOV      #1, R2 ;PICK UP INIT POINTER
3890 017640 030237 001364      1$: BIT      R2, LINE ;SHOULD THIS LINE BE SET UP ?
3891 017644 001402      BEQ      2$ ;NO
3892 017646 010177 162200      MOV      R1, 20ZLPR ;SET UP LINE PARAMETERS
3893 017652 005201      2$: INC      R1 ;POSITION POINTER TO THE NEXT LINE
3894 017654 106302      ASLB      R2 ;GOT 'EM ALL ?
3895 017656 103370      BCC      1$ ;IF NO, GO SET UP THE NEXT LINE
3896 017660 005037 001372      CLR      SAVLIN ;CLEAR LINE # INDICATOR
3897 017664 012700 001422      MOV      #TDO, R0 ;POINT TO THE DATA AREA
3898 017670 005020      CLR      (R0)+ ;CLEAR A DATA WORD
3899 017672 022700 001462      CMP      #STOP, R0 ;FINISHED ?
3900 017676 001374      BNE      -6 ;NO
3901 017700 005000      CLR      R0 ;CLEAR OFFSET
3902 017702 012702 000001      MOV      #1, R2 ;LINE POINTER
3903 017706 052777 010140 162126    BIS      #MSENAB!SILOEN!RIE, 20ZCSR ;START SCANNER & SET SILO ENABLE
3904
3905 017714 030237 001364      3$: BIT      R2, LINE ;VALID LINE?

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3906	017720	001002				BNE	+6	:YES
3907	017722	000137	020136			JMP	17\$	:TRY NEXT LINE
3908	017726	005777	162114			TST	ADZRBUF	:EMPTY THE SILO
3909	017732	100775				BMI	-4	:BR IF DATA VALID IS SET!
3910	017734	106427	000000			MTPS	#0	:SET PROCESSOR PRIORITY TO 0
3911	017740	012777	020126	162124		MOV	#11\$,ADZRIV	:SET FOR UNEXPECTED INTER.
3912	017746	012777	000340	162120		MOV	#PR7,ADZRI5	:SET PRIO.
3913	017754	013700	001372			MOV	SAVLIN,R0	:MAKE OFFSET
3914	017760	006300				ASL	R0	:MAKE POWER OF TWO
3915	017762	010277	162070			MOV	R2,ADZTCR	:SET TCR BIT
3916	017766	005004			5\$:	CLR	R4	
3917	017770	032777	100000	162044	6\$:	BIT	#TRDY,ADZCSR	
3918	017776	001004				BNE	7\$	
3919	020000	104414				DELAY		
3920	020002	005204				INC	R4	
3921	020004	001371				BNE	6\$	
3922	020006	104003				ERROR	3	:*TRDY FAILED TO SET
3923	020010	116077	001422	162050	7\$:	MOVB	TDO(R0),ADZTDR	:LOAD A CHARACTER
3924	020016	005260	001422			INC	TDO(R0)	:SET UP NEXT CHARACTER
3925	020022	022760	000017	001422		CMP	#15.,TDO(R0)	:15 CHARS YET?
3926	020030	001406				BEQ	8\$	
3927	020032	032777	020000	162002		BIT	#SILOAL,ADZCSR	:SILO ALARM = 0 ?
3928	020040	001401				BEQ	+4	:YES
3929	020042	104013				ERROR	13	:*SILO ALARM SHOULD NOT = 1
3930								:UNTIL 16. DATA CHARACTERS
3931	020044	000751				BR	6\$	
3932	020046	012777	020134	162016	8\$:	MOV	#12\$,ADZRIV	:SET NEW VECTOR
3933	020054	032777	100000	161760		BIT	#TRDY,ADZCSR	:READY FOR 16TH CHAR
3934	020062	001774				BEQ	-6	
3935	020064	016077	001422	161774		MOV	TDO(R0),ADZTDR	:LOAD THE 16TH CHAR.
3936	020072	005004				CLR	R4	
3937	020074	032777	020000	161740	9\$:	BIT	#SILOAL,ADZCSR	
3938	020102	001005				BNE	10\$	
3939	020104	104414				DELAY		
3940	020106	005204				INC	R4	
3941	020110	001371				BNE	9\$	
3942	020112	104014				ERROR	14	:*SILO ALARM FAILED TO SET!
3943	020114	000410				BR	17\$	:SILO ALARM SHOULD =1 AFTER 16.
3944								:DATA CHARACTERS
3945	020116	000240			10\$:	.P		:STALL
3946	020120	000240				NOP		
3947	020122	104000				ERROR		:SILO ALARM NOT INTERRUPTING.
3948	020124	000404				BR	17\$	:CONTINUE TEST.
3949	020126	022626			11\$:	CMP	(SP)+,(SP)+	:FAKE RTI
3950	020130	104012				ERROR	12	:RX SHOULD NOT INTERRUPT
3951	020132	000401				BR	17\$	:CONTINUE
3952	020134	022626			12\$:	CMP	(SP)+,(SP)+	:GOOD INTERRUPT TO HERE.
3953	020136	040277	161714		17\$:	BIC	R2,ADZTCR	:CLR TCR BIT
3954	020142	104401				SCOP1		:LOOP?
3955	020144	005237	001372			INC	SAVLIN	:INC EXPECTED LINE
3956	020150	106302				ASLB	R2	:NEXT LINE
3957	020152	103402				BCS	+6	:NO
3958	020154	000137	017714			JMP	3\$	:YES
3959	020160	005037	001362			CLR	LOCK	:CLEAR TIGHT LOOP FOR NEXT TEST

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3960				
3961				
3962				
3963				
3964				
3965				
3966				
3967	020164	000004		
3968	020166	012737	000031	001122
3969	020174	012737	020772	001360
3970	020202	104417		
3971	020204	013737	001364	020770
3972	020212	013701	001366	
3973	020216	012700	000001	
3974	020222	030037	001364	
3975	020226	001402		
3976	020230	010177	161616	
3977	020234	005201		
3978	020236	106300		
3979	020240	103370		
3980	020242	012700	001422	
3981	020246	005020		
3982	020250	022700	001462	
3983	020254	001374		
3984	020256	012777	020514	161606
3985	020264	012777	000340	161602
3986	020272	012777	020414	161576
3987	020300	012777	000340	161572
3988	020306	052777	000040	161526
3989	020314	052777	000100	161520
3990	020322	052777	040000	161512
3991	020330	113777	001364	161520
3992	020336	106437	026172	
3993				
3994				
3995	020342	005037	020412	
3996	020346	013727	006554	
3997	020352	000000		
3998	020354	005337	020352	
3999	020360	001375		
4000	020362	105737	020770	
4001	020366	001002		
4002	020370	000137	020670	
4003	020374	005237	020412	
4004	020400	001362		
4005	020402	104007		
4006	020404	104011		
4007	020406	000137	020742	
4008	020412	000000		
4009				
4010				
4011	020414	005777	161422	
4012	020420	100401		
4013	020422	104003		
4014	020424	117703	161414	
4015				

```

***** TEST 31 *****
*THIS TEST RUNS ALL LINES FULL BORE
*BASED UPON QUALIFIED LINES
*..THIS IS AN INTERRUPT TEST ON THE RECEIVER AND
*TRANSMITTER

::* TEST 31
*****
TST31: SCOPE
      MOV      #31,STSTNM      ;LOAD THE NUMBER OF THIS TEST
      MOV      #TST32,NEXT     ;POINT TO THE START OF THE NEXT TEST
      DCLASM                     ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
RSTART: MOV      LINE,RXTCR     ;SET IMAGE OF TCR BITS
      MOV      PAR,R1           ;PICK UP PARAMETER
INIT:   MOV      #1,R0          ;PICK UP INIT POINTER
      BIT      R0,LINE          ;SHOULD THIS LINE BE SET UP
      BEQ      1$              ;NO
1$:     MOV      R1,JDZLPR       ;SET UP LINE PARAM REGISTER
      INC      R1
      ASLB     R0               ;GOT 'EM ALL ?
      BCC      INIT            ;NO
INIT1:  MOV      #TDO,R0        ;CLEAR TRANS DATA POINTER & REC POINTERS
      CLR      (R0)+
      CMP      #STOP,R0        ;FINISHED ?
      BNE      INIT1           ;NO, CONTINUE CLEARING
      MOV      #RXSVC,JDZRIV    ;SET UP REC INTR VECTOR
      MOV      #PR7,JDZRIIS    ;STATUS
      MOV      #TXSVC,JDZTIV    ;SET UP TRANS INTR VECTOR
      MOV      #PR7,JDZTIS      ;STATUS
      BIS      #MSENAB,JDZCSR   ;SET MASTER SCAN ENABLE
      BIS      #RIE,JDZCSR      ;SET REC INTR ENABLE
      BIS      #TIE,JDZCSR      ;SET TRANS INTR ENABLE
      MOVB     LINE,JDZTCR      ;SET TCR BITS...UP UP AND AWAY !
      MTPS     @#LESS1         ;ALLOW INTERRUPTS

SNAP:   CLR      66$
67$:   MOV      DLYCNT,(PC)+    ;SET FOR DELAY
68$:   0
      DEC      68$
      BNE      -4
      TSTB     RXTCR           ;WAIT FOR ALL RECIEVERS TO FINISH
      BNE      3$
      JMP      OUT
3$:     INC      66$
      BNE      67$
      ERROR    7               ;*TRANSMITTER FAILED TO INTERRUPT
      ERROR    11              ;*RECEIVER FAILED TO INTERRUPT
      JMP      FINI
66$:   0

;TRANS INTR SVC ROUTINE
TXSVC:  TST      JDZCSR         ;TRANS INTR ?
      BMI      +4
      ERROR    3               ;*TRANSMITTER FAILED
      MOVB     JDZCSR,R3       ;SAVE IT
;NOW TEST FOR LINE # ETC

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4016	020430	042703	177770		BIC	#1C<7>,R3	:STRIP JUNK
4017	020434	010304			MOV	R3,R4	:SAVE
4018	020436	012702	000001		MOV	#1,R2	:SET UP POSITION POINTER
4019	020442	105303		3\$:	DECB	R3	:IS IT THIS LINE ?
4020	020444	100402			BMI	4\$	:YES
4021	020446	006302			ASL	R2	:UP THE LINE #
4022	020450	000774			BR	3\$	:GO 'ROUND AGAIN
4023	020452	030237	001364	4\$:	BIT	R2,LINE	:VALID LINE?
4024	020456	001001			BNE	.+4	:YES
4025	020460	104011			ERROR	11	:NO,INVALID LINE!!!!
4026	020462	042704	177770		BIC	#1C<7>,R4	:STRIP JUNK
4027	020466	006304			ASL	R4	:MAKE POWER OF 2
4028	020470	116477	001422	161370	MOVB	TDO(R4),DZTDR	:LOAD CHARACTER
4029	020476	105264	001422		INCB	TDO(R4)	:SET UP NEXT CHARACTER
4030	020502	001002			BNE	5\$	:LAST CHARACTER ?
4031	020504	040277	161346		BIC	R2,DZTCR	:YES,CLEAR TCR BIT
4032	020510	005200		5\$:	INC	R0	:INCR RECEIVER TIMER
4033	020512	000002			RTI		
4034							
4035							
4036							
4037	020514	105777	161322		:REC INTR SVC ROUTINE		
4038	020520	100401			RXSVC: TSTB	DZCSR	:REC DONE ?
4039	020522	104004			BMI	.+4	:YES
4040	020524	032777	020000	161310	ERROR	4	:FALSE INTERRUPT
4041	020532	001401			BIT	#SILOAL,DZCSR	:SILO ALARM?
4042	020534	104000			BEQ	.+4	:NO
4043	020536	017704	161304		ERROR		:SILO ALARM SHOULD NOT =1
4044	020542	100401			MOV	DZRBUF,R4	:SAVE IT
4045	020544	104000			BMI	.+4	:YES
4046	020546	032704	070000		ERROR		:YOU LOSE ...DATA VALID WAS'NT SET
4047	020552	001401			BIT	#OVRUN!FRMERR!PARER,R4	
4048	020554	104000			BEQ	.+4	
4049	020556	010403			ERROR		:RECEIVER ERROR FLAG/S WERE SET
4050	020560	000303			MOV	R4,R3	
4051	020562	042703	177770		SWAB	R3	
4052	020566	010337	001372		BIC	#1C<7>,R3	:STRIP JUNK
4053	020572	012702	000001		MOV	R3,SAVLIN	:SAVE LINE NUMBER
4054	020576	105303		5\$:	MOV	#1,R2	:SET UP POSITION POINTER
4055	020600	100402			DECB	R3	
4056	020602	006302			BMI	6\$	
4057	020604	000774			ASL	R2	:RE POSITION POINTER
4058	020606	030237	001364	6\$:	BR	5\$	:GO 'ROUND AGAIN
4059	020612	001001			BIT	R2,LINE	:LINE VALID ?
4060	020614	104011			BNE	.+4	:YES
4061	020616	013703	001372		ERROR	11	:INVALID LINE #
4062	020622	006303			MOV	SAVLIN,R3	:GET THE LINE NUMBER AGAIN
4063	020624	126304	001442		ASL	R3	:USE R3 AS A POINTER IN THE DATA TABLE
4064	020630	001405			CMPB	TRO(R3),R4	:DOES THE DATA CHARACTER COMPARE ?
4065	020632	016305	001442		BEQ	2\$	:YES
4066	020636	042704	177400		MOV	TRO(R3),R5	:SAVE EXPECTED
4067					BIC	#1C<377>,R4	:CLEAR JUNK
4068							:R2 = LINE # BY BIT POSITION
4069							:R4 = ACTUAL DATA
4070	020642	104005					:R5 = EXPECTED DATA
4071	020644	005263	001442	2\$:	ERROR	5	:NO, DATA DOES NOT COMPARE
					INC	TRO(R3)	:SET UP FOR NEXT CHARACTER

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4072	020650	105763	001442		TSTB	TR0(R3) ; ALL CHARS DONE?
4073	020654	001002			BNE	+6
4074	020656	040237	020770		BIC	R2,RXTCR ; ZERO LINE DONE INDICATOR.
4075	020662	012716	020342		MOV	#SNAP,(SP) ; RESET THE BACKGROUND TIMING LOOP
4076	020666	000002			RTI	
4077						
4078						
4079						
4080	020670	106427	000340	OUT:	FINISH UP ROUTINE	
4081	020674	104413			MTPS #PR7	STOP ALL INTERRUPTS
4082	020676	005003			DEVICE.CLR	CLEAR ALL INTERRUPTS AWAY
4083	020700	005037	001372		CLR R3	
4084	020704	012702	000001		CLR SAVLIN	
4085	020710	030237	001364	15:	MOV #1,R2	
4086	020714	001405			BIT R2,LINE	VALID LINE ?
4087	020716	022763	000400 001442		BEQ 25	NO
4088	020724	001401			CMP #400,TR0(R3)	RECEIVED A BINARY COUNT PATTERN ?
4089	020726	104000			BEQ +4	YES
4090					ERROR 0	THE LINE FAILED TO RECEIVE A FULL
4091	020730	005237	001372	25:	INC SAVLIN	BINARY COUNT PATTERN
4092	020734	005723			TST (R3)+	SET UP FOR NEXT LINE
4093	020736	106302			ASLB R2	ADD 2
4094	020740	103363			BCC 15	SET UP NEXT LINE POINTER
4095	020742			FINI:		FINISHED ?
4096	020742	013777	002074 161122		MOV DZRI5,DZRIV	RESTORE TRAPCATCHER
4097	020750	005077	161120		CLR DZRI5	
4098	020754	013777	002100 161114		MOV DZTI5,DZTIV	
4099	020762	005077	161112		CLR DZTI5	
4100	020766	104400			ADVANCE	GO TO THE NEXT TEST
4101	020770	000000		RXTCR:	0	RX IMAGE OF TCR BITS

***** TEST 32 *****

*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.
 * 19.2 K 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.

::* TEST 32

 TST32: SCOPE
 MOV #32,\$TSTNM ; LOAD THE NUMBER OF THIS TEST
 MOV #2,\$TIMES
 MOV #TST33,NEXT ; POINT TO THE START OF THE NEXT TEST
 MOV #3,\$LOCK ; SET FOR LOOP
 CLR OFFSET ; RESET THIS VARIABLE

4122	020772	000004		
4123	020774	012737	000032	001122
4124	021002	012737	000002	001226
4125	021010	012737	021466	001360
4126	021016	012737	021142	001362
4127	021024	005037	023112	

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4129	021030	005037	001372		CLR	SAVLIN	:RESET LINE NUMBER INDICATOR
4129	021034	005037	001374		CLR	XMTLIN	:USE THIS WORD TO TELL WHAT LINE TRANSMITTED
4130	021040	012737	000001	001216	MOV	#1,STMP0	:USE STMP0 AS A BIT POINTER
4131	021046	012737	010070	021464	MOV	#RCVON!550!EIGHT	:TWO STOP,7S :BUILD TEMPORARY PARAMETERS
4132	021054	033737	001216	001364	1S: BIT	STMP0,LINE	:IS THIS LINE ACTIVE?
4133	021062	001027			BNE	3S	:IF SO, GO GET STARTED
4134	021064	012737	010070	021464	2S: MOV	#RCVON!550!EIGHT	:TWO STOP,7S :LOAD PARAMETERS TEMPORARILY
4135	021072	012700	001422		MOV	#TDO,RO	:POINT TO THE DATA AREA
4136	021076	005020			CLR	(RO)+	:CLEAR A DATA WORD
4137	021100	022700	001462		CMP	#STOP,RO	:FINISHED ?
4138	021104	001374			BNE	-6	:NO
4139	021106	005237	001374		INC	XMTLIN	:POINT TO THE NEXT LINE TO TRANSMIT
4140	021112	042737	000007	021464	BIC	#7,7S	:MAKE SURE TEMPORARY PARAMETERS POINT TO 0
4141	021120	053737	001374	021464	BIS	XMTLIN,7S	:ADD DESIRED LINE NUMBER
4142	021126	005037	023112		CLR	OFFSET	
4143	021132	106337	001216		ASLB	STMP0	:POINT TO THE NEXT LINE
4144	021136	103346			BCC	1S	:PROCESS THE NEXT LINE
4145	021140	104400			ADVANCE		:TEST TO SEE IF THIS TEST GETS REPEATED
4146	021142				3S:		
4147	021142	104417			DCLASH		:CLEAR DEVICE AND SET MAINT BIT IF I MODE
4148	021144	042737	010000	021464	BIC	#RCVON,7S	:ZERO PARAMTERS FOR TX LINE
4149	021152	013777	021464	160672	MOV	7S,JDZLPR	:LOAD PARAMTERS FOR TX
4150	021160	005737	001370		TST	MODE	:STAGGERED?
4151	021164	100011			BPL	100S	:BR IF NO
4152	021166	000241			CLC		:SET UP LINE
4153	021170	006037	021464		ROR	7S	
4154	021174	103002			BCC	98S	:BR IF LINE WAS EVEN
4155	021176	000241			CLC		:PREPARE TO MKE LINE EVEN
4156	021200	000401			BR	99S	:CONTINUE
4157	021202	000261			SEC		:PREPARE TO MAKE LINE ODD
4158	021204	006137	021464		98S: ROL	7S	:SET ALTERED LINE
4159	021210	052737	010000	021464	99S: BIS	#RCVON,7S	:SET RX ON
4160	021216	013777	021464	160626	100S: MOV	7S,JDZLPR	:LOAD RX PARAMETERS
4161	021224	042737	000007	021464	BIC	#7,7S	:CLEAR OLD LINE #
4162	021232	053737	001374	021464	BIS	XMTLIN,7S	:SET LINE UP AGAIN
4163	021240	013737	021464	001400	MOV	7S,REGIST	:SAVE PARAMETERS FOR PRINTOUT
4164	021246	012700	001422		MOV	#TDO,RO	:POINT TO THE DATA AREA
4165	021252	005020			CLR	(RO)+	:CLEAR A DATA WORD
4166	021254	022700	001462		CMP	#STOP,RO	:FINISHED ?
4167	021260	001374			BNE	-6	:NO
4168	021262	005002			CLR	R2	:USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
4169	021264	005003			CLR	R3	:USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
4170	021266	005037	001220		CLR	STMP1	:INITIALIZE THE TIMER
4171	021272	005037	001224		CLR	STMP3	:INITIALIZE THESE BITS ALSO
4172	021276	012737	000020	001376	MOV	#20,XMTCNT	:SET HOW MANY CHARACTERS TO TRANSMIT
4173	021304	012777	022552	160564	MOV	#XMTSRV,JDZTIV	
4174	021312	012777	022676	160552	MOV	#RXISR1,JDZRIV	
4175	021320	013777	026170	160546	MOV	DZPRT,JDZRIS	
4176	021326	013777	026170	160544	MOV	DZPRT,JDZTIS	
4177	021334	113777	001216	160514	MOV	STMP0,JDZTCR	:START THE VALID LINE
4178	021342	052777	040140	160472	BIS	#TIE!RIE!MSENAB,JDZCSR	
4179	021350	106427	000000		MTPS	#0	:LOWER THE PRIORITY TO ALLOW INTERRUPTS
4180	021354	032777	000100	160460	4S: BIT	#RIE,JDZCSR	:IS ROUTINE DONE?
4181	021362	001407			BEQ	5S	:WHEN ALL IS DONE RX IE IS CLEARED IN ISR.
4182	021364	005237	001220		INC	STMP1	:COUNT TIME
4183	021370	001371			BNE	4S	:CONTINUE TEST

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4184 021372 105237 001224      INCB      $TMP3      ;DOUBLE COUNT
4185 021376 001366              BNE        4$      ;CONTINUE TEST
4186 021400 104011              ERROR      11      ;INTERRUPTS NOT FINISHED
4187 021402 004737 007212      5$:      JSR        PC,SERV.G  ;(<1G)?
4188 021406 104401              SCOP1      ;LOOP?
4189 021410 062737 000002 023112      ADD        #2,OFFSET
4190 021416 013700 021464      MOV        7$,R0
4191 021422 042700 170377      BIC        #1<17*400>,R0
4192 021426 022700 007400      CMP        #<17*400>,R0
4193 021432 001010              BNE        6$
4194 021434 032737 000030 021464      BIT        #BIT4+BIT3,7$
4195 021442 001610              BEQ        2$
4196 021444 162737 000010 021464      SUB        #BIT3,7$
4197 021452 000633              BR         3$
4198 021454 062737 000400 021464 6$:      ADD        #400,7$
4199 021462 000627              BR         3$
4200 021464 000000              7$:      0
4201                                     ;***** TEST 33 *****
4202                                     ;* THIS TEST VERIFIES THAT EVEN PARITY WORKS
4203                                     ;* FOR ALL ODD LINES SELECTED AND THAT ODD PARITY WORKS FOR ALL
4204                                     ;* EVEN LINES SELECTED.
4205                                     ;*THE MAIN FUNCTION OF THIS TEST IS TO VERIFY
4206                                     ;*THAT "PE" (PARITY ERROR) CAN BE FLAGGED BY
4207                                     ;*THE UARTS. THIS TEST WILL NOT BE DONE UNLESS
4208                                     ;*YOU ARE IN "STAGGERED" MODE.
4209                                     ;*40(8) CHARS ARE USED FOR THIS TEST.
4210                                     ;*ALL SELECTED LINES WILL BE ENABLED
4211                                     ;*AT THE SAME TIME!
4212                                     ;: TEST 33
4213                                     ;:*****
4214 021466 000004      TST33:      SCOPE
4215 021470 012737 000033 001122      MOV        #33,$STNM
4216 021476 012737 022120 001360      MOV        #TST34,NEXT
4217 021504 005737 001370              TST        MODE
4218 021510 100111              BPL        6$
4219 021512 104417              DCLASM
4220 021514 013701 001366      MOV        PAR,R1
4221 021520 042701 000200      BIC        #ODDPAR,R1
4222 021524 052701 000100      BIS        #PARITY,R1
4223 021530 012702 000001      MOV        #1,R2
4224 021534 030237 001364      1$:      BIT        R2,LINE
4225 021540 001411              BEQ        3$
4226 021542 032701 000001      BIT        #BIT0,R1
4227 021546 001002              BNE        2$
4228 021550 052701 000200      BIS        #ODDPAR,R1
4229 021554 010177 160272      2$:      MOV        R1,$DZLPR
4230 021563 042701 000200      BIC        #ODDPAR,R1
4231 021564 005201      3$:      INC        R1
4232 021566 106302      ASLB      R2
4233 021570 103361              BCC        1$
4234 021572 005037 001372      CLR        SAVLIN
4235 021576 005002              CLR        R2
4236 021600 005003              CLR        R3
4237 021602 012737 000040 001376      MOV        #40,XMTCNT
4238 021610 012700 001422      MOV        #T00,R0
4239 021614 005020      CLR        (R0)+
;LOAD THE NUMBER OF THIS TEST
;POINT TO THE START OF THE NEXT TEST
;IS THIS STAGGERED MODE?
;IF NOT, DON'T DO THIS TEST
;CLEAR DEVICE AND SET MAINT BIT IF I MODE
;USE R1 TO BUILD PARAMETERS TO BE LOADED
;MAKE SURE ODD PARITY ISN'T SET
;MAKE SURE PARITY IS TURNED ON
;USE R2 AS A LINE POINTER
;IS THIS A VALID LINE?
;IF NOT, SKIP TO THE NEXT LINE
;IS THIS LINE AN ODD LINE?
;IF IT'S ODD, USE EVEN PARITY
;IF IT'S EVEN, USE ODD PARITY
;LOAD THE LINE PARAMETER REGISTER
;SET UP THE NEXT PARITY TO EVEN
;POINT TO THE NEXT LINE
;MOVE THE BIT POINTER IN R2 TO THE NEXT LINE
;IF WE'RE NOT DONE, GO CHECK THE NEXT LINE
;CLEAR THE LINE NUMBER INDICATOR
;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
;TRANSMIT A BINARY COUNT PATTERN(00-40)
;POINT TO THE DATA AREA
;CLEAR A DATA WORD

