

DH11

SPEED SELECT LOGIC

MD-11-DZDHD-C

EP-DZDHD-C-DL-A

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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDHC-C-D
PRODUCT NAME: DH11 SPEED SELECTION LOGIC TEST
DATE: JUNE 1976
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: MICHAEL DAVIS

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NOTE: THE EXTERNAL CLOCK FUNCTIONS (SPEED CODES 16 AND 17) ARE NOT TESTED.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 FAMILY STANDARD COMPUTER WITH 4KW OF MEMORY
 ASR-33 TELETYPE OR EQUIVALENT
 DH11 ASYNCHRONOUS MULTIPLEXER
 CM11 MAINTENANCE CARD INSTALLED

2.2 STORAGE

THE PROGRAM LOADS INTO 4KW OF MEMORY

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING ABSOLUTE BINARY TAPES
 IS TO BE USED

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

4.1.1 AFTER PROGRAM LOAD (INITIAL PROGRAM START)

ALL CONSOLE SWITCHES DOWN

4.1.2 TO MODIFY DEVICE VECTOR AND CONTROL REGISTER ADDRESSES
AFTER PROGRAM RESTART

SW00=1

4.1.3 TO START PROGRAM AT SELECTED TEST AFTER PROGRAM RESTART

SW01=1

4.2 STARTING ADDRESS

THE STARTING ADDRESS FOR ALL TESTS IS 000200

THE RESTART ADDRESS FOR ALL TESTS IS 0002000

THE STARTING ADDRESS TO ENTER A SELECTED TEST IS 000200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 INITIAL PROGRAM START

4.3.1.1 LOAD PROGRAM INTO MEMORY

4.3.1.2 LOAD ADDRESS 000200

4.3.1.3 CLEAR CONSOLE SWITCHES

4.3.1.4 PRESS START

4.3.1.5 THE PROGRAM WILL TYPE "DH11 SPEED SELECTION LOGIC TEST"
AND WILL THEN TYPE "VECTOR ADDRESS-" AND WAIT FOR AN
INPUT FROM THE TELETYPE KEYBOARD.

4.3 (CONT'D)

4.3.1.6 TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
FOR THE DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>

NOTE: WORDS IN ANGLE BRACKETS, I.E. <CARRIAGE RETURN> MEAN THAT
THE TELETYPE KEY WITH THE NAMED FUNCTION SHOULD BE STRUCK

IF AN INCORRECT ADDRESS IS ENTERED, THE PROGRAM
WILL TYPE "?" AND WILL REPEAT THE SECOND MESSAGE OF 4.3.1.5
4.3.1.7 THE PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.1.9 TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER OF THE
DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>

IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL TYPE
"?" AND WILL THEN REPEAT THE MESSAGE OF 4.3.1.7
4.3.1.9 THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT IS
ABOUT TO START TESTING, AND THEN TESTING WILL BEGIN

4.3.2 PROGRAM RESTART WITH ALL SWITCHES DOWN

4.3.2.1 PERFORM 4.3.1.2 TO 4.3.1.5

4.3.2.2 THE PROGRAM WILL TYPE "DH11 SPEED SELECTION LOGIC TEST"
AND WILL THEN CONTINUE AS DESCRIBED IN 4.3.1.9

4.3.3 PROGRAM RESTART WITH SW00=1

4.3.3.1 LOAD ADDRESS 000200

4.3.3.2 SET SW01=1

4.3.3.3 PRESS START

4.3.3.4 THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1.5 TO 4.3.1.9

4.3.4 PROGRAM RESTART WITH SW01=1

4.3.4.1 LOAD ADDRESS 000200

4.3.4.2 SET SW01=1

4.3.4.3 PRESS START

4.3.4.4 THE PROGRAM WILL TYPE "DH11 SPEED SELECTION LOGIC TEST"
AND WILL THEN TYPE "TEST PC-" AND WILL WAIT FOR AN INPUT
FROM THE TELETYPE KEYBOARD

4.3.4.5 TYPE IN THE ADDRESS OF THE TEST AT WHICH THE PROGRAM IS TO
BE STARTED FOLLOWED BY <CARRIAGE RETURN>

4.3.4.6 THE PROGRAM WILL TYPE R TO INDICATE THAT IT HAS STARTED
AND WILL START TESTING AT THE SELECTED TEST.

NOTE: CARE MUST BE TAKEN WHEN THIS FEATURE IS USED, SINCE
THERE IS NO PROTECTION AGAINST SELECTING AN ADDRESS THAT
IS IN THE MIDDLE OF A TEST

NOTE: IF IT IS DESIRED TO LOOP ON THE TEST THAT IS SELECTED
SET SW14=1 BEFORE ENTERING THE TEST ADDRESS

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW15=1, HALT ON ERROR
 SW14=1, LOOP ON CURRENT TEST
 SW13=1, SUPPRESS ERROR TYPEOUT
 SW11=1, INHIBIT ITERATIONS
 SW10=1, ESCAPE TO NEXT TEST ON ERROR
 SW09=1, FREEZE VARIABLE PARAMETER IN CURRENT TEST
 SW01=1, START PROGRAM AT SELECTED TEST
 SW00=1, CHANGE PARAMETERS AT PROGRAM RESTART

5.2 SUBROUTINE ABSTRACTS

5.2.1 TRAPCATCHER (LOCATIONS 000000-000776)

THIS ROUTINE IS USED TO INTERCEPT UNEXPECTED INTERRUPTS AND TRAPS. THE AREA FROM 000000-000776 IS LOADED WITH THE FOLLOWING SEQUENCE

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IF AN UNEXPECTED INTERRUPT OR TRAP OCCURS, THE PROGRAM WILL HALT WITH THE PC 2 GREATER THAN THE ADDRESS TO WHICH THE PROGRAM TRAPPED. THE PROCESSOR STACK MAY BE EXAMINED TO DETERMINE WHERE THE PROGRAM WAS WHEN THE TRAP OR INTERRUPT OCCURED.

5.2.2 START (PROGRAM INITIALIZATION)

THIS ROUTINE INITIALIZES ALL PROGRAM FLAGS AND COUNTERS, TYPES THE PROGRAM TITLE MESSAGE, AND INPUTS THE VECTOR AND CONTROL REGISTER ADDRESSES OF THE DH11 TO BE TESTED.

5.2.3 BEGIN (PROGRAM START AND RESTART)

THIS ROUTINE IS ENTERED IMMEDIATELY AFTER "START" AND EACH TIME A PROGRAM PASS HAS BEEN COMPLETED. THE ROUTINE SETS UP THE PROCESSOR STACK AND STATUS WORD AND THEN TRANSFERS CONTROL TO THE TEST AT WHICH TESTING WILL BEGIN. IF SW01=0 WHEN THIS ROUTINE IS ENTERED TESTING WILL START AT T1 (TEST 1). IF SW01=1 WHEN THIS ROUTINE IS ENTERED, TESTING WILL START AT THE PC ENTERED FROM THE TELETYPE KEYBOARD.

5.2.4 EOP (END OF PASS)

THIS ROUTINE IS ENTERED ONCE PER PASS AFTER ALL TESTS HAVE BEEN COMPLETED. THIS ROUTINE TYPES THE MAINDEC IDENTIFICATION CODE OF THE PROGRAM, CLEARS ERROR FLAGS AND UPDATES THE PASS COUNT. IF THE PROGRAM WAS LOADED UNDER ACT11 OR DDP, THE ROUTINE CHECKS FOR RETURN TO THE ACT11 OR DDP MONITOR. IF THE PROGRAM IS NOT UNDER MONITOR CONTROL, THE ROUTINE TRANSFERS TO BEGIN.

5.2.5 SCOPER (SCOPE LOOP AND ITERATION HANDLER)

THIS ROUTINE IS ENTERED EACH TIME A TEST IS COMPLETED. THE ROUTINE CHECKS FOR THE FOLLOWING UPON ENTRY

- A) IF SW10=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST IN SEQUENCE, AFTER CLEARING ERROR FLAGS.
- B) IF SW11=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST IN SEQUENCE, AFTER CLEARING ERROR FLAGS.
- C) IF SW14=1, THE ROUTINE WILL LOOP ON THE CURRENT TEST REGARDLESS OF THE ITERATION COUNT.

IF NONE OF THE ABOVE IS TRUE, THE ROUTINE WILL ADD 1 TO THE COUNT OF TEST ITERATIONS, AND COMPARE THIS VALUE TO THE NUMBER OF ITERATIONS THAT SHOULD BE PERFORMED. IF THESE NUMBERS ARE EQUAL, THE ROUTINE WILL TRANSFER TO THE NEXT TEST IN SEQUENCE. IF THE NUMBERS ARE NOT EQUAL, THE TEST CURRENTLY IN PROGRESS WILL BE REPEATED.

5.2.6 SCOP1R (FREEZE ON CURRENT DATA)

THE CALL TO THIS ROUTINE FOLLOWS IMMEDIATELY AFTER THE CALL TO THE ERROR HANDLER IN THOSE TESTS THAT HAVE VARIABLE PARAMETERS. THIS ROUTINE IS ALWAYS ENTERED IN THOSE TESTS, WHETHER OR NOT AN ERROR OCCURS. IF SW09=1, THE ROUTINE WILL TRANSFER CONTROL BACK TO THE TEST AT A POINT WHICH WILL ALLOW REPEATING THE FUNCTION UNDER TEST CONTINUOUSLY WITH THE SAME DATA. IF THIS OPTION IS SELECTED, THE ROUTINE "SCOPER" IS NEVER ENTERED AND ITERATION COUNTS WILL NOT BE UPDATED.

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5.2.7 ERRORS (ERROR HANDLER)

THIS ROUTINE IS ENTERED UPON ERROR DETECTION ONLY.
WITH ALL CONSOLE SWITCHES DOWN, THE ROUTINE PROCEEDS AS FOLLOWS:

- A) THE PC OF THE INSTRUCTION THAT CALLED THE ERROR HANDLER IS ACCESSED THRU THE STACK, AND THEN THE EMT INSTRUCTION ITSELF IS FETCHED. THE 8 LSB OF THE EMT INSTRUCTION ARE THE ERROR CODE. THIS CODE IS USED TO ACCESS A TABLE OF ERROR MESSAGES AND ERROR DATA STORAGE LOCATIONS.
- B) IF THE TEST THAT FAILED DID NOT FAIL PREVIOUSLY DURING THIS PASS, A COMPLETE ERROR REPORT IS MADE IF THE TEST THAT FAILED FAILED MOR THAT ONCE DURING THE CURRENT PASS, ONLY THE DATA RELATING TO THE FAILUER IS TYPED. IF SW13=1, NO ERROR TYPEOUT IS MADE.
- C) THE ROUTINE NOW CHECKS FOR HALT ON ERROR. IF SW15=1 THE PROGRAM WILL HALT WITH THE PC OF THE CALL TO THE ERROR ROUTINE IN R0. IF SW15=0, THE PROGRAM WILL NOT HALT, BUT WILL CHECK FOR ESCAPE TO NEXT TEST.
- D) IF SW10=0, THE ROUTINE WILL RETURN TO THE TEST IN PROGRESS. IF SW10=1, THE ROUTINE WILL ABORT THE CURRENT TEST, AND TRANSFER TO THE NEXT TEST IN SEQUENCE, THRU THE ROUTINE "SCOPER".

5.2.8 TRPSRV (TRAP DECODE AND DISPATCH)

THIS ROUTINE DECODES THE 8 LSB OF THE TRAP INSTRUCTION THAT CAUSED TH PROGRAM INTERRUPT, AND TRANSFERS CONTROL TO THE ROUTINE THRU THE TABLE "TRPTAB" USING THE 8 LSB OF THE TRAP INSTRUCTION AS AN OFFSET TO THE POINTER TO THE ROUTINE TO BE ENTERED.

- 5.3 PROGRAM AND OR OPERATOR ACTION
- 5.3.1 PROGRAM START WITH ALL SWITCHES DOWN
- 5.3.1.1 REFER TO SECTIONS 4.3.1 AND 4.3.2 FOR INITIAL PROGRAM BEHAVIOR.
- 5.3.1.2 AFTER "R" HAS BEEN TYPED BY THE PROGRAM, TEST EXECUTION WILL BEGIN. EACH TEST WILL BE REPEATED A SELECTED NUMBER OF ITERATIONS (SEE LISTING FOR EXACT NUMBER FOR EACH TEST) AND THEN THE PROGRAM WILL PROCEED TO THE NEXT TEST.
- 5.3.1.3 WHEN ALL ITERATIONS HAVE BEEN COMPLETED, THE PROGRAM WILL TYPE "DZDHD" AND THEN RESTART TESTING AT TEST 1 (LOCATION T1 IN THE PROGRAM).
- 5.3.1.4 IF AN ERROR OCCURS, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR MESSAGE, AND THEN CONTINUE THE TEST IN PROGRESS.
- 5.3.2 PROGRAM START WITH SW00=1
- THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1 AND 5.3.1
- 5.3.3 PROGRAM START WITH SW01=1
- 5.3.3.1 REFER TO SECTION 4.3.4 FOR INITIAL PROGRAM BEHAVIOR
- 5.3.3.2 TEST EXECUTION WILL START AT THE ADDRESS SPECIFIED AND WILL CONTINUE AS DESCRIBED IN 5.3.1.2
- 5.3.3.3 AFTER "DZDHD" HAS BEEN TYPED, THE PROGRAM WILL RESUME TESTING AT TEST 1
- 5.3.4 PROGRAM OPERATION WITH SW15=1
- SAME AS 5.3.1, EXCEPT THAT IN THE CASE OF AN ERROR, THE PROGRAM WILL HALT AFTER THE ERROR TYPEOUT, AND THE PC+2 OF THE CALL TO THE ERROR ROUTINE WILL BE DISPLAYED IN R0.
- 5.3.5 PROGRAM OPERATION WITH SW13=1
- SAME AS 5.3.1 EXCEPT THAT NO ERROR TYPEOUTS WILL OCCUR
- 5.3.6 PROGRAM OPERATION WITH SW11=1
- SAME AS 5.3.1 EXCEPT THAT EACH TEST WILL BE REPEATED ONCE ONLY
- 5.3.7 PROGRAM OPERATION WITH SW10=1
- SAME AS 5.3.1, EXCEPT THAT IN THE CASE OF AN ERROR THE CURRENT TEST WILL BE ABORTED, AND THE PROGRAM WILL PROCEED TO THE NEXT TEST IN SEQUENCE.

5. (CONT'D)

5.3.8 PROGRAM OPERATION WITH SW14=1, OR SW09=1

THESE FUNCTIONS ARE NORMALLY USED FOR TROUBLE SHOOTING.
SEE SECTION 6.3 FOR THEIR USE.

6. ERRORS

6.1 ERROR HALTS

THE ERROR MESSAGE FORMAT FOR ALL ERROR TYPEOUTS
IS AS FOLLOWS

PC+2 MESSAGE
HEADER (IF APPLICABLE)
DATA (IF APPLICABLE)

WHERE

PC+2 IS THE ADDRESS OF THE CALL TO THE ERROR HANDLER + 2
MESSAGE IS AN ASCII MESSAGE DESCRIBING (BRIEFLY) THE FAILURE
HEADER IS A DESCRIPTION OF THE DATA TO FOLLOW
DATA IS OCTAL INFORMATION RELATING TO THE CAUSE OF THE FAILURE
IF THE SAME ERROR OCCURS IN A GIVEN TEST ON THE SAME
PASS, AND IF DATA IS ASSOCIATED WITH THAT ERROR, ONLY
DATA IS TYPE ON SUCCEEDING ERROR TYPEOUTS

IF NO DATA IS ASSOCIATED WITH THE ERROR
THE COMPLETE ERROR MESSAGE IS TYPED.

6.1.1 ERROR DESCRIPTIONS

SEE LISTING FOR DETAILS OF ERRORS

6.2 ERROR RECOVERY

6.2.1 SW15=0

IF THE PROGRAM IS RUN WITH SW15=0, NO OPERATOR ACTION IS
REQUIRED TO CONTINUE TESTING

6.2.2 SW15=1

IF THE PROGRAM IS RUN WITH SW15=1, TO CONTINUE TESTING
AFTER THE PROGRAM HAS HALTED, PRESS THE PROCESSOR
CONSOLE CONTINUE SWITCH

6.2.3 ILLEGAL INTERRUPTS

IF AN INTERRUPT OCCURS TO A VECTOR ADDRESS NOT
SELECTED DURING PROGRAM INITIALIZATION, THE PROGRAM WILL
HALT IN THE TRAPCATCHER. THE ADDRESS AT WHICH
THE PROGRAM HALTS IS 2 GREATER THAN THE ADDRESS
TO WHICH THE INTERRUPT OCCURED. THE PROGRAM MUST BE
RESTARTED AT 200 TO RECOVER FROM THIS ERROR.

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6.3 SCOPE LOOPING

6.3.1 TO SCOPE ON A SPECIFIC TEST, SET SW14=1 AND SW13=1
THIS WILL CAUSE THE PROGRAM TO CONTINUOUSLY LOOP ON THE
SAME TEST, AND WILL CAUSE ALL ERROR TYPEOUTS TO BE INHIBITED

6.3.2 TO SCOPE ON A SPECIFIC VALUE OF A PARAMETER WITHIN
A TEST, SET SW09=1 TO FREEZE THE DATA
(SEE LISTING FOR THOSE TESTS THAT INCORPORATE THIS FEATURE)

6. (CONT'D)

6.3.3 PROGRAM START TO SCOPE LOOP ON SELECTED TEST
PERFORM SECTION 4.3.4 WITH SW14=1

7. RESTRICTIONS

7.1 STARTING

THE DH11 TEST CARD MUST BE INSTALLED

7.2 RUNNING

NONE

8. MISCELLANEOUS

8.1 EXECUTION TIME

THE TIME FOR ONE PASS OF THE PROGRAM (END OF
TYPEOUT OF DZDHD TO END OF TYPEOUT OF DZDHD)
IS GIVEN FOR VARIOUS PROCESSORS IN THE TABLE BELOW

PROCESSOR	TIME
PDP-11/05,10	
PDP-11/20	
PDP-11/40	
PDP-11/45	

9. PROGRAM DESCRIPTION

TRANSMITTER LINE SPEED SELECTION IS TESTED ON A LINE BY LINE BASIS USING A RELATIVE TIMING TECHNIQUE TO DETERMINE IF SPEED SELECTION FOR A SELECTED LINE IS CORRECT.

THE TEST PROCEEDS AS FOLLOWS:

A SPEED OF 50 BAUD IS SET FOR A SELECTED LINE, AND A COUNT IS RECORDED FROM THE TIME THAT THE BAR BIT IS SET FOR THAT LINE TO THE TIME THAT TRANSMITTER DONE IS SET. THREE CHARACTERS ARE TRANSMITTED. AT THE SAME TIME, A TIMEOUT COUNTER IS STARTED. IF THE TIMEOUT COUNTER DECREMENTS TO 0 BEFORE TRANSMITTER DONE IS RECEIVED, AN ERROR MESSAGE IS REPORTED. IF THE TIMEOUT DOES NOT OCCUR, THE TIME COUNT IS STORED, AND THE NEXT LINE SPEED IS SELECTED. TRANSMISSION IS RESTARTED AND THE TIME COUNT, AND TIMEOUT ARE RESTARTED. WHEN TRANSMITTER DONE IS RECEIVED, THE TIME COUNTS FOR THE CURRENT SPEED AND THE PREVIOUS SPEED ARE COMPARED. IF THE TIME COUNT FOR THE CURRENT SPEED IS GREATER THAN OR EQUAL TO THE COUNT FOR THE PREVIOUS SPEED, A TIMING ERROR HAS OCCURED, SINCE A HIGHER SELECTED BAUD RATE SHOULD MEAN THAT THE NUMBER OF COUNTS RECORDED IS LESS THAN AT A LOWER BAUD RATE. THIS PROCEDURE IS REPEATED FOR ALL SPEED CODES 1-15.

THE NEXT GROUP OF TESTS VERIFIES THAT RECEIVER SPEED SELECTION IS CORRECT, BY USING A RELATIVE TIMING COMPARISON AS DESCRIBED ABOVE. A CHARACTER IS TRANSMITTED AS ABOVE AND THE TIME FROM THE START OF TRANSMISSION TO THE TIME THAT CHARACTER AVAILABLE IS RECEIVED IS RECORDED. ALSO, THE TIMEOUT COUNT IS DECREMENTED. IF THE TIMEOUT COUNTER DECREMENTS TO 0 BEFORE CHARACTER AVAILABLE OCCURS, AN ERROR HAS OCCURED. THE PROCEDURE IS REPEATED AT THE NEXT HIGHEST BAUD RATE AND A COMPARISON IS MADE AS IN THE TRANSMITTER TESTS IF THE TIME COUNT AT THE PRESENT BAUD RATE IS GREATER THAN OR EQUAL TO THE PREVIOUS BAUD RATE, AN ERROR HAS OCCURED.

10. LISTING

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;DH11 SPEED SELECTION LOGIC TEST
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;STARTING PROCEDURE
;LOAD PROGRAM
;LOAD ADDRESS 000200
;PRESS START
;PROGRAM WILL TYPE DH11 SPEED SELECTION LOGIC TEST
;PROGRAM WILL TYPE "VECTOR ADDRESS-"
;TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR

MO1

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DZDHD.C.PFC

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512      ;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
513      ;PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
514      ;TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
515      ;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
516      ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
517      ;AT THE END OF A PASS, PROGRAM WILL TYPE " DZDHD "
518      ;AND THEN RESUM TESTING

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;SWITCH REGISTER OPTIONS

520		SW15=100000	;=1,HALT ON ERROR
521		SW14=40000	;=1,LOOP ON CURRENT TEST
522		SW13=20000	;=1,INHIBIT ERROR TYPEOUT
523	100000	SW12=10000	
524	040000	SW11=4000	;=1,INHIBIT ITERATIONS
525	020000	SW10=2000	;=1,ESCAPE TO NEXT TEST ON ERROR
526	010000	SW09=1000	;=1,LOOP WITH CURRENT DATA
527	004000	SW08=400	
528	002000	SW06=100	
529	001000	SW05=40	
530	000400	SW04=20	
531	000100	SW03=10	
532	000040	SW02=4	
533	000020	SW01=2	
534	000010	SW00=1	
535	000004		;RESTART PROGRAM AT SELECTED TEST
536	000002		;RESELECT VECTOR AND CONTROL REGISTER
537	000001		;ADDRESS AFTER PROGRAM RESTART
538			

