

DJ 11

DJ11 LGC TEST
CZDJAF0

AH-8504F-MC

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IDENTIFICATION

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1. ABSTRACT

THIS PROGRAM TESTS THE LOGIC OF THE DJ11 ASYNCHRONOUS MULTIPLEXER IN MAINTENANCE MODE. IT CHECKS THAT ALL THE CONTROL REGISTERS FUNCTION PROPERLY, THAT INTERRUPTS OCCURE AT THE RIGHT LEVEL, AND THAT DATA CAN BE TRANSMITTED AND RECEIVED CORRECTLY. THIS PROGRAM DOES NOT TEST THAT THE INPUT AND OUTPUT LEAD CONNECTIONS ARE FUNCTIONAL. (SEE MAINDEC-11-DZDJB, PROGRAMS 2 AND 3 FOR ON-LINE TESTING). THE PROGRAM SHOU'D BE RUN FOR AT LEAST 2 PASSES WITH ALL SWITCHES DOWN.

NOTE: THE PROGRAM WILL AUTOSIZE THE SILO ALARM LEVEL OF THE DJ11 AND WILL RUN AT ANY ALARM LEVEL SET. AND WILL RUN AT ANY ALARM LEVEL SET.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 STANDARD COMPUTER WITH CONSOLE TELETYPE UP TO 16 DJ11 ASYNCHRONOUS MULTIPLEXERS.

2.2 STORAGE

THIS PROGRAM USES ALL OF 8K, EXCEPT ABS LOADER.

2.3 PRELIMINARY PROGRAMS

NONE

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SFE 5.1 (ALL DOWN FOR WORST CASE TESTING)

4.2 STARTING ADDRESS

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200. IT MAY BE

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RESTARTED AT 1000 AFTER ALL PARAMETERS HAVE BEEN SELECTED.

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4.3 PROGRAM AND OPERATOR ACTION

- 1) LOAD PROGRAM INTO MEMORY USING ABS LOADER.
- 2) LOAD ADDRESS 200.
- 3) IF HARDWARE SWITCH REGISTER IS AVAILABLE, SET SWITCHES (SEE SEC. 5.1), ALL DOWN FOR WORST CASE, PRESS START.
- 4) IF SWITCH-LESS PROCESSOR SIMPLY PRESS START.
- 5) ENTER PARAMETERS (SEE SEC. 5.3) AS THEY ARE REQUESTED.
- 6) THE PROGRAM WILL LOOP AND BELL WILL RING ONCE EVERY PASS. EOP'' IS ALSO PRINTED ON EACH PASS.
- 7) A MINIMUM OF TWO PASSES SHOULD ALWAYS BE RUN.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

AT SA 200, ALL SWITCHES DOWN IS WORST CASE TESTING. EACH SUBTEST WILL BE LOOPED UPON UNTIL COMPLETION OF 16 PASSES OF THAT SUBTEST. THE BELL WILL RING UPON COMPLETION OF A PASS OF THE ENTIRE PROGRAM.

THE SWITCH SETTINGS ARE:

SW<15> = 1 HALT ON ERROR
SW<14> = 1 SCOPE LOOP
SW<13> = 1 INHIBIT PRINTOUT
SW<12> = 1 PRINT SILO ALARM LEVEL (IN OCTAL)
SW<11> = 1 INHIBIT ITERATIONS OF SUBTEST
SW<10> = 1 BELL ON ERROR
 0 BELL ON PASS COMPLETE
SW<09> = 1 LOOP ON ERROR
SW<08> = 1 LOOP ON TEST IN SW<7:0>

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC. 176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(I.E.) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

1. <CR> IF NO CHANGES ARE TO BE MADE.
2. 6 DIGITS 0-7 TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE; LAST DIGIT FOLLOWED BY <CR>.
3. ^U TO ALLOW REENTERING VALUE IF ERROR IS

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COMMITTED KEYING IN SWREG VALUE.

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BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ^G (CNTRL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

THIS SUBROUTINE CALL (VIA A TRAP INSTRUCTION) IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED IN LOCATION 'LAD'. IF A SCOPE LOOP IS REQUESTED, THE CURRENT SUBTEST WILL BE LOOPED UPON. SW<11> ON A 1 INHIBITS ITERATION OF SUBTESTS. THE CONTENTS OF 'LAD' MAY BE USED TO DETERMINE THE LAST SUBTEST SUCCESSFULLY COMPLETED.

5.2.2 HLT

THIS ROUTINE (CALLED BY AN EMT INSTRUCTION) PRINTS OUT AN ERROR MESSAGE (SEE 6.1). IF SW<9> IS ON A 1 AND A HLT IS EXECUTED, THE SUBTEST WILL BE LOOPED UPON UNTIL 16 CONSECUTIVE GOOD PASSES ARE COMPLETED. TO INHIBIT TYPEOUTS, PUT SW<13> ON A 1. TO RING THE BELL ON AN ERROR, PUT SW<10> ON A 1.

5.2.4 ALMCK

IN THE NORMAL OPERATION THE 'DONE' BIT IS SET AS EACH CHARACTER IS READ INTO THE FI/FO BUFFER (SILO). BUT THIS 'DONE' CONDITION CAN BE DELAYED TO CAUSE DONE ON THE 5, 9, OR 17 CHARACTER. THIS IS DONE BY CUTTING ONE OF THE JUMPERS (W1,W2,W3) ON THE M7285 CONTROL BOARD. THE PROGRAM TESTS FOR THIS 'SILO ALARM LEVEL' AND IF SW12 IS SET (1) IT WILL PRINT OUT THE LEVEL AT WHICH EACH DJ11 WILL SET 'DONE.' THE SUBROUTINE ALSO ADJUSTS THE CHARACTER COUNTERS TO ENSURE THAT THE MAXIMUM NUMBER OF CHARACTERS TO BE TRANSFERED IS A MULTIPLE OF THE SILO ALARM LEVEL. THIS ENSURES THAT ALL DATA WILL BE READ OUT OF THE SILO. DONE WILL NOT SET IF THE NUMBER OF CHARACTERS IN THE FI/FO BUFFER IS LESS THAN THE SILO ALARM LEVEL. (NOTE CHARACTER PRESENT IS SET ON EACH CHARACTER IN THE BUFFER, REGARDLESS OF THE SILO ALARM LEVEL.)

5.2.5 TRAPCATCHER

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A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0 - 56 TO DETECT

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ANY UNEXPECTED TRAPS AND A ".+2" - "IOT" SEQUENCE IS REPEATED FROM 60 - 776 TO DETECT ANY UNEXPECTED INTERRUPTS. THUS ANY UNEXPECTED TRAPS WILL HALT AT THE VECTOR + 2. ANY UNEXPECTED INTERRUPTS WILL RESULT IN AN ERROR "HLT" IN "IOTRAP".

5.3 PROGRAM AND OPERATOR ACTION

THE FOLLOWING REQUESTS ARE MADE TO THE OPERATOR AT THE BEGINNING OF THE PROGRAM. A DETAILED DESCRIPTION OF WHAT IS REQUIRED FOR EACH PARAMETER IS GIVEN BELLOW.

- 1) 'FIRST DJ11 ADDRESS: "
 THE CSR ADDRESS OF THE FIRST DJ11 YOU WISH TO TEST. MUST BE BETWEEN 160000(8) AND 177777(8). THE DEFAULT (CARRIAGE RETURN) IS TO 160010(8). 'P(REVIOUS)' SELECTS THE ADDRESS PREVIOUSLY SELECTED.
- 2) 'VECTOR ADDRESS: "
 THE RECEIVER INTERRUPT VECTOR ADDRESS OF THE FIRST DJ11 YOU WISH TO TEST. MUST BE BETWEEN 300(8) AND 1000(8). THE DEFAULT (CARRIAGE RETURN) IS TO 300(8). 'P(REVIOUS)' SELECTS THE ADDRESS PREVIOUSLY SELECTED.
- 3) 'NO. OF DJ11'S: "
 THE NUMBER OF DJ11 UNITS YOU WISH TO TEST AT ONE TIME. MUST BE BETWEEN 1 AND 16. THE DEFAULT (CARRIAGE RETURN) IS TO 1. 'P(REVIOUS)' SELECTS THE NUMBER OF UNITS PREVIOUSLY SELECTED.
- 4) 'STANDARD CONFIGURATION? "
 'Y(ES)' OR DEFAULT (CARRIAGE RETURN) SELECTS 8 LEVEL CODE, NO PARITY. 'N(O)' CAUSES REQUESTS FOR CODE LEVEL AND PARITY ON ALL REQUESTED LINES IN GROUPS OF FOUR. 'P(REVIOUS)' SELECTS THE CODE LEVELS AND PARITIES PREVIOUSLY SELECTED.
- 5) 'CHAR LENGTH: "
 THE CODE LEVEL FOR THE LINE GROUP SPECIFIED. MUST BE 5, 6, 7, OR 8. THE DEFAULT (CARRIAGE RETURN) IS TO 8 LEVEL CODE.
- 6) 'PARITY (NO, ODD, EVEN): "
 THE TYPE OF PARITY SELECTED FOR THE LINE GROUP SPECIFIED. THE DEFAULT (CARRIAGE RETURN) IS TO NO PARITY.

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

22-CZDJA-F-0 DJ11 LOGIC TESTS MACY11 30A(1052) 26-FEB-79 15:47 K 1
CZDJAF P11 25-FEB-79 15:41 PAGE 11

SEQ 0010

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ADR DJ3DR (R1) (R2) (R3) (R4)

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WHERE:

ADR = ADDRESS OF ERROR HLT
DJADR = CSR ADDRESS OF DJ11 UNDER TEST
(RN) - CONTENTS OF GENERAL REGISTER 'N'. FROM NONE TO
FOUR OF THESE MAY BE TYPED DEPENDING ON THE NUMBER
FOLLOWING THE HLT; E.G., HLT+3 WOULD TYPE (R1)
THRU (R3); HLT (BY ITSELF) WOULD STOP AFTER TYPING
ADR AND DJADR.

TO FIND THE FAILING TEST, LOOK AT THE LISTING ABOVE THE
ADDRESS TYPED. IN MOST CASES THE COMMENT BESIDE THE HLT
TELLS WHAT WAS BEING CHECKED AND WHAT WAS EXPECTED. ALSO, A
LIST OF THE PROBABLE FAILING LOGIC IS GIVEN IN THE COMMENTS
AT THE BEGINNING OF THE TEST.

6.2 ERROR RECOVERY

RESTART AT 200 OR 1000.

6.3 ERROR COUNTER

AN ERROR COUNT IS KEPT IN 'ERRORS'. IT CAN BE CLEARED FROM
THE CONSOLE, BY RESTARTING AT 200, OR BY RELOADING THE
PROGRAM.

7. RESTRICTIONS

IF MORE THAN ONE DJ11 IS TESTED AT A TIME, THE DEVICE
ADDRESSES AND THE VECTOR ADDRESSES MUST ALL BE CONTIGUOUS.

IF THIS PROGRAM IS RUN WITH A MONITOR, I.E. ACT11 OR DDP,
THE DEVICE ADDRESSES MUST FOLLOW THE FLOATING ADDRESS
CONVENTION. DJ11'S WILL BE FIRST, STARTING AT 160010..

8. MISCELLANEOUS

8.1 EXECUTION TIME

DUE TO THE VARIOUS BAUD RATES AVAILABLE AND THE ABILITY TO
7) "WHAT ARE THE BR PRIORITIES? FOR:"

"DEVICE 1=" ETC.
"DEVICE 2="

THIS WILL GO TO THE NUMBER OF DEVICES SPECIFIED
IN QUESTION 3 ABOVE. PRIORITIES ALLOWED ARE 0 THROUGH 7.
CHECK UP TO 16 DJ11'S AT ONCE. THE EXECUTION TIME CAN BE
ANYWHERE FROM 15 SECONDS TO THREE AND A HALF HOURS. THE

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FOLLOWING TYPICAL TIMES ARE FOR ONE DJ11 WITH ALL LINES AT
THE SAME SPEED, 8 LEVEL CODE, 2 STOP BITS, AND NO PARITY ON
A PDP-11/20 WITHOUT TRACE TRAPPING. FOR MULTIPLE DJ11'S,
MULTIPLY THESE TIMES BY THE NUMBER OF UNITS SELECTED FOR
TEST.

BAUD RUN TIME

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8.2 STACK POINTER

STACK IS INITALLY SET TO 1200

8.3 PASS COUNT

A 32 BIT (2 WORDS) PASS COUNT IS KEPT IN PCNT. IT CAN BE
CLEARED FROM THE CONSOLE, BY RESTARTING AT 200, OR BY
RELOADING THE PROGRAM.

8.4 POWER FAIL

EACH TEST CAN BE POWER FAILED WITH NO ERRORS. TO USE, START
THE TEST AS USUAL AND POWER DOWN THEN UP AT ANY TIME. THE
ROUTINE SHOULD TYPE 'POWER' AND RESTART THE PROGRAM WITH NO
OTHER ERROR TYPEOUTS.

9. PROGRAM DESCRIPTION

THIS PROGRAM TESTS THE LOGIC OF UP TO 16 DJ11 ASYNCHRONOUS
DATA MULTIPLEXERS IN MAINTENANCE MODE. IT CHECKS THAT ALL
THE CONTROL REGISTERS FUNCTION PROPERLY, THAT INTERRUPTS
OCCURE AT THE RIGHT PRIORITY LEVEL, AND THAT DATA CAN BE
TRANSMITTED AND RECEIVED CORRECTLY. THE PROGRAM HAS MANY
SUBTESTS (THE CODE BETWEEN 2 SCOPE STATEMENTS) WHICH ARE RUN
16 TIMES BEFORE CONTINUING TO THE NEXT. SW<11> ON A 1
CAUSES EACH SUBTEST TO BE RUN ONLY ONCE. SW<9> ON A 1
ENABLES LOOP ON ERROR. THE ADDRESS 'ICNT' CONTAINS THE
ITERATION COUNT IN THE LEFT BYTE AND THE TEST NUMBER IN THE
RIGHT BYTE. ALL THE SUBTESTS SHOULD BE RUN SEQUENTIALLY BY
STARTING AT 200 NOT BY STARTING AT THE BEGINNING OF THE
SUBTEST. TO LOOP ON A PARTICULAR SUBTEST, PUT THE TEST
NUMBER (SEE LISTING) IN THE RIGHT BYTE OF THE SWITCH
REGISTER AND SW<8> ON A 1. THIS TEST WILL BE LOOPED UPON
UNTIL SW<8> IS PUT ON A 0 OR THE RIGHT BYTE IS CHANGED. IF

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THE TEST IS NON-EXISTANT, THE PROGRAM WILL BE RUN AS USUAL.
IF MORE THAN ONE DJ11 IS SELECTED, ALL THE SUBTESTS ARE

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 DESCRIPTION

PERFORMED ON ONE UNIT AT A TIME. THE BELL WILL NOT RING AND
 EOP PRINT, UNTIL A PASS HAS BEEN MADE ON EACH OF THE DJ11'S
 SELECTED FOR TEST.

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.TITLE 22-CZDJA-F-0 DJ11 LOGIC TESTS

.ENABLE ABS

.ENABLE AMA

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SW	SWITCH	USE
SW15=	100000	:HALT ON ERROR
SW14=	40000	:LOOP ON TEST
SW13=	20000	:INHIBIT ERROR TYPEOUTS
SW12=	10000	:PRINT SILO ALARM LEVEL
SW11=	4000	:INHIBIT ITERATIONS
SW10=	2000	:0 - BELL ON PASS COMPLETE
		:1 - BELL ON ERROR
SW9=	1000	:LOOP ON ERROR
SW8=	400	:LOOP ON TEST IN SW<7:0>
.REM!		

DJ11 REGISTER BIT ASSIGNMENTS:

CONTROL STATUS REGISTER (CSR) XXXXX0

BIT0	RECEIVER ENABLE (READ/WRITE)
BIT1	HALF DUPLEX SELECT (READ/WRITE)
BIT2	MAINTENANCE (READ/WRITE)
BIT3	CLEAR MOS (WRITE ONLY)
BIT4	CLEAR MOS FLAG (READ ONLY)
BIT5	NOT USED
BIT6	RECEIVER INTERRUPT ENABLE (READ/WRITE)
BIT7	DONE (READ ONLY)
BIT8	MASTER TRANSMITTER SCAN ENABLE (READ/WRITE)
BIT9	NOT USED
BIT10	READ/WRITE BREAK REGISTER (READ/WRITE)
BIT11	NOT USED
BIT12	STATUS ENABLE (READ/WRITE)
BIT13	FI/FO OVERRUN (READ ONLY)
BIT14	MASTER TRANSMITTER INTERRUPT ENABLE (READ/WRITE)
BIT15	TRANSMITTER READY (READ ONLY)

RECEIVER BUFFER REGISTER (RBUF) XXXXX2 (READ ONLY)

BIT0-7	RECEIVED CHARACTER
BIT8-11	LINE NUMBER
BIT12	PARITY ERROR
BIT13	FRAMING ERROR
BIT14	UART OVERRUN ERROR
BIT15	CHARACTER PRESENT

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104400
 104000
 000004
 177776
 000000
 000001
 000002
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 000001
 000002
 000004
 000010
 000020
 000040
 000100
 000200
 000400
 001000
 002000
 004000
 010000
 020000
 040000
 100000
 000340
 000000
 000020
 001200

TRANSMITTER CONTROL REGISTER (TCR) XXXXX4 (READ/WRITE)
 BIT0-15 STOP THE SCANNER ON CORRESPONDING LINE
 TRANSMITTER BUFFER (TBUF) XXXXX6
 BIT0-7 TRANSMITTED CHARACTER (WRITE ONLY)
 BIT8-11 LINE NUMBER (READ ONLY)
 BREAK CONTROL STATUS REGISTER (BCSR) XXXXX4 (BIT10 OF CSR SET) (READ/WRITE)
 BIT0-15 TRANSMIT A BREAK ON CORRESPONDING LINE!
 SCOPE= TRAP
 HLT= EMT
 TYPE= IOT
 PS= 177776
 R0= %0
 R1= %1
 R2= %2
 R3= %3
 R4= %4
 R5= %5
 TTY= %5
 SP= %6
 PC= %7
 BELL= 7
 BIT0= 1
 BIT1= 2
 BIT2= 4
 BIT3= 10
 BIT4= 20
 BIT5= 40
 BIT6= 100
 BIT7= 200
 BIT8= 400
 BIT9= 1000
 BIT10= 2000
 BIT11= 4000
 BIT12= 10000
 BIT13= 20000
 BIT14= 40000
 BIT15= 100000
 LEVEL7 = 340
 OPEN = 0
 DJMXNO=16.
 STACK =1200
 ;MAX ALLOWED NUMBER OF DJ11'S

537		000000		. = 0		;TRAP CATCHER IN LOCATIONS 0 THRU 776
538	000000	000000	000000	0.0		;LOCATIONS 0 AND 2 CONTAIN 'HALT' INSTRUCTIONS
539						;LOCATIONS 4 THRU 56 CONTAIN '+2' AND 'HALT' IN EVERY VECTOR
540						;LOCATIONS 60 THRU 776 CONTAIN '+2' AND 'IOT' IN EVERY VECTOR
541						
542						
543		000046		. - 46		
544	000046	014450			\$ENDAD	
545						
546		000174		. - 174		
547	000174	000000		DISPREG: 0		
548	000176	000000		SWREG: 0		
549						
550		000200		. = 200		
551	000200	000137	001402	JMP	BEGIN	;200 ALWAYS IS THE STARTING ADDRESS
552		001000		. = 1000		;RESTART ADDRESS
553	001000	000137	002344	JMP	QABR	
554						
555		001200		. - 1200		
556					ADDRESS TABLES	
557						
558						'LENGTH' TABLE IS SET SO THE FIRST FOUR BYTES (2 WORDS) CONTAIN
559						THE CHARACTER LENGTH FOR THE 4 LINE GROUPS OF THE FIRST DJ11, ETC.
560						
561						'PARITY' TABLE HAS 4 WORDS, ONE FOR EACH LINE GROUP. THE FIRST WORD CONTAINS
562						THE ODD PARITY FLAGS FOR LINES 0-3 OF ALL DJ11'S. THE NEXT WORD
563						HAS PARITY FLAGS FOR LINES 4-7, ETC. EACH BIT IN THE WORD REPRESENTS
564						EACH DJ11. BIT 0 IN EACH OF THE FOUR WORDS IS FOR DJ/0 TO BIT
565						15 FOR DJ/15.
566						
567	001200	000100		LENGTH: .BLKB 100		;TABLE OF CHAR. LENGTHS (MASK)
568	001300	000000		PARITY: 0		;ODD PARITY FLAGS FOR LINES 0-3
569	001302	000000		PARIT2: 0		;ODD PARITY FLAGS FOR LINES 4-7
570	001304	000000		PARIT3: 0		;ODD PARITY FLAGS FOR LINES 10-13
571	001306	000000		PARIT4: 0		;ODD PARITY FLAGS FOR LINES 14-17
572	001310	000000		ICNT: 0		;ITERATION COUNT-LH, TEST NO.-RH
573	001312	000000		ERRORS: 0		;ERROR COUNT REGISTER
574	001314	000000	000000	PCNT: 0.0		;PASS COUNT REGISTER
575						
576	001320	160010		CSR: 160010		;CONTROL STATUS REGISTER(DJ UNDER TEST)
577	001322	160012		RBUF: 160012		;RECEIVER BUFFER REGISTER(DJ UNDER TEST)
578	001324			TCR: 160014		;TRANSMITTER CONTROL REGISTER(DJ UNDER TEST)
579	001324	160014		BCSR: 160014		;BREAK STATUS REGISTER(DJ UNDER TEST)
580	001326	160016		TBUF: 160016		;TRANSMITTER BUFFER REGISTER(DJ UNDER TEST)
581						
582	001330	000300		RCVVEC: 300		;RECEIVER INTERRUPT VECTOR ADDRESS(DJ UNDER TEST)
583	001332	000302		RCVLVL: 302		
584	001334	000304		XMTVEC: 304		;TRANSMITTER INTERRUPT VECTOR ADDRESS(DJ UNDER TEST)
585	001336	000306		XMTLVL: 306		
586						
587	001340	160010		DEVADR: 160010		;FIRST DEVICE ADDRESS(SELECTED)
588	001342	000300		VECADR: 300		;FIRST VECTOR ADDRESS(SELECTED)
589	001344	000001		UNITS: 1		;NUMBER OF UNITS TO BE TESTED
590	001346	000000		TIMER: 0		;USED TO SAVE RELATIVE TIMES
591	001350	000000		ALMFLG: 0		;TEST FLAG FOR SILO ALARM LEVEL
592	001352	000000		TIMERA: 0		;TIME COUNTERS

593	001354	000000	TIMERB: 0	
594	001356	000000	COUNT: 0	;CHAR COUNTER
595	001360	000000	SUM: 0	;SUMATION OF ALARM LEVEL CHAR'S
596				
597	001362	000000	DJUUT: 0	;UNIT NUMBER OF DJ11 UNDER TEST
598	001364	000000	DJLEN: 0	;CHAR MASK TABLE POINTER
599	001366	000000	DJPAR: 0	;UNIT FLAG (FOR ODD PARITY FLAG)
600	001370	160010	DEFADR: 160010	;DEFAULT FIRST DEVICE ADDRESS
601	001372	000300	DEFVEC: 300	;DEFAULT FIRST VECTOR ADDRESS
602				
603	001374	177570	SWR: 177570	
604	001376	177570	DISPLAY:177570	
605				
606				
607	001400	177777	FTIME: -1	
608				
609				

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610
611 001402 012706 001200      BEGIN: MOV    #STACK, SP      ;SET UP STACK POINTER
612 001406 004737 017524      JSR    PC, SUSWRR      ;CHECK FOR SWITCH REGISTER
613 001412 012700 000020      MOV    #20,R0
614 001416 012720 016364      MOV    #IOTRAP,(R0)+      ;IOT VECTOR (20)
615 001422 012720 000340      MOV    #340,(R0)+
616 001426 012720 016224      MOV    #PDOWNS,(R0)+      ;POWER FAIL VECTOR (24)
617 001432 012720 000340      MOV    #340,(R0)+
618 001436 012720 015254      MOV    #EMTS,(R0)+      ;EMT VECTOR (30)
619 001442 012720 000340      MOV    #340,(R0)+
620 001446 012720 015112      MOV    #TRAPS,(R0)+      ;TRAP VECTOR (34)
621 001452 012720 000340      MOV    #340,(R0)+
622 001456 005037 001312      CLR    ERRORS      ;CLEAR ERROR COUNTER
623 001462 005037 001314      CLR    PCNT      ;CLEAR PASS COUNTER
624 001466 005037 001316      CLR    PCNT+2
625 001472 005037 001350      CLR    ALMFLG
626 001476 005737 000042      TST    #42      ;CHECK FOR ACT11 OR DDP PRESENT
627 001502 001404      BEQ    GETADR      ;BRANCH IF NONE
628 001504 004737 017304      JSR    PC, AUTO      ;GO TO SUBROUTINE TO 'MAP' DJ11 ON THE SYS
629 001510 000137 002344      JMP    QABR      ;SKIP OPERATOR ACTION
630
631 001514 000004 017013      GETADR: TYPE, MTITLE
632 001520 000004 016524      TYPE, RETURN
633 001524 000004 016532      TYPE, MSGADR
634 001530 004537 015476      JSR    R5, READIN      ;TYPE 'FIRST DJ11 ADDRESS'
635 001534 001340      .WORD DEVADR      ;READ INPUT FROM TTY AND SAVE
636 001536 001366      BNE GETADR      ;IN DEVADR
637 001540 005737 001340      TST    DEVADR      ;BRANCH IF BAD INPUT
638 001544 001003      BNE 1$
639 001546 013737 00 370 001340      MOV    DEFADR,DEVADR
640 001554 042737 000007 001340 1$: BIC    #7,DEVADR
641 001562 022737 160000 001340      CMP    #160000,DEVADR
642 001570 101351      BHI GETADR
643
644 001572 000004 016562      GETVEC: TYPE, MSGVEC
645 001576 004537 015476      JSR    R5, READIN      ;TYPE 'VECTOR ADDRESS:'
646 001602 001342      .WORD VECADR      ;READ INPUT FROM TTY AND SAVE
647 001604 001372      BNE GETVEC      ;IN VECADR
648 001606 005737 001342      TST    VECADR      ;BRANCH IF BAD INPUT
649 001612 001003      BNE 1$      ;CHECK FOR CR
650 001614 012737 000300 001342      MOV    #300, VECADR      ;SET TO FIRST FLOATING VECTOR
651 001622 042737 000007 001342 1$: BIC    #7, VECADR      ;CLEAR TO MODULO 10
652 001630 022737 000300 001342      CMP    #300, VECADR      ;CHECK FOR LOW LIMIT
653 001636 003355      BGT GETVEC
654 001640 022737 001000 001342      CMP    #1000, VECADR      ;CHECK FOR UPPER LIMIT
655 001646 003751      BLE GETVEC
656 001650 000004 016606      GETNUM: TYPE, MSGNUM
657 001654 004737 015644      JSR    PC,READ$      ;TYPE 'NUMBER OR UNITS:'
658      ; CHECK STRING FOR VALID DIGITS, TERMINATOR, AND 'P'
659 001660 012702 015772      MOV    #INPUT,R2      ;READ INPUT FROM THE TTY
660 001664 112201      MOV    (R2)+,R1      ;POINTS TO INPUT STRING
661 001666 001434      BEQ 1$      ;LOAD 1ST CHAR
662 001670 122701 000120      CMP    #'P',R1      ;BRANCH IF IMMEDIATE TERMINATOR
663 001674 001443      BEQ CONFIG      ;CHECK FOR A P
664 001676 120127 000071      CMP    R1,#71      ;CONFIGURE MODE IF SO
665 001702 101362      BHI GETNUM      ;MUST BE A VALID ASCII NUMBER
                        ;ELSE RETRY

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666	001704	162701	000060		SUB	#60,R1		;STRIP ASCII CODE
667	001710	003757			BLE	GETNUM		;SHOULDN'T BE ZERO OR NEG
668					;1ST CHAR IS A VALID DIGIT, 1 THRU 9 - CHECK REST OF STRING			
669	001712	105722			TSTB	(R2)+		;2ND CHAR A TERMINATOR?
670	001714	001423			BEQ	3\$		;YES - R1 HAS THE FINAL # OF UNITS
671	001716	105712			TSTB	(R2)		;NO - NXT CHAR MUST BE THE TERMINATOR
672	001720	001353			BNE	GETNUM		;ELSE RETRY.
673	001722	124227	000071		CMPE	-(R2),#71		;CHECK 2ND CHAR FOR A VALID NUMBER
674	001726	101350			BHI	GETNUM		
675	001730	111203			MOVB	(R2),R3		;MAKE IT MORE ACCESSIBLE
676	001732	162703	000060		SUB	#60,R3		;STRIP ASCII CODE
677	001736	100744			BMI	GETNUM		;SHOULDN'T BE NEGATIVE
678					;BOTH LOW AND HIGH ORDER DIGITS ARE OK - CONVERT DECIMAL VALUE.			
679	001740	010146			MOV	R1,-(SP)		;SAVE IT FOR LATER
680	001742	006301			ASL	R1		;MULT HI ORDER BY 8
681	001744	006301			ASL	R1		
682	001746	006301			ASL	R1		
683	001750	006316			ASL	(SP)		;MULTIPLY IT BY 2
684	001752	062601			ADD	(SP)+,R1		;RESULT IS (HI ORD)*10.
685	001754	060301			ADD	R3,R1		;NOW ADD IN THE LOW ORDER
686	001756	000402			BR	3\$		
687	001760	012701	000001		1\$:	MOV	#1,R1	;LOAD DEFAULT VALUE HERE
688					;R1 HAS THE CONVERTED VALUE - COMPARE AGAINST MAX ALLOWED.			
689	001764	020127	000020		3\$:	CMP	R1,#D.MXNO	;TOO BIG?
690	001770	101327			BHI	GETNUM		;YES - RETRY.
691	001772	010137	001344		MOV	R1,UNIT		;VALUE OK - STORE RESULT
692	001776	012737	000100	001362	MOV	#100,DJUT		;PRIME UNIT UNDER TEST NUMBER
693					;CONFIG: TYPE, MSGCON			
694	002004	000004	016631		JSR	PC	READS	;TYPE 'STANDARD CONFIG?'
695	002010	004737	015644		CMPE	#P,	INPUT	;READ INPUT FROM ITY
696	002014	122737	000120	015772	BNE	AAA		;CHECK FOR 'P'
697	002022	001002			JMP	QABR		;GO THRU IF NOT PREVIOUS
698	002024	000137	002344		AAA:	MOV	#44,R0	;BRANCH IF PREVIOUS
699	002030	012700	000044		MOV	#LENGTH,R1		;SET UP COUNTER
700	002034	012701	001200		1\$:	CLR	(R1)+	;POINT TO CHAR LEN TABLE
701	002040	005021			;PUT CHAR MASK FOR 8 IN CHAR TABLE			
702					;AND CLR PARITY TABLE			
703	002042	005300			DEC	R0		;COUNT DOWN
704	002044	001375			BNE	1\$		;BRANCH IF NOT DONE
705	002046	105737	015772		TSTB	INPUT		;CHECK FOR CR
706	002052	001002			BNE	SSS		;GO THRU IF NOT DEFAULT
707	002054	000137	002344		JMP	QABR		;BRANCH IF DEFAULT
708	002060	122737	000131	015772	SSS:	CMPE	#131, INPUT	;CHECK FOR 'Y'
709	002066	001002			BNE	DDD		;GO THRU IF NOT DEFAULT
710	002070	000137	002344		JMP	QABR		;BRANCH IF DEFAULT
711	002074	122737	000116	015772	DDD:	CMPE	#116, INPUT	;CHECK FOR 'N'
712	002102	001340			BNE	CONFIG		;BRANCH IF ILLEGAL ENTRY
713	002104	005000			CLR	R0		;CLR UNIT COUNTER
714	002106	005001			CLR	R1		;CLR LINE COUNTER
715	002110	012702	001200		MOV	#LENGTH,R2		;SET UP POINTER TO CHAR MASK TABLE
716	002114	012703	001300		MOV	#PARITY,R3		;SET UP POINTER TO PARITY TABLE
717	002120	012704	000001		MOV	#1,R4		;SET UP MARKER
718	002124	000004	016665		TYPLIN:	TYPE,	MSGLIN	;TYPE 'LINES'
719	002130	010105			MOV	R1,TTY		;TYPE R1 IN OCTAL
720	002132	004737	016052		JSR	PC,PRINTS		;AND SUPPRESS LEADING ZERO'S
721	002136	000004	016676		TYPE,	MSGDAS		;TYPE A DASH (-)