```


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4240	021616	022700	001462		CMP	#STOP,R0	;FINISHED ?
4241	021622	001374			BNE	.-6	;NO
4242	021624	005000			CLR	R0	;CLEAR OFFSET
4243	021626	012777	022552	160242	MOV	#XMTSRV,ADZTIV	;SET UP THE TRANSMITTER INTERRUPT VECTOR
4244	021634	012777	021742	160230	MOV	#9\$,ADZRIV	;SET UP THE RECEIVER INTERRUPT VECTOR
4245	021642	013777	026170	160224	MOV	DZPRT,ADZRRIS	;SET THE INTERRUPT VECTOR STATUS
4246	021650	013777	026170	160222	MOV	DZPRT,ADZTIS	;SET TRANSMITTER INTERRUPT PRIORITY
4247	021656	052777	040140	160156	BIS	#RIE,ADZCSR	;ENABLE THE DEVICE
4248	021664	113777	001364	160164	MOV	LINE,ADZTCR	;ENABLE ALL SELECTED LINES
4249	021672	106427	000000		MTPS	#0	;ALLOW INTERRUPTS
4250	021676	005037	021736		CLR	7\$	
4251	021702	005037	021740		CLR	8\$	
4252	021706	032777	000100	160126	BIT	#RIE,ADZCSR	;WHEN RX DONE: RIE WILL =0
4253	021714	001407			BEQ	6\$	;BR IF ALL DONE
4254	021716	005237	021736		INC	7\$	
4255	021722	001371			BNE	5\$	
4256	021724	105237	021740		INCB	8\$	
4257	021730	100366			BPL	5\$	
4258	021732	104011			ERROR	11	;*RX FAILED TO FINISH (INTERRUPT)
4259	021734	104400			ADVANCE		;ADVANCE LOOP
4260	021736	000000					
4261	021740	000000					
4262							
4263							
4264							
4265							
4266	021742	017704	160100		MOV	ADZRBUFF,R4	;GET THE CHARACTER
4267	021746	100401			BMI	10\$	;IF IT WAS VALID, CONTINUE TESTING
4268	021750	104000			ERROR		;ERROR- ILLEGAL CHAR... DATA VALID NOT SET
4269	021752	010401			MOV	R4,R1	;COPY THE RECEIVED INFORMATION
4270	021754	000301			SWAB	R1	;GET THE LINE NUMBER IN THE LOWER BYTE
4271	021756	042701	177770		BIC	#1C<7>,R1	;ISOLATE THE LINE NUMBER
4272	021762	006301			ASL	R1	;ALIGN IT ON A WORD BOUNDARY
4273	021764	032704	010000		BIT	#PARER,R4	;PARITY ERROR SHOULD BE SET. IS IT?
4274	021770	001013			BNE	11\$	;IF SO, GO CHECK CHARACTER
4275	021772	013737	002046	001400	MOV	DZRBUFF,REGIST	;SET UP FOR THE ERROR MESSAGE
4276	022000	010405			MOV	R4,R5	
4277	022002	042705	000377		BIC	#377,R5	
4278	022006	156105	001442		BISB	TRO(R1),R5	;GET THE CORRECT CHARACTER
4279	022012	052705	110000		BIS	#DVALID!PARER,R5	;BUILD WHAT WAS EXPECTED
4280	022016	104006			ERROR	6	;ERROR- DID NOT GET CORRECT INFORMATION
4281	022020	126104	001442		CMPB	TRO(R1),R4	;CHECK THE CHARACTER. IS IT CORRECT?
4282	022024	001413			BEQ	12\$	;IF SO, GO SET UP NEXT CHARACTER
4283	022026	116105	001442		MOV	TRO(R1),R5	;LOAD THE CHARACTER FOR ERROR REPORTING
4284	022032	042705	177400		BIC	#1C<377>,R5	;CLEAR SIGN EXTEND
4285	022036	010137	001372		MOV	R1,SAVLIN	;GET THE LINE NUMBER FOR REPORTING
4286	022042	006237	001372		ASR	SAVLIN	;ALIGN IT CORRECTLY
4287	022046	042704	177400		BIC	#1C<377>,R4	;REMOVE THE JUNK FROM R4, THE ACTUAL CHARACTER
4288	022052	104005			ERROR	5	;DATA ERROR
4289	022054	005261	001442		INC	TRO(R1)	;SET UP THE NEXT CHARACTER
4290	022060	005203			INC	R3	;ADD TO THE TOTAL RECEIVED COUNT
4291	022062	032777	040000	157752	BIT	#TIE,ADZCSR	;ARE TRANSMISSIONS DONE?
4292	022070	001010			BNE	13\$	;IF NO, GO RECEIVE SOME MORE
4293	022072	020203			CMP	R2,R3	;ARE ALL CHARACTERS RECEIVED?
4294	022074	001006			BNE	13\$	;IF NO, GO RECEIVE SOME MORE
4295	022076	042777	000100	157736	BIC	#RIE,ADZCSR	;DISABLE RECEIVER INTERRUPTS

;RECEIVER SERVICE ROUTINE

K07

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4296 022104 012716 021734      MOV    #6$, (SP)      ;CRUNCH THE STACK
4297 022110 000002              RTI          ;RETURN AND FINISH
4298 022112 012716 021676      13$: MOV    #4$, (SP)      ;CRUNCH THE STACK
4299 022116 000002              RTI          ;GO BACK TO RECEIVER WAIT LOOP
4300                                     ;***** TEST 34 *****
4301                                     ;*THIS TEST VERIFIES THAT ODD PARITY WORKS FOR ALL ODD LINES
4302                                     ;* SELECTED AND THAT EVEN PARITY WORKS FOR ALL EVEN LINES SELECTED
4303                                     ;*THE MAIN FUNCTION OF THIS TEST IS TO VERIFY
4304                                     ;*THAT "PE" (PARITY ERROR) CAN BE FLAGGED BY
4305                                     ;*THE UARTS. THIS TEST WILL NOT BE DONE UNLESS
4306                                     ;*YOU ARE IN "STAGGERED" MODE.
4307                                     ;*40(8) CHARS ARE USED FOR THIS TEST.
4308                                     ;*ALL SELECTED LINES WILL BE ENABLED
4309                                     ;*AT THE SAME TIME!
4310                                     ;::* TEST 34
4311                                     ;:*****
4312 022120 000004      TST34: SCOPE
4313 022122 012737 000034 001122  MOV    #34, $TSTNM      ;LOAD THE NUMBER OF THIS TEST
4314 022130 012737 004432 001360  MOV    #SEOP, NEXT      ;POINT TO THE END-OF-PASS HANDLER
4315 022136 005737 001370          TST     MODE              ;IS THIS STAGGERED MODE?
4316 022142 100111          BPL     6$                      ;IF NOT, DON'T DO THIS TEST
4317 022144 104417          DCLASM ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
4318 022146 013701 001366          MOV    PAR, R1            ;USE R1 TO BUILD PARAMETERS TO BE LOADED
4319 022152 042701 000200          BIC    #ODDPAR, R1        ;MAKE SURE ODD PARITY ISN'T SET
4320 022156 052701 000100          BIS    #PARITY, R1       ;MAKE SURE PARITY IS TURNED ON
4321 022162 012702 000001          MOV    #1, R2            ;USE R2 AS A LINE POINTER
4322 022166 030237 001364      1$: BIT     R2, LINE          ;IS THIS A VALID LINE?
4323 022172 001411          BEQ     3$                      ;IF NOT, SKIP TO THE NEXT LINE
4324 022174 032701 000001          BIT     #BIT0, R1         ;IS THIS LINE AN ODD LINE?
4325 022200 001402          BEQ     2$                      ;IF IT'S EVEN, USE EVEN PARITY
4326 022202 052701 000200          BIS    #ODDPAR, R1       ;IF IT'S ODD, USE ODD PARITY
4327 022206 010177 157640      2$: MOV    R1, JDZLPR        ;LOAD THE LINE PARAMETER REGISTER
4328 022212 042701 000200          BIC    #ODDPAR, R1       ;SET UP THE NEXT PARITY TO EVEN
4329 022216 005201          3$: INC     R1                  ;POINT TO THE NEXT LINE
4330 022220 106302          ASLB    R2                      ;MOVE THE BIT POINTER IN R2 TO THE NEXT LINE
4331 022222 103361          BCC     1$                      ;IF WE'RE NOT DONE, GO CHECK THE NEXT LINE
4332 022224 005037 001372          CLR    SAVLIN            ;CLEAR THE LINE NUMBER INDICATOR
4333 022230 005002          CLR     R2                      ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
4334 022232 005003          CLR     R3                      ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
4335 022234 012737 000040 001376  MOV    #40, XMTCNT        ;TRANSMIT A BINARY COUNT PATTERN(00-40)
4336 022242 012700 001422          MOV    #TDO, RO          ;POINT TO THE DATA AREA
4337 022246 005020          CLR     (RO)+                  ;CLEAR A DATA WORD
4338 022250 022700 001462          CMP    #STOP, RO         ;FINISHED ?
4339 022254 001374          BNE     -6                      ;NO
4340 022256 005000          CLR     RO                      ;CLEAR OFFSET
4341 022260 012777 022552 157610  MOV    #XMTSRV, JDZTIV    ;SET UP THE TRANSMITTER INTERRUPT VECTOR
4342 022266 012777 022374 157576  MOV    #9$, JDZRIV      ;SET UP THE RECEIVER INTERRUPT VECTOR
4343 022274 013777 026170 157572  MOV    DZPRT, JDZRIIS ;SET THE INTERRUPT VECTOR STATUS
4344 022302 013777 026170 157570  MOV    DZPRT, JDZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
4345 022310 052777 040140 157524  BIS    #RIE!TIE!MSENAB, JDZCSR ;ENABLE THE DEVICE
4346 022316 113777 001364 157532  MOV    LINE, JDZTCR    ;ENABLE ALL SELECTED LINES
4347 022324 106427 000000          MTPS   #0              ;ALLOW INTERRUPTS
4348 022330 005037 022370      4$: CLR     7$
4349 022334 005037 022372          CLR     8$
4350 022340 032777 000100 157474 5$: BIT     #RIE, JDZCSR    ;WHEN RX DONE; RIE WILL =0
4351 022346 001407          BEQ     6$                      ;BR IF ALL DONE