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539
540
541      ;REGISTER DEFINITIONS
542
543      000000      R0=%0      ;GENERAL REGISTER
544      000001      R1=%1      ;GENERAL REGISTER
545      000002      R2=%2      ;GENERAL REGISTER
546      000003      R3=%3      ;GENERAL REGISTER
547      000004      R4=%4      ;GENERAL REGISTER
548      000005      R5=%5      ;GENERAL REGISTER
549      000006      SP=%6      ;PROCESSOR STACK POINTER
550      000007      PC=%7      ;PROGRAM COUNTER
551
552      ;LOCATION EQUIVALENCIES
553
554      177570      SWR=177570      ;CONSOLE SWITCH REGISTER
555      177570      LIGHTS=177570      ;PDP-11/45 DISPLAY REGISTER
556      177776      PS=177776      ;PROCESSOR STATUS WORD
557      014734      STACK=ENDCOD+200;START OF PROCESSOR STACK
558
559      ;INSTRUCTION DEFINITIONS
560
561      005746      PUSH1SP=5746      ;DECREMENT PROCESSOR STACK 1 WORD
562      005726      POP1SP=5726      ;INCREMENT PROCESSOR STACK 1 WORD
563      010046      PUSHRO=10046      ;SAVE R0 ON STACK
564      012600      POPRO=12600      ;RESTORE R0 FROM STACK
565      024646      PUSH2SP=24646      ;DECREMENT STACK TWICE
566      022626      POP2SP=22626      ;INCREMENT STACK TWICE
567      .EQUIV EMT,HLT ;BASIC DEFINITION OF ERROR CALL
568
569
570      100000      BIT15=100000
571      040000      BIT14=40000
572      020000      BIT13=20000
573      010000      BIT12=10000
574      004000      BIT11=4000
575      002000      BIT10=2000
576      001000      BIT09=1000
577      000400      BIT08=400
578      000200      BIT07=200
579      000100      BIT06=100
580      000040      BIT05=40
581      000020      BIT04=20
582      000010      BIT03=10
583      000004      BIT02=4
584      000002      BIT01=2
585      000001      BIT00=1

```

588	000000	000000	.+2	: UNEXPECTED TRAP TO THIS LOCATION
589	000002	000002	HALT	: EXAMINE STACK TO FIND CAUSE
590	000004	000006	.+2	: UNEXPECTED TRAP TO THIS LOCATION
591	000006	000008	HALT	: EXAMINE STACK TO FIND CAUSE
592	000010	000012	.+2	: UNEXPECTED TRAP TO THIS LOCATION
593	000012	000014	HALT	: EXAMINE STACK TO FIND CAUSE
594	000014	000016	.+2	: UNEXPECTED TRAP TO THIS LOCATION
595	000016	000018	HALT	: EXAMINE STACK TO FIND CAUSE
596	000020	000022	.+2	: UNEXPECTED TRAP TO THIS LOCATION
597	000022	000024	HALT	: EXAMINE STACK TO FIND CAUSE
598	000024	000026	.+2	: UNEXPECTED TRAP TO THIS LOCATION
599	000026	000028	HALT	: EXAMINE STACK TO FIND CAUSE
600	000030	000032	.+2	: UNEXPECTED TRAP TO THIS LOCATION
601	000032	000034	HALT	: EXAMINE STACK TO FIND CAUSE
602	000034	000036	.+2	: UNEXPECTED TRAP TO THIS LOCATION
603	000036	000038	HALT	: EXAMINE STACK TO FIND CAUSE
604	000040	000042	.+2	: UNEXPECTED TRAP TO THIS LOCATION
605	000042	000044	HALT	: EXAMINE STACK TO FIND CAUSE
606	000044	000046	.+2	: UNEXPECTED TRAP TO THIS LOCATION
607	000046	000048	HALT	: EXAMINE STACK TO FIND CAUSE
608	000050	000052	.+2	: UNEXPECTED TRAP TO THIS LOCATION
609	000052	000054	HALT	: EXAMINE STACK TO FIND CAUSE
610	000054	000056	.+2	: UNEXPECTED TRAP TO THIS LOCATION
611	000056	000058	HALT	: EXAMINE STACK TO FIND CAUSE
612	000060	000062	.+2	: UNEXPECTED TRAP TO THIS LOCATION
613	000062	000064	HALT	: EXAMINE STACK TO FIND CAUSE
614	000064	000066	.+2	: UNEXPECTED TRAP TO THIS LOCATION
615	000066	000068	HALT	: EXAMINE STACK TO FIND CAUSE
616	000070	000072	.+2	: UNEXPECTED TRAP TO THIS LOCATION
617	000072	000074	HALT	: EXAMINE STACK TO FIND CAUSE
618	000074	000076	.+2	: UNEXPECTED TRAP TO THIS LOCATION
619	000076	000078	HALT	: EXAMINE STACK TO FIND CAUSE
620	000100	000102	.+2	: UNEXPECTED TRAP TO THIS LOCATION
621	000102	000104	HALT	: EXAMINE STACK TO FIND CAUSE
622	000104	000106	.+2	: UNEXPECTED TRAP TO THIS LOCATION
623	000106	000108	HALT	: EXAMINE STACK TO FIND CAUSE
624	000110	000112	.+2	: UNEXPECTED TRAP TO THIS LOCATION
625	000112	000114	HALT	: EXAMINE STACK TO FIND CAUSE
626	000114	000116	.+2	: UNEXPECTED TRAP TO THIS LOCATION
627	000116	000118	HALT	: EXAMINE STACK TO FIND CAUSE
628	000120	000122	.+2	: UNEXPECTED TRAP TO THIS LOCATION
629	000122	000124	HALT	: EXAMINE STACK TO FIND CAUSE
630	000124	000126	.+2	: UNEXPECTED TRAP TO THIS LOCATION
631	000126	000128	HALT	: EXAMINE STACK TO FIND CAUSE
632	000130	000132	.+2	: UNEXPECTED TRAP TO THIS LOCATION
633	000132	000134	HALT	: EXAMINE STACK TO FIND CAUSE
634	000134	000136	.+2	: UNEXPECTED TRAP TO THIS LOCATION
635	000136	000138	HALT	: EXAMINE STACK TO FIND CAUSE
636	000140	000142	.+2	: UNEXPECTED TRAP TO THIS LOCATION
637	000142	000144	HALT	: EXAMINE STACK TO FIND CAUSE
638	000144	000146	.+2	: UNEXPECTED TRAP TO THIS LOCATION
639	000146	000148	HALT	: EXAMINE STACK TO FIND CAUSE
640	000150	000152	.+2	: UNEXPECTED TRAP TO THIS LOCATION
641	000152	000154	HALT	: EXAMINE STACK TO FIND CAUSE

: TRAPCATCHER FOR ILLEGAL INTERRUPTS

.=0

642	000154	000156	.+2	:UNEXPECTED TRAP TO THIS LOCATION
643	000156	000000	HALT	:EXAMINE STACK TO FIND CAUSE
644	000160	000162	.+2	:UNEXPECTED TRAP TO THIS LOCATION
645	000162	000000	HALT	:EXAMINE STACK TO FIND CAUSE
646	000164	000156	.+2	:UNEXPECTED TRAP TO THIS LOCATION
647	000166	000000	HALT	:EXAMINE STACK TO FIND CAUSE
648	000170	000172	.+2	:UNEXPECTED TRAP TO THIS LOCATION
649	000172	000000	HALT	:EXAMINE STACK TO FIND CAUSE
650	000174	000176	.+2	:UNEXPECTED TRAP TO THIS LOCATION
651	000176	000000	HALT	:EXAMINE STACK TO FIND CAUSE
652	000200	000202	.+2	:UNEXPECTED TRAP TO THIS LOCATION
653	000202	000000	HALT	:EXAMINE STACK TO FIND CAUSE
654	000204	000206	.+2	:UNEXPECTED TRAP TO THIS LOCATION
655	000206	000000	HALT	:EXAMINE STACK TO FIND CAUSE
656	000210	000212	.+2	:UNEXPECTED TRAP TO THIS LOCATION
657	000212	000000	HALT	:EXAMINE STACK TO FIND CAUSE
658	000214	000216	.+2	:UNEXPECTED TRAP TO THIS LOCATION
659	000216	000000	HALT	:EXAMINE STACK TO FIND CAUSE
660	000220	000222	.+2	:UNEXPECTED TRAP TO THIS LOCATION
661	000222	000000	HALT	:EXAMINE STACK TO FIND CAUSE
662	000224	000226	.+2	:UNEXPECTED TRAP TO THIS LOCATION
663	000226	000000	HALT	:EXAMINE STACK TO FIND CAUSE
664	000230	000232	.+2	:UNEXPECTED TRAP TO THIS LOCATION
665	000232	000000	HALT	:EXAMINE STACK TO FIND CAUSE
666	000234	000236	.+2	:UNEXPECTED TRAP TO THIS LOCATION
667	000236	000000	HALT	:EXAMINE STACK TO FIND CAUSE
668	000240	000242	.+2	:UNEXPECTED TRAP TO THIS LOCATION
669	000242	000000	HALT	:EXAMINE STACK TO FIND CAUSE
670	000244	000246	.+2	:UNEXPECTED TRAP TO THIS LOCATION
671	000246	000000	HALT	:EXAMINE STACK TO FIND CAUSE
672	000250	000252	.+2	:UNEXPECTED TRAP TO THIS LOCATION
673	000252	000000	HALT	:EXAMINE STACK TO FIND CAUSE
674	000254	000256	.+2	:UNEXPECTED TRAP TO THIS LOCATION
675	000256	000000	HALT	:EXAMINE STACK TO FIND CAUSE
676	000260	000262	.+2	:UNEXPECTED TRAP TO THIS LOCATION
677	000262	000000	HALT	:EXAMINE STACK TO FIND CAUSE
678	000264	000266	.+2	:UNEXPECTED TRAP TO THIS LOCATION
679	000266	000000	HALT	:EXAMINE STACK TO FIND CAUSE
680	000270	000272	.+2	:UNEXPECTED TRAP TO THIS LOCATION
681	000272	000000	HALT	:EXAMINE STACK TO FIND CAUSE
682	000274	000276	.+2	:UNEXPECTED TRAP TO THIS LOCATION
683	000276	000000	HALT	:EXAMINE STACK TO FIND CAUSE
684	000300	000302	.+2	:UNEXPECTED TRAP TO THIS LOCATION
685	000302	000000	HALT	:EXAMINE STACK TO FIND CAUSE
686	000304	000306	.+2	:UNEXPECTED TRAP TO THIS LOCATION
687	000306	000000	HALT	:EXAMINE STACK TO FIND CAUSE
688	000310	000312	.+2	:UNEXPECTED TRAP TO THIS LOCATION
689	000312	000000	HALT	:EXAMINE STACK TO FIND CAUSE
690	000314	000316	.+2	:UNEXPECTED TRAP TO THIS LOCATION
691	000316	000000	HALT	:EXAMINE STACK TO FIND CAUSE
692	000320	000322	.+2	:UNEXPECTED TRAP TO THIS LOCATION
693	000322	000000	HALT	:EXAMINE STACK TO FIND CAUSE
694	000324	000326	.+2	:UNEXPECTED TRAP TO THIS LOCATION
695	000326	000000	HALT	:EXAMINE STACK TO FIND CAUSE
696	000330	000332	.+2	:UNEXPECTED TRAP TO THIS LOCATION
697	000332	000000	HALT	:EXAMINE STACK TO FIND CAUSE

698	000334	000336	.+2	:UNEXPECTED TRAP TO THIS LOCATION
699	000336	000000	HALT	:EXAMINE STACK TO FIND CAUSE
700	000340	000342	.+2	:UNEXPECTED TRAP TO THIS LOCATION
701	000342	000000	HALT	:EXAMINE STACK TO FIND CAUSE
702	000344	000346	.+2	:UNEXPECTED TRAP TO THIS LOCATION
703	000346	000000	HALT	:EXAMINE STACK TO FIND CAUSE
704	000350	000352	.+2	:UNEXPECTED TRAP TO THIS LOCATION
705	000352	000000	HALT	:EXAMINE STACK TO FIND CAUSE
706	000354	000356	.+2	:UNEXPECTED TRAP TO THIS LOCATION
707	000356	000000	HALT	:EXAMINE STACK TO FIND CAUSE
708	000360	000362	.+2	:UNEXPECTED TRAP TO THIS LOCATION
709	000362	000000	HALT	:EXAMINE STACK TO FIND CAUSE
710	000364	000366	.+2	:UNEXPECTED TRAP TO THIS LOCATION
711	000366	000000	HALT	:EXAMINE STACK TO FIND CAUSE
712	000370	000372	.+2	:UNEXPECTED TRAP TO THIS LOCATION
713	000372	000000	HALT	:EXAMINE STACK TO FIND CAUSE
714	000374	000376	.+2	:UNEXPECTED TRAP TO THIS LOCATION
715	000376	000000	HALT	:EXAMINE STACK TO FIND CAUSE
716	000400	000402	.+2	:UNEXPECTED TRAP TO THIS LOCATION
717	000402	000000	HALT	:EXAMINE STACK TO FIND CAUSE
718	000404	000406	.+2	:UNEXPECTED TRAP TO THIS LOCATION
719	000406	000000	HALT	:EXAMINE STACK TO FIND CAUSE
720	000410	000412	.+2	:UNEXPECTED TRAP TO THIS LOCATION
721	000412	000000	HALT	:EXAMINE STACK TO FIND CAUSE
722	000414	000416	.+2	:UNEXPECTED TRAP TO THIS LOCATION
723	000416	000000	HALT	:EXAMINE STACK TO FIND CAUSE
724	000420	000422	.+2	:UNEXPECTED TRAP TO THIS LOCATION
725	000422	000000	HALT	:EXAMINE STACK TO FIND CAUSE
726	000424	000426	.+2	:UNEXPECTED TRAP TO THIS LOCATION
727	000426	000000	HALT	:EXAMINE STACK TO FIND CAUSE
728	000430	000432	.+2	:UNEXPECTED TRAP TO THIS LOCATION
729	000432	000000	HALT	:EXAMINE STACK TO FIND CAUSE
730	000434	000436	.+2	:UNEXPECTED TRAP TO THIS LOCATION
731	000436	000000	HALT	:EXAMINE STACK TO FIND CAUSE
732	000440	000442	.+2	:UNEXPECTED TRAP TO THIS LOCATION
733	000442	000000	HALT	:EXAMINE STACK TO FIND CAUSE
734	000444	000446	.+2	:UNEXPECTED TRAP TO THIS LOCATION
735	000446	000000	HALT	:EXAMINE STACK TO FIND CAUSE
736	000450	000452	.+2	:UNEXPECTED TRAP TO THIS LOCATION
737	000452	000000	HALT	:EXAMINE STACK TO FIND CAUSE
738	000454	000456	.+2	:UNEXPECTED TRAP TO THIS LOCATION
739	000456	000000	HALT	:EXAMINE STACK TO FIND CAUSE
740	000460	000462	.+2	:UNEXPECTED TRAP TO THIS LOCATION
741	000462	000000	HALT	:EXAMINE STACK TO FIND CAUSE
742	000464	000466	.+2	:UNEXPECTED TRAP TO THIS LOCATION
743	000466	000000	HALT	:EXAMINE STACK TO FIND CAUSE
744	000470	000472	.+2	:UNEXPECTED TRAP TO THIS LOCATION
745	000472	000000	HALT	:EXAMINE STACK TO FIND CAUSE
746	000474	000476	.+2	:UNEXPECTED TRAP TO THIS LOCATION
747	000476	000000	HALT	:EXAMINE STACK TO FIND CAUSE
748	000500	000502	.+2	:UNEXPECTED TRAP TO THIS LOCATION
749	000502	000000	HALT	:EXAMINE STACK TO FIND CAUSE
750	000504	000506	.+2	:UNEXPECTED TRAP TO THIS LOCATION
751	000506	000000	HALT	:EXAMINE STACK TO FIND CAUSE
752	000510	000512	.+2	:UNEXPECTED TRAP TO THIS LOCATION
753	000512	000000	HALT	:EXAMINE STACK TO FIND CAUSE

754	000514	000516	.+2	; UNEXPECTED TRAP TO THIS LOCATION
755	000516	000000	HALT	; EXAMINE STACK TO FIND CAUSE
756	000520	000522	.+2	; UNEXPECTED TRAP TO THIS LOCATION
757	000522	000000	HALT	; EXAMINE STACK TO FIND CAUSE
758	000524	000526	.+2	; UNEXPECTED TRAP TO THIS LOCATION
759	000526	000000	HALT	; EXAMINE STACK TO FIND CAUSE
760	000530	000532	.+2	; UNEXPECTED TRAP TO THIS LOCATION
761	000532	000000	HALT	; EXAMINE STACK TO FIND CAUSE
762	000534	000536	.+2	; UNEXPECTED TRAP TO THIS LOCATION
763	000536	000000	HALT	; EXAMINE STACK TO FIND CAUSE
764	000540	000542	.+2	; UNEXPECTED TRAP TO THIS LOCATION
765	000542	000000	HALT	; EXAMINE STACK TO FIND CAUSE
766	000544	000546	.+2	; UNEXPECTED TRAP TO THIS LOCATION
767	000546	000000	HALT	; EXAMINE STACK TO FIND CAUSE
768	000550	000552	.+2	; UNEXPECTED TRAP TO THIS LOCATION
769	000552	000000	HALT	; EXAMINE STACK TO FIND CAUSE
770	000554	000556	.+2	; UNEXPECTED TRAP TO THIS LOCATION
771	000556	000000	HALT	; EXAMINE STACK TO FIND CAUSE
772	000560	000562	.+2	; UNEXPECTED TRAP TO THIS LOCATION
773	000562	000000	HALT	; EXAMINE STACK TO FIND CAUSE
774	000564	000566	.+2	; UNEXPECTED TRAP TO THIS LOCATION
775	000566	000000	HALT	; EXAMINE STACK TO FIND CAUSE
776	000570	000572	.+2	; UNEXPECTED TRAP TO THIS LOCATION
777	000572	000000	HALT	; EXAMINE STACK TO FIND CAUSE
778	000574	000576	.+2	; UNEXPECTED TRAP TO THIS LOCATION
779	000576	000000	HALT	; EXAMINE STACK TO FIND CAUSE
780	000600	000602	.+2	; UNEXPECTED TRAP TO THIS LOCATION
781	000602	000000	HALT	; EXAMINE STACK TO FIND CAUSE
782	000604	000606	.+2	; UNEXPECTED TRAP TO THIS LOCATION
783	000606	000000	HALT	; EXAMINE STACK TO FIND CAUSE
784	000610	000612	.+2	; UNEXPECTED TRAP TO THIS LOCATION
785	000612	000000	HALT	; EXAMINE STACK TO FIND CAUSE
786	000614	000616	.+2	; UNEXPECTED TRAP TO THIS LOCATION
787	000616	000000	HALT	; EXAMINE STACK TO FIND CAUSE
788	000620	000622	.+2	; UNEXPECTED TRAP TO THIS LOCATION
789	000622	000000	HALT	; EXAMINE STACK TO FIND CAUSE
790	000624	000626	.+2	; UNEXPECTED TRAP TO THIS LOCATION
791	000626	000000	HALT	; EXAMINE STACK TO FIND CAUSE
792	000630	000632	.+2	; UNEXPECTED TRAP TO THIS LOCATION
793	000632	000000	HALT	; EXAMINE STACK TO FIND CAUSE
794	000634	000636	.+2	; UNEXPECTED TRAP TO THIS LOCATION
795	000636	000000	HALT	; EXAMINE STACK TO FIND CAUSE
796	000640	000642	.+2	; UNEXPECTED TRAP TO THIS LOCATION
797	000642	000000	HALT	; EXAMINE STACK TO FIND CAUSE
798	000644	000646	.+2	; UNEXPECTED TRAP TO THIS LOCATION
799	000646	000000	HALT	; EXAMINE STACK TO FIND CAUSE
800	000650	000652	.+2	; UNEXPECTED TRAP TO THIS LOCATION
801	000652	000000	HALT	; EXAMINE STACK TO FIND CAUSE
802	000654	000656	.+2	; UNEXPECTED TRAP TO THIS LOCATION
803	000656	000000	HALT	; EXAMINE STACK TO FIND CAUSE
804	000660	000662	.+2	; UNEXPECTED TRAP TO THIS LOCATION
805	000662	000000	HALT	; EXAMINE STACK TO FIND CAUSE
806	000664	000666	.+2	; UNEXPECTED TRAP TO THIS LOCATION
807	000666	000000	HALT	; EXAMINE STACK TO FIND CAUSE
808	000670	000672	.+2	; UNEXPECTED TRAP TO THIS LOCATION
809	000672	000000	HALT	; EXAMINE STACK TO FIND CAUSE

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 DZCHDC.PFC

910	000674	000676	.+2	;UNEXPECTED TRAP TO THIS LOCATION
911	000676	000000	HALT	;EXAMINE STACK TO FIND CAUSE
912	000700	000702	.+2	;UNEXPECTED TRAP TO THIS LOCATION
913	000702	000000	HALT	;EXAMINE STACK TO FIND CAUSE
914	000704	000706	.+2	;UNEXPECTED TRAP TO THIS LOCATION
915	000706	000000	HALT	;EXAMINE STACK TO FIND CAUSE
916	000710	000712	.+2	;UNEXPECTED TRAP TO THIS LOCATION
917	000712	000000	HALT	;EXAMINE STACK TO FIND CAUSE
919	000714	000716	.+2	;UNEXPECTED TRAP TO THIS LOCATION
919	000716	000000	HALT	;EXAMINE STACK TO FIND CAUSE
920	000720	000722	.+2	;UNEXPECTED TRAP TO THIS LOCATION
921	000722	000000	HALT	;EXAMINE STACK TO FIND CAUSE
922	000724	000726	.+2	;UNEXPECTED TRAP TO THIS LOCATION
923	000726	000000	HALT	;EXAMINE STACK TO FIND CAUSE
924	000730	000732	.+2	;UNEXPECTED TRAP TO THIS LOCATION
925	000732	000000	HALT	;EXAMINE STACK TO FIND CAUSE
926	000734	000736	.+2	;UNEXPECTED TRAP TO THIS LOCATION
927	000736	000000	HALT	;EXAMINE STACK TO FIND CAUSE
928	000740	000742	.+2	;UNEXPECTED TRAP TO THIS LOCATION
929	000742	000000	HALT	;EXAMINE STACK TO FIND CAUSE
930	000744	000746	.+2	;UNEXPECTED TRAP TO THIS LOCATION
931	000746	000000	HALT	;EXAMINE STACK TO FIND CAUSE
932	000750	000752	.+2	;UNEXPECTED TRAP TO THIS LOCATION
933	000752	000000	HALT	;EXAMINE STACK TO FIND CAUSE
934	000754	000756	.+2	;UNEXPECTED TRAP TO THIS LOCATION
935	000756	000000	HALT	;EXAMINE STACK TO FIND CAUSE
936	000760	000762	.+2	;UNEXPECTED TRAP TO THIS LOCATION
937	000762	000000	HALT	;EXAMINE STACK TO FIND CAUSE
938	000764	000766	.+2	;UNEXPECTED TRAP TO THIS LOCATION
939	000766	000000	HALT	;EXAMINE STACK TO FIND CAUSE
940	000770	000772	.+2	;UNEXPECTED TRAP TO THIS LOCATION
941	000772	000000	HALT	;EXAMINE STACK TO FIND CAUSE
942	000774	000776	.+2	;UNEXPECTED TRAP TO THIS LOCATION
943	000776	000000	HALT	;EXAMINE STACK TO FIND CAUSE

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844                                     ; STANDARD INTERRUPT VECTORS
845
846
847                                     . = 24
848 000024 013732 PFAIL ; POWER FAIL HANDLER
849 000026 000340 340 ; SERVICE AT LEVEL 7
850 000030 012564 ERRORS ; ERROR HANDLER
851 000032 000340 340 ; SERVICE AT LEVEL 7
852 000034 012766 TRPSRV ; GENERAL HANDLER DISPATCH SERVICE
853 000036 000340 340 ; SERVICE AT LEVEL 7
854                                     . = 200
855 000200 000167 000574 JMP START ; GO TO START OF PROGRAM
856
857
858
859 ; DEFINITIONS FOR TRAP SUBROUTINE CALLS
860 ; POINTERS TO SUBROUTINES CAN BE FOUND STARTING
861 ; AT LOCATION "TRPTAB"
862
863 104400 SCOPE=TRAP+Y ; SCOPE LOOP AND ITERATION HANDLER
864 104401 TYPE=TRAP+Y ; TELETYPE OUTPUT ROUTINE
865 104402 OCTASC=TRAP+Y ; OCTAL TO ASCII CONVERSION
866 104403 INSTR=TRAP+Y ; INPUT ASCII STRING
867 104404 INSTER=TRAP+Y ; STRING INPUT ERROR
868 104405 PARAM=TRAP+Y ; CONVERT STRING TO OCTAL, CHECK LIMITS
869 104406 SAVOSP=TRAP+Y ; SAVE R0-R5, PC
870 104407 RESOS=TRAP+Y ; RESTORE R0-R5
871 104410 SCOPE1=TRAP+Y ; CHECK FOR FREEZE ON CURRENT DATA

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872          001000          .=1000
873
874          ;PROGRAM INITIALIZATION
875          ;LOCK OUT INTERRUPTS
876          ;SET UP PROCESSOR STACK
877          ;SET UP POWER FAIL VECTOR
878          ;CLEAR PROGRAM FLAGS AND COUNTS
879          ;TYPE TITLE MESSAGE
880
881 001000 012767 000340 176770 START: MOV      #340,PS          ;LOCK OUT INTERRUPTS
882 001006 012706 014734          MOV      #STACK,SP          ;SET UP PROCESSOR STACK
883 001012 012737 013732 000024 MOV      #PFAIL,2#24          ;SET UP POWER FAIL TRAP
884 001020 005067 012670          CLR      STFLG              ;CLEAR TEST START FLAG
885 001024 005067 012624          CLR      PASCNT              ;CLEAR PASS COUNT
886 001030 005067 012622          CLR      ERRCNT              ;CLEAR ERROR COUNT
887 001034 005067 012612          CLR      ERRFLG              ;CLEAR ERROR FLAG
888 001040 005067 012606          CLR      ERRFLG              ;CLEAR LAST ERROR PC
889 001044 104401 014076          TYPE      ,MTITLE            ;TYPE TITLE MESSAGE
890 001050 005767 012636          TST      INIFLG              ;CHECK INITIALIZATION FLAG
891 001054 001001          BNE      VEC1                        ;IF NOT 0, CHECK SWITCHES
892                                     ;FOR REINITIALIZATION
893 001056 000404          BR      VEC2
894 001060 032767 000001 176502 VEC1: BIT      #SW00,SWR          ;IF SW00=1, GET NEW VECTOR
895 001066 001445          BEQ      BEGIN                      ;AND CSR
896 001070 012701 000300          VEC2: MOV      #300,R1
897 001074 012702 000302          MOV      #302,R2
898 001100 012703 000004          MOV      #4,R3
899 001104 010211          IS:   MOV      R2,(R1)              ;RESTORE TRAPCATCHER
900 001106 005012          CLR      (R2)                      ;IN FLOATING VECTOR AREA
901 001110 060301          ADD      R3,R1
902 001112 060302          ADD      R3,R2
903 001114 020127 001000          CMP      R1,#1000
904 001120 001371          BNE      IS
905 001122 104403          INSTR          ;INPUT ADDRESS OF DEVICE VECTOR
906 001124 014144          MVECTOR          ;MESSAGE "VECTOR ADDRESS-"
907 001126 104405          PARAM          ;CONVERT STRING TO OCTAL
908 001130 000300          300          ;LOW LIMIT
909 001132 000770          770          ;HIGH LIMIT
910 001134 013642          DHRVEC          ;LOCATIONS TO BE FILLED
911 001136          003          .BYTE 3          ;NUMBER OF LOCATIONS
912 001137          004          .BYTE 4          ;LSB MASK
913 001140 104403          INSTR          ;INPUT ADDRESS OF DEVICE CSR
914 001142 014166          MREGAD          ;MESSAGE "CONTROL REGISTER ADDRESS-"
915 001144 104405          PARAM          ;CONVERT STRING TO OCTAL
916 001146 000000          0          ;LOW LIMIT
917 001150 177776          177776          ;HIGH LIMIT
918 001152 013620          DHSCR          ;LOCATIONS TO BE FILLED
919 001154          007          .BYTE 7          ;NUMBER OF LOCATIONS
920 001155          010          .BYTE 10          ;LSB MASK
921 001156 016767 012454 012454 MOV      DHSSR,DHSLR          ;SET UP ADDRESS OF SILO
922 001164 005267 012450          INC      DHSLR              ;STATUS REGISTER HIGH BYTE
923 001170 005767 012516          TST      INIFLG              ;IF INITIALIZATION FLAG
924 001174 001002          BNE      BEGIN                      ;IS CLEARED
925 001176 005167 012510          COM      INIFLG              ;SET IT
926
927          ;PROGRAM STAR

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928                                     :CHECK FOR PROGRAM START AT SELECTED ADDRESS
929
930 001202 012767 000340 176566 BEGIN: MOV    #340,PS          ;LOCK OUT INTERRUPTS
931 001210 012706 014734          MOV    #STACK,SP          ;SET UP PROCESSOR STACK
932 001214 032767 000002 176346 BIT     #SW01,SWR          ;IF SW01=1
933 001222 001410          BEQ     1$          ;GET PC FOR PROGRAM START
934 001224 104403          INSTR          ;GET PC
935 001226 014332          MTSTPC          ;MESSAGE "TEST PC"
936 001230 104405          PARAM          ;CONVERT STRING TO OCTAL
937 001232 000000          0
938 001234 017500          17500
939 001236 000207          RETURN
940 001240          001          .BYTE 1
941 001241          001          .BYTE 1
942 001242 000410          BR     2$
943 001244 012767 001274 012406 1$: MOV    #T1,RETURN          ;NORMAL START, TEST 1
944 001252 005767 012436          TST    STFLG          ;IF LOOPING, BYPASS TYPEOUT
945 001256 001004          BNE     3$
946 001260 005167 012430          COM     STFLG
947 001264 104401 014326          2$: TYPE    MR
948 001270 000177 012364          3$: JMP     @RETURN          ;TYPE "R" TO INDICATE START
                                     ;START TESTING

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949
950      ; TRANSMITTER LINE SPEED SELECTION TEST
951      ; TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 0
952      ; VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
953      ; VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
954      ; AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
955
956 001274 012767 000340 176474 T1:  MOV    #340,PS      ; DISABLE ALL INTERRUPTS
957 001302 012767 000010 012356      MOV    #10,ICOUNT  ; SET UP FOR 10 ITERATIONS
958 001310 012767 001514 012344      MOV    #5$,ESCAPE  ; SET UP TO ESCAPE TO NEXT TEST
959 001316 012767 001352 012340      MOV    #1$,FREEZ1  ; SET UP TO LOOP WITH DATA
960 001324 012705 000000          ; LINE 0 WILL BE TESTED
961 001330 012700 002000          ; CONSTANT FOR SELECTION
962                                ; OF INITIAL (LOWEST) SPEED
963 001334 012701 000015          ; 15 DIFFERENT SPEEDS WILL BE TESTED
964 001340 012704 000001          ; BINARY CODE FOR INITIAL SPEED
965 001344 012767 177777 012350      MOV    #-1,TIME1  ; INITIALIZE COMPARISION VALUE
966 001352 012777 004000 012240 1$:  MOV    #BIT11,ADHSCR ; CLEAR INTERFACE
967 001360 010577 012234          MOV    R5,ADHSCR   ; SELECT LINE 0 FOR TESTING
968 001364 005077 012236          CLR     ADHBA      ; CLEAR BUS ADDRESS
969 001370 012777 177775 012232      MOV    #-3,ADHBC   ; SET UP TO TRANSMIT
970                                ; 3 CHARACTERS
971 001376 010077 012222          MOV    R0,ADHLPR   ; SELECT LINE SPEED
972 001402 005067 012315          CLR     TIME2      ; CLEAR TRANSMITTER TIME TIMER
973 001406 005067 012314          CLR     TEMP1      ; SET UP NO CLOCK TIMER
974 001412 012767 000010 012310      MOV    #10,TEMP2
975 001420 012777 000001 012204      MOV    #1,ADHBA   ; SET BAR BIT FOR LINE 0
976                                ; TO START TRANSMISSIO'
977 001426 005777 012166          2$:  TST     ADHSCR   ; WAIT FOR TRANSMITTER
978                                ; TO FINISH
979 001432 100412          BMI     3$
980 001434 005267 012264          INC     TIME2      ; UPDATE TRANSMITTER TIMER
981 001440 005267 012262          INC     TEMP1      ; UPDATE NO CLOCK TIMER
982 001444 001370          BNE     2$
983 001446 005367 012256          DEC     TEMP2
984 001452 001365          BNE     2$
985 001454 104001          HLT     1
986 001456 000405          BR      4$
987 001460 026767 012240 012234 3$:  CMP     TIME2,TIME1
988 001466 103401          BLO     4$
989                                ; TRANSMITTER DID NOT FINISH, ERROR
990                                ; VERIFY THAT TRANSMITTER
991 001470 104002          HLT     2      ; WAS FASTER AT THIS SELECTED SPEED
992                                ; (NUMBER OF COUNTS IN TIME2
993 001472 104410          4$:  SCOPE1  ; LESS THAN TIME1)
994 001474 016767 012224 012220      MOV    TIME2,TIME1 ; TRANSMITTER TIMING ERROR FOR
995 001502 005204          INC     R4      ; LINE 0
996 001504 062700 002000          ADD     #2000,R0    ; CHECK FOR FREEZE ON CURRENT DATA
997 001510 005301          DEC     R1      ; SET UP FOR NEXT COMPARISION
998 001512 001317          BNE     1$      ; SELECT NEXT SPEED
999 001514 104400          5$:  SCOPE      ; CHECK FOR ITERATIONS, LOOP
1000
1001      ; TRANSMITTER LINE SPEED SELECTION TEST
1002      ; TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 1
1003      ; VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1004      ; VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS

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1005                                     ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1006
1007 001516 012767 000340 176252 T2: MOV #340,PS ;DISABLE ALL INTERRUPTS
1008 001524 012767 000010 012134 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS
1009 001532 012767 001736 012122 MOV #5$,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
1010 001540 012767 001574 012116 MOV #1$,FREEZ1 ;SET UP TO LOOP WITH DATA
1011 001546 012705 000001 MOV #1,R5 ;LINE 1 WILL BE TESTED
1012 001552 012700 002000 MOV #2000,R0 ;CONSTANT FOR SELECTION
1013 ;OF INITIAL (LOWEST) SPEED
1014 001556 012701 000015 MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
1015 001562 012704 000001 MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
1016 001566 012767 177777 012126 MOV #-1,TIME1 ;INITIALIZE COMPARISON VALUE
1017 001574 012777 004000 012016 1$: MOV #BIT11,ADHSCR ;CLEAR INTERFACE
1018 001602 010577 012012 MOV R5,ADHSCR ;SELECT LINE 1 FOR TESTING
1019 001606 005077 012014 CLR ADHBA ;CLEAR BUS ADDRESS
1020 001612 012777 177775 012010 MOV #-3,ADHBC ;SET UP TO TRANSMIT
1021 ;3 CHARACTERS
1022 001620 010077 012000 MOV R0,ADHLPR ;SELECT LINE SPEED
1023 001624 005067 012074 CLR TIME2 ;CLEAR TRANSMITTER TIME TIMER
1024 001630 005067 012072 CLR TEMP1 ;SET UP NO CLOCK TIMER
1025 001634 012767 000010 012066 MOV #10,TEMP2
1026 001642 012777 000002 011762 MOV #2,ADHBAR ;SET BAR BIT FOR LINE 1
1027 ;TO START TRANSMISSION
1028 001650 005777 011744 2$: TST ADHSCR ;WAIT FOR TRANSMITTER
1029 ;TO FINISH
1030 001654 100412 BMI 3$
1031 001656 005267 012042 INC TIME2 ;UPDATE TRANSMITTER TIMER
1032 001662 005267 012040 INC TEMP1 ;UPDATE NO CLOCK TIMER
1033 001666 001370 BNE 2$
1034 001670 005367 012034 DEC TEMP2
1035 001674 001365 BNE 2$
1036 001676 104001 HLT 1 ;TRANSMITTER DID NOT FINISH, ERROR
1037 001700 000405 BR 4$
1038 001702 026767 012016 012012 3$: CMP TIME2,TIME1 ;VERIFY THAT TRANSMITTER
1039 001710 103401 BLO 4$ ;WAS FASTER AT THIS SELECTED SPEED
1040 ; (NUMBER OF COUNTS IN TIME2
1041 ; LESS THAN TIME1)
1042 001712 104002 HLT 2 ;TRANSMITTER TIMING ERROR FOR
1043 ; LINE 1
1044 001714 104410 4$: SCOPE1 ;CHECK FOR FREEZE ON CURRENT DATA
1045 001716 016767 012002 011776 MOV TIME2,TIME1 ;SET UP FOR NEXT COMPARISON
1046 001724 005204 INC R4 ;SELECT NEXT SPEED
1047 001726 062700 002000 ADD #2000,R0
1048 001732 005301 DEC R1
1049 001734 001317 BNE 1$
1050 001736 104400 5$: SCOPE ;CHECK FOR ITERATIONS, LOOP
1051
1052 ;TRANSMITTER LINE SPEED SELECTION TEST
1053 ;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 2
1054 ;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1055 ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1056 ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1057
1058 001740 012767 000340 176030 T3: MOV #340,PS ;DISABLE ALL INTERRUPTS
1059 001746 012767 000010 011712 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS
1060 001754 012767 002160 011700 MOV #5$,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST

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Line	Address	Instruction	Comments
1061	001762	012767 002016	011674
1062	001770	012705 000002	
1063	001774	012700 002000	
1064			
1065	002000	012701 000015	
1066	002004	012704 000001	
1067	002010	012767 177777	011704
1068	002016	012777 004000	011574 1\$:
1069	002024	010577 011570	
1070	002030	005077 011572	
1071	002034	012777 177775	011566
1072			
1073	002042	010077 011556	
1074	002046	005067 011652	
1075	002052	005067 011650	
1076	002056	012767 000010	011644
1077	002064	012777 000004	011540
1078			
1079	002072	005777 011522	2\$:
1080			
1081	002076	100412	
1082	002100	005267 011620	
1083	002104	005267 011616	