722	002142	062701	000003		ADD	#3, R1	: LAST LINE IN GROUP OF 4
723	002146	010105			MOV	R1, TTY	: TYPE R1 IN OCTAL
724	002150	004737	016052		JSR	PC, PRINTS	: AND SUPPRESS LEADING ZERO'S
725	002154	005201			INC	R1	: FIRST LINE NEXT GROUP
726	002156	000004	016702		GETLEN: TYPE,	MSGLEN	: TYPE 'CHAR LENGTH: ''
727	002162	005037	015770		CLR	INHRE	
728	002166	004737	015644		JSR	PC, READ\$	: READ FROM THE TTY
729	002172	105737	015772		TSTB	INPUT	: CHECK FOR CR (DEFAULT)
730	002176	001421			BEQ	GETPAR	: BRANCH IF DEFAULT
731	002200	105737	015773		TSTB	INPUT+1	: CHECK FOR BAD DATA
732	002204	001364			BNE	GETLEN	: BRANCH IF BAD
733	002206	162737	000060	015772	SUB	#60, INPUT	: CONVERT FROM ASCII
734	002214	112712	177777		MOVB	#-1, (R2)	: SET UP MASK
735	002220	106312			2\$: ASLB	(R2)	: CLEAR MASK BIT BY BIT
736	002222	103355			BCC	GETLEN	: BAD INPUT, > 8
737	002224	105337	015772		DECB	INPUT	: COUNT
738	002230	001373			BNE	2\$	: BRANCH IF NOT DONE
739	002232	132712	000037		BITB	#37, (R2)	: CHECK FOR 5 CHAR
740	002236	001347			BNE	GETLEN	: BAD INPUT, < 5
741	002240	005202			INC	R2	: INC TO NEXT LINE GROUP
742	002242	000004	016723		GETPAR: TYPE,	MSGPAR	: TYPE 'PARITY (NO, ODD, EVEN):
743	002246	005037	015770		CLR	INHRE	
744	002252	004737	015644		JSR	PC, READ\$	: READ INPUT FROM TTY
745	002256	005737	015772		TST	INPUT	: CHECK FOR CR
746	002262	001415			BEQ	3\$	: BRANCH IF DEFAULT
747	002264	122737	000116	015772	CMPB	#116, INPUT	: CHECK FOR 'N'
748	002272	001411			BEQ	3\$	: BRANCH IF 'NO'
749	002274	122737	000105	015772	CMPB	#105, INPUT	: CHECK FOR 'E'
750	002302	001405			BEQ	3\$	: BRANCH IF 'EVEN'
751	002304	122737	000117	015772	CMPB	#117, INPUT	: CHECK FOR 'O'
752	002312	001353			BNE	GETPAR	: BRANCH IF NONE
753	002314	050413			BIS	R4, (R3)	: SET THE ODD PARITY FLAG
754	002316	005723			3\$: TST	(R3)+	: POINT TO THE NEXT PARITY WORD
755	002320	032701	000017		BIT	#17, R1	: CHECK FOR NEXT UNIT
756	002324	001277			BNE	TYPLIN	: BRANCH IF NOT
757	002326	012703	001300		MOV	#PARITY, R3	: RESET PARITY TABLE POINTER
758	002332	006304			ASL	R4	: FLAG TO NEXT UNIT
759	002334	005200			INC	R0	: COUNT UNITS
760	002336	020037	001344		CMP	R0, UNITS	: CHECK FOR LAST
761	002342	001270			BNE	TYPLIN	: BRANCH IF MORE
762							
763							
764							
765	002344	000004	017051				: ROUTINE TO GET BUS PRIORITIES FOR INDIVIDUAL DJ11S
766	002350	012737	000061	017210	QABR: TYPE,	MSBR	: TYPE QUESTION- BR PRIORITIES???
767	002356	012737	000061	017212	MOV	#61, DEVNUM	: LOAD UP INITIAL DEVICE #
768	002364	010446			MOV	#61, UNITS1	: LOAD FIRST UNIT FOR BR QUESTION
769	002366	012704	017232		MOV	R4, -(SP)	: SAVE CONTENTS OF R4
770					MOV	#PRTBLE+2, R4	: SKIPPING FIRST TABLE LOCATION
771	002372	063737	001344	017212			: TO ALLOW ROUTINE BRSET TO WORK
772	002400	000004	017174		DEVNEW: ADD	UNITS, UNITS1	: LOAD TOTAL UNITS IN UNITS1
773	002404	000004	017210		TYPE,	VICE	: TYPE OUT WORD 'DEVICE'
774	002410	000004	000075		TYPE,	DEVNUM	: TYPE DEVICE NUMBER
775	002414	004737	015644		TYPE,	'='	: TYPE AN EQUAL SIGN
776	002420	023727	015772	000060	JSR	PC, READ\$	: GO READ\$ IN NUMBER(ASCII)
777	002426	100415			CMP	INPUT, #60	: CMP DECIMAL 7 AND BR INPUT
					BMI	NOGOOD	: REPORT ERROR

778	002430	022737	000067	015772	CMP	#67, INPUT	:	CHECK IF A VALID ENTRY
779	002436	100411			BMI	NOGOOD	:	REPORT ERROR
780	002440	013724	015772		MOV	INPUT, (R4)+	:	STORE VALUE OF PRIO
781	002444	005237	017210		INC	DEVNUM	:	TO NEXT DEVICE # (IN ASCII)
782	002450	023737	017212	017210	CMP	UNITS1, DEVNUM	:	ARE YOU TESTING LAST DEVICE???
783	002456	001350			BNE	DEVNEW	:	BACK IF MORE DEVICES
784	002460	000403			BR	AROUND	:	THRU IF ALL DEVICES FINISHED
785	002462	000004	017117		NOGOOD:	TYPE, MSBAD	:	TYPE ERROR IN INPUT VALUE
786	002466	000744			BR	DEVNEW	:	BACK TO ASK AGAIN
787	002470	012604			AROUND:	MOV (SP)+, R4	:	RESTORE R4

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788
789 002472 000005          RESTAR: RESET          ;ISSUE RE FT
790 002474 012706 001200      MOV      #STACK, SP      ;SET UP STACK POINTER
791 002500 005737 001400      TST      FTIME
792 002504 001410          BEQ      CLRVEC
793 002506 022737 000176 001374  CMP      #SWREG, SWR
794 002514 001004          BNE      CLRVEC
795 002516 004737 017604      JSR      PC,      CNTLU
796 002522 005037 001400      CLR      FTIME
797 002526 012700 000300      CLRVEC: MOV      #300,R0      ;BEGINNING OF FLOATING VECTORS
798 002532 005720          1$: TST      (R0)+
799 002534 010060 177776      MOV      R0,-2(R0)      ;'+2'
800 002540 012720 000004      MOV      #!OT, (R0)+      ;'!OT'
801 002544 022700 001000      CMP      #1000,R0
802 002550 001370          BNE      1$
803 002552 062737 000010 001320  ADD      #10,      CSR      ;UPDATE DEVICE ADDRESS TO NEXT UNIT
804 002560 062737 000010 001330  ADD      #10,      RCVVEC      ;UPDATE DEVICE VECTOR ADDRESS
805 002566 062737 000004 001364  ADD      #4,      DJLEN      ;MOVE CHAR TABLE POINTER
806 002574 006337 001366          ASL      DJPAR      ;UPDATE PARITY FLAG MARKER
807 002600 023737 001362 001344  CMP      DJUUT,UNITS
808 002606 002416          BLT      2$
809 002610 005037 001362          CLR      DJUUT
810 002614 013737 001340 001320  MOV      DEVADR,CSR
811 002622 013737 001342 001330  MOV      VECADR,RCVVEC
812 002630 012737 001200 001364  MOV      #LENGTH,DJLEN      ;INIT CHAR TABLE POINTER
813 002636 012737 000001 001366  MOV      #1,DJPAR      ;INIT PARITY FLAG MARKER
814 002644 005237 001362          2$: INC      DJUUT
815 002650 013701 001320          MOV      CSR,      R1      ;SET UP ALL THE REGISTER ADDRESSES
816 002654 062701 000002          ADD      #2,      R1      ;ADD 2
817 002660 010137 001322          MOV      R1,      RBUF      ;SET UP RECEIVER BUFFER
818 002664 062701 000002          ADD      #2,      R1      ;ADD 2
819 002670 010137 001324          MOV      R1,      TCP      ;SET UP TRANSMITTER CONTROL REG
820          ; AND BREAK STATUS REG
821 002674 062701 000002          ADD      #2,      R1      ;ADD 2
822 002700 010137 001326          MOV      R1,      TBUF      ;SET UP TRANSMITTER BUFFER
823 002704 013701 001330          MOV      RCVVEC, R1      ;POINTER FOR VECTOR SETUP
824 002710 005721          TST      (R1)+      ;INC R1
825 002712 010137 001332          MOV      R1,      RCVLVL      ;SET INT LVL
826 002716 005721          TST      (R1)+      ;INC R1
827 002720 010137 001334          MOV      R1,      XMTVEC      ;TRANSMITTER VECTOR
828 002724 005721          TST      (R1)+      ;INC R1
829 002726 010137 001336          MOV      R1,      XMTLVL      ;XMT INT LVL ADR
830 002732 005037 001310          CLR      ICNT
831 002736 005037 015250          CLR      LAD
832 002742 104400          SCOPE
833
834

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842 002744 012737 003002 000004 TST1: MOV #1$, @#4 ;SET UP TIME-OUT TRAP VECTOR
843 002752 012737 000340 000006 MOV #LEVEL7,@#6
844 002760 005777 176334 TST @CSR ;REFERENCE CSR (READ)
845 002764 005077 176330 CLR @CSR ;CLEAR CSR (WRITE)
846 002770 005577 176324 ADC @CSR ;CHECK CSR (READ AND WRITE)
847 002774 001405 BEQ 2$ ;BRANCH IF OK
848 002776 104000 HLT ;CSR NOT CLEARED
849
850 003000 000403 BR 2$ ;SKIP ISR
851
852 003002 012601 1$: MOV (SP)+,R1 ;SAVE RTI ADR FOR TYPING
853 003004 1040C1 HLT+1 ;CAN'T REFERENCE CSR!
854
855 003006 005726 TST (SP)+ ;FINISH CLEARING STACK
856 003010 012737 000006 000004 2$: MOV #6,@#4
857 003016 005037 000006 CLR @#6
858 003022 104400 SCOPE
859
860
861
862
863
864
865 003024 012777 000002 176266 TST2: MOV #BIT1,@CSR ;SET BIT1
866 003032 032777 000002 176260 BIT #BIT1,@CSR ;CHECK THAT BIT1 IS SET
867 003040 001001 BNE .+4 ;BRANCH IF OK
868 003042 104000 HLT ;CSR BIT1 FAILED TO SET
869
870 003044 032777 177775 176246 BIT #177775,@CSR ;CHECK THAT NO OTHER BIT SET
871 003052 001401 BEQ .+4 ;BRANCH IF OK
872 003054 104000 HLT ;EXTRA BIT SET IN CSR
873
874 003056 005077 176236 CLR @CSR ;CLEAR BIT1
875 003062 032777 000002 176230 BIT #BIT1,@CSR ;CHECK THAT BIT1 IS CLEARED
876 003070 001401 BEQ .+4 ;BRANCH IF OK
877 003072 104000 HLT ;CSR BIT1 FAILED TO CLEAR
878
879 003074 104400 SCOPE
880
881
882
883
884
885
886 003076 012777 000004 176214 TST3: MOV #BIT2,@CSR ;SET BIT2
887 003104 032777 000004 176206 BIT #BIT2,@CSR ;CHECK THAT BIT2 IS SET
888 003112 001001 BNE .+4 ;BRANCH IF OK
889 003114 104000 HLT ;CSR BIT2 FAILED TO SET
890

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891	003116	032777	177773	176174	BIT	#177773,@CSR	:CHECK THAT NO OTHER BIT SET
892	003124	001401			BEQ	+.4	:BRANCH IF OK
893	003126	104000			HLT		:EXTRA BIT SET IN CSR
894							
895	003130	005077	176164		CLR	@CSR	:CLEAR BIT2
896	003134	032777	000004	176156	BIT	#BIT2,@CSR	:CHECK THAT BIT2 IS CLEARED
897	003142	001401			BEQ	+.4	:BRANCH IF OK
898	003144	104000			HLT		:CSR BIT2 FAILED TO CLEAR
899							

SCOPE

 :TEST 4: TEST THAT CSR BIT6 CAN BE SET AND CLEARED
 :PROBABLE FAULTY LOGIC: M7285 (D2-2) E4,E18, (D2-4) E47,E64

907	003150	012777	000100	176142	TST4: MOV	#BIT6,@CSR	:SET BIT6
908	003156	032777	000100	176134	BIT	#BIT6,@CSR	:CHECK THAT BIT6 IS SET
909	003164	001001			BNE	+.4	:BRANCH IF OK
910	003166	104000			HLT		:CSR BIT6 FAILED TO SET
911							
912	003170	032777	177677	176122	BIT	#177677,@CSR	:CHECK THAT NO OTHER BIT SET
913	003176	001401			BEQ	+.4	:BRANCH IF OK
914	003200	104000			HLT		:EXTRA BIT SET IN CSR
915							
916	003202	005077	176112		CLR	@CSR	:CLEAR BIT6
917	003206	032777	000100	176104	BIT	#BIT6,@CSR	:CHECK THAT BIT6 IS CLEARED
918	003214	001401			BEQ	+.4	:BRANCH IF OK
919	003216	104000			HLT		:CSR BIT6 FAILED TO CLEAR
920							

SCOPE

 :TEST 5: TEST THAT CSR BIT8 CAN BE SET AND CLEARED
 :PROBABLE FAULTY LOGIC: M7285 (D2-2) E6,E18, (D2-4) E47,E31

928	003222	012777	000400	176070	TST5: MOV	#BIT8,@CSR	:SET BIT8
929	003230	032777	000400	176062	BIT	#BIT8,@CSR	:CHECK THAT BIT8 IS SET
930	003236	001001			BNE	+.4	:BRANCH IF OK
931	003240	104000			HLT		:CSR BIT8 FAILED TO SET
932							
933	003242	032777	177377	176050	BIT	#177377,@CSR	:CHECK THAT NO OTHER BIT SET
934	003250	001401			BEQ	+.4	:BRANCH IF OK
935	003252	104000			HLT		:EXTRA BIT SET IN CSR
936							
937	003254	005077	176040		CLR	@CSR	:CLEAR BIT8
938	003260	032777	000400	176032	BIT	#BIT8,@CSR	:CHECK THAT BIT8 IS CLEARED
939	003266	001401			BEQ	+.4	:BRANCH IF OK
940	003270	104000			HLT		:CSR BIT8 FAILED TO CLEAR
941							

SCOPE

 :TEST 6: TEST THAT CSR BIT10 CAN BE SET AND CLEARED
 :PROBABLE FAULTY LOGIC: M7285 (D2-2) E30,E24, (D2-4) E47,E31

942 003272 104400
 943
 944
 945
 946

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947  
948  
949 003274 012777 002000 176016 TST6: MOV #BIT10, @CSR ;SET BIT10  
950 003302 032777 002000 176010 BIT #BIT10, @CSR ;CHECK THAT BIT10 IS SET  
951 003310 001001 BNE .+4 ;BRANCH IF OK  
952 003312 104000 HLT ;CSR BIT10 FAILED TO SET  
953  
954 003314 032777 175777 175776 BIT #175777, @CSR ;CHECK THAT NO OTHER BIT SET  
955 003322 001401 BEQ .+4 ;BRANCH IF OK  
956 003324 104000 HLT ;EXTRA BIT SET IN CSR  
957  
958 003326 005077 175766 CLR @CSR ;CLEAR BIT10  
959 003332 032777 002000 175760 BIT #BIT10, @CSR ;CHECK THAT BIT10 IS CLEARED  
960 003340 001401 BEQ .+4 ;BRANCH IF OK  
961 003342 104000 HLT ;CSR BIT10 FAILED TO CLEAR  
962  
963 003344 104400 SCOPE  
964  
965  
966 ;*****  
967 ;TEST 7: TEST THAT CSR BIT12 CAN BE SET AND CLEARED  
968 ;PROBABLE FAULTY LOGIC: M7285 (D2-2) E5, E1, (D2-4) E47, E31  
969 ;*****  
970 003346 012777 010000 175744 TST7: MOV #BIT12, @CSR ;SET BIT12  
971 003354 032777 010000 175736 BIT #BIT12, @CSR ;CHECK THAT BIT12 IS SET  
972 003362 001001 BNE .+4 ;BRANCH IF OK  
973 003364 104000 HLT ;CSR BIT12 FAILED TO SET  
974  
975 003366 032777 167777 175724 BIT #167777, @CSR ;CHECK THAT NO OTHER BIT SET  
976 003374 001401 BEQ .+4 ;BRANCH IF OK  
977 003376 104000 HLT ;EXTRA BIT SET IN CSR  
978  
979 003400 005077 175714 CLR @CSR ;CLEAR BIT12  
980 003404 032777 010000 175706 BIT #BIT12, @CSR ;CHECK THAT BIT12 IS CLEARED  
981 003412 001401 BEQ .+4 ;BRANCH IF OK  
982 003414 104000 HLT ;CSR BIT12 FAILED TO CLEAR  
983  
984 003416 104400 SCOPE  
985  
986 ;*****  
987 ;TEST 10: TEST THAT CSR BIT14 CAN BE SET AND CLEARED  
988 ;PROBABLE FAULTY LOGIC: M7285 (D2-2) E3, E1, (D2-4) E47, E31  
989 ;*****  
990  
991 003420 012777 040000 175672 TST10: MOV #BIT14, @CSR ;SET BIT14  
992 003426 032777 040000 175664 BIT #BIT14, @CSR ;CHECK THAT BIT14 IS SET  
993 003434 001001 BNE .+4 ;BRANCH IF OK  
994 003436 104000 HLT ;CSR BIT14 FAILED TO SET  
995  
996 003440 032777 137777 175652 BIT #137777, @CSR ;CHECK THAT NO OTHER BIT SET  
997 003446 001401 BEQ .+4 ;BRANCH IF OK  
998 003450 104000 HLT ;EXTRA BIT SET IN CSR  
999  
1000 003452 005077 175642 CLR @CSR ;CLEAR BIT14  
1001 003456 032777 040000 175634 BIT #BIT14, @CSR ;CHECK THAT BIT14 IS CLEARED  
1002 003464 001401 BEQ .+4 ;BRANCH IF OK
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1003 003466 104000          HLT          ;CSR BIT14 FAILED TO CLEAR
1004
1005 003470 104400          SCOPE
1006
1007          ;*****
1008          ;TEST 11:      TEST THAT RECEIVER ENABLE (BIT0 OF THE CSR) CAN BE SET
1009          ;                AND CLEARED, AND THAT CLEAR MOS (BIT3) IS WRITE ONLY.
1010          ;PROBABLE FAULTY LOGIC: M7285 (D2-2) E26,E36,E7,E24, (D2-8) E17,E14,E15
1011          ;*****
1012
1013 003472 012777 000004 175620 TST11: MOV    #BIT2, @CSR    ;SET MAINTENANCE MODE (BIT2)
1014 003500 005005          CLR    R5          ;SET UP COUNTER
1015 003502 052777 000010 175610 1$:  BIS    #BIT3, @CSR    ;SET CLEAR MOS (BIT3)
1016 003510 017701 175604          MOV    @CSR, R1      ;SAVE CSR
1017 003514 032701 000010          BIT    #BIT3, R1      ;CHECK CLEAR MOS (BIT3)
1018 003520 001401          BEQ    .+4          ;BRANCH IF OK
1019 003522 104001          HLT+1          ;CLEAR MOS (BIT3) SET (WRITE-ONLY)
1020          ;R1 = CONTENTS OF CSR
1021 003524 032701 000020          BIT    #BIT4, R1      ;CHECK CLEAR MOS FLAG
1022 003530 001403          BEQ    2$          ;BRANCH IF CLEARED
1023 003532 105305          DEC8   R5          ;WAIT FOR MOS TO CLEAR
1024 003534 001365          BNE    1$          ;BRANCH IF MORE TIME
1025 003536 104001          HLT+1          ;CLEAR MOS FLAG (BIT4) FAILED TO CLEAR
1026          ;R1 = CONTENTS OF CSR
1027 003540 022701 000004 2$:  CMP    #BIT2, R1      ;CHECK THAT ONLY MAINTENANCE BIT SET
1028 003544 001401          BEQ    .+4          ;BRANCH IF OK
1029 003546 104001          HLT+1          ;CLEAR MOS CLEARED MAINTENANCE
1030          ;OR SET OTHER CSR BITS
1031          ;R1 = CONTENTS OF CSR
1032 003550 052777 000001 175542  BIS    #BIT0, @CSR    ;SET RECEIVER ENABLE
1033 003556 017701 175536          MOV    @CSR, R1      ;SAVE CSR
1034 003562 032777 000001 175530  BIT    #BIT0, @CSR    ;CHECK THAT RECEIVER ENABLE SET
1035 003570 001001          BNE    .+4          ;BRANCH IF OK
1036 003572 104001          HLT+1          ;RECEIVER ENABLE FAILED TO SET
1037          ;R1 = CONTENTS OF CSR
1038 003574 022777 000005 175516  CMP    #5, @CSR      ;CHECK REST OF CSR
1039 003602 001401          BEQ    .+4          ;BRANCH IF OK
1040 003604 104001          HLT+1          ;CSR ERROR
1041          ;R1 = CONTENTS OF CSR
1042          ;NOTE: IF THE TTY MODULE IS BEING USED AND DONE (BIT7) IS SET,
1043          ;        THE ERROR COULD BE DUE TO MAINTENANCE OR CLEAR MOS NOT WORKING.
1044 003606 042777 000001 175504  BIC    #BIT0, @CSR    ;CLEAR RECEIVER ENABLE
1045 003614 017701 175500          MOV    @CSR, R1      ;SAVE CSR
1046 003620 022777 000004 175472  CMP    #BIT2, @CSR    ;CHECK CSR
1047 003626 001401          BEQ    .+4          ;BRANCH IF OK
1048 003630 104001          HLT+1          ;RECEIVER ENABLE DIDN'T CLEAR
1049          ;OR OTHER CSR BIT SET
1050          ;R1 = CONTENTS OF CSR
1051
1052 003632 104400          SCOPE
1053
1054          ;*****
1055          ;TEST 12:      TEST THAT CSR RESPONDS PROPERLY TO BYTE COMMANDS
1056          ;PROBABLE FAULTY LOGIC: M7285 (D2-4) E47
1057          ;*****
1058

```

1059	003634	012777	052506	175456	TST12: MOV	#052506,@CSR	;SET TEST NUMBER IN CSR
1060	003642	105077	175452		CLRB	@CSR	;CLR EVEN BYTE
1061	003646	017701	175446		MOV	@CSR, R1	;SAVE CSR
1062	003652	022701	052400		CMP	#052400,R1	;CHECK CSR
1063	003656	001401			BEQ	+.4	;BRANCH IF OK
1064	003660	104001			HLT+1		;EVEN BYTE CLR FAILED ON CSR
1065							;R1 = CONTENTS OF CSR
1066	003662	012777	052506	175430	MOV	#052506,@CSR	;SET TEST NUMBER IN CSR
1067	003670	005237	001320		INC	CSR	;INC TO ODD BYTE
1068	003674	105077	175420		CLRB	@CSR	;CLR ODD BYTE
1069	003700	005337	001320		DEC	CSR	;RESTORE TO EVEN
1070	003704	017701	175410		MOV	@CSR, R1	;SAVE CSR
1071	003710	022701	000106		CMP	#000106,R1	;CHECK CSR
1072	003714	001401			BEQ	+.4	;BRANCH IF OK
1073	003716	104001			HLT+1		;ODD BYTE CLR FAILED ON CSR
1074							;R1 = CONTENTS OF CSR

SCOPE

 :TEST 13: TEST THAT THE BIS AND BIC INSTRUCTIONS SET AND CLEAR R/W
 :BITS OF CSR
 :PROBABLE FAULTY LOGIC: M7285 (D2-4) E47
 :*****

1084	003722	005077	175372		TST13: CLR	@CSR	;CLEAR THE CSR
1085	003726	017701	175366		MOV	@CSR, R1	;CHECK AND SAVE CSR
1086	003732	001401			BEQ	+.4	;BRANCH IF CLEARED OK
1087	003734	104001			HLT+1		;RESET FAILED TO CLR CSR
1088							
1089	003736	052777	052506	175354	BIS	#052506,	@CSR ;SET ALL R/W BITS OF CSR
1090	003744	022777	052506	175346	CMP	#052506,	@CSR ;CHECK THAT THEY GOT SET
1091	003752	001401			BEQ	+.4	;BRANCH IF OK
1092	003754	104000			HLT		;REG FAILED CMP
1093							
1094	003756	042777	052506	175334	BIC	#052506,	@CSR ;CLEAR CSR
1095	003764	017701	175330		MOV	@CSR, R1	;CHECK AND SAVE CSR
1096	003770	001401			BEQ	+.4	;BRANCH IF CLEARED OK
1097	003772	104001			HLT+1		;CLR FAILED TO CLR CSR

SCOPE

 :TEST 14: TEST BITS OF TCR FOR READ/WRITE CAPABILITY
 :PROBABLE FAULTY LOGIC: M7285 (D2-2) ALL, (D2-3) E8,E20,E21,E43,E47
 :*****

1106	003776	012777	177777	175320	TST14: MOV	#177777,@TCR	;SET ALL BITS OF TCR
1107	004004	017701	175314		MOV	@TCR, R1	;CHECK AND SAVE TCR
1108	004010	022701	177777		CMP	#177777,R1	;CHECK THAT ALL THE BITS ARE SET
1109	004014	001401			BEQ	+.4	;BRANCH IF OK
1110	004016	104001			HLT+1		;BIT(S) OF TCR FAILED TO SET
1111							
1112	004020	005077	175300		CLR	@TCR	;CLEAR TCR
1113	004024	017701	175274		MOV	@TCR, R1	;CHECK THAT IT CLEARED AND SAVE
1114	004030	001401			BEQ	+.4	;BRANCH IF CLR

```

1115 004032 104001          HLT+1          ;BIT(S) OF TCR FAILED TO CLEAR
1116
1117 004034 104400          SCOPE
1118
1119          ;*****
1120          ; TEST 15:      TEST THAT TCR RESPONDS PROPERLY TO BYTE COMMANDS
1121          ;PROBABLE FAULTY LOGIC:  M7285 (D2-3) E41
1122          ;*****
1123
1124 004036 012777 177777 175260 TST15:  MOV    #177777,@TCR      ;SET TEST NUMBER IN TCR
1125 004044 105077 175254          CLR    @TCR          ;CLR EVEN BYTE
1126 004050 017701 175250          MOV    @TCR,R1        ;SAVE TCR
1127 004054 022701 177400          CMP    #177400,R1      ;CHECK TCR
1128 004060 001401          BEQ     .+4          ;BRANCH IF OK
1129 004062 104001          HLT+1          ;EVEN BYTE CLR FAILED ON TCR
1130          ;R1 = CONTENTS OF TCR
1131 004064 012777 177777 175232          MOV    #177777,@TCR      ;SET TEST NUMBER IN TCR
1132 004072 005237 001324          INC     TCR          ;INC TO ODD BYTE
1133 004076 105077 175222          CLR    @TCR          ;CLR ODD BYTE
1134 004102 005337 001324          DEC     TCR          ;RESTORE TO EVEN
1135 004106 017701 175212          MOV    @TCR,R1        ;SAVE TCR
1136 004112 022701 000377          CMP    #000377,R1      ;CHECK TCR
1137 004116 001401          BEQ     .+4          ;BRANCH IF OK
1138 004120 104001          HLT+1          ;ODD BYTE CLR FAILED ON TCR
1139          ;R1 = CONTENTS OF TCR
1140
1141 004122 104400          SCOPE
1142
1143          ;*****
1144          ; TEST 16:      TEST THAT THE BIS AND BIC INSTRUCTIONS SET AND CLEAR R/W
1145          ;                BITS OF TCR
1146          ;PROBABLE FAULTY LOGIC:  M7285 (D2-3) E41
1147          ;*****
1148
1149 004124 005077 175174          TST16:  CLR    @TCR          ;CLEAR THE TCR
1150 004130 017701 175170          MOV    @TCR,R1      ;CHECK AND SAVE TCR
1151 004134 001401          BEQ     .+4          ;BRANCH IF CLEARED OK
1152 004136 104001          HLT+1          ;RESET FAILED TO CLR TCR
1153
1154 004140 052777 177777 175156          BIS    #177777,@TCR      ;SET ALL R/W BITS OF TCR
1155 004146 022777 177777 175150          CMP    #177777,@TCR      ;CHECK THAT THEY GOT SET
1156 004154 001401          BEQ     .+4          ;BRANCH IF OK
1157 004156 104000          HLT          ;REG FAILED CMP
1158
1159 004160 042777 177777 175136          BIC    #177777,@TCR      ;CLEAR TCR
1160 004166 017701 175132          MOV    @TCR,R1      ;CHECK AND SAVE TCR
1161 004172 001401          BEQ     .+4          ;BRANCH IF CLEARED OK
1162 004174 104001          HLT+1          ;CLR FAILED TO CLR TCR
1163
1164 004176 104400          SCOPE
1165 004200 012737 000001 001346          MOV    #1,    TIMER      ;INITIALIZE TIMER
1166 004206 012737 004214 015250          MOV    #.+6,  LAD       ;RESET LOOP ADDRESS
1167
1168          ;*****
1169          ; TEST 17:      TEST THAT TRANSMIT READY (BIT15 OF CSR) SETS AND CLEARS
1170          ;                WHEN TCR0 IS SET AND CLEARED.