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4352	022350	005237	022370		INC	7\$	
4353	022354	001371			BNE	5\$	
4354	022356	105237	022372		INCB	8\$	
4355	022362	100366			BPL	5\$	
4356	022364	104011			ERROR	11	
4357	022366	104400		6\$:	ADVANCE		;*RX FAILED TO FINISH (INTERRUPT)
4358	022370	000000		7\$:	0		;ADVANCE LOOP
4359	022372	000000		8\$:	0		
4360							
4361							
4362							
4363							
4364	022374	017704	157446	9\$:	MOV	ADZBUF,R4	;GET THE CHARACTER
4365	022400	100401			BMI	10\$	;IF IT WAS VALID, CONTINUE TESTING
4366	022402	104000			ERROR		;ERROR- ILLEGAL CHAR... DATA VALID NOT SET
4367	022404	010401		10\$:	MOV	R4,R1	;COPY THE RECEIVED INFORMATION
4368	022406	000301			SWAB	R1	;GET THE LINE NUMBER IN THE LOWER BYTE
4369	022410	042701	177770		BIC	#1C<7>,R1	;ISOLATE THE LINE NUMBER
4370	022414	006301			ASL	R1	;ALIGN IT ON A WORD BOUNDARY
4371	022416	032704	010000		BIT	#PARER,R4	;PARITY ERROR SHOULD BE SET. IS IT?
4372	022422	001013			BNE	11\$	;IF SO, GO CHECK CHARACTER
4373	022424	013737	002046 001400		MOV	DZBUF,REGIST	;SET UP FOR THE ERROR MESSAGE
4374	022432	010405			MOV	R4,R5	
4375	022434	042705	000377		BIC	#377,R5	
4376	022440	156105	001442		BISB	TR0(R1),R5	;GET THE CORRECT CHARACTER
4377	022444	052705	110000		BIS	#DVALID,PARER,R5	;BUILD WHAT WAS EXPECTED
4378	022450	104006			ERROR	6	;ERROR- DID NOT GET CORRECT INFORMATION
4379	022452	126104	001442	11\$:	CMPB	TR0(R1),R4	;CHECK THE CHARACTER. IS IT CORRECT?
4380	022456	001413			BEG	12\$	;IF SO, GO SET UP NEXT CHARACTER
4381	022460	116105	001442		MOVB	TR0(R1),R5	;LOAD THE CHARACTER FOR ERROR REPORTING
4382	022464	042705	177400		BIC	#1C<377>,R5	;CLEAR SIGN EXTEND
4383	022470	010137	001372		MOV	R1,SAVLIN	;GET THE LINE NUMBER FOR REPORTING
4384	022474	006237	001372		ASR	SAVLIN	;ALIGN IT CORRECTLY
4385	022500	042704	177400		BIC	#1C<377>,R4	;REMOVE THE JUNK FROM R4, THE ACTUAL CHARACTER
4386	022504	104005			ERROR	5	;DATA ERROR
4387	022506	005261	001442	12\$:	INC	TR0(R1)	;SET UP THE NEXT CHARACTER
4388	022512	005203			INC	R3	;ADD TO THE TOTAL RECEIVED COUNT
4389	022514	032777	040000 157320		BIT	#TIE,ADZCSR	;ARE TRANSMISSIONS DONE?
4390	022522	001010			BNE	13\$	;IF NO, GO RECEIVE SOME MORE
4391	022524	020203			CMP	R2,R3	;ARE ALL CHARACTERS RECEIVED?
4392	022526	001006			BNE	13\$	;IF NO, GO RECEIVE SOME MORE
4393	022530	042777	000100 157304		BIC	#RIE,ADZCSR	;DISABLE RECEIVER INTERRUPTS
4394	022536	012716	022366		MOV	#6\$, (SP)	;CRUNCH THE STACK
4395	022542	000002			RTI		;RETURN AND FINISH
4396	022544	012716	022330	13\$:	MOV	#4\$, (SP)	;CRUNCH THE STACK
4397	022550	000002			RTI		;GO BACK TO RECEIVER WAIT LOOP

;RECEIVER SERVICE ROUTINE

```

4398
4399
4400
4401
4402 022552 117701 157266 XMTSRV: MOVB 0HDZCSR,R1 ;GET THE LINE NUMBER. IS THE TRANSMITTER
4403 022556 100401 BMI 1$ ;REALLY READY? IF SO, GO LOAD THE CHARACTER
4404 022560 104003 ERROR 3 ;*TRANSMITTER NOT READY- FALSE INTERRUPT
4405 022562 042701 177770 1$: BIC #1C<7>,R1 ;ISOLATE THE LINE NUMBER
4406 022566 006301 ASL R1 ;MAKE SURE IT REFERENCES A WORD BOUNDARY
4407 022570 116177 001422 157270 MOVB TDO(R1),0DZTDR ;LOAD THE CURRENT CHARACTER FOR THIS LINE
4408 022576 005261 001422 INC TDO(R1) ;SET UP NEXT CHARACTER FOR THIS LINE
4409 022602 005202 INC R2 ;UP THE NUMBER OF TRANSMISSIONS
4410 022604 023761 001376 001422 CMP XMTCNT,TDO(R1) ;HAVE WE DONE ALL PATTERNS ON THIS LINE?
4411 022612 001015 BNE 4$ ;IF NOT, KEEP ON TRANSMITTING
4412 022614 012700 000001 MOV #1,R0 ;SET UP A DESELECTION POINTER
4413 022620 006201 ASR R1 ;GET THE LINE NUMBER AGAIN
4414 022622 005301 2$: DEC R1 ;REDUCE THE COUNT. WAS THIS THE LINE?
4415 022624 100402 BMI 3$ ;IF SO, GO DISABLE THE ENABLE BIT FOR IT
4416 022626 006300 ASL R0 ;MOVE THE POINTER TO THE NEXT LINE
4417 022630 000774 BR 2$ ;GO CHECK THE NEXT LINE
4418 022632 140077 157220 3$: BICB R0,0DZTCR ;DISABLE THE LINE POINTED TO BY R0
4419 022636 001003 BNE 4$ ;IF MORE LINES ARE ACTIVE, GO CONTINUE TRANSMIT
4420 022640 042777 040000 157174 BIC #TIE,0DZCSR ;IF NOT, DISABLE TRANSMITTER INTERRUPTS
4421 022646 000002 4$: RTI ;RETURN TO THE TIMING LOOP
4422
4423 ; RELATIVE TIME BUILDING ROUTINE
4424 ; -----
4425
4426 022650 012737 000004 001222 BUILD: MOV #4,STMP2 ;ROTATE 4 BITS BACK INTO STMP1
4427 022656 006037 001224 1$: ROR STMP3 ;GET THE BITS FROM STMP3, THE HIGH BYTE
4428 022662 006037 001220 ROR STMP1 ;OF THE RELATIVE TIME COUNTER. PUT THEM BACK
4429 022666 005337 001222 DEC STMP2 ;INTO STMP1 USING THE CARRY BIT WITH
4430 ;ROTATE INSTRUCTIONS
4431 022672 001371 BNE 1$ ;REDUCE COUNT. ALL BITS BACK? IF NOT, GET MORE
4432 022674 000207 RTS PC ;RETURN TO CALLING TEST
4433

```


;RECEIVER SERVICE ROUTINE

Address	Hex	Dec	Label	Instruction	Comment
4434					;RECEIVER SERVICE ROUTINE
4435					
4436	022676	105777	157140	RXISR1: TSTB	3DZCSR
4437	022702	100401		BMI	1\$
4438	022704	104004		ERROR	4
4439	022706	017704	157134	1\$: MOV	3DZRBUF,R4
4440	022712	100401		BMI	2\$
4441	022714	104000		ERROR	
4442	022716	032704	070000	2\$: BIT	#OVRRUN!FMERR:PARER,R4 ;ARE ANY ERROR FLAGS SET?
4443	022722	001404		BEQ	3\$
4444	022724	013737	002046 001400	MOV	DZRBUF,REGIST
4445	022732	104002		ERROR	2
4446	022734	010401		3\$: MOV	R4,R1
4447	022736	000301		SWAB	R1
4448	022740	042701	177770	BIC	#1C<7>,R1
4449	022744	006301		ASL	R1
4450	022746	120461	001442	CMPB	R4,TRO(R1)
4451	022752	001413		BEQ	4\$
4452	022754	116105	001442	MOVB	TRO(R1),R5
4453	022760	042705	177400	BIC	#1C<377>,R5
4454	022764	042704	177400	BIC	#1C<377>,R4
4455	022770	010137	001372	MOV	R1,SAVLIN
4456	022774	006237	001372	ASR	SAVLIN
4457	023000	104005		ERROR	5
4458	023002	005261	001442	4\$: INC	TRO(R1)
4459	023006	005203		INC	R3
4460	023010	032761	000020 001442	BIT	#20,TRO(R1)
4461	023016	001402		BEQ	5\$
4462	023020	020203		CMP	R2,R3
4463	023022	001401		BEQ	6\$
4464	023024	000002		5\$: RTI	
4465	023026	004737	022650	6\$: JSR	PC,BUILD
4466					
4467	023032	013700	023112	MOV	OFFSET,R0
4468	023036	013760	001220 002102	MOV	\$TMP1,TMTBL(R0)
4469	023044	005737	023112	TST	OFFSET
4470	023050	001414		BEQ	7\$
4471	023052	005740		TST	-(R0)
4472	023054	026037	002102 001220	CMP	TMTBL(R0),\$TMP1
4473	023062	101007		BHI	7\$
4474	023064	016005	002102	MOV	TMTBL(R0),R5
4475	023070	010137	001372	MOV	R1,SAVLIN
4476	023074	006237	001372	ASR	SAVLIN
4477	023100	104021		ERROR	21
4478	023102	042777	000140 156732	7\$: BIC	#RIE!MSENAB,3DZCSR ;DISABLE THE DEVICE
4479	023110	000002		RTI	
4480	023112	000000		OFFSET: 0	;RETURN TO THE PROGRAM

:DZ11 ECHO/CABLE TEST
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```

: *STARTING PROCEDURE
: *LOAD PROGRAM
: *LOAD ADDRESS 000210
: *PRESS START
: *PROGRAM WILL TYPE DZ11 ECHO/CABLE TEST
: *PROGRAM WILL TYPE WHICH TEST- ECHO OR CABLE
: *TYPE IN E OR C RESPECTIVELY
: *PROGRAM WILL TYPE "VECTOR ADDRESS-"
: *TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
: *FOR THE DZ11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
: *PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
: *TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
: *FOR THE DZ11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
: *PROGRAM WILL TYPE "LINE NUMBER-"
: *TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
: *FOLLOWED BY <CARRIAGE RETURN>
: *PROGRAM WILL TYPE "BAUD RATE-"
: *TYPE IN THE BAUD RATE OF THE DZ11 TERMINAL
: *,FOLLOWED BY <CARRIAGE RETURN>
: *THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL

```

```

: *
: *      50
: *      75
: *      110
: *      135      (ROUNDED OFF 134.5)
: *      150
: *      300
: *      600
: *      1200
: *      1800
: *      2000
: *      2400
: *      3600
: *      4800
: *      7200
: *      9600

```

: *ALL OTHERS ARE REJECTED

: *PROGRAM WILL TYPE "ECHO" OR "CABLE TEST" TO INDICATE THAT TESTING HAS STARTED

```

: PROGRAM INITIALIZATION
: LOCK OUT INTERRUPTS
: SET UP PROCESSOR STACK
: SET UP POWER FAIL VECTOR
: CLEAR PROGRAM FLAGS AND COUNTS

```

```

XSTART: MOV    #STACK, SP      : SET UP PROCESSOR STACK
        MTPS   #PR7           : LOCK OUT INTERRUPTS
        MOV    #XSTART, SLPADR : SET UP IN CASE OF POWER FAIL
        CLR    STFLG           : CLEAR TEST START FLAG
        CLR    SPASS           : CLEAR PASS COUNT
        CLR    SERTTL          : CLEAR ERROR COUNT
        CLRB   SERFLG          : CLEAR ERROR FLAG

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023114 012706 001120
023120 106427 000340
023124 012737 023114
023132 005037 025274
023136 005037 001242
023142 005037 001132
023146 105037 001123

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001126

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DZ02AB.P11

MACY11 27(732) 03-NOV-76
DZ11 DEVICE DIAGNOSTICS.

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4537	023152	005037	025300			CLR	LAST	:CLEAR LAST ERROR PC
4538	023156	032777	000001	155774	VEC1:	BIT	#SW00,JSWR	:IF SW00=1, GET NEW VECTOR
4539	023164	001465				BEG	OTHER	:AND CSR
4540	023166	012701	000300		VEC2:	MOV	#300,R1	
4541	023172	012702	000302			MOV	#302,R2	
4542	023176	010221			IS:	MOV	R2,(R1)+	:RESTORE TRAPCATCHER
4543	023200	005022				CLR	(R2)+	:IN FLOATING VECTOR AREA
4544	023202	022122				CMP	(R1)+,(R2)+	:UPDATE THE POINTERS
4545	023204	020127	001000			CMP	R1,#1000	
4546	023210	001372				BNE	IS	
4547	023212	104403				INSTR		:INPUT ADDRESS OF DEVICE VECTOR
4548	023214	025326				MVECTOR		:MESSAGE "VECTOR ADDRESS--"
4549	023216	104405				PARAM		:CONVERT STRING TO OCTAL
4550	023220	000300				300		:LOW LIMIT
4551	023222	000770				770		:HIGH LIMIT
4552	023224	002072				DZRV		:LOCATIONS TO BE FILLED
4553	023226	003			.BYTE	3		:LSB MASK
4554	023227	004			.BYTE	4		:NUMBER OF LOCATIONS
4555	023230	104403				INSTR		:INPUT ADDRESS OF DEVICE CSR
4556	023232	025350				MREGAD		:MESSAGE "CONTROL REGISTER ADDRESS--"
4557	023234	104405				PARAM		:CONVERT STRING TO OCTAL
4558	023236	160000				160000		:LOW LIMIT
4559	023240	163700				163700		:HIGH LIMIT
4560	023242	002042				DZCSR		:LOCATIONS TO BE FILLED
4561	023244	007			.BYTE	7		:LSB MASK
4562	023245	001			.BYTE	1		:NUMBER OF LOCATIONS
4563	023246	013737	002042	002046		MOV	DZCSR,DZRV	:BEGIN BUILDING DEVICE ADDRESSES
4564	023254	062737	000002	002046		ADD	#2,DZRV	:FORM THE READ BUFFER ADDRESS
4565	023262	013737	002046	002052		MOV	DZRV,DZLPR	:REMEMBER THAT THIS IS ALSO LINE PARAMETER REG.
4566	023270	013737	002046	002056		MOV	DZRV,DZTCR	:BEGIN BUILDING TRANSMITTER CONTROL REGISTER
4567	023276	062737	000002	002056		ADD	#2,DZTCR	:FORM THE TRANSMITTER CONTROL REGISTER POINTER
4568	023304	013737	002056	002060		MOV	DZTCR,HDZTCR	
4569	023312	005237	002060			INC	HDZTCR	
4570	023316	013737	002056	002066		MOV	DZTCR,DZTDR	:BEGIN FORMING TRANSMITTER DATA REGISTER
4571	023324	062737	000002	002066		ADD	#2,DZTDR	:FORM THE TRANSMITTER DATA REGISTER
4572	023332	013737	002066	002062		MOV	DZTDR,DZMSR	
4573	023340	032777	000002	155612	OTHER:	BIT	#SW01,JSWR	:RESELECT OF TEST?
4574	023346	001427				BEG	XBEGIN	:IF NOT, SKIP ASKING WHICH ONE
4575	023350	104403				INSTR		:INPUT WHICH TEST YOU ARE RUNNING
4576	023352	025534				MMHCH		:ECHO OR CABLE
4577	023354	104416				PAWCH		:SET FLAG
4578	023356	025272				WCHFLG		:THIS FLAG
4579	023360	104403			BAUD:	INSTR		:INPUT BAUD RATE
4580	023362	025456				MSPEED		:MESSAGE "BAUD RATE--"
4581	023364	104415				PARAM		:CONVERT DECIMAL STRING TO OCTAL
4582	023366	000062				50.		:LOW LIMIT
4583	023370	022600				9600.		:HIGH LIMIT
4584	023372	025310				LINESP		:LOCATION TO BE FILLED
4585	023374	000			.BYTE	0		:LSB MASK
4586	023375	001			.BYTE	1		:NUMBER OF LOCATIONS
4587	023376	104413			LINEX:	DEVICE.CLR		:CLEAR DEVICE
4588	023400	005037	025274			CLR	STFLG	:CLEAR PROGRAM START FLAG
4589	023404	104403				INSTR		:INPUT LINE NUMBER
4590	023406	025446				MLINE		:MESSAGE "LINE NUMBER--"
4591	023410	104405				PARAM		:CONVERT STRING TO OCTAL
4592	023412	000000				0		:LOW LIMIT

