

PCL11-A,B

PCL11 STND ALN VO2C
CZPLBC0

AH-E263C-MC

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: IDENTIFICATION

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: PROGRAM CODE AC-E262C-MC
: PPROGRAM NAME CZPLBCO PCL11 STAND ALONE TEST
: DATE CREATED 22-OCT-75
: UPDATED (TO VER 02) 13-MAR-78
: MODIFIED 06-JUN-79
: MAINTAINER SPECIAL SYSTEMS KANATA
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.SBTTL HEADER AND INSTRUCTIONS
.REPT 0

1. GENERAL

THE PARALLEL COMMUNICATIONS LINK (PCL11) TEST WILL VIGOROUSLY TEST THE HARDWARE INVOLVED IN ANY ONE PDP-11 PROCESSOR CONTAINING PCL11 HARDWARE.

THERE ARE THREE SEPARATE SECTIONS IN THIS TEST. TO COMPLETELY CHECK BOTH TRANSMITTER AND RECEIVER PORTIONS OF THE PCL11, ALL THREE SECTIONS MUST BE RUN SUCCESSFULLY.

THE FIRST TEST IS THE BASIC TRANSMITTER TEST WHICH IS DESIGNED TO BE RUN AS A STAND ALONE DEVICE TEST ON THE TRANSMITTER. IT WILL RUN WITH NO MANUAL INTERVENTION (AFTER INITIAL SETUP) ASSUMING THAT THE TRANSMITTER ADDRESS SWITCHES IN THE MASTER SECTION ARE SET TO BE AT LEAST EQUAL TO THE TRANSMITTERS OWN ADDRESS SWITCHES. THIS ASSURES THAT TIMING SLICES WILL SELECT THE TRANSMITTER BEING TESTED.

THE SECOND TEST IS THE BASIC RECEIVER TEST WHICH IS DESIGNED TO RUN AS A STAND ALONE DEVICE TEST FOR THE RECEIVER MODULE. AFTER INITIAL SETUP, THIS TEST RUNS WITH NO MANUAL INTERVENTION.

THE THIRD TEST IS THE TRANSMITTER-RECEIVER LOOP TEST. THE OBJECTIVE OF THE THIRD TEST IS TO TEST ANY FUNCTIONS THAT WERE NEGLECTED IN THE FIRST AND SECOND TESTS DUE TO THE NEED FOR TRANSMITTER TO RECEIVER COMMUNICATIONS. IT WILL ALSO TEST THE T.D.M. BUS DRIVERS AND RECEIVERS BY SENDING DATA PATTERNS AND CHECKING THE DATA RECEIVED. FURTHER, IT WILL EXERCISE THE ABILITY TO REJECT OR TRUNCATE COMMUNICATIONS.

THE TESTS ARE SELECTED, IN THE START-UP PROCEDURE, SO THAT ANY ONE OF THE TESTS MAY BE LOOPED INDIVIDUALLY, OR ALL THREE MAY BE LOOPED AS AN OVERALL TEST.

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2. REQUIREMENTS

2.1 GENERAL:

2.11 PDP-11 PROCESSOR WITH 8K OF MEMORY
AND A CONSOLE DEVICE ON-LINE.

2.12 PCL11 HARDWARE ON THE UNIBUS

2.13 ALL PROCESSOR MAINDECS MUST HAVE BEEN RUN
SUCCESSFULLY PRIOR TO RUNNING PCL11 TEST.

2.14 ONE PCL11 CONNECTED TO UNIBUS
(SEE PCL11 OPTION DESCRIPTION SEC 2.1)

3. RESTRICTIONS

3.1 THIS TEST CANNOT BE LOADED INTO A PDP-11 WITH
LESS THAN 8K OF MEMORY.

3.3 SINCE THERE ARE TIMING LOOPS IN THIS TEST,
IT MAY NOT RUN SUCCESSFULLY IN SOLID-STATE MEMORY
IF THE DELAY CONSTANT (CNTRL-D) IS LOWERED TO
BELOW 6.
*** THIS ALSO APPLIES TO USING FASTER PDP-11'S (45, 70, ETC.)***

4. TEST SET-UP

4.1 ENSURE PCL11 HAS BEEN INSTALLED CORRECTLY
AS PER THE INSTALLATION PROCEDURE IN SEC 2.1 OF
PCL11 OPTION DESCRIPTION (YC-A20TC-00)

4.2 ENSURE ALL CABLES CONNECTING THE PCL11 UNDER
TEST TO OTHER PCL11 UNITS OR DISPLAY PANELS
ARE DISCONNECTED (OR DISABLED).