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1171
1172
1173
1174
1175 004214 012777 000400 175076 TST17: MOV #400, @CSR ;SET XMTR SCAN ENABLE
1176 004222 052777 000001 175074 BIS #BIT0, @TCR ;SET XMTR CONTROL BIT, LINE 0
1177 004230 005000 CLR R0 ;SET UP WAIT COUNTER
1178 004232 017701 175062 1$: MOV @CSR, R1 ;CHECK AND SAVE XMTR READY
1179 004236 100404 BMI 2$ ;BRANCH IF SET OK
1180 004240 005200 INC R0 ;WAIT A WHILE
1181 004242 001373 BNE 1$
1182 004244 104001 HLT+1 ;XMTR READY FAILED TO SET
1183
1184 004246 000416 BR 3$ ;SKIP LINE # CHECK ON ERROR
1185
1186 004250 050037 001346 2$: BIS R0, TIMEP ;SET UP TIMER
1187 004254 017701 175046 MOV @TBUF, R1 ;SAVE LINE NUMBER
1188 004260 105001 CLRB R1
1189 004262 000301 SWAB R1
1190 004264 022701 000000 CMP #0, R1 ;CHECK THAT THE XMTR STOPPED ON LINE 0
1191 004270 001401 BEQ .+4 ;BRANCH IF OK
1192 004272 104001 HLT+1 ;WRONG LINE NUMBER APPEARED IN TBUF
1193
1194 004274 017702 175020 MOV @CSR, R2 ;CHECK AND SAVE XMTR READY
1195 004300 100401 BMI .+4 ;BRANCH IF OK
1196 004302 104002 HLT+2 ;READING THE TBUF CLEARED XMTR READY
1197
1198 004304 042777 000001 175012 3$: BIC #BIT0, @TCR ;CLR XMTR CONTROL BIT, LINE 0
1199 004312 017701 175002 MOV @CSR, R1 ;CHECK AND SAVE XMTR READY
1200 004316 100001 BPL .+4 ;BRANCH IF OK
1201 004320 104001 HLT+1 ;XMTR READY FAILED TO CLEAR WHEN
1202 ; XMTR CONTROL FOR LINE 0 WAS CLEARED
1203
1204 004322 104400 SCOPE
1205
1206
1207
1208
1209
1210
1211
1212
1213

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;*****
;TEST 20: TEST THAT TRANSMIT READY (BIT15 OF CSR) SETS AND CLEARS
; WHEN EACH TCR BIT IS SET AND CLEARED.
; ALSO CHECK THAT THE RIGHT LINE NO. APPEARS IN TBUF.
;PROBABLE FAULTY LOGIC: M7285 (D2-5) ALL, (D2-6) E23, E32, E33, E49, (D2-2) E3, E1
;*****

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1214 004324 012777 000400 174766 TST20: MOV #400, @CSR ;SET XMTR SCAN ENABLE
1215 004332 005001 CLR R1
1216 004334 012704 000001 MOV #1, R4 ;SET UP MARKER
1217 004340 050477 174760 4$: BIS R4, @TCR ;SET XMTR CONTROL BIT, EACH LINE
1218 004344 005000 CLR R0 ;SET UP WAIT COUNTER
1219 004346 017702 174746 1$: MOV @CSR, R2 ;CHECK AND SAVE XMTR READY
1220 004352 100404 BMI 2$ ;BRANCH IF SET OK
1221 004354 005300 DEC R0 ;WAIT A WHILE
1222 004356 001373 BNE 1$
1223 004360 104002 HLT+2 ;XMTR READY FAILED TO SET
1224 ;R1=LINE #
1225 ;R2=CSR
1226

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1227 004362 000414 BR 3$ ;SKIP LINE # CHECK ON ERROR
1228
1229 004364 050037 001346 2$: BIS R0, TIMER ;SET UP TIMER
1230 004370 017702 174732 MOV @TBUF, R2 ;SAVE LINE NUMBER
1231 004374 000302 SWAB R2
1232 004376 020201 CMP R2, R1 ;CHECK THAT THE XMTR STOPPED ON RIGHT LINE
1233 004400 001401 BEQ .+4 ;BRANCH IF OK
1234 004402 104002 HLT+2 ;WRONG LINE NUMBER APPEARED IN TBUF
1235 ;R1=LINE # (SHOULD BE)
1236 ;R2=LINE # (TBUF)
1237
1238
1239 004404 017703 174710 MOV @CSR, R3 ;CHECK AND SAVE XMTR READY
1240 004410 100401 BMI .+4 ;BRANCH IF OK
1241 004412 104003 HLT+3 ;READING THE TBUF CLEARED XMTR READY
1242
1243 004414 040477 174704 3$: BIC R4, @TCR ;CLR XMTR CONTROL BIT, EACH LINE
1244 004420 017702 174674 MOV @CSR, R2 ;CHECK AND SAVE XMTR READY
1245 004424 100001 BPL .+4 ;BRANCH IF OK
1246 004426 104002 HLT+2 ;XMTR READY FAILED TO CLEAR WHEN
1247 ; XMTR CONTROL FOR LINE .LINE WAS CLEARED
1248 ;R1 = LINE #
1249 ;R2 = CONTENTS OF CSR
1250
1251 004430 005201 INC R1 ;INC LINE COUNTER TO NEXT LINE
1252 004432 006304 ASL R4 ;SHIFT MARKER TO NEXT LINE
1253 004434 103341 BCC 4$ ;BRANCH IF NOT LAST LINE
1254
1255 004436 104400 SCOPE
1256
1257
1258
1259 *****
1260 :TEST 21: TEST THAT MASTER TRANSMIT SCAN ENABLE (CSR BIT 8) ON A 0
1261 : DISABLES TRANSMITTER READY (CSR BIT 15)
1262 : WHEN TCR BIT, LINE 0 IS SET.
1263 :PROBABLE FAULTY LOGIC: M7285 (D2-6) E49,E23,E32,E33
1264 :*****
1265
1265 004440 005077 174654 TST21: CLR @CSR ;CLEAR CONTROL STATUS
1266 004444 052777 000001 174652 BIS #BIT0,@TCR ;SET XMTR CONTROL BIT, LINE 0
1267 004452 013700 001346 MOV TIMER,R0 ;GET TIMER FROM PREVIOUS TEST
1268 004456 017701 174636 1$: MOV @CSR,R1 ;CHECK AND SAVE XMTR READY
1269 004462 100002 BPL 2$ ;BRANCH IF NOT SET
1270 004464 104001 HLT+1 ;XMTR READY SET WITHOUT
1271 004466 000402 BR 3$ ;MASTER TRAN SCAN ENABLE
1272 004470 005300 2$: DEC R0 ;WAIT A WHILE
1273 004472 001371 BNE 1$ ;AND CHECK AGAIN
1274
1275 004474 052777 000400 174616 3$: BIS #400,@CSR ;SET MASTER TRAN SCAN ENABLE
1276 004502 005000 CLR R0
1277 004504 017701 174610 4$: MOV @CSR, R1 ;CHECK AND SAVE XMTR READY
1278 004510 100403 BMI 5$
1279 004512 005200 INC R0
1280 004514 001373 BNE 4$
1281 004516 104001 HLT+1 ;TRAN READY NEVER CAME UP
1282 ;TCR BIT WAS SET FIRST

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1283
1284 004520 042777 000001 174576 5$: BIC #BIT0, @TCR ; THEN MASTER TRAN SCAN ENABLE
1285 004526 017701 174566 MOV @CSR, R1 ; CLEAR IT OUT
1286 004532 100001 BPL .+4 ; CHECK AND SAVE TRAN READY
1287 004534 104001 HLT+1 ; BRANCH IF OK
1288 ; TRAN READY DIDN'T CLEAR.
1289 004536 104400 SCOPE
1290
1291
1292 ;*****
1293 ;TEST 22: TEST TRANSMIT INTERRUPT LEVEL
1294
1295 ; THIS TESTS ALL INTERRUPT LEVELS. THIS TEST WILL
1296 ; TEST ALL DEVICES WHICH ARE SPECIFIED DURING QUESTIONING.
1297
1298 ; ERROR PRINT OUT IS AS FOLLOWS:::
1299 ; ADDR DJADR RO R1
1300 ;
1301 ; ADDR= ADDRESS OF ERROR HLT
1302 ; DJADR= CSR ADDRESS OF DJ11 UNDER TEST
1303 ; R1= BR LEVEL FOR DJ11 TO ALLOW INTR
1304 ; R2= BR LEVEL WHERE ERROR OCCURED
1305
1306 ;PROBABLE FAULTY LOGIC: M7821 WIRING, PROPER PRIORITY CHIP
1307 ;*****
1308
1309 004540 012777 004656 174566 TST22: MOV #INTR1,@XMTVEC ; SET UP XMTR INTERRUPT VECTOR
1310 004546 012777 000340 174562 MOV #340,@XMTLVL ; AT LEVEL 7
1311 004554 012737 000010 017214 MOV #10,PRIOLO ; LOAD BR7+1 INTO BR TEST LEVEL
1312 004562 012737 000005 017226 AGAIN1: MOV #5,CT ; LOADS COUNTER 5 ROL -BR PRIOT
1313 004570 005337 017214 DEC PRIOLO ; START TEST BR7, THEN BR6,BR5...ETC.
1314 004574 013737 017214 017216 MOV PRIOLO,NOW ; LOAD PRE-ROL-ED DECIMAL PRIO
1315 004602 004737 014464 JSR PC, BRSET ; GO TO SUBROUTINE TO :::::
1316 ; LOAD BR INTR LEVEL OF DJ11
1317 ; (LEVEL)= DECIMAL #(0 TO 7)
1318 ; (MASK)= OCTAL #(0 TO 340)
1319 ; (0,40,100,140,200,240,300,340)
1320 ; (NOW)= OCTAL #(0 TO 340) AS
1321 ; MASK, BUT CURRENTLY TESTING
1322 004606 042737 000340 177776 BIC #340,@PS ; CLEAR PS LEVEL
1323 004614 053737 017216 177776 BIS NOW,@PS ; SET PS TO CURRENT TEST LEVEL
1324 004622 012777 040400 174470 MOV #040400,@CSR ; SET TRAN MASTER INT. ENABLE
1325 004630 012777 000001 174466 MOV #BIT0, @TCR ; SET TRAN CONTROL BIT. LINE C
1326 004636 017701 174456 WAIT1: MOV @CSR, R1 ; WAIT
1327 004642 100375 BPL WAIT1
1328
1329 004644 NINTR1: ;
1330 ; IF YOU ARE HERE NO INTR OCCURED
1331 ;
1332 004644 023737 017216 017220 CMP NOW,MASK ; IS THIS AN ERROR?????
1333 004652 002407 BLT ERROR1 ; BRANCH IF YES
1334 004654 000417 BR THRU1 ; IF NO,GO ON TO NEXT BR
1335
1336 004656 INTR1: ;
1337 ; IF YOU ARE HERE AN INTR OCCURED
1338

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1339 004656 022626          CMP      (SP)+,(SP)+      ; CLEAN UP THE STACK
1340 004660 023737 017216 017220  CMP      NOW,MASK      ; IS THIS AN ERROR?????
1341 004666 002001          BGE      ERROR1      ; BRANCH IF ERROR
1342 004670 000411          BR       THRU1      ; IF NO,SEE IF ALL BR LEVELS TESTED
1343
1344 004672          ERROR1: ; IF YOU ARE HERE , THEN SOMETHING IS WRONG
1345                      ; ERROR.....!
1346
1347 004672 010146          MOV      R1,-(6)      ;PUSH R1 ON STACK
1348 004674 010246          MOV      R2,-(6)      ;PUSH R2 ON STACK
1349
1350 004676 013701 017220    MOV      MASK,      R1      ; R1=BR LEVEL ALLOWED
1351                      ; (BR BITS OF PSW)
1352 004702 013702 017216    MOV      NOW,      R2      ; R2=BR LEVEL OF ERROR
1353                      ; (BR BITS OF PSW)
1354
1355 004706 104002          HLT+2      ; REPORT ERROR+ REG. 1,2
1356
1357 004710 012602          MOV      (6)+,R2      ;POP STACK INTO R2
1358 004712 012601          MOV      (6)+,R1      ;POP STACK INTO R1
1359
1360 004714          THRU1:
1361 004714 005077 174404    CLR      @TCR
1362 004720 005077 174374    CLR      @CSR
1363 004724 005737 017216    TST      NOW
1364 004730 001314          BNE      AGAIN1      ; TEST IF LAST BR WAS CHECKED
1365                      ; BACK TO TEST NEXT INTR LOWER
1366                      ; (NOW) = 0
1367 004732 013777 001336 174374  END22: MOV      XMTLVL,@XMTVEC ; RELOAD AND CLEAN UP
1368 004740 012777 000004 174370    MOV      #IOT, @XMTLVL
1369 004746 042737 000340 177776    BIC      #340,@#PS
1370
1371 004754 104400          SCOPE
1372
1373 004756 005037 001346    CLR      TIMER      ;INITIALIZE TIMER
1374 004762 012737 004770 015250    MOV      #.+6, LAD      ;RESET LOOP ADDRESS
1375
1376          ;*****
1377          ;TEST 23:      TEST THAT LINE 0 CAN TRANSMIT AND
1378          ;              RECEIVE A CHARACTER. (377)
1379          ; 1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1380          ; 3$: CHECKS THAT NO ERRORS IN FI/FO
1381          ; 4$: CHECKS THAT RIGHT LINE # (0) IN FI/FO
1382          ; 5$: CHECKS FOR RIGHT CHARACTER LENGTH
1383          ; 6$: CHECKS THAT CORRECT DATA WAS RECEIVED
1384          ; 7$: CHECKS THAT CHARACTER PRESENT CLEARS
1385          ; 8$: CHECKS THAT DONE CLEARS
1386          ;PROBABLY FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD 003 SERIES
1387          ;*****
1388
1389          ;              INITIALIZE
1390          ;              DEVICE'CSR'REGISTER
1391
1392 004770 004737 014600    TST23: JSR      PC,      @#INITD  SET:
1393                      ;BIT2 = MAINTENANCE
1394                      ;BIT3 = CLEAR MOS
1395                      ;BIT8 = MASTER XMTR SCAN ENH

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[illegible]

1451	005146	005077	174152	CLR	@TCR	:CLEAR TCR
1452	005152	005077	174142	CLR	@CSR	:CLEAR CSR
1453	005156	104400		SCOPE		
1454						
1455						
1456				*****		
1457				TEST 24: TEST THAT LINE 1 CAN TRANSMIT AND		
1458				RECEIVE A CHARACTER. (377)		
1459				1\$:	CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.	
1460				3\$:	CHECKS THAT NO ERRORS IN FI/FO	
1461				4\$:	CHECKS THAT RIGHT LINE # (1) IN FI/FO	
1462				5\$:	CHECKS FOR RIGHT CHARACTER LENGTH	
1463				6\$:	CHECKS THAT CORRECT DATA WAS RECEIVED	
1464				7\$:	CHECKS THAT CHARACTER PRESENT CLEARS	
1465				8\$:	CHECKS THAT DONE CLEARS	
1466				PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES		
1467				*****		
1468				INITIALIZE		
1469				DEVICE 'CSR' REGISTER		
1470						
1471	005160	004737	014600	TST24:	JSR PC, @#INITD	SET:
1472						:BIT2 = MAINTENANCE
1473						:BIT3 = CLEAR MOS
1474						:BIT8 = MASTER XMTR SCAN ENB
1475				WAIT FOR MOS TO CLEAR		
1476						SET:
1477						:BIT0 = RECEIVER ENABLE
1478	005164	052777	000002 174132	LOP24:	BIS #BIT1, @TCR	:SET XMTR CONTROL BIT, LINE 1
1479	005172	017701	174122		MOV @CSR, R1	:WAIT FOR XMTR READY
1480	005176	100375			BPL LOP24	
1481	005200	012777	000377 174120		MOV #377, @RBUF	:SEND A RUBOUT
1482	005206	005000			CLR R0	:CLEAR COUNTER
1483	005210	105305		1\$:	DECB R5	:SHORT WAIT LOOP
1484	005212	001376			BNE 1\$	
1485	005214	017701	174102		MOV @RBUF, R1	:WAIT FOR CHAR. PRES.
1486	005220	100405			BMI 3\$	:BRANCH WHEN FOUND
1487	005222	005200			INC R0	:TIME COUNTER
1488	005224	001371			BNE 1\$	:BRANCH IF NOT TIME-OUT
1489	005226	017702	174066		MOV @CSR, R2	:SAVE CSR
1490	005232	104002			HLT+2	:CHARACTER READY DIDN'T SET
1491						:R1 = CONTENTS OF RBUF
1492						:R2 = CONTENTS OF CSR
1493	005234	050037	001346	3\$:	BIS R0, TIMER	:SAVE THE TIMER
1494	005240	032701	070000		BIT #70000, R1	:CHECK FOR ERROR BITS
1495	005244	001401			BEQ .+4	:BRANCH IF NONE
1496	005246	104001			HLT+1	:ERROR IN RECEIVED CHAR
1497						:R1 = CONTENTS OF RBUF
1498						:BIT14=UART OVERRUN
1499						:BIT13=FRAMING ERROR
1500						:BIT12=PARITY ERROR
1501	005250	010102		4\$:	MOV R1, R2	:DUPLICATE DATA WORD
1502	005252	042702	170377		BIC #170377, R2	:MASK LINE#
1503	005256	000302			SWAB R2	:LINE # IN LOW BYTE
1504	005260	122702	000001		CMPB #1, R2	:CHECK LINE #
1505	005264	001401			BEQ .+4	:BRANCH IF OK
1506	005266	104001			HLT+1	:WRONG LINE # RECEIVED

```

;R1 = CONTENTS OF RBUF
;BITS8-11 - LINE #
;GET MASK OF CHARACTER
;CHECK CHAR LENGTH.
;BRANCH IF OK
;WRONG CHARACTER LENGTH
;R1=DATA FROM FI/FO
;R2=MASK (BITS SET NOT EXPECTED)
;REVERSE THE MASK
;CHECK THE ACTURAL DATA
;BRANCH IF OK
;WRONG CHAR LEN OR DATA ERROR
;R1=DATA FROM FI/FO (COMPLETE WORD)
;R2=DATA (LOW BYTE) EXPECTED
;READ FI/FO
;BRANCH IF CHAR PRESENT NOT SET
;CHARACTER PRESENT STAYED SET
;R1 = CONTENTS OF RBUF
;SAVE THE CSR
;CHECK THE CSR
;BRANCH IF OK
;DONE DIDN'T CLEAR OR OTHER CSR ERROR
;R1 = CONTENTS OF CSR
;CLEAR TCR
;CLEAR CSR

```

```

:                               INITIALIZE
:                               DEVICE 'CSR' REGISTER

```

```

SET:
;BIT2 = MAINTENANCE
;BIT3 = CLEAR MOS
;BIT8 = MASTER XMTR SCAN ENB

SET:
;BIT0 = RECEIVER ENABLE

;SET XMTR CONTROL BIT. LINE
;WAIT FOR XMTR READY

;SEND A RUBOUT
;CLEAR COUNTER
;SHORT WAIT LOOP

```

1563	005402	001376		BNE	1\$			
1564	005404	017701	173712	MOV	@RBUF, R1			:WAIT FOR CHAR. PRES.
1565	005410	100405		BMI	3\$			:BRANCH WHEN FOUND
1566	005412	005200		INC	R0			:TIME COUNTER
1567	005414	001371		BNE	1\$			:BRANCH IF NOT TIME-OUT
1568	005416	017702	173676	MOV	@CSR, R2			:SAVE CSR
1569	005422	104002		HLT+2				:CHARACTER READY DIDN'T SET
1570								:R1 = CONTENTS OF RBUF
1571								:R2 = CONTENTS OF CSR
1572	005424	050037	001346	3\$: BIS	R0, TIMER			:SAVE THE TIMER
1573	005430	032701	0700C0	BIT	#70000, R1			:CHECK FOR ERROR BITS
1574	005434	001401		BEQ	+.4			:BRANCH IF NONE
1575	005436	104001		HLT+1				:ERROR IN RECEIVED CHAR
1576								:R1 = CONTENTS OF RBUF
1577								:BIT14=UART OVERRUN
1578								:BIT13=FRAMING ERROR
1579								:BIT12=PARITY ERROR
1580	005440	010102		4\$: MOV	R1, R2			:DUPLICATE DATA WORD
1581	005442	042702	170377	BIC	#170377, R2			:MASK LINE#
1582	005446	000302		SWAB	R2			:LINE # IN LOW BYTE
1583	005450	122702	000002	CMPB	#2., R2			:CHECK LINE #
1584	005454	001401		BEQ	+.4			:BRANCH IF OK
1585	005456	104001		HLT+1				:WRONG LINE # RECEIVED
1586								:R1 = CONTENTS OF RBUF
1587								:BITS8-11 = LINE #
1588	005460	117702	173700	5\$: MOV	@JLEN, R2			:GET MASK OF CHARACTER
1589	005464	130201		BITB	R2, R1			:CHECK CHAR LENGTH.
1590	005466	001401		BEQ	+.4			:BRANCH IF OK
1591	005470	104002		HLT+2				:WRONG CHARACTER LENGTH
1592								:R1=DATA FROM FI/FO
1593								:R2=MASK (BITS SET NOT EXPECTED)
1594	005472	105102		6\$: COMB	R2			:REVERSE THE MASK
1595	005474	120102		CMPB	R1, R2			:CHECK THE ACTUAL DATA
1596	005476	001401		BEQ	+.4			:BRANCH IF OK
1597	005500	104002		HLT+2				:WRONG CHAR LEN OR DATA ERROR
1598								:R1=DATA FROM FI/FO (COMPLETE WORD)
1599								:R2=DATA (LOW BYTE) EXPECTED
1600	005502	017701	173614	7\$: MOV	@RBUF, R1			:READ FI/FO
1601	005506	100001		BPL	+.4			:BRANCH IF CHAR PRESENT NOT SET
1602	005510	104001		HLT+1				:CHARACTER PRESENT STAYED SET
1603								:R1 = CONTENTS OF RBUF
1604	005512	017701	173602	8\$: MOV	@CSR, R1			:SAVE THE CSR
1605	005516	022701	100405	CMP	#100405, R1			:CHECK THE CSR
1606	005522	001401		BEQ	+.4			:BRANCH IF OK
1607	005524	104001		HLT+1				:DONE DIDN'T CLEAR OR OTHER CSR ERROR
1608								:R1 = CONTENTS OF CSR
1609	005526	005077	173572	CLR	@TCR			:CLEAR TCR
1610	005532	005077	173562	CLR	@CSR			:CLEAR CSR
1611	005536	104400		SCOPE				

1612
 1613
 1614
 1615
 1616
 1617
 1618

 :TEST 26: TEST THAT LINE 3 CAN TRANSMIT AND
 : RECEIVE A CHARACTER. (377)
 :
 : 1\$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
 : 3\$: CHECKS THAT NO ERRORS IN FI/FO
 : 4\$: CHECKS THAT RIGHT LINE # (3) IN FI/FO

```

1619      5$: CHECKS FOR RIGHT CHARACTER LENGTH
1620      6$: CHECKS THAT CORRECT DATA WAS RECEIVED
1621      7$: CHECKS THAT CHARACTER PRESENT CLEARS
1622      8$: CHECKS THAT DONE CLEARS
1623      :PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
1624      :*****
1625
1626      :
1627      :      INITIALIZE
1628      :      DEVICE 'CSR' REGISTER
1629      005540 004737 014600 TST26: JSR PC, @#INIT'D SET:
1630      :BIT2 = MAINTENANCE
1631      :BIT3 = CLEAR MOS
1632      :BIT8 = MASTER XMTR SCAN ENB
1633      :WAIT FOR MOS TO CLEAR
1634      :
1635      :
1636      005544 052777 000010 173552 LOP26: BIS #BIT3, @TCR ;SET XMTR CONTROL BIT, LINE 3
1637      005552 017701 173542 MOV @CSR, R1 ;WAIT FOR XMTR READY
1638      005556 100375 BPL LOP26
1639      005560 012777 000377 173540 MOV #377, @TBUF ;SEND A RUBOUT
1640      005566 005000 CLR R0 ;CLEAR COUNTER
1641      005570 105305 1$: DEC R5 ;SHORT WAIT LOOP
1642      005572 001376 BNE 1$
1643      005574 017701 173522 MOV @RBUF, R1 ;WAIT FOR CHAR. PRES.
1644      005600 100405 BMI 3$ ;BRANCH WHEN FOUND
1645      005602 005200 INC R0 ;TIME COUNTER
1646      005604 001371 BNE 1$ ;BRANCH IF NOT TIME-OUT
1647      005606 017702 173506 MOV @CSR, R2 ;SAVE CSR
1648      005612 104002 HLT+2 ;CHARACTER READY DIDN'T SET
1649      :R1 = CONTENTS OF RBUF
1650      :R2 = CONTENTS OF CSR
1651      005614 050037 001346 3$: BIS R0, TIMER ;SAVE THE TIMER
1652      005620 032701 070000 BIT #70000, R1 ;CHECK FOR ERROR BITS
1653      005624 001401 BEQ .+4 ;BRANCH IF NONE
1654      005626 104001 HLT+1 ;ERROR IN RECEIVED CHAR
1655      :R1 = CONTENTS OF RBUF
1656      :BIT14=UART OVERRUN
1657      :BIT13=FRAMING ERROR
1658      :BIT12=PARITY ERROR
1659      005630 010102 4$: MOV R1, R2 ;DUPLICATE DATA WORD
1660      005632 042702 170377 BIC #170377, R2 ;MASK LINE#
1661      005636 000302 SWAB R2 ;LINE # IN LOW BYTE
1662      005640 122702 000003 CMPB #3, R2 ;CHECK LINE #
1663      005644 001401 BEQ .+4 ;BRANCH IF OK
1664      005646 104001 HLT+1 ;WRONG LINE # RECEIVED
1665      :R1 = CONTENTS OF RBUF
1666      :BITS8-11 = LINE #
1667      005650 117702 173510 5$: MOVB @DJLEN, R2 ;GET MASK OF CHARACTER
1668      005654 130201 BITB R2, R1 ;CHECK CHAR LENGTH.
1669      005656 001401 BEQ .+4 ;BRANCH IF OK
1670      005660 104002 HLT+2 ;WRONG CHARACTER LENGTH
1671      :R1=DATA FROM FI/FO
1672      :R2=MASK (BITS SET NOT EXPECTED)
1673      005662 105102 6$: COMB R2, R2 ;REVERSE THE MASK
1674      005664 120102 CMPB R1, R2 ;CHECK THE ACTUAL DATA
  
```

1675	005666	001401			BEQ	.+4		;BRANCH IF OK
1676	005670	104002			HLT+2			;WRONG CHAR LEN OR DATA ERROR
1677								;R1=DATA FROM FI/FO (COMPLETE WORD)
1678								;R2=DATA (LOW BYTE) EXPECTED
1679	005672	017701	173424	7\$:	MOV	@RBUF,	R1	;READ FI/FO
1680	005676	100001			BPL	.+4		;BRANCH IF CHAR PRESENT NOT SET
1681	005700	104001			HLT+1			;CHARACTER PRESENT STAYED SET
1682								;R1 = CONTENTS OF RBUF
1683	005702	017701	173412	8\$:	MOV	@CSR,	R1	;SAVE THE CSR
1684	005706	022701	100405		CMP	#100405,	R1	;CHECK THE CSR
1685	005712	001401			BEQ	.+4		;BRANCH IF OK
1686	005714	104001			HLT+1			;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1687								;R1 = CONTENTS OF CSR
1688	005716	005077	173402		CLR	@TCR		;CLEAR TCR
1689	005722	005077	173372		CLR	@CSR		;CLEAR CSR
1690	005726	104400			SCOPE			
1691	005730	005237	001364		INC	DJLEN		
1692	005734	012737	005742	015250	MOV	#+6,	LAD	
1693								
1694								
1695								
1696								
1697								
1698								
1699								
1700								
1701								
1702								
1703								
1704								
1705								
1706								
1707								
1708								
1709								
1710	005742	004737	014600	TST27:	JSR	PC,	@#INITD	SET:
1711								;BIT2 = MAINTENANCE
1712								;BIT3 = CLEAR MOS
1713								;BIT8 = MASTER XMTR SCAN ENB
1714								
1715								
1716								
1717	005746	052777	000020	173350				
1718	005754	017701	173340					
1719	005760	100375						
1720	005762	012777	000377	173336				
1721	005770	005000						
1722	005772	105305						
1723	005774	001376						
1724	005776	017701	173320					
1725	006002	100405						
1726	006004	005200						
1727	006006	001371						
1728	006010	017702	173304					
1729	006014	104002						
1730								

```

*****
:TEST 30:      TEST THAT LINE 5 CAN TRANSMIT AND
:              RECEIVE A CHARACTER. (377)
:
: 1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
: 3$: CHECKS THAT NO ERRORS IN FI/FO
: 4$: CHECKS THAT RIGHT LINE # (5) IN FI/FO
: 5$: CHECKS FOR RIGHT CHARACTER LENGTH
: 6$: CHECKS THAT CORRECT DATA WAS RECEIVED
: 7$: CHECKS THAT CHARACTER PRESENT CLEARS
: 8$: CHECKS THAT DONE CLEARS
:
:PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
:*****
:
:      INITIALIZE

```

```

1787      :      DEVICE 'CSR' REGISTER
1788      :
1789      :      TST30: JSR      PC,      @#INITD
1790      :
1791      :
1792      :      ;WAIT FOR MOS TO CLEAR
1793      :
1794      :
1795      :
1796      :      SET:
1797      :      ;BIT2 = MAINTENANCE
1798      :      ;BIT3 = CLEAR MOS
1799      :      ;BIT8 = MASTER XMTR SCAN ENB
1800      :
1801      :      SET:
1802      :      ;BIT0 = RECEIVER ENABLE
1803      :
1804      :      ;SET XMTR CONTROL BIT, LINE 5
1805      :      ;WAIT FOR XMTR READY
1806      :
1807      :      LOP30: BIS      #BIT5,  @TCR
1808      :      MOV      @CSR,   R1
1809      :      BPL      LOP30
1810      :      MOV      #377,  @TBUF
1811      :      ;SEND A RUBOUT
1812      :      ;CLEAR COUNTER
1813      :      ;SHORT WAIT LOOP
1814      :
1815      :      1$: DEC      R5
1816      :      BNE      1$
1817      :      MOV      @RBUF, R1
1818      :      ;WAIT FOR CHAR. PRES.
1819      :      ;BRANCH WHEN FOUND
1820      :      ;TIME COUNTER
1821      :      ;BRANCH IF NOT TIME-OUT
1822      :      ;SAVE CSR
1823      :      ;CHARACTER READY DIDN'T SET
1824      :      ;R1 = CONTENTS OF RBUF
1825      :      ;R2 = CONTENTS OF CSR
1826      :      ;SAVE THE TIMER
1827      :      ;CHECK FOR ERROR BITS
1828      :      ;BRANCH IF NONE
1829      :      ;ERROR IN RECEIVED CHAR
1830      :      ;R1 = CONTENTS OF RBUF
1831      :      ;BIT14=UART OVERRUN
1832      :      ;BIT13=FRAMING ERROR
1833      :      ;BIT12=PARITY ERROR
1834      :      ;DUPLICATE DATA WORD
1835      :      ;MASK LINE#
1836      :      ;LINE # IN LOW BYTE
1837      :      ;CHECK LINE #
1838      :      ;BRANCH IF OK
1839      :      ;WRONG LINE # RECEIVED
1840      :      ;R1 = CONTENTS OF RBUF
1841      :      ;BITS8-11 = LINE #
1842      :      ;GET MASK OF CHARACTER
1843      :      ;CHECK CHAR LENGTH.
1844      :      ;BRANCH IF OK
1845      :      ;WRONG CHARACTER LENGTH
1846      :      ;R1=DATA FROM FI/FO
1847      :      ;R2=MASK (BITS SET NOT EXPECTED)
1848      :      ;REVERSE THE MASK
1849      :      ;CHECK THE ACTUAL DATA
1850      :      ;BRANCH IF OK
1851      :      ;WRONG CHAR LEN OR DATA ERROR
1852      :      ;R1=DATA FROM FI/FO (COMPLETE WORD)
1853      :      ;R2=DATA (LOW BYTE) EXPECTED
1854      :      ;READ FI/FO
1855      :      ;BRANCH IF CHAR PRESENT NOT SET
1856      :      ;CHARACTER PRESENT STAYED SET
1857      :      ;R1 = CONTENTS OF RBUF

```

1843 006274 017701 173020
 1844 006300 022701 100405
 1845 006304 001401
 1846 006306 104001
 1847
 1848 006310 005077 173010
 1849 006314 005077 173000
 1850 006320 104400
 1851
 1852
 1853
 1854
 1855
 1856
 1857
 1858
 1859
 1860
 1861
 1862
 1863
 1864
 1865
 1866
 1867
 1868 006322 004737 014600
 1869
 1870
 1871
 1872
 1873
 1874
 1875 006326 052777 000100 172770
 1876 006334 017701 172760
 1877 006340 100375
 1878 006342 012777 000377 172756
 1879 006350 005000
 1880 006352 105305
 1881 006354 001376
 1882 006356 017701 172740
 1883 006362 100405
 1884 006364 005200
 1885 006366 001371
 1886 006370 017702 172724
 1887 006374 104002
 1888
 1889
 1890 006376 050037 001346
 1891 006402 032701 070000
 1892 006406 001401
 1893 006410 104001
 1894
 1895
 1896
 1897
 1898 006412 010102

```

8$:  MOV    @CSR, R1      ;SAVE THE CSR
      CMP    #100405,R1   ;CHECK THE CSR
      BEQ    .+4          ;BRANCH IF OK
      HLT+1              ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                          ;R1 = CONTENTS OF CSR
      CLR    @TCR         ;CLEAR TCR
      CLR    @CSR         ;CLEAR CSR
      SCOPE

*****
:TEST 31:  TEST THAT LINE 6 CAN TRANSMIT AND
           RECEIVE A CHARACTER. (377)
:          1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
:          3$: CHECKS THAT NO ERRORS IN FI/FO
:          4$: CHECKS THAT RIGHT LINE # (6) IN FI/FO
:          5$: CHECKS FOR RIGHT CHARACTER LENGTH
:          6$: CHECKS THAT CORRECT DATA WAS RECEIVED
:          7$: CHECKS THAT CHARACTER PRESENT CLEARS
:          8$: CHECKS THAT DONE CLEARS
:PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
*****

:          INITIALIZE
:          DEVICE'CSR'REGISTER
TST31: JSR    PC,    @WINITD SET:
                               ;BIT2 = MAINTENANCE
                               ;BIT3 = CLEAR MOS
                               ;BIT8 = MASTER XMTR SCAN ENB
:WAIT FOR MOS TO CLEAR
:
:          SET:
:          ;BIT0 = RECEIVER ENABLE

LOP31: BIS    #BIT6, @TCR   ;SET XMTR CONTROL BIT, LINE 6
      MOV    @CSR, R1      ;WAIT FOR XMTR READY
      BPL    LOP31
      MOV    #377, @TBUF   ;SEND A RUBOUT
      CLR    R0            ;CLEAR COUNTER
      1$: DEC  R5           ;SHORT WAIT LOOP
      BNE    1$
      MOV    @RBUF,R1      ;WAIT FOR CHAR. PRES.
      BMI    3$           ;BRANCH WHEN FOUND
      INC    R0            ;TIME COUNTER
      BNE    1$           ;BRANCH IF NOT TIME-OUT
      MOV    @CSR, R2      ;SAVE CSR
      HLT+2              ;CHARACTER READY DIDN'T SET
                          ;R1 = CONTENTS OF RBUF
                          ;R2 = CONTENTS OF CSR
                          ;SAVE THE TIMER
                          ;CHECK FOR ERROR BITS
                          ;BRANCH IF NONE
                          ;ERROR IN RECEIVED CHAR
                          ;R1 = CONTENTS OF RBUF
                          ;BIT14=UART OVERRUN
                          ;BIT13=FRAMING ERROR
                          ;BIT12=PARITY ERROR
                          ;DUPLICATE DATA WORD

3$:  BIS    R0,TIMER
      BIT    #70000, R1
      BFC    .+4
      HLT+1

4$:  MOV    R1,    R2