[illegible]

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4649 023704 013777 001366 156140      MOV      PAR,JDZLPR      ;LOAD THE LINE PARAMETER REGISTER
4650 023712 012777 023766 156152      MOV      #INTSVC,JDZRV      ;SET UP INTERRUPT SERVICE
4651 023720 013777 025320 156146      MOV      PRIO,JDZRV      ;AND LEVEL
4652 023726 106437 026172      MTPS     #LESS1      ;ALLOW INTERRUPTS
4653 023732 012777 000140 156102      MOV      #RIE!MSENAB,JDZCSR ;SET RECEIVER INTERRUPT ENABLE
4654 023740 104402 025474      TYPE     MCHAR      ;TYPE "ANY CHARACTER"
4655 023744 105777 155214      15:      TSTB     JDZTKS      ;IF SOMEBODY HITS A KEY- GET NEW LINE #
4656 023750 100375      BPL      15      ;LOOP HERE
4657 023752 005777 155210      TST      JDZTKB      ;CLEAR CHAR
4658 023756 004737 007212      JSR      PC,SERV.G      ;MAKE SURE IT WASN'T <1G>
4659 023762 000137 023376      JMP      LINEX      ;

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4660
4661
4662
4663 023766 105777 156050      INTSVC:  TSTB     JDZCSR      ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
4664 023772 100401      BMI      .+4      ;TEST REC. FLAG
4665 023774 104004      ERROR     4      ;ERROR - INTERRUPT NOT CAUSED BY FLAG
4666 023776 017737 156044 025322      MOV      JDZRBUFF,RECDAT
4667 024004 100401      BMI      .+4
4668 024006 104023      ERROR     23      ;NON- VALID CHARACTER
4669 024010 032737 020000 025322      BIT      #BIT13,RECDAT ;CHECK FOR FRAMING ERROR
4670 024016 001401      BEQ      .+4      ;BR IF NO ERROR
4671 024020 104025      ERROR     25      ;EITHER SOMEBODY HIT THE
4672      ;"BREAK KEY" OR YOU HAVE AN ERROR!
4673 024022 113737 025322 025324      MOV      RECDAT,TBUF ;MOVE CHARACTER TO OUTPUT AREA
4674 024030 113737 025322 010452      MOV      RECDAT,INBUF ;MOVE CHARACTER TO CHECK FOR 1C
4675 024036 042737 177600 010452      BIC      #1C<177>,INBUF ;STRIP JUNK PLUS PARITY
4676 024044 042737 174377 025322      BIC      #174377,RECDAT ;SAVE ONLY LINE NUMBER
4677 024052 000337 025322      SWAB     RECDAT
4678 024056 023737 001372 025322      CMP      SAVLIN,RECDAT ;DOES THE LINE # COMPARE?
4679 024064 001401      BEQ      .+4
4680 024066 104015      ERROR     15      ;#WRONG LINE NUMBER
4681 024070 013777 025316 155760      MOV      NUMTCR,JDZTCR ;ENABLE THE LINE TO TRANSMIT
4682 024076 012777 000040 155736      MOV      #MSENAB,JDZCSR ;START THE TRANSMITTERS SCANNER
4683 024104 123727 010452 000003      CMP      INBUF,#3      ;IS IT A 1C ?
4684 024112 001004      BNE      15      ;NO
4685 024114 104413      DEVICE.CLR
4686 024116 012716 024606      MOV      #XEOP,(SP) ;CRUNCH STACK
4687 024122 000002      RTI
4688 024124 013777 025316 155724 15:      MOV      NUMTCR,JDZTCR ;ENABLE THE LINE
4689 024132 113777 025324 155726      MOV      TBUF,JDZTDR ;TRANSMIT THE CHARACTER
4690 024140 012777 000140 155674      MOV      #RIE!MSENAB,JDZCSR ;RESTART THE RECEIVER
4691 024146 000002      RTI

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4692
4693
4694      ;THIS TEST TRANSMITS A BINARY COUNT PATTERN
4695      ;VIA INTERRUPT MODE TO THE RECEIVER
4696      ;...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
4697 024150 106427 000340      TEST2: MTPS     #PR7      ;DISABLE INTERRUPTS
4698 024154 012737 000002 001122      MOV      #2,STSTNM
4699 024162 012737 024606 001360      MOV      #XEOP,NEXT
4700 024170 104413      DEVICE.CLR
4701      ;#TEST TO VERIFY THAT SETTING DTR FOR A GIVEN LINE
4702      ;#WILL BRING UP "CO" AND "RING" FOR THE SAME LINE
4703      ;#THE DIST PNL MUST HAVE JUMPER FROM DTR TO RQST TO SEND
4704      ;#IN ORDER FOR THIS TEST TO WORK!

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4705	024172	012737	024200	001362		MOV	#15, LOCK	: LOOP
4706	024200	113777	025316	155652	1S:	MOV	NUMTCR, 3HDZTCR	: SET DTR
4707	024206	005005				CLR	R5	
4708	024210	153705	025316			BIS	NUMTCR, R5	: BUILD EXPECTED
4709	024214	000305				SWAB	R5	: PUT IN HIGH BYTE
4710	024216	153705	025316			BIS	NUMTCR, R5	
4711	024222	104414				DELAY		: WAIT FOR CABLE DELAY
4712	024224	017704	155632			MOV	3DZMSR, R4	: READY MODEM BITS
4713	024230	020504				CMP	R5, R4	: ARE THEY OK?
4714	024232	001401				BEG	25	: BR IF YES
4715	024234	104022				ERROR	22	: IS THE TEST CONNECTOR ON?
4716								: HAS RIGHT LINE BEEN SELECTED?
4717								: IF SO- YOU HAVE A PROBLEM!
4718								: MODEM BITS NOT RIGHT
4719	024236	104401			2S:	SCOP1		: LOOP
4720	024240	104413			3S:	DEVICE. CLR		: INIT DZ11
4721	024242	013737	025312	001366		MOV	SPEED, PAR	: SET LINE SPEED
4722	024250	053737	025314	001366		BIS	NUMLIN, PAR	: SELECT LINE # & REC. INTERRUPT ENABLE
4723	024256	052737	010000	001366		BIS	#RCVON, PAR	: ENABLE THE RECEIVER FOR THIS LINE
4724	024264	052777	040140	155550		BIS	#TIE!R!E!MSENAB	: 3DZCSR; SET TRANSMITTER INTERRUPT ENABLE
4725	024272	012777	024406	155572		MOV	#INTREC, 3DZRIV	: SET UP INTR SERVICE
4726	024300	013777	025320	155566		MOV	PRI0, 3DZRI5	: SET UP LEVEL
4727	024306	012777	024566	155562		MOV	#INTRAN, 3DZTIV	: SET UP INTR SERVICE
4728	024314	013777	025320	155556		MOV	PRI0, 3DZTIS	: SET UP LEVEL
4729	024322	005001				CLR	R1	: RX DATA POINTER- SET TO 0
4730	024324	005002				CLR	R2	: TX DATA POINTER- SET TO 0
4731	024326	013777	001366	155516		MOV	PAR, 3DZLPR	: SET THE PARAMETERS AND TURN ON RECEIVER
4732	024334	106437	026172			MTPS	3#LESS1	: ALLOW INTERRUPTS
4733	024340	013777	025316	155510		MOV	NUMTCR, 3DZTCR	: SET UP TCR BIT
4734								
4735								: YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
4736	024346	105777	154612		SPIN:	TSTB	3STKS	: IF SOMEBODY HITS A KEY- GET A NEW LINE #
4737	024352	100006				BPL	15	: BR IF NO KEY HIT
4738	024354	005777	154606			TST	3STKB	: CLEAR CHAR
4739	024360	004737	007212			JSR	PC, SERV.G	: MAKE SURE IT WASN'T <1G>
4740	024364	000137	023376			JMP	LINEX	: SW02=1
4741	024370	005237	025276		1S:	INC	LOCKUP	: INC TIMEOUT FLAG
4742	024374	001364				BNE	SPIN	: IF NOT 0 RETURN SPINNING
4743	024376	104011				ERROR	11	: *RECEIVER FAILED TO INTERRUPT CHECK CABLE/TERMINATOR
4744	024400	000004			QUITS:	SCOPE		
4745	024402	000137	024606			JMP	XEOP	: CALL FOR END OF PASS
4746	024406	005037	025276		INTREC:	CLR	LOCKUP	: CLEAR TIMEOUT FLAG
4747	024412	105777	155424			TSTB	3DZCSR	: TEST REC DONE
4748	024416	100401				BMI	.+4	: YES
4749	024420	104004				ERROR	4	: *FALSE INTERRUPT
4750	024422	017737	155420	025322		MOV	3DZRBUF, RECDAT	: SAVE WORD
4751	024430	100401				BMI	.+4	
4752	024432	104023				ERROR	23	: *NON VALID CHARACTER
4753	024434	032737	040000	025322		BIT	#BIT14, RECDAT	: DATA OVERRUN ?
4754	024442	001401				BEG	.+4	: NO
4755	024444	104024				ERROR	24	: *YES
4756	024446	032737	020000	025322		BIT	#BIT13, RECDAT	: FRAMING ERROR ?
4757	024454	001401				BEG	.+4	: NO
4758	024456	104025				ERROR	25	: *YES
4759	024460	032737	010000	025322		BIT	#BIT12, RECDAT	: PARITY ERROR ?
4760	024466	001401				BEG	.+4	: NO

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4705	024172	012737	024200	001362		MOV	#15, LOCK	: LOOP
4706	024200	113777	025316	155652	15:	MOVB	NUMTCR, 2NDZTCR	: SET DTR
4707	024206	005005				CLR	R5	
4708	024210	153705	025316			BISB	NUMTCR, R5	: BUILD EXPECTED
4709	024214	000305				SWAB	R5	: PUT IN HIGH BYTE
4710	024216	153705	025316			BISB	NUMTCR, R5	
4711	024222	104414				DELAY		: WAIT FOR CABLE DELAY
4712	024224	017704	155632			MOV	2DZMSR, R4	: READY MODEM BITS
4713	024230	020504				CMP	R5, R4	: ARE THEY OK?
4714	024232	001401				BEG	25	: BR IF YES
4715	024234	104022				ERROR	22	: IS THE TEST CONNECTOR ON?
4716								: HAS RIGHT LINE BEEN SELECTED?
4717								: IF SO- YOU HAVE A PROBLEM!
4718								: MODEM BITS NOT RIGHT
4719	024236	104401			25:	SCOP1		: LOOP
4720	024240	104413			35:	DEVICE.CLR		: INIT DZ11
4721	024242	013737	025312	001366		MOV	SPEED, PAR	: SET LINE SPEED
4722	024250	053737	025314	001366		BIS	NUMLIN, PAR	: SELECT LINE # & REC. INTERRUPT ENABLE
4723	024256	052737	010000	001366		BIS	#RCVON, PAR	: ENABLE THE RECEIVER FOR THIS LINE
4724	024264	052777	040140	155550		BIS	#TIE!R!E!MSENAB, 2DZCSR	: SET TRANSMITTER INTERRUPT ENABLE
4725	024272	012777	024406	155572		MOV	#INTREC, 2DZRIV	: SET UP INTR SERVICE
4726	024300	013777	025320	155566		MOV	PRI0, 2DZRI5	: SET UP LEVEL
4727	024306	012777	024566	155562		MOV	#INTRAN, 2DZTIV	: SET UP INTR SERVICE
4728	024314	013777	025320	155556		MOV	PRI0, 2DZTIS	: SET UP LEVEL
4729	024322	005001				CLR	R1	: RX DATA POINTER- SET TO 0
4730	024324	005002				CLR	R2	: TX DATA POINTER- SET TO 0
4731	024326	013777	001366	155516		MOV	PAR, 2DZLPR	: SET THE PARAMETERS AND TURN ON RECEIVER
4732	024334	106437	026172			MTPS	2#LESS1	: ALLOW INTERRUPTS
4733	024340	013777	025316	155510		MOV	NUMTCR, 2DZTCR	: SET UP TCR BIT
4734								
4735								: YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
4736	024346	105777	154612		SPIN:	TSTB	25TKS	: IF SOMEBODY HITS A KEY- GET A NEW LINE #
4737	024352	100006				BPL	15	: BR IF NO KEY HIT
4738	024354	005777	154606			TST	25TKB	: CLEAR CHAR
4739	024360	004737	007212			JSR	PC, SERV.G	: MAKE SURE IT WASN'T <1G>
4740	024364	000137	023376			JMP	LINEX	: SW02=1
4741	024370	005237	025276		15:	INC	LOCKUP	: INC TIMEOUT FLAG
4742	024374	001364				BNE	SPIN	: IF NOT 0 RETURN SPINNING
4743	024376	104011				ERROR	11	: *RECEIVER FAILED TO INTERRUPT CHECK CABLE/TERMINATOR
4744	024400	000004			QUITS:	SCOPE		
4745	024402	000137	024606			JMP	XEOP	: CALL FOR END OF PASS
4746	024406	005037	025276		INTREC:	CLR	LOCKUP	: CLEAR TIMEOUT FLAG
4747	024412	105777	155424			TSTB	2DZCSR	: TEST REC DONE
4748	024416	100401				BMI	.+4	: YES
4749	024420	104004				ERROR	4	: *FALSE INTERRUPT
4750	024422	017737	155420	025322		MOV	2DZRBUF, RECDAT	: SAVE WORD
4751	024430	100401				BMI	.+4	
4752	024432	104023				ERROR	23	: *NON VALID CHARACTER
4753	024434	032737	040000	025322		BIT	#BIT14, RECDAT	: DATA OVERRUN ?
4754	024442	001401				BEG	.+4	: NO
4755	024444	104024				ERROR	24	: *YES
4756	024446	032737	020000	025322		BIT	#BIT13, RECDAT	: FRAMING ERROR ?
4757	024454	001401				BEG	.+4	: NO
4758	024456	104025				ERROR	25	: *YES
4759	024460	032737	010000	025322		BIT	#BIT12, RECDAT	: PARITY ERROR ?
4760	024466	001401				BEG	.+4	: NO

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4790
4791
4792 024606 104402
4793 024610 025404
4794 024612 005037 025300
4795 024616 105037 001123
4796 024622 000137 023426
4797
4798
4799 024626 011605
4800 024630 012537 025012
4801 024634 012537 025014
4802 024640 012537 025016
4803 024644 112537 025020
4804 024650 112537 025021
4805 024654 010516
4806 024656 005005
4807 024660 012704 010452
4808 024664 122714 000015
4809 024670 001424
4810 024672 121427 000060
4811 024676 002421
4812 024700 121427 000071
4813 024704 003016
4814 024706 142714 000060
4815 024712 005002
4816 024714 152402
4817 024716 060205
4818 024720 122714 000015
4819 024724 001410
4820 024726 006305
4821 024730 010502
4822 024732 006305
4823 024734 006305
4824 024736 060205
4825 024740 000754
4826 024742 104404
4827 024744 000744
4828
4829
4830
4831 024746 020537 025014
4832 024752 101373
4833 024754 020537 025012
4834 024760 103770
4835 024762 133705 025020
4836 024766 001365
4837
4838
4839
4840 024770 013704 025016
4841 024774 010524
4842 024776 062705 000002
4843 025002 105337 025021

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;END OF PASS
;RESTART TEST

XEOP: TYPE ;TYPE NAME OF TEST
      MPASS
      CLR LAST ;CLEAR LAST ERROR PC
      CLRB SERFLG ;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$
      MOV (R5)+,9$
      MOV (R5)+,10$
      MOV R5,(SP)
2$:   CLR R5
      MOV #INBUF,R4
      CMPB #15,(R4)
1$:   BEQ 3$
      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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4844 025006 001372
 4845 025010 000002
 4846 025012 000000
 4847 025014 000000
 4848 025016 000000
 4849 025020 000
 4850 025021 000

BNE 55
 RTI
 6\$: 0
 7\$: 0
 8\$: 0
 9\$: .BYTE 0
 10\$: .BYTE 0

;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
 ;BUFFER TO THE CHARACTERS "E" AND "C".
 ;IF THE CHARACTER IS "E" CLEAR THE FLAG
 ;IF THE CHARACTER IS "C" SET THE FLAG

4858 025022 017605 000000 .PAWCH:MOV 2(SP),R5
 4859 025026 142737 000040 010452 BICB #40,INBUF ;SET FOR LOWER CASE INPUT
 4860 025034 122737 000105 010452 CMPB #'E,INBUF ;IS IT "E" ?
 4861 025042 001002 BNE 1\$
 4862 025044 105015 CLRB (R5) ;000
 4863 025046 000406 BR 2\$
 4864 025050 122737 000103 010452 1\$: CMPB #'C,INBUF ;IS IT "C" ?
 4865 025056 001005 BNE 3\$
 4866 025060 112715 177777 MOVB #-1,(R5) ;3177
 4867 025064 062716 000002 2\$: ADD #2,(SP)
 4868 025070 000002 RTI
 4869 025072 104404 3\$: INSTER ;RETRY
 4870 025074 000752 BR .PAWCH

;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
 ;LINE NUMBER (SAVLIN) FOR DZLPR, DZTCR AND DZCSR
 ;REGISTER USAGE.