4.3 DETERMINE OR SET UP PROPER TDM ADDRESSES FOR
THE RECEIVER AND TRANSMITTER. THE TRANSMITTER'S
ADDRESS IS IN S1 ON THE M7991 MODULE; THE
RECEIVER'S IS IN S1 ON THE M7997 MODULE.

4.4 ENSURE S1 ON THE M7994 MODULE IS SET TO A NUMBER
GREATER THAN OR EQUAL TO THE TRANSMITTER'S ADDRESS.

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5. LOADING

THE PCL11 TEST IS ON PAPER TAPE IN PDP-11 .ABS
FORMAT. THE TAPE IS LOADED BY MEANS OF THE PDP-11
ABSOLUTE LOADER.

6. STARTING AND RESTARTING ADDRESSES

START ADDR

RESTART ADDR

200

204 (FOR DIFFERENT T.D.M. BUS ADDRESSES)
224 (FOR TEST SELECT)

7. SWITCH REGISTER OPTIONS

7.1 ALL TESTS

SW 15 - 0	HALT AFTER ERRORS
SW 15 - 1	DON'T HALT AFTER ERRORS
SW 14 - 0	ALLOW PRINTING
SW 14 - 1	INHIBIT PRINTING
SW 13 - 0	SEE SW 15
SW 13 - 1	AFTER ERROR, RE-TRY CURRENT ROUTINE
SW 12 - 0	CARRY ON TO NEXT SUBTEST
SW 12 - 1	DON'T EXIT THIS SUBTEST
SW 11 - 0	10 TIMES THRU ALL SUBTESTS PER PASS
SW 11 - 1	ONCE THRU ALL SUBTESTS PER PASS

7.2 TRANSMITTER TEST

SW 10 - 0	START AT 1ST SUBTEST AND RUN
SW 10 - 1	START AT SUBTEST # IN SW'S <3:0>
SW 09 - 0	STAY IN MASTER SECTION SCOPE LOOP
SW 09 - 1	EXIT MASTER SECTION SCOPE LOOP

7.3 RECEIVER TEST

SW 10 - 0	START AT 1ST SUBTEST AND RUN
SW 10 - 1	START AT SUBTEST # IN SW'S <2:0>

7.4 TRANSMITTER-RECEIVER LOOP

SW 10 - 0	START AT 1ST SUBTEST AND RUN
SW 10 - 1	START AT SUBTEST # IN SW'S <2:0>

7.5 SWITCH REGISTER OPTION USE ON NON-SWITCH-REGISTER PDP-11'S

AT START UP TIME

THE PROGRAM WILL DECIDE WHETHER A HARDWARE SWITCH REGISTER EXISTS ON THE PDP-11. IF NONE EXISTS, A SOFTWARE FLAG WILL BE SET INDICATING TO THE REST OF THE PROGRAM THAT THE 'SWITCH MONITOR' IS TO BE USED TO ACHIEVE CHANGING OF SWITCH OPTIONS.

THE MONITOR IS ENTERED AT THE START OF THE TEST PROGRAM AUTOMATICALLY. IT IS ALSO ENTERED AUTOMATICALLY ON AN ERROR HALT IF SW 15 = 0. AT OTHER TIMES IT MUST BE CALLED BY THE OPERATOR BY TYPING CNTRL-S

WHEN THE MONITOR IS ENTERED THE FOLLOWING IS PRINTED:

SWR - XXXXXX :

SHOWING THE OPERATOR THE PRESENT CONTENTS OF THE SOFTWARE SWITCH REGISTER LOCATION. HE MAY CHANGE THE LOCATION BY TYPING: YYYYYY <CR>

IN RESPONSE; OR HE MAY LEAVE THE LOCATION UNCHANGED BY TYPING ONLY <CR>.