```

```

ZZ-CZDJA-F-0 DJ11 LOGIC TESTS MACY11 30A(1052) 26-FEB-79 15:47 E 4
CZDJA.F.P11 26-FEB-79 15:41 TST31: TEST ALL OF LINE 6 TRANSMIT AND RECEIVE LOGIC PAGE 44
SEQ 0043

1899 006414 042702 170377 BIC #170377,R2 ;MASK LINE#
1900 006420 000302 SWAB R2 ;LINE # IN LOW BYTE
1901 006422 122702 000006 CMPB #6,, R2 ;CHECK LINE #
1902 006426 001401 BEQ .+4 ;BRANCH IF OK
1903 006430 104001 HLT+1 ;WRONG LINE # RECEIVED
1904 ;R1 = CONTENTS OF RBUF
1905 ;BITS8-11 = LINE #
1906 006432 117702 172726 5$: MOV B @DJLEN, R2 ;GET MASK OF CHARACTER
1907 006436 130201 BITB R2, R1 ;CHECK CHAR LENGTH.
1908 006440 001401 BEQ .+4 ;BRANCH IF OK
1909 006442 104002 HLT+2 ;WRONG CHARACTER LENGTH
1910 ;R1=DATA FROM FI/FO
1911 ;R2=MASK (BITS SET NOT EXPECTED)
1912 006444 105102 6$: COMB R2 ;REVERSE THE MASK
1913 006446 120102 CMPB R1, R2 ;CHECK THE ACTUAL DATA
1914 006450 001401 BEQ .+4 ;BRANCH IF OK
1915 006452 104002 HLT+2 ;WRONG CHAR LEN OR DATA ERROR
1916 ;R1=DATA FROM FI/FO (COMPLETE WORD)
1917 ;R2=DATA (LOW BYTE) EXPECTED
1918 006454 017701 172642 7$: MOV @RBUF, R1 ;READ FI/FO
1919 006460 100001 BPL .+4 ;BRANCH IF CHAR PRESENT NOT SET
1920 006462 104001 HLT+1 ;CHARACTER PRESENT STAYED SET
1921 ;R1 = CONTENTS OF RBUF
1922 006464 017701 172630 8$: MOV @CSR, R1 ;SAVE THE CSR
1923 006470 022701 100405 CMP #100405,R1 ;CHECK THE CSR
1924 006474 001401 BEQ .+4 ;BRANCH IF OK
1925 006476 104001 HLT+1 ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1926 ;R1 = CONTENTS OF CSR
1927 006500 005077 172620 CLR @TCR ;CLEAR TCR
1928 006504 005077 172610 CLR @CSR ;CLEAR CSR
1929 006510 104400 SCOPE
1930
1931 *****
1932 :TEST 32: TEST THAT LINE 7 CAN TRANSMIT AND
1933 : RECEIVE A CHARACTER. (377)
1934 :
1935 : 1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1936 : 3$: CHECKS THAT NO ERRORS IN FI/FO
1937 : 4$: CHECKS THAT RIGHT LINE # (7) IN FI/FO
1938 : 5$: CHECKS FOR RIGHT CHARACTER LENGTH
1939 : 6$: CHECKS THAT CORRECT DATA WAS RECEIVED
1940 : 7$: CHECKS THAT CHARACTER PRESENT CLEARS
1941 : 8$: CHECKS THAT DONE CLEARS
1942 :PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL: M7279 ALL: UART CARD D03 SERIES
1943 :*****
1944 :
1945 : INITIALIZE
1946 : DEVICE'CSR'REGISTER
1947 006512 004737 014600 TST32: JSR PC, @#INITD SET:
1948 ;BIT2 = MAINTENANCE
1949 ;BIT3 = CLEAR MOS
1950 ;BIT8 = MASTER XMTR SCAN ENB
1951 :WAIT FOR MOS TO CLEAR
1952 :
1953 : SET:
1954 006516 052777 000200 172600 BIS #BIT7, @TCR ;SET XMTR CONTROL BIT, LINE 7

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1955	006524	017701	172570		LOP32:	MOV	@CSR,	R1		;WAIT FOR XMTR READY
1956	006530	100375				BPL	LOP32			
1957	006532	012777	000377	172566		MOV	#377,	@RBUF		;SEND A RUBOUT
1958	006540	005000				CLR	R0			;CLEAR COUNTER
1959	006542	105305			1\$:	DECB	R5			;SHORT WAIT LOOP
1960	006544	001376				BNE	1\$			
1961	006546	017701	172550			MOV	@RBUF,R1			;WAIT FOR CHAR. PRES.
1962	006552	100405				BMI	3\$			;BRANCH WHEN FOUND
1963	006554	005200				INC	R0			;TIME COUNTER
1964	006556	001371				BNE	1\$			;BRANCH IF NOT TIME-OUT
1965	006560	017702	172534			MOV	@CSR,	R2		;SAVE CSR
1966	006564	104002				HLT+2				;CHARACTER READY DIDN'T SET
1967										;R1 = CONTENTS OF RBUF
1968										;R2 = CONTENTS OF CSR
1969	006566	050037	001346		3\$:	BIS	R0,TIMER			;SAVE THE TIMER
1970	006572	032701	070000			BIT	#70000,R1			;CHECK FOR ERROR BITS
1971	006576	001401				BEQ	+.4			;BRANCH IF NONE
1972	006600	104001				HLT+1				;ERROR IN RECEIVED CHAR
1973										;R1 = CONTENTS OF RBUF
1974										;BIT14=UART OVERRUN
1975										;BIT13=FRAMING ERROR
1976										;BIT12=PARITY ERROR
1977	006602	010102			4\$:	MOV	R1,	R2		;DUPLICATE DATA WORD
1978	006604	042702	170377			BIC	#170377,R2			;MASK LINE#
1979	006610	000302				SWAB	R2			;LINE # IN LOW BYTE
1980	006612	122702	000007			CMPB	#7.,	R2		;CHECK LINE #
1981	006616	001401				BEQ	+.4			;BRANCH IF OK
1982	006620	104001				HLT+1				;WRONG LINE # RECEIVED
1983										;R1 = CONTENTS OF RBUF
1984										;BITS8-11 = LINE #
1985	006622	117702	172536		5\$:	MOV8	@DJLEN,	R2		;GET MASK OF CHARACTER
1986	006626	130201				BIT8	R2,	R1		;CHECK CHAR LENGTH.
1987	006630	001401				BEQ	+.4			;BRANCH IF OK
1988	006632	104002				HLT+2				;WRONG CHARACTER LENGTH
1989										;R1=DATA FROM FI/FO
1990										;R2=MASK (BITS SET NOT EXPECTED)
1991	006634	105102			6\$:	COMB	R2			;REVERSE THE MASK
1992	006636	120102				CMPB	R1,	R2		;CHECK THE ACTUAL DATA
1993	006640	001401				BEQ	+.4			;BRANCH IF OK
1994	006642	104002				HLT+2				;WRONG CHAR LEN OR DATA ERROR
1995										;R1=DATA FROM FI/FO (COMPLETE WORD)
1996										;R2=DATA (LOW BYTE) EXPECTED
1997	006644	017701	172452		7\$:	MOV	@RBUF,	R1		;READ FI/FO
1998	006650	100001				BPL	+.4			;BRANCH IF CHAR PRESENT NOT SET
1999	006652	104001				HLT+1				;CHARACTER PRESENT STAYED SET
2000										;R1 = CONTENTS OF RBUF
2001	006654	017701	172440		8\$:	MOV	@CSR,	R1		;SAVE THE CSR
2002	006660	022701	100405			CMP	#100405,R1			;CHECK THE CSR
2003	006664	001401				BEQ	+.4			;BRANCH IF OK
2004	006666	104001				HLT+1				;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2005										;R1 = CONTENTS OF CSR
2006	006670	005077	172430			CLR	@TCR			;CLEAR TCR
2007	006672	005077	172427			CLR	@CSR			;CLEAR CSR
2008	006674	104400				SCOPE				
2009	006702	005237	001364			INC	DJLEN			
2010	006706	012737	006714	C15250		MOV	#. +6,	LAD		

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				*****		TEST 33: TEST THAT LINE 8 CAN TRANSMIT AND			
						RECEIVE A CHARACTER. (377)			
				1\$:		CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.			
				3\$:		CHECKS THAT NO ERRORS IN FI/FO			
				4\$:		CHECKS THAT RIGHT LINE # (8) IN FI/FO			
				5\$:		CHECKS FOR RIGHT CHARACTER LENGTH			
				6\$:		CHECKS THAT CORRECT DATA WAS RECEIVED			
				7\$:		CHECKS THAT CHARACTER PRESENT CLEARS			
				8\$:		CHECKS THAT DONE CLEARS			
				PROBABLE FAULTY LOGIC:		M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES			

				INITIALIZE					
				DEVICE 'CSR' REGISTER					
006714	004737	014600		TST33:	JSR	PC,	@#INITD	SET:	
								:BIT2 =	MAINTENANCE
								:BIT3 =	CLEAR MOS
								:BIT8 =	MASTER XMTR SCAN ENB
				;WAIT FOR MOS TO CLEAR				SET:	
								:BIT0 =	RECEIVER ENABLE
006720	052777	000400	172376	LOP33:	BIS	#BIT8,	@ICR	:SET XMTR CONTROL BIT, LINE 8	
006726	017701	172366			MOV	@CSR,	R1	:WAIT FOR XMTR READY	
006732	100375				BPL	LOP33			
006734	012777	000377	172364		MOV	#377,	@TBUF	:SEND A RUBOUT	
006742	005000				CLR	R0		:CLEAR COUNTER	
006744	105305			1\$:	DECB	R5		:SHORT WAIT LOOP	
006746	001376				BNE	1\$			
006750	017701	172346			MOV	@RBUF, R1		:WAIT FOR CHAR. PRES.	
006754	100405				BMI	3\$		:BRANCH WHEN FOUND	
006756	005200				INC	R0		:TIME COUNTER	
006760	001371				BNE	1\$		:BRANCH IF NOT TIME-OUT	
006762	017702	172332			MOV	@CSR,	R2	:SAVE CSR	
006766	104002				HLT+2			:CHARACTER READY DIDN'T SET	
								:R1 = CONTENTS OF RBUF	
								:R2 = CONTENTS OF CSR	
006770	050037	001346		3\$:	BIS	R0, TIMER		:SAVE THE TIMER	
006774	032701	070000			BIT	#70000, R1		:CHECK FOR ERROR BITS	
007000	001401				BEQ	+.4		:BRANCH IF NONE	
007002	104001				HLT+1			:ERROR IN RECEIVED CHAR	
								:R1 = CONTENTS OF RBUF	
								:BIT14=UART OVERRUN	
								:BIT13=FRAMING ERROR	
								:BIT12=PARITY ERROR	
007004	010102			4\$:	MOV	R1,	R2	:DUPLICATE DATA WORD	
007006	042702	170377			BIC	#170377, R2		:MASK LINE#	
007012	000302				SWAB	R2		:LINE # IN LOW BYTE	
007014	122702	000010			CMPB	#8,, R2		:CHECK LINE #	
007020	001401				BEQ	+.4		:BRANCH IF OK	
007022	104001				HLT+1			:WRONG LINE # RECEIVED	
								:R1 = CONTENTS OF RBUF	
								:BITS8-11 = LINE #	
007024	177702	172334		5\$:	MOVB	@DJLEN, R2		:GET MASK OF CHARACTER	

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TEST 34: TEST THAT LINE 9 CAN TRANSMIT AND
RECEIVE A CHARACTER. (377)

1\$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.

3\$: CHECKS THAT NO ERRORS IN FI/FO

4\$: CHECKS THAT RIGHT LINE # (9) IN FI/FO

5\$: CHECKS FOR RIGHT CHARACTER LENGTH

6\$: CHECKS THAT CORRECT DATA WAS RECEIVED

7\$: CHECKS THAT CHARACTER PRESENT CLEARS

8\$: CHECKS THAT DONE CLEARS

PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES

ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	ASSEMBLY CODE	COMMENT
2104					INITIALIZE	
2105					DEVICE 'CSR' REGISTER	
2106						
2107	007104	004737	014600		IST34: JSR PC, @INITD	SET: BIT2 = MAINTENANCE
2108						:BIT3 = CLEAR MOS
2109						:BIT8 = MASTER XMTR SCAN ENB
2110					:WAIT FOR MOS TO CLEAR	
2111						
2112						SET: BIT0 = RECEIVER ENABLE
2113						
2114	007110	052777	001000	172206	LOP34: BIS #BIT9, @TCR	:SET XMTR CONTROL BIT, LINE 9
2115	007116	017701	172176		MOV @CSR, R1	:WAIT FOR XMTR READY
2116	007122	100375			BPL LOP34	
2117	007124	012777	000377	172174	MOV #377, @TBUF	:SEND A RUBOUT
2118	007132	005000			CLR R0	:CLEAR COUNTER
2119	007134	105305			1\$: DECB R5	:SHORT WAIT LOOP
2120	007136	001376			BNE 1\$	
2121	007140	017701	172156		MOV @RBUF, R1	:WAIT FOR CHAR. PRES.
2122	007144	100405			BMI 3\$	:BRANCH WHEN FOUND

2123	007146	005200		INC	R0		:TIME COUNTER
2124	007150	001371		BNF	1\$		:BRANCH IF NOT TIME-OUT
2125	007152	017702	172142	MOV	@CSR, R2		:SAVE CSR
2126	007156	104002		HLT+2			:CHARACTER READY DIDN'T SET
2127							:R1 = CONTENTS OF RBUF
2128							:R2 = CONTENTS OF CSR
2129	007160	050037	001346	3\$: BIS	R0, TIMER		:SAVE THE TIMER
2130	007164	032701	070000	BIT	#70000, R1		:CHECK FOR ERROR BITS
2131	007170	001401		BEQ	+.4		:BRANCH IF NONE
2132	007172	104001		HLT+1			:ERROR IN RECEIVED CHAR
2133							:R1 = CONTENTS OF RBUF
2134							:BIT14=UART OVERRUN
2135							:BIT13=FRAMING ERROR
2136							:BIT12=PARITY ERROR
2137	007174	010102		4\$: MOV	R1, R2		:DUPLICATE DATA WORD
2138	007176	042702	170377	BIC	#170377, R2		:MASK LINE#
2139	007202	000302		SWAB	R2		:LINE # IN LOW BYTE
2140	007204	122702	000011	CMPB	#9, R2		:CHECK LINE #
2141	007210	001401		BEQ	+.4		:BRANCH IF OK
2142	007212	104001		HLT+1			:WRONG LINE # RECEIVED
2143							:R1 = CONTENTS OF RBUF
2144							:BITS8-11 = LINE #
2145	007214	117702	172144	5\$: MOV	@JLEN, R2		:GET MASK OF CHARACTER
2146	007220	130201		BITB	R2, R1		:CHECK CHAR LENGTH.
2147	007222	001401		BEQ	+.4		:BRANCH IF OK
2148	007224	104002		HLT+2			:WRONG CHARACTER LENGTH
2149							:R1=DATA FROM FI/FO
2150							:R2=MASK (BITS SET NOT EXPECTED)
2151	007226	105102		6\$: COMB	R2		:REVERSE THE MASK
2152	007230	120102		CMPB	R1, R2		:CHECK THE ACTUAL DATA
2153	007232	001401		BEQ	+.4		:BRANCH IF OK
2154	007234	104002		HLT+2			:WRONG CHAR LEN OR DATA ERROR
2155							:R1=DATA FROM FI/FO (COMPLETE WORD)
2156							:R2=DATA (LOW BYTE) EXPECTED
2157	007236	017701	172060	7\$: MOV	@RBUF, R1		:READ FI/FO
2158	007242	100001		BPL	+.4		:BRANCH IF CHAR PRESENT NOT SET
2159	007244	104001		HLT+1			:CHARACTER PRESENT STAYED SET
2160							:R1 = CONTENTS OF RBUF
2161	007246	017701	172046	8\$: MOV	@CSR, R1		:SAVE THE CSR
2162	007252	022701	100405	CMP	#100405, R1		:CHECK THE CSR
2163	007256	001401		BEQ	+.4		:BRANCH IF OK
2164	007260	104001		HLT+1			:DONE DIDN'T CLEAR OR OTHER CSR ERROR
2165							:R1 = CONTENTS OF CSR
2166	007262	005077	172036	CLR	@TCR		:CLEAR TCR
2167	007266	005077	172026	CLR	@CSR		:CLEAR CSR
2168	007272	104400		SCOPE			

 :TEST 35: TEST THAT LINE 10 CAN TRANSMIT AND
 : RECEIVE A CHARACTER. (377)
 :
 : 1\$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
 : 3\$: CHECKS THAT NO ERRORS IN FI/FO
 : 4\$: CHECKS THAT RIGHT LINE # (10) IN FI/FO
 : 5\$: CHECKS FOR RIGHT CHARACTER LENGTH
 : 6\$: CHECKS THAT CORRECT DATA WAS RECEIVED
 : 7\$: CHECKS THAT CHARACTER PRESENT CLEARS

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2179      ;      8$: CHECKS THAT DONE CLEARS
2180      ;PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
2181      ;*****
2182      ;
2183      ;      INITIALIZE
2184      ;      DEVICE 'CSR' REGISTER
2185      ;
2186      007274 004737 014600      TST35: JSR      PC,      @#INITD      SET:
2187      ;BIT2 = MAINTENANCE
2188      ;BIT3 = CLEAR MOS
2189      ;BIT8 = MASTER XMTR SCAN ENB
2190      ;WAIT FOR MOS TO CLEAR
2191      ;
2192      ;
2193      007300 052777 002000 172016      LOP35: BIS      #BIT10, @TCR      ;SET XMTR CONTROL BIT, LINE 10
2194      007306 017701 172006      MOV      @CSR, R1      ;WAIT FOR XMTR READY
2195      007312 100375      BPL      LOP35
2196      007314 012777 000377 172004      MOV      #377, @TBUF      ;SEND A RUBOUT
2197      007322 005000      CLR      R0      ;CLEAR COUNTER
2198      007324 105305      1$: DECR     R5      ;SHORT WAIT LOOP
2199      007326 001376      BNE      1$
2200      007330 017701 171766      MOV      @RBUF, R1      ;WAIT FOR CHAR. PRES.
2201      007334 100405      BMI      3$      ;BRANCH WHEN FOUND
2202      007336 005200      INC      R0      ;TIME COUNTER
2203      007340 001371      BNE      1$      ;BRANCH IF NOT TIME-OUT
2204      007342 017702 171752      MOV      @CSR, R2      ;SAVE CSR
2205      007346 104002      HLT+2      ;CHARACTER READY DIDN'T SET
2206      ;R1 = CONTENTS OF RBUF
2207      ;R2 = CONTENTS OF CSR
2208      007350 050037 001346      3$: BIS      R0, TIMER      ;SAVE THE TIMER
2209      007354 032701 070000      BIT      #70000, R1      ;CHECK FOR ERROR BITS
2210      007360 001401      BEQ      .+4      ;BRANCH IF NONE
2211      007362 104001      HLT+1      ;ERROR IN RECEIVED CHAR
2212      ;R1 = CONTENTS OF RBUF
2213      ;BIT14=UART OVERRUN
2214      ;BIT13=FRAMING ERROR
2215      ;BIT12=PARITY ERROR
2216      007364 010102      4$: MOV      R1, R2      ;DUPLICATE DATA WORD
2217      007366 042702 170377      BIC      #170377, R2      ;MASK LINE#
2218      007372 000302      SWAB     R2      ;LINE # IN LOW BYTE
2219      007374 122702 000012      CMPB    #10, R2      ;CHECK LINE #
2220      007400 001401      BEQ      .+4      ;BRANCH IF OK
2221      007402 104001      HLT+1      ;WRONG LINE # RECEIVED
2222      ;R1 = CONTENTS OF RBUF
2223      ;BITS8-11 = LINE #
2224      007404 117702 171754      5$: MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
2225      007410 130201      BITB    R2, R1      ;CHECK CHAR LENGTH.
2226      007412 001401      BFO      .+4      ;BRANCH IF OK
2227      007414 104002      HLT+2      ;WRONG CHARACTER LENGTH
2228      ;R1=DATA FROM FI/FO
2229      ;R2=MASK (BITS SET NOT EXPECTED)
2230      007416 105102      6$: COMB    R2      ;REVERSE THE MASK
2231      007420 120102      CMPB    R1, R2      ;CHECK THE ACTUAL DATA
2232      007422 001401      BEQ      .+4      ;BRANCH IF OK
2233      007424 104002      HLT+2      ;WRONG CHAR LEN OR DATA ERROR
2234      ;R1=DATA FROM FI/FO (COMPLETE WORD)

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2235
2236 007426 017701 171670      7$:  MOV    @RBUF, R1      ;R2-DATA (LOW BYTE) EXPECTED
2237 007432 100001              BPL     .+4      ;READ FI/FO
2238 007434 104001              HLT+1    ;BRANCH IF CHAR F-PRESENT NOT SET
2239                                ;CHARACTER PRESENT STAYED SET
2240 007436 017701 171556      8$:  MOV    @CSR, R1      ;R1 = CONTENTS OF RBUF
2241 007442 022701 100405      CMP     #100405,R1 ;SAVE THE CSR
2242 007446 001401              BEQ     .+4      ;CHECK THE CSR
2243 007450 104001              HLT+1    ;BRANCH IF OK
2244                                ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2245 007452 005077 171646      CLR     @TCR      ;R1 = CONTENTS OF CSR
2246 007456 005077 171636      CLR     @CSR      ;CLEAR TCR
2247 007462 104400              SCOPE    ;CLEAR CSR
2248
2249
2250 *****
2251 :TEST 36:      TEST THAT LINE 11 CAN TRANSMIT AND
2252 :              RECEIVE A CHARACTER. (377)
2253 :              1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
2254 :              3$: CHECKS THAT NO ERRORS IN FI/FO
2255 :              4$: CHECKS THAT RIGHT LINE # (11) IN FI/FO
2256 :              5$: CHECKS FOR RIGHT CHARACTER LENGTH
2257 :              6$: CHECKS THAT CORRECT DATA WAS RECEIVED
2258 :              7$: CHECKS THAT CHARACTER PRESENT CLEARS
2259 :              8$: CHECKS THAT DONE CLEARS
2260 :PROBABLE FAULTY LOGIC: M7285 (U2-7) ALL; M7279 ALL; UART CARD D03 SERIES
2261 :*****
2262
2263 :              INITIALIZE
2264 :              DEVICE 'CSR' REGISTER
2265 007464 004737 014600      TST36: JSR     PC,      @#INITD  SET:
2266                                ;BIT2 = MAINTENANCE
2267                                ;BIT3 = CLEAR MOS
2268                                ;BIT8 = MASTER XMTR SCAN ENB
2269 :WAIT FOR MOS TO CLEAR
2270                                SET:
2271                                ;BIT0 = RECEIVER ENABLE
2272 007470 052777 004000 171626  LOP36: BIS     #BIT11, @TCR  ;SET XMTR CONTROL BIT, LINE 11
2273 007476 017701 171616      MOV     @CSR, R1      ;WAIT FOR XMTR READY
2274 007502 100375              BPL     LOP36
2275 007504 012777 000377 171614  MOV     #377, @RBUF ;SEND A RUBOUT
2276 007512 005000              CLR     R0      ;CLEAR COUNTER
2277 007514 105305              DECB    R5      ;SHORT WAIT LOOP
2278 007516 001376              BNE     1$
2279 007520 017701 171576      MOV     @RBUF,R1    ;WAIT FOR CHAR. PRES.
2280 007524 100405              BMI     3$      ;BRANCH WHEN FOUND
2281 007526 005200              INC     R0      ;TIME COUNTER
2282 007530 001371              BNE     1$      ;BRANCH IF NOT TIME-OUT
2283 007532 017702 171562      MOV     @CSR, R2    ;SAVE CSR
2284 007536 104002              HLT+2    ;CHARACTER READY DIDN'T SET
2285                                ;R1 = CONTENTS OF RBUF
2286                                ;R2 = CONTENTS OF CSR
2287 007540 050037 001346      3$:  BIS     R0, TIMER ;SAVE THE TIMER
2288 007544 032701 070000      BIT     #70000, R1 ;CHECK FOR ERROR BITS
2289 007550 001401              BEQ     .+4      ;BRANCH IF NONE
2290 007552 104001              HLT+1    ;ERROR IN RECEIVED CHAR
  
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2291
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2295 007554 010102
2296 007556 042702 170377
2297 007562 000302
2298 007564 122702 000013
2299 007570 001401
2300 007572 104001
2301
2302
2303 007574 117702 171564
2304 007600 130201
2305 007602 001401
2306 007604 104002
2307
2308
2309 007606 105102
2310 007610 120102
2311 007612 001401
2312 007614 104002
2313
2314
2315 007616 017701 171500
2316 007622 100001
2317 007624 104001
2318
2319 007626 017701 171466
2320 007632 022701 100405
2321 007636 001401
2322 007640 104001
2323
2324 007642 005077 171456
2325 007646 005077 171446
2326 007652 104400
2327 007654 005277 001364
2328 007660 012737 007666 015250
2329
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2346 007666 004737 014600

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4$: MOV R1, R2
   BIC #170377, R2
   SWAB R2
   CMPB #11., R2
   BEQ .+4
   HLT+1

5$: MOVB @DJLEN, R2
   BITB R2, R1
   BEQ .+4
   HLT+2

6$: COMB R2
   CMPB R1, R2
   BEQ .+4
   HLT+2

7$: MOV @RBUF, R1
   BPL .+4
   HLT+1

8$: MOV @CSR, R1
   CMP #100405, R1
   BEQ .+4
   HLT+1

   CLR @TCR
   CLR @CSR
   SCOPE
   INC DJLEN
   MOV #.+6, LAD

```

```

;R1 - CONTENTS OF RBUF
;BIT14=UART OVER RUN
;BIT13=FRAMING ERROR
;BIT12=PARITY ERROR
;DUPLICATE DATA WORD
;MASK LINE#
;LINE # IN LOW BYTE
;CHECK LINE #
;BRANCH IF OK
;WRONG LINE # RECEIVED
;R1 = CONTENTS OF RBUF
;BITS8-11 = LINE #
;GET MASK OF CHARACTER
;CHECK CHAR LENGTH.
;BRANCH IF OK
;WRONG CHARACTER LENGTH
;R1=DATA FROM FI/FO
;R2=MASK (BITS SET NOT EXPECTED)
;REVERSE THE MASK
;CHECK THE ACTUAL DATA
;BRANCH IF OK
;WRONG CHAR LEN OR DATA ERROR
;R1=DATA FROM FI/FO (COMPLETE WORD)
;R2=DATA (LOW BYTE) EXPECTED
;READ FI/FO
;BRANCH IF CHAR PRESENT NOT SET
;CHARACTER PRESENT STAYED SET
;R1 = CONTENTS OF RBUF
;SAVE THE CSR
;CHECK THE CSR
;BRANCH IF OK
;DONE DIDN'T CLEAR OR OTHER CSR ERROR
;R1 = CONTENTS OF CSR
;CLEAR TCR
;CLEAR CSR

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*****
;TEST 37: TEST THAT LINE 12 CAN TRANSMIT AND
;          RECEIVE A CHARACTER. (377)
;
;1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
;3$: CHECKS THAT NO ERRORS IN FI/FO
;4$: CHECKS THAT RIGHT LINE # (12) IN FI/FO
;5$: CHECKS FOR RIGHT CHARACTER LENGTH
;6$: CHECKS THAT CORRECT DATA WAS RECEIVED
;7$: CHECKS THAT CHARACTER PRESENT CLEARS
;8$: CHECKS THAT DONE CLEARS
;PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
*****
;
;          INITIALIZE
;          DEVICE 'CSR' REGISTER
;
;TST37: JSR PC, @#INITD SET:
;          BIT2 - MAINTENANCE

```

Address	Op Code	Op 1	Op 2	Op 3	Op 4	Op 5	Op 6	Op 7	Op 8	Op 9	Op 10	Op 11	Op 12	Op 13	Op 14	Op 15	Op 16	Op 17	Op 18	Op 19	Op 20	Op 21	Op 22	Op 23	Op 24	Op 25	Op 26	Op 27	Op 28	Op 29	Op 30	Op 31	Op 32	Op 33	Op 34	Op 35	Op 36	Op 37	Op 38	Op 39	Op 40	Op 41	Op 42	Op 43	Op 44	Op 45	Op 46	Op 47	Op 48	Op 49	Op 50	Op 51	Op 52	Op 53	Op 54	Op 55	Op 56	Op 57	Op 58	Op 59	Op 60	Op 61	Op 62	Op 63	Op 64	Op 65	Op 66	Op 67	Op 68	Op 69	Op 70	Op 71	Op 72	Op 73	Op 74	Op 75	Op 76	Op 77	Op 78	Op 79	Op 80	Op 81	Op 82	Op 83	Op 84	Op 85	Op 86	Op 87	Op 88	Op 89	Op 90	Op 91	Op 92	Op 93	Op 94	Op 95	Op 96	Op 97	Op 98	Op 99	Op 100	Op 101	Op 102	Op 103	Op 104	Op 105	Op 106	Op 107	Op 108	Op 109	Op 110	Op 111	Op 112	Op 113	Op 114	Op 115	Op 116	Op 117	Op 118	Op 119	Op 120	Op 121	Op 122	Op 123	Op 124	Op 125	Op 126	Op 127	Op 128	Op 129	Op 130	Op 131	Op 132	Op 133	Op 134	Op 135	Op 136	Op 137	Op 138	Op 139	Op 140	Op 141	Op 142	Op 143	Op 144	Op 145	Op 146	Op 147	Op 148	Op 149	Op 150	Op 151	Op 152	Op 153	Op 154	Op 155	Op 156	Op 157	Op 158	Op 159	Op 160	Op 161	Op 162	Op 163	Op 164	Op 165	Op 166	Op 167	Op 168	Op 169	Op 170	Op 171	Op 172	Op 173	Op 174	Op 175	Op 176	Op 177	Op 178	Op 179	Op 180	Op 181	Op 182	Op 183	Op 184	Op 185	Op 186	Op 187	Op 188	Op 189	Op 190	Op 191	Op 192	Op 193	Op 194	Op 195	Op 196	Op 197	Op 198	Op 199	Op 200	Op 201	Op 202	Op 203	Op 204	Op 205	Op 206	Op 207	Op 208	Op 209	Op 210	Op 211	Op 212	Op 213	Op 214	Op 215	Op 216	Op 217	Op 218	Op 219	Op 220	Op 221	Op 222	Op 223	Op 224	Op 225	Op 226	Op 227	Op 228	Op 229	Op 230	Op 231	Op 232	Op 233	Op 234	Op 235	Op 236	Op 237	Op 238	Op 239	Op 240	Op 241	Op 242	Op 243	Op 244	Op 245	Op 246	Op 247	Op 248	Op 249	Op 250	Op 251	Op 252	Op 253	Op 254	Op 255	Op 256	Op 257	Op 258	Op 259	Op 260	Op 261	Op 262	Op 263	Op 264	Op 265	Op 266	Op 267	Op 268	Op 269	Op 270	Op 271	Op 272	Op 273	Op 274	Op 275	Op 276	Op 277	Op 278	Op 279	Op 280	Op 281	Op 282	Op 283	Op 284	Op 285	Op 286	Op 287	Op 288	Op 289	Op 290	Op 291	Op 292	Op 293	Op 294	Op 295	Op 296	Op 297	Op 298	Op 299	Op 300	Op 301	Op 302	Op 303	Op 304	Op 305	Op 306	Op 307	Op 308	Op 309	Op 310	Op 311	Op 312	Op 313	Op 314	Op 315	Op 316	Op 317	Op 318	Op 319	Op 320	Op 321	Op 322	Op 323	Op 324	Op 325	Op 326	Op 327	Op 328	Op 329	Op 330	Op 331	Op 332	Op 333	Op 334	Op 335	Op 336	Op 337	Op 338	Op 339	Op 340	Op 341	Op 342	Op 343	Op 344	Op 345	Op 346	Op 347	Op 348	Op 349	Op 350	Op 351	Op 352	Op 353	Op 354	Op 355	Op 356	Op 357	Op 358	Op 359	Op 360	Op 361	Op 362	Op 363	Op 364	Op 365	Op 366	Op 367	Op 368	Op 369	Op 370	Op 371	Op 372	Op 373	Op 374	Op 375	Op 376	Op 377	Op 378	Op 379	Op 380</
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2403 010042 104001 HLT+1 ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2404 ;R1 = CONTENTS OF CSR
2405 010044 005077 171254 CLR @TCR ;CLEAR TCR
2406 010050 005077 171244 CLR @CSR ;CLEAR CSR
2407 010054 104400 SCOPE
2408
2409 ;*****
2410 ;TEST 40: TEST THAT LINE 13 CAN TRANSMIT AND
2411 ; RECEIVE A CHARACTER. (377)
2412 ; 1$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
2413 ; 3$: CHECKS THAT NO ERRORS IN FI/FO
2414 ; 4$: CHECKS THAT RIGHT LINE # (13) IN FI/FO
2415 ; 5$: CHECKS FOR RIGHT CHARACTER LENGTH
2416 ; 6$: CHECKS THAT CORRECT DATA WAS RECEIVED
2417 ; 7$: CHECKS THAT CHARACTER PRESENT CLEARS
2418 ; 8$: CHECKS THAT DONE CLEARS
2419 ;PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
2420 ;*****
2421
2422 ; INITIALIZE
2423 ; DEVICE 'CSR' REGISTER
2424
2425 010056 004737 014600 TST40: JSR PC, @#INITD SET:
2426 ;BIT2 = MAINTENANCE
2427 ;BIT3 = CLEAR MOS
2428 ;BIT8 = MASTER XMTR SCAN ENB
2429 ;WAIT FOR MOS TO CLEAR
2430 ;
2431 ; SET:
2432 ;BIT0 = RECEIVER ENABLE
2433 010062 052777 020000 171234 LOP40: BIS #BIT13, @TCR ;SET XMTR CONTROL BIT, LINE 13
2434 010070 017701 171224 MOV @CSR, R1 ;WAIT FOR XMTR READY
2435 010074 100375 BPL LOP40
2436 010076 012777 000377 171222 MOV #377, @TBUF ;SEND A RUBOUT
2437 010104 005000 CLR R0 ;CLEAR COUNTER
2438 010106 105305 1$: DECB R5 ;SHORT WAIT LOOP
2439 010110 001376 BNE 1$
2440 010112 017701 171204 MOV @RBUF, R1 ;WAIT FOR CHAR. PRES.
2441 010116 100405 BMI 3$ ;BRANCH WHEN FOUND
2442 010120 005200 INC R0 ;TIME COUNTER
2443 010122 001371 BNE 1$ ;BRANCH IF NOT TIME-OUT
2444 010124 017702 171170 MOV @CSR, R2 ;SAVE CSR
2445 010130 104002 HLT+2 ;CHARACTER READY DIDN'T SET
2446 ;R1 = CONTENTS OF RBUF
2447 ;R2 = CONTENTS OF CSR
2448 010132 050037 001346 3$: BIS R0, TIMER ;SAVE THE TIMER
2449 010136 032701 070000 BIT #70000, R1 ;CHECK FOR ERROR BITS
2450 010142 001401 BEQ .+4 ;BRANCH IF NONE
2451 010144 104001 HLT+1 ;ERROR IN RECEIVED CHAR
2452 ;R1 = CONTENTS OF RBUF
2453 ;BIT14=UART OVERRUN
2454 ;BIT13=FRAMING ERROR
2455 ;BIT12=PARITY ERROR
2456 010146 010102 4$: MOV R1, R2 ;DUPLICATE DATA WORD
2457 010150 042702 170377 BIC #170377, R2 ;MASK LINE#
2458 010154 000302 SWAB R2 ;LINE # IN LOW BYTE
2459 010156 122702 000015 CMPB #13, R2 ;CHECK LINE #