4878 025076 013737 001372 025314 SET: MOV SAVLIN,NUMLIN ;SAVE SAVLIN
 4879 025104 013700 001372 XTCRO: MOV SAVLIN,R0 ;COPY THE LINE NUMBER FOR LOOP CONTROL
 4880 025110 005037 025316 CLR NUMTCR ;SET A DEFAULT OF LINE 0 OR NO LINES
 4881 025114 012702 000001 MOV #1,R2 ;SET A BIT POINTER TO THE FIRST LINE
 4882 025120 005300 XTCR1: DEC R0 ;REDUCE THE INDICATOR. IS IT MINUS YET?
 4883 025122 100402 BMI SET1 ;IF SO, R2 POINTS TO THE RIGHT LINE
 4884 025124 006302 ASL R2 ;IF NOT, MOVE THE POINTER TO THE NEXT LINE
 4885 025126 000774 BR XTCR1 ;GO SEE IF THIS LINE IS THE ONE
 4886 025130 012701 025172 SET1: MOV #TABLE2,R1
 4887 025134 010237 025316 MOV R2,NUMTCR ;COPY THE CORRECT BIT POINTER
 4888 025140 022137 025310 1\$: CMP (R1)+,LINESP
 4889 025144 001407 BEQ 2\$
 4890 025146 005721 TST (R1)+
 4891 025150 001373 BNE 1\$;IS IT THE END OF TABLE?
 4892 025152 104402 025420 TYPE ,MINVAL ;NO
 4893 025156 012705 023360 MOV #BAUD,R5 ;INVALID BAUD RATE,BEGIN AGAIN
 4894 025162 000402 BR 3\$;JUMP TO BAUD THRU R5
 4895 025164 011137 025312 2\$: MOV (R1),SPEED ;SET UP BAUD RATE
 4896 025170 000205 3\$: RTS R5

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4844 025006 001372
 4845 025010 000002
 4846 025012 000000
 4847 025014 000000
 4848 025016 000000
 4849 025020 000
 4850 025021 000

6\$: BNE 5\$
 7\$: RTI
 8\$: 0
 9\$: 0
 10\$: .BYTE 0
 .BYTE 0

;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
 ;BUFFER TO THE CHARACTERS "E" AND "C"
 ;IF THE CHARACTER IS "E" CLEAR THE FLAG
 ;IF THE CHARACTER IS "C" SET THE FLAG

4858 025022 017605 000000
 4859 025026 142737 000040 010452
 4860 025034 122737 000105 010452
 4861 025042 001002
 4862 025044 105015
 4863 025046 000406
 4864 025050 122737 000103 010452
 4865 025056 001005
 4866 025060 112715 177777
 4867 025064 062716 000002
 4868 025070 000002
 4869 025072 104404
 4870 025074 000752

.PAWCH:MOV 2(SP),R5
 BICB #40,INBUF ;SET FOR LOWER CASE INPUT
 CMPB #'E,INBUF ;IS IT "E" ?
 BNE 1\$
 CLRB (R5) ;000
 BR 2\$
 1\$: CMPB #'C,INBUF ;IS IT "C" ?
 BNE 3\$
 MOVB #-1,(R5) ;3177
 2\$: ADD #2,(SP)
 RTI
 3\$: INSTER ;RETRY
 BR .PAWCH

;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
 ;LINE NUMBER (SAVLIN) FOR DZLPR, DZTCR AND DZCSR
 ;REGISTER USAGE.

4878 025076 013737 001372 025314
 4879 025104 013700 001372
 4880 025110 005037 025316
 4881 025114 012702 000001
 4882 025120 005300
 4883 025122 100402
 4884 025124 006302
 4885 025126 000774
 4886 025130 012701 025172
 4887 025134 010237 025316
 4888 025140 022137 025310
 4889 025144 001407
 4890 025146 005721
 4891 025150 001373
 4892 025152 104402 025420
 4893 025156 012705 023360
 4894 025162 000402
 4895 025164 011137 025312
 4896 025170 000205

SET: MOV SAVLIN,NUMLIN ;SAVE SAVLIN
 XTCR0: MOV SAVLIN,R0 ;COPY THE LINE NUMBER FOR LOOP CONTROL
 CLR NUMTCR ;SET A DEFAULT OF LINE 0 OR NO LINES
 MOV #1,R2 ;SET A BIT POINTER TO THE FIRST LINE
 XTCR1: DEC R0 ;REDUCE THE INDICATOR. IS IT MINUS YET?
 BMI SET1 ;IF SO, R2 POINTS TO THE RIGHT LINE
 ASL R2 ;IF NOT, MOVE THE POINTER TO THE NEXT LINE
 BR XTCR1 ;GO SEE IF THIS LINE IS THE ONE
 SET1: MOV #TABLE2,R1
 MOV R2,NUMTCR ;COPY THE CORRECT BIT POINTER
 1\$: CMP (R1)+,LINESP
 BEQ 2\$
 TST (R1)+ ;IS IT THE END OF TABLE?
 BNE 1\$;NO
 TYPE ,MINVAL ;INVALID BAUD RATE,BEGIN AGAIN
 MOV #BAUD,R5 ;JUMP TO BAUD THRU R5
 BR 3\$
 2\$: MOV (R1),SPEED ;SET UP BAUD RATE
 3\$: RTS R5

4897
 4898
 4899

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4900
4901 025172 000062
4902 025174 010070
4903 025176 000113
4904 025200 010470
4905 025202 000156
4906 025204 011070
4907 025206 000207
4908 025210 011470
4909 025212 000226
4910 025214 012070
4911 025216 000454
4912 025220 012470
4913 025222 001130
4914 025224 013070
4915 025226 002260
4916 025230 013470
4917 025232 003410
4918 025234 014070
4919 025236 003720
4920 025240 014470
4921 025242 004540
4922 025244 015070
4923 025246 007020
4924 025250 015470
4925 025252 011300
4926 025254 016070
4927 025256 016040
4928 025260 016470
4929 025262 022600
4930 025264 017070
4931 025266 177777 000000

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 12470 ;ONE STOP BIT
;WORD 600. ;600 BAUD
;WORD 13070 ;ONE STOP BIT
;WORD 1200. ;1200 BAUD
;WORD 13470 ;ONE STOP BIT
;WORD 1800. ;1800 BAUD
;WORD 14070 ;ONE STOP BIT
;WORD 2000. ;2000 BAUD
;WORD 14470 ;ONE STOP BIT
;WORD 2400. ;2400 BAUD
;WORD 15070 ;ONE STOP BIT
;WORD 3600. ;3600 BAUD
;WORD 15470 ;ONE STOP BIT
;WORD 4800. ;4800 BAUD
;WORD 16070 ;ONE STOP BIT
;WORD 7200. ;7200 BAUD
;WORD 16470 ;ONE STOP BIT
;WORD 9600. ;9600 BAUD
;WORD 17070 ;
;WORD -1,0 ;TABLE TERMINATOR

4932
4933
4934 025272 000000
4935 025274 000000
4936 025276 000000
4937 025300 000000
4938 025302 000000
4939 025304 000000
4940 025306 000000
4941 025310 000156
4942 025312 006307
4943
4944 025314 000100
4945
4946 025316 000001
4947 025320 000240
4948 025322 000000
4949 025324 000000
4950 025326 053200 041505 047524
025350 041600 047117 051124
025404 050200 051501 020123
025420 044600 053116 046101
025446 046200 047111 035105
025456 041200 052501 020104

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 1
LINESE: 110.
SPEED: 6307 ;DEFAULT BAUD RATE
;DEFAULT 110 BAUD, 8 BITS/CHAR,
;FDX, 2 STOP BITS
;DEFAULT VALUE, REC. INTERRUPT ENABLED
NUMLIN: 100
NUMTCR: 1 ;DEFAULT VALUE, TCR BIT 0
PRIO: 240 ;DEFAULT DEVICE PRIORITY 5
RECDAT: 0
TBUF: 0
MVECT0: .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 - /

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```

025474 052200 050131 020105 MCHAR: .ASCIZ <200>/TYPE A CHAR. ON DZ11 TERMINAL /
025534 053600 044510 044103 MWHICH: .ASCIZ <200>/WHICH TEST ? ECHO OR CABLE (E OR C) /
025602 052200 051105 044515 MTERM: .ASCIZ <200>/TERMINAL ECHO TEST /
025627 200 040503 046102 MCABLE: .ASCIZ <200>/CABLE TEST /
025644 006777 177777 177412 MQUICK: .ASCII <377><15><377><377><12><377><377>
025653 124 042510 050440 .ASCII /THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789/
025750 006777 177777 177412 .ASCII <377><15><377><377><12><377><377><377><0>
025762

```

.EVEN

;*****

;UTILITIES

;*****

;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 DZPRT, R0 ;PLACE THE BASE VECTOR ADDRESS IN R0
        ADD #2, R0 ;CALCULATE THE RECEIVER INTERRUPT STATUS ADDR.
        MOV R0, DZPRT ;STORE IT HERE
        ADD #2, R0 ;CALCULATE THE TRANSMITTER INTERRUPT VECTOR
        MOV R0, DZTIV ;STORE IT HERE
        ADD #2, R0 ;CALCULATE THE TRANSMITTER VECTOR STATUS ADDRESS
        MOV R0, DZTIS ;STORE IT HERE

```

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

```

        MOV $BASE, R0 ;COPY THE ADDRESS BEING LOADED
        MOV R0, DZCSR ;XXX0
        INC R0
        MOV R0, HDZCSR ;XXX1
        INC R0
        MOV R0, DZRBUFF ;XXX2
        MOV R0, DZLPR ;XXX2
        INC R0
        MOV R0, HDZRBUFF ;XXX3
        MOV R0, HDZLPR ;XXX3
        INC R0
        MOV R0, DZTCR ;XXX4
        INC R0
        MOV R0, HDZTCR ;XXX5
        INC R0
        MOV R0, DZMSR ;XXX6
        MOV R0, DZTDR ;XXX6
        INC R0
        MOV R0, HDZMSR ;XXX7
        MOV R0, HDZTDR ;XXX7
        RTS
        PC

```

DZPRT: PR5

LESS1: PR4

;LEVEL TO ALLOW INTERRUPTS

4951
4952
4953
4954
4955
4956
4957
4958
4959
4960
4961
4962
4963
4964
4965
4966
4967
4968
4969
4970
4971
4972
4973
4974
4975
4976
4977
4978
4979
4980
4981
4982
4983
4984
4985
4986
4987
4988
4989
4990
4991
4992
4993
4994
4995
4996

```

025762 006337 026170
025766 006337 026170
025772 006337 026170
025776 006337 026170
026002 006337 026170
026006 013737 026170 026172
026014 162737 000001 026172
026022 042737 000037 026172
026030 013700 002072
026034 062700 000002
026040 010037 002074
026044 062700 000002
026050 010037 002076
026054 062700 000002
026060 010037 002100
026064 013700 001310
026070 010037 002042
026074 005200
026076 010037 002044
026102 005200
026104 010037 002046
026110 010037 002052
026114 005200
026116 010037 002050
026122 010037 002054
026126 005200
026130 010037 002056
026134 005200
026136 010037 002060
026142 005200
026144 010037 002062
026150 010037 002066
026154 005200
026156 010037 002064
026162 010037 002070
026166 000207
026170 000240
026172 000200

```


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			;ERROR ERROR TABLE	
.ERRTAB:			0	;ERROR 0
4997				
4998	026174	000000	0	
4999	026176	000000	0	
5000	026200	000000	0	
5001				
5002	026202	026406	EM1	;ERROR
5003	026204	027606	DH1	
5004	026206	030004	DT1	
5005				
5006	026210	026461	EM2	;ERROR 2
5007	026212	027631	DH2	
5008	026214	030016	DT2	
5009				
5010	026216	026507	EM3	;ERROR 3
5011	026220	027664	DH3	
5012	026222	030034	DT3	
5013				
5014	026224	026546	EM4	;ERROR 4
5015	026226	027664	DH3	
5016	026230	030034	DT3	
5017				
5018	026232	026575	EM5	;ERROR 5
5019	026234	027676	DH4	
5020	026236	030042	DT4	
5021				
5022	026240	026624	EM6	;ERROR 6
5023	026242	027676	DH4	
5024	026244	030042	DT4	
5025				
5026	026246	026662	EM7	;ERROR 7
5027	026250	027664	DH3	
5028	026252	030034	DT3	
5029				
5030	026254	026723	EM8	;ERROR 10
5031	026256	027664	DH3	
5032	026260	030034	DT3	
5033				
5034	026262	026765	EM9	;ERROR 11
5035	026264	027664	DH3	
5036	026266	030034	DT3	
5037				
5038	026270	027023	EM10	;ERROR 12
5039	026272	027664	DH3	
5040	026274	030034	DT3	
5041				
5042	026276	027062	EM13	;ERROR 13
5043	026300	027664	DH3	
5044	026302	030034	DT3	
5045				
5046	026304	027113	EM14	;ERROR 14
5047	026306	027664	DH3	
5048	026310	030034	DT3	
5049				
5050	026312	027145	EM15	;ERROR 15
5051	026314	000000	0	
5052	026316	000000	0	

5089
5090

026406	047200	020117	046123	EM1:	:ERROR MESSAGES
026461	200	042522	044507	EM2:	.ASCIZ <200>/NO SLAVE SYNC RESPONSE FROM DZ11 REGISTER/
026507	200	051124	047101	EM3:	.ASCIZ <200>/REGISTER R/W FAILURE?
026546	051200	041505	044505	EM4:	.ASCIZ <200>/TRANSMIT READY (TRDY) NOT SET/
026575	200	040504	040524	EM5:	.ASCIZ <200>/RECEIVER DONE NOT SET/
026624	042200	030532	020061	EM6:	.ASCIZ <200>/DATA COMPARISON ERROR/
026662	052200	040522	051516	EM7:	.ASCIZ <200>/DZ11 *RECEIVER BUFFER* ERROR/
026723	200	047125	054105	EM8:	.ASCIZ <200>/TRANSMITTER FAILED TO INTERRUPT/
026765	200	042522	042503	EM9:	.ASCIZ <200>/UNEXPECTED TRANSMITTER INTERRUPT/
027023	200	047125	054105	EM10:	.ASCIZ <200>/RECEIVER FAILED TO INTERRUPT/
027062	051600	046111	020117	EM11:	.ASCIZ <200>/UNEXPECTED RECEIVER INTERRUPT/
027113	200	044523	047514	EM13:	.ASCIZ <200>/SILO ALARM SET TOO SOON/
027145	200	041501	044524	EM14:	.ASCIZ <200>/SILO ALARM FAILED TO SET/
027207	200	042522	042101	EM15:	.ASCIZ <200>/ACTION DETECTED ON INVALID LINE./
027260	042200	052101	020101	EM16:	.ASCIZ <200>/READING DZRBUFF DID NOT CLEAR SILO ALARM/
027316	051200	041505	044505	EM17:	.ASCIZ <200>/DATA VALID SHOULD NOT BE SET/
027357	200	042522	040514	EM20:	.ASCIZ <200>/RECEIVER DONE SHOULD NOT BE SET/
027407	200	047515	042504	EM21:	.ASCIZ <200>/RELATIVE TIMING ERROR./
027451	200	040504	040524	EM22:	.ASCIZ <200>/MODEM SIGNAL ERROR ON CABLE TEST/
027501	200	040504	040524	EM23:	.ASCIZ <200>/DATA VALID IS NOT SET!./
027527	200	051106	046501	EM24:	.ASCIZ <200>/DATA OVERRUN IS SET!./
027557	200	040520	044522	EM25:	.ASCIZ <200>/FRAMING ERROR OCCURRED/
				EM26:	.ASCIZ <200>/PARITY ERROR OCCURRED/
027606	052200	040522	020120	DH1:	.ASCIZ <200>/TRAP PC DZ11 REG/
027631	200	054105	042520	DH2:	.ASCIZ <200>/EXPECTED FOUND REGISTER/
027664	046200	047111	020105	DH3:	.ASCIZ <200>/LINE NO./
027676	042600	050130	041505	DH4:	.ASCIZ <200>/EXPECTED FOUND LINE/
027725	200	054124	046040	DH5:	.ASCIZ <200>/TX LINE PREVIOUS TIME ACTUAL TIME PARAMETER/