1084	002110	001370	
1085	002112	005367 011612	
1086	002116	001365	
1087	002120	104001	
1088	002122	000405	
1089	002124	026767 011574 011570	3\$:
1090	002132	103401	
1091			
1092			
1093	002134	104002	
1094			
1095	002136	104410	4\$:
1096	002140	016767 011560 011554	
1097	002146	005204	
1098	002150	062700 002000	
1099	002154	005301	
1100	002156	001317	
1101	002160	104400	5\$:
1102			
1103			
1104			
1105			
1106			
1107			
1108			
1109	002162	012767 000340 175606	T
1110	002170	012767 000010 011470	
1111	002176	012767 002402 011456	
1112	002204	012767 002240 011452	
1113	002212	012705 000003	
1114	002216	012700 002000	
1115			
1116	002222	012701 000015	

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1117	002226	012704	000001		MOV	#1,R4	;BINARY CODE FOR INITIAL SPEED
1118	002232	012767	177777	011462	MOV	#-1,TIME1	;INITIALIZE COMPARISON VALUE
1119	002240	012777	004000	011352	1\$: MOV	#BIT11,ADHSCR	;CLEAR INTERFACE
1120	002246	010577	011346		MOV	R5,ADHSCR	;SELECT LINE 3 FOR TESTING
1121	002252	005077	011350		CLR	ADHBA	;CLEAR BUS ADDRESS
1122	002256	012777	177775	011344	MOV	#-3,ADHBC	;SET UP TO TRANSMIT
1123							;3 CHARACTERS
1124	002264	010077	011334		MOV	R0,ADHLPR	;SELECT LINE SPEED
1125	002270	005067	011430		CLR	TIME2	;CLEAR TRANSMITTER TIME TIMER
1126	002274	005067	011426		CLR	TEMP1	;SET UP NO CLOCK TIMER
1127	002300	012767	000010	011422	MOV	#10,TEMP2	
1128	002306	012777	000010	011316	MOV	#10,ADHBAR	;SET BAR BIT FOR LINE 3
1129							;TO START TRANSMISSION
1130	002314	005777	011300		2\$: TST	ADHSCR	;WAIT FOR TRANSMITTER
1131							;TO FINISH
1132	002320	100412			BMI	3\$	
1133	002322	005267	011376		INC	TIME2	;UPDATE TRANSMITTER TIMER
1134	002326	005267	011374		INC	TEMP1	;UPDATE NO CLOCK TIMER
1135	002332	001370			BNE	2\$	
1136	002334	005367	011370		DEC	TEMP2	
1137	002340	001365			BNE	2\$	
1138	002342	104001			HLT	1	;TRANSMITTER DID NOT FINISH, ERROR
1139	002344	000405			BR	4\$	
1140	002346	026767	011352	011346	3\$: CMP	TIME2,TIME1	;VERIFY THAT TRANSMITTER
1141	002354	103401			BLO	4\$	;WAS FASTER AT THIS SELECTED SPEED
1142							; (NUMBER OF COUNTS IN TIME2
1143							; LESS THAN TIME1)
1144	002356	104002			HLT	2	;TRANSMITTER TIMING ERROR FOR
1145							;LINE 3
1146	002360	104410			4\$: SCOPE1		;CHECK FOR FREEZE ON CURRENT DATA
1147	002362	016767	011336	011332	MOV	TIME2,TIME1	;SET UP FOR NEXT COMPARISON
1148	002370	005204			INC	R4	;SELECT NEXT SPEED
1149	002372	062700	002000		ADD	#2000,R0	
1150	002376	005301			DEC	R1	
1151	002400	001317			BNE	1\$	
1152	002402	104400			5\$: SCOPE		;CHECK FOR ITERATIONS, LOOP
1153							
1154							;TRANSMITTER LINE SPEED SELECTION TEST
1155							;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 4
1156							;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1157							;VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
1158							;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1159							
1160	002404	012767	000340	175364	7\$: MOV	#340,PS	;DISABLE ALL INTERRUPTS
1161	002412	012767	000010	011246	MOV	#10,ICOUNT	;SET UP FOR 10 ITERATIONS
1162	002420	012767	002624	011234	MOV	#5\$,ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
1163	002426	012767	002462	011230	MOV	#1\$,FREEZ1	;SET UP TO LOOP WITH DATA
1164	002434	012705	000004		MOV	#4,R5	;LINE 4 WILL BE TESTED
1165	002440	012700	002000		MOV	#2000,R0	;CONSTANT FOR SELECTION
1166							;OF INITIAL (LOWEST) SPEED
1167	002444	012701	000015		MOV	#15,R1	;15 DIFFERENT SPEEDS WILL BE TESTED
1168	002450	012704	000001		MOV	#1,R4	;BINARY CODE FOR INITIAL SPEED
1169	002454	012767	177777	011240	MOV	#-1,TIME1	;INITIALIZE COMPARISON VALUE
1170	002462	012777	004000	011130	1\$: MOV	#BIT11,ADHSCR	;CLEAR INTERFACE
1171	002470	010577	011124		MOV	R5,ADHSCR	;SELECT LINE 4 FOR TESTING
1172	002474	005077	011126		CLR	ADHBA	;CLEAR BUS ADDRESS

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1173	002500	012777	177775	011122		MOV	#-3,ADHBC		;SET UP TO TRANSMIT
1174									;3 CHARACTERS
1175	002506	010077	011112			MOV	RO,ADHLPR		;SELECT LINE SPEED
1176	002512	005067	011206			CLR	TIME2		;CLEAR TRANSMITTER TIME TIMER
1177	002516	005067	011204			CLR	TEMP1		;SET UP NO CLOCK TIMER
1178	002522	012767	000010	011200		MOV	#10,TEMP2		
1179	002530	012777	000020	011074		MOV	#20,ADHBAR		;SET BAR BIT FOR LINE 4
1180									;TO START TRANSMISSION
1181	002536	005777	011056		2\$:	TST	ADHSCR		;WAIT FOR TRANSMITTER
1182									;TO FINISH
1183	002542	100412				BMI	3\$		
1184	002544	005267	011154			INC	TIME2		;UPDATE TRANSMITTER TIMER
1185	002550	005267	011152			INC	TEMP1		;UPDATE NO CLOCK TIMER
1186	002554	001370				BNE	2\$		
1187	002556	005367	011146			DEC	TEMP2		
1188	002562	001365				BNE	2\$		
1189	002564	104001				HLT	1		;TRANSMITTER DID NOT FINISH, ERROR
1190	002566	000405				BR	4\$		
1191	002570	026767	011130	011124	3\$:	CMP	TIME2,TIME1		;VERIFY THAT TRANSMITTER
1192	002576	103401				BLO	4\$		;WAS FASTER AT THIS SELECTED SPEED
1193									; (NUMBER OF COUNTS IN TIME2
1194									; LESS THAN TIME1)
1195	002600	104002				HLT	2		;TRANSMITTER TIMING ERROR FOR
1196									;LINE 4
1197	002602	104410			4\$:	SCOPE1			;CHECK FOR FREEZE ON CURRENT DATA
1198	002604	016767	011114	011110		MOV	TIME2,TIME1		;SET UP FOR NEXT COMPARISION
1199	002612	005204				INC	R4		;SELECT NEXT SPEED
1200	002614	062700	002000			ADD	#2000,R0		
1201	002620	005301				DEC	R1		
1202	002622	001317				BNE	1\$		
1203	002624	104400			5\$:	SCOPE			;CHECK FOR ITERATIONS, LOOP
1204									
1205									;TRANSMITTER LINE SPEED SELECTION TEST
1206									;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 5
1207									;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1208									;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1209									;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1210									
1211	002626	012767	000340	175142	T6:	MOV	#340,PS		;DISABLE ALL INTERRUPTS
1212	002634	012767	000010	011024		MOV	#10,ICOUNT		;SET UP FOR 10 ITERATIONS
1213	002642	012767	003046	011012		MOV	#5\$,ESCAPE		;SET UP TO ESCAPE TO NEXT TEST
1214	002650	012767	002704	011006		MOV	#1\$,FREEZ1		;SET UP TO LOOP WITH DATA
1215	002656	012705	000005			MOV	#5,R5		;LINE 5 WILL BE TESTED
1216	002662	012700	002000			MOV	#2000,R0		;CONSTANT FOR SELECTION
1217									;OF INITIAL (LOWEST) SPEED
1218	002666	012701	000015			MOV	#15,R1		;15 DIFFERENT SPEEDS WILL BE TESTED
1219	002672	012704	000001			MOV	#1,R4		;BINARY CODE FOR INITIAL SPEED
1220	002676	012767	177777	011016		MOV	#-1,TIME1		;INITIALIZE COMPARISION VALUE
1221	002704	012777	004000	010706	1\$:	MOV	#BIT11,ADHSCR		;CLEAR INTERFACE
1222	002712	010577	010702			MOV	R5,ADHSCR		;SELECT LINE 5 FOR TESTING
1223	002716	005077	010704			CLR	ADHBA		;CLEAR BUS ADDRESS
1224	002722	012777	177775	010700		MOV	#-3,ADHBC		;SET UP TO TRANSMIT
1225									;3 CHARACTERS
1226	002730	010077	010670			MOV	RO,ADHLPR		;SELECT LINE SPEED
1227	002734	005067	010764			CLR	TIME2		;CLEAR TRANSMITTER TIME TIMER
1228	002740	005067	010762			CLR	TEMP1		;SET UP NO CLOCK TIMER

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1229 002744 012767 000010 010756      MOV      #10,TEMP2
1230 002752 012777 000040 010652      MOV      #40,JDHBAR      :SET BAR BIT FOR LINE 5
1231                                     :TO START TRANSMISSION
1232 002760 005777 010634      25:    TST      JDHSCR      :WAIT FOR TRANSMITTER
1233                                     :TO FINISH
1234 002764 100412      BMI      35
1235 002766 005267 010732      INC      TIME2      :UPDATE TRANSMITTER TIMER
1236 002772 005267 010730      INC      TEMP1      :UPDATE NO CLOCK TIMER
1237 002776 001370      BNE      25
1238 003000 005367 010724      DEC      TEMP2
1239 003004 001365      BNE      25
1240 003006 104001      HLT
1241 003010 003405      SR      45      :TRANSMITTER DID NOT FINISH, ERROR
1242 003012 026767 010706 010702 35:  CMP      TIME2,TIME1
1243 003020 103401      BLC      45      :VERIFY THAT TRANSMITTER
1244                                     :WAS FASTER AT THIS SELECTED SPEED
1245                                     : (NUMBER OF COUNTS IN TIME2
1246 003022 104002      HLT      2      :LESS THAN TIME1)
1247                                     :TRANSMITTER TIMING ERROR FOR
1248 003024 104410      45:    SCOPE1      :LINE 5
1249 003026 016767 010672 010666      MOV      TIME2,TIME1      :CHECK FOR FREEZE ON CURRENT DATA
1250 003034 005204      INC      R4      :SET UP FOR NEXT COMPARISION
1251 003036 062700 002000      ADD      #2000,R0      :SELECT NEXT SPEED
1252 003042 005301      DEC      R1
1253 003044 001317      BNE      15
1254 003046 104400      55:    SCOPE      :CHECK FOR ITERATIONS. LOOP
1255                                     :TRANSMITTER LINE SPEED SELECTION TEST
1256                                     :TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 6
1257                                     :VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1258                                     :VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1259                                     :AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1260
1261 003050 012767 000340 174720 77:    MOV      #340,PS
1262 003056 012767 000010 010602      MOV      #10,ICOUNT      :DISABLE ALL INTERRUPTS
1263 003064 012767 003270 010570      MOV      #55,ESCAPE      :SET UP FOR 10 ITERATIONS
1264 003072 012767 003126 010564      MOV      #15,FREEZ1      :SET UP TO ESCAPE TO NEXT TEST
1265 003100 012705 000006      MOV      #6,R5      :SET UP TO LOOP WITH DATA
1266 003104 012700 002000      MOV      #2000,R0      :LINE 6 WILL BE TESTED
1267                                     :CONSTANT FOR SELECTION
1268                                     :OF INITIAL (LOWEST) SPEED
1269 003110 012701 000015      MOV      #15,R1      :15 DIFFERENT SPEEDS WILL BE TESTED
1270 003114 012704 000001      MOV      #1,R4      :BINARY CODE FOR INITIAL SPEED
1271 003120 012767 177777 010574      MOV      #-1,TIME1      :INITIALIZE COMPARISION VALUE
1272 003126 012777 004000 010464 15:    MOV      #BIT11,JDHSCR      :CLEAR INTERFACE
1273 003134 010577 010460      MOV      R5,JDHSCR      :SELECT LINE 6 FOR TESTING
1274 003140 005077 010462      CLR      JDHBA      :CLEAR BUS ADDRESS
1275 003144 012777 177775 010456      MOV      #-3,JD4BC      :SET UP TO TRANSMIT
1276                                     :3 CHARACTERS
1277 003152 010077 010446      MOV      R0,JDHLPR      :SELECT LINE SPEED
1278 003156 005067 010542      CLR      TIME2      :CLEAR TRANSMITTER TIME TIMER
1279 003162 005067 010540      CLR      TEMP1      :SET UP NO CLOCK TIMER
1280 003166 012767 000010 010534      MOV      #10,TEMP2
1281 003174 012777 000100 010430      MOV      #100,JDHBAR      :SET BAR BIT FOR LINE 6
1282                                     :TO START TRANSMISSION
1283 003202 005777 010412      25:    TST      JDHSCR      :WAIT FOR TRANSMITTER
1284                                     :TO FINISH

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1285 003206 100412 BMI 3$
1286 003210 005267 010510 INC TIME2 ;UPDATE TRANSMITTER TIMER
1287 003214 005267 010506 INC TEMP1 ;UPDATE NO CLOCK TIMER
1288 003220 001370 BNE 2$
1289 003222 005367 010502 DEC TEMP2
1290 003226 001365 BNE 2$
1291 003230 104001 HLT 1 ;TRANSMITTER DID NOT FINISH, ERROR
1292 003232 000405 BR 4$
1293 003234 026767 010464 010460 3$: CMP TIME2,TIME1
1294 003242 103401 BLO 4$ ;VERIFY THAT TRANSMITTER
;WAS FASTER AT THIS SELECTED SPEED
; (NUMBER OF COUNTS IN TIME2
; LESS THAN TIME1)
1295
1296
1297 003244 104002 HLT 2 ;TRANSMITTER TIMING ERROR FOR
;LINE 6
1298
1299 003246 104410 4$: SCOPE1
1300 003250 016757 010450 010444 MOV TIME2,TIME1
1301 003256 005204 INC R4 ;CHECK FOR FREEZE ON CURRENT DATA
1302 003260 062700 002000 ADD #2000,R0 ;SET UP FOR NEXT COMPARISON
1303 003264 005301 DEC R1 ;SELECT NEXT SPEED
1304 003266 001317 BNE 1$
1305 003270 104400 5$: SCOPE ;CHECK FOR ITERATIONS, LOOP
1306
1307 ;TRANSMITTER LINE SPEED SELECTION TEST
1308 ;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 7
1309 ;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1310 ;VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
1311 ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1312
1313 003272 012767 000340 174476 710: MOV #340,PS ;DISABLE ALL INTERRUPTS
1314 003300 012767 000010 010360 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS
1315 003306 012767 002512 010346 MOV #55,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
1316 003314 012767 003350 010342 MOV #15,FREEZ1 ;SET UP TO LOOP WITH DATA
1317 003322 012705 000007 MOV #7,R5 ;LINE 7 WILL BE TESTED
1318 003326 012700 002000 MOV #2000,R0 ;CONSTANT FOR SELECTION
1319 ;OF INITIAL (LOWEST) SPEED
1320 003332 012701 000015 MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
1321 003336 012704 000001 MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
1322 003342 012767 177777 010352 MOV #-1,TIME1 ;INITIALIZE COMPARISON VALUE
1323 003350 012777 004000 010242 1$: MOV #BIT11,2DHSCR ;CLEAR INTERFACE
1324 003356 010577 010236 MOV R5,2DHSCR ;SELECT LINE 7 FOR TESTING
1325 003362 005077 010240 CLR 2DHBA ;CLEAR BUS ADDRESS
1326 003366 012777 177775 010234 MOV #-3,2DHBC ;SET UP TO TRANSMIT
1327 ;3 CHARACTERS
1328 003374 010077 010224 MOV R0,2DHLPR ;SELECT LINE SPEED
1329 003400 005067 010320 CLR TIME2 ;CLEAR TRANSMITTER TIME TIMER
1330 003404 005067 010316 CLR TEMP1 ;SET UP NO CLOCK TIMER
1331 003410 012767 000010 010312 MOV #10,TEMP2
1332 003416 012777 000200 010206 MOV #200,2DHBAR ;SET BAR BIT FOR LINE 7
1333 ;TO START TRANSMISSION
1334 003424 005777 010170 2$: TST 2DHSCR ;WAIT FOR TRANSMITTER
1335 ;TO FINISH
1336 003430 100412 BMI 3$
1337 003432 005267 010266 INC TIME2 ;UPDATE TRANSMITTER TIMER
1338 003436 005267 010264 INC TEMP1 ;UPDATE NO CLOCK TIMER
1339 003442 001370 BNE 2$
1340 003444 005367 010260 DEC TEMP2

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1341 003450 001365      BNE      25
1342 003452 104001      HLT      1
1343 003454 000405      BR       45
1344 003456 026767 010242 010235 35:  CMP      TIME2,TIME1
1345 003464 103401      BLO      45
1346
1347
1348 003466 104002      HLT      2
1349
1350 003470 104410      45:  SCOPE1
1351 003472 016767 010226 010222  MOV      TIME2,TIME1
1352 003500 005204      INC      R4
1353 003502 062700 002000  ADD      #2000,R0
1354 003506 005301      DEC      R1
1355 003510 001317      BNE      15
1356 003512 104400      55:  SCOPE
1357
1358      ;TRANSMITTER LINE SPEED SELECTION TEST
1359      ;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 10
1360      ;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1361      ;VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
1362      ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1363
1364 003514 012767 000340 174254 T11:  MOV      #340,PS
1365 003522 012767 000010 010136  MOV      #10,ICOUNT
1366 003530 012767 003734 010124  MOV      #55,ESCAPE
1367 003536 012767 003572 010120  MOV      #15,FREEZ1
1368 003544 012705 000010  MOV      #10,R5
1369 003550 012700 002000  MOV      #2000,R0
1370
1371 003554 012701 000015  MOV      #15,R1
1372 003560 012704 000001  MOV      #1,R4
1373 003564 012767 177777 010130  MOV      #-1,TIME1
1374 003572 012777 004000 010020 15:  MOV      #BIT11,JDHSCR
1375 003600 010577 010014  MOV      R5,JDHSCR
1376 003604 005077 010016  CLR      JDHBA
1377 003610 012777 177775 010012  MOV      #-3,JDHBC
1378
1379 003616 010077 010002  MOV      R0,JDHLPR
1380 003622 005067 010076  CLR      TIME2
1381 003626 005067 010074  CLR      TEMP1
1382 003632 012767 000010 010070  MOV      #10,TEMP2
1383 003640 012777 000400 007764  MOV      #400,JDHBAR
1384
1385 003646 005777 007746      25:  TST      JDHSCR
1386
1387 003652 100412      BMI      35
1388 003654 005267 010044      INC      TIME2
1389 003660 005267 010042      INC      TEMP1
1390 003664 001370      BNE      25
1391 003666 005367 010036      DEC      TEMP2
1392 003672 001365      BNE      25
1393 003674 104001      HLT      1
1394 003676 000405      BR       45
1395 003700 026767 010020 010014 35:  CMP      TIME2,TIME1
1396 003706 103401      BLO      45

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;TRANSMITTER DID NOT FINISH, ERROR

;VERIFY THAT TRANSMITTER
;WAS FASTER AT THIS SELECTED SPEED
;NUMBER OF COUNTS IN TIME2
;LESS THAN TIME1);TRANSMITTER TIMING ERROR FOR
;LINE 7;CHECK FOR FREEZE ON CURRENT DATA
;SET UP FOR NEXT COMPARISON
;SELECT NEXT SPEED

;CHECK FOR ITERATIONS, LOOP

;LINE 10 WILL BE TESTED
;CONSTANT FOR SELECTION
;OF INITIAL (LOWEST) SPEED
;15 DIFFERENT SPEEDS WILL BE TESTED
;BINARY CODE FOR INITIAL SPEED
;INITIALIZE COMPARISON VALUE
;CLEAR INTERFACE
;SELECT LINE 10 FOR TESTING
;CLEAR BUS ADDRESS
;SET UP TO TRANSMIT
;3 CHARACTERS
;SELECT LINE SPEED
;CLEAR TRANSMITTER TIME TIMER
;SET UP NO CLOCK TIMER;SET BAR BIT FOR LINE 10
;TO START TRANSMISSION
;WAIT FOR TRANSMITTER
;TO FINISH;UPDATE TRANSMITTER TIMER
;UPDATE NO CLOCK TIMER

;TRANSMITTER DID NOT FINISH, ERROR

;VERIFY THAT TRANSMITTER
;WAS FASTER AT THIS SELECTED SPEED

Line	Address	Instruction	Comments
1397			;(NUMBER OF COUNTS IN TIME2
1398			;LESS THAN TIME1)
1399	003710	104002	HLT 2 ;TRANSMITTER TIMING ERROR FOR
1400			;LINE 10
1401	003712	104410	;CHECK FOR FREEZE ON CURRENT DATA
1402	003714	016767 010004 010000	;SET UP FOR NEXT COMPARISON
1403	003722	005204	;SELECT NEXT SPEED
1404	003724	062700 002000	
1405	003730	005301	
1406	003732	001317	
1407	003734	104400	5\$: SCOPE ;CHECK FOR ITERATIONS, LOOP
1408			
1409			;TRANSMITTER LINE SPEED SELECTION TEST
1410			;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 11
1411			;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1412			;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1413			;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1414			
1415	003736	012767 000340 174032	T12: MOV #340,PS ;DISABLE ALL INTERRUPTS
1416	003744	012767 000010 007714	MOV #0,ICOUNT ;SET UP FOR 10 ITERATIONS
1417	003752	012767 004156 007702	MOV #55,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
1418	003760	012767 004014 007676	MOV #1\$,FREEZ1 ;SET UP TO LOOP WITH DATA
1419	003766	012705 000011	MOV #11,R5 ;LINE 11 WILL BE TESTED
1420	003772	012700 002000	MOV #2000,RO ;CONSTANT FOR SELECTION
1421			;OF INITIAL (LOWEST) SPEED
1422	003776	012701 000015	MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
1423	004002	012704 000001	MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
1424	004006	012767 177777 007706	MOV #-1,TIME1 ;INITIALIZE COMPARISON VALUE
1425	004014	012777 004000 007576	1\$: MOV #BIT11,ADHSCR ;CLEAR INTERFACE
1426	004022	010577 007572	MOV R5,ADHSCR ;SELECT LINE 11 FOR TESTING
1427	004026	005077 007574	CLR ADHBA ;CLEAR BUS ADDRESS
1428	004032	012777 177775 007570	MOV #-3,ADHBC ;SET UP TO TRANSMIT
1429			;3 CHARACTERS
1430	004040	010077 007560	MOV RO,ADH_LPR ;SELECT LINE SPEED
1431	004044	005067 007654	CLR TIME2 ;CLEAR TRANSMITTER TIME TIMER
1432	004050	005067 007652	CLR TEMP1 ;SET UP NO CLOCK TIMER
1433	004054	012767 000010 007646	MOV #10,TEMP2
1434	004062	012777 001000 007542	MOV #1000,ADHBAR ;SET BAR BIT FOR LINE 11
1435			;TO START TRANSMISSION
1436	004070	005777 007524	2\$: TST ADHSCR ;WAIT FOR TRANSMITTER
1437			;TO FINISH
1438	004074	100412	BMI 3\$
1439	004076	005267 007622	INC TIME2 ;UPDATE TRANSMITTER TIMER
1440	004102	005267 007620	INC TEMP1 ;UPDATE NO CLOCK TIMER
1441	004106	001370	BNE 2\$
1442	004110	005367 007614	DEC TEMP2
1443	004114	001365	BNE 2\$
1444	004116	104001	HLT 1
1445	004120	000405	BR 4\$;TRANSMITTER DID NOT FINISH. ERROR
1446	004122	026767 007576 007572	3\$: CMP TIME2,TIME1 ;VERIFY THAT TRANSMITTER
1447	004130	103401	BLO 4\$;WAS FASTER AT THIS SELECTED SPEED
1448			;(NUMBER OF COUNTS IN TIME2
1449			;LESS THAN TIME1)
1450	004132	104002	HLT 2 ;TRANSMITTER TIMING ERROR FOR
1451			;LINE 11
1452	004134	104410	4\$: SCOPE ;CHECK FOR FREEZE ON CURRENT DATA

1453	004136	016767	007562	007556		MOV	TIME2,TIME1		;SET UP FOR NEXT COMPARISION
1454	004144	005204				INC	R4		;SELECT NEXT SPEED
1455	004146	062700	002000			ADD	#2000,R0		
1456	004152	005301				DEC	R1		
1457	004154	001317				BNE	1\$		
1458	004156	104400			5\$:	SCOPE			;CHECK FOR ITERATIONS, LOOP
1459									
1460									;TRANSMITTER LINE SPEED SELECTION TEST
1461									;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 12
1462									;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1463									;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1464									;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1465									
1466	004160	012767	000340	173610	T13:	MOV	#340,PS		;DISABLE ALL INTERRUPTS
1467	004166	012767	000010	007472		MOV	#10,ICOUNT		;SET UP FOR 10 ITERATIONS
1468	004174	012767	004400	007460		MOV	#5\$,ESCAPE		;SET UP TO ESCAPE TO NEXT TEST
1469	004202	012767	004236	007454		MOV	#1\$,FREEZ1		;SET UP TO LOOP WITH DATA
1470	004210	012705	000012			MOV	#12,R5	;LINE 12	WILL BE TESTED
1471	004214	012700	002000			MOV	#2000,R0		;CONSTANT FOR SELECTION
1472									;OF INITIAL (LOWEST) SPEED
1473	004220	012701	000015			MOV	#15,R1		;15 DIFFERENT SPEEDS WILL BE TESTED
1474	004224	012704	000001			MOV	#1,R4		;BINARY CODE FOR INITIAL SPEED
1475	004230	012767	177777	007464		MOV	#-1,TIME1		;INITIALIZE COMPARISION VALUE
1476	004236	012777	004000	007354	1\$:	MOV	#BIT11,JDHSCR		;CLEAR INTERFACE
1477	004244	010577	007350			MOV	R5,JDHSCR		;SELECT LINE 12 FOR TESTING
1478	004250	005077	007352			CLR	JDHBA		;CLEAR BUS ADDRESS
1479	004254	012777	177775	007346		MOV	#-3,JDHBC		;SET UP TO TRANSMIT
1480									;3 CHARACTERS
1481	004262	010077	007336			MOV	R0,JDHLPR		;SELECT LINE SPEED
1482	004266	005067	007432			CLR	TIME2		;CLEAR TRANSMITTER TIME TIMER
1483	004272	005067	007430			CLR	TEMP1		;SET UP NO CLOCK TIMER
1484	004276	012767	000010	007424		MOV	#10,TEMP2		
1485	004304	012777	002000	007320		MOV	#2000,JDHBAR		;SET BAR BIT FOR LINE 12
1486									;TO START TRANSMISSION
1487	004312	005777	007302		2\$:	TST	JDHSCR		;WAIT FOR TRANSMITTER
1488									;TO FINISH
1489	004316	100412				BMI	3\$		
1490	004320	005267	007400			INC	TIME2		;UPDATE TRANSMITTER TIMER
1491	004324	005267	007376			INC	TEMP1		;UPDATE NO CLOCK TIMER
1492	004330	001370				BNE	2\$		
1493	004332	005367	007372			DEC	TEMP2		
1494	004336	001365				BNE	2\$		
1495	004340	104001				HLT	1		;TRANSMITTER DID NOT FINISH, ERROR
1496	004342	000405				BR	4\$		
1497	004344	026767	007354	007350	3\$:	CMP	TIME2,TIME1		;VERIFY THAT TRANSMITTER
1498	004352	103401				BLO	4\$		;WAS FASTER AT THIS SELECTED SPEED
1499									; (NUMBER OF COUNTS IN TIME2
1500									; LESS THAN TIME1)
1501	004354	104002				HLT	2		;TRANSMITTER TIMING ERROR FOR
1502									;LINE 12
1503	004356	104410			4\$:	SCOPE1			;CHECK FOR FREEZE ON CURRENT DATA
1504	004360	016767	007340	007334		MOV	TIME2,TIME1		;SET UP FOR NEXT COMPARISION
1505	004366	005204				INC	R4		;SELECT NEXT SPEED
1506	004370	062700	002000			ADD	#2000,R0		
1507	004374	005301				DEC	R1		
1508	004376	001317				BNE	1\$		

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1509 004400 104400          5$: SCOPE                      ;CHECK FOR ITERATIONS, LOOP
1510
1511                      ;TRANSMITTER LINE SPEED SELECTION TEST
1512                      ;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 13
1513                      ;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1514                      ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1515                      ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1516
1517 004402 012767 000340 173366 T14: MOV #340,PS          ;DISABLE ALL INTERRUPTS
1518 004410 012767 000010 007250      MOV #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
1519 004416 012767 004622 007236      MOV #5$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1520 004424 012767 004460 007232      MOV #1$,FREEZ1      ;SET UP TO LOOP WITH DATA
1521 004432 012705 000013              MOV #13,R5          ;LINE 13 WILL BE TESTED
1522 004436 012700 002000              MOV #2000,R0         ;CONSTANT FOR SELECTION
1523                      ;OF INITIAL (LOWEST) SPEED
1524 004442 012701 000015              MOV #15,R1          ;15 DIFFERENT SPEEDS WILL BE TESTED
1525 004446 012704 000001              MOV #1,R4           ;BINARY CODE FOR INITIAL SPEED
1526 004452 012767 177777 007242      MOV #-1,TIME1       ;INITIALIZE COMPARISION VALUE
1527 004460 012777 004000 007132 1$: MOV #BIT11,ADHSCR     ;CLEAR INTERFACE
1528 004466 010577 007126              MOV R5,ADHSCR        ;SELECT LINE 13 FOR TESTING
1529 004472 005077 007130              CLR ADHBA           ;CLEAR BUS ADDRESS
1530 004476 012777 177775 007124      MOV #-3,ADHBC        ;SET UP TO TRANSMIT
1531                      ;3 CHARACTERS
1532 004504 010077 007114              MOV R0,ADHLPR        ;SELECT LINE SPEED
1533 004510 005067 007210              CLR TIME2          ;CLEAR TRANSMITTER TIME TIMER
1534 004514 005067 007206              CLR TEMP1         ;SET UP NO CLOCK TIMER
1535 004520 012767 000010 007202      MOV #10,TEMP2
1536 004526 012777 004000 007076      MOV #4000,ADHBAR     ;SET BAR BIT FOR LINE 13
1537                      ;TO START TRANSMISSION
1538 004534 005777 007060          2$: TST ADHSCR           ;WAIT FOR TRANSMITTER
1539                      ;TO FINISH
1540 004540 100412              BMI 3$
1541 004542 005267 007156              INC TIME2          ;UPDATE TRANSMITTER TIMER
1542 004546 005267 007154              INC TEMP1         ;UPDATE NO CLOCK TIMER
1543 004552 001370              BNE 2$
1544 004554 005367 007150              DEC TEMP2
1545 004560 001365              BNE 2$
1546 004562 104001              HLT 1
1547 004564 000405              BR 4$
1548 004566 026767 007132 007126 3$: CMP TIME2,TIME1
1549 004574 103401              BLO 4$
1550                      ;TRANSMITTER DID NOT FINISH. ERROR
1551                      ;VERIFY THAT TRANSMITTER
1552                      ;WAS FASTER AT THIS SELECTED SPEED
1553                      ; (NUMBER OF COUNTS IN TIME2
1554                      ; LESS THAN TIME1)
1555 004576 104002              HLT 2
1556                      ;TRANSMITTER TIMING ERROR FOR
1557                      ;LINE 13
1558 004600 104410          4$: SCOPE1
1559 004602 016767 007116 007112      MOV TIME2,TIME1
1560 004610 005204              INC R4
1561 004612 062700 002000      ADD #2000,R0
1562 004616 005301              DEC R1
1563 004620 001317              BNE 1$
1564 004622 104400          5$: SCOPE                      ;CHECK FOR ITERATIONS, LOOP
                      ;TRANSMITTER LINE SPEED SELECTION TEST
                      ;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 14
                      ;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED

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1565                                     :VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1566                                     :AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1567
1568 004624 012767 000340 173144 T15: MOV #340,PS ;DISABLE ALL INTERRUPTS
1569 004632 012767 000010 007026 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS
1570 004640 012767 005044 007014 MOV #5$,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
1571 004646 012767 004702 007010 MOV #1$,FREEZ1 ;SET UP TO LOOP WITH DATA
1572 004654 012705 000014 MOV #14,R5 ;LINE 14 WILL BE TESTED
1573 004660 012700 002000 MOV #2000,R0 ;CONSTANT FOR SELECTION
1574 ;OF INITIAL (LOWEST) SPEED
1575 004664 012701 000015 MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
1576 004670 012704 000001 MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
1577 004674 012767 177777 007020 MOV #-1,TIME1 ;INITIALIZE COMPARISION VALUE
1578 004702 012777 004000 006710 1$: MOV #BIT11,ADHSCR ;CLEAR INTERFACE
1579 004710 010577 006704 MOV R5,ADHSCR ;SELECT LINE 14 FOR TESTING
1580 004714 005077 006706 CLR ADHBA ;CLEAR BUS ADDRESS
1581 004720 012777 177775 006702 MOV #-3,ADHBC ;SET UP TO TRANSMIT
1582 ;3 CHARACTERS
1583 004726 010077 006672 MOV R0,ADHLPR ;SELECT LINE SPEED
1584 004732 005067 006766 CLR TIME2 ;CLEAR TRANSMITTER TIME TIMER
1585 004736 005067 006764 CLR TEMP1 ;SET UP NO CLOCK TIMER
1586 004742 012767 000010 006760 MOV #10,TEMP2
1587 004750 012777 010000 006654 MOV #10000,ADHBAR ;SET BAR BIT FOR LINE 14
1588 ;TO START TRANSMISSION
1589 004756 005777 006636 2$: TST ADHSCR ;WAIT FOR TRANSMITTER
1590 ;TO FINISH
1591 004762 100412 BMI 3$
1592 004764 005267 006734 INC TIME2 ;UPDATE TRANSMITTER TIMER
1593 004770 005267 006732 INC TEMP1 ;UPDATE NO CLOCK TIMER
1594 004774 001370 BNE 2$
1595 004776 005367 006726 DEC TEMP2
1596 005002 001365 BNE 2$
1597 005004 104001 HLT 1 ;TRANSMITTER DID NOT FINISH, ERROR
1598 005006 000405 BR 4$
1599 005010 026767 006710 006704 3$: CMP TIME2,TIME1 ;VERIFY THAT TRANSMITTER
1600 005016 103401 BLO 4$ ;WAS FASTER AT THIS SELECTED SPEED
1601 ;(NUMBER OF COUNTS IN TIME2
1602 ;LESS THAN TIME1)
1603 005020 104002 HLT 2 ;TRANSMITTER TIMING ERROR FOR
1604 ;LINE 14
1605 005022 104410 4$: SCOPE1 ;CHECK FOR FREEZE ON CURRENT DATA
1606 005024 016767 006674 006670 MOV TIME2,TIME1 ;SET UP FOR NEXT COMPARISION
1607 005032 005204 INC R4 ;SELECT NEXT SPEED