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2459	010152	001401			BEQ	+.4			:BRANCH IF OK
2460	010164	104001			HLT+1				:WRONG LINE # RECEIVED
2461									:R1 = CONTENTS OF RBUF
2462									:BITS8-11 = LINE #
2463	010166	117702	171172	5\$:	MOVB	@DJLEN,	R2		:GET MASK OF CHARACTER
2464	010172	130201			BITB	R2,	R1		:CHECK CHAR LENGTH.
2465	010174	001401			BEQ	+.4			:BRANCH IF OK
2466	010176	104002			HLT+2				:WRONG CHARACTER LENGTH
2467									:R1=DATA FROM FI/FO
2468									:R2=MASK (BITS SET NOT EXPECTED)
2469	010200	105102		6\$:	COMB	R2			:REVERSE THE MASK
2470	010202	120102			CMPB	R1,	R2		:CHECK THE ACTUAL DATA
2471	010204	001401			BEQ	+.4			:BRANCH IF OK
2472	010206	104002			HLT+2				:WRONG CHAR LEN OR DATA ERROR
2473									:R1=DATA FROM FI/FO (COMPLETE WORD)
2474									:R2=DATA (LOW BYTE) EXPECTED
2475	010210	017701	171106	7\$:	MOV	@RBUF,	R1		:READ FI/FO
2476	010214	100001			BPL	+.4			:BRANCH IF CHAR PRESENT NOT SET
2477	010216	104001			HLT+1				:CHARACTER PRESENT STAYED SET
2478									:R1 = CONTENTS OF RBUF
2479	010220	017701	171074	8\$:	MOV	@CSR,	R1		:SAVE THE CSR
2480	010224	022701	100405		CMP	#100405,	R1		:CHECK THE CSR
2481	010230	001401			BEQ	+.4			:BRANCH IF OK
2482	010232	104001			HLT+1				:DONE DIDN'T CLEAR OR OTHER CSR ERROR
2483									:R1 = CONTENTS OF CSR
2484	010234	005077	171064		CLR	@TCR			:CLEAR TCR
2485	010240	005077	171054		CLR	@CSR			:CLEAR CSR
2486	010244	104400			SCOPE				

:TEST 41: TEST THAT LINE 14 CAN TRANSMIT AND
RECEIVE A CHARACTER. (377)
:1\$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
:3\$: CHECKS THAT NO ERRORS IN FI/FO
:4\$: CHECKS THAT RIGHT LINE # (14) IN FI/FO
:5\$: CHECKS FOR RIGHT CHARACTER LENGTH
:6\$: CHECKS THAT CORRECT DATA WAS RECEIVED
:7\$: CHECKS THAT CHARACTER PRESENT CLEARS
:8\$: CHECKS THAT DONE CLEARS
:PROBABLE FAULTY LOGIC: M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES

2501					:	INITIALIZE			
2502					:	DEVICE 'CSR' REGISTER			
2503					:				
2504	010246	004737	014600	TST41:	JSR	PC,	@#INITD	SET:	:BIT2 = MAINTENANCE
2505									:BIT3 = CLEAR MOS
2506									:BIT8 = MASTER XMTR SCAN ENB
2507					:	WAIT FOR MOS TO CLEAR			
2508					:			SET:	:BIT0 = RECEIVER ENABLE
2509					:				
2510					:				
2511	010252	052777	040000	171044	LOP41:	BIS	#BIT14,	@TCR	:SET XMTR CONTROL BIT, LINE 14
2512	010260	017701	171034		MOV	@CSR,	R1		:WAIT FOR XMTR READY
2513	010264	100375			BPL	LOP41			
2514	010266	012777	000377	171032	MOV	#377,	@TBUF		:SEND A RUBOUT

2515	010274	005000			CLR	R0			;CLEAR COUNTER
2516	010276	105305			DECB	R5			;SHORT WAIT LOOP
2517	010300	001376			BNE	1\$			
2518	010302	017701	171014		MOV	@RBUF,R1			;WAIT FOR CHAR. PRES.
2519	010306	100405			BMI	3\$			;BRANCH WHEN FOUND
2520	010310	005200			INC	R0			;TIME COUNTER
2521	010312	001371			BNE	1\$			;BRANCH IF NOT TIME-OUT
2522	010314	017702	171000		MOV	@CSR, R2			;SAVE CSR
2523	010320	104002			HLT+2				;CHARACTER READY DIDN'T SET
2524									;R1 = CONTENTS OF RBUF
2525									;R2 = CONTENTS OF CSR
2526	010322	050037	001346		BIS	R0,TIMER			;SAVE THE TIMER
2527	010326	032701	070000		BIT	#70000, R1			;CHECK FOR ERROR BITS
2528	010332	001401			BEQ	+.4			;BRANCH IF NONE
2529	010334	104001			HLT+1				;ERROR IN RECEIVED CHAR
2530									;R1 = CONTENTS OF RBUF
2531									;BIT14=UART OVERRUN
2532									;BIT13=FRAMING ERROR
2533									;BIT12=PARITY ERROR
2534	010336	010102			MOV	R1, R2			;DUPLICATE DATA WORD
2535	010340	042702	170377		BIC	#170377,R2			;MASK LINE#
2536	010344	000302			SWAB	R2			;LINE # IN LOW BYTE
2537	010346	122702	000016		CMPB	#14., R2			;CHECK LINE #
2538	010352	001401			BEQ	+.4			;BRANCH IF OK
2539	010354	104001			HLT+1				;WRONG LINE # RECEIVED
2540									;R1 = CONTENTS OF RBUF
2541									;BITS8-11 = LINE #
2542	010356	117702	171002		MOVB	@DJLEN, R2			;GET MASK OF CHARACTER
2543	010362	130201			BITB	R2, R1			;CHECK CHAR LENGTH.
2544	010364	001401			BEQ	+.4			;BRANCH IF OK
2545	010366	104002			HLT+2				;WRONG CHARACTER LENGTH
2546									;R1=DATA FROM FI/FO
2547									;R2=MASK (BITS SET NOT EXPECTED)
2548	010370	105102			COMB	R2			;REVERSE THE MASK
2549	010372	120102			CMPB	R1, R2			;CHECK THE ACTUAL DATA
2550	010374	001401			BEQ	+.4			;BRANCH IF OK
2551	010376	104002			HLT+2				;WRONG CHAR LEN OR DATA ERROR
2552									;R1=DATA FROM FI/FO (COMPLETE WORD)
2553									;R2=DATA (LOW BYTE) EXPECTED
2554	010400	017701	170716		MOV	@RBUF, R1			;READ FI/FO
2555	010404	100001			BPL	+.4			;BRANCH IF CHAR PRESENT NOT SET
2556	010406	104001			HLT+1				;CHARACTER PRESENT STAYED SET
2557									;R1 = CONTENTS OF RBUF
2558	010410	017701	170704		MOV	@CSR, R1			;SAVE THE CSR
2559	010414	022701	100405		CMP	#100405,R1			;CHECK THE CSR
2560	010420	001401			BEQ	+.4			;BRANCH IF OK
2561	010422	104001			HLT+1				;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2562									;R1 = CONTENTS OF CSR
2563	010424	005077	170674		CLR	@TCR			;CLEAR TCR
2564	010430	005077	170664		CLR	@CSR			;CLEAR CSR
2565	010434	104400			SCOPE				

 ;TEST 42: TEST THAT LINE 15 CAN TRANSMIT AND
 ; RECEIVE A CHARACTER. (377)
 ;
 ; 1\$: CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.

[illegible]

2627	010560	105102		6\$:	COMB	R2			:REVERSE THE MASK
2628	010562	120102			CMPB	R1,	R2		:CHECK THE ACTUAL DATA
2629	010564	001401			BEQ	+.4			:BRANCH IF OK
2630	010566	104002			HLT+2				:WRONG CHAR LEN OR DATA ERROR
2631									:R1=DATA FROM FI/FO (COMPLETE WORD)
2632									:R2=DATA (LOW BYTE) EXPECTED
2633	010570	017701	170526	7\$:	MOV	@RBUF,	R1		:READ FI/FO
2634	010574	100001			BPL	+.4			:BRANCH IF CHAR PRESENT NOT SET
2635	010576	104001			HLT+1				:CHARACTER PRESENT STAYED SET
2636									:R1 = CONTENTS OF RBUF
2637	010600	017701	170514	8\$:	MOV	@CSR,	R1		:SAVE THE CSR
2638	010604	022701	100405		CMP	#100405,	R1		:CHECK THE CSR
2639	010610	001401			BEQ	+.4			:BRANCH IF OK
2640	010612	104001			HLT+1				:DONE DIDN'T CLEAR OR OTHER CSR ERROR
2641									:R1 = CONTENTS OF CSR
2642	010614	005077	170504		CLR	@TCR			:CLEAR TCR
2643	010620	005077	170474		CLR	@CSP			:CLEAR CSR
2644	010624	104400			SCOPE				
2645	010626	162737	000003	001364	SUB	#3,	DJLEN		
2646	010634	005237	001346		INC	TIMER			:WORSE CASE TIME, ONE CHARACTER
2647	010640	013700	001346		MOV	TIMER,	R0		:DUP TIMER
2648	010644	006200			ASR	R0			:/2
2649	010646	006200			ASR	R0			:/4
2650	010650	005200			INC	R0			:+1
2651	010652	006137	001346		ROL	TIMER			:TIMER * 2
2652	010656	060037	001346		ADD	R0,	TIMER		:2.25 TIMES ONE CHARACTER TIME
2653	010662	012737	010670	015250	MOV	#+6,	LAD		:RESET LOOP ADDRESS

 :TEST 43: TEST THAT CHARACTER PRESENT (BIT15) OF RBUF
 : IS CLEARED (BY CLEAR MOS).
 :PROBABLE FAULTY LOGIC: M7285 (D2-8) E17,E14,E15; M7279; M7280

2661				:	INITIALIZE				
2662				:					
2663	010670	004737	014600	TST43:	JSR	PC,@INITD			
2664				:SET:					
2665				:	BIT2 = MAINTENANCE				
2666				:	BIT3 = CLEAR MOS				
2667				:	BIT8 = TRANS SCAN ENABLE				
2668				:	WAIT FOR BIT4 = MOS CLEAR				
2669				:SET:					
2670				:	BIT0 = RECEIVER ENABLE				
2671	010674	012777	000001	170422	MOV	#BIT0,	@TCR		:TRANS CONTROL, LINE0
2672	010702	012704	000040		MOV	#40,R4			:SET UP COUNTER TO OUTPUT 32 CHAR'S
2673	010706	017701	170406	1\$:	MOV	@CSR,R1			:WAIT FOR TRANS READY
2674	010712	100375			BPL	1\$			
2675	010714	010477	170406		MOV	R4,@TBUF			:TRANSMIT COUNT
2676	010720	005304			DEC	R4			:COUNT DOWN
2677	010722	001371			BNE	1\$			
2678									
2679	010724	105777	170370	2\$:	TSTB	@CSR			:MAKE SURE DONE IS SET
2680	010730	100375			BPL	2\$			
2681									
2682	010732	052777	000010	170360	BIS	#BIT3,@CSR			:CLEAR MOS

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2683 010740 032777 000020 170352 3$: BIT #BIT4,@CSR ;WAIT FOR CLRMOS TO FINISH
2684 010746 001374 BNE 3$
2685
2686 010750 017701 170346 MOV @RBUF,R1 ;CHECK RBUF AND SAVE
2687 010754 100001 BPL .+4
2688 010756 104001 HLT+1
2689 010760 017701 170334 MOV @CSR,R1 ;SAVE CSR
2690 010764 022701 100405 CMP #100405,R1 ;CHECK CSR
2691 010770 001401 BEQ .+4 ;BRANCH IF OK
2692 010772 104001 HLT+1 ;CSR ERROR. POSSIBILITIES:
2693 ;(1) DONE DIDN'T CLEAR
2694
2695 ;(2) TRANSMITTER UART DIDN'T CLR.
2696 ;R1=CONTENTS OF CSR
2697
2698 010774 013700 001346 MOV TIMER, R0 ;SET UP TIMER
2699 011000 105305 4$: DECB R5 ;SHORT WAIT LOOP
2700 011002 001376 BNE 4$
2701
2702 011004 017701 170310 MOV @CSR,R1 ;SAVE CSR
2703 011010 105701 TSTB R1 ;CHECK FOR DONE
2704 011012 100001 BPL .+4 ;BRANCH IF OK
2705 011014 104001 HLT+1 ;DONE CAME UP!
2706 ;MOS MUST NOT HAVE CLEARED
2707 011016 005300 DEC R0 ;TIMER COUNT
2708 011020 001367 BNE 4$
2709
2710 011022 022701 100405 CMP #100405,R1 ;CHECK CSR
2711 011026 001401 BEQ .+4 ;BRANCH IF OK
2712 011030 104001 HLT+1 ;CSR ERROR
2713
2714 011032 017701 170264 MOV @RBUF,R1 ;CHECK RBUF
2715 011036 100001 BPL .+4 ;BRANCH IF OK
2716 011040 104001 HLT+1 ;RBUF NOT EMPTY!
2717
2718 011042 005077 170256 CLR @TCR
2719 011046 005077 170246 CLR @CSR
2720
2721 011052 104400 SCOPE
2722
2723
2724
2725
2726
2727
2728
2729
2730
2731
2732
2733
2734 011054 004737 014600
2735
2736
2737
2738
  
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*****
:TEST 44: TEST THAT TRANSMITTER READY CLEARS WHEN TBUF IS LOADED
:NOTE: DUE TO THE DOUBLE BUFFERING BY THE UART, TWO CHARACTERS
: MUST BE LOADED TO INSURE SEEING TRANSMITTER READY CLEAR
:PROBABLE FAULTY LOGIC: M7285 (D2-6) E39, E23, E49
*****
  
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:
: INITIALIZE
: DEVICE 'CSR' REGISTER
:
TST44: JSR PC,@INITD SET:
;WAIT FOR MOS TO CLEAR ;BIT2 = MAINTENANCE
; ;BIT3 = CLEAR MOS
; ;BIT8 = MASTER XMTR SCAN ENB
: SET:
  
```

2739				:			:BITO - RECEIVER ENABLE
2740				:			
2741	011060	052777	000001	170236		BIS	#BIT0, @TCR ;TRANS CONTROL, LINE 0
2742	011066	017701	170226		1\$:	MOV	@CSR, R1 ;WAIT FOR XMTR READY
2743	011072	100375				BPL	1\$
2744	011074	012777	000001	170224		MOV	#1, @TBUF ;TRANSMIT A 1
2745	011102	017701	170212		2\$:	MOV	@CSR, R1 ;WAIT FOR XMTR READY
2746	011106	100375				BPL	2\$
2747	011110	012777	000002	170210		MOV	#2, @TBUF ;TRANSMIT A 2
2748	011116	017701	170176			MOV	@CSR, R1 ;CHECK FOR XMTR READY
2749	011122	100001				BPL	.+4 ;BRANCH IF XMTR READY CLEARED
2750	011124	104001				HLT+1	;TRANSMITTER READY FAILED TO CLEAR
2751							;R1 = CONTENTS OF CSR
2752	011126	013700	001346			MOV	TIMER, R0 ;SET UP TIMER
2753	011132	105305			3\$:	DECB	R5 ;SHORT WAIT LOOP
2754	011134	001376				BNE	3\$
2755	011136	017701	170156			MOV	@CSR, R1 ;SAVE CSR FOR THE RECORD
2756	011142	000400				BR	.+2 ;NOP FOR TIMING
2757	011144	005300				DEC	R0 ;TIMER COUNT
2758	011146	001371				BNE	3\$;BRANCH IF MORE TIME
2759							
2760	011150	042701	000200			BIC	#BIT7,R1 ;DONE MAY OR MAY NOT BE SET SO DONT TEST FOR IT
2761	011154	022701	100405			CMP	#100405,R1 ;TEST REST OF THE CSR
2762	011160	001401				BEQ	.+4
2763	011162	104001				HLT+1	;A CSR ERROR
2764							;R1 = CONTENTS OF CSR
2765							
2766	011164	017701	170132			MOV	@RBUF, R1 ;CHECK RBUF FOR CHAR PRESENT
2767	011170	100401				BMI	.+4 ;BRANCH IF CHAR PRESENT
2768	011172	104001				HLT+1	;CHAR PRESENT MISSING
2769							;R1 = CONTENTS OF RBUF
2770	011174	022701	100001			CMP	#100001,R1 ;CHECK THE DATA
2771	011200	001401				BEQ	.+4 ;BRANCH IF OK
2772	011202	104001				HLT+1	;RECEIVER ERROR
2773							;R1 = CNTENTS OF RBUF
2774	011204	017701	170112			MOV	@RBUF, R1 ;CHECK RBUF FOR SECOND CHAR
2775	011210	100401				BMI	.+4 ;BRANCH IF CHAR PRESENT
2776	011212	104001				HLT+1	;CHAR PRESENT MISSING
2777							;R1 = CONTENTS OF RBUF
2778	011214	022701	100002			CMP	#100002,R1 ;CHECK THE DATA
2779	011220	001401				BEQ	.+4 ;BRANCH IF OK
2780	011222	104001				HLT+1	;RECEIVER ERROR
2781							;R1 = CNTENTS OF RBUF
2782	011224	017701	170072			MOV	@RBUF, R1 ;CHECK FOR NO MORE CHARACTER'S
2783	011230	100001				BPL	.+4 ;BRANCH IF CHAR PRESENT CLEARED
2784	011232	104001				HLT+1	;CHAR PRESENT NOT CLEARED!
2785							;R1 = CONTENTS OF RBUF
2786	011234	017701	170060			MOV	@CSR, R1 ;SAVE CSR
2787	011240	022701	100405			CMP	#100405,R1 ;CHECK CSR
2788	011244	001401				BEQ	.+4 ;BRANCH IF OK
2789	011246	104001				HLT+1	;CSR ERROR
2790							;R1 = CONTENTS OF CSR
2791	011250	005077	170050			CLR	@TCR ;CLEAR TCR
2792	011254	005077	170040			CLP	@CSR ;CLEAR CSR
2793	011260	104400				SCOPE	
2794							

2795				
2796				
2797				
2798				
2799				
2800				
2801				
2802				
2803				
2804				
2805	011262	004737	014600	
2806				
2807				
2808				
2809				
2810				
2811	011266	052777	000001	170030
2812	011274	005737	001350	
2813	011300	001005		
2814	011302	004737	014644	
2815	011306	012737	000001	001350
2816	011314	012777	000414	167776
2817				
2818				
2819	011322	032777	000020	167770
2820	011330	001374		
2821				
2822				
2823	011332	013702	001356	
2824	011336	017701	167756	
2825	011342	100375		
2826	011344	012777	000252	167754
2827	011352	005302		
2828	011354	001370		
2829	011356	013700	001346	
2830	011362	105305		
2831	011364	001376		
2832	011366	017701	167726	
2833	011372	105701		
2834	011374	100002		
2835	011376	104001		
2836				
2837	011400	000402		
2838	011402	005300		
2839	011404	001366		
2840				
2841	011406	017701	167710	
2842	011412	100001		
2843	011414	104001		
2844				
2845	011416	005277	167676	
2846	011422	017701	167674	
2847	011426	100403		
2848	011430	105300		
2849	011432	001373		
2850	011434	104001		

```

*****
TEST 45:      TEST THE SILO ALARM LEVEL AT WHICH DONE WILL SET.
               TEST THAT RECEIVER ENABLE ON A 0 INHIBITS
               CHARACTER PRESENT.
PROBABLE FAULTY LOGIC: M7285 (D2-7) E32, E15; M7279 (D11-3) E19,E23
*****
               INITIALIZE
DEVICE'CSR'REGISTER

TST45: JSR     PC,@#INITD          SET:
                                   ;BIT2 = MAINTENANCE
                                   ;BIT3 = CLEAR MOS
                                   ;BIT8 = MASTER XMTR SCAN ENB

;WAIT FOR MOS TO CLEAR

               SET:
               ;BITC = RECEIVER ENABLE
               ;TRANS CONTROL, LINE 0
               ;HAS THE ALARM LEVEL BEEN TESTED?
               ;YES
               ;NO, GO DO IT
               ;SET THE FLAG
11$: MOV       #1,ALMFLG           ;BIT2 = MAINTENANCE
MOV        #414, @CSR             ;BIT3 = CLEAR MOS
                                   ;BIT8 = MASTER TRAN SCAN ENB
10$: BIT       #BIT4, @CSR         ;WAIT FOR MOS TO CLEAR
BNE        10$

;OUTPUT THE # OF CHARACTERS NECESSARY FOR THE SILO ALARM
;LEVEL TO ALLOW DONE TO SET.
MOV        COUNT,R2              ;SET CHAR COUNT
1$: MOV        @CSR, R1            ;WAIT FOR XMTR READY
BPL        1$
MOV        #252, @TBUF           ;SEND AN '*'
DEC        R2
BNE        1$
2$: MOV        TIMER, R0          ;SET UP TIMER
DECB       R5                    ;SHORT WAIT LOOP
BNE        2$
MOV        @CSR, R1              ;SAVE CSR FOR TYPING
TSTB       R1                   ;CHECK FOR DONE
BPL        3$                   ;BRANCH IF NOT SET
HLT+1      ;DONE SET WHEN RCV ENB CLR
                                   ;R1=CONTENTS OF CSR
3$: BR        4$
DEC        R0                    ;TIMER COUNT
BNE        2$                   ;BRANCH IF MORE TIMER
4$: MOV        @RBUF, R1          ;CHECK AND SAVE FI/FO
BPL        .+4                  ;BRANCH IF OK
HLT+1      ;CHARACTER PRESENT IN FI/FO
                                   ;R1=DATA FROM FI/FO
5$: INC        @CSR              ;SET RECEIVER ENABLE
MOV        @RBUF, R1            ;CHECK FOR CHARACTER PRESENT
BMI        6$                   ;BRANCH IF OK
DECB       R0                   ;SHORT TIMER
BNE        5$
HLT+1      ;CHARACTER PRESENT MISSING

```

```

2851
2852 011436 005077 167662      6$: CLR @TCR ;R1 = CONTENTS OF RBUF
2853                                ;CLR TRANS CONTROL REG
2854 011442 104400              SCOPE
2855
2856 ;*****
2857 ;TEST 46: TEST THAT HALF DUPLEX (BIT1) DISABLES THE RECEIVER UARTS.
2858 ;PROBABLE FAULTY LOGIC: M7285 (D2-4) E32, E17, E22, (D2-2) E5, E1
2859 ;*****
2860
2861 011444 004737 014570      TST46: JSR PC, @#INITC ;INITIALIZE
2862                                ;BIT1 = HALF DUPLEX
2863                                ;BIT2 = MAINTENANCE
2864                                ;BIT3 = CLEAR MOS
2865                                ;BIT8 = MASTER TRAN SCAN ENB
2866                                ;WAIT FOR MOS TO CLEAR
2867                                ;BIT0 = RECEIVER ENABLE
2868 011450 012777 000001 167646  MOV #BIT0, @TCR ;SET XMTR CONTROL BIT, LINE0
2869                                ;OUTPUT THE # OF CHARACTERS NECESSARY FOR THE SILO ALARM
2870                                ;LEVEL TO ALLOW DONE TO SET.
2871 011456 013702 001356      MOV COUNT,R2 ;SET CHAR COUNT
2872 011462 017701 167632      1$: MOV @CSR, R1 ;WAIT FOR XMTR READY
2873 011466 100375              BPL 1$
2874 011470 012777 000252 167630  MOV #252, @TBUF ;SEND AN '*'
2875 011476 005302              DEC R2
2876 011500 001370              BNE 1$
2877 011502 013700 001346      MOV TIMER, R0 ;SET UP TIMER
2878 011506 105305              2$: DECB R5 ;SHORT WAIT LOOP
2879 011510 001376              BNE 2$
2880 011512 017701 167602      MOV @CSR, R1 ;SAVE CSR
2881 011516 105701              TSTB R1 ;CHECK FOR DONE
2882 011520 100002              BPL 3$ ;BRANCH IF NOT SET
2883 011522 104001              HLT+1 ;DONE SET WHEN HALF DUPLEX (BIT1) SET
2884                                ;R1=CONTENTS OF CSR
2885 011524 000402              BR 4$
2886 011526 005300              3$: DEC R0 ;TIMER COUNT
2887 011530 001366              BNE 2$ ;BRANCH IF MORE TIMER
2888
2889 011532 017701 167564      4$: MOV @RBUF, R1 ;CHECK AND SAVE FI/FO
2890 011536 100001              BPL .+4 ;BRANCH IF OK
2891 011540 104001              HLT+1 ;CHARACTER PRESENT IN FI/FO
2892                                ;R1=DATA FROM FI/FO
2893 011542 042777 000002 167550  BIC #BIT1, @CSR ;CLEAR HALF DUPLEX BIT
2894 011550 000240              NOP
2895 011552 000240              NOP
2896 011554 000240              NOP
2897 011556 000240              NOP
2898 011560 017701 167536      5$: MOV @RBUF, R1 ;CHECK FOR CHAR PRESENT
2899 011564 100001              RPL .+4 ;BRANCH IF CHAR NOT PRESENT
2900 011566 104001              HLT+1 ;CHAR PRESENT AFTER H/D CLEARED
2901                                ;R1 = CONTENTS OF RBUF
2902 011570 005077 167530      CLR @TCR ;CLR TRANS CONTROL REG
2903
2904 011574 104400              SCOPE
2905
2906 ;*****

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2907      ;TEST 47:      TEST RECEIVER INTERRUPT LEVEL
2908      ;      ERROR PRINT OUT IS AS FOLLOWS:::
2909      ;      ADDR DJADR R0 R1
2910      ;
2911      ;      ADDR= ADDRESS OF ERROR HLT
2912      ;      DJADR= CSR ADDRESS OF DJ11 UNDER TEST
2913      ;      R1= BR LEVEL FOR DJ11 TO ALLOW INTR
2914      ;      R2= BR LEVEL WHERE ERROR OCCURED
2915      ;
2916      ;PROBABLE FAULTY LOGIC: M7821 WIRING, PROPLR PRIORITY CHIP
2917      ;*****
2918
2919 011576 012777 011736 167524 TST47: MOV #INTR2,@RCVVEC ; SET UP RCVR INTERRUPT VECTOR
2920 011604 012777 000340 167520      MOV #340,@RCVLVL ; AT LEVEL 7
2921 011612 012737 000010 017214      MOV #10,PRIOLO ; LOAD BR7+1 INTO BR TEST LEVEL
2922 011620 012737 000005 017226 AGAIN2: MOV #5,CT ; LOADS COUNTER FOR 5 ROL -BR
2923 011626 005337 017214      DEC PRIOLO ; START TEST BR7, THEN BR6,BR5...ETC.
2924 011632 013737 017214 017216      MOV PRIOLO,NOW ; LOAD PRE-ROL-ED DECIMAL PRIO
2925 011540 004737 014464      JSR PC, BRSET ; GO TO SUBROUTINE TO :::::
2926      ;      LOAD BR INTR LEVEL OF DJ11
2927      ;      (LEVEL)= DECIMAL #(0 TO 7)
2928      ;      (MASK)= OCTAL #(0 TO 340)
2929      ;      (0,40,100,140,200,240,300,340)
2930      ;      (NOW)= OCTAL #(0 TO 340) AS
2931      ;      MASK, BUT CURRENTLY TESTING
2932 011644 042737 000340 177776      BIC #340,@MPS ; CLEAR PS LEVEL
2933 011652 053737 017216 177776      BIS NOW,@MPS ; SET PS TO CURRENT TEST LEVEL
2934 011660 004737 014560      JSR PC, @#INITR ; SET:
2935      ;      BIT2 = MAINTENANCE
2936      ;      BIT3 = CLEAR MOS
2937      ;      BIT6 = RECEIVER INTERRUPT ENABLE
2938      ;      BIT8 = MASTER TRANS SCAN ENABLE
2939      ;      WAIT FOR MOS TO CLEAR
2940      ;      BIT0 = RECEIVER ENABLE
2941 011664 012777 000001 167432      MOV #BIT0, @TCR ; SET TRAN CONTROL BIT, LINE 0
2942      ;OUTPUT THE # OF CHARACTERS NECESSARY FOR THE SILO ALARM
2943      ;LEVEL TO ALLOW DONE TO SET.
2944 011672 013702 001356      MOV COUNT,R2 ; SET CHAR COUNT
2945 011676 017701 167416 1$: MOV @CSR, R1 ; WAIT FOR TRAN RDY
2946 011702 100375      BPL 1$
2947 011704 012777 000025 167414      MOV #25, @TBUF ;SEND #25
2948 011712 005302      DEC R2
2949 011714 001370      BNE 1$
2950 011716 105717 167376 2$: TSTB @CSR ;WAIT FOR DONE
2951 011722 100375      BPL 2$
2952 011724      NINTR2:
2953      ;
2954      ; IF YOU ARE HERE NO INTR OCCURED
2955 011724 023737 017216 017220      CMP NOW,MASK ; IS THIS AN ERROR????
2956 011732 002407      BLT ERROR2 ; BRANCH IF YES
2957 011734 000417      BR THRU2 ; IF NO,GO ON NEXT BR
2958
2959 011736      INTR2:
2960      ;
2961 011736 022626      CMP (SP)+,(SP)+ ; CLEAN UP THE STACK
2962 011740 023737 017216 017220      CMP NOW,MASK ; IS THIS AN ERROR????
  
```

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2963 011746 002001      BGE      ERROR2      ; BRANCH IF ERROR
2964 011750 000411      BR        THRU2      ; IF NO,SEE IF ALL BR LEVELS TESTED
2965
2966 011752      ERROR2: ; IF YOU ARE HERE , THEN SOMETHING IS WRONG
2967                      ; ERROR!.....
2968
2969 011752 010146      MOV      R1,-(6)      ;PUSH R1 ON STACK
2970 011754 010246      MOV      R2,-(6)      ;PUSH R2 ON STACK
2971
2972 011756 013701 017220      MOV MASK,      R1      ; R1=BR LEVEL ALLOWED
2973                      ; (BR BITS OF PSW)
2974 011762 013702 017216      MOV NOW,      R2      ; R2=BR LEVEL OF ERROR
2975                      ; (BR BITS OF PSW)
2976
2977 011766 104002      HLT+2      ; REPORT ERROR+ REG. 0,1
2978
2979
2980 011770 012602      MOV      (6)+,R2      ;POP STACK INTO R2
2981 011772 012601      MOV      (6)+,R1      ;POP STACK INTO R1
2982
2983 011774      THRU2:
2984
2985 011774 017701 167322      MOV      @RBUF, R1      ; READ THE CHARACTER
2986 012000 100401      BMI      .+4      ; BRANCH IF CHAR PRESENT
2987 012002 104001      HLT+1      ; CHAR PRESENT MISSING
2988                      ; R1= CONTENTS OF RBUF
2989 012004 022701 100025      CMP      #100025,R1      ; CHECK THE DATA
2990 012010 001401      BEQ      .+4      ; BRANCH IF OK
2991 012012 104001      HLT+1      ; RECEIVED DATA ERROR
2992                      ; R1= CONTENTS OF RBUF
2993
2994 012014 005077 167304      CLR      @TCR
2995 012020 005077 167274      CLR      @CSR
2996 012024 005737 017216      TST      NOW
2997 012030 001273      BNE      AGAIN2      ; TEST IF LAST BR WAS CHECKED
2998                      ; BACK TO TEST NEXT INTR LOWER
2999                      ; (NOW) = 0
3000 012032 013777 001332 167270      MOV      RCVLVL,@RCVVEC      ; RELOAD AND CLEAN UP
3001 012040 012777 000004 167270      MOV      #10T, @XMTLVL
3002 012046 042737 000340 177776      BIC      #340,@MPS
3003
3004
3005 012054 104400      SCOPE
3006
3007
3008
3009
3010
3011
3012
3013
3014
3015
3016
3017 012056 004737 014600
3018