REFERENCE PAGE 9 OF THIS LISTING FOR 'SWITCH' BIT POSITIONS. UPON DETECTING A <CR> THE MONITOR WILL TYPE:

CNTRL-P TO CONTINUE

THE OPERATOR NOW HAS THE OPTION OF TYPING ^P TO CONTINUE THE PROGRAM WHERE IT LEFT OFF, OR ^S TO RE-ENTER THE SWITCH MONITOR.

8. TEST DESCRIPTION

8.1 TEST 1 - TRANSMITTER TEST:

SUBTEST 00	TEST INITIAL CONDITIONS AFTER RESET
SUBTEST 01	COMMAND REGISTER TEST
SUBTEST 02	BYTE COUNT REGISTER TEST
SUBTEST 03	BUS ADDRESS REGISTER TEST
SUBTEST 04	MASTER SECTION TEST
SUBTEST 05	DATA SILO TEST
SUBTEST 06	STATUS REGISTER AND ERRORS TEST
SUBTEST 07	INTERRUPT TEST
SUBTEST 10	C.R.C GENERATION TEST

8.2 TEST 2 - RECEIVER TEST:

SUBTEST 00	TEST INITIAL CONDITIONS AFTER RESET
SUBTEST 01	COMMAND REGISTER TEST
SUBTEST 02	BYTE COUNT REGISTER TEST
SUBTEST 03	BUS ADDRESS REGISTER TEST
SUBTEST 04	DATA SILO TEST
SUBTEST 05	STATUS REGISTER AND ERRORS TEST
SUBTEST 06	INTERRUPT TEST
SUBTEST 07	C.R.C GENERATION TEST

8.3 TEST 3 - XMTR-RCVR LOOP TEST:

SUBTEST 00	CHK NPR FROM RCVR SILO TO XMTR SILO
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SUBTEST 01 DATA LOOPS TEST
SUBTEST 02 TRANSMISSION ERRORS TEST
SUBTEST 03 REJECT AND TRUNCATE TEST

8.4 TEST 4 - COMBINATION RUN

RUN TEST 1 THEN
RUN TEST 2 THEN
RUN TEST 3 THEN
RUN TEST 1 ETC .

8.5 THE TESTS WILL IDENTIFY THEMSELVES UPON SELECTION, IN THE FOLLOWING WAY:

TEST 1 'PCL11 TRANSMITTER TEST'
TEST 2 'PCL11 RECEIVER TEST'
TEST 3 'TRANSMITTER - RECEIVER LOOP TESTS'
TEST 4 'PCL11 TESTS 1 - 3 SEQUENCE''