1608 005034 062700 002000 ADD #2000,R0
1609 005040 005301 DEC R1
1610 005042 001317 BNE 1$
1611 005044 104400 5$: SCOPE ;CHECK FOR ITERATIONS, LOOP
1612
1613 ;TRANSMITTER LINE SPEED SELECTION TEST
1614 ;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 15
1615 ;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1616 ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1617 ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1618
1619 005046 012767 000340 172722 T16: MOV #340,PS ;DISABLE ALL INTERRUPTS
1620 005054 012767 000010 006604 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS

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1621	005062	012767	005266	006572	MOV	#5\$,ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
1622	005070	012767	005124	006566	MOV	#1\$,FREEZ1	;SET UP TO LOOP WITH DATA
1623	005076	012705	000015		MOV	#15,R5	;LINE 15 WILL BE TESTED
1624	005102	012700	002000		MOV	#2000,R0	;CONSTANT FOR SELECTION
1625							;OF INITIAL (LOWEST) SPEED
1626	005106	012701	000015		MOV	#15,R1	;15 DIFFERENT SPEEDS WILL BE TESTED
1627	005112	012704	000001		MOV	#1,R4	;BINARY CODE FOR INITIAL SPEED
1628	005116	012767	177777	006576	MOV	#-1,TIME1	;INITIALIZE COMPARISON VALUE
1629	005124	012777	004000	006466 1\$:	MOV	#8111,ADHSCR	;CLEAR INTERFACE
1630	005132	010577	006462		MOV	R5,ADHSCR	;SELECT LINE 15 FOR TESTING
1631	005136	005077	006464		CLR	ADHBA	;CLEAR BUS ADDRESS
1632	005142	012777	177775	006460	MOV	#-3,ADHBC	;SET UP TO TRANSMIT
1633							;3 CHARACTERS
1634	005150	010077	006450		MOV	R0,ADHLPR	;SELECT LINE SPEED
1635	005154	005067	006544		CLR	TIME2	;CLEAR TRANSMITTER TIME TIMER
1636	005160	005067	006542		CLR	TEMP1	;SET UP NO CLOCK TIMER
1637	005164	012767	000010	006536	MOV	#10,TEMP2	
1638	005172	012777	020000	006432	MOV	#20000,ADHBAR	;SET BAR BIT FOR LINE 15
1639							;TO START TRANSMISSION
1640	005200	005777	006414	2\$:	TST	ADHSCR	;WAIT FOR TRANSMITTER
1641							;TO FINISH
1642	005204	100412			BMI	3\$	
1643	005206	005267	006512		INC	TIME2	;UPDATE TRANSMITTER TIMER
1644	005212	005267	006510		INC	TEMP1	;UPDATE NO CLOCK TIMER
1645	005216	001370			BNE	2\$	
1646	005220	005367	006504		DEC	TEMP2	
1647	005224	001365			BNE	2\$	
1648	005226	104001			HLT	1	;TRANSMITTER DID NOT FINISH. ERROR
1649	005230	000405			BR	4\$	
1650	005232	026767	006466	006462 3\$:	CMP	TIME2,TIME1	;VERIFY THAT TRANSMITTER
1651	005240	103401			BLO	4\$	;WAS FASTER AT THIS SELECTED SPEED
1652							; (NUMBER OF COUNTS IN TIME2
1653							; LESS THAN TIME1)
1654	005242	104002			HLT	2	;TRANSMITTER TIMING ERROR FOR
1655							;LINE 15
1656	005244	104410		4\$:	SCOPE1		;CHECK FOR FREEZE ON CURRENT DATA
1657	005246	016767	006452	006446	MOV	TIME2,TIME1	;SET UP FOR NEXT COMPARISON
1658	005254	005204			INC	R4	;SELECT NEXT SPEED
1659	005256	062700	002000		ADD	#2000,R0	
1660	005262	005301			DEC	R1	
1661	005264	001317			BNE	1\$	
1662	005266	104400		5\$:	SCOPE		;CHECK FOR ITERATIONS. LOOP
1663							
1664							;TRANSMITTER LINE SPEED SELECTION TEST
1665							;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 16
1666							;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1667							;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1668							;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1669							
1670	005270	012767	000340	172500 T17:	MOV	#340,PS	;DISABLE ALL INTERRUPTS
1671	005276	012767	000010	006362	MOV	#10,ICOUNT	;SET UP FOR 10 ITERATIONS
1672	005304	012767	005510	006350	MOV	#5\$,ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
1673	005312	012767	005346	006344	MOV	#1\$,FREEZ1	;SET UP TO LOOP WITH DATA
1674	005320	012705	000016		MOV	#16,R5	;LINE 16 WILL BE TESTED
1675	005324	012700	002000		MOV	#2000,R0	;CONSTANT FOR SELECTION
1676							;OF INITIAL (LOWEST) SPEED

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1677	005330	012701	000015		MOV	#15,R1	;15 DIFFERENT SPEEDS WILL BE TESTED
1678	005334	012704	000001		MOV	#1,R4	;BINARY CODE FOR INITIAL SPEED
1679	005340	012767	177777	006354	MC	#-1,TIME1	;INITIALIZE COMPARISON VALUE
1680	005346	012777	004000	006244	1\$: MOV	#BIT11,ADHSCR	;CLEAR INTERFACE
1681	005354	010577	006240		MOV	R5,ADHSCR	;SELECT LINE 16 FOR TESTING
1682	005360	005077	006242		CLR	ADHBA	;CLEAR BUS ADDRESS
1683	005364	012777	177775	006236	MOV	#-3,ADHBC	;SET UP TO TRANSMIT
1684							;3 CHARACTERS
1685	005372	010077	006226		MOV	R0,ADHLPR	;SELECT LINE SPEED
1686	005376	005067	006322		CLR	TIME2	;CLEAR TRANSMITTER TIME TIMER
1687	005402	005067	006320		CLR	TEMP1	;SET UP NO CLOCK TIMER
1688	005406	012767	000010	006314	MOV	#10,TEMP2	
1689	005414	012777	040000	006210	MOV	#40000,ADHBAR	;SET BAR BIT FOR LINE 16
1690							;TO START TRANSMISSION
1691	005422	005777	006172		2\$: TST	ADH=CR	;WAIT FOR TRANSMITTER
1692							;TO FINISH
1693	005426	100412			BMI	3\$	
1694	005430	005267	006270		INC	TIME2	;UPDATE TRANSMITTER TIMER
1695	005434	005267	006266		INC	TEMP1	;UPDATE NO CLOCK TIMER
1696	005440	001370			BNE	2\$	
1697	005442	005367	006262		DEC	TEMP2	
1698	005446	001365			BNE	2\$	
1699	005450	104001			HLT	1	;TRANSMITTER DID NOT FINISH, ERROR
1700	005452	000405			BR	4\$	
1701	005454	026767	006244	006240	3\$: CMP	TIME2,TIME1	;VERIFY THAT TRANSMITTER
1702	005462	103401			BLO	4\$	;WAS FASTER AT THIS SELECTED SPEED
1703							; (NUMBER OF COUNTS IN TIME2
1704							; LESS THAN TIME1)
1705	005464	104002			HLT	2	;TRANSMITTER TIMING ERROR FOR
1706							;LINE 16
1707	005466	104410			4\$: SCOPE1		;CHECK FOR FREEZE ON CURRENT DATA
1708	005470	016767	006230	006224	MOV	TIME2,TIME1	;SET UP FOR NEXT COMPARISON
1709	005476	005204			INC	R4	;SELECT NEXT SPEED
1710	005500	062700	002000		ADD	#2000,R0	
1711	005504	005301			DEC	R1	
1712	005506	001317			BNE	1\$	
1713	005510	104400			5\$: SCOPE		;CHECK FOR ITERATIONS, LOOP
1714							
1715							;TRANSMITTER LINE SPEED SELECTION TEST
1716							;TRANSMIT 3 CHARACTERS AT A SELECTED SPEED ON LINE 17
1717							;VERIFY THAT TRANSMITTER DONE OCCURS AT THE SELECTED SPEED
1718							;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1719							;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1720							
1721	005512	012767	000340	172256	T20: MOV	#340,PS	;DISABLE ALL INTERRUPTS
1722	005520	012767	000010	006140	MOV	#10,ICOUNT	;SET UP FOR 10 ITERATIONS
1723	005526	012767	005732	006126	MOV	#5\$,ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
1724	005534	012767	005570	006122	MOV	#1\$,FREEZ1	;SET UP TO LOOP WITH DATA
1725	005542	012705	000017		MOV	#17,R5	;LINE 17 WILL BE TESTED
1726	005546	012700	002000		MOV	#2000,R0	;CONSTANT FOR SELECTION
1727							;OF INITIAL (LOWEST) SPEED
1728	005552	012701	000015		MOV	#15,R1	;15 DIFFERENT SPEEDS WILL BE TESTED
1729	005556	012704	000001		MOV	#1,R4	;BINARY CODE FOR INITIAL SPEED
1730	005562	012767	177777	006132	MOV	#-1,TIME1	;INITIALIZE COMPARISON VALUE
1731	005570	012777	004000	006022	1\$: MOV	#BIT11,ADHSCR	;CLEAR INTERFACE
1732	005576	010577	006016		MOV	R5,ADHSCR	;SELECT LINE 17 FOR TESTING

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1733	005602	005077	006020		CLR	ADH3A		; CLEAR BUS ADDRESS
1734	005606	012777	177775	006014	MOV	#-3,ADHBC		; SET UP TO TRANSMIT
1735								; 3 CHARACTERS
1736	005614	010077	006004		MOV	RO,ADHLPR		; SELECT LINE SPEED
1737	005620	005067	006100		CLR	TIME2		; CLEAR TRANSMITTER TIME TIMER
1738	005624	005067	006076		CLR	TEMP1		; SET UP NO CLOCK TIMER
1739	005630	012767	000010	006072	MOV	#10,TEMP2		
1740	005636	012777	100000	005766	MOV	#100000,ADHBAR		; SET BAR BIT FOR LINE 17
1741								; TO START TRANSMISSION
1742	005644	005777	005750		TST	ADHSCR		; WAIT FOR TRANSMITTER
1743								; TO FINISH
1744	005650	100412			BMI	3\$		
1745	005652	005267	006046		INC	TIME2		; UPDATE TRANSMITTER TIMER
1746	005656	005267	006044		INC	TEMP1		; UPDATE NO CLOCK TIMER
1747	005662	001370			BNE	2\$		
1748	005664	005367	006040		DEC	TEMP2		
1749	005670	001365			BNE	2\$		
1750	005672	104001			HLT	1		; TRANSMITTER DID NOT FINISH, ERROR
1751	005674	000405			BR	4\$		
1752	005676	026767	006022	006016	CMP	TIME2,TIME1		; VERIFY THAT TRANSMITTER
1753	005704	103401			BLO	4\$		; WAS FASTER AT THIS SELECTED SPEED
1754								; (NUMBER OF COUNTS IN TIME2
1755								; LESS THAN TIME1)
1756	005706	104002			HLT	2		; TRANSMITTER TIMING ERROR FOR
1757								; LINE 17
1758	005710	104410			SCOPE1			; CHECK FOR FREEZE ON CURRENT DATA
1759	005712	016767	006006	006002	MOV	TIME2,TIME1		; SET UP FOR NEXT COMPARISION
1760	005720	005204			INC	R4		; SELECT NEXT SPEED
1761	005722	062700	002000		ADD	#2000,R0		
1762	005726	005301			DEC	R1		
1763	005730	001317			BNE	1\$		
1764	005732	104400			SCOPE			; CHECK FOR ITERATIONS, LOOP
1765								
1766								; RECEIVER LINE SPEED SELECTION TEST
1767								; TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 0
1768								; VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
1769								; VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1770								; AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1771								
1772	005734	012767	000340	172034	T21: MOV	#340,PS		; DISABLE ALL INTERRUPTS
1773	005742	012767	000010	005716	MOV	#10,ICOUNT		; SET UP FOR 10 ITERATIONS
1774	005750	012767	006154	005704	MOV	#5\$,ESCAPE		; SET UP TO ESCAPE TO NEXT TEST
1775	005756	012767	006012	005700	MOV	#1\$,FREEZ1		; SET UP TO LOOP WITH DATA
1776	005764	012705	000000		MOV	#0,R5		; LINE 0 WILL BE TESTED
1777	005770	012700	002100		MOV	#2100,R0		; CONSTANT FOR SELECTION
1778								; OF INITIAL (LOWEST) SPEED
1779	005774	012701	000015		MOV	#15,R1		; 15 DIFFERENT SPEEDS WILL BE TESTED
1780	006000	012704	000001		MOV	#1,R4		; BINARY CODE FOR INITIAL SPEED
1781	006004	012767	177777	005710	MOV	#-1,TIME1		; INITIALIZE COMPARISION VALUE
1782	006012	012777	004000	005600	1\$: MOV	#BIT11,ADHSCR		; CLEAR INTERFACE
1783	006020	010577	005574		MOV	R5,ADHSCR		; SELECT LINE 0 FOR TESTING
1784	006024	005077	005576		CLR	ADHBA		; CLEAR BUS ADDRESS
1785	006030	012777	177777	005572	MOV	#-1,ADHBC		; SET UP TO TRANSMIT
1786								; 1 CHARACTERS
1787	006036	010077	005562		MOV	RO,ADHLPR		; SELECT LINE SPEED
1788	006042	005067	005656		CLR	TIME2		; CLEAR RECEIVER TIME TIMER

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1789 006046 005067 005654          CLR      TEMP1          ;SET UP NO CLOCK TIMER
1790 006052 012767 000010 005650    MOV      #10,TEMP2
1791 006060 012777 000001 005544    MOV      #1,ADHBAR          ;SET BAR BIT FOR LINE 0
1792                                ;TO START TRANSMISSION
1793 006066 105777 005526          2$:  TSTB      ADHSCR          ;WAIT FOR RECEIVER
1794                                ;TO FINISH
1795 006072 100412          BMI      3$
1796 006074 005267 005624          INC      TIME2          ;UPDATE RECEIVER TIMER
1797 006100 005267 005622          INC      TEMP1          ;UPDATE NO CLOCK TIMER
1798 006104 001370          BNE      2$
1799 006106 005367 005616          DEC      TEMP2
1800 006112 001365          BNE      2$
1801 006114 104001          HLT      1          ;RECEIVER DID NOT FINISH, ERROR
1802 006116 000405          BR       4$
1803 006120 026767 005600 005574 3$:  CMP      TIME2,TIME1          ;VERIFY THAT RECEIVER
1804 006126 103401          BLO      4$          ;WAS FASTER AT THIS SELECTED SPEED
1805                                ; (NUMBER OF COUNTS IN TIME2
1806                                ; LESS THAN TIME1)
1807 006130 104002          HLT      2          ;RECEIVER TIMING ERROR FOR
1808                                ; LINE 0
1809 006132 104410          4$:  SCOPE1          ;CHECK FOR FREEZE ON CURRENT DATA
1810 006134 016767 005564 005560    MOV      TIME2,TIME1          ;SET UP FOR NEXT COMPARISION
1811 006142 005204          INC      R4          ;SELECT NEXT SPEED
1812 006144 062700 002100          ADD      #2100,R0
1813 006150 005301          DEC      R1
1814 006152 001317          BNE      1$
1815 006154 104400          5$:  SCOPE          ;CHECK FOR ITERATIONS, LOOP
1816
1817          ;RECEIVER LINE SPEED SELECTION TEST
1818          ;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 1
1819          ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
1820          ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1821          ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1822
1823 006156 012767 000340 171612 T22:  MOV      #340,PS          ;DISABLE ALL INTERRUPTS
1824 006164 012767 000010 005474    MOV      #10,ICOUNT          ;SET UP FOR 10 ITERATIONS
1825 006172 012767 006376 005462    MOV      #5$,ESCAPE          ;SET UP TO ESCAPE TO NEXT TEST
1826 006200 012767 006234 005456    MOV      #1$,FREEZ1          ;SET UP TO LOOP WITH DATA
1827 006206 012705 000001          MOV      #1,R5          ;LINE 1 WILL BE TESTED
1828 006212 012700 002100          MOV      #2100,R0          ;CONSTANT FOR SELECTION
1829                                ; OF INITIAL (LOWEST) SPEED
1830 006216 012701 000015          MOV      #15,R1          ;15 DIFFERENT SPEEDS WILL BE TESTED
1831 006222 012704 000001          MOV      #1,R4          ;BINARY CODE FOR INITIAL SPEED
1832 006226 012767 177777 005466    MOV      #-1,TIME1          ;INITIALIZE COMPARISION VALUE
1833 006234 012777 004000 005356 1$:  MOV      #BIT11,ADHSCR          ;CLEAR INTERFACE
1834 006242 010577 005252          MOV      R5,ADHSCR          ;SELECT LINE 1 FOR TESTING
1835 006246 005077 005354          CLR      ADHBA          ;CLEAR BUS ADDRESS
1836 006252 012777 177777 005350    MOV      #-1,ADHBC          ;SET UP TO TRANSMIT
1837                                ; 1 CHARACTERS
1838 006260 010077 005340          MOV      R0,ADHLPR          ;SELECT LINE SPEED
1839 006264 005067 005434          CLR      TIME2          ;CLEAR RECEIVER TIME TIMER
1840 006270 005067 005432          CLR      TEMP1          ;SET UP NO CLOCK TIMER
1841 006274 012767 000010 005426    MOV      #10,TEMP2
1842 006302 012777 000002 005322    MOV      #2,ADHBAR          ;SET BAR BIT FOR LINE 1
1843                                ;TO START TRANSMISSION
1844 006310 105777 005304          2$:  TSTB      ADHSCR          ;WAIT FOR RECEIVER

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1845                                     ;TO FINISH
1846 006314 100412 BMI 3$
1847 006316 005267 J05402 INC TIME2
1848 006322 005267 005400 INC TEMP1
1849 006326 001370 BNE 2$
1850 006330 005367 005374 DEC TEMP2
1851 006334 001365 BNE 2$
1852 006336 104001 HLT 1
1853 006340 000405 BR 4$
1854 006342 026767 005356 005352 3$: CMP TIME2,TIME1
1855 006350 103401 BLO 4$
1856                                     ;RECEIVER DID NOT FINISH, ERPR
1857                                     ;RECEIVER TIMING ERROR FOR
1858 006352 104002 HLT 2
1859                                     ;LINE 1
1860 006354 104410 4$: SCOPE1
1861 006356 016767 005342 005336 MOV TIME2,TIME1
1862 006364 005204 INC R4
1863 006366 062700 002100 ADD #2100,R0
1864 006372 005301 DEC R1
1865 006374 001317 BNE 1$
1866 006376 104400 5$: SCOPE
1867                                     ;CHECK FOR ITERATIONS, LOOP
1868                                     ;RECEIVER LINE SPEED SELECTION TEST
1869                                     ;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 2
1870                                     ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
1871                                     ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1872                                     ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1873
1874 006400 012767 000340 171370 T23: MOV #340,PS
1875 006406 012767 000010 005252 MOV #10,ICOUNT
1876 006414 012767 006620 005240 MOV #5$,ESCAPE
1877 006422 012767 006456 005234 MOV #1$,FREEZ1
1878 006430 012705 000002 MOV #2,R5
1879 006434 012700 002100 MOV #2100,R0
1880                                     ;LINE 2 WILL BE TESTED
1881 006440 012701 000015 MOV #15,R1
1882 006444 012704 000001 MOV #1,R4
1883 006450 012757 177777 005244 MOV #-1,TIME1
1884 006456 012777 004000 005134 1$: MOV #BIT11,JDHSCR
1885 006464 010577 005130 MOV R5,JDHSCR
1886 006470 005077 005132 CLR JDHBA
1887 006474 012777 177777 005126 MOV #-1,JDHBC
1888                                     ;1 CHARACTERS
1889 006502 010077 005116 MOV R0,JDHLPR
1890 006506 005067 005212 CLR TIME2
1891 006512 005067 005210 CLR TEMP1
1892 006516 012767 000010 005204 MOV #10,TEMP2
1893 006524 012777 000004 005100 MOV #4,JDHBA
1894                                     ;SET BAR BIT FOR LINE 2
1895 J06532 105777 005062 2$: TSTB JDHSCR
1896                                     ;TO START TRANSMISSION
1897                                     ;WAIT FOR RECEIVER
1898 BMI 3$
1899 INC TIME2
1900 INC TEMP1
1900 BNE 2$

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1901	006552	005367	005152		DEC	TEMP2	
1902	006556	001365			BNE	2\$	
1903	006560	104001			HLT	1	;RECEIVER DID NOT FINISH, ERROR
1904	006562	000405			BR	4\$	
1905	006564	026767	005134	005130	3\$: CMP	TIME2, TIME1	;VERIFY THAT RECEIVER
1906	006572	103401			BLO	4\$	;WAS FASTER AT THIS SELECTED SPEED
1907							; (NUMBER OF COUNTS IN TIME2
1908							; LESS THAN TIME1)
1909	006574	104002			HLT	2	;RECEIVER TIMING ERROR FOR
1910							; LINE 2
1911	006576	104410			4\$: SCOPE1		;CHECK FOR FREEZE ON CURRENT DATA
1912	006600	016767	005120	005114	MOV	TIME2, TIME1	;SET UP FOR NEXT COMPARISION
1913	006606	005204			INC	R4	;SELECT NEXT SPEED
1914	006610	062700	002100		ADD	#2100, R0	
1915	006614	005301			DEC	R1	
1916	006616	001317			BNE	1\$	
1917	006620	104400			5\$: SCOPE		;CHECK FOR ITERATIONS, LOOP
1918							
1919							;RECEIVER LINE SPEED SELECTION TEST
1920							;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 3
1921							;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
1922							;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
1923							;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1924							
1925	006622	012767	000340	171146	T24: MOV	#340, PS	;DISABLE ALL INTERRUPTS
1926	006630	012767	000010	005030	MOV	#10, ICOUNT	;SET UP FOR 10 ITERATIONS
1927	006636	012767	007042	005016	MOV	#5\$, ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
1928	006644	012767	006700	005012	MOV	#1\$, FREEZ1	;SET UP TO LOOP WITH DATA
1929	006652	012705	000003		MOV	#3, R5	;LINE 3 WILL BE TESTED
1930	006656	012700	002100		MOV	#2100, R0	;CONSTANT FOR SELECTION
1931							;OF INITIAL (LOWEST) SPEED
1932	006662	012701	000015		MOV	#15, R1	;15 DIFFERENT SPEEDS WILL BE TESTED
1933	006666	012704	000001		MOV	#1, R4	;BINARY CODE FOR INITIAL SPEED
1934	006672	012767	177777	005022	MOV	#-1, TIME1	;INITIALIZE COMPARISION VALUE
1935	006700	012777	004000	004712	1\$: MOV	#BIT1!, 2DHSCR	;CLEAR INTERFACE
1936	006706	010577	004706		MOV	R5, 2DHSCR	;SELECT LINE 3 FOR TESTING
1937	006712	005077	004710		CLR	2DHBA	;CLEAR BUS ADDRESS
1938	006716	012777	177777	004704	MOV	#-1, 2DHBC	;SET UP TO TRANSMIT
1939							;1 CHARACTERS
1940	006724	010077	004674		MOV	R0, 2DHLPR	;SELECT LINE SPEED
1941	006730	005067	004770		CLR	TIME2	;CLEAR RECEIVER TIME TIMER
1942	006734	005067	004766		CLR	TEMP1	;SET UP NO CLOCK TIMER
1943	006740	012767	000010	004762	MOV	#10, TEMP2	
1944	006746	012777	000010	004656	MOV	#10, 2DHBAR	;SET BAR BIT FOR LINE 3
1945							;TO START TRANSMISSION
1946	006754	105777	004640		2\$: TSTL	2DHSCR	;WAIT FOR RECEIVER
1947							;TO FINISH
1948	006760	100412			BMI	3\$	
1949	006762	005267	004736		INC	TIME2	;UPDATE RECEIVER TIMER
1950	006766	005267	004734		INC	TEMP1	;UPDATE NO CLOCK TIMER
1951	006772	001370			BNE	2\$	
1952	006774	005367	004730		DEC	TEMP2	
1953	007000	001365			BNE	2\$	
1954	007002	104001			HLT	1	;RECEIVER DID NOT FINISH, ERROR
1955	007004	000405			BR	4\$	
1956	007006	026767	004712	004706	3\$: CMP	TIME2, TIME1	;VERIFY THAT RECEIVER

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1957 007014 103401          BLO      45          ;WAS FASTER AT THIS SELECTED SPEED
1958                                     ; (NUMBER OF COUNTS IN TIME2
1959                                     ; LESS THAN TIME1)
1960 007016 104002          HLT      2          ;RECEIVER TIMING ERROR FOR
1961                                     ; LINE 3
1962 007020 104410          45:    SCOPE1      ;CHECK FOR FREEZE ON CURRENT DATA
1963 007022 016767 004676 004672  MOV      TIME2,TIME1 ;SET UP FOR NEXT COMPARISON
1964 007030 005204          INC      R4          ;SELECT NEXT SPEED
1965 007032 062700 002100  ADD      #2100,R0
1966 007036 005301          DEC      R1
1967 007040 001317          BNE      15
1968 007042 104400          55:    SCOPE          ;CHECK FOR ITERATIONS. LOOP
1969
1970                                     ;RECEIVER LINE SPEED SELECTION TEST
1971                                     ;TRANSMIT 1 CHARACTER AT A SELECTED SPEED ON LINE 4
1972                                     ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
1973                                     ;VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
1974                                     ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
1975
1976 007044 012767 000340 170724 125:    MOV      #340,P5          ;DISABLE ALL INTERRUPTS
1977 007052 012767 000010 004606  MOV      #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
1978 007060 012767 007264 004574  MOV      #55,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1979 007066 012767 007122 004570  MOV      #15,FREEZ1      ;SET UP TO LOOP WITH DATA
1980 007074 012705 000004          MOV      #4,R5          ;LINE 4 WILL BE TESTED
1981 007100 012700 002100  MOV      #2100,R0      ;CONSTANT FOR SELECTION
1982                                     ;OF INITIAL (LOWEST) SPEED
1983 007104 012701 000015          MOV      #5,R1          ;15 DIFFERENT SPEEDS WILL BE TESTED
1984 007110 012704 000001  MOV      #1,R4          ;BINARY CODE FOR INITIAL SPEED
1985 007114 012767 177777 004600  MOV      #-1,TIME1      ;INITIALIZE COMPARISON VALUE
1986 007122 012777 004000 004470 15:    MOV      #BIT11,JDHSCR      ;CLEAR INTERFACE
1987 007130 010577 004464          MOV      R5,JDHSCR      ;SELECT LINE 4 FOR TESTING
1988 007134 005077 004466          CLR      JDHBA          ;CLEAR BUS ADDRESS
1989 007140 012777 177777 004462  MOV      #-1,JDHBC      ;SET UP TO TRANSMIT
1990                                     ; 1 CHARACTER
1991 007146 010077 004452          MOV      R0,JDHLPR      ;SELECT LINE SPEED
1992 007152 005067 004546          CLR      TIME2          ;CLEAR RECEIVER TIME TIMER
1993 007156 005067 004544          CLR      TEMP1          ;SET UP NO CLOCK TIMER
1994 007162 012767 000010 004540  MOV      #10,TEMP2
1995 007170 012777 000020 004434  MOV      #20,JDHBA      ;SET BAR BIT FOR LINE 4
1996                                     ;TO START TRANSMISSION
1997 007176 105777 004416          25:    TSTB      JDHSCR      ;WAIT FOR RECEIVER
1998                                     ;TO FINISH
1999 007202 100412          BMI      35
2000 007204 005267 004514          INC      TIME2          ;UPDATE RECEIVER TIMER
2001 007210 005267 004512          INC      TEMP1          ;UPDATE NO CLOCK TIMER
2002 007214 001370          BNE      25
2003 007216 005367 004506          DEC      TEMP2
2004 007222 001365          BNE      25
2005 007224 104001          HLT      1          ;RECEIVER DID NOT FINISH, ERROR
2006 007226 000405          BR      45
2007 007230 026767 004470 004464 35:    CMP      TIME2,TIME1
2008 007236 103401          BLO      45
2009
2010                                     ;WAS FASTER AT THIS SELECTED SPEED
2011 007240 104002          HLT      2          ; (NUMBER OF COUNTS IN TIME2
2012                                     ; LESS THAN TIME1)
                                     ;RECEIVER TIMING ERROR FOR
                                     ; LINE 4

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2013	007242	104410			45:	SCOPE1		:CHECK FOR FREEZE ON CURRENT DATA
2014	007244	016767	004454	004450		MOV	TIME2,TIME1	:SET UP FOR NEXT COMPARISON
2015	007252	005204				INC	R4	:SELECT NEXT SPEED
2016	007254	062700	002100			ADD	#2100,R0	
2017	007260	005301				DEC	R1	
2018	007262	001317				BNE	15	
2019	007264	104400			55:	SCOPE		:CHECK FOR ITERATIONS, LOOP
2020								
2021								:RECEIVER LINE SPEED SELECTION TEST
2022								:TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 5
2023								:VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2024								:VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
2025								:AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2026								
2027	007266	012767	000340	170502	T26:	MOV	#340,FS	:DISABLE ALL INTERRUPTS
2028	007274	012767	000010	004354		MOV	#10,ICOUNT	:SET UP FOR 10 ITERATIONS
2029	007302	012767	007506	004352		MOV	#55,ESCAPE	:SET UP TO ESCAPE TO NEXT TEST
2030	007310	012767	007344	004346		MOV	#15,FREEZ1	:SET UP TO LOOP WITH DATA
2031	007316	012705	000005			MOV	#5,R5	:LINE 5 WILL BE TESTED
2032	007322	012700	002100			MOV	#2100,R0	:CONSTANT FOR SELECTION
2033								:OF INITIAL (LOWEST) SPEED
2034	007326	012701	000015			MOV	#15,R1	:15 DIFFERENT SPEEDS WILL BE TESTED
2035	007332	012704	000001			MOV	#1,R4	:BINARY CODE FOR INITIAL SPEED
2036	007336	012767	177777	004356		MOV	#-1,TIME1	:INITIALIZE COMPARISON VALUE
2037	007344	012777	004000	004246	15:	MOV	#BIT11,2DHSCR	:CLEAR INTERFACE
2038	007352	010577	004242			MOV	R5,2DHSCR	:SELECT LINE 5 FOR TESTING
2039	007356	005077	004244			CLR	2DHBA	:CLEAR BUS ADDRESS
2040	007362	012777	177777	004240		MOV	#-1,2DHBC	:SET UP TO TRANSMIT
2041								:1 CHARACTERS
2042	007370	010077	004230			MOV	R0,2DHLPR	:SELECT LINE SPEED
2043	007374	005067	004324			CLR	TIME2	:CLEAR RECEIVER TIME TIMER
2044	007400	005067	004322			CLR	TEMP1	:SET UP NO CLOCK TIMER
2045	007404	012767	000010	004316		MOV	#10,TEMP2	
2046	007412	012777	000040	004212		MOV	#40,2DHBAR	:SET BAR BIT FOR LINE 5
2047								:TO START TRANSMISSION
2048	007420	105777	004174		25:	TSTB	2DHSCR	:WAIT FOR RECEIVER
2049								:TO FINISH
2050	007424	100412				BMI	35	
2051	007426	005267	004272			INC	TIME2	:UPDATE RECEIVER TIMER
2052	007432	005267	004270			INC	TEMP1	:UPDATE NO CLOCK TIMER
2053	007436	001370				BNE	25	
2054	007440	005367	004264			DEC	TEMP2	
2055	007444	001365				BNE	25	
2056	007446	104001				HLT	!	:RECEIVER DID NOT FINISH. ERROR
2057	007450	000405				BR	45	
2058	007452	026767	004246	004242	35:	CMP	TIME2,TIME1	:VERIFY THAT RECEIVER
2059	007460	103401				BLO	45	:WAS FASTER AT THIS SELECTED SPEED
2060								: (NUMBER OF COUNTS IN TIME2
2061								: LESS THAN TIME1)
2062	007462	104002				HLT	2	:RECEIVER TIMING ERROR FOR
2063								:LINE 5
2064	007464	104410			45:	SCOPE1		:CHECK FOR FREEZE ON CURRENT DATA
2065	007466	016767	004232	004226		MOV	TIME2,TIME1	:SET UP FOR NEXT COMPARISON
2066	007474	005204				INC	R4	:SELECT NEXT SPEED
2067	007476	062700	002100			ADD	#2100,R0	
2068	007502	005301				DEC	R1	

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2069 007504 001317      BNE      1$
2070 007506 104400      5$:      SCOPE                      ;CHECK FOR ITERATIONS, LOOP
2071
2072      ;RECEIVER LINE SPEED SELECTION TEST
2073      ;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 6
2074      ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2075      ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2076      ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2077
2078 007510 012767 000340 170260 T27:  MOV      #340,PS      ;DISABLE ALL INTERRUPTS
2079 007516 012767 000010 004142      MOV      #10,ICOUNT    ;SET UP FOR 10 ITERATIONS
2080 007524 012767 007730 004130      MOV      #5$,ESCAPE    ;SET UP TO ESCAPE TO NEXT TEST
2081 007532 012767 007566 004124      MOV      #1$,FREEZE1   ;SET UP TO LOOP WITH DATA
2082 007540 012705 000006      MOV      #6,R5          ;LINE 6 WILL BE TESTED
2083 007544 012700 002100      MOV      #2100,R0      ;CONSTANT FOR SELECTION
2084      ;OF INITIAL (LOWEST) SPEED
2085 007550 012701 000015      MOV      #15,R1      ;15 DIFFERENT SPEEDS WILL BE TESTED
2086 007554 012704 000001      MOV      #1,R4          ;BINARY CODE FOR INITIAL SPEED
2087 007560 012767 177777 004134      MOV      #-1,TIME1     ;INITIALIZE COMPARISON VALJE
2088 007566 012777 004000 004024 1$:  MOV      #BIT11,JDHSCR  ;CLEAR INTERFACE
2089 007574 010577 004020      MOV      R5,JDHSCR    ;SELECT LINE 6 FOR TESTING
2090 007600 005077 004022      CLR      JDHBA        ;CLEAR BUS ADDRESS
2091 007604 012777 177777 004016      MOV      #-1,JDHBC    ;SET UP TO TRANSMIT
2092      ;1 CHARACTERS
2093 007612 010077 004006      MOV      R0,JDHLPR    ;SELECT LINE SPEED
2094 007616 005067 004102      CLR      TIME2        ;CLEAR RECEIVER TIME TIMER
2095 007622 005067 004100      CLR      TEMP1        ;SET UP NO CLOCK TIMER
2096 007626 012767 000010 004074      MOV      #10,TEMP2
2097 007634 012777 000100 003770      MOV      #100,JDHBAR ;SET BAR BIT FOR LINE 6
2098      ;TO START TRANSMISSION
2099 007642 105777 003752      2$:  TSTB      JDHSCR      ;WAIT FOR RECEIVER
2100      ;TO FINISH
2101 007646 100412      BMI      3$
2102 007650 005267 004050      INC      TIME2        ;UPDATE RECEIVER TIMER
2103 007654 005267 004046      INC      TEMP1        ;UPDATE NO CLOCK TIMER
2104 007660 001370      BNE      2$
2105 007662 005367 004042      DEC      TEMP2