```

```

*****
:TEST 50:      TEST FI/FO OVERRUN
:              THE FI/FO BUFFER SHOULD HOLD 64 CHARACTERS.
:PROBABLE FAULTY LOGIC: M7285 (D1-7) E32, E17, E22 (D2-2) E5, E1
*****

```

```

:
:      INITIALIZE
:      DEVICE 'CSR' REGISTER
:
:      SET:
TST50: JSR      PC,      @#INITD ;BIT2 = MAINTENANCE
:BIT3 = CLEAR MOS

```

```

3019
3020
3021
3022
3023
3024 012062 012777 177777 167234
3025 012070 012700 000100
3026 012074 017701 167220
3027 012100 100375
3028 012102 000377 167220
3029 012106 032701 020000
3030 012112 001401
3031 012114 104001
3032
3033 012116 005300
3034 012120 001365
3035
3036 012122 013700 001346
3037 012126 017701 167166
3038 012132 100375
3039 012134 105305
3040 012136 001376
3041 012140 017701 167154
3042 012144 100401
3043 012146 104001
3044
3045 012150 005300
3046 012152 001370
3047
3048
3049
3050 012154 105701
3051 012156 100401
3052 012160 104001
3053
3054 012162 022701 100605
3055 012166 001401
3056 012170 104001
3057
3058
3059
3060
3061
3062
3063
3064
3065 012172 000377 167130
3066 012176 013700 001346
3067 012202 105305
3068 012204 001376
3069 012206 017701 167106
3070 012212 032701 020000
3071 012216 001003
3072 012220 005300
3073 012222 001367
3074 012224 104001

;WAIT FOR MOS TO CLEAR
;BIT8 = MASTER XMTR SCAN ENB
SET:
;BIT0 = RECEIVER ENABLE
;TRANS CONTROL BIT, ALL LINES
;SET UP COUNTER - 64, CHAR FI/FO BUFF
;SAVE AND WAIT FOR TRANS READY
;TRANSMIT LINE # ON LINE
;CHECK FI/FO OVERRUN
;BRANCH IF OK
;FI/FO OVERRUN TOO SOON
;R1=CONTENTS OF CSR
;COUNT DOWN
1$: MOV #177777,@TCR
MOV #100, R0
MOV @CSR, R1
BPL 1$
SWAB @TBUF
BIT #BIT13, R1
BEQ .+4
HLT+1
2$: MOV TIMER, R0
MOV @CCR, R1
BPL 2$
3$: DECB R5
BNE 3$
MOV @CSR, R1
BMI .+4
HLT+1
DEC R0
BNE 1$
;SET UP TIMER
;WAIT FOR XMTR READY
;SHORT WAIT LOOP
;SAVE CSR FOR THE RECORD
;BRANCH IF TRANS READY
;TRANS READY MISTERIOUSLY DISAPPEARED
;R1=CONTENTS OF CSR
;TIME 3 CHARACTER LENGTHS
;BRANCH IF MORE TIME
;FI/FO SHOULD NOW BE FULL
TSTB R1
BMI .+4
HLT+1
CMP #100605,R1
BEQ .+4
HLT+1
;CHECK THAT DONE IS SET
;BRANCH IF OK
;DONE DIDN'T COME UP!
;R1 = CONTENTS OF CSR
;CHECK THAT FI/FO NOT OVERRUN
;BRANCH IF OK
;FI/FO OVERRUN SET
;OR SOME OTHER CSR ERROR
;R1=CONTENTS OF CSR
*****
;TEST 50A: TEST THAT FI/FO OVERRUN COMES UP WHEN 65TH CHARACTER
; IS RECEIVED WITHOUT READING FI/FO
*****
T50A: SWAB @TBUF
MOV TIMER, R0
DECB R5
BNE 11$
MOV @CSR,R1
BIT #BIT13,R1
BNE 12$
DEC R0
BNE 11$
HLT+1
;SEND 65TH CHARACTER
;SET UP TIMER
;SHORT WAIT LOOP
;SAVE CSR
;CHECK FI/FO OVERRUN
;BRANCH WHEN SET
;TIMER
;BRANCH IF MORE TIME
;FI/FO OVERRUN DIDN'T COME UP

```

```

3075
3076 012226 022701 120605      12$:  CMP      #120605,R1      ;R1 = CONTENTS OF CSR
3077 012232 001401              BEQ      .+4          ;CHECK TOTAL CSR
3078 012234 104001              HLT+1        ;BRANCH IF OK
3079                                     ;SOMETHING IN CSR FOULED UP
3080                                     ;R1=CONTENTS OF CSR
3081
3082 :*****
3083 :TEST 50B:  TEST THAT READING THE RECEIVER BUFFER CAUSES FI/FO
3084 :           OVERRUN TO CLEAR.
3085 :           NOTE:  BECAUSE OF TIMING OF THE FI/FO, FI/FO OVERRUN CAN COME
3086 :                   BACK UP AFTER READING ONE CHARACTER, SO A SECOND MUST
3087 :                   BE READ TO INSURE THAT FI/FO OVERRUN IS CLEAR.
3088 :*****
3089 012236 012700 000002      T50B:  MOV      #2,      R0      ;SET UP COUNTER - 2 CHARACTERS
3090 012242 017701 167054      21$:  MOV      @RBUF, R1      ;CHECK AND SAVE FIRST CHAR IN FI/FO
3091 012246 100401              BMI      .+4          ;BRANCH IF CHAR PRESENT
3092 012250 104001              HLT+1        ;CHARACTER PRESENT GONE!
3093
3094 012252 032701 070000              BIT      #070000,R1      ;CHECK RECEIVER ERRORS
3095 012256 001401              BEQ      .+4          ;BRANCH IF OK
3096 012260 104001              HLT+1        ;RECEIVER ERROR
3097                                     ;R1=CONTENTS OF RBUF
3098                                     ;BIT14=UART OVERRUN
3099                                     ;BIT13=FRAMMING ERROR
3100                                     ;BIT12=PARITY ERROR
3101
3102 012262 010102              MOV      R1,      R2      ;PUT LINE # IN R2
3103 012264 000302              SWAB      R2
3104 012266 042702 177760      BIC      #177760,R2
3105 012272 120102              CMPB     R1,      R2      ;CHECK DATA (=LINE#)
3106 012274 001401              BEQ      .+4          ;BRANCH IF OK
3107 012276 104001              HLT+1        ;WRONG DATA RECEIVED
3108                                     ;R1=FI/FO DATA
3109                                     ; (DATA SHOULD=LINE#)
3110 012300 005300      22$:  DEC      R0          ;COUNT CHARACTERS
3111 012302 001403              BEQ      24$        ;BRANCH WHEN DONE
3112 012304 105305      23$:  DECB     R5          ;SHORT WAIT LOOP - GIVE FI/FO TIME
3113 012306 001376              BNE      23$
3114 012310 000754              BR       21$
3115                                     ;GO READ ANOTHER
3116 012312 017701 167002      24$:  MOV      @CSR,   R1      ;SAVE CSR
3117 012316 022701 100605      CMP      #100605,R1      ;CHECK THAT FI/FO OVERRUN CLEARED
3118 012322 001401              BEQ      .+4          ;BRANCH IF OK
3119 012324 104001              HLT+1        ;FI/FO OVERRUN DIDN'T CLR
3120                                     ;OR SOMEOTHER CSR PROBLEM
3121                                     ;R1=CONTENTS OF CSR
3122
3123 :*****
3124 :TEST 50C:  TEST THAT FI/FO OVERRUN INTERRUPT
3125 :           DOESN'T OCCUR WHEN THE PROCESSOR IS AT LEVEL 5
3126 :*****
3127
3128
3129 012326 042737 000340 177776      T50C:  BIC      #340,   @#PS      ;CLEAR PSW
3130 012334 052737 000240 177776      BIS      #240,   @#PS      ;SET PROCESSOR TO LEVEL 5

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3131	012342	012777	012432	166760	MOV	#32\$, @RCVVEC	:SET UP RECEIVER INTERRUPT VEC
3132	012350	012777	000340	166754	MOV	#340, @RCVLVL	
3133	012356	052777	010000	166734	BIS	#BIT12, @CSR	:SET STATUS ENABLE
3134	012364	017701	166730		MOV	@CSR, R1	:SAVE CSR
3135	012370	022701	110605		CMP	#110605, R1	:CHECK CSR
3136	012374	001401			BEQ	+.4	
3137	012376	104001			HLT+1		:CSR ERROR
3138							:R1=CONTENTS OF CSR
3139	012400	000377	166722		SWAB	@TBUF	:SEND LINE #
3140	012404	005777	166710	30\$:	TST	@CSR	:WAIT FOR TRANSMITTER READY
3141	012410	100375			BPL	30\$	
3142	012412	000377	166710		SWAB	@TBUF	:SEND LINE #
3143	012416	017701	166676	31\$:	MOV	@CSR, R1	:SAVE CSR
3144	012422	032701	020000		BIT	#BIT13, R1	:WAIT FOR FI/FO OVERRUN
3145	012426	001773			BEQ	31\$	
3146	012430	000410			BR	33\$	:SKIP ISR
3147							
3148	012432	017701	166662	32\$:	MOV	@CSR, R1	:SAVE CSR
3149	012436	104001			HLT+1		:INTERRUPT OCCURRED AT LEVEL 5
3150	012440	005777	166656		TST	@RBUF	:POP ONE CHARACTER
3151	012444	012716	012456		MOV	#34\$, (SP)	:RESET RETURN ADDRESS
3152	012450	000002			RTI		:RETURN
3153							
3154	012452	012700	000002	33\$:	MOV	#2, R0	:SET UP COUNTER - 2 CHARACTERS
3155	012456	017701	166640	34\$:	MOV	@RBUF, R1	:READ ONE CHARACTER
3156	012462	100401			BMI	+.4	:BRANCH IF CHARACTER PRESENT
3157	012464	104001			HLT+1		
3158							
3159							
3160	012466	032701	070000		BIT	#70000, R1	:CHECK ERRORS
3161	012472	001401			BEQ	+.4	
3162	012474	104001			HLT+1		
3163							
3164	012476	010102			MOV	R1, R2	:DUP DATA
3165	012500	000302			SWAB	R2	
3166	012502	042702	177760		BIC	#177760, R2	:CLR ALL BUT LINE #
3167	012506	120102			CMPB	R1, R2	:CHECK DATA
3168	012510	001401			BEQ	+.4	
3169	012512	104001			HLT+1		
3170							
3171	012514	005300			DEC	R0	:COUNT CHARACTERS
3172	012516	003403			BLE	36\$	:BRANCH IF DONE
3173	012520	105305		35\$:	DECB	R5	:SHORT WAIT LOOP
3174	012522	001376			BNE	35\$	
3175	012524	000754			BR	34\$	:GO READ ANOTHER CHARACTER
3176							
3177	012526	017701	166566	36\$:	MOV	@CSR, R1	:SAVE CSR
3178	012532	022701	110605		CMP	#110605, R1	:CHECK THAT FI/FO OVERRUN CLEARED
3179	012536	001401			BEQ	+.4	:BRANCH IF OK
3180	012540	104001			HLT+1		:FI/FO OVERRUN DIDN'T CLR
3181							:OR SOMEOTHER CSR PROBLEM
3182							:R1=CONTENTS OF CSR
3183							
3184							
3185							
3186							

;*****
 ;TEST 50D: TEST THAT FI/FO OVERRUN INTERRUPT
 ; OCCURS WHEN PROCESSOR IS AT LEVEL 4

```

3187
3188
3189 012542 042737 000340 177776 T50D: BIC #340, @#PS ;CLEAR PROCESSOR LEVEL
3190 012550 052737 000200 177776 BIS #200, @#PS ;SET PROCESSOR TO LEVEL 4
3191 012556 012777 012642 166544 MOV #42$, @RCVVEC ;SET UP RECEIVER INTERRUPT VEC
3192 012564 017701 166530 MOV @CSR, R1 ;SAVE CSR
3193 012570 022701 110605 CMP #110605, R1 ;CHECK CSR
3194 012574 001401 BEQ .+4
3195 012576 104001 HLT+1
3196
3197 012600 000377 166522
3198 012604 005777 166510 40$: SWAB @TBUF ;SEND LINE #
3199 012610 100375 TST @CSR ;WAIT FOR TRANSMITTER READY
3200 012612 000377 166510 BPL 40$
3201 012616 017701 166476 41$: SWAB @TBUF ;SEND LINE #
3202 012622 032701 020000 MOV @CSR, R1 ;SAVE CSR
3203 012626 001773 BIT @BIT13, R1 ;WAIT FOR FI/FO OVERRUN
3204 012630 104001 BEQ 41$
3205 HLT+1 ;INTERUPT DIDN'T OCCURE WHEN OVERRUN SET
3206 012632 052777 000010 166460 BIS #BIT3, @CSR ;R1 = CONTENTS OF CSR
3207 012640 000470 BR 45$ ;CLEAR MOS
3208 ;SKIP TO THE END
3209 012642 017701 166452 42$: MOV @CSR, R1 ;SAVE CSR
3210 012646 022701 130605 CMP #130605, R1 ;CHECK CSR
3211 012652 001401 BEQ .+4 ;BRANCH IF OK
3212 012654 104001 HLT+1 ;CSR ERROR
3213 ;R1 = CONTENTS OF CSR
3214 012656 012700 000101 43$: MOV #101, RC ;SET UP COUNTER - 65 CHARACTERS
3215 012662 017701 166434 MOV @RBUF, R1 ;READ ONE CHARACTER
3216 012666 100401 BMI .+4 ;BRANCH IF CHARACTER PRESENT
3217 012670 104001 HLT+1
3218
3219 012672 032701 070000 BIT #70000, R1 ;CHECK ERRORS
3220 012676 001401 BEQ .+4
3221 012700 104001 HLT+1
3222
3223 012702 010102 MOV R1, R2 ;DUP DATA
3224 012704 000302 SWAB R2
3225 012706 042702 177760 BIC #177760, R2 ;CLR ALL BUT LINE #
3226 012712 120102 CMPB R1, R2 ;CHECK DATA
3227 012714 001401 BEQ .+4
3228 012716 104001 HLT+1
3229
3230 012720 017701 166374 MOV @CSR, R1 ;SAVE CSR
3231 012724 005300 DEC R0
3232 012726 001420 BEQ 46$ ;GET OUT IF ALL CHAR'S READ
3233 012730 022700 000100 CMP #100, R0 ;CHECK FOR FIRST CHAR READ
3234 012734 001752 BEQ 43$ ;SKIP CSR CHECK ON FIRST CHAR
3235 012736 020037 001356 CMP R0, COUNT ;IF CHAR'S LEFT IN SILO IS LESS THEN
3236 ;ALARM LEVEL, DONE WILL GO AWAY.
3237 012742 002405 BLT 44$
3238 012744 022701 110605 CMP #110605, R1 ;CHECK CSR
3239 012750 001401 BEQ .+4
3240 012752 104001 HLT+1
3241
3242 012754 000742 BR 43$
  
```

```

3243
3244 012756 022701 110405      44$:  CMP      #110405,R1      ;CHECK CSR
3245 012762 001401              BEQ      .+4          ;BRANCH IF OK
3246 012764 104001              HLT+1        ;DONE DIDN'T GO AWAY
3247                                ;OR OTHER CSR ERROR
3248 012766 000735              BR      43$
3249
3250 012770 017701 166326      46$:  MOV      @RBUF, R1      ;READ A CHARACTER
3251 012774 100001              BPL      .+4          ;BRANCH IF NO CHAR. PRES
3252 012776 104001              HLT+1        ;CHAR. PRESENT.
3253
3254 013000 013777 001332 166322  MOV      RCVLVL, @RCVVEC
3255 013006 012777 000004 166316  MOV      #IOT,  @RCVVLV
3256 013014 012716 013022          MOV      #45$,  (SP)      ;RESET RETURN ADDRESS ON STACK
3257 013020 000002              RTI              ;RESTORE PSW
3258 013022 005077 166276      45$:  CLR      @TCR
3259 013026 005077 166266          CLR      @CSR
3260 013032 042737 000340 177776  BIC      #340,  @MPS      ;LOWER PROCESSOR STATUS
3261
3262 013040 104400              SCOPE
3263
3264
3265
3266
3267
3268
3269
3270 013042 012777 000414 166250  TST51:  MOV      #414,  @CSR      ;BIT2 = MAINTENANCE
3271                                ;BIT3 = CLEAR MOS
3272                                ;BIT8 = TRANS SCAN ENABLE
3273 013050 032777 000020 166242  10$:  BIT      #BIT4,  @CSR      ;WAIT FOR MOS TO CLEAR
3274 013056 001374              BNE      10$
3275 013060 005001              CLR      R1
3276 013062 012777 000001 166234  MOV      #1,    @TCR      ;SET UP LINE COUNTER
3277 013070 017702 166274      LOP51:  MOV      @CSR,  R2      ;TRANS CONTROL, LINE 0
3278 013074 100375              BPL      LOP51      ;WAIT FOR TRANS READY
3279 013076 012777 000001 166222  MOV      #1,    @TBUF      ;SEND #1
3280 013104 017702 166210      2$:  MOV      @CSR,  R2      ;WAIT FOR TRANS READY
3281 013110 100375              BPL      2$
3282 013112 012777 000002 166206  MOV      #2,    @TBUF      ;SEND #2
3283 013120 013700 001346          MOV      TIMER, R0      ;SET UP TIMER
3284 013124 105305              3$:  DECB     R5          ;SHORT TIME LOOP
3285 013126 001376              BNE      3$
3286 013130 017702 166164          MOV      @CSR,  R2      ;SAVE CSR FOR THE RECORD
3287 013134 000400              BR      .+2          ;NOP FOR TIMING
3288 013136 005300              DEC     R0          ;TIMER COUNT
3289 013140 001371              BNE      3$
3290 013142 005277 166152          INC     @CSR      ;SET RECEIVER ENABLE
3291 013146 017702 166146          MOV      @CSR,  R2      ;SAVE CSR
3292 013152 032702 000001          BIT      #BIT0,  R2      ;CHECK RECEIVER ENABLE
3293 013156 001001              BNE      .+4          ;BRANCH IF OK
3294 013160 104002              HLT+2        ;RECEIVER ENABLE FAILED TO SET
3295
3296
3297 013162 013700 001346          4$:  MOV      TIMER,R0      ;R1 = LINE #
3298 013166 105305              DECB     R5          ;R2 = CONTENTS OF CSR
                                ;SET UP TIMER
                                ;WAIT SHORT TIME LOOP

```

```

;*****
;TEST 51:      TEST THAT UART OVERRUN IS DETECTED ON ALL LINES
;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E3, E1; M7279; M7280
;*****

```

3299	013170	001376			BNE	4\$			
3300	013172	017702	166124		MOV	@RBUF,R2			;CHECK FOR CHAR PRES
3301	013176	100403			BMI	5\$			;OK
3302	013200	005300			DEC	R0			;TIMER COUNT
3303	013202	001371			BNE	4\$			
3304	013204	104002			HLT+2				;NO CHARACTER PRESENT
3305									;R1 = LINE #
3306									;R2 = CONTENTS OF RBUF
3307	013206	032702	040000	5\$:	BIT	#BIT14,R2			;CHECK FOR UART OVERRUN
3308	013212	001001			BNE	.+4			;BRANCH IF OK
3309	013214	104002			HLT+2				;UART OVERRUN MISSING
3310									;R1 = LINE #
3311									;R2 = CONTENTS OF RBUF
3312	013216	122702	000002		CMPS	#2,R2			;CHECK THE DATA
3313	013222	001401			BEQ	.+4			;BRANCH IF OK
3314	013224	104002			HLT+2				;DATA ERROR - 3RD CHAR OVERRUNS 2ND
3315									;R1 = LINE #
3316									;R2 = CONTENTS OF RBUF
3317	013226	010203			MOV	R2,R3			;DUP DATA
3318	013230	000303			SWAB	R3			
3319	013232	042703	177700		BIC	#177700,R3			;MASK ALL BIT LINE #, ERROR BITS
3320	013236	020103			CMP	R1,R3			;CHECK LINE #, ERRORS
3321	013240	001401			BEQ	.+4			;BRANCH IF OK
3322	013242	104002			HLT+2				;LINE # OR OTHER RBUF ERROR
3323									;R1 = LINE #
3324									;R2 = CONTENTS OF RBUF
3325	013244	017702	166052	7\$:	MOV	@RBUF,R2			;CHECK FOR MORE DATA
3326	013250	100002			BPL	8\$			;BRANCH IF OK
3327	013252	104002			HLT+2				;EXTRA DATA IN FI/FO!
3328									;R1 = LINE #
3329									;R2 = CONTENTS OF RBUF
3330	013254	000773			BR	7\$			
3331									
3332	013256	005377	166036	8\$:	DEC	@CSR			;CLEAR RECEIVER ENABLE
3333	013262	017702	166032		MOV	@CSR,R2			;SAVE CSR
3334	013266	022702	100404		CMP	#100404,R2			;CHECK CSR
3335	013272	001401			BEQ	.+4			;BRANCH IF OK
3336	013274	104002			HLT+2				;CSR ERROR
3337									;R1 = LINE NUMBER
3338									;R2 = CONTENTS OF CSR
3339	013276	005201			INC	R1			;COUNT LINES
3340	013300	006377	166020		ASL	@TCR			;GO TO NEXT LINE
3341	013304	103271			BCC	LOP51			;BRANCH BACK IF MORE LINES
3342									
3343	013306	005077	166006		CLR	@CSR			
3344									
3345	013312	104400							
3346					SCOPE				
3347									

 ;TEST 52: TEST BITS OF BCSR FOR READ/WRITE CAPABILITY
 ;PROBABLE FAULTY LOGIC: M7285 (D2-2) E5, E1, (D2-3) E16, E2, E19, E35

3353	013314	012777	002010	165776	TST52:	MOV	#002010,@CSR		;SET CSR
3354	013322	012777	177777	165774		MOV	#177777,@BCSR		;SET ALL BITS OF BCSR

3355	013330	017701	165770	MOV	@BCSR, R1	;CHECK AND SAVE BCSR
3356	013334	022701	177777	CMP	#177777, R1	;CHECK THAT ALL THE BITS ARE SET
3357	013340	001401		BEQ	+.4	;BRANCH IF OK
3358	013342	104001		HLT+1		;BIT(S) OF BCSR FAILED TO SET
3359						
3360	013344	005077	165754	CLR	@BCSR	;CLEAR BCSR
3361	013350	017701	165750	MOV	@BCSR, R1	;CHECK THAT IT CLEARED AND SAVE
3362	013354	001401		BEQ	+.4	;BRANCH IF CLR
3363	013356	104001		HLT+1		;BIT(S) OF BCSR FAILED TO CLEAR

SCOPE

 :TEST 53: TEST THAT LINE0 CAN TRANSMIT AND RECEIVE A BREAK
 :ALSO CHECKS FRAMING ERROR(RBUF BIT13)
 :ALSO CHECKS PARITY ERROR(RBUF BIT12)
 :IF ODD PARITY IS SELECTED
 :PROBABLE FAULTY LOGIC: M7285 (D2-2) E5, E1, (D2-3) E16, E2, E'9, E35
 :*****

3375	013362	004737	014550	TST53:	JSR	PC,	@INITA	;INITIALIZE
3376								;BIT2 = MAINTENANCE
3377								;BIT3 = CLEAR MOS
3378								;BIT10= R/W BCSR
3379								;WAIT FOR MOS TO CLEAR
3380								;BIT0 = RECEIVER ENABLE
3381	013366	012777	000001	165730	MOV	#1,	@BCSR	;SEND BREAKS, LINE 0
3382	013374	013700	001346		MOV	TIMER,	R0	;SET UP TIMER
3383	013400	105305		1\$:	DECB	R5		;SHORT WAIT LOOP
3384	013402	001376			BNE	1\$		
3385	013404	017701	165712		MOV	@RBUF,	R1	;SAVE CHAR PRES
3386	013410	100403			BMI	2\$		;BRANCH WHEN FOUND
3387	013412	005200			INC	R0		;WAIT A WHILE
3388	013414	001371			BNE	1\$		
3389	013416	104001			HLT+1			;CHAR PRES NEVER CAME UP
3390								;R1=CONTENTS OF RBUF
3391								
3392	013420	032701	020000	2\$:	BIT	#020000,R1		;CHECK FOR FRAMING ERROR
3393	013424	001001			BNE	+.4		;BRANCH IF OK
3394	013426	104001			HLT+1			;FRAMING ERROR NOT UP
3395								;R1=CONTENTS OF RBUF
3396	013430	133737	001366	001300	BITB	DJPAR, PARITY		;CHECK ODD PARITY FLAG
3397	013436	001404			BEQ	3\$		;BRANCH IF NOT
3398	013440	032701	010000		BIT	#010000,R1		;CHECK PARITY ERROR
3399	013444	001005			BNE	4\$		
3400	013446	104001			HLT+1			;ODD PARITY SHOULD CAUSE PARITY ERROR
3401								;R1=CONTENTS OF RBUF
3402								
3403	013450	032701	010000	3\$:	BIT	#010000,R1		;CHECK PARITY ERROR
3404	013454	001401			BEQ	+.4		;BRANCH IF OK
3405	013456	104001			HLT+1			;EVEN PARITY OR NO PARITY
3406								;SHOULDN'T CAUSE PARITY ERROR
3407								;R1=CONTENTS OF RBUF
3408	013460	032701	040000	4\$:	BIT	#040000,R1		;CHECK UART OVERRUN
3409	013464	001401			BEQ	+.4		;BRANCH IF OK
3410	013466	104001			HLT+1			;UART OVERRUN SET!!

3411									
3412	013470	032701	007400		BIT	#007400,R1			;R1=CONTENTS OF RBUF
3413	013474	001401			BEQ	.+4			;CHECK LINE #
3414	013476	104001			HLT+1				;BRANCH IF OK
3415									;WRONG LINE# IN FI/FO
3416	013500	105701			TSTB	R1			;R1=CONTENTS OF RBUF
3417	013502	001401			BEQ	.+4			;CHECK DATA
3418	013504	104001			HLT+1				;BRANCH IF OK
3419									;WRONG DATA RECEIVED
3420									;R1=CONTENTS OF RBUF
3421	013506	017701	165610		MOV	@RBUF, R1			;READ FI/FO AGAIN
3422	013512	100001			BPL	.+4			;BRANCH IF OK
3423	013514	104001			HLT+1				;EXTRA CHAR IN FI/FO
3424									;R1 = CONTENTS OF RBUF
3425	013516	005077	165602		CLR	@BCSR			;CLEAR BREAK CONTROL REG
3426	013522	105305		5\$:	DECB	R5			;SHORT WAIT LOOP-REGISTER A MARK
3427	013524	001376			BNE	5\$			
3428									
3429	013526	104400			SCOPE				
3430									
3431									
3432									
3433									
3434									
3435									
3436									
3437									
3438									
3439									

 :TEST 54: TEST THAT EACH LINE CAN TRANSMIT AND RECEIVE A BREAK
 : ALSO CHECKS FRAMING ERROR(RBUF BIT13)
 : ALSO CHECKS PARITY ERROR(RBUF BIT12)
 : IF ODD PARITY IS SELECTED
 :PROBABLE FAULTY LOGIC: M7285 (D2-2) E5, E1, (D2-3) E16, E2, E19 E35
 :*****

3440	013530	004737	014550	TST54:	JSR	PC,	@INITA		;INITIALIZE
3441									;BIT2 = MAINTENANCE
3442									;BIT3 = CLEAR MOS
3443									;BIT10= R/W BCSR
3444									;WAIT FOR MOS TO CLEAR
3445									;BITC = RECEIVER ENABLE
3446	013534	005001			CLR	R1			;SET UP LINE COUNTER
3447	013536	012704	000001		MOV	#1, R4			;SET UP LINE MARKER
3448	013542	013700	001346	LOP54:	MOV	TIMER, R0			;SET UP TIMER
3449	013546	050477	165552		BIS	R4, @BCSR			;SET BREAK CONTROL BIT, LINE # IN R1
3450	013552	105305		1\$:	DECB	R5			;SHORT WAIT LOOP
3451	013554	001376			BNE	1\$			
3452	013556	017702	165540		MOV	@RBUF, R2			;READ RBUF FOR CHAR PRES
3453	013562	100403			BMI	7\$			;BRANCH WHEN FOUND
3454	013564	005200			INC	R0			;WAIT A WHILE
3455	013566	001371			BNE	1\$			
3456	013570	104002			HLT+2				;CHAR PRES NEVER CAME UP
3457									;R1 = LINE #
3458									;R2 = CONTENTS OF RBUF
3459									
3460	013572	032702	020000	2\$:	BIT	#020000,R2			;CHECK FOR FRAMING ERROR
3461	013576	001001			BNE	.+4			;BRANCH IF OK
3462	013600	104002			HLT+2				;FRAMING ERROR NOT UP
3463									;R1 = LINE #
3464									;R2 = CONTENTS OF RBUF
3465									
3466	013602	010103			MOV	R1, R3			;GET LINE #

3467	013604	006203			ASR	R3		;/4 TO GET RID OF BITS 1 & 0
3468	013606	006203			ASR	R3		
3469	013610	006303			ASL	R3		;SHIFT BACK FOR EVEN ADDR OF PARITY TABLE
3470	013612	133763	001366	001300	BITB	DJPAR,PARITY(3)		;CHECK ODD PARITY FLAG
3471	013620	001404			BEQ	3\$		;BRANCH IF NOT
3472	013622	032702	010000		BIT	#010000,R2		;CHECK PARITY ERROR
3473	013626	001005			BNE	4\$		
3474	013630	104002			HLT+2			;ODD PARITY SHOULD CAUSE PARITY ERROR
3475								;R1 = LINE #
3476								;R2 = CONTENTS OF RBUF
3477								
3478	013632	032702	010000		3\$: BIT	#010000,R2		;CHECK PARITY ERROR
3479	013636	001401			BEQ	4\$		;BRANCH IF OK
3480	013640	104002			HLT+2			;EVEN PARITY OR NO PARITY
3481								;SHOULDN'T CAUSE PARITY ERROR
3482								;R1 = LINE #
3483								;R2 = CONTENTS OF RBUF
3484	013642	032702	040000		4\$: BIT	#040000,R2		;CHECK UART OVERRUN
3485	013646	001401			BEQ	+\$		;BRANCH IF OK
3486	013650	104002			HLT+2			;UART OVERRUN SET!
3487								;R1 = LINE #
3488								;R2 = CONTENTS OF RBUF
3489	013652	010203			MOV	R2, R3		;DUP DATA
3490	013654	000303			SWAB	R3		;LINE # IN LOW BYTE
3491	013656	042703	177760		BIC	#177760,R3		;MASK ALL BUT LINE #
3492	013662	020103			CMP	R1, R3		;CHECK FOR RIGHT LINE #
3493	013664	001401			BEQ	+\$		;BRANCH IF OK
3494	013666	104002			HLT+2			;WRONG LINE# IN FI/FO
3495								;R1 = LINE #
3496								;R2 = CONTENTS OF RBUF
3497								
3498								
3499	013670	105702			TSTB	R2		;CHECK DATA
3500	013672	001401			BEQ	+\$		;BRANCH IF OK
3501	013674	104002			HLT+2			;WRONG DATA RECEIVED
3502								;R1 = LINE #
3503								;R2 = CONTENTS OF RBUF
3504	013676	017702	165420		MOV	@RBUF, R2		;READ FI/FO AGAIN
3505	013702	100001			BPL	+\$		;BRANCH IF OK
3506	013704	104002			HLT+2			;EXTRA CHAR IN FI/FO
3507								;R1 = LINE #
3508								;R2 = CONTENTS OF RBUF
3509	013706	005077	165412		CLR	@BCSR		;CLEAR BREAK CONTROL REG
3510	013712	005201			INC	R1		;COUNT LINES
3511	013714	006304			ASL	R4		;UPDATE LINE MARKER
3512	013716	103311			BCC	LOP54		;BRANCH IF MORE LINES
3513								
3514	013720	005077	165374		CLR	@CSR		;CLEAR CSR
3515	013724	104400			SCOPE			
3516								
3517	013726	012737	000002	015252	MOV	#2, TIMES		
3518								
3519								
3520								
3521								
3522								

 ;TEST 55: TEST THAT RESET CLEARS ALL BUFFERS
 ; NOTE: THE FI/FO BUFFER IS NOT COMPLETELY CLEARED
 ; BY RESET; ONLY CHARACTER PRESENT IS CLEARED.