.EVEN

030004	000002		DT1:	:DATA TABLES FOR ERROR MESSAGES
030006	006	003		2
030010	001204			.BYTE 6,3
030012	006	001		\$REG1
030014	001202			.BYTE 6,1
				\$REG0
030016	000003		DT2:	3
030020	006	004		.BYTE 6,4
030022	001214			\$REG5
030024	006	001		.BYTE 6,1
030026	001212			\$REG4
030030	006	001		.BYTE 6,1
030032	001202			\$REG0
030034	000001		DT3:	1
030036	003	001		.BYTE 3,1
030040	001372			SAVL IN
030042	000003		DT4:	3
030044	006	004		.BYTE 6,4
030046	001214			\$REG5
030050	006	001		.BYTE 6,1
030052	001212			\$REG4
030054	003	001		.BYTE 3,1

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030056	001372		SAVLIN	
030060	000004		DT5:	4
030062	003	005	.BYTE	3,5
030064	001372		SAVLIN	
030066	006	011	.BYTE	6,9.
030070	001214		\$REGS	
030072	006	007	.BYTE	6,7
030074	001220		\$TMP1	
030076	006	001	.BYTE	6,1
030100	001400		REGIST	
030102	000001		CORMAX:	
			.END	

[illegible]

1046	1057		
1046	1058		
1046	1049		
1046	1074		
1046	1078		
1046	1081		
1046	1084		
1046	1068		
1046	1076		
1046	1079		
1046	1082		
1046	1054		
1046	1055		
1046	1048		
1046	1069		
1046	1077		
1046	1080		
1046	1083		
1046	1051		
1046			
1983	1988#		
1876	1944	1986#	2261
1985#			
1878	1946	1987#	
1046	1059		
1046	1050		
1046	1053		
1046	1060		
1653	2566#		
639#			

[illegible]

[illegible]

DZCR5	001574	1241#												
DZCR6	001610	1248#												
DZCR7	001624	1255#												
DZCSR	002042	1364#	1767	2175*	2176	2183*	2687	2727	2759	2791	2823	2855	2887	3014
		3052	3235	3282*	3286	3290	3314	3336	3370*	3374	3378	3401	3451*	3473
		3517*	3519	3533*	3539*	3541	3586*	3588	3599*	3605*	3611*	3613	3628*	3659*
		3673	3678	3686	3692	3697*	3698*	3737*	3772*	3779	3794	3794	3800	3834
		3861*	3865*	3870*	3903*	3917	3927	3933	3937	3988*	3989*	3990*	4011	4037
		4040	4178*	4180	4247*	4252	4291	4295*	4345*	4350	4389	4393*	4420*	4436
		4478*	4560	4563	4626*	4629	4653*	4663	4682*	4690*	4724*	4747	4782	4974*
DZLEV	025762	2483	4955*											
DZLPR	002052	1368#	3026*	3079*	3088*	3276*	3358*	3445*	3505*	3573*	3650*	3761*	3892*	3976*
		4149*	4160*	4229*	4327*	4565*	4625*	4649*	4731*	4979*				
DZLV0	001504	1208#	1503	1506	1524*	1527*								
DZLV1	001520	1215#												
DZLV10	001644	1264#												
DZLV11	001660	1271#												
DZLV12	001674	1278#												
DZLV13	001710	1285#												
DZLV14	001724	1292#												
DZLV15	001740	1299#												
DZLV16	001754	1306#												
DZLV17	001770	1313#												
DZLV2	001534	1222#												
DZLV3	001550	1229#												
DZLV4	001564	1236#												
DZLV5	001600	1243#												
DZLV6	001614	1250#												
DZLV7	001630	1257#												
DZMSR	002062	1372#	2705	3104	3140	3198	4572*	4712	4988*					
DZNUM	001410	1146#	1420	1556*	1744	2574*	2611*	2612	2618	2620				
DZPRT	026170	2477*	2478	2479*	3510*	3515	3516	3537	3538	3578*	3584	3585	3600*	3609
		3610	3656	3658	4175	4176	4245	4246	4343	4344	4955*	4956*	4957*	4958*
		4959*	4960	4994*										
DZRBUF	002046	1366#	2693	3078	3320	3368	3407	3452	3479	3670	3708	3830	3844	3908
		4043	4266	4275	4364	4373	4439	4444	4563*	4564*	4565	4566	4666	4750
		4978*												
DZRI5	002074	1378#	3515*	3537*	3584*	3609*	3656*	3738	3739*	3912*	3985*	4096	4097*	4175*
		4245*	4343*	4651*	4726*	4965*								
DZRIV	002072	1377#	1											

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]


```
PS      = 177776
PSW     = 177776
PUSHRO  = 010046
PUSHIS  = 005746
PUSH2S  = 024646
PMRVEC  = 000024
QUITS   = 024400
RCVON   = 010000
RDATA   = 025304
```

850#												
4539#	4573#											
4002#	4080#											
812#	3841	4046	4442									
1137#	2481*	3272	3354	3440	3501	3569	3646	3757	3888	3972	4220	4318
4623#	4624*	4625	4645*	4646*	4648*	4649	4721*	4722*	4723*	4731		
1336#	1475	1488	1500	1542	1598	1631	1685	2491	4549	4557	4591	
2034#	2052											
810#	3471	4046	4273	4279	4371	4377	4442					
2037	2039	2041	2051#	2058	2060	2062						
848#	3441	4222	4320									
1352#	4581											
1210#	1550*	1634	1638									
1217#												
1266#												
1273#												
1280#												
1287#												
1294#												
1301#												
1308#												
1315#	1645											
1224#												
1231#												
1238#												
1245#												
1252#												
1259#												
1354#	4577											
688#	1451*	1554*	1589*	1647*	1653*	1748*	1751*	1757*	1762	1794*	1881*	1900*
1907#	1914*	1928*	1930*	1963*	1980*	2205*	2264*	2329*	2376	2483*	2555*	2672*
3996#	4187*	4432*	4465*	4638*	4658*	4739*	4993*					
674#												
768#												
777#												
775#												
779#	1437	2667	3598	3627	3731	3736						
4651#	4726	4728	4947#									
691#												
692#												
693#												
694#												
695#	4995											
696#	4994											
697#												
698#	956	960	1418*	1703*	2685	3666*	3912	3985	3987	4080*	4531*	4599*
4642#	4697*											
671#	672											
672#												
776#												
774#												
778#												
763#	2344*	2345*	2354*	2360*	2372*	2373*						
4744#	4776											
853#	4131	4134	4148	4159	4648	4723						

K09

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RDONE = 000200	789#	3016	3286	3314	3374	3401	3473	3541	3613	3686	4759	4764	4769*
RECDAT 025322	4666*	4669	4673	4674	4676*	4677*	4678	4750*	4753	4756			
REGIST 001400	4770*	4771	4948#										
RESREG 007054	1142#	3368*	3452*	4163*	4275*	4373*	4444*	5090					
RESTAR 011254	2257	2260#											
RESVEC= 000010	2377	2514#											
RESOS = 104410	758#												
RIE = 000100	1342#	2260											
	788#	2856	3054	3539	3611	3698	3737	3903	3989	4178	4180	4247	4252
	4295	4345	4350	4393	4478	4653	4690	4724					
RINGO = 000001	893#												
RING1 = 000002	894#												
RING2 = 000004	895#												
RING3 = 000010	896#												
RING4 = 000020	897#												
RING5 = 000040	898#												
RING6 = 000100	899#												
RING7 = 000200	900#												
RL0 = 000000	818#												
RL1 = 000400	819#												
RL2 = 001000	820#												
RL3 = 001400	821#												
RL4 = 002000	822#												
RL5 = 002400	823#												
RL6 = 003000	824#												
RL7 = 003400	825#												
RSTART 020212	3972#												
RSTRT 024622	4796#												
RUN 001406	1145#	1424*	2458	2460*	2461*	2467*	2468*						
RXISR1 022676	4174	4436#											
RXSVC 020514	3984	4037#											
RXTCR 020770	3971#	4000	4074*	4101#									
RO =%000000	679#	1460*	1462*	1463	1565*	1574	1576	1578	1579	1580	1582	1583	1584
	1658#	1659	1660	1671*	1679*	1691*	1693*	1695	1696	1754*	1757	1874	1875*
	1880	1885	1888*	1940	1948*	1952	1953	1955*	1956*	1957	1979*	2093	2098*
	2110	2119*	2136	2139*	2149*	2163	2164*	2165	2166*	2167*	2168*	2169*	2187
	2188*	2189*	2191*	2346	2371*	2469*	2475	2476	2477	2480	2481	2482	2497*
	2498	2500	2502	2504	2507	2508	2521*	2543*	2544*	2545*	2546*	2547*	2549*
	2550*	2551*	2553*	2580*	2583*	2590*	2597*	2634*	2643*	2645*	2647	2658*	2687*
	2688	2690*	2693*	2694	2696*	2699*	2700	2702*	2705*	2706	2708*	2727*	2729*
	2730	2738	2759*	2761*	2762	2766*	2767	2773*	2775	2791*	2793*	2794	2798*
	2799	2805*	2807	2823*	2825*	2826	2830*	2831	2837*	2839	2855*	2857*	2858
	2862*	2863	2869*	2871	2887*	2889*	2890	2894*	2895	2901*	2903	2918*	2921*
	2922	2927*	2928	2936*	2938	2961*	2967*	2968	2973*	2974	2982*	2984	2986
	2990	3014*	3016*	3018	3021*	3022	3028*	3031	3052*	3053*	3055	3062*	3063
	3078*	3080	3089	3104*	3106	3114	3140*	3165	3170	3198*	3211	3217	3235*
	3241*	3243	3249	3327*	3328*	3363*	3364*	3365	3367*	3384	3398	3412*	3416*
	3417*	3442*	3443	3447*	3766*	3767*	3768	3770*	3776*	3777*	3790	3791*	3897*
	3898*	3899	3901*	3913*	3914*	3923	3924*	3925	3935	3973*	3974	3978*	3990*
	3981*	3982	4032*	4135*	4136*	4137	4164*	4165*	4166	4190*	4191*	4192	4238*
	4239*	4240	4242*	4336*	4337*	4338	4340*	4412*	4416*	4418	4467*	4468*	4471
	4472	4474	4879*	4882*	4963*	4964*	4965	4966*	4967	4968*	4969	4973*	4974
	4975*	4976	4977*	4978	4979	4980*	4981	4982	4983*	4984	4985*	4986	4987*
	4988	4989	4990*	4991	4992								
R1 =%000001	680#	1566*	1572*	1574*	1575*	1576*	1577*	1578*	1579*	1583*	1584*	1692*	1693
	1694*	1695	1941	1978*	2092	2099*	2111	2115*	2117	2118	2119	2120	2148*

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R2	=%000002	2347	2370*	2522*	2540*	2543	2576*	2578*	2579*	2581	2586	2588	2591*	2592
		2594	2600*	2601*	2603	2614*	2615	2620*	2621	2623*	2644*	2645	2646*	2647
		2648	2655*	2656*	2688*	2694*	2700*	2706*	2713*	2717	3272*	3276	3277*	3354*
		3358	3359*	3440*	3441*	3445	3446*	3501*	3505	3506*	3569*	3573	3574*	3646*
		3650	3651*	3757*	3761	3762*	3888*	3892	3893*	3972*	3976	3977*	4220*	4221*
		4222*	4226	4228*	4229	4230*	4231*	4269*	4270*	4271*	4272*	4278	4281	4283
		4285	4289*	4318*	4319*	4320*	4324	4326*	4327	4328*	4329*	4367*	4368*	4369*
		4370*	4376	4379	4381	4383	4387*	4402*	4405*	4406*	4407	4408*	4410	4413*
		4414*	4446*	4447*	4448*	4449*	4450	4452	4455	4458*	4460	4475	4540*	4542*
		4544	4545	4729*	4762	4774	4778*	4886*	4888	4890	4895			
		681*	1567*	1580*	1581*	1582*	1637*	1641*	1643*	2091	2100*	2348	2369*	2523*
		2524*	2541*	2544	2569*	2571*	2572	2575*	2603*	2604	2605*	2606*	2607*	2608
		2609*	2610*	2642*	2654*	2655	2660*	2662*	2664*	2665*	2666*	2735*	2744*	3030*
		3035*	3143*	3148	3151*	3154	3164	3169	3199*	3200	3202*	3206	3208	3209
		3215	3237*	3238	3240	3255*	3273*	3274	3278*	3281*	3283	3285	3325	3329*
		3355*	3356	3360*	3369*	3371	3373	3414	3418*	3450*	3453	3455	3456	3486
		3487*	3502*	3503	3507*	3570*	3571	3575*	3647*	3648	3652*	3660*	3661	3664*
		3669	3730	3758*	3759	3763*	3771*	3773	3778	3848	3851*	3864	3889*	3890
		3894*	3902*	3905	3915	3953	3956*	4018*	4021*	4023	4031	4053*	4056*	4058
		4074	4084*	4085	4093*	4168*	4223*	4224	4232*	4235*	4293	4321*	4322	4330*
		4333*	4391	4409*	4462	4541*	4542	4543*	4544	4730*	4785	4786*	4815*	4816*
		4817	4821*	4824	4881*	4884*	4887							
R3	=%000003	682*	1611*	1612*	1615*	1621*	1638*	1639*	1640*	1642*	1644*	1645	1993	2000*
		2010*	2013*	2014	2019*	2090	2101*	2112	2122*	2123*	2124*	2125	2132*	2133*
		2138*	2141*	2147*	2349	2368*	2526*	2527*	2528*	2529*	2530*	2531*	2532*	2545
		2570*	2608*	2737*	2740*	3086*	3087*	3088	3111*	3112*	3113	3142*	3150*	3155
		3313*	3317*	3400*	3709*	3710*	3711*	3717*	3722*	3723	3782*	3792	3808*	3809
		4014*	4016*	4017	4019*	4049*	4050*	4051*	4052	4054*	4061*	4062*	4063	4065
		4071*	4072	4082*	4087	4092	4169*	4236*	4290*	4293	4334*	4388*	4391	4459*
		4462												
		683*	1994	1999*	2003*	2004*	2005	2012*	2015	2018*	2026	2035*	2036	2038
		2040	2042*	2043	2044	2066*	2067*	2071*	2089	2102*	2113	2120*	2122	2126*
R4	=%000004	2127*	2128*	2146*	2220*	2221	2222*	2223*	2224*	2225*	2226*	2227	2228	2229
		2350	2367*	2533*	2539	2547	2650*	2651*	2730*	2731	2738*	2762*	2763	2767*
		2775*	2794*	2795	2799*	2807*	2826*	2827	2831*	2839*	2858*	2859	2863*	2871*
		2890*	2891	2895*	2903*	2922*	2923*	2924	2928*	2929*	2930	2938*	2939*	2940
		2968*	2969*	2970	2974*	2975*	2976	2984*	2985*	2990*	2991*	2992	3018*	3022*
		3031*	3032	3055*	3056	3063*	3064	3080*	3081	3083	3086	3089*	3090	3106*
		3107	3108	3111	3114*	3115	3154*	3157*	3159*	3161	3163	3165*	3166	3170*
		3211*	3212	3217*	3242*	3246*	3249*	3250	3320*	3321	3404*	3407*	3408	3472*
		3476*	3479*	3480	3677*	3681*	3685*	3689*	3708*	3709	3726*	3727	3783*	3787*
		3799*	3803*	3811*	3813*	3830*	3831	3844*	3845	3916*	3920*	3936*	3940*	4017*
R5	=%000005	4026*	4027*	4028	4029*	4043*	4046	4049	4063	4066*	4266*	4269	4273	4276
		4281	4287*	4364*	4367	4371	4374	4379	4385*	4439*	4442	4446	4450	4454*
		4627*	4632*	4635*	4712*	4713	4764*	4765*	4766	4807*	4808	4810	4812	4814*
		4816	4818	4840*	4841*									
		684*	2025	2027*	2028	2029	2030	2031	2032	2033	2034*	2043*	2046*	2047*
		2048*	2057	2059	2061	2067	2068*	2072*	2088	2103*	2114	2118*	2121	2129*
		2145*	2218*	2219*	2220	2223	2351	2366*	2393*	2397*	2402*	2407*	2534*	2535
		2536*	2728*	2729	2731	2736*	2760*	2761	2763	2766	2769	2770*	2772*	2773
		2777*	2792*	2793	2795	2798	2801	2802*	2804*	2805	2809*	2824*	2825	2827
		2830	2833	2834*	2836*	2837	2841*	2856*	2857	2859	2862	2865	2866*	2868*
		2869	2873*	2888*	2889	2891	2894	2897	2898*	2900*	2901	2905*	2919*	2921
		2924	2927	2932	2933*	2935*	2936	2942	2943*	2945*	2947*	2962*	2967	2970
		2973	2978	2979*	2981*	2982	2986	2994	2995*	2997*	2999*	3015*	3025*	3029*
		3032	3054*	3056	3059*	3064	3081*	3082*	3083	3090	3107*	3108	3115	3160*