2106 007666 001365      BNE      2$
2107 007670 104001      HLT
2108 007672 000405      BR
2109 007674 026767 004024 004020 3$:  CMP      TIME2,TIME1  ;RECEIVER DID NOT FINISH, ERROR
2110 007702 103401      BLO      4$
2111      ;VERIFY THAT RECEIVER
2112      ;WAS FASTER AT THIS SELECTED SPEED
2113      ; (NUMBER OF COUNTS IN TIME2
2114      ; LESS THAN TIME1)
2115 007704 104002      HLT      2          ;RECEIVER TIMING ERROR FOR
2116      ;LINE 6
2117 007706 104410      4$:  SCOPE1      ;CHECK FOR FREEZE ON CURRENT DATA
2118 007710 016767 004010 004004      MOV      TIME2,TIME1 ;SET UP FOR NEXT COMPARISON
2119 007716 005204      INC      R4          ;SELECT NEXT SPEED
2120 007720 062770 002100      ADD      #2100,R0
2121 007724 005301      DEC      R1
2122 007726 001317      BNE      1$
2123 007730 104400      5$:  SCOPE                      ;CHECK FOR ITERATIONS, LOOP
2124      ;RECEIVER LINE SPEED SELECTION TEST
2125      ;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 7

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2125                                     ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2126                                     ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2127                                     ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2128
2129 007732 012767 000340 170036 T30: MOV #340,PS ;DISABLE ALL INTERRUPTS
2130 007740 012767 000010 003720 MOV #10,COUNT ;SET UP FOR 10 ITERATIONS
2131 007746 012767 010152 003706 MOV #5$,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
2132 007754 012767 010010 003702 MOV #1$,FREEZE1 ;SET UP TO LOOP WITH DATA
2133 007752 012705 000007 MOV #7,R5 ;LINE 7 WILL BE TESTED
2134 007766 012700 002100 MOV #2100,R0 ;CONSTANT FOR SELECTION
2135                                     ;OF INITIAL (LOWEST) SPEED
2136 007772 012701 000015 MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
2137 007776 012704 000001 MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
2138 010002 012767 177777 003712 MOV #-1,TIME1 ;INITIALIZE COMPARISION VALUE
2139 010010 012777 004000 003602 1$: MOV #BIT11,ADHSCR ;CLEAR INTERFACE
2140 010016 010577 003576 MOV R5,ADHSCR ;SELECT LINE 7 FOR TESTING
2141 010022 005077 003600 CLR ADHBA ;CLEAR BUS ADDRESS
2142 010026 012777 177777 003574 MOV #-1,ADHBC ;SET UP TO TRANSMIT
2143                                     ;1 CHARACTERS
2144 010034 010077 003564 MOV R0,ADHLPR ;SELECT LINE SPEED
2145 010040 005067 003660 CLR TIME2 ;CLEAR RECEIVER TIME TIMER
2146 010044 005067 003656 CLR TEMP1 ;SET UP NO CLOCK TIMER
2147 010050 012767 000010 003652 MOV #10,TEMP2
2148 010056 012777 000200 003546 MOV #200,ADHBAR ;SET BAR BIT FOR LINE 7
2149                                     ;TO START TRANSMISSION
2150 010064 105777 003530 2$: TSTB ADHSCR ;WAIT FOR RECEIVER
2151                                     ;TO FINISH
2152 010070 100412 BMI 3$
2153 010072 005267 003626 INC TIME2 ;UPDATE RECEIVER TIMER
2154 010076 005267 003624 INC TEMP1 ;UPDATE NO CLOCK TIMER
2155 010102 001370 BNE 2$
2156 010104 005367 003620 DEC TEMP2
2157 010110 001365 BNE 2$
2158 010112 104001 HLT 1 ;RECEIVER DID NOT FINISH. ERROR
2159 010114 000405 BR 4$
2160 010116 026767 003602 003576 3$: CMP TIME2,TIME1 ;VERIFY THAT RECEIVER
2161 010124 103401 BLO 4$ ;WAS FASTER AT THIS SELECTED SPEED
2162                                     ; (NUMBER OF COUNTS IN TIME2
2163                                     ; LESS THAN TIME1)
2164 010126 104002 HLT 2 ;RECEIVER TIMING ERROR FOR
2165                                     ; LINE 7
2166 010130 104410 4$: SCOPE1 ;CHECK FOR FREEZE ON CURRENT DATA
2167 010132 016767 003566 003562 MOV TIME2,TIME1 ;SET UP FOR NEXT COMPARISION
2168 010140 005204 INC R4 ;SELECT NEXT SPEED
2169 010142 062700 002100 ADD #2100,R0
2170 010146 005301 DEC R1
2171 010150 001317 BNE 1$
2172 010152 104400 5$: SCOPE ;CHECK FOR ITERATIONS. LOOP
2173
2174 ;RECEIVER LINE SPEED SELECTION TEST
2175 ;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 10
2176 ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2177 ;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2178 ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2179
2180 010154 012767 000340 167614 T31: MOV #340,PS ;DISABLE ALL INTERRUPTS

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2181	010162	012767	000010	003476	MOV	#10,ICOUNT	;SET UP FOR 10 ITERATIONS
2182	010170	012767	010374	003464	MOV	#5\$,ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
2183	010176	012767	010232	003460	MOV	#1\$,FREEZ1	;SET UP TO LOOP WITH DATA
2184	010204	012705	000010		MOV	#10,R5	;LINE 10 WILL BE TESTED
2185	010210	012700	002100		MOV	#2100,R0	;CONSTANT FOR SELECTION
2186							;OF INITIAL (LOWEST) SPEED
2187	010214	012701	000015		MOV	#15,R1	;15 DIFFERENT SPEEDS WILL BE TESTED
2188	010220	012704	000001		MOV	#1,R4	;BINARY CODE FOR INITIAL SPEED
2189	010224	012767	177777	003470	MOV	#-1,TIME1	;INITIALIZE COMPARISON VALUE
2190	010232	012777	004000	003360	1\$: MOV	#BIT11,ADHSCR	;CLEAR INTERFACE
2191	010240	010577	003354		MOV	R5,ADHSCR	;SELECT LINE 10 FOR TESTING
2192	010244	005077	003356		CLR	ADHBA	;CLEAR BUS ADDRESS
2193	010250	012777	177777	003352	MOV	#-1,ADHBC	;SET UP TO TRANSMIT
2194							;1 CHARACTERS
2195	010256	010077	003342		MOV	R0,ADHLPR	;SELECT LINE SPEED
2196	010262	005067	003436		CLR	TIME2	;CLEAR RECEIVER TIME TIMER
2197	010266	005067	003434		CLR	TEMP1	;SET UP NO CLOCK TIMER
2198	010272	012767	000010	003430	MOV	#10,TEMP2	
2199	010300	012777	000400	003324	MOV	#400,ADHBA	;SET BAR BIT FOR LINE 10
2200							;TO START TRANSMISSION
2201	010306	105777	003306		2\$: TSTB	ADHSCR	;WAIT FOR RECEIVER
2202							;TO FINISH
2203	010312	100412			BMI	3\$	
2204	010314	005267	003404		INC	TIME2	;UPDATE RECEIVER TIMER
2205	010320	005267	003402		INC	TEMP1	;UPDATE NO CLOCK TIMER
2206	010324	001370			BNE	2\$	
2207	010326	005367	003376		DEC	TEMP2	
2208	010332	001365			BNE	2\$	
2209	010334	104001			HLT	1	;RECEIVER DID NOT FINISH, ERROR
2210	010336	000405			BR	4\$	
2211	010340	026767	003360	003354	3\$: CMP	TIME2,TIME1	;VERIFY THAT RECEIVER
2212	010346	103401			BLO	4\$	;WAS FASTER AT THIS SELECTED SPEED
2213							; (NUMBER OF COUNTS IN TIME2
2214							; LESS THAN TIME1)
2215	010350	104002			HLT	2	;RECEIVER TIMING ERROR FOR
2216							;LINE 10
2217	010352	104410			4\$: SCOPE1		;CHECK FOR FREEZE ON CURRENT DATA
2218	010354	016767	003344	003340	MOV	TIME2,TIME1	;SET UP FOR NEXT COMPARISON
2219	010362	005204			INC	R4	;SELECT NEXT SPEED
2220	010364	062700	002100		ADD	#2100,R0	
2221	010370	005301			DEC	R1	
2222	010372	001317			BNE	1\$	
2223	010374	104400			5\$: SCOPE		;CHECK FOR ITERATIONS, LOOP
2224							
2225							;RECEIVER LINE SPEED SELECTION TEST
2226							;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 11
2227							;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2228							;VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
2229							;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2230							
2231	010376	012767	000340	167372	T32: MOV	#34L	;DISABLE ALL INTERRUPTS
2232	010404	012767	000010	003254	MOV	#10,ICOUNT	;SET UP FOR 10 ITERATIONS
2233	010412	012767	010616	003242	MOV	#5\$,ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
2234	010420	012767	010454	003236	MOV	#1\$,FREEZ1	;SET UP TO LOOP WITH DATA
2235	010426	012705	000011		MOV	#11,R5	;LINE 11 WILL BE TESTED
2236	010432	012700	002100		MOV	#2100,R0	;CONSTANT FOR SELECTION

2237									;OF INITIAL (LOWEST) SPEED
2238	010436	012701	000015		MOV	#15,R1			;15 DIFFERENT SPEEDS WILL BE TESTED
2239	010442	012704	000001		MOV	#1,R4			;BINARY CODE FOR INITIAL SPEED
2240	010446	012767	177777	003246	MOV	#-1,TIME1			;INITIALIZE COMPARISION VALUE
2241	010454	012777	004000	003136	1\$:	MOV	#BIT11,ADHSCR		;CLEAR INTERFACE
2242	010462	010577	003132		MOV	R5,ADHSCR			;SELECT LINE 11 FOR TESTING
2243	010466	005077	003134		CLR	ADHBA			;CLEAR BUS ADDRESS
2244	010472	012777	177777	003130	MOV	#-1,ADHBC			;SET UP TO TRANSMIT
2245									;1 CHARACTERS
2246	010500	010077	003120		MOV	R0,ADHLPR			;SELECT LINE SPEED
2247	010504	005067	003214		CLR	TIME2			;CLEAR RECEIVER TIME TIMER
2248	010510	005067	003212		CLR	TEMP1			;SET UP NO CLOCK TIMER
2249	010514	012767	000010	003206	MOV	#10,TEMP2			
2250	010522	012777	001000	003102	MOV	#1000,ADHBAR			;SET BAR BIT FOR LINE 11
2251									;TO START TRANSMISSION
2252	010530	105777	003064		2\$:	TSTB	ADHSCR		;WAIT FOR RECEIVER
2253									;TO FINISH
2254	010534	100412			BMI	3\$			
2255	010536	005267	003162		INC	TIME2			;UPDATE RECEIVER TIMER
2256	010542	005267	003160		INC	TEMP1			;UPDATE NO CLOCK TIMER
2257	010546	001370			BNE	2\$			
2258	010550	005367	003154		DEC	TEMP2			
2259	010554	001365			BNE	2\$			
2260	010556	104001			HLT	1			;RECEIVER DID NOT FINISH. ERROR
2261	010560	000405			BR	4\$			
2262	010562	026767	003136	003132	3\$:	CMP	TIME2,TIME1		;VERIFY THAT RECEIVER
2263	010570	103401			BLO	4\$			;WAS FASTER AT THIS SELECTED SPEED
2264									; (NUMBER OF COUNTS IN TIME2
2265									; LESS THAN TIME1)
2266	010572	104002			HLT	2			;RECEIVER TIMING ERROR FOR
2267									;LINE 11
2268	010574	104410			4\$:	SCOPE1			;CHECK FOR FREEZE ON CURRENT DATA
2269	010576	016767	003122	003116	MOV	TIME2,TIME1			;SET UP FOR NEXT COMPARISION
2270	010604	005204			INC	R4			;SELECT NEXT SPEED
2271	010606	062700	002100		ADD	#2100,R0			
2272	010612	005301			DEC	R1			
2273	010614	001317			BNE	1\$			
2274	010616	104400			5\$:	SCOPE			;CHECK FOR ITERATIONS. LOOP
2275									
2276									;RECEIVER LINE SPEED SELECTION TEST
2277									;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 12
2278									;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2279									;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2280									;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2281									
2282	010620	012767	000340	167150	T33:	MOV	#340,PS		;DISABLE ALL INTERRUPTS
2283	010626	012767	000010	003032	MOV	#10,ICOUNT			;SET UP FOR 10 ITERATIONS
2284	010634	012767	011040	003020	MOV	#5\$,ESCAPE			;SET UP TO ESCAPE TO NEXT TEST
2285	010642	012767	010676	003014	MOV	#1\$,FREEZ1			;SET UP TO LOOP WITH DATA
2286	010650	012705	000012		MOV	#12,R5			;LINE 12 WILL BE TESTED
2287	010654	012700	002100		MOV	#2100,R0			;CONSTANT FOR SELECTION
2288									;OF INITIAL (LOWEST) SPEED
2289	010660	012701	000015		MOV	#15,R1			;15 DIFFERENT SPEEDS WILL BE TESTED
2290	010664	012704	000001		MOV	#1,R4		</	

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2293	010704	010577	002710		MOV	R5, 2DHSCR	; SELECT LINE 12 FOR TESTING
2294	010710	005077	002712		CLR	2DHBA	; CLEAR BUS ADDRESS
2295	010714	012777	177777	002706	MOV	#-1, 2DHBC	; SET UP TO TRANSMIT
2296							; 1 CHARACTERS
2297	010722	010077	002676		MOV	R0, 2DHLPR	; SELECT LINE SPEED
2298	010726	005067	002772		CLR	TIME2	; CLEAR RECEIVER TIME TIMER
2299	010732	005067	002770		CLR	TEMP1	; SET UP NO CLOCK TIMER
2300	010736	012767	000010	002764	MOV	#10, TEMP2	
2301	010744	012777	002000	002660	MOV	#2000, 2DHBAR	; SET BAR BIT FOR LINE 12
2302							; TO START TRANSMISSION
2303	010752	105777	002642		2\$: TSTB	2DHSCR	; WAIT FOR RECEIVER
2304							; TO FINISH
2305	010756	100412			SMB	3\$	
2306	010760	005267	002740		INC	TIME2	; UPDATE RECEIVER TIMER
2307	010764	005267	002736		INC	TEMP1	; UPDATE NO CLOCK TIMER
2308	010770	001370			BNE	2\$	
2309	010772	005367	002732		DEC	TEMP2	
2310	010776	001365			BNE	2\$	
2311	011000	104001			HLT	1	; RECEIVER DID NOT FINISH, ERROR
2312	011002	000405			BR	4\$	
2313	011004	026767	002714	002710	3\$: CMP	TIME2, TIME1	; VERIFY THAT RECEIVER
2314	011012	103401			BLO	4\$	; WAS FASTER AT THIS SELECTED SPEED
2315							; (NUMBER OF COUNTS IN TIME2
2316							; LESS THAN TIME1)
2317	011014	104002			HLT	2	; RECEIVER TIMING ERROR FOR
2318							; LINE 12
2319	011016	104410			4\$: SCOPE1		; CHECK FOR FREEZE ON CURRENT DATA
2320	011020	016767	002700	002674	MOV	TIME2, TIME1	; SET UP FOR NEXT COMPARISON
2321	011026	005204			INC	R4	; SELECT NEXT SPEED
2322	011030	062700	002100		ADD	#2100, R0	
2323	011034	005301			DEC	R1	
2324	011036	001317			BNE	1\$	
2325	011040	104400			5\$: SCOPE		; CHECK FOR ITERATIONS, LOOP
2326							
2327							; RECEIVER LINE SPEED SELECTION TEST
2328							; TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 13
2329							; VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2330							; VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
2331							; AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2332							
2333	011042	012767	000340	166726	T34: MOV	#340, PS	; DISABLE ALL INTERRUPTS
2334	011050	012767	000010	002610	MOV	#10, ICOUNT	; SET UP FOR 10 ITERATIONS
2335	011056	012767	011262	002576	MOV	#5\$, ESCAPE	; SET UP TO ESCAPE TO NEXT TEST
2336	011064	012767	011120	002572	MOV	#1\$, FREEZ1	; SET UP TO LOOP WITH DATA
2337	011072	012705	000013		MOV	#13, R5	; LINE 13 WILL BE TESTED
2338	011076	012700	002100		MOV	#2100, R0	; CONSTANT FOR SELECTION
2339							; OF INITIAL (LOWEST) SPEED
2340	011102	012701	000015		MOV	#15, R1	; 15 DIFFERENT SPEEDS WILL BE TESTED
2341	011106	012704	000001		MOV	#1, R4	; BINARY CODE FOR INITIAL SPEED
2342	011112	012767	177777	002602	MOV	#-1, TIME1	; INITIALIZE COMPARISON VALUE
2343	011120	012777	004000	002472	1\$: MOV	#BIT11, 2DHSCR	; CLEAR INTERFACE
2344	011126	010577	002466		MOV	R5, 2DHSCR	; SELECT LINE 13 FOR TESTING
2345	011132	005077	002470		CLR	2DHBA	; CLEAR BUS ADDRESS
2346	011136	012777	177777	002464	MOV	#-1, 2DHBC	; SET UP TO TRANSMIT
2347							; 1 CHARACTERS
2348	011144	010077	002454		MOV	R0, 2DHLPR	; SELECT LINE SPEED

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2349	011150	005067	002550		CLR	TIME2		;CLEAR RECEIVER TIME TIMER
2350	011154	005067	002546		CLR	TEMP1		;SET UP NO CLOCK TIMER
2351	011160	012767	000010	002542	MOV	#10,TEMP2		
2352	011166	012777	004000	002436	MOV	#4000,ADHBAR		;SET BAR BIT FOR LINE 13
2353								;TO START TRANSMISSION
2354	011174	105777	002420		2\$: TSTB	ADHSCR		;WAIT FOR RECEIVER
2355								;TO FINISH
2356	011200	100412			BMI	3\$		
2357	011202	005267	002516		INC	TIME2		;UPDATE RECEIVER TIMER
2358	011206	005267	002514		INC	TEMP1		;UPDATE NO CLOCK TIMER
2359	011212	001370			BNE	2\$		
2360	011214	005367	002510		DEC	TEMP2		
2361	011220	001365			BNE	2\$		
2362	011222	104001			HLT	1		;RECEIVER DID NOT FINISH, ERROR
2363	011224	000405			BR	4\$		
2364	011226	026767	002472	002466	3\$: CMP	TIME2,TIME1		;VERIFY THAT RECEIVER
2365	011234	103401			BLO	4\$		;WAS FASTER AT THIS SELECTED SPEED
2366								; (NUMBER OF COUNTS IN TIME2
2367								; LESS THAN TIME1)
2368	011236	104002			HLT	2		;RECEIVER TIMING ERROR FOR
2369								;LINE 13
2370	011240	104410			4\$: SCOPE1			;CHECK FOR FREEZE ON CURRENT DATA
2371	011242	016767	002456	002452	MOV	TIME2,TIME1		;SET UP FOR NEXT COMPARISION
2372	011250	005204			INC	R4		;SELECT NEXT SPEED
2373	011252	062700	002100		ADD	#2100,R0		
2374	011256	005301			DEC	R1		
2375	011260	001317			BNE	1\$		
2376	011262	104400			5\$: SCOPE			;CHECK FOR ITERATIONS, LOOP
2377								
2378								;RECEIVER LINE SPEED SELECTION TEST
2379								;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 14
2380								;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2381								;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2382								;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2383								
2384	011264	012767	000340	166504	T35: MOV	#340,PS		;DISABLE ALL INTERRUPTS
2385	011272	012767	000010	002366	MOV	#10,ICOUNT		;SET UP FOR 10 ITERATIONS
2386	011300	012767	011504	002354	MOV	#5\$,ESCAPE		;SET UP TO ESCAPE TO NEXT TEST
2387	011306	012767	011342	002350	MOV	#1\$,FREEZ1		;SET UP TO LOOP WITH DATA
2388	011314	012705	000014		MOV	#14,R5		;LINE 14 WILL BE TESTED
2389	011320	012700	002100		MOV	#2100,R0		;CONSTANT FOR SELECTION
2390								;OF INITIAL (LOWEST) SPEED
2391	011324	012701	000015		MOV	#15,R1		;15 DIFFERENT SPEEDS WILL BE TESTED
2392	011330	012704	000001		MOV	#1,R4		;BINARY CODE FOR INITIAL SPEED
2393	011334	012767	177777	002360	MOV	#-1,TIME1		;INITIALIZE COMPARISION VALJE
2394	011342	012777	004000	002250	1\$: MOV	#BIT11,ADHSCR		;CLEAR INTERFACE
2395	011350	010577	002244		MOV	R5,ADHSCR		;SELECT LINE 14 FOR TESTING
2396	011354	005077	002246		CLR	ADHBA		;CLEAR BUS ADDRESS
2397	011360	012777	177777	002242	MOV	#-1,ADHBC		;SET UP TO TRANSMIT
2398								;1 CHARACTERS
2399	011366	010077	002232		MOV	R0,ADHLPR		;SELECT LINE SPEED
2400	011372	005067	002326		CLR	TIME2		;CLEAR RECEIVER TIME TIMER
2401	011376	005067	002324		CLR	TEMP1		;SET UP NO CLOCK TIMER
2402	011402	012767	000010	002320	MOV	#10,TEMP2		
2403	011410	012777	010000	002214	MOV	#10000,ADHBAR		;SET BAR BIT FOR LINE 14
2404								;TO START TRANSMISSION

Line	Address	Instruction	Comments
2405	011416	105777 002176	2\$: TSTB 3DHSCR ;WAIT FOR RECEIVER
2406			;TO FINISH
2407	011422	100412	BMI 3\$
2408	011424	005267 002274	INC TIME2 ;UPDATE RECEIVER TIMER
2409	011430	005267 002272	INC TEMP1 ;UPDATE NO CLOCK TIMER
2410	011434	001370	BNE 2\$
2411	011436	005367 002266	DEC TEMP2
2412	011442	001365	BNE 2\$
2413	011444	104001	HLT 1 ;RECEIVER DID NOT FINISH, ERROR
2414	011446	000405	BR 4\$
2415	011450	026767 002250 002244	3\$: CMP TIME2,TIME1 ;VERIFY THAT RECEIVER
2416	011456	103401	BLO 4\$;WAS FASTER AT THIS SELECTED SPEED
2417			; (NUMBER OF COUNTS IN TIME2
2418			; LESS THAN TIME1)
2419	011460	104002	HLT 2 ;RECEIVER TIMING ERROR FOR
2420			; LINE 14
2421	011462	104410	4\$: SCOPE1 ;CHECK FOR FREEZE ON CURRENT DATA
2422	011464	016767 002234 002230	MOV TIME2,TIME1 ;SET UP FOR NEXT COMPARISON
2423	011472	005204	INC R4 ;SELECT NEXT SPEED
2424	011474	062700 002100	ADD #2100,R0
2425	011500	005301	DEC R1
2426	011502	001317	BNE 1\$
2427	011504	104400	5\$: SCOPE ;CHECK FOR ITERATIONS, LOOP
2428			
2429			;RECEIVER LINE SPEED SELECTION TEST
2430			;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 15
2431			;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2432			;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2433			;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2434			
2435	011506	012767 000340 166262	3\$: MOV #340,PS ;DISABLE ALL INTERRUPTS
2436	011514	012767 000010 002144	MOV #10,COUNT ;SET UP FOR 10 ITERATIONS
2437	011522	012767 011726 002132	MOV #5\$,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
2438	011530	012767 011564 002126	MOV #1\$,FREEZ1 ;SET UP TO LOOP WITH DATA
2439	011536	012705 000015	MOV #15,R5 ;LINE 15 WILL BE TESTED
2440	011542	012700 002100	MOV #2100,R0 ;CONSTANT FOR SELECTION
2441			;OF INITIAL (LOWEST) SPEED
2442	011546	012701 000015	MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
2443	011552	012704 000001	MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
2444	011556	012767 177777 002136	MOV #-1,TIME1 ;INITIALIZE COMPARISON VALUE
2445	011564	012777 004000 002026	1\$: MOV #BIT11,3DHSCR ;CLEAR INTERFACE
2446	011572	010577 002022	MOV R5,3DHSCR ;SELECT LINE 15 FOR TESTING
2447	011576	005077 002024	CLR 3DHBA ;CLEAR BUS ADDRESS
2448	011602	012777 177777 002020	MOV #-1,3DHBC ;SET UP TO TRANSMIT
2449			;1 CHARACTERS
2450	011610	010077 002010	MOV R0,3DHLPR ;SELECT LINE SPEED
2451	011614	005067 002104	CLR TIME2 ;CLEAR RECEIVER TIME TIMER
2452	011620	005067 002102	CLR TEMP1 ;SET UP NO CLOCK TIMER
2453	011624	012767 000010 002076	MOV #10,TEMP2
2454	011632	012777 020000 001772	MOV #20000,3DHBAR ;SET BAR BIT FOR LINE 15
2455			;TO START TRANSMISSION
2456	011640	105777 001754	2\$: TSTB 3DHSCR ;WAIT FOR RECEIVER
2457			;TO FINISH
2458	011644	100412	BMI 3\$
2459	011646	005267 002052	INC TIME2 ;UPDATE RECEIVER TIMER
2460	011652	005267 002050	INC TEMP1 ;UPDATE NO CLOCK TIMER

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2461	011656	001370		BNE	2\$	
2462	011660	005367	002044	DEC	TEMP2	
2463	011664	001365		BNE	2\$	
2464	011666	104001		HLT	1	;RECEIVER DID NOT FINISH, ERROR
2465	011670	000405		BR	4\$	
2466	011672	026767	002026 002022	3\$: CMP	TIME2, TIME1	;VERIFY THAT RECEIVER
2467	011700	103401		BLO	4\$	;WAS FASTER AT THIS SELECTED SPEED
2468						; (NUMBER OF COUNTS IN TIME2
2469						; LESS THAN TIME1)
2470	011702	104002		HLT	2	;RECEIVER TIMING ERROR FOR
2471						; LINE 15
2472	011704	104410		4\$: SCOPE1		;CHECK FOR FREEZE ON CURRENT DATA
2473	011706	016767	002012 002006	MOV	TIME2, TIME1	;SET UP FOR NEXT COMPARIION
2474	011714	005204		INC	R4	;SELECT NEXT SPEED
2475	011716	062700	002100	ADD	#2100, R0	
2476	011722	005301		DEC	R1	
2477	011724	001317		BNE	1\$	
2478	011726	104400		5\$: SCOPE		;CHECK FOR ITERATIONS. LOOP
2479						
2480						;RECEIVER LINE SPEED SELECTION TEST
2481						;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 16
2482						;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2483						;VERIFY THAT THE AMOUN OF TIME TAKEN IS LESS
2484						;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2485						
2486	011730	012767	000340 166040	T37: MOV	#340, PS	;DISABLE ALL INTERRUPTS
2487	011736	012767	000010 001722	MOV	#10, ICOUNT	;SET UP FOR 10 ITERATIONS
2488	011744	012767	012150 001710	MOV	#5\$, ESCAPE	;SET UP TO ESCAPE TO NEXT TEST
2489	011752	012767	012006 001704	MOV	#1\$, FREEZ1	;SET UP TO LOOP WITH DATA
2490	011760	012705	000016	MOV	#16, R5	;LINE 16 WILL BE TESTED
2491	011764	012700	002100	MOV	#2100, R0	;CONSTANT FOR SELECTION
2492						;OF INITIAL (LOWEST) SPEED
2493	011770	012701	000015	MOV	#15, R1	;15 DIFFERENT SPEEDS WILL BE TESTED
2494	011774	012704	000001	MOV	#1, R4	;BINARY CODE FOR INITIAL SPEED
2495	012000	012767	177777 001714	MOV	#-1, TIME1	;INITIALIZE COMPARIION VALUE
2496	012006	012777	004000 001604	1\$: MOV	#BIT11, 2DHSCR	;CLEAR INTERFACE
2497	012014	010577	001600	MOV	R5, 2DHSCR	;SELECT LINE 16 FOR TESTING
2498	012020	005077	001602	CLR	2DHBA	;CLEAR BUS ADDRESS
2499	012024	012777	177777 001576	MOV	#-1, 2DHBC	;SET UP TO TRANSMIT
2500						;1 CHARACTERS
2501	012032	010077	001566	MOV	R0, 2DHLPR	;SELECT LINE SPEED
2502	012036	005067	001662	CLR	TIME2	;CLEAR RECEIVER TIME TIMER
2503	012042	005067	001660	CLR	TEMP1	;SET UP NO CLOCK TIMER
2504	012046	012767	000010 001654	MOV	#10, TEMP2	
2505	012054	012777	040000 001550	MOV	#40000, 2DHBAR	;SET BAR BIT FOR LINE 16
2506						;TO START TRANSMISSION
2507	012062	105777	001532	2\$: TSTB	2DHSCR	;WAIT FOR RECEIVER
2508						;TO FINISH
2509	012066	100412		BMI	3\$	
2510	012070	005267	001630	INC	TIME2	;UPDATE RECEIVER TIMER
2511	012074	005267	001626	INC	TEMP1	;UPDATE NO CLOCK TIMER
2512	012100	001370		BNE	2\$	
2513	012102	005367	001622	DEC	TEMP2	
2514	012106	001365		BNE	2\$	
2515	012110	104001		HLT	1	;RECEIVER DID NOT FINISH, ERROR
2516	012112	000405		BR	4\$	

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2517 012114 026767 001604 001600 3$: CMP TIME2,TIME1 ;VERIFY THAT RECEIVER
2518 012122 103401 BLO 4$ ;WAS FASTER AT THIS SELECTED SPEED
2519 ;(NUMBER OF COUNTS IN TIME2
2520 ;LESS THAN TIME1)
2521 012124 104002 HLT 2 ;RECEIVER TIMING ERROR FOR
2522 ;LINE 16
2523 012126 104410 4$: SCOPE1 ;CHECK FOR FREEZE ON CURRENT DATA
2524 012130 016767 001570 001564 MOV TIME2,TIME1 ;SET UP FOR NEXT COMPARISON
2525 012136 005204 INC R4 ;SELECT NEXT SPEED
2526 012140 062700 002100 ADD #2100,R0
2527 012144 005301 DEC R1
2528 012146 001317 BNE 1$
2529 012150 104400 5$: SCOPE ;CHECK FOR ITERATIONS, LOOP
2530
2531 ;RECEIVER LINE SPEED SELECTION TEST
2532 ;TRANSMIT 1 CHARACTERS AT A SELECTED SPEED ON LINE 17
2533 ;VERIFY THAT RECEIVER DONE OCCURS AT THE SELECTED SPEED
2534 ;VERIFY THAT THE AMOUNT OF TIME TAKEN IS LESS
2535 ;AT THIS SPEED THAN AT THE PREVIOUSLY SELECTED SPEED
2536
2537 012152 012767 000340 165616 T40: MOV #340,PS ;DISABLE ALL INTERRUPTS
2538 012160 012767 000010 001500 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS
2539 012166 012767 012372 001466 MOV #5$,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
2540 012174 012767 012230 001462 MOV #1$,FREEZ1 ;SET UP TO LOOP WITH DATA
2541 012202 012705 000017 MOV #17,R5 ;LINE 17 WILL BE TESTED
2542 012206 012700 002100 MOV #2100,R0 ;CONSTANT FOR SELECTION
2543 ;OF INITIAL (LOWEST) SPEED
2544 012212 012701 000015 MOV #15,R1 ;15 DIFFERENT SPEEDS WILL BE TESTED
2545 012216 012704 000001 MOV #1,R4 ;BINARY CODE FOR INITIAL SPEED
2546 012222 012767 177777 001472 MOV #-1,TIME1 ;INITIALIZE COMPARISON VALUE
2547 012230 012777 004000 001362 1$: MOV #BIT11,JDHSCR ;CLEAR INTERFACE
2548 012236 010577 001356 MOV R5,JDHSCR ;SELECT LINE 17 FOR TESTING
2549 012242 005077 001360 CLR JDHBA ;CLEAR BUS ADDRESS
2550 012246 012777 177777 001354 MOV #-1,JDHBC ;SET UP TO TRANSMIT
2551 ;1 CHARACTERS
2552 012254 010077 001344 MOV R0,JDHLPR ;SELECT LINE SPEED
2553 012260 005067 001440 CLR TIME2 ;CLEAR RECEIVER TIME TIMER
2554 012264 005067 001436 CLR TEMP1 ;SET UP NO CLOCK TIMER
2555 012270 012767 000010 001432 MOV #10,TEMP2
2556 012276 012777 100000 001326 MOV #100000,JDHBAR ;SET BAR BIT FOR LINE 17
2557 ;TO START TRANSMISSION
2558 012304 105777 001310 2$: TSTB JDHSCR ;WAIT FOR RECEIVER
2559 ;TO FINISH
2560 012310 100412 BMI 3$
2561 012312 005267 001406 INC TIME2 ;UPDATE RECEIVER TIMER
2562 012316 005267 001404 INC TEMP1 ;UPDATE NO CLOCK TIMER
2563 012322 001370 BNE 2$
2564 012324 005367 001400 DEC TEMP2
2565 012330 001365 BNE 2$
2566 012332 104001 HLT 1 ;RECEIVER DID NOT FINISH, ERROR
2567 012334 000405 BR 4$
2568 012336 026767 001362 001356 3$: CMP TIME2,TIME1 ;VERIFY THAT RECEIVER
2569 012344 103401 BLO 4$ ;WAS FASTER AT THIS SELECTED SPEED
2570 ;(NUMBER OF COUNTS IN TIME2
2571 ;LESS THAN TIME1)
2572 012346 104002 HLT 2 ;RECEIVER TIMING ERROR FOR

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ADDRESS	HEX	ASCII	OPERATION	OPERAND	COMMENT
2573					;LINE 17
2574	012350	104410	4\$:	SCOPE1	;CHECK FOR FREEZE ON CURRENT DATA
2575	012352	016767	001346	001342	MOV TIME2,TIME1
2576	012360	005204			;SET UP FOR NEXT COMPARISON
2577	012362	062700	002100		;SELECT NEXT SPEED
2578	012366	005301			
2579	012370	001317			
2580	012372	104400	5\$:	SCOPE	;CHECK FOR ITERATIONS, LOOP

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2583
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2585
2586
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2588 012374 104401
2589 012376 014316
2590 012400 005067 001312
2591 012404 005067 001242
2592 012410 005267 001240
2593 012414 016767 001234 165146
2594 012422 013701 000042
2595 012426 001405
2596 012430 000005
2597 012432 004711
2598 012434 000240
2599 012436 000240
2600 012440 000240
2601 012442 000167 166534
2602
2603
2604
2605
2606 012446 032767 002000 165114
2607 012454 001030
2608 012456 032767 040000 165104
2609 012464 001021
2610 012466 032767 004000 165074
2611 012474 001006
2612 012476 005267 001166
2613 012502 026767 001162 001156
2614 012510 001007
2615 012512 005067 001152
2616 012516 005067 001130
2617 012522 011667 001132
2618 012526 000002
2619 012530 016716 001124
2620 012534 000002
2621 012536 005767 001110
2622 012542 001745
2623 012544 000762
2624
2625
2626
2627 012546 032767 001000 165014
2628 012554 001402
2629 012556 016716 001102
2630 012562 000002

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

EOP: TYPE
MEPASS ;TYPE NAME OF TEST
CLR LAST ;CLEAR LAST ERROR PC
CLR ERRFLG ;CLEAR ERROR FLAG
INC PASCNT ;UPDATE PASS COUNT
MOV PASCNT, LIGHTS ;DISPLAY PASS COUNT
MOV #42, R1 ;CHECK FOR ACT-11 OR DDP
BEQ RESTRT ;IF NOT, CONTINUE TESTING
RESET

LOGICAL: JSR PC, (R1)
NOP
NOP
NOP
RESTRT: JMP BEGIN

;CHECK FOR LOOP ON CURRENT TEST
;CHECK FOR ITERATION SUPPRESSION

SCOPER: BIT #SW10, SWR
BNE 4$
BIT #SW14, SWR
BNE 3$
BIT #SW11, SWR
BNE 2$
INC LPCNT
CMP LPCNT, ICOUNT
BNE 3$
2$: CLR LPCNT
CLR ERRFLG
MOV (SP), RETURN
RTI
3$: MOV RETURN, (SP)
RTI
4$: TST ERRFLG
BEQ 1$
BR 2$

;CHECK FOR FREEZE ON CURRENT DATA

SCOP1R: BIT #S. 09, SWR
BEQ 1$
MOV FREEZ1, (SP)
1$: RTI

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2631
2632
2633
2634 012564 032767 020000 164776 ERRORS: BIT #SW13,SWR
2635 012572 001051 BNE HALTS
2636 012574 021667 001116 CMP (SP),LAST
2637 012600 001404 BEQ 1$
2638 012602 011667 001110 MOV (SP),LAST
2639 012506 005067 001040 CLR ERRFLG
2640 012612 104406 1$: SAVC5P
2641 012614 011605 MOV (SP),R5
2642 012616 162705 000002 SUB #2,R5
2643 012622 011504 MOV (R5),R4
2644 012624 006304 ASL R4
2645 012625 006304 ASL R4
2646 012630 042704 177001 BIC #177001,R4
2647 012634 062704 014506 ADD #ERRTAB,R4
2648 012640 012467 000034 MOV (R4)+,ERRMSG
2649 012644 011467 000042 MOV (R4),DATABP
2650 012650 005767 000776 TST ERRFLG
2651 012654 001403 BEQ TYPMSG
2652 012656 005767 000030 TST DATABP
2653 012662 001007 BNE TYPDAT
2654 012664 104402 TYPMSG: OCTASC
2655 012666 012760 ERTABO
2656 012670 012767 000001 000754 MOV #1,ERRFLG
2657 012676 104401 TYPE
2658 012700 000000 ERRMSG: 0
2659 012702 005767 000004 TYPDAT: TST DATABP
2660 012706 001402 BEQ RESREG
2661 012710 104402 OCTASC
2662 012712 000000 DATABP: 0
2663 012714 104407 RESREG: RESOS
2664 012716 005767 164646 HALTS: TST SWR
2665 012722 100005 BPL EXITER
2666 012724 010046 PUSHRO
2667 012726 016600 000002 MOV 2(SP),R0
2668 012732 000000 HALT
2669 012734 012600 POPRO
2670 012736 005267 000714 EXITER: INC ERRCNT
2671 012742 032767 002000 164620 BIT #SW10,SWR
2672 012750 001402 BEQ 1$
2673 012752 016716 000704 MOV ESCAPE,(SP)
2674 012756 000002 1$: RTI
2675 012760 000001 ERTABO: 1
2676 012762 006 002 .BYTE 6,2
2677 012764 013710 SAVPC