```

3523      ;PROBABLE FAULTY LOGIC. M7285 (D2-8) E13
3524      ;*****
3525
3526 013734 052737 000340 177776 TST55: BIS #340,@#PS ;SET PROCESSOR TO LEVEL 7
3527 013742 012777 177777 165354      MOV #177777,@TCR ;SET ALL TCR BITS
3528 013750 012777 052507 165342      MOV #052507,@CSR ;SET ALL R/W BITS OF CSR
3529 013756 012777 177777 165340      MOV #177777,@BCSR ;SET ALL BREAK CONTROL BITS (SEND BREAKS)
3530      ;NOTE: ALL LINES SHOULD BE SENDING BREAKS, BUT NONE SHOULD BE RECEIVING
3531      ; BECAUSE THE HALF DUPLEX BIT IS SET
3532 013764 012777 177777 165334      MOV #177777,@TBUF ;LOADING TRANS BUFF WHEN BREAK BIT SET
3533      ; SHOULD DO NOTHING
3534 013772 000005      RESET ;CLEAR THE WORLD
3535 013774 013737 001320 014004      MOV CSR,1$ ;CHECK CSR AND SAVE
3536 014002 013701      MOV @PC)+,R1
3537 014004 000000 1$: 000000
3538 014006 001401      BEQ .+4
3539 014010 104001      HLT+1
3540
3541 014012 017701 165306      MOV @TCR,R1 ;CHECK TCR AND SAVE
3542 014016 001401      BEQ .+4
3543 014020 104001      HLT+1
3544
3545 014022 017701 165276      MOV @BCSR,R1 ;CHECK BCSR AND SAVE
3546 014026 001401      BEQ .+4
3547 014030 104001      HLT+1
3548
3549 014032 017701 165264      MOV @RBUF,R1 ;CHECK RBUF AND SAVE
3550 014036 100001      BPL .+4
3551 014040 104001      HLT+1
3552
3553 014042 017701 165260      MOV @TBUF,R1 ;CHECK TBUF AND SAVE
3554 014046 001401      BEQ .+4
3555 014050 104001      HLT+1
3556
3557 014052 104400      SCOPE
3558
3559
3560      ;*****
3561      ;TEST 56: SEND A BINARY COUNT PATTERN ON EACH LINE
3562      ;PROBABLE FAULTY LOGIC: COULD BE ALMOST ANYWHERE!
3563      ;*****
3564
3565 014054 005001      TST56: CLR R1 ;SET UP LINE COUNTER
3566 014056 012703 100000      MOV #100000,R3 ;SET UP RCV DATA
3567 014062 012777 014260 165240      MOV #ISR56,@RCVVEC ;SET UP RECEIVER INTERRUPT VECTOR
3568 014070 012777 000240 165234      MOV #240,@RCVLVL
3569 014076 042737 000340 177776      BIC #340,@#PS ;CLEAR PROCESSOR PRIORITY
3570 014104 052737 000200 177776      BIS #200,@#PS ;SET PRIORITY TO 4
3571 014112 012700 000001      MOV #1,R0 ;SET UP LINE MARKER
3572 014116 012777 010514 165174      MOV #010514,@CSR ;BIT2 = MAINTENANCE
3573      ;BIT3 = CLR MOS
3574      ;BIT6 = RECEIVER INTERRUPT ENB
3575      ;BIT8 = TRANS SCAN ENABLE
3576      ;BIT12= STATUS ENABLE
3577 014124 032777 000020 165166 10$: BIT #BIT4, @CSR ;WAIT FOR MOS TO CLEAR
3578 014132 001374      BNE 10$

```

3579	014134	052777	000001	165156		BIS	#1,@CSR		:SET THE RCV EN BIT
3580	014142	005004			1\$:	CLR	R4		:SET FOR OUTPUT DATA
3581	014144	010077	165154			MOV	R0,@TCR		:TRANS CONTROL, ONE LINE AT A TIME
3582	014150	005777	165144		2\$:	TST	@CSR		:WAIT FOR TRANS READY
3583	014154	100375				BPL	2\$		
3584	014156	010477	165144			MOV	R4,@TBUF		:SEND DATA
3585	014162	105204				INCB	R4		:BINARY COUNT
3586	014164	123704	001360			CMPB	SUM,R4		:MAKE SURE THE CORECT NUMBER IS OUTPUTED
3587	014170	001367				BNE	2\$		
3588	014172	147704	165166		3\$:	BICB	@DJLEN,R4		:SET FOR MAX. RECIEVER COUNT
3589	014176	120403				CMPB	R4,R3		:WAIT FOR RECEIVER DONE
3590	014200	001374				BNE	3\$		
3591	014202	017702	165112			MOV	@CSR,R2		:SAVE CSR
3592	014206	022702	110505			CMP	#1'0505,R2		:CHECK CSR
3593	014212	001401				BEQ	.+4		:BRANCH IF OK
3594	014214	104002				HLT+2			:CSR ERROR
3595									:R1=LINE #
3596									:R2=CONTENTS OF CSR
3597	014216	017702	165100			MOV	@RBUF,R2		:CHECK CHARACTER PRESENT
3598	014222	100001				BPL	.+4		:BRANCH IF OK
3599	014224	104002				HLT+2			:CHARACTER PRESENT SET!!
3600									:R1=LINE #
3601									:R2=CONTENTS OF CSR
3602	014226	105003				CLRB	R3		:RESET EXPECTED DATA
3603	014230	062703	000400			ADD	#400,R3		:UPDATE LINE # IN EXPECTED DATA
3604	014234	005201				INC	R1		:UPDATE LINE #
3605	014236	032701	000003			BIT	#3,R1		:CHECK FOR FOURTH LINE
3606	014242	001002				BNE	4\$		:BRANCH IF NOT
3607	014244	005237	001364			INC	DJLEN		:MOVE CHARACTER LENGTH POINTER
3608	014250	000241			4\$:	CLC			
3609	014252	006300				ASL	R0		:UPDATE LINE MARKER
3610	014254	103332				BCC	1\$		:BRANCH IF MORE
3611	014256	000416				BR	END56		:SKIP ISR
3612									
3613	014260	017702	165036		ISR56:	MOV	@RBUF,R2		:READ FIRST DATA
3614	014264	100401				BMI	11\$		:BRANCH IF CHARACTER PRESENT
3615	014266	104003				HLT+3			:INTERRUPT BUT NO CHAR PRESENT
3616									:R1=LINE #
3617									:R2=CONTENTS OF RBUF
3618									:R3=EXPECTED DATA
3619	014270	147703	165070		11\$:	BICB	@DJLEN,R3		:MASK CHAR. LENGTH
3620	014274	020203				CMP	R2,R3		:CHECK THE DATA
3621	014276	001401				BEQ	.+4		:BRANCH IF OK
3622	014300	104003				HLT+3			:DATA ERROR
3623									:R1=LINE #
3624									:R2=CONTENTS OF RBUF
3625									:R3=EXPECTED DATA
3626	014302	105203				INCB	R3		:UPDATE EXPECTED DATA
3627	014304	017702	165012			MOV	@RBUF,R2		:READ MORE DATA
3628	014310	100767				BMI	11\$		:BRANCH IF MORE
3629	014312	000002			12\$:	RTI			:RETURN
3630									
3631	014314	162737	000004	001364	END56:	SUB	#4,DJLEN		:RESET CHAR LENGTH POINTER
3632	014322	013777	001332	165000		MOV	RCV LVL,@RCVVEC		:RESTORE RECEIVER INT. VEC
3633	014330	012777	000004	164774		MOV	#101,@RCV LVL		
3634	014336	005077	164762			CLR	@TCR		:CLEAR TCR

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3635 014342 005077 164752 CLR SCOPE @CSR ;CLEAR CSR
3636 014346 104400
3637
3638 014350 012737 000020 015252 MOV #20, TIMES
3639 014356 023737 001362 00344 CMP DJUUT,UNITS ;CHECK FOR LAST UNIT
3640 014364 002004 BGE DONE ;BRANCH IF LAST UNIT
3641 014366 005037 001350 CLR ALMFLG ;CLEAR FLAG FOR NEXT UNIT
3642 014372 000137 002472 JMP RESTAR ;JUMP IF NOT
3643
3644 014376 DONE:
3645 014376 004737 017454 JSR PC, KBDINT
3646 014402 062737 000001 001316 ADD #1,PCNT+2 ;ADD 1 TO THE PASS COUNT
3647 014410 005537 001314 ADC PCNT ;MAKE IT DOUBLE PREC.
3648 014414 000004 016516 TYPE ,MEOP ;END OF PASS INDICATOR
3649 014420 032777 002000 164746 BIT #SW10,@SWR ;RING THE BELL?
3650 014426 001004 SNE 4$ ;NO!
3651 014430 000004 000007 TYPE ,BELL ;RING THE BELL
3652 014434 000004 000177 TYPE ,177 ;TYPE A FILLER FOR 11/05
3653 014440 013700 000042 4$: MOV @42,R0 ;GET MONITOR ADDRESS
3654 014444 001405 BEQ 3$ ;IF NONE
3655 014446 000005 RESET ;RESET AND
3656 014450 SENDAD -
3657 014450 004710 JSR 7,(0) ;GO TO MONITOR
3658 014452 000240 NOP ;SAVE ROOM
3659 014454 000240 NOP ;FOR
3660 014456 000240 NOP ;ACT11
3661 014460 000137 002472 3$: JMP RESTAR ;RETURN
3662
3663
3664
3665
3666
3667 014464 BRSET:
3668 014464 010046 MOV R0, -(SP) ; SAVE R0
3669 014466 010146 MOV R1, -(SP) ; SAVE R1
3670 014470 013700 001362 MOV DJUUT, R0 ; LOAD UP UUT DEVICE #
3671 014474 006100 ROL R0 ; MULT X 2 TO SAVE OFFSET
3672 014476 012701 017230 MOV #PRTBLE, R1 ; LOAD IN BASE OF TABLE
3673 014502 060100 ADD R1, R0 ; STORE LOCATION OF BR IN R0
3674 014504 011037 017220 MOV (R0), MASK ; SAVE BR FROM QUESTION
3675 014510 162737 000060 017220 SUB #60, MASK ; MASK= DECIMAL #(0 TO 7)
3676
3677 014516 013737 017220 017222 1$: MOV MASK, LEVEL ; CREATED FROM ASCII
3678 014524 006137 017220 ROL MASK ; STORE FOR ERROR PRINTOUT
3679 014530 006137 017216 ROL NOW ; ROTATE 5 TIMES TO
3680 014534 005337 017226 DEC CT ; CREATE BR LEVELS AS BELOW
3681 014540 001371 BNE 1$ ; COUNT TO 5
3682
3683
3684
3685 014542 012601 MOV (SP)+, R1 ; RELOAD R1
3686 014544 012600 MOV (SP)+, R0 ; RELOAD R0
3687
3688 014546 000207 RTS PC ; BACK TO MAIN CODE/ QUESTIONING
3689
3690 ; MASK AND NOW ARE LOADED.

```

```

3691      .
3692      .      INITIALIZATION ROUTINE
3693      .
3694      .      DEVICE CSR REGISTER
3695      .
3696      .      ON FAILURE:      REGISTER 0 CONTAINS ERROR ADDRESS
3697      .
3698      .      SET:
3699      .      BIT01 = HALF DUPLEX
3700      .      BIT02 = MAINTENANCE
3701      .      BIT03 = CLEAR MOS
3702      .      BIT06 = RECEIVER INTERRUPT ENABLE
3703      .      BIT08 = MASTER XMTR SCAN ENB
3704      .      BIT10 = R/W BCSR
3705      .
3706      .      WAIT FOR MOS TO CLEAR
3707      .      SET:
3708      .      BIT00 = RECEIVER ENABLE
3709      .
3710      .
3711      014550  012777  002014  164542  INITA:  MOV      #2014,@CSR      SET
3712      014556  000413              BR      INTR      ;BIT(S)2,3,10 THEN 0
3713      .
3714      014560  012777  000514  164532  INITB:  MOV      #514,@CSR      ;BIT(S)2,3,6,8 THEN 0
3715      014566  000407              BR      INTR
3716      .
3717      014570  012777  000416  164522  INITC:  MOV      #416,@CSR      ;BIT(S)1,2,3,8 THEN 0
3718      014576  000403              BR      INTR
3719      .
3720      014600  012777  000414  164512  INITD:  MOV      #414,@CSR      ;BIT(S)2,3,8 THEN 0
3721      .
3722      014606  005000              INTR:  CLR      R0
3723      .
3724      014610  005200              1$:      INC      R0      ;ANTIHANG
3725      014612  001004              BNE      2$      ;ROUTINE
3726      .
3727      014614  011600              MOV      (SP),R0      ;RECORD SUBROUTINE CALL RETURN
3728      014616  162700  000002              SUB      #2,R0      ;FORM CALL ADDRESS FOR DISPLAY
3729      .
3730      014622  104000              HLT
3731      .      ;BIT#4 OF DEVICE CSR FAILED TO CLEAR
3732      014624  032777  000020  164466  2$:      BIT      #BIT4,@CSR      ;TEST HAS MOS CLEARED
3733      014632  001366              BNE      1$      ;NO BRANCHES
3734      .
3735      014634  052777  000001  164456              B'5      #1,      @CSR      ;SET:
3736      014642  000207              RTS      PC      ;BIT00 RECEIVE ENABLE
3737      .      ;CONTINUE
3738      .

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3739
3740 014644 013701 001320 ALMCK: MOV CSR,R1 ;GET CSR ADDR INTO R1
3741 014650 012761 000001 000004 MOV #1,(R1) ;SET LINE 0 IN THE TCR
3742 014656 052711 000004 BIS #BIT2,(R1) ;SET THE MAINT BIT
3743 014662 005037 001356 CLR COUNT
3744 014666 005037 001360 CLR SUM
3745 014672 005037 001352 CLR TIMERA
3746 014676 012737 000200 001354 2$: MOV #200,TIMERB ;SET UP TIME CONSTANTS
3747 014704 005711 TST (R1) ;WAIT FOR TRANSFER READY BIT
3748 014706 100373 BPL 2$
3749 014710 112761 000377 000006 MOVB #377,6(R1) ;OUTPUT A CHAR TO TBUF
3750 014716 005237 001356 INC COUNT ;COUNT EACH CHAR
3751 014722 105711 1$: TSTB (R1) ;CHECK FOR DONE IN THE CSR
3752 014724 100405 BMI 3$ ;IF SET GET OUT OF THE LOOP
3753 014726 004537 015056 JSR R5,TIME ;GIVE DONE TIME TO SET
3754 014732 000773 BR 1$ ;RETURN TO TEST FOR DONE AGAIN
3755 014734 000760 BR 2$ ;RETURN TO OUTPUT ANOTHER CHAR
3756 014736 000742 BR ALMCK ;ERROR RETURN TRY AGAIN
3757 014740 042711 000001 3$: BIC #BIT0,(R1) ;TURN OFF RCV ENABLE
3758 014744 022737 000001 001356 CMP #1,COUNT ;IF SILO LEVEL SET FOR 1 THEN GET OUT
3759 014752 001414 BEQ 4$
3760 014754 063737 001356 001360 7$: ADD COUNT,SUM ;CONTINUE TO A COUNT OF 256
3761 014762 023727 001360 000377 CMP SUM,#377
3762 014770 002771 BLT 7$
3763 014772 001403 BEQ 10$
3764 014774 163737 001356 001360 SUB COUNT,SUM ;IF EQUAL USE IT
3765 015002 000403 10$: BR 11$ ;IF GREATER SUBTRACT 1 COUNT SO IT'S LESS
3766 015004 012737 000377 001360 4$: MOV #377,SUM ;ALL SET GET OUT
3767 015012 004737 017454 11$: JSR PC,KBDINT ;PUT SUM TO MAX VALUE
3768 015016 032777 010000 164350 BIT #SW12,@SWR ;GET THE SWITCH REGISTER
3769 015024 001413 BEQ 13$ ;PRINT ALARM LEVEL?
3770 015026 000004 016756 TYPE, MALARM ;NO
3771 015032 010105 MOV R1,TTY ;YES, PRINT CSR FIRST
3772 015034 004737 016042 JSR PC,PRINTR
3773 015040 000004 016676 TYPE, MSGDAS
3774 015044 013705 001356 MOV COUNT,TTY ;PRINT ALARM LEVEL
3775 015050 004737 016042 JSR PC,PRINTR
3776 015054 000207 13$: RTS PC
3777
3778
3779
3780 015056 105237 001352 TIME: INCB TIMERA ;INCREMENT THROUGH ONE WORD
3781 015062 001012 BNE 1$ ;GO TEST FOR DONE AGAIN
3782 015064 005337 001354 DEC TIMERB ;MAKE TIMERB LARGER IF FAST PROCESSOR
3783 015070 001007 BNE 1$
3784 015072 023727 001356 000022 CMP COUNT,#22 ;HAVE OUTPUTTED 18 TIMES
3785 015100 001002 BNE 2$ ;NO, GO OUTPUT ANOTHER CHAR
3786 015102 104001 HLT+1 ;YES,DONE DID NOT SET AFTER 18 OUTPUTS
3787
3788 015104 005725 TST (R5)+ ;R1 = CSR
3789 015106 005725 2$: TST (R5)+ ;SET R5 FOR ERROR RETURN
3790 015110 000205 1$: RTS R5 ;SET R5 FOR NEXT OUTPUT RETURN
;RETURN FROM ABOVE OR RETEST DONE

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```

3791      ;          $SCOPE          SCOPE LOOP HANDLER
3792
3793      ;THIS ROUTINE HANDLES THE ITERATIONS, LOOPING, ERROR
3794      ;LOOPING, AND THE DISPLAYING OF THE TEST NUMBER.
3795
3796      ;"SCOPE" IS PLACED BETWEEN EACH SUBTEST IN THE TEST AND
3797      ;RECORDS THE STARTING ADDRESS OF THE SUBTEST IN "LAD:"
3798
3799      015112 004737 017454 TRAP$: JSR      PC,      KBDINT
3800      015116 032777 000400 164250 BIT      #SW8,@SWR      ;LOOP ON SPEC. TEST?
3801      015124 001404 BEQ      1$      ;NO LOOP ON SPEC. TEST
3802      015126 127737 164242 001310 CMPB    @SWR,ICNT    ;ON RIGHT TEST? *SW7-0*
3803      015134 001434 BEQ      OVER$    ;NOT RIGHT TEST
3804      015136 032777 040000 164230 1$: BIT    #SW14,@SWR    ;LOOP ON TEST?
3805      015144 001026 BNE      KITS$    ;LOOP ON TEST IS SET
3806      015146 032777 004000 164220 BIT      #SW11,@SWR    ;KILL ITERATIONS
3807      015154 001012 BNE      SVLAD$    ;YES - KILL ITERATIONS
3808      015156 105737 001311 TSTB     ICNT+1    ;FIRST ONE?
3809      015162 001404 BEQ      2$      ;BRANCH IF FIRST
3810      015164 123737 015252 001311 CMPB    TIMES,ICNT+1    ;DONE?
3811      015172 001013 BNE      KITS$    ;BRANCH IF NOT
3812      015174 112737 000001 001311 2$: MOVB   #1,ICNT+1    ;FIRST ITERATION
3813      015202 105237 001310 SVLAD$: INCB    ICNT      ;COUNT TEST NUMBERS
3814      015206 011637 015250 MOV      (6),LAD    ;SAVE LOOP ADDRESS
3815      015212 013737 001310 001376 MOV      ICNT,@WDISPLAY ;DISPLAY TEST NO. AND ITERATION COUNT
3816      015220 000002 RTI
3817
3818      015222 105237 001311 KITS$: INCB    ICNT+1    ;INC THE ITERATION COUNT
3819      015226 013737 001310 001376 OVER$: MOV   ICNT,@WDISPLAY ;SET UP DISPLAY
3820      015234 005737 015250 TST      LAD      ;FIRST ONE?
3821      015240 001760 BEQ      SVLAD$    ;YES
3822      015242 013716 015250 MOV      LAD,(6)    ;FUDGE RETURN ADDRESS
3823      015246 000002 RTI
3824
3825      015250 000000 LAD:      0      ;LOOP ADDRESS
3826      015252 000020 TIMES:    20    ;RUN 20 TIMES
  
```

```

3827
3828      :      $HLT      ERROR TYPEOUT HANDLER
3829
3830      :THIS ROUTINE PRINTS OUT ERROR MESSAGES STARTING WITH THE
3831      :ADDRESS OF THE 'HLT'. IT ALSO COUNTS THE NUMBER OF ERRORS
3832      :AND HAS THE CAPABILITY OF LOOPING ON ERROR, BELL ON ERROR,
3833      :'HALT' ON ERROR, AND INHIBIT TYPEOUTS. AN OPTIONAL ARGUMENT
3834      : (HLT+3) WILL BE PLACED IN 'HLTCT$:' FOR ADITONAL TYPEOUTS.
3835
3836 015254 004737 017454 EMT$: JSR PC, KBDINT
3837 015260 032777 002000 164106 BIT #SW10,@SWR :BELL ON ERROR?
3838 015266 001402 BEQ 1$ :NO - SKIP
3839 015270 000004 000007 TYPE ,BELL :RING BELL
3840 015274 005237 001312 1$: INC ERRORS :COUNT THE NUMBER OF ERRORS
3841 015300 032777 020000 164066 BIT #SW13,@SWR :SKIP TYPEOUT IF SET
3842 015306 001026 BNE 2$ :SKIP TYPEOUTS
3843 015310 000004 015314 TYPE ,.+2 :.ASCIZ <15><12>
3844 015320 011637 015424 MOV (6),HLTADR :PUT ADDRESS OF INSTRUCTION ON STACK
3845 015324 162737 000002 015424 SUB #2,HLTADR :FUDGE ADDRESS
3846 015332 117737 000066 015422 MOV# @HLTADR,HLTCT$ :GET HLT ARGUMENT
3847 015340 013705 015424 MOV HLTADR,TTY :TYPE HLTADR IN OCTAL
3848 015344 004737 016042 JSR PC,PRINTR :TYPE LEADING ZERO'S
3849 015350 000004 015354 TYPE ,.+2 :.ASCIZ " "
3850 015360 004737 015426 JSR PC,ERRORS :GO TO USER ERROR ROUTINE
3851 015364 005777 164004 2$: TST @SWR :HALT ON ERROR
3852 015370 100001 BPL .+4 :SKIP IF CONTINUE
3853 015372 000000 HALT :HALT ON ERROR!
3854 015374 004737 017454 JSR PC,KBDINT
3855 015400 032777 001000 163766 BIT #SW9,@SWR :CHECK FOR INHIBIT LOOP ON ERROR
3856 015406 001001 BNE .+4 :SKIP IF LOOP ON ERROR
3857 015410 000002 RTI :RETURN
3858 015412 105037 001311 CLRE ICNT+1 :CLEAR ITERATION COUNT
3859 015416 000137 015222 JMP KITS :LOOP ON TEST UNTIL NO ERRORS
3860
3861 015422 000000 HLTCT$: 0 :HLT ARGUMENT
3862 015424 000000 HLTADR: 0 :LAST HLT INSTRUCTION EXECUTED
3863
3864 015426 ERRORS:
3865 015426 013705 001320 MOV CSR,TTY :TYPE CSR IN OCTAL
3866 015432 004737 016042 JSR PC,PRINTR :TYPE LEADING ZERO'S
3867 015436 042737 007700 015464 BIC #7700,2$
3868 015444 105337 015422 1$: DECB HLTCT$
3869 015450 100411 BMI 3$
3870 015452 062737 000100 015464 ADD #100,2$
3871 015460 000004 016527 TYPE ,SPACE
3872 015464 010005 2$: MOV %0,TTY :TYPE REGISTER X IN OCTAL
3873 015466 004737 016042 JSR %7,PRINTR
3874 015472 000164 BR 1$
3875 015474 000207 3$: RTS PC
  
```

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3876
3877 ;SUBROUTINE TO SAVE INPUT AS OCTAL NUMBER
3878
3879 015476 012737 000001 015770 READIN: MOV #1,INHRE
3880 015504 004737 015644 JSR PC, READ$ ;GO READ TTY UNTIL CR
3881 015510 005037 015770 CLR INHRE
3882 015514 010146 MOV R1,-(6) ;PUSH R1 ON STACK
3883 015516 010246 MOV R2,-(6) ;PUSH R2 ON STACK
3884 015520 010346 MOV R3,-(6) ;PUSH R3 ON STACK
3885 015522 012501 MOV (R5)+, R1
3886 015524 012737 000020 017664 MOV #20,CNT
3887 015532 012702 015772 MOV #INPUT,R2
3888 015536 122712 000120 CMPB #120,(R2) ;CHECK FOR 'P'
3889 015542 001425 BEQ 3$
3890 015544 005011 CLR (R1)
3891 015546 112203 1$: MOVB (R2)+,R3
3892 015550 120327 000015 CMPB R3,#15
3893 015554 001420 BEQ 3$
3894 015556 162703 000060 SUB #60,R3
3895 015562 032703 177770 BIT #177770,R3
3896 015566 001013 BNE 3$ ;BRANCH IF BAD DATA
3897 015570 006311 ASL (R1)
3898 015572 103410 BCS 2$
3899 015574 006311 ASL (R1)
3900 015576 103406 BCS 2$
3901 015600 006311 ASL (R1)
3902 015602 103404 BCS 2$
3903 015604 050311 BIS R3,(R1)
3904 015606 005337 017664 DEC CNT
3905 015612 000755 BR 1$
3906 015614 000244 2$: CLZ
3907 015616 013737 177776 015642 3$: MOV @#PS, PSTEMP ;MAKE SURE Z-BIT IS CLR
3908 015624 012603 MOV (6)+,R3 ;SAVE CONDITION CODES
3909 015626 012602 MOV (6)+,R2 ;POP STACK INTO R3
3910 015630 012601 MOV (6)+,R1 ;POP STACK INTO R2
3911 015632 013737 015642 177776 MOV PSTEMP, @#PS ;POP STACK INTO R1
3912 015640 000205 RTS R5 ;RESTORE CONDITION CODES
3913
3914 015642 000000 PSTEMP: 0 ;TEMPORARY STORAGE FOR PS
3915
3916 015644 010346 READ$: MOV R3,-(6) ;SAVE R3
3917 015646 012703 015772 1$: MOV #INPUT,R3 ;GET ADDRESS
3918 015652 022703 016012 2$: CMP #INPUT+20,R3 ;BUFFER FULL?
3919 015656 001415 BEQ 4$ ;YES - TYPE '?'
3920 015660 105737 177560 TSTB @#177560 ;WAIT FOR
3921 015664 100375 BPL -4 ;A CHARACTER
3922 015666 113713 177562 MOVB @#177562,(3) ;GET CHARACTER
3923 015672 142713 000200 BICB #200,(3) ;GET RID OF JUNK
3924 015676 122713 000177 CMPB #177,(3) ;IS IT A RUBOUT
3925 015702 001403 BEQ 4$ ;SKIP IF NOT
3926 015704 122713 000025 CMPB #25,(3)
3927 015710 001006 BNE 3$
3928 015712 4$: TYPE ;ASCIZ '?'<15><12>'=' ''
3929 015712 000004 015716 BR 1$ ;ZAP THE BUFFER AND LOOP
3930 015724 000750 3$: MOVB (3),TYPE ;SET UP FOR TYPING
3931 015726 111337 016514

```

SEQ 0080

3932	015732	000004	016514		TYPE	TYPE	
3933	015736	122723	000015		CMPB	#15.(3)+	;ECHO IT
3934	015742	001343			BNE	2\$	;CHECK FOR RETURN
3935	015744	005737	015770		TST	INHRE	;LOOP IF NOT RETURN
3936	015750	001401			BEQ	5\$	
3937	015752	000402			BR	6\$	
3938	015754	105063	177777	5\$:	CLRB	-1(3)	;ZAP RETURN (THE 15)
3939	015760	000004	000012	6\$:	TYPE	,12	;TYPE A LINE FEED
3940	015764	012603			MOV	(6)+,R3	;RESTORE R3
3941	015766	000207			RTS	PC	;RETURN
3942							
3943	015770	000000		INHRE:	0		
3944	015772	000020		INPUT:	.BLKW 20		;TTY INPUT AREA

```

3945          :      $OCTAL      OCTAL TYPEOUT ROUTINE
3946
3947          :THIS ROUTINE IS USED TO TYPE AN OCTAL NUMBER ON THE ITY. IT WILL TYPE
3948          :ALL 6 CHARACTERS, SUPPRESS LEADING ZEROES, TYPE AN 18 BIT ADDRESS, OR TYPE
3949          :THE 16 BITS. IT IS CALLED VIA THE DUMP, SDUMP, DUMP18, OR BITYPE MACRO'S.
3950
3951 016032 012737 170101 016200 BITYPE: MOV      #170101,.PR      ;SET BIT FLAG AND 16. CHARACTER COUNT
3952 016040 000411                BR          .PTIT           ;NOW TYPE IT IN BIT FORM
3953 016042 112737 000001 016200 PRINTR: MOVB     #1,.PR       ;SET ZERO FILL SWITCH
3954 016050 000402                BR          .+6             ;SKIP
3955 016052 005037 016200          PRINTS: CLR      .PR        ;SUPPRESS LEADING ZERO'S
3956 016056 112737 177772 016201          MOVB     #-6,.PR+1   ;SET COUNT
3957 016064 010446                .PTIT:  MOV      R4,-(6)     ;SAVE R4
3958 016066 012704 016202          MOV      #.PR+2,R4        ;SET POINTER TO FIRST ASCII CHAR.
3959 016072 105014                CLRB     (4)              ;CLEAR FIRST BYTE
3960 016074 000411                BR          .PRF           ;ROTATE FIRST BIT
3961 016076 105014                .PRL:  CLRB     (4)        ;CLEAR BYTE OF CHARACTER
3962 016100 032737 000100 016200          BIT      #100,.PR    ;BIT TYPING MODE?
3963 016106 001004                BNE      .PRF             ;YES - SKIP 2 ROTATES
3964 016110 006105                ROL      ITY              ;ROTATE BIT INTO C
3965 016112 106114                ROLB     (4)              ;PACK IT
3966 016114 006105                ROL      ITY              ;ROTATE BIT INTO C
3967 016116 106114                ROLB     (4)              ;PACK IT
3968 016120 006105                .PRF:  ROL      ITY        ;ROTATE BIT INTO C
3969 016122 106114                ROLB     (4)              ;PACK IT
3970 016124 105714                TSTB     (4)              ;IS IT ZERO?
3971 016126 001402                BEQ      .+6              ;SKIP INC
3972 016130 105237 016200          INCB     .PR              ;SET FILL SWITCH
3973 016134 105737 016200          TSTB     .PR              ;CHECK FILL SWITCH
3974 016140 001402                BEQ      .+6              ;SKIP BITSET
3975 016142 152724 000060          BISB     #'0,(4)+        ;MAKE INTO ASCII CHAR
3976 016146 105237 016201          INCB     .PR+1           ;INC COUNT
3977 016152 001351                BNE      .PRL             ;REPEAT
3978 016154 022704 016202          CMP      #.PR+2,R4        ;EMPTY BUFFER?
3979 016160 001002                BNE      .+6              ;SKIP IF NOT
3980 016162 112724 000060          MOVB     #'0,(4)+        ;LOAD 1 ZERO
3981 016166 105014                CLRB     (4)              ;NULL TERMINATOR
3982 016170 000004 016202          TYPE      .PR+2           ;TYPE IT
3983 016174 012604                MOV      (6)+,R4          ;RESTORE R4
3984 016176 000207                RTS      PC               ;RETURN
3985 016200 000012                .PR:    .BLKW     12       ;COUNT, SWITCH, AND OUTPUT BUFFER
  
```