8.6 THE TESTS WILL SIGNIFY COMPLETION BY PRINTING THE FOLLOWING END PASS MESSAGES ALONG WITH THE PASS COUNT IN DECIMAL:

TEST 1 -- END PASS # N
TEST 2 -- END PASS # NA
TEST 3 -- END PASS # NB
TEST 4 -- END PASS # NC

9. STARTING AND OPERATING PROCEDURE
- LOAD THE PROGRAM TAPE USING THE PDP-11 ABSOLUTE LOADER
- 9.1 START UP:
- START PROGRAM AT 200
PROGRAM WILL ASK THE FOLLOWING (ONE AT A TIME)
- XMTR 1ST UNIBUS ADDR.. (DEFAULT = 164200)
RCVR 1ST UNIBUS ADDR... (DEFAULT = 164220)
XMTR VECTOR.. (DEFAULT = 170)
RCVR VECTOR.. (DEFAULT = 174)
XMTR PRIORITY (4-7).. (DEFAULT = 5)
RCVR PRIORITY (4-7).. (DEFAULT = 5)
XMTR TDM BUS ADDR (1-37).. (DEFAULT = 1)
RCVR TDM BUS ADDR (1-37).. (DEFAULT = 1)
- RESPOND TO EACH PROMPT WITH:
<CR> IF DEFAULT IS DESIRED
XXXXX <CR> IF XXXXX IS DESIRED FOR NEW ENTRY
- 9.11 SELECT TEST:
- THE PROGRAM THEN TYPES:
- SELECT TEST (<CR> FOR HELP)..
- THE OPERATOR HAS THE FOLLOWING CHOICES:
- 1 = SELECT TEST 1 TO RUN ONLY (TRANSMITTER LOGIC TEST)
2 = SELECT TEST 2 TO RUN ONLY (RECEIVER LOGIC TEST)
3 = SELECT TEST 3 TO RUN ONLY (XMTR -TO- RCVR LOOP TEST)
4 = SEQUENCE TEST 1, TEST 2, TEST 3 REPETEDLY.
<CR> PRINT THIS HELP MESSAGE.
- 9.12 POSSIBLE INTERVENTION:
- 9.121 IF SW 12 IS UP AT START TIME, THE FIRST SUBTEST
WILL RUN CONTINUOUSLY AND THE TEST WILL NEVER
ACHIEVE A SUCCESSFUL PASS COMPLETE. SWITCH 12
MUST BE LEFT DOWN UNLESS AN INTERMITTENT ERROR
OCCURS IN A SUBTEST AND IT IS DESIRED TO SCOPE
THE MODULE WITH THE SAME SUBTEST RUNNING CONTINUOUSLY.
AT ANY TIME, SW 12 MAY BE LOWERED AND THE TEST
SEQUENCE WILL RESUME.
- 9.122 ANY PARTICULAR SUBTEST MAY BE STARTED BY
STARTING WITH OPTION SWITCH 10 = 1 AND THE
NUMBER OF THE DESIRED SUBTEST IN SW'S <3:0>.
IF IT IS DESIRED, HOWEVER, TO CONTINUOUSLY
RUN ONLY THE SELECTED SUBTEST, SW 12 MUST BE RAISED
AS WELL AS SW 10 AT START UP TIME.
- 9.123 WHEN THE MASTER SECTION TEST HAS IT'S TURN TO RUN
THE FOLLOWING MESSAGE WILL APPEAR ON THE CONSOLE

331 PRINTER

332
333 SCOPE SECTION FOR SLICE TIMING
334 RAISE SW 09 TO EXIT THIS LOOP
335

336 THIS IS A 'HANG-UP' PROVIDED FOR MAINTENANCE
337 PURPOSES OF CHECKING AND ADJUSTING SLICE
338 TIMING IN THE MASTER SECTION. NEITHER THE
339 PRINTOUT NOR THE 'HANG-UP' WILL OCCUR IF
340 SW 09 IS UP.
341

342
343 9.124 NORMALLY, 10 (OCTAL) PASSES ARE MADE OF THE
344 COMPLETE TEST BEFORE A PASS COMPLETE IS
345 ACHIEVED AND
346

347 END PASS XX
348

349 IS PRINTED ON THE CONSOLE PRINTER.
350 HOWEVER, RAISING SW 11 WILL CAUSE EVERY SINGLE
351 PASS TO BE CONSIDERED AS COMPLETE.
352

353 9.13 RESTARTING:
354

355 THE TEST MAY BE RE-STARTED AT LOC. 204
356 THIS WILL OMIT MOST OPENING DIALOGUE.
357 THE FOLLOWING WILL STILL BE REQUESTED, HOWEVER:
358

359 TRANSMITTER TDM BUS ADDRESS IS (1-37).. (DEFAULT - 1)
360 RECEIVER TDM BUS ADDRESS IS (1-37).. (DEFAULT 1)
361

362 OR --THE TEST MAY BE RE-STARTED AT LOC. 224
363 THIS WILL OMIT ALL OF THE OPENING DIALOGUE
364 AND BEGIN RIGHT AT THE TEST SELECTOR.
365