```

```

2678      ; TRAP DISPATCH SERVICE
2679      ; ARGUMENT OF TRAP IS EXTRACTED
2680      ; AND USED AS OFFSET TO OBTAIN POINTER
2681      ; TO SELECTED SUBROUTINE
2682
2683 012766 011646      TRPSRV: MOV      (SP), -(SP)      ; GET PC OF RETURN
2684 012770 162716 000002 SUB      #2, (SP)      ; =PC OF TRAP
2685 012774 017616 000000 MOV      2(SP), (SP)    ; GET TRAP
2686 013000 006316      TRPOK: ASL      (SP)      ; MULTIPLY TRAP ARG BY 2
2687 013002 042716 177001 BIC      #177001, (SP)  ; CLEAR UNWANTED BITS
2688 013006 062716 014426 ADD      #TRPTAB, (SP) ; POINTER TO SUBROUTINE ADDRESS
2689 013012 017616 000000 MOV      3(SP), (SP)    ; SUBROUTINE ADDRESS
2690 013016 000136      JMP      2(SP)+      ; GO TO SUBROUTINE
2691
2692      ; SAVE PC OF TEST THAT FAILED AND RC R5
2693
2694 013020 016667 000004 000662 SV05P: MOV      4(SP), SAVPC
2695
2696      ; SAVE R0-R5
2697
2698 013026 010567 000652 SV05:  MOV      R5, SAVR5
2699 013032 010467 000644      MOV      R4, SAVR4
2700 013036 010367 000636      MOV      R3, SAVR3
2701 013042 010267 000630      MOV      R2, SAVR2
2702 013046 010167 000622      MOV      R1, SAVR1
2703 013052 010067 000614      MOV      R0, SAVR0
2704 013056 000002      RTI
2705      ; RESTORE R0-R5
2706
2707 013060 016700 000606 RS05:  MOV      SAVR0, R0
2708 013064 016701 000604      MOV      SAVR1, R1
2709 013070 016702 000602      MOV      SAVR2, R2
2710 013074 016703 000600      MOV      SAVR3, R3
2711 013100 016704 000576      MOV      SAVR4, R4
2712 013104 016705 000574      MOV      SAVR5, R5
2713 013110 000002      RTI