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	3161*	3162*	3163*	3166	3172*	3205*	3206*	3207*	3208*	3212	3219*	3236*	3250
	3253*	3289*	3293*	3297*	3303*	3308*	3309*	3310*	3312*	3321	3377*	3381*	3385*
	3391*	3396*	3397*	3398*	3399*	3408	3458*	3464*	3469*	3470*	3471*	3480	3518*
	3525*	3540*	3547*	3587*	3595*	3612*	3620*	3676*	3727	3816*	3822*	3827*	3828*
	3829*	3831	3837*	3838	3840*	3841*	3842	4065*	4276*	4277*	4278*	4279*	4283*
	4284*	4374*	4375*	4376*	4377*	4381*	4382*	4452*	4453*	4474*	4597*	4628*	4636
	4707*	4708*	4709*	4710*	4713	4762*	4763*	4766	4799*	4800	4801	4802	4803
	4804	4805	4806*	4817*	4820*	4821	4822*	4823*	4824*	4831	4833	4835	4841
	4842*	4858*	4862*	4866*	4893*	4896*							
R6 =%000006	685#	687											
R7 =%000007	686#	688											
SAVLIN 001372	1139#	3280*	3297	3326*	3327	3362*	3385	3415*	3416	3449*	3458	3485*	3509*
	3577*	3654*	3663*	3723	3765*	3776	3816	3850*	3896*	3913	3955*	4052*	4061
	4083*	4091*	4128*	4234*	4285*	4286*	4332*	4383*	4384*	4455*	4456*	4475*	4476*
	4594	4678	4771	4878	4879	5090							
SAVNUM 001411	1147#	1420*	1557*	1742*	1744*	2621*							
SAVPC 001402	1143#	2084*	2284										
SAVOS = 104407	1340#	2217											
SCOP1 = 104401	1328#	2716	2946	2998	3174	3221	3324	3339	3411	3484	3849	3871	3954
	4188	4719											
SERV.G 007212	1794	2205	2288#	2295	4187	4638	4658	4739					
SET 025076	4597	4878#											
SETAPT 011260	1451	2521#											
SETFLG= 104406	1338#	1535											
SET.PS 010620	955	2426#											
SET1 025130	4883	4886#											
SEVEN = 000020	841#												
SEVENS= 000060	845#												
SILAL= 026000	791#	3016	3794	3800	3834	3927	3937	4040					
SILLEN= 010000	790#	2824	3054	3772	3861	3870	3903						
SIX = 000010	840#												
SIXS = 000050	844#												
SNAP 020342	3995#	4075											
SP =%000006	687#	1417*	1431*	1432*	1440	1441	1519*	1520*	1521	1523	1525	1702*	1796
	1801*	1807*	1810	1812	1813	1831	1833*	1849*	1874*	1875	1885*	1887	1888
	1889*	1891	1893	1895	1901	1903*	1905*	1913*	1917	1921	1922	1926	1940*
	1941*	1948	1949*	1960	1961*	1962*	1972	1973*	1978	1979	1993*	1994*	1995
	1996*	2012	2013	2014*	2015*	2018	2019	2025*	2026*	2027	2033*	2071	2072
	2084	2110*	2111*	2112*	2113*	2114*	2115	2116*	2125*	2133	2145	2146	2147
	2148	2149	2163*	2164	2187*	2191	2198*	2213	2215	2218	2271	2279*	2290*
	2291*	2292	2303*	2304*	2305	2310	2316	2318	2320*	2321	2324*	2325*	2326
	2346*	2347*	2348*	2349*	2350*	2351*	2352*	2353	2361*	2365	2366	2367	2368
	2369	2370	2371	2376*	2393	2409*	2426	2431	2436	2438*	2439*	2637*	2664
	2668*	2713	2714	2769*	2772	2801*	2804	2833*	2836	2865*	2868	2897*	2900
	2932*	2935	2942*	2945	2978*	2981	2994*	2997	3529	3532	3552	3555	3604
	3625	3949	3952	4075*	4296*	4298*	4394*	4396*	4530*	4600*	4686*	4776*	4779*
	4799	4805*	4858	4867*									
SPACNT 006457	2153#												
SPEED 025312	4624	4646	4721	4895*	4942#								
SPIN 024346	4736#	4742	4779										
STACK = 001120	662#	1417	1702	2279	4530	4600							
STFLG 025274	4533*	4588*	4605	4607*	4611	4613*	4935#						
STKLMT= 177774	673#												
STOP 001462	1177#	3365	3768	3899	3982	4137	4166	4240	4338				
SVOS 006214	2088#												
SWR 001160	1016#	1434	1438*	1453	1457	1552	1586	1651	1668	1673	1678	1681	1706

		1802 2313*	1820 2314*	1845 2321*	2206 2352	2211 2365*	2269 2486	2274 2554*	2276 4538	2288 4573	2296 4639	2297*	2307*	2312*
SWREG	000176	980#	1438											
SW0	= 000001	726#												
SW00	= 000001	716#	726	1453	4538									
SW01	= 000002	715#	725	2486	4573									
SW02	= 000004	714#	724											
SW03	= 000010	713#	723	1552	1586									
SW04	= 000020	712#	722	1681										
SW05	= 000040	711#	721											
SW06	= 000100	710#	720	1668										
SW07	= 000200	709#	719											
SW08	= 000400	708#	718	2274										
SW09	= 001000	707#	717	1845										
SW1	= 000002	725#												
SW10	= 002000	706#	2276											
SW11	= 004000	705#												
SW12	= 010000	704#	2206											
SW13	= 020000	703#	2211											
SW14	= 040000	702#												
SW15	= 100000	701#												
SW2	= 000004	724#												
SW3	= 000010	723#												
SW4	= 000020	722#												
SW5	= 000040	721#												
SW6	= 000100	720#												
SW7	= 000200	719#												
SW8	= 000400	718#												
SW9	= 001000	717#												
S110	= 001000	857#												
S1200	= 003400	862#												
S134	= 001400	858#												
S150	= 002000	859#												
S1800	= 004000	863#												
S19200	= 007400	870#												
S2000	= 004400	864#												
S2400	= 005000	865#												
S300	= 002400	860#												
S3600	= 005400	866#												
S4800	= 006000	867#												
S50	= 000000	855#	4131	4134										
S600	= 003000	861#												
S7200	= 006400	868#												
S75	= 000400	856#												
S9600	= 007000	869#												
TABLE2	025172	4886	4901#											
TBITVE	= 000014	759#												
TBUF	025324	4673#	4689	4949#										
TCR0	= 000001	874#	2919	3027										
TCR1	= 000002	875#												
TCR2	= 000004	876#												
TCR3	= 000010	877#												
TCR4	= 000020	878#												
TCR5	= 000040	879#												
TCR6	= 000100	880#												
TCR7	= 000200	881#												

[illegible]

[illegible]

[illegible]

SENDAD	004576
SENDCT	004562
SENV	001254
SENVN	001255
SEOP	004432
SEOPCT	004554
SERFLG	001123
SERMAX	001135
SERROR	006570
SERRPC	001136
SERRTB	001360
SERTTL	001132
SETABL	001254
SETEND	001360
SFATAL	001236
SFFLG	005660
SFILLC	001176
SFILLS	001175
SGDADR	001140
SGDOAT	001144
SGET42	004566
SHD =	000001
SHIBTS	001462
SICNT	001124
SILLUP	007644
SINTAG	001155
SITEMB	001134
SLF	001232
SLFLG	005657
SLPADR	001126
SLPERR	001130
SMADR1	001266
SMADR2	001272
SMADR3	001276
SMADR4	001302
SMAIL	001234
SMAMS1	001264
SMAMS2	001270
SMAMS3	001274
SMAMS4	001300
SMBADR	001464
SMFLG	005656
SMSCAD	001250
SMSCLG	001252
SMSCTY	001234
SMTYP1	001265
SMTYP2	001271
SMTYP3	001275
SMTYP4	001301
SMXCNT	005104

[illegible]

STSTM 001466

[illegible]

H10

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DZDZAB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

.SASTA= ***** U	1936	1939
.SX = 001462	1183#	1188

[illegible]

[illegible]

K10

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DZDZAB.P11 CROSS REFERENCE TABLE -- MACRO NAMES

.SSCOP	1#	639#	1781
.SSIZE	1#		
.SSUPR	1#		
.STRAP	1#	-639#	
.STYPB	1#		
.STYPD	1#		
.STYPE	1#	639#	1852
.STYPO	1#		
.S4OCA	1#		
.1170	1#		

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CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ADC	2461	2468													
ADD	1575	1577	1643	1644	1889	1949	1961	1973	1996	2068	2116	2124	2223	2226	2409
	2438	2462	2470	2540	2541	2614	2662	3253	4189	4198	4564	4567	4571	4817	4824
ASL	4842	4867	4964	4966	4968										
	2046	2047	2048	2167	2222	2224	3159	3328	3417	3777	3914	4021	4027	4056	4062
ASLB	4272	4370	4406	4416	4449	4820	4822	4823	4884	4955	4956	4957	4958	4959	
	1507	1508	1509	1510	1511	2947	2999	3151	3202	3255	3278	3329	3360	3418	3447
ASR	3487	3507	3575	3652	3664	3763	3851	3894	3956	3978	4093	4143	4232	4330	
	1570	1615	1621	1956	2127	2128	3157	3303	3391	3464	3717	3822	4286	4384	4413
	4456	4476													
BCC	1616	1622	2652	3152	3203	3256	3279	3330	3361	3419	3448	3488	3508	3576	3653
	3764	3895	3979	4094	4144	4154	4233	4331							
BCS	1571	1613	2315	2537	3304	3392	3465	3718	3823	3852	3957				
BEQ	1435	1443	1522	1553	1559	1614	1620	1662	1669	1682	1707	1755	1797	1817	1823
	1846	1848	1879	1892	1927	1943	1947	1967	1969	2006	2037	2045	2137	2207	2214
	2231	2237	2248	2253	2257	2268	2277	2289	2306	2434	2487	2538	2587	2589	2593
	2595	2613	2619	2624	2732	2739	2764	2768	2776	2796	2800	2808	2828	2832	2840
	2860	2864	2872	2892	2896	2904	2925	2931	2941	2971	2977	2993	3019	3023	3033
	3057	3065	3084	3091	3109	3116	3156	3167	3171	3213	3218	3239	3251	3275	3284
	3287	3299	3322	3337	3357	3372	3375	3387	3409	3438	3444	3454	3460	3481	3504
	3520	3542	3572	3589	3614	3649	3713	3724	3728	3760	3795	3818	3832	3835	3843
	3891	3926	3928	3934	3975	4041	4047	4064	4086	4088	4181	4195	4225	4253	4282
	4323	4325	4351	4380	4443	4451	4461	4463	4470	4539	4574	4603	4640	4670	4679
	4714	4754	4757	4760	4767	4772	4809	4819	4889						
BGE	1826														
BGT	1750	2041	2319	4813											
BHI	2058	4473	4832												
BHIS	3793														
BIC	1520	1524	1581	1747	2123	2225	2291	2304	2320	2325	2394	2479	2524	2532	2550
	2666	2766	2798	2830	2862	2894	2923	2927	2929	2939	2973	3082	3325	3414	3486
	3533	3599	3605	3711	3726	3730	3737	3848	3870	3953	4016	4026	4031	4051	4066
	4074	4140	4148	4161	4191	4221	4230	4271	4277	4284	4287	4295	4319	4328	4369
	4375	4382	4385	4393	4405	4420	4448	4453	4454	4478	4675	4676	4763	4765	4769
	4962														
BICB	2004	2042	3169	3215	4418	4814	4859								
BIS	1527	1582	1640	2175	2321	2549	2578	2579	2591	3027	3028	3029	3062	3240	3241
	3282	3312	3370	3399	3441	3451	3471	3517	3539	3586	3611	3659	3697	3698	3772
	3829	3841	3861	3864	3865	3903	3988	3989	3990	4141	4159	4162	4178	4222	4228
	4247	4279	4320	4326	4345	4377	4624	4646	4648	4722	4723	4724			
BISB	2043	2183	3161	3163	3164	3206	3208	3209	3310	3398	4278	4376	4708	4710	4816
BIT	1453	1552	1586	1651	1668	1681	1706	1802	1820	1845	2176	2206	2211	2274	2276
	2294	2458	2486	2586	2588	2592	2594	2986	3155	3243	3274	3283	3286	3290	3314
	3336	3356	3371	3374	3378	3401	3443	3453	3473	3503	3519	3541	3571	3588	3613
	3648	3661	3686	3759	3773	3784	3794	3800	3834	3890	3905	3917	3927	3933	3937
	3974	4023	4040	4046	4058	4085	4132	4180	4194	4224	4226	4252	4273	4291	4322
	4324	4350	4371	4389	4442	4460	4538	4573	4669	4753	4756	4759			
BITB	1878	1883	1915	1946	2061	3148	3200	3238	4835						
BLO	2060	4834													
BLOS	1674	2649	3839												
BLT	1906	2039	2317	4811											
BMI	1458	2548	2582	3145	3194	3197	3679	3693	3909	4012	4020	4038	4044	4055	4267
	4365	4403	4415	4437	4440	4630	4664	4667	4748	4751	4783	4883			
BNE	1446	1454	1456	1464	1526	1587	1646	1650	1652	1655	1667	1697	1705	1743	1803
	1821	1836	1877	1884	1886	1894	1902	1916	1923	1945	1951	1954	1971	2011	2062
	2070	2131	2135	2140	2144	2177	2190	2212	2233	2262	2275	2293	2295	2327	2364
	2396	2401	2406	2430	2453	2459	2464	2473	2485	2499	2501	2503	2509	2573	2584

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CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

	2598	2616	2659	2743	2745	2948	2987	3000	3036	3149	3201	3244	3247	3291	3294
	3315	3318	3366	3379	3382	3402	3405	3413	3474	3477	3526	3548	3596	3621	3662
	3682	3687	3690	3769	3774	3785	3788	3801	3804	3810	3814	3869	3900	3906	3918
	3921	3938	3941	3983	3999	4001	4004	4024	4030	4059	4073	4133	4138	4167	4183
	4185	4193	4227	4241	4255	4274	4292	4294	4339	4353	4372	4390	4392	4411	4419
	4431	4546	4606	4612	4633	4637	4684	4742	4775	4836	4844	4651	4865	4891	
BPL	1450	1518	1610	1800	1871	1920	2002	2008	2209	2270	2302	2309	2323	2965	3138
	3671	3674	3780	3846	4151	4218	4257	4316	4355	4656	4737				
BR	1436	1528	1562	1585	1619	1624	1665	1677	1710	1798	1805	1811	1814	1873	1899
	1909	1918	1925	1937	1959	2017	2050	2052	2266	2356	2380	2399	2404	2412	2432
	2456	2466	2506	2511	2542	2552	2585	2599	2627	2632	2636	2663	3158	3175	3222
	3306	3340	3394	3467	3523	3530	3545	3550	3553	3593	3602	3618	3623	3626	3665
	3720	3732	3798	3825	3931	3943	3948	3951	4022	4057	4156	4197	4199	4417	4609
	4777	4825	4827	4863	4870	4885	4894								
CLC	1568	1623	2311	3307	3395	3468	3721	3826	4152	4155					
CLR	1421	1425	1426	1427	1462	1516	1671	1694	1729	1745	1795	1819	2034	2199	2307
	2362	2551	2571	2580	2590	2600	2601	2609	2634	2690	2696	2702	2708	2711	2735
	2736	2737	2770	2777	2802	2809	2834	2841	2866	2873	2898	2905	2933	2943	2949
	2979	2995	3001	3015	3026	3030	3142	3160	3172	3205	3219	3242	3280	3289	3313
	3362	3364	3367	3377	3400	3420	3449	3472	3489	3509	3518	3540	3577	3587	3612
	3628	3654	3676	3677	3685	3739	3741	3765	3767	3770	3782	3783	3799	3811	3896
	3898	3901	3916	3936	3959	3981	3995	4082	4083	4097	4099	4127	4128	4129	4136
	4142	4165	4168	4169	4170	4171	4234	4235	4236	4239	4242	4250	4251	4332	4333
	4334	4337	4340	4348	4349	4533	4534	4535	4537	4543	4588	4601	4627	4635	4707
	4729	4730	4746	4794	4806	4815	4880								
CLRB	1422	1461	1604	1730	1818	1834	1898	1924	1975	1976	1977	2141	2216	2398	2408
	2574	2969	2975	2985	2991	3483	3684	4536	4795	4862					
CMP	1434	1463	1645	1661	1673	1695	1696	1796	1812	1825	2057	2059	2213	2267	2288
	2316	2318	2429	2433	2463	2471	2498	2500	2502	2508	2572	2615	2647	2648	2714
	2731	2763	2795	2827	2859	2891	2924	2970	3032	3056	3064	3083	3090	3108	3115
	3166	3212	3250	3321	3365	3408	3480	3529	3532	3552	3555	3604	3625	3723	3768
	3792	3809	3831	3899	3925	3949	3952	3982	4087	4137	4166	4192	4240	4293	4338
	4391	4410	4462	4472	4544	4545	4678	4713	4766	4771	4831	4833	4888		
CMPB	1455	1521	1525	1649	1876	1891	1893	1901	1922	1926	1944	2005	2036	2038	2040
	2044	2261	2292	2305	2326	2395	2400	2405	2612	3727	3838	3842	4063	4281	4379
	4450	4639	4683	4774	4808	4810	4812	4818	4860	4864					
COM	3087	3112	4607	4613											
DEC	1558	1739	1748	2010	2129	2143	2189	2583	2623	2744	3868	3998	4414	4429	4632
	4882														
DECB	1448	1465	1590	1656	1742	1905	1908	2069	2134	2139	2568	4019	4054	4843	
EMT	663														
HALT	951	1672	1676	1680	1872	2272	2355	2379	2435	2455	2635				
INC	1736	1746	1824	1974	2273	2363	2597	2658	2740	3035	3150	3246	3277	3326	3359
	3404	3415	3446	3476	3485	3506	3525	3547	3574	3595	3620	3651	3663	3681	3689
	3762	3791	3803	3808	3837	3840	3850	3893	3920	3924	3940	3955	3977	4003	4032
	4071	4091	4139	4182	4231	4254	4289	4290	4329	4352	4387	4388	4408	4409	4458
	4459	4569	4741	4975	4977	4980	4983	4985	4987	4990					
INCB	1829	1928	2611	3293	3317	3381	3412	3787	3813	4029	4184	4256	4354	4778	4786
IOT	664														
JMP	982	984	1444	1452	1459	1573	1588	1591	1714	1762	2280	2514	2717	3147	3705
	3775	3853	3872	3907	3958	4002	4007	4615	4659	4740	4745	4796			
JSR	1451	1554	1589	1653	1757	1794	1881	1900	1907	1914	1963	2205	2264	2483	4187
	4465	4597	4638	4658	4739										
MOV	1417	1419	1423	1424	1428	1431	1432	1433	1438	1439	1440	1441	1460	1481	1494
	1519	1523	1549	1550	1555	1563	1564	1565	1566	1567	1572	1574	1576	1578	1579
	1580	1583	1584	1611	1637	1638	1641	1642	1658	1659	1660	1678	1679	1691	1692