366 9.14 (CONTROL CHARACTERS)
367

368 CNTRL-C RESTART TO SELECT NEW TDM BUS ADDRESSES
369 CNTRL-T RESTART AT TEST SELECTOR
370 CNTRL-D MODIFY DELAY CONSTANT
371 (NORMALLY SET FOR FASTEST PDP-11)
372 CNTRL-S MODIFY SWITCH OPTIONS ON NON-
373 SWITCH REGISTER PDP-11'S
374 CNTRL-P CONTINUE AFTER CONTROL FUNCTION
375 CNTRL-F MODIFY CONSOLE FILL COUNT

10 ERRORS

BASICALLY, THE ERRORS IN THIS TEST ARE IN THE FORM:

**ERROR X AT LOCATION YYYYYY

WHERE X IS THE ERROR NUMBER:

TRANSMITTER TEST ERROR #'S 1 TO 121 (TEST # 1)

RECEIVER TEST ERROR #'S 200-262 (TEST # 2)

LOOP TEST ERROR #'S 300-355 (TEST # 3)

AND YYYYYY IS THE ADDRESS IN THE LISTING WHERE THE
ERROR OCCURRED.

REFER TO THE LISTING ABOVE THE COMMENT:

***** ERROR X *****

TO DETERMINE THE CAUSE OF THE ERROR PRINTOUT.

DATA ERRORS WILL CAUSE A FURTHER PRINTOUT INDICATING
THE ERRONEOUS DATA:

SHOULD BE AAAAAA, WAS BBBBBB

OTHER ERRORS WILL CAUSE THE FOLLOWING FURTHER
PRINTOUTS:

TRANSMITTER STATUS REGISTER = CCCCCC

RECEIVER STATUS REGISTER = DDDDDD

NO. OF WORDS RECEIVED = EEEEE

SILO OUTPUT WORD WAS FFFFFF

SILO INPUT WORD WAS HHHHHH

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000240
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.ENDR
.TITLE CZPLBCO PCL11 STND ALN V02C
.SBTTL SYMBOLIC DEFINITIONS
.NLIST TTM
.LIST ME

*****THESE ADDED FOR SAFETY***

;INTERNAL DEFINITIONS:

PS = 177776
HWSWR = 177570
SSWR = SWREG

;REGISTER DEFINITIONS

R0 = %0
R1 = %1
R2 = %2
R3 = %3
R4 = %4
R5 = %5
SP = %6
PC = %7

;BUS REQUEST DEFINITIONS:

P7 = 340
P6 = 300
P5 = 240
P4 = 200
P3 = 140
P2 = 100
P1 = 40

;BIT DEFINITIONS:

B15 = 100000
B14 = 40000
B13 = 20000
B12 = 10000
B11 = 4000
B10 = 2000
B09 = 1000
B08 = 400
B07 = 200
B06 = 100
B05 = 40
B04 = 20
B03 = 10
B02 = 4
B01 = 2
B00 = 1

;OTHER DEFINITIONS:

ISP = BEGIN

;INITIAL STACK POINTER

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.SBTTL MACRO DEFINITIONS

;BOARD INITIALIZE MACRO

.MACRO BDINIT DEV
.NLIST
  .IF IDN <DEV>,<XMTR>
    BIS #B01,@TCR
  .IFF
    .IF IDN <DEV>,<RCVR>
      BIS #B01,@RCR
    .IFF
      .ERROR ;BAD ARGUMENT FOR BDINIT
    .ENDC
  .ENDC
.LIST
.ENDM

N = 1 ;INITIAL ERROR NUMBER
;ERROR MACROS

.MACRO ERROR P
;***** ERROR P *****
  BIT #B14,@SR
  BNE .+14
  MOV #P,ERRNUM
  JSR PC,E.R
  N = N+1
.ENDM

.MACRO DATERR P
;***** ERROR P *****
  BIT #B14,@SR
  BNE .+14
  MOV #P,ERRNUM
  JSR PC,DERR
  N = N+1
.ENDM

.MACRO HLT
  JSR PC,SWHLT
.ENDM

;PRINT MACRO (MSG ADDR IN R0)