```

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```

2714      ;TELETYPE OUTPUT ROUTINE
2715
2716      013112 017605 000000      TYPED: MOV      2(SP),R5
2717      013116 062716 000002      ADD      #2,(SP)
2718      013122 105777 000466      1$:  TSTB    2TPCSR
2719      013126 100375          BPL      1$
2720      013130 105715          TSTB    (R5)
2721      013132 001001          BNE     2$
2722      013134 000002          RTI
2723      013136 112577 000454      2$:  MOVB    (R5)+,2TPDBR
2724      013142 000767          BR      1$
2725
2726      ;ASCII STRING INPUT ROUTINE
2727
2728      013144 017667 000000 000006 INSTRG: MOV      2(SP),MSG
2729      013152 062716 000002      ADD      #2,(SP)
2730      013156 104401      INSTR1: TYPE
2731      013160 000000      MSG:    0
2732      013162 012704 014450      MOV      #INBLF,R4
2733      013166 012703 000007      MOV      #7,R3
2734      013172 105777 000412      1$:  TSTB    2TKCSR
2735      013176 100375          BPL      1$
2736      013200 117714 000406      MOVB     2TKDBR,(R4)
2737      013204 142714 000200      BICB     #200,(R4)
2738      013210 122427 000015      CMPB     (R4)+,#15
2739      013214 001413          BEQ      INSTR2
2740      013216 117777 000370 000372      MOVB     2TKDBR,2TPDBR
2741      013224 105777 000364      2$:  TSTB    2TPCSR
2742      013230 100375          BPL      2$
2743      013232 005303          DEC      R3
2744      013234 001356          BNE     1$
2745      013236 104401      INSTRE: TYPE
2746      013240 014222      MQM
2747      013242 000745          BR      INSTR1
2748      013244 000002      INSTR2: RTI
  
```

```

2750
2751
2752
2753 013246 011605
2754 013250 012567 000146
2755 013254 012567 000144
2756 013260 012567 000142
2757 013264 112567 000140
2758 013270 112567 000135
2759 013274 010516
2760 013276 005005
2761 013300 112704 014450
2762 013304 122714 000015
2763 013310 001420
2764 013312 121427 000060
2765 013316 002415
2766 013320 121427 000067
2767 013324 003012
2768 013326 142714 000060
2769 013332 152405
2770 013334 122714 000015
2771 013340 001406
2772 013342 006305
2773 013344 006305
2774 013346 006305
2775 013350 100760
2776 013352 104404
2777 013354 000750
2778
2779
2780
2781 013356 020567 000042
2782 013362 101373
2783 013364 020567 000032
2784 013370 103770
2785 013372 136705 000032
2786 013376 001365
2787
2788
2789
2790 013400 016704 000022
2791 013404 010524
2792 013406 062705 000002
2793 013412 105367 000013
2794 013416 001372
2795 013420 000002
2796 013422 000000
2797 013424 000000
2798 013426 000000
2799 013430 000000
2800 013431

;CONVERT ASCII STRING TO OCTAL

PARAMS: MOV (SP),R5
MOV (R5)+,LOLIM
MOV (R5)+,HILIM
MOV (R5)+,DEVADR
MOVB (R5)+,LOBITS
MOVB (R5)+,ADRCNT
MOV R5,(SP)
PARAM1: CLR R5
MOV #INBUF,R4
CMPB #15,(R4)
BEQ PARERR
15: CMPB (R4),#60
BLT PARERR
CMPB (R4),#67
BGT PARERR
BICB #60,(R4)
BISB (R4)+,R5
CMPB #15,(R4)
BEQ LIMITS
ASL R5
ASL R5
ASL R5
BR 15
PARERR: INSTER
BR PARAM1

;TEST TO SEE IF NUMBER IS WITHIN LIMITS

LIMITS: CMP R5,HILIM
BHI PARERR
CMP R5,LOLIM
BLO PARERR
BITB LOBITS,R5
BNE PARERR

;STORE NUMBER AT SPECIFIED ADDRESS

15: MOV DEVADR,R4
MOV R5,(R4)+
ADD #2,R5
DECB ADRCNT
BNE 15
RTI
LOLIM: 0
HILIM: 0
DEVADR: 0
LOBITS: 0
ADRCNT=LOBITS+1

```

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```

2901
2902
2903                                     :CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
2904 013432 104401
2905 013434 014226
2906 013436 017601 000000
2907 013442 062716 000002
2908 013446 012167 000130
2909 013452 112167 000126
2910 013456 112167 000123
2911 013462 013167 000120
2912 013466 016704 000114
2913 013472 116705 000106
2914 013476 012700 014462
2915 013502 010403
2916 013504 042703 177770
2917 013510 062703 000260
2918 013514 110320
2919 013516 006204
2920 013520 006204
2921 013522 006204
2922 013524 005305
2923 013526 001365
2924 013530 012703 014474
2925 013534 114023
2926 013536 105367 000042
2927 013542 001374
2928 013544 105767 000035
2929 013550 001405
2930 013552 112723 000240
2931 013556 105367 000023
2932 013562 001373
2933 013564 105013
2934 013566 104401
2935 013570 014474
2936 013572 005367 000004
2937 013576 001325
2938 013600 000002
2939 013602 000000
2940 013604 000000
2941 013606 013605
2942 013606 000000

OCTASN: TYPE
MCRLF
MOV 2(SP),R1
ADD #2,(SP)
MOV (R1)+,WRDCNT
1$: MOVB (R1)+,CHRCNT
    MOVB (R1)+,SPACNT
    MOV 2(R1)+,BINWRD
2$: MOV BINWRD,R4
    MOVB CHRCNT,R5
    MOV #TEMP,R0
3$: MOV R4,R3
    BIC #177770,R3
    ADD #260,R3
    MOVB R3,(R0)+
    ASR R4
    ASR R4
    ASR R4
    DEC R5
    BNE 3$
    MOV #MDATA,R3
4$: MOVB -(R0),(R3)+
    DECB CHRCNT
    BNE 4$
    TSTB SPACNT
    BEQ 6$
5$: MOVB #240,(R3)+
    DECB SPACNT
    BNE 5$
6$: CLRB (R3)
    TYPE
    MDATA
    DEC WRDCNT
    BNE 1$
    RTI
WRDCNT: 0
CHRCNT: 0
SPACNT=CHRCNT+1
BINWRD: 0

```

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2843 ;INDIRECT POINTERS

2844			
2845	013610	177560	TKCSR: 177560
2846	013612	177562	TKDBR: 177562
2847	013614	177564	TPCSR: 177564
2848	013616	177566	TPDBR: 177566
2849	013620	000000	DHSCR: 0
2850	013622	000000	DHNRC: 0
2851	013624	000000	DHLPR: 0
2852	013626	000000	DHBA: 0
2853	013630	000000	DHBC: 0
2854	013632	000000	DHBAR: 0
2855	013634	000000	DHBCR: 0
2856	013636	000000	DHSSR: 0
2857	013640	000000	DHSLR: 0
2858	013642	000000	DHVEC: 0
2859	013644	000000	DHRLVL: 0
2860	013646	000000	DHTVEC: 0
2861	013650	000000	DHTLVL: 0