	1693	1702	1709	1711	1712	1751	1754	1801	1807	1808	1810	1813	1827	1828	1831
	1832	1833	1849	1874	1875	1880	1888	1903	1940	1948	1948	1952	1957	1958	1960
	1962	1972	1978	1979	1993	1994	1995	1999	2000	2009	2012	2013	2014	2015	2018
	2019	2025	2026	2027	2028	2029	2030	2033	2035	2066	2067	2071	2072	2084	2088
	2089	2090	2091	2092	2093	2098	2099	2100	2101	2102	2103	2110	2111	2112	2113
	2114	2115	2117	2120	2122	2132	2145	2146	2147	2148	2149	2153	2164	2168	2187
	2188	2191	2198	2215	2218	2220	2227	2228	2229	2271	2278	2279	2290	2296	2297
	2303	2310	2324	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2360
	2361	2365	2366	2367	2368	2369	2370	2371	2372	2373	2376	2393	2397	2402	2407
	2426	2428	2431	2436	2437	2439	2457	2465	2469	2474	2475	2476	2477	2480	2481
	2482	2497	2504	2512	2521	2522	2523	2533	2534	2535	2543	2544	2545	2546	2547
	2553	2554	2569	2570	2575	2576	2577	2603	2605	2606	2607	2608	2610	2622	2628
	2629	2630	2631	2637	2640	2641	2642	2643	2644	2645	2646	2650	2654	2655	2660
	2664	2668	2670	2671	2682	2683	2684	2685	2686	2687	2688	2692	2693	2694	2698
	2699	2700	2704	2705	2706	2710	2713	2725	2726	2727	2728	2729	2730	2738	2757
	2758	2759	2760	2761	2762	2767	2769	2772	2773	2775	2789	2790	2791	2792	2793
	2794	2799	2801	2804	2805	2807	2821	2822	2823	2824	2825	2826	2831	2833	2836
	2837	2839	2853	2854	2855	2856	2857	2858	2863	2865	2868	2869	2871	2885	2886
	2887	2888	2889	2890	2895	2897	2900	2901	2903	2916	2917	2918	2919	2920	2921
	2922	2928	2932	2935	2936	2938	2942	2945	2959	2960	2961	2962	2963	2967	2968
	2974	2978	2981	2982	2984	2990	2994	2997	3012	3013	3014	3016	3018	3021	3022
	3025	3031	3049	3050	3052	3053	3054	3055	3059	3063	3075	3076	3078	3079	3080
	3081	3086	3088	3089	3101	3102	3104	3105	3106	3107	3111	3113	3114	3134	3135
	3136	3140	3143	3146	3154	3165	3170	3190	3191	3192	3198	3199	3211	3217	3232
	3233	3235	3236	3237	3249	3268	3269	3270	3272	3273	3276	3281	3285	3297	3320
	3327	3350	3351	3352	3354	3355	3358	3363	3368	3369	3373	3385	3407	3416	3434
	3435	3436	3440	3442	3445	3450	3452	3455	3458	3479	3498	3499	3501	3502	3503
	3513	3514	3515	3516	3535	3536	3537	3538	3566	3567	3569	3570	3573	3582	3583
	3584	3585	3607	3608	3609	3610	3643	3644	3646	3647	3650	3655	3656	3657	3658
	3660	3708	3709	3738	3740	3753	3754	3755	3757	3758	3761	3766	3771	3776	3778
	3816	3830	3844	3862	3863	3884	3885	3886	3888	3889	3892	3897	3902	3911	3912
	3913	3915	3932	3935	3968	3969	3971	3972	3973	3976	3980	3984	3985	3986	3987
	3996	4017	4018	4043	4049	4052	4053	4061	4065	4075	4084	4096	4098	4123	4124
	4125	4126	4130	4131	4134	4135	4149	4160	4163	4164	4172	4173	4174	4175	4176
	4190	4215	4216	4220	4223	4229	4237	4238	4243	4244	4245	4246	4266	4269	4275
	4276	4285	4296	4298	4313	4314	4318	4321	4327	4335	4336	4341	4342	4343	4344
	4364	4367	4373	4374	4383	4394	4396	4412	4426	4439	4444	4446	4455	4467	4468
	4474	4475	4530	4532	4540	4541	4542	4563	4565	4566	4568	4570	4572	4600	4604
	4610	4621	4622	4623	4625	4626	4628	4643	4645	4649	4650	4651	4653	4666	4681
	4682	4686	4688	4690	4698	4699	4705	4712	4721	4725	4726	4727	4728	4731	4733
	4750	4776	4779	4799	4800	4801	4802	4805	4807	4821	4840	4841	4858	4878	4879
	4881	4886	4887	4893	4895	4960	4963	4965	4967	4969	4973	4974	4976	4978	4979
	4981	4982	4984	4986	4988	4989	4991	4992							
MOVB	1420	1506	1556	1557	1744	1830	1837	1885	1913	1921	1935	1936	1938	2003	2031
	2032	2118	2119	2121	2125	2133	2138	2166	2210	2221	2246	2263	2403	2478	2526
	2620	2621	2656	3296	3338	3384	3456	3457	3511	3534	3580	3606	3669	3790	3873
	3923	3991	4014	4028	4177	4248	4283	4346	4381	4402	4407	4452	4636	4673	4674
	4689	4706	4762	4764	4785	4803	4804	4866							
MTPS	1418	1703	2653	3510	3578	3579	3600	3601	3666	3699	3866	3910	3992	4080	4179
	4249	4347	4531	4599	4642	4652	4697	4732							
NOP	1709	1758	1759	1760	2689	2691	2695	2697	2701	2703	2707	2709	3521	3522	3543
	3544	3590	3591	3615	3616	3667	3668	3700	3701	3945	3946				
RESET	1416	1756	2567	2661	2989										
ROL	1561	2312	2313	2314	2460	2467	2626	3308	3396	3469	3722	3827	4158		
ROR	1569	1612	2126	2536	2651	4153	4427	4428							
RORB	2527	2528	2529	2530	2531										

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CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

RTI	1838	1850	1890	2020	2073	2094	2104	2150	2178	2184	2192	2200	2281	2378	2410
	2440	2638	2669	3874	4033	4076	4297	4299	4395	4397	4421	4464	4479	4687	4691
RTS	4780	4787	4845	4868											
SEC	1647	1930	1980	2169	2329	2555	2672	4432	4896	4993					
SUB	1560	2625	3305	3393	3466	3466	3824	4157							
SWAB	1955	2219	2427	2665	4196	4196									
TRAP	1639	3162	3207	3309	3397	3470	3710	3828	4050	4270	4368	4447	4677	4709	4770
	1326	1328	1330	1332	1334	1336	1338	1340	1342	1344	1346	1348	1350	1352	1354
TST	1356														
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	2232	2236	2247	2252	2256	2269	2452	2484	2507	2539	2581	2604	2930	2940	2976
	2992	3144	3437	3670	3678	3692	3845	3908	4011	4092	4150	4217	4315	4469	4471
TSTB	4602	4605	4611	4629	4657	4738	4782	4890							
	1445	1449	1457	1517	1654	1799	1816	1870	1919	1942	1953	1966	2001	2007	2136
	2208	2230	2301	2308	2322	2618	2964	3137	3193	3196	3298	3386	3459	3673	3712
	3779	3817	4000	4037	4072	4436	4655	4663	4736	4747					
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.ASCIZ	988	1041	1648	2331	2338	2382	4950	5090							
.BLKB	1146														
.BLKW	1144	1206	1207	1208	1209	1210	1211	1213	1214	1215	1216	1217	1218	1220	1221
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	1239	1241	1242	1243	1244	1245	1246	1248	1249	1250	1251	1252	1253	1255	1256
	1257	1258	1259	1260	1262	1263	1264	1265	1266	1267	1269	1270	1271	1272	1273
	1274	1276	1277	1278	1279	1280	1281	1283	1284	1285	1286	1287	1288	1290	1291
	1292	1293	1294	1295	1297	1298	1299	1300	1301	1302	1304	1305	1306	1307	1308
.BYTE	1309	1311	1312	1313	1314	1315	1316								
	998	999	1004	1005	1013	1014	1022	1023	1024	1025	1057	1058	1068	1069	1076
	1077	1079	1080	1082	1083	1147	1154	1155	1156	1157	1158	1479	1480	1492	1493
	1504	1505	1546	1547	1602	1603	1635	1636	1689	1690	1766	1769	1772	1775	1981
	1982	1983	2078	2079	2152	2153	2283	2286	2335	2383	2385	2495	2495	4553	4554
.ENABL	4561	4562	4585	4586	4595	4596	4849	4850	5090						
.END	1	639													
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	1046	1068	1076	1079	1082	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094
	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1111	1181
	1183	1190	1203	1723	1724	1726	1745	1750	1753	1754	1756	1762	1764	1784	1787
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	1935	1936	1939	1966	1981	2343	2352	2353	2359	2365	2366	2376	2378	2382	2443
	2674	2676	2679	2681	2682	2684	2719	2722	2724	2725	2727	2749	2754	2756	2757
	2759	2781	2786	2788	2789	2791	2813	2818	2820	2821	2823	2845	2850	2852	2853
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	2958	2959	2961	2967	3001	3003	3009	3011	3012	3014	3040	3046	3048	3049	3051
	3069	3072	3074	3075	3077	3095	3098	3100	3101	3103	3121	3130	3133	3134	3136
	3178	3187	3189	3190	3192	3225	3229	3231	3232	3234	3259	3265	3267	3268	3270
	3272	3343	3347	3349	3350	3352	3354	3424	3431	3433	3434	3436	3440	3491	3495
	3497	3498	3500	3501	3531	3556	3558	3559	3563	3565	3566	3568	3569	3603	3629
	3631	3633	3640	3642	3643	3645	3646	3743	3750	3752	3753	3755	3757	3876	3881
	3883	3884	3886	3888	3961	3965	3967	3968	3970	3971	4105	4120	4122	4123	4126
	4148	4202	4205	4212	4214	4215	4217	4220	4229	4301	4303	4310	4312	4313	4315
	4318	4327	5090												
.EQUIV	663	664	672	687	688	717	718	719	720	721	722	723	724	725	726
	745	746	747	748	749	750	751	752	753	754					
.EVEN	1046	1148	1159	1648	1984	2333	2339	2382	2387	4950	5090				
.IF	639	640	661	727	755	969	972	974	991	995	997	1026	1034	1038	1039

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DZDZAB.P11MACY11 27(732) 03-NOV-76 15:03 PAGE 136
CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

	1042	1043	1045	1068	1076	1079	1082	1085	1086	1087	1088	1089	1090	1091	1092
	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107
	1111	1180	1182	1189	1203	1722	1723	1724	1725	1726	1728	1749	1752	1754	1756
	1762	1764	1783	1786	1790	1794	1802	1814	1816	1817	1818	1820	1822	1830	1832
	1834	1840	1841	1855	1876	1934	1936	1939	1966	1981	2342	2352	2353	2358	2365
	2366	2374	2376	2378	2382	2426	2675	2679	2680	2682	2683	2718	2722	2723	2725
	2726	2748	2754	2755	2757	2758	2780	2786	2787	2789	2790	2812	2818	2819	2821
	2822	2844	2850	2851	2853	2854	2876	2882	2883	2885	2886	2908	2913	2914	2916
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	3434	3435	3439	3490	3491	3495	3496	3498	3499	3500	3528	3554	3558	3559	3563
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	3751	3753	3754	3756	3875	3881	3882	3884	3885	3887	3960	3965	3966	3968	3969
	3970	4104	4120	4121	4123	4125	4147	4201	4202	4212	4213	4215	4216	4219	4227
	4300	4301	4310	4311	4313	4314	4317	4325	5090						
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	2426	2676	2679	2681	2682	2683	2684	2719	2722	2724	2725	2726	2727	2749	2754
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	3136	3178	3187	3189	3190	3191	3192	3225	3229	3231	3232	3233	3234	3259	3265
	3267	3268	3269	3270	3343	3347	3349	3350	3351	3352	3424	3431	3433	3434	3435
	3436	3491	3495	3497	3498	3499	3500	3528	3554	3559	3563	3565	3566	3567	3568
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	3881	3883	3884	3885	3886	3961	3965	3967	3968	3969	3970	4105	4120	4122	4123
	4125	4126	4202	4205	4212	4214	4215	4216	4217	4227	4301	4310	4312	4313	4314
	4327														
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	4216	4300	4310	4311	4314	5090									
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DZDZAB.P11MACY11 27(732) 03-NOV-76 15:03 PAGE 137
CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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	1745	1756	1778	1790	1989	2382	2674	2675	2679	2680	2682	2684	2718	2722	2723
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.MCALL	639	769	1043												
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	1336	1338	1340	1342	1344	1346	1348	1350	1352	1354	1356	1358	1407	1648	1715
	1745	1756	1778	1790	1989	2382	2674	2675	2679	2680	2682	2684	2718	2722	2723
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	2821	2823	2844	2850	2851	2853	2855	2876	2882	2883	2885	2887	2908	2913	2914
	2916	2918	2950	2956	2957	2959	2961	3002	3009	3010	3012	3014	3039	3046	3047
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	3753	3755	3875	3881	3882	3884	3886	3960	3965	3966	3968	3970	4104	4120	4121
	4123	4126	4201	4212	4213	4215	4217	4300	4310	4311	4313	4315	4522	4950	5090
.PAGE	941	989	1111	1150	1319	1361	1383	1407	1715	2443	2517	2674	4398	4434	4997
.REM	1														
.REPT	650	659	951	1028	1034	1205	1989								
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	1853	1932	2340	2674											
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	1017	1026	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1048	1049	1050
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	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102
	1103	1104	1105	1106	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171
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	1929	1964	2193	2265	2337	2375	2377	2413	2414	2415	4901	4902	4903	4904	4905
	4906	4907	4908	4909	4910	4911	4912	4913	4914	4915	4916	4917	4918	4919	4920
	4921	4922	4923	4924	4925	4926	4927	4928	4929	4930	4931				

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0*,DZDZAB.SEG/SOL/CRF/PAGNUM/NL:TOC=SYSMAC.CO,DZDZAB.P11
RUN-TIME: 57 76 11 SECONDS
RUN-TIME RATIO: 323/146=2.2
CORE USED: 51K (101 PAGES)

Speaker runtime 20 Seconds, 64 KCS, 599 disk reads, 4 disk writes, 133 pages

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 2nd Floor, New York, N.Y. 10019-1001. Phone: 212-260-1000. Telex: 270-0 SHAW (100) 1000000.

[illegible]