```

3986 016224 012777 016352 000126 PDOWN$: MOV #ILLUP,@PUVEC$ ;SET FOR FAST UP
3987 016232 012777 000340 000122 MOV #340,@PUVEC$+2 ;PRIO:7
3988 016240 010046 MOV R0,-(6) ;PUSH R0 ON STACK
3989 016242 010146 MOV R1,-(6) ;PUSH R1 ON STACK
3990 016244 010246 MOV R2,-(6) ;PUSH R2 ON STACK
3991 016246 010346 MOV R3,-(6) ;PUSH R3 ON STACK
3992 016250 010446 MOV R4,-(6) ;PUSH R4 ON STACK
3993 016252 010546 MOV R5,-(6) ;PUSH R5 ON STACK
3994 016254 010637 016356 MOV SP,.SAVR6 ;SAVE SP
3995 016260 012777 016270 000072 MOV #PUP$,@PUVEC$ ;SET UP VECTOR
3996 016266 000000 HALT ;WAIT FOR PF
3997
3998 016270 013706 016356 PUP$: MOV .SAVR6,SP ;GET SP
3999 016274 005001 CLR R1 ;WAIT LOOP FOR THE TTY
4000 016276 005201 1$: INC R1 ;WAIT FOR THE INC
4001 016300 001376 BNE 1$ ;OF WORD
4002 016302 012605 MOV (6)+,R5 ;POP STACK INTO R5
4003 016304 012604 MOV (6)+,R4 ;POP STACK INTO R4
4004 016306 012603 MOV (6)+,R3 ;POP STACK INTO R3
4005 016310 012602 MOV (6)+,R2 ;POP STACK INTO R2
4006 016312 012601 MOV (6)+,R1 ;POP STACK INTO R1
4007 016314 012600 MOV (6)+,R0 ;POP STACK INTO R0
4008 016316 012737 016224 000024 MOV #PDOWNS,@#24 ;SET UP THE POWER DOWN VECTOR
4009 016324 012737 000340 000026 MOV #340,@#26 ;PRIO:7
4010 016332 000004 016336 TYPE .+2 ;.ASCIZ <15><12>'POWER'
4011 016346 000137 002472 JMP RESTAR ;JMP TO USER ADDRESS
4012
4013 016352 000000 ILLUP: HALT ;THE POWER UP SEQUENCE WAS STARTED
4014 016354 000776 BR .-2 ; BEFORE THE POWER DOWN WAS COMPLETE
4015
4016 016356 000000 .SAVR6: 0 ;PUT THE SP HERE
4017 016360 000024 000026 PUVEC$: 24.26 ;POWER UP VECTOR

```

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4018
4019
4020
4021
4022
4023 016364 022716 001000
4024 016370 002407
4025 016372 162716 000004
4026 016376 012601
4027 016400 005726
4028 016402 011602
4029 016404 104002
4030
4031
4032 016406 000002
4033
4034
4035
4036
4037
4038
4039
4040
4041
4042
4043 016410 010546
4044 016412 017605 000002
4045 016416 032705 177400
4046 016422 001004
4047 016424 010537 016514
4048 016430 012705 016514
4049 016434 105715
4050 016436 001406
4051 016440 112537 177566
4052 016444 105737 177564
4053 016450 100375
4054 016452 000770
4055 016454 017646 000002
4056 016460 062766 000002 000004
4057 016466 022666 000002
4058 016472 001006
4059 016474 062705 000002
4060 016500 042705 000001
4061 016504 010566 000002
4062 016510 012605
4063 016512 000002
4064 016514 000000
4065
4066 016516 005015 047505 000120
4067 016524 005015 000
4068 016527 040 000040
4069 016532 005015 044506 051522
4070 016540 020124 045104 030461
4071 016546 040440 042104 042522
4072 016554 051523 020072 000040
4073 016562 005015 042526 052103

;*****
;IOT HANDLER. REENTERENT ROUTINE TO EITHER TYPE MESSAGES OR
;INDICATE A FAULSE INTERRUPT OR TRAP.
;*****
IOTRAP: CMP #1000, (SP) ;CHECK RETURN ADDRESS FOR FAULSE TRAP
        BLT IOTS ;BRANCH IF 'TYPE' COMMAND INTENDED
        SUB #4, (SP) ;GET VECTOR ADDRESS FROM RETURN ADDRESS
        MOV (SP)+, R1 ;PUT IN R1 FOR TYPING
        TST (SP)+ ;POP STACK
        MOV (SP), R2 ;SAVE RETURN ADDRESS FOR TYPING
        HLT+2 ;UNEXPECTED INTERRUPT OR TRAP
                ;R1 = VECTOR ADDRESS
                ;R2 = RETURN PC
                ;CONTINUE THE PROGRAM

        RTI

;MCALL $TYPE
; $TYPE MESSAGE TIMEOUT ROUTINE

;THIS ROUTINE IS USE TO TYPE ASCII MESSAGES ON THE TTY. THE
;CALL CAN BE IN ONE OF 3 FORMS: 1) 'TYPE ,ADR' - TYPES THE
;MESSAGE STARTING IN LOCATION 'ADR:' 2) 'TYPE ,CHAR' - TYPES
;THE ASCII 'CHAR', AND 3) 'PRINT <15><12>'MESSAGE'> - TYPES
;THE MESSAGE WHICH IS INLINE ASCII.

IOTS: MOV TTY, -(6) ;SAVE TTY
      MOV @2(6), TTY ;GET ADDRESS TO BE TYPED
      BIT #177400, TTY ;IS IT A TYPEM?
      BNE 1$ ;NO
      MOV TTY, TYPE ;GET THE CHARACTER
      MOV #TYPE, TTY ;FUDGE THE ADDRESS
1$: TSTB (TTY) ;TERMINATOR?
    BEQ 2$ ;GET OUT IF SO
    MOVB (TTY)+, @177566 ;LOAD AND TYPE THE CHARACTER
    TSTB @177566 ;IS THE PRINTER READY
    BPL -4 ;WAIT UNTIL IT IS
    BR 1$ ;GET THE NEXT CHARACTER
2$: MOV @2(6), -(6) ;GET ADDRESS TO BE TYPED
    ADD #2, 4(6) ;ADD 2 TO THE ADDRESS
    CMP (6)+, 2(6) ;IS IT .+2?
    BNE 3$ ;NO
    ADD #2, TTY ;ADD 2 TO THE ADDRESS
    BIC #1, TTY ;BACK UP TO AN EVEN BYTE
    MOV TTY, 2(6) ;RESTORE ADDRESS
3$: MOV (6)+, TTY ;RESTORE TTY
    RTI ;RETURN
    .TYPE: 0 ;CHARACTER TYPE LOCATION

MEOP: .ASCIIZ <15><12> 'EOP'
RETURN: .ASCIIZ <15><12>
SPACE: .ASCIIZ " "
MSGADR: .ASCIIZ <15><12> 'FIRST DJ11 ADDRESS: '
MSGVEC: .ASCIIZ <15><12> 'VECTOR ADDRESS: '

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4074	016570	051117	040440	042104	
4075	016576	042522	051523	020072	
4076	016604	000040			
4077	016606	005015	047516	020056	MSGNUM: .ASCIZ <15><12>'NO. OF DJ11'S: ''
4078	016614	043117	042040	030512	
4079	016622	023461	035123	020040	
4080	016630	000			
4081	016631	015	051412	040524	MSGCON: .ASCIZ <15><12>'STANDARD CONFIGURATION? ''
4082	016636	042116	051101	020104	
4083	016644	047503	043116	043511	
4084	016652	051125	052101	077511	
4085	016660	037516	020040	000	
4086	016665	015	046012	047111	MSGLEN: .ASCIZ <15><12>'LINES ''
4087	016672	051505	000040		
4088	016676	026440	000040		MSGDAS: .ASCIZ '' - ''
4089	016702	005015	044103	051101	MSGLEN: .ASCIZ <15><12>'CHAR LENGTH: ''
4090	016710	046040	047105	052107	
4091	016716	035110	020040	000	
4092	016723	015	050012	051101	MSGPAR: .ASCIZ <15><12>'PARITY(NO, ODD, EVEN): ''
4093	016730	052111	024131	047516	
4094	016736	020054	042117	026104	
4095	016744	042440	042526	024516	
4096	016752	020072	000040		
4097	016756	005015	044523	047514	MALARM: .ASCIZ <15><12>'SILO ALARM LEVEL FOR CSR'<15><12>
4098	016764	040440	040514	046522	
4099	016772	046040	053105	046105	
4100	017000	043040	051117	041440	
4101	017006	051123	005015	000	
4102	017013	015	041412	042132	MTITLE: .ASCIZ <15><12>'CZDJA-F DJ11 LOGIC TESTS'<15><12>
4103	017020	040512	043055	020040	
4104	017026	045114	030461	046040	
4105	017034	043517	041511	052040	
4106	017042	051505	051524	005015	
4107	017050	000			
4108					
4109					
4110					
4111					
4112	017051	015	053412	040510	MSBR. .ASCIZ <15><12>'WHAT ARE THE BR PRIORITIES ?? FOR::/'
4113	017056	020124	051101	020105	
4114	017064	044124	020105	051102	
4115	017072	050040	044522	051117	
4116	017100	052111	042511	020123	
4117	017106	037477	043040	051117	
4118	017114	035072	000		
4119	017117	015	020012	044124	MSBAD: .ASCIZ <15><12>'THAT BR IS A GOOD FOR NOTHING. TRY AGAIN?/'
4120	017124	052101	041040	020122	
4121	017132	051511	040440	043440	
4122	017140	047517	020104	047506	
4123	017146	020122	047516	044124	
4124	017154	047111	027107	052040	
4125	017162	054522	040440	040507	
4126	017170	047111	000077		
4127	017174	005015	042504	044526	VICE: .ASCIZ<15><12>'DEVICE /
4128	017202	042503	020040	000040	
4129					

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4130          :          S ORAGE FOR INTERRUPT TESTING
4131
4132          .EVEN
4133 017210 000061 DEVNUM: 000061          : DEFAULT FIRST DEVICE # 1
4134 017212 000061 UNITS1: 000061          : STORE FOR UNITS+1, DFAULT 1
4135 017214 000001 PRILO: .WORD 1          : FOR DECIMAL PRIORITIES #
4136 017216 000001 NOW: .WORD 1          : OCTAL # OF BR
4137          : OF CURRENT TESTING
4138 017220 000001 MASK: .WORD 1          : OCTAL # OF ALLOWED BR
4139 017222 000001 LEVEL: .WORD 1          : DECIMAL BR PRIO
4140 017224 000001 UUTD1: .WORD 1          : DEVICE # FOR ROTATE LEFT OF BR
4141 017226 000001 CT: .WORD 1          : STORE COUNTER FOR ROLS
4142 017230 000026 PRBLE: .BLKW 26          : TABLE OF INPUT BR
4143          .EVEN
4144
4145          :SUBROUTINE TO AUTOMATICLY DETERMINE THE NUMBER OF DJ11'S ON THE SYSTEM
4146          : AND WHERE THEIR INTERRUPT VECTORS ARE.
4147          : THIS ROUTINE IS ONLY USED IF LOC 42 IS NOT ZERO, AS WHEN THE PROGRAM IS
4148          : BEING RUN UNDER ACT11 OR DDP MONITOR CONTROL.
4149          : NOTE: SOME OF THE LOGIC MUST BE FUNCTIONAL OR THIS ROUTINE WILL BOMB
4150
4151 017304 012700 160000 AUTO: MOV #160000, R0          : START AT NO RESPONSE BASE DJ11 -10'8)
4152 017310 012702 000001 MOV #1, R2          : COUNTER OF NON RESPONSE OR DJ11 OR DONE
4153 017314 012737 000002 000006 MOV #RTI, @#6          : RTI WHEN TIME-OUT
4154 017322 005001 5$: CLR R1          : SET UP COUNTER
4155 017324 000261 1$: SEC          : SET CARRY
4156 017326 005710 IST (R0)          : CHECK FOR ANY DJ11'S
4157 017330 103404 BCS 2$          : BRANCH IF IT TIMED OUT
4158 017332 062700 000010 ADD #10, R0          : POINT TO NEXT DJ11 ADDRESS
4159 017336 005201 INC R1          : COUNT DJ11'S
4160 017340 000771 BR 1$          : LOOK FOR MORE
4161
4162 017342 005302 2$: DEC R2          : COUNT DOWN DEVICES
4163 017344 100405 BMI 7$          : BRANCH IF DONE
4164 017346 062700 000010 ADD #10, R0          : POINT TO FIRST DJ11
4165 017352 010037 001340 MOV R0, DEVADR          : SAVE FIRST DJ11 ADDRESS
4166 017356 000761 BR 5$          : GO COUNT DJ11'S
4167
4168 017360 005037 7$: CLR @#6          : RESTORE TIME-OUT CATCHER
4169 017364 010137 001344 MOV R1, UNITS          : SAVE COUNT
4170 017370 001003 BNE 3$          : BRANCH IF NOT ZERO
4171 017372 104000 HLT          : REPORT THAT NO DJ11'S WERE FOUND
4172 017374 000137 014376 JMP DONE          : EXIT THIS PROGRAM
4173
4174          :ROUTINE TO DETERMINE VECTOR ADDRESSES
4175
4176 017400 013746 000020 3$: MOV @#20, -(SP)          : SAVE IOT VECTOR ON THE STACK
4177 017404 012737 017440 000020 MOV #4$, @#20          : RESET IOT VECTOR
4178 017412 013701 001340 MOV DEVADR, R1          : GET FIRST DJ ADR
4179 017416 012721 040400 MOV #40400, (R1)+          : SET CSR
4180          : BIT8 = TRANS SCAN ENABLE
4181          : BIT14 = TRANS INTERRUPT ENABLE
4182 017422 005721 IST (R1)+          : INC POINTER
4183 017424 012721 000001 MOV #1, (R1)+          : SET ICR, LINE 0
4184 017430 000001 WAIT          : WAIT FOR AN INTERRUPT
4185 017432 012637 000020 MOV (SP)+, @#20          : RESTORE IOT VECTOR

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4186 017436 000207          RTS      PC
4187
4188 017440 162716 000010      4$: SUB      #10, (SP)      ;REPOSITION ADDRESS TO RVC VEC
4189 017444 011637 001342      MOV      (SP), VECADR ;SAVE FIRST VECTOR
4190 017450 022626            CMP      (SP)+, (SP)+ ;RESET STACK FROM IOT
4191 017452 000002            RTI      ;RETURN FROM INTERRUPT - RESTORE STATUS
4192
4193
4194 017454 022737 000176 001374 KBDINT: CMP      #SWREG,SWR
4195 017462 001016            BNE      1$
4196 017464 005037 017522            CLR      TMP1
4197 017470 113737 177562 017522      MOV      177562,TMP1
4198 017476 142737 000200 017522      BIC      #200,TMP1
4199 017504 122737 000007 017522      CMP      #7,TMP1
4200 017512 001002            BNE      1$
4201 017514 004737 017604            JSR      PC,CNTLU
4202 017520 000207          1$: RTS      PC
4203
4204 017522 000000          TMP1: 0
4205
4206
4207 017524 013746 000006      SUSWRR: MOV      6,-(SP)
4208 017530 013746 000004      MOV      4,-(SP)
4209 017534 012737 017554 000004      MOV      #1$,4
4210 017542 022777 177777 161624      CMP      #-1,@SWR
4211 017550 001402            BEQ      2$
4212 017552 000407            BR       3$
4213 017554 022626          1$: CMP      (SP)+,(SP)+
4214 017556 012737 000176 001374      2$: MOV      #SWREG,SWR
4215 017564 012737 000174 001374      MOV      #DISPREG,DISPLAY
4216 017572 012637 000004      3$: MOV      (SP)+,4
4217 017576 012637 000006      MOV      (SP)+,6
4218 017602 000207          RTS      PC
4219
4220
4221 017604 022737 000176 001374 CNTLU: CMP      #SWREG,SWR
4222 017612 001023            BNE      1$
4223 017614 003004 017676            TYPE      ,SWREQ
4224 017620 013705 000176            MOV      SWREQ,TTY
4225 017624 004737 016042            JSR      PC,PRINTR ;TYPE SWREG IN OCTAL
4226 017630 000004 017666            TYPE      ,NEWIS ;TYPE LEADING ZERO'S
4227 017634 004537 015476            JSR      R5,READIN
4228 017640 017522            .WORD      TMP1
4229 017642 001360            BNE      CNTLU
4230 017644 022737 000020 017664      CMP      #20,CNT
4231 017652 001403            BEQ      1$
4232 017654 013777 017522 161512      MOV      TMP1,@SWR
4233 017662 000207          1$: RTS      PC
4234
4235 017664 000000          CNT: 0
4236
4237 017666 020040 042516 036527 NEWIS: .ASCIIZ '' NEW= ''
4238 017674 000040
4239 017676 005015 053523 036522 SWREQ: .ASCIIZ <15><12>'SWR= ''
4240 017704 000040
4241

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77-(ZDJA-F-0 DJ11 LOGIC TESTS MACY11 30A(1052) 26-FEB-79 15:47 J 7
CZDJAF.P11 26-FEB-79 15:41 PAGE 88
AUTOMATIC SYSTEM SIZER

SFO 0087

4242

000001

.END

[illegible]

DEVNEW	002400	772#	783	786										
DEVNUM	017210	766*	773	781*	782	4133#								
DISPLA	001376	604#	3815*	3819*	4215*									
DISPRE	000174	547#	4215											
DJLEN	001364	598#	805*	812*	1430	1509	1588	1667	1691*	1748	1827	1906	1985	2009*
		2066	2145	2224	2303	2327*	2384	2463	2542	2621	2645*	3588	3607*	3619
		3631*												
DJMXNO-	000020	535#	689											
DJPAR	001366	599#	806*	813*	3396	3470								
DJUUT	001362	597#	692*	807	809*	814*	3639	3670						
DONE	014376	3640	3644#	4172										
EMTS	015254	618	3836#											
END22	004732	1367#												
END56	014314	3611	3631#											
ERRORS	001312	573#	622*	3840*	3861									
ERRORS	015426	3850	3864#											
ERROR1	004672	1333	1341	1344#										
ERROR2	011752	2956	2963	2966#										
FTIME	001400	607#	791	796*										
GETADR	001514	627	631#	636	642									
GETLEN	002156	726#	732	736	740									
GETNUM	001650	656#	665	667	672	674	677	690						
GETPAR	002242	730	742#	752										
GETVER	001572	644#	647	653	655									
HLT	104000	504#	848	853	868	872	877	889	893	898	910	914	919	931
		935	940	952	956	961	973	977	982	994	998	1003	1019	1025
		1029	1036	1040	1048	1064	1073	1087	1092	1097	1110	1115	1129	1138
		1152	1157	1162	1182	1192	1196	1201	1223	1234	1241	1246	1270	1281
		1287	1355	1411	1417	1427	1433	1439	1444	1449	1490	1496	1506	1512
		1518	1523	1528	1569	1575	1585	1591	1597	1602	1607	1648	1654	1664
		1670	1676	1681	1686	1729	1735	1745	1751	1757	1762	1767	1808	1814
		1824	1830	1836	1841	1846	1887	1893	1903	1909	1915	1920	1925	1966
		1972	1982	1988	1994	1999	2004	2047	2053	2063	2069	2075	2080	2085
		2126	2132	2142	2148	2154	2159	2164	2205	2211	2221	2227	2233	2238
		2243	2284	2290	2300	2306	2312	2317	2322	2365	2371	2381	2387	2397
		2398	2403	2444	2450	2460	2466	2472	2477	2482	2523	2529	2539	2545
		2551	2556	2561	2602	2608	2618	2624	2630	2635	2640	2688	2692	2705
		2712	2716	2750	2763	2768	2772	2776	2780	2784	2789	2835	2843	2850
		2883	2891	2900	2977	2987	2991	3031	3043	3052	3056	3074	3078	3092
		3096	3107	3119	3137	3149	3157	3162	3169	3180	3195	3204	3212	3217
		3221	3228	3240	3246	3252	3294	3304	3309	3314	3322	3327	3336	3358
		3363	3389	3394	3400	3405	3410	3414	3418	3423	3456	3462	3474	3480
		3486	3494	3501	3506	3539	3543	3547	3551	3555	3594	3599	3615	3622
		3730	3786	4029	4171									
HLTADR	015424	3844*	3845*	3846	3847	3862#								
HLTCTS	015422	3846*	3861#	3868*										
ICNT	001310	572#	830*	3802	3808	3810	3812*	3813*	3815	3818*	3819	3825	3858*	
ILLUP	016352	3986	4013#											
INHRE	015770	727*	743*	3879*	3881*	3935	3943#							
INITA	014550	3375	3440	3711#										
INITB	014560	2934	3714#											
INITC	014570	2861	3717#											
INITD	014600	1392	1471	1550	1629	1710	1789	1868	1947	2028	2107	2186	2265	2346
		2425	2504	2583	2663	2734	2805	3017	3720#					
INITR	014606	3712	3715	3718	3722#									
INPUT	015772	659	696	705	708	711	729	731	733*	737*	745	747	749	751

[illegible]

OVERS	015226	3803	3819#														
PARITY	001300	568#	716	757	3396	3470											
PARIT2	001302	569#															
PARIT3	001304	570#															
PARIT4	001306	571#															
PCNT	001314	574#	623*	624*	3646*	3647*	3603										
PDOWN\$	016224	616	3986#	4008													
PRINTR	016042	3772	3775	3848	3866	3873	3953#	4225									
PRINTS	016052	720	724	3955#													
PRIOLO	017214	1311*	1313*	1314	2921*	2923*	2924	4135#									
PRTBLE	017230	769	3672	4142#													
PS =	177776	506#	1322*	1323*	1369*	2932*	2933*	3001*	3129*	3130*	3189*	3190*	3260*	3526*			
		3569*	3570*	3907	3911*												
PSTEMP	015642	3907*	3911	3914#													
PUP\$	016270	3995	3998#														
PUVEC\$	016360	3986*	3987*	3995*	4017#												
CABR	002344	553	629	698	707	710	765#										
RBUF	001322	577#	817*	1406	1442	1485	1521	1564	1600	1643	1679	1724	1760	1803			
		1839	1882	1918	1961	1997	2042	2078	2121	2157	2200	2236	2279	2315			
		2360	2396	2439	2475	2518	2554	2597	2633	2686	2714	2766	2774	2782			
		2841	2846	2889	2898	2985	3090	3150	3155	3215	3250	3300	3325	3385			
		3421	3452	3504	3549	3597	3613	3627									
RCVLVL	001332	583#	825*	2920*	2999	3132*	3254	3255*	3568*	3632	3633*						
RCVVEC	001330	582#	804*	811*	823	2919*	2999*	3131*	3191*	3254*	3567*	3632*					
READIN	015476	634	645	3879#	4227												
READ\$	015644	657	695	728	744	775	3880	3916#									
RESTAR	002472	789#	3642	3661	4011												
RETURN	016524	632	4067#														
SCOPE -	104400	503#	832	858	879	900	921	942	963	984	1005	1052	1076	1099			
		1117	1141	1164	1204	1255	1289	1371	1453	1532	1611	1690	1771	1850			
		1929	2008	2089	2168	2247	2326	2407	2486	2565	2644	2721	2793	2854			
		2904	3005	3262	3345	3365	3429	3515	3557	3636							
		3871	4068#														
SPACE	U16527	706	708#														
SSS	002060	536#	611	790													
STACK -	001200	595#	3586	3744*	3760*	3761	3764*	3766*									
SUM	001360	612	4207#														
SUSWRR	017524	3807	3813#	3821													
SVLADS	015202	603#	793	3649	3768	3800	3802	3804	3806	3837	3841	3851	3855	4194			
SWR	001374	4210	4214*	4221	4232*												
		548#	793	4194	4214	4221	4224										
SWREG	000176	4223	4239#														
SWREQ	017676	455#	3649	3836	3837												
SW10 -	002000	454#	3806														
SW11	004000	453#	3768														
SW12 =	010000	452#	3841														
SW13	020000	451#	3804														
SW14 =	040000	450#															
SW15 -	100000	458#	3799	3800													
SW8 =	000400	457#	3855														
SW9 -	001000	580#	822*	1187	1230	1402*	1481*	1560*	1639*	1720*	1799*	1878*	1957*	2038*			
TBUF	001326	2117*	2196*	2275*	2356*	2435*	2514*	2593*	2675*	2744*	2747*	2826*	2874*	2947*			
		3028*	3065*	3139*	3142*	3197*	3200*	3279*	3282*	3532*	3553	3584*					
TCR	001324	578#	819*	1106*	1107	1112*	1113	1124*	1125*	1126	1131*	1132*	1133*	1134*			
		1135	1149*	1150	1154*	1155	1159*	1160	1176*	1198*	1217*	1243*	1266*	1284*			
		1325*	1361*	1399*	1451*	1478*	1530*	1557*	1609*	1636*	1688*	1717*	1769*	1796*			

		1848*	1875*	1927*	1954*	2006*	2035*	2087*	2114*	2166*	2193*	2245*	2272*	2324*
		2353*	2405*	2432*	2484*	2511*	2563*	2590*	2642*	2671*	2718*	2741*	2791*	2811*
		2852*	2868*	2902*	2941*	2994*	3024*	3258*	3276*	3340*	3527*	3541	3581*	3634*
THRU1	004714	1334	1342	1360#										
THRU2	011774	2957	2964	2983#										
TIME	015056	3753	3780#											
TIMER	001346	590#	1165*	1186*	1229*	1267	1373*	1414*	1493*	1572*	1651*	1732*	1811*	1890*
		1969*	2050*	2129*	2208*	2287*	2368*	2447*	2526*	2605*	2646*	2647	2651*	2652*
		2698	2752	2829	2877	3036	3066	3283	3297	3382	3448			
TIME RA	001352	592#	3745*	3780*										
TIME RB	001354	593#	3746*	3782*										
TIME S	015252	3517*	3638*	3810	3826#									
TMP1	017522	4196*	4197*	4198*	4199	4204#	4228	4232						
TRAPS	015112	620	3799#											
TST1	002744	842#												
TST10	003420	991#												
TST11	003472	1013#												
TST12	003634	1059#												
TST13	003722	1084#												
TST14	003776	1106#												
TST15	004036	1124#												
TST16	004124	1149#												
TST17	004214	1175#												
TST2	003024	865#												
TST20	004324	1214#												
TST21	004440	1265#												
TST22	004540	1309#												
TST23	004770	1392#												
TST24	005160	1471#												
TST25	005350	1550#												
TST26	005540	1629#												
TST27	005742	1710#												
TST3	003076	886#												
TST30	006132	1789#												
TST31	006322	1868#												
TST32	006512	1947#												
TST33	006714	2028#												
TST34	007104	2107#												
TST35	007274	2186#												
TST36	007464	2265#												
TST37	007666	2346#												
TST4	003150	907#												
TST40	010056	2425#												
TST41	010246	2504#												
TST42	010436	2583#												
TST43	010670	2663#												

TSI55	013734	3526#												
TST56	014054	3565#												
TST6	003274	949#												
TST7	003346	970#												
TYPE =	000004	505#	631	632	633	644	656	694	718	721	726	742	765	772
		773	774	785	3648	3651	3652	3770	3775	3839	3843	3849	3871	3929
		3932	3939	3982	4010	4223	4226							
		718#	756	761										
TYPLIN	002124	3065#												
T50A	012172	3089#												
T50B	012236	3129#												
T50C	012326	3189#												
T50D	012542	589#	691*	760	771	807	3639	4169*						
UNITS	001344	767*	771*	782	4134#									
UNITS1	017212	4140#												
UUTDJ	017224	588#	646	648	650*	651*	652	654	811	4189*				
VECADR	001342	772	4127#											
VICE	017174	1326#	1327											
WAIT1	004636	585#	829*	1310*	1367	1368*	3000*							
XMTLVL	001336	584#	827*	1309*	1367*									
XMTVEC	001334	544	3656#											
SENDAD=	014450	537#	541	543#	546#	550#	552#	555#	567#	867	871	876	888	892
.	017706	897	909	913	918	930	934	939	951	955	960	972	976	981
		993	997	1002	1018	1028	1035	1039	1047	1063	1072	1086	1091	1096
		1109	1114	1128	1137	1151	1156	1161	1166	1191	1195	1200	1233	1240
		1245	1286	1374	1416	1426	1432	1438	1443	1448	1495	1505	1511	1517
		1522	1527	1574	1584	1590	1596	1601	1606	1653	1663	1669	1675	1680
		1685	1692	1734	1744	1750	1756	1761	1766	1813	1823	1829	1835	1840
		1845	1892	1902	1908	1914	1919	1924	1971	1981	1987	1993	1998	2003
		2010	2052	2062	2068	2074	2079	2084	2131	2141	2147	2153	2158	2163
		2210	2220	2226	2232	2237	2242	2289	2299	2305	2311	2316	2321	2328
		2370	2380	2386	2392	2397	2402	2449	2459	2465	2471	2476	2481	2528
		2538	2544	2550	2555	2560	2607	2617	2623	2629	2634	2639	2653	2687
		2691	2704	2711	2715	2749	2756	2762	2767	2771	2775	2779	2783	2788
		2842	2890	2899	2986	2990	3030	3042	3051	3055	3077	3091	3095	3106
		3118	3136	3156	3161	3168	3179	3194	3211	3216	3220	3227	3239	3245
		3251	3287	3293	3308	3313	3321	3335	3357	3362	3393	3404	3409	3413
		3417	3422	3461	3485	3493	3500	3505	3538	3542	3546	3550	3554	3593
		3598	3621	3656	3663	3825	3843	3844#	3849	3850#	3852	3856	3861	3862
		3921	3929	3944#	3954	3971	3974	3979	3985#	4010	4014	4053	4142#	
.BIT	177777	441#	450	451	452	453	454	455	456	457	458	459	3649	3799
		3836	3841	3855										
.PR	016200	3951*	3953*	3955*	3956*	3958	3962	3972*	3973	3976*	3978	3982	3985#	
.PRF	016120	3960	3963	3968#										
.PRL	016076	3961#	3977											
.PTIT	016064	3952	3957#											
.SAVR6	016356	3994*	3998	4016#										
.TYPE	016514	3931*	3932	4047*	4048	4064#								

[illegible]

ZZ-CZDJA-F-0 DJ11 LOGIC TESTS MACY11 30A(1052) 26-FEB-79 15:47 E 8
CZDJAF.P11 26-FEB-79 15:41 CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0095

\$SCOPE	1#	3791
\$SETUP	1#	
\$SRAT	1#	
\$SWDOC	1#	447
\$SWRDF	1#	602
\$SWRRR	1#	4206
\$TRAP	1#	
\$TYPE	1#	4035
\$URAT	1#	
\$XRDY	835#	1206
\$XRDYC	835#	2723
\$XRDYO	835#	1167
\$XUOR	835#	3264
.SCOP	1#	
.SCOPE	1#	

. ABS. 017706 000

ERRORS DETECTED: 0

CZDJAF.BIN.CZDJAF.SEO/CRF/SOL/NL:TOC=CZDJAF.MAC,CZDJAF.P11
RUN-TIME: 11 16 .9 SECONDS
RUN-TIME RATIO: 159/29-5.4
CORE USED: 32K (63 PAGES)