;PROGRAM VARIABLES

2862			
2863			
2864	013652	000000	ERRFLG: 0 ;ERROR FLAG
2865	013654	000000	PASCNT: 0 ;PASS COUNT
2866	013656	000000	ERRCNT: 0 ;ERROR COUNT
2867	013660	000000	RETURN: 0 ;SCOPE RETURN ADDRESS FOR TEST LOOPING
2868	013662	000000	ESCAPE: 0 ;ADDRESS FOR ERROR ESCAPE
2869	013664	000000	FREEZ1: 0 ;DATA LOOPING RETURN ADDRESS
2870	013666	000000	ICOUNT: 0 ;ITERATION COUNT FOR TEST IN PROGRESS
2871	013670	000000	LPCNT: 0 ;NUMBER OF ITERATIONS THIS TEST
2872	013672	000000	SAVR0: 0 ;R0 SAVE AREA
2873	013674	000000	SAVR1: 0 ;R1 SAVE AREA
2874	013676	000000	SAVR2: 0 ;R2 SAVE AREA
2875	013700	000000	SAVR3: 0 ;R3 SAVE ARE
2876	013702	000000	SAVR4: 0 ;R4 SAVE AREA
2877	013704	000000	SAVR5: 0 ;R5 SAVE AREA
2878	013706	000000	SAVSP: 0 ;STACK POINTER SAVE AREA
2879	013710	000000	SAVPC: 0 ;CALLING ROUTINE SAVE AREA
2880	013712	000000	INIFLG: 0 ;PROGRAM INITIALIZATION FLAG
2881	013714	000000	STFLG: 0 ;PROGRAM START FLAG
2882	013716	000000	LAST: 0 ;LAST ERROR PC
2883	013720	000000	TCONST: 0
2884	013722	000000	TIME1: 0
2885	013724	000000	TIME2: 0
2886	013726	000000	TEMP1: 0
2887	013730	000000	TEMP2: 0

```

2888                                     ;ENTER HERE ON POWER FAILURE
2889
2890
2891 013732 010046          PFAIL: MOV    R0,-(SP)          ;SAVE R0-R5 ON PROCESSOR STACK
2892 013734 010146          MOV    R1,-(SP)
2893 013736 010246          MOV    R2,-(SP)
2894 013740 010346          MOV    R3,-(SP)
2895 013742 010446          MOV    R4,-(SP)
2896 013744 010546          MOV    R5,-(SP)
2897 013746 016746 164052  MOV    24,-(SP)
2898 013752 010667 177730  MOV    SP,SAVSP          ;SAVE STACK POINTER
2899 013756 012767 013770 164040 MOV    #RESTART,24      ;SET UP FOR POWER UP TRAP
2900 013764 000000          HALT                     ;HALT ON POWER DOWN NORMAL
2901 013766 000777          BR      .
2902
2903                                     ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
2904
2905 013770 016706 177712  RESTAR: MOV    SAVSP,SP          ;RESTORE STACK POINTER
2906 013774 012605          MOV    (SP)+,R5          ;RESTORE R0-R5
2907 013776 012604          MOV    (SP)+,R4
2908 014000 012603          MOV    (SP)+,R3
2909 014002 012602          MOV    (SP)+,R2
2910 014004 012601          MOV    (SP)+,R1
2911 014006 012600          MOV    (SP)+,R0
2912 014010 012767 013732 164006  MOV    #PFAIL,24      ;SET UP FOR POWER FAILURE
2913 014016 012767 000340 163752  MOV    #340,PS
2914 014024 012706 014734          MOV    #STACK,SP
2915 014030 005067 000426          CLR    TEMP
2916 014034 005267 000422          INC    TEMP
2917 014040 001375          BNE     .-4
2918 014042 104402          OCTASC
2919 014044 014066          PFTAB
2920 014046 104401          TYPE
2921 014050 014231          MPFAIL
2922 014052 005067 177574          CLR    ERRFLG
2923 014056 005067 177634          CLR    LAST
2924 014062 000177 177572          JMP    @RETURN
2925 014066 000001          PFTAB: 1
2926 014070 000006 000002          6,2
2927 014074 000207          RETURN

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2928	014076	005015	042012	030510	MTITLE: .ASCIZ <15><12><12>/DH11 SPEED SELECTION LOGIC TEST /<15><12>
2929	014104	020061	050123	042505	
2930	014112	020104	042523	042514	
2931	014120	052103	047511	020116	
2932	014126	047514	044507	020103	
2933	014134	042524	052123	006440	
2934	014142	000012			
2935	014144	005015	042526	052103	MVECTO: .ASCIZ <15><12>/VECTOR ADDRESS-/
2936	014152	051117	040440	042104	
2937	014160	042522	051523	000055	
2938	014166	005015	047503	052116	MREGAD: .ASCIZ <15><12>/CONTROL REGISTER ADDRESS-/
2939	014174	047522	020114	042522	
2940	014202	044507	052123	051105	
2941	014210	040440	042104	042522	
2942	014216	051523	000055		
2943	014222	020040	000077		MQM: .ASCIZ / ?/
2944	014226	005015	000		MCRLF: .ASCIZ <15><12>
2945	014231	040	050040	053517	MPFAIL: .ASCIZ / POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
2946	014236	051105	043040	044501	
2947	014244	052514	042522	020054	
2948	014252	051120	043517	040522	
2949	014260	020115	042522	052123	
2950	014266	051101	020124	052101	
2951	014274	052040	051505	020124	
2952	014302	047111	050040	047522	
2953	014310	051107	051505	000123	
2954	014316	005015	055104	044104	MEPASS: .ASCIZ <15><12>/DZDHD/
2955	014324	000104			
2956	014326	005015	000122		MR: .ASCIZ <15><12>/R/
2957	014332	005015	042524	052123	MTSTPC: .ASCIZ <15><12>/TEST PC-/
2958	014340	050040	026503	000	
2959	014345	116	020117	046103	EM1: .ASCIZ /NO CLOCK/<15><12>/LINE SPEED/
2960	014352	041517	006513	046012	
2961	014360	047111	020105	051440	
2962	014366	042520	042105	000	
2963	014373	124	046511	047111	EM2: .ASCIZ /TIMING ERROR/<15><12>/LINE SPEED/
2964	014400	020107	051105	047522	
2965	014406	006522	046012	047111	
2966	014414	020105	051440	042520	
2967	014422	042105	000		
2968		014426			.EVEN
2969					
2970					;TABLE OF POINTERS FOR TRAP DECODING
2971					
2972	014426	012446			TRPTAB: SCOPER
2973	014430	013112			TYPER
2974	014432	013432			OCTASN
2975	014434	013144			INSTRG
2976	014436	013236			INSTRE
2977	014440	013246			PARAMS
2978	014442	013020			SVOSP
2979	014444	013060			RSOS
2980	014446	012546			SCOP1R
2981					
2982					;BUFFERS FOR INPUT-OUTPUT
2983					

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2984	014450	000000		INBUF:	0	
2985		014462		.=.+10		
2986	014462	000000		TEMP:	0	
2987		014474		.=.+10		
2988	014474	000000		MDATA:	0	
2989		014506		.=.+10		
2990						
2991				;TABLE OF POINTERS TO ERROR MESSAGES AND DATA		
2992						
2993	014506			ERRTAB:	0	
2994	014506	000000			0	;NO MESSAGE
2995	014510	000000			0	;NO DATA
2996	014512	014345		ET1:	EM1	;NO CLOCK ERROR
2997	014514	014522			DT1	
2998	014516	014373		ET2:	EM2	;TIMING ERROR
2999	014520	014522			DT1	
3000						
3001				;DATA TABLES FOR ERROR OUTPUT		
3002						
3003	014522	000002		DT1:	2	;2 DATA WORDS WILL BE TYPED
3004	014524	002	004	.BYTE	2,4	;TWO DIGITS, 4 SPACES
3005	014526	013704			SAVR5	;LINE UNDER TEST
3006	014530	002	000	.BYTE	2,0	;TWO DIGITS, NO SPACES
3007	014532	013702			SAVR4	;SELECTED SPEED
3008	014534	000000		ENDCOD:	0	
3009		000001		.END		

EM1	014345	2959#	2996											
EM2	014373	2963#	2998											
ENDCOD	014534	557	3008#											
EOP	012374	2588#												
ERRCNT	013656	886*	2670*	2866#										
ERRFLG	013652	887*	888*	2591*	2616*	2621	2639*	2650	2656*	2864#	2522*			
ERRMSG	012700	2648*	2658#											
ERRORS	012564	850	2634#											
ERRTAB	014506	2647	2993#											
ERTAB0	012760	2655	2675#											
ESCAPE	013662	958*	1009*	1060*	1111*	1162*	1213*	1264*	1315*	1366*	1417*	1468*	1519*	1570*
		1621*	1672*	1723*	1774*	1825*	1876*	1927*	1978*	2029*	2080*	2131*	2182*	2233*
		2284*	2335*	2386*	2437*	2488*	2539*	2673	2868#					
ET1	014512	2996#												
ET2	014516	2998#												
EXITER	012736	2665	2670#											
FREEZ1	013664	959*	1010*	1061*	1112*	1163*	1214*	1265*	1316*	1367*	1418*	1469*	1520*	1571*
		1622*	1673*	1724*	1775*	1826*	1877*	1928*	1979*	2030*	2081*	2132*	2183*	2234*
		2285*	2336*	2387*	2438*	2489*	2540*	2629	2869#					
HALTS	012716	2635	2664#											
HILIM	013424	2755*	2781	2797#										
ICOUNT	013666	957*	1008*	1059*	1110*	1161*	1212*	1263*	1314*	1365*	1416*	1467*	1518*	1569*
		1620*	1671*	1722*	1773*	1824*	1875*	1926*	1977*	2028*	2079*	2130*	2181*	2232*
		2283*	2334*	2385*	2436*	2487*	2538*	2613	2870#					
INBUF	014450	2733	2761	2984#										
INIFLG	013712	890	923	925*	2880#									
INSTER=	104404	867#	2776											
INSTR =	104403	866#	905	913	934									
INSTRE	013236	2746#	2976											
INSTRG	013144	2729#	2975											
INSTR1	013156	2731#	2748											
INSTR2	013244	2740	2749#											
LAST	013716	2590*	2636	2638*	2882#	2923*								
LIGHTS=	177570	555#	2593*											
LIMITS	013356	2771	2781#											
LINE =	000020	949#	1000#	1051#	1102#	1153#	1204#	1255#	1306#	1357#	1408#	1459#	1510#	1561#
		1612#	1663#	1714#	1765#	1816#	1867#	1918#	1969#	2020#	2071#	2122#	2173#	2224#
		2275#	2326#	2377#	2428#	2479#	2530#	2581#						
		2757*	2785	2799#	2800									
LOBITS	013430	2597#												
LOGICA	012432	2754*	2783	2796#										
LOLIM	013422	2612*	2613	2615										

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DZCHDC.PFC CROSS REFERENCE TABLE -- USER SYMBOLS

PARAM = 104405	868*	907	915	936										
PARAMS 013246	2753*	2977												
PARAM1 013276	2760*	2777												
PARERR 013352	2763	2765	2767	2776*	2782	2784	2786							
PASCNT 013654	885*	2592*	2593	2865*										
PC =%000007	550*	2597*												
PFAIL 013732	848	883	2891*	2912										
PFTAB 014066	2919	2925*												
POPRO = 012600	564*	2669												
POP1SP= 005726	562*													
POP2SP= 022626	566*													
PS = 177776	556*	881*	930*	956*	1007*	1058*	1109*	1160*	1211*	1262*	1313*	1364*	1415*	
	1466*	1517*	1568*	1619*	1670*	1721*	1772*	1823*	1874*	1925*	1976*	2027*	2078*	
	2129*	2180*	2231*	2282*	2333*	2384*	2435*	2486*	2537*	2913*				
	563*	2666												
PUSHRO= 010046	561*													
PUSH1S= 005746	565*													
PUSH2S= 024646														
RESREG 012714	2660	2663*												
RESTAR 013770	2899	2905*												
RESTR 012442	2595	2601*												
RESOS = 104407	870*	2663												
RETURN 013660	943*	948	2617*	2619	2867*	2924								
RSOS 013060	2707*	2979												
RO =%000000	543*	961*	971	996*	1012*	1022	1047*	1063*	1073	1098*	1114*	1124	1149*	
	1165*	1175	1200*	1216*	1226	1251*	1267*	1277	1302*	1318*	1328	1353*	1369*	
	1379	1404*	1420*	1430	1455*	1471*	1481	1506*	1522*	1532	1557*	1573*	1583	
	1608*	1624*	1634	1659*	1675*	1685	1710*	1726*	1736	1761*	1777*	1787	1812*	
	1828*	1838	1863*	1879*	1889	1914*	1930*	1940	1965*	1981*	1991	2016*	2032*	
	2042	2067*	2083*	2093	2118*	2134*	2144	2169*	2185*	2195	2220*	2236*	2246	
	2271*	2287*	2297	2322*	2338*	2348	2373*	2389*	2399	2424*	2440*	2450	2475*	
	2491*	2501	2526*	2542*	2552	2577*	2667*	2703	2707*	2814*	2818*	2825	2891	
	2911*													
R1 =%000001	544*	896*	899*	901*	903	963*	997*	1014*	1048*	1065*	1099*	1116*	1150*	
	1167*	1201*	1218*	1252*	1269*	1303*	1320*	1354*	1371*	1405*	1422*	1456*	1473*	
	1507*	1524*	1558*	1575*	1609*	1626*	1660*	1677*	1711*	1728*	1762*	1773*	1813*	
	1830*	1864*	1881*	1915*	1932*	1966*	1983*	2017*	2034*	2068*	2085*	2119*	2136*	
	2170*	2187*	2221*	2238*	2272*	2289*	2323*	2340*	2374*	2391*	2425*	2442*	2476*	
	2493*	2527*	2544*	2578*	2594*	2597	2702	2708*	2806*	2808	2809	2810	2811	
	2892	2910*												
R2 =%000002	545*	897*	899	900*	902*	2701	2709*	2893	2909*					
R3 =%000003	546*	898*	901	902	2700	2710*	2734*	2744*	2815*	2816*	2817*	2818	2824*	
	2825*	2830*	2833*	2894	2908*									
R4 =%000004	547*	964*	995*	1015*	1046*	1066*	1097*	1117*	1148*	1168*	1199*	1219*	1250*	
	1270*	1301*	1321*	1352*	1372*	1403*	1423*	1454*	1474*	1505*	1525*	1556*	1576*	
	1607*	1627*	1658*	1678*	1709*	1729*	1760*	1780*	1811*	1831*	1862*	1882*	1913*	
	1933*	1964*	1984*	2015*	2035*	2066*	2086*	2117*	2137*	2168*	2188*	2219*	2239*	
	2270*	2290*	2321*	2341*	2372*	2392*	2423*	2443*	2474*	2494*	2525*	2545*	2576*	
	2643*	2644*	2645*	2646*	2647*	2648	2649	2699	2711*	2733*	2737*	2738*	2739	
	2761*	2762	2764	2766	2768*	2769	2770	2790*	2791*	2812*	2815	2819*	2820*	
	2821*	2895	2907*											
RS =%000005	548*	960*	967	1011*	1018	1062*	1069	1113*	1120	1164*	1171	1215*	1222	
	1266*	1273	1317*	1324	1368*	1375	1419*	1426	1470*	1477	1521*	1528	1572*	
	1579	1623*	1630	1674*	1681	1725*	1732	1776*	1783	1827*	1834	1878*	1885	
	1929*	1936	1980*	1987	2031*	2038	2082*	2089	2133*	2140	2184*	2191	2235*	
	2242	2286*	2293	2337*	2344	2388*	2395	2439*	2446	2490*	2497	2541*	2548	
	2641*	2642*	2643	2698	2712*	2717*	2721	2724	2753*	2754	2755	2756	2757	

N05.

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DZDHDC.PFC CROSS REFERENCE TABLE -- USER SYMBOLS

		2758	2759	2760*	2769*	2772*	2773*	2774*	2781	2783	2785	2791	2792*	2813*
SAVPC	013710	2822*	2896	2906*										
SAVR0	013672	2677	2694*	2879*										
SAVR1	013674	2703*	2707	2872*										
SAVR2	013676	2702*	2708	2873*										
SAVR3	013700	2701*	2709	2874*										
SAVR4	013702	2700*	2710	2875*										
SAVR5	013704	2699*	2711	2876*	3007									
SAVSP	013706	2698*	2712	2877*	3005									
SAVOSP=	104406	2878*	2898*	2905										
SCOPE =	104400	869*	2640											
		863*	999	1050	1101	1152	1203	1254	1305	1356	1407	1458	1509	1560
		1611	1662	1713	1764	1815	1866	1917	1968	2019	2070	2121	2172	2223
SCOPE1=	104410	2274	2325	2376	2427	2478	2529	2580						
		2606*	2972											
		871*	993	1044	1095	1146	1197	1248	1299	1350	1401	1452	1503	1554
		1605	1656	1707	1758	1809	1860	1911	1962	2013	2064	2115	2166	2217
SCOPIR	012546	2268	2319	2370	2421	2472	2523	2574						
SP	=:0000006	2627*	2980											
		549*	882*	931*	2617	2619*	2629*	2636	2638	2641	2667	2673*	2693*	2694*
		2685*	2686*	2687*	2688*	2689*	2690	2694	2717	2718*	2729	2730*	2753	2759*
		2806	2807*	2891*	2892*	2893*	2894*	2895*	2896*	2897*	2898	2905*	2906	2907
		2908	2909	2910	2911	2914*								
SPACNT=	013605	2810*	2828	2831*	2841*									
STACK =	014734	557*	882	931	2914									
START	001000	855	881*											
STFLG	013714	884*	944	946*	2881*									
SV05	013026	2698*												
SV05P	013020	2694*	2978											
SWR =	177570	554*	894	932	2606	2608	2610	2627	2634	2664	2671			
SW00 =	000001	537*	894											
SW01 =	000002	536*	932											
SW02 =	000004	535*												
SW03 =	000010	534*												
SW04 =	000020	533*												
SW05 =	000040	532*												
SW06 =	000100	531*												
SW08 =	000400	530*												
SW09 =	001000	529*	2627											
SW10 =	002000	528*	2606	2671										
SW11 =	004000	527*	2610											
SW12 =	010000	526*												
SW13 =	020000	525*	2634											
SW14 =	040000	524*	2608											
SW15 =	100000	523*												
TCONST	013720	2883*												
TEMP	014462	2814	2915*	2916*	2986*									
TEMP1	013726	973*	981*	1024*	1032*	1075*	1083*	1126*	1134*	1177*	1185*	1228*	1236*	1279*
		1287*	1330*	1338*	1381*	1389*	432*	1440*	1483*	1491*	1534*	1542*	1585*	1593*
		1636*	1644*	1687*	1695*	1738*	1746*	1789*	1797*	1840*	1848*	1891*	1899*	1942*
		1950*	1993*	2001*	2044*	2052*	2095*	2103*	2146*	2154*	2137*	2205*	2248*	2256*
		2299*	2307*	2350*	2358*	2401*	2409*	2452*	2460*	2503*	2511*	2554*	2562*	2886*
TEMP2	013730	974*	983*	1025*	1034*	1076*	1085*	1127*	1136*	1178*	1187*	1229*	1238*	1280*
		1289*	1331*	1340*	1382*	1391*	1433*	1442*	1484*	1493*	1535*	1544*	1586*	1595*
		1637*	1646*	1688*	1697*	1739*	1748*	1790*	1799*	1841*	1850*	1892*	1901*	1943*
		1952*	1994*	2003*	2045*	2054*	2096*	2105*	2147*	2156*	2198*	2207*	2249*	2258*

[illegible]

[illegible]

[illegible]

E06

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 DZDHD.C.PFC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ADD	901 1659 2424 2644	902 1710 2475 2645	996 1761 2526 2686	1047 1912 2577 2772	1098 1863 2647 2773	1149 1914 2688 2774	1200 1965 2718	1251 2016 2730	1302 2067 2792	1353 2118 2807	1404 2163 2817	1455 2220	1506 2271	1557 2322	1609 2373
ASL	2644	2645	2686	2772	2773	2774									
ASR	2819	2820	2821												
BEQ	895	933	2595	2622	2628	2637	2651	2660	2672	2740	2763	2771	2829		
BGT	2767														
BHI	2782														
BIC	2646	2687	2816												
BICB	2738	2768													
BISB	2769														
BIT	894	932	2606	2608	2610	2627	2634	2671							
BTTB	2795														
BLO	988 1753 2518 2765	1039 1804 2569	1090 1955 2784	1141 1906	1192 1957	1243 2008	1294 2059	1345 2110	1396 2161	1447 2212	1498 2263	1549 2314	1600 2365	1651 2416	1702 2467
BLT	2765														
BMI	979 1744 2509	1030 1795 2560	1081 1846	1132 1897	1183 1948	1234 1999	1285 2050	1336 2101	1387 2152	1438 2203	1489 2254	1540 2305	1591 2356	1642 2407	1693 2458
BNE	891 1151 1406 1661 1915 2171 2426 2553 2555	904 1186 1441 1696 1951 2206 2461 2722 2720	924 1198 1443 1698 1953 2208 2463 2745 2736	945 1202 1457 1712 1967 2222 2477 2786 2743	982 1237 1492 1747 2002 2257 2512 2794	984 1239 1494 1749 2004 2259 2514 2823	998 1253 1508 1763 2018 2273 2528 2827	1033 1288 1543 1798 2053 2308 2563 2832	1035 1290 1545 1800 2055 2310 2565 2837	1049 1304 1559 1814 2069 2324 2579 2917	1084 1339 1594 1849 2104 2353 2607	1096 1341 1596 1851 2106 2361 2609	1100 1355 1610 1865 2120 2375 2611	1135 1390 1645 1900 2155 2410 2614	1137 1392 1647 1902 2157 2412 2635
BFL	2555	2720	2736	2743	2794	2823	2827	2832	2837	2917					
BR	993 1649 2414	942 1700 2465	986 1751 2516	1037 1802 2567	1088 1853 2623	1139 1904 2725	1190 1955 2748	1241 2006 2775	1292 2057 2777	1343 2108 2901	1394 2159	1445 2210	1496 2261	1547 2312	1598 2363
CLR	884 1121 1376 1631 1896 2141 2396 2616 2833	885 1125 1380 1635 1890 2145 2400 2639	886 1126 1381 1636 1891 2146 2401 2760	887 1172 1427 1682 1937 2192 2447 2915	889 1176 1431 1686 1941 2196 2451 2922	900 1177 1432 1687 1942 2197 2452 2923	968 1223 1478 1733 1988 2243 2498	972 1227 1482 1737 1992 2247 2502	973 1228 1483 1738 1993 2248 2503	1019 1274 1529 1784 2039 2294 2549	1023 1278 1533 1788 2043 2298 2553	1024 1279 1534 1789 2044 2299 2554	1070 1325 1580 1835 2090 2345 2590	1074 1329 1584 1839 2094 2349 2591	1075 1330 1585 1840 2095 2350 2615
CLRB	2833														
CMP	903 1701 2466	987 1752 2517	1038 1803 2568	1089 1854 2613	1140 1905 2636	1191 1956 2781	1242 2007 2783	1293 2058	1344 2109	1395 2160	1446 2211	1497 2262	1548 2313	1599 2364	1650 2415
CMPB	2739	2762	2764	2766	2770										
COM	925	946													
DEC	983 1354 1748 2119 2513 2793	997 1391 1762 2156 2527 2826	1034 1405 1799 2170 2564 2831	1048 1442 1813 2207 2578	1085 1456 1850 2221 2744	1099 1493 1864 2258 2822	1136 1507 1901 2272 2836	1150 1544 1915 2309	1167 1556 1952 2323	1201 1595 1966 2360	1238 1609 2003 2374	1252 1646 2017 2411	1289 1660 2054 2425	1303 1697 2068 2462	1340 1711 2105 2476
DECB	2793	2826	2831												
EMT	567														
HALT	589 619 649	591 621 651	593 623 653	595 625 655	597 627 657	599 629 659	601 631 661	603 633 663	605 635 665	607 637 667	609 639 669	611 641 671	613 643 673	615 645 675	617 647 677

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 DZDHD.C.PFC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

	679	691	683	685	687	689	691	693	695	697	699	701	703	705	707
	709	711	713	715	717	719	721	723	725	727	729	731	733	735	737
	739	741	743	745	747	749	751	753	755	757	759	761	763	765	767
	769	771	773	775	777	779	781	783	785	787	789	791	793	795	797
	799	801	803	805	807	809	811	813	815	817	819	821	823	825	827
	829	831	833	835	837	839	841	843	2668	2900					
INC	922	980	981	995	1031	1032	1046	1082	1083	1097	1133	1134	1148	1184	1185
	1199	1235	1236	1250	1286	1287	1301	1337	1338	1352	1388	1389	1403	1439	1440
	1454	1490	1491	1505	1541	1542	1556	1592	1593	1607	1643	1644	1658	1694	1695
	1709	1745	1746	1760	1796	1797	1811	1847	1848	1862	1898	1899	1913	1949	1950
	1964	2000	2001	2015	2051	2052	2066	2102	2103	2117	2153	2154	2168	2204	2205
	2219	2255	2256	2270	2306	2307	2321	2357	2358	2372	2408	2409	2423	2459	2460
	2474	2510	2511	2525	2561	2562	2576	2592	2612	2670	2916				
JMP	855	948	2601	2690	2924										
JSR	2597														
MOV	881	882	883	896	897	898	899	921	930	931	943	956	957	958	959
	960	961	963	964	965	966	967	969	971	974	975	994	1007	1008	1009
	1010	1011	1012	1014	1015	1016	1017	1018	1020	1022	1025	1026	1045	1058	1059
	1060	1061	1062	1063	1065	1066	1067	1068	1069	1071	1073	1076	1077	1096	1109
	1110	1111	1112	1113	1114	1116	1117	1118	1119	1120	1122	1124	1127	1128	1147
	1160	1161	1162	1163	1164	1165	1167	1168	1169	1170	1171	1173	1175	1178	1179
	1198	1211	1212	1213	1214	1215	1216	1218	1219	1220	1221	1222	1224	1226	1229
	1230	1249	1262	1263	1264	1265	1266	1267	1269	1270	1271	1272	1273	1275	1277
	1290	1291	1300	1313	1314	1315	1316	1317	1318	1320	1321	1322	1323	1324	1326
	1328	1331	1332	1351	1364	1365	1366	1367	1368	1369	1371	1372	1373	1374	1375
	1377	1379	1382	1383	1402	1415	1416	1417	1418	1419	1420	1422	1423	1424	1425
	1426	1428	1430	1433	1434	1453	1466	1467	1468	1469	1470	1471	1473	1474	1475
	1476	1477	1479	1481	1484	1485	1504	1517	1518	1519	1520	1521	1522	1524	1525
	1526	1527	1528	1530	1532	1535	1536	1555	1568	1569	1570	1571	1572	1573	1575
	1576	1577	1578	1579	1581	1583	1586	1587	1606	1619	1620	1621	1622	1623	1624
	1626	1627	1628	1629	1630	1632	1634	1637	1638	1657	1670	1671	1672	1673	1674
	1675	1677	1678	1679	1680	1681	1683	1685	1688	1689	1708	1721	1722	1723	1724
	1725	1726	1728	1729	1730	1731	1732	1734	1736	1739	1740	1759	1772	1773	1774
	1775	1776	1777	1779	1780	1781	1782	1783	1785	1787	1790	1791	1810	1823	1824
	1825	1826	1827	1828	1830	1831	1832	1833	1834	1836	1838	1841	1842	1861	1874
	1875	1876	1877	1878	1879	1881	1882	1883	1884	1885	1887	1889	1892	1893	1912
	1925	1926	1927	1928	1929	1930	1932	1933	1934	1935	1936	1938	1940	1943	1944
	1963	1976	1977	1978	1979	1980	1981	1983	1984	1985	1986	1987	1989	1991	1994
	1995	2014	2027	2028	2029	2030	2031	2032	2034	2035	2036	2037	2038	2040	2042
	2045	2046	2065	2078	2079	2080	2081	2082	2083	2085	2086	2087	2088	2099	2091
	2093	2096	2097	2116	2129	2130	2131	2132	2133	2134	2136	2137	2138	2139	2140
	2142	2144	2147	2148	2167	2180	2181	2182	2183	2184	2185	2187	2188	2189	2190
	2191	2193	2195	2198	2199	2218	2231	2232	2233	2234	2235	2236	2238	2239	2240
	2241	2242	2244	2246	2249	2250	2269	2282	2283	2284	2285	2286	2287	2289	2290
	2291	2292	2293	2295	2297	2300	2301	2320	2333	2334	2335	2336	2337	2338	2340
	2341	2342	2343	2344	2346	2348	2351	2352	2371	2384	2385	2386	2387	2388	2399
	2391	2392	2393	2394	2395	2397	2399	2402	2403	2422	2435	2436	2437	2438	2439
	2440	2442	2443	2444	2445	2446	2448	2450	2453	2454	2473	2486	2487	2488	2489
	2490	2491	2493	2494	2495	2496	2497	2499	2501	2504	2505	2524	2537	2538	2539
	2540	2541	2542	2544	2545	2546	2547	2548	2550	2552	2555	2556	2575	2593	2594
	2617	2619	2629	2638	2641	2643	2648	2649	2656	2667	2673	2683	2685	2689	2694
	2698	2699	2700	2701	2702	2703	2707	2708	2709	2710	2711	2712	2717	2729	2733
	2734	2753	2754	2755	2756	2759	2761	2790	2791	2806	2808	2811	2812	2814	2815
	2824	2891	2892	2893	2894	2895	2896	2897	2898	2899	2905	2906	2907	2908	2909
	2910	2911	2912	2913	2914										
MC 4B	2724	2737	2741	2757	2758	2809	2810	2813	2818	2825	2830				

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 DZDHD.C.PFC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

NJP	2598	2599	2600												
RESET	2596														
RETURN	939	2927													
RTI	2618	2620	2630	2674	2704	2713	2723	2749	2795	2838					
SUB	2642	2684													
TRAP	863	864	865	866	867	868	869	870	871						
TST	990	923	944	977	1028	1079	1130	1181	1232	1283	1334	1385	1436	1487	1538
TSTB	1589	1640	1691	1742	2621	2650	2652	2659	2664						
	1793	1844	1895	1946	1997	2048	2099	2150	2201	2252	2303	2354	2405	2456	2507
	2559	2719	2721	2735	2742	2828									
.ASCIZ	2928	2935	2938	2943	2944	2945	2954	2956	2957	2959	2963				
.BYTE	911	912	919	920	940	941	2676	3004	3006						
.ENABL	520														
.END	3009														
.ENDC	893	894	921	923	960	1011	1062	1113	1164	1215	1266	1317	1368	1419	1470
	1521	1572	1623	1674	1725	1776	1827	1878	1929	1980	2031	2082	2133	2184	2235
	2286	2337	2388	2439	2490	2541									
.EQUIV	567														
.EVEN	2968														
.IF	891	893	921	959	1010	1061	1112	1163	1214	1265	1316	1367	1418	1469	1520
	1571	1622	1673	1724	1775	1826	1877	1928	1979	2030	2081	2132	2183	2234	2285
	2336	2387	2438	2489	2540										
.IFF	893	894													
.IIF	880														
.IRP	2949	2883													
.LIST	1	501	520	864	865	866	867	868	869	870	871	872	949	960	1000
	1011	1051	1062	1102	1113	1153	1164	1204	1215	1255	1266	1306	1317	1357	1368
	1408	1419	1459	1470	1510	1521	1561	1572	1612	1623	1663	1674	1714	1725	1765
	1776	1816	1827	1867	1878	1918	1929	1969	1980	2020	2031	2071	2082	2122	2133
	2173	2184	2224	2235	2275	2286	2326	2337	2377	2388	2428	2439	2479	2490	2530
	2541	2581													
.MACRO	1	872	949												
.NLIST	1	501	520	864	865	866	867	868	869	870	871	872	949	960	1000
	1011	1051	1062	1102	1113	1153	1164	1204	1215	1255	1266	1306	1317	1357	1368
	1408	1419	1459	1470	1510	1521	1561	1572	1612	1623	1663	1674	1714	1725	1765
	1776	1816	1827	1867	1878	1918	1929	1969	1980	2020	2031	2071	2082	2122	2133
	2173	2184	2224	2235	2275	2286	2326	2337	2377	2388	2428	2439	2479	2490	2530
	2541	2581													
.PAGE	539	586	844	872	2631	2678	2714	2750	2801	2843	2888	2928			
.REM	1														
.REPT	588	949	1765												
.TITLE	520														

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0

*DZDHD.C, DZDHD.C.SEG/SOL/CRF/PAGNUM=DSKZ:UTIL2.P11, DSKM:DZDHD.C.PFC
 RUN-TIME: 13 24 3 SECONDS
 RUN-TIME RATIO: 107/42=2.5
 CORE USED: 11K (21 PAGES)

Spooler runtime 12 Seconds, 358 KCS, 307 disk reads, 3 disk writes, 71 pages.

[illegible]