.MACRO PNTM A
  MOV #A,R0
  JSR PC,TYP0UT
.ENDM
;PRINT MESSAGE
;POINTED TO BY A

;SCOPE LOOP MACRO

.MACRO SCOPE X
  JSR R5,SCPRTN
  X
.ENDM

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529      ;INTER-PDP-11 COMPATABLE MOVE TO PS
530      ;TO RUN ON LSI-11: CHANGE THIS MACRO TO:
531      ;      MOV      SRC,-(SP)
532      ;      MOV      #LLL,-(SP)
533      ;      RTI
534      ;LLL:
535
536      .MACRO  MTPS      SRC,?LLL
537      MOV      SRC,@#PS
538      .ENDM
539
540      ;REGISTER SAVE AND RESTORE MACRO'S
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543      .MACRO  REGSAV
544      JSR      R5,REGSAV
545      .ENDM
546
547      .MACRO  REGRES
548      JSR      R5,REGRES
549      .ENDM
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			.SBTTL TRAP CATCHERS		
			.ENABLE	ABS	
551					
552					
553		000000			0
554	000000	000002	.WORD	.+2	
555	000002	000000	.WORD	0	
556	000004	004476	.WORD	ERRTRP	:TRAP BAD DEVICE ADDRESSES
557	000006	000340	.WORD	340	
558		000176	.REPT	126.	
559			.WORD	.+2	
560			.WORD	0	
561			.ENDR		
(1)	000010	000012	.WORD	.+2	
(1)	000012	000000	.WORD	0	
(1)	000014	000016	.WORD	.+2	
(1)	000016	000000	.WORD	0	
(1)	000020	000022	.WORD	.+2	
(1)	000022	000000	.WORD	0	
(1)	000024	000026	.WORD	.+2	
(1)	000026	000000	.WORD	0	
(1)	000030	000032	.WORD	.+2	
(1)	000032	000000	.WORD	0	
(1)	000034	000036	.WORD	.+2	
(1)	000036	000000	.WORD	0	
(1)	000040	000042	.WORD	.+2	
(1)	000042	000000	.WORD	0	
(1)	000044	000046	.WORD	.+2	
(1)	000046	000000	.WORD	0	
(1)	000050	000052	.WORD	.+2	
(1)	000052	000000	.WORD	0	
(1)	000054	000056	.WORD	.+2	
(1)	000056	000000	.WORD	0	
(1)	000060	000062	.WORD	.+2	
(1)	000062	000000	.WORD	0	
(1)	000064	000066	.WORD	.+2	
(1)	000066	000000	.WORD	0	
(1)	000070	000072	.WORD	.+2	
(1)	000072	000000	.WORD	0	
(1)	000074	000076	.WORD	.+2	
(1)	000076	000000	.WORD	0	
(1)	000100	000102	.WORD	.+2	
(1)	000102	000000	.WORD	0	
(1)	000104	000106	.WORD	.+2	
(1)	000106	000000	.WORD	0	
(1)	000110	000112	.WORD	.+2	
(1)	000112	000000	.WORD	0	
(1)	000114	000116	.WORD	.+2	
(1)	000116	000000	.WORD	0	
(1)	000120	000122	.WORD	.+2	
(1)	000122	000000	.WORD	0	
(1)	000124	000126	.WORD	.+2	
(1)	000126	000000	.WORD	0	
(1)	000130	000132	.WORD	.+2	
(1)	000132	000000	.WORD	0	
(1)	000134	000136	.WORD	.+2	
(1)	000136	000000	.WORD	0	
(1)	000140	000142	.WORD	.+2	

(1)	000142	000000	.WORD	0
(1)	000144	000146	.WORD	.+2
(1)	000146	000000	.WORD	0
(1)	000150	000152	.WORD	.+2
(1)	000152	000000	.WORD	0
(1)	000154	000156	.WORD	.+2
(1)	000156	000000	.WORD	0
(1)	000160	000162	.WORD	.+2
(1)	000162	000000	.WORD	0
(1)	000164	000166	.WORD	.+2
(1)	000166	000000	.WORD	0
(1)	000170	000172	.WORD	.+2
(1)	000172	000000	.WORD	0
(1)	000174	000176	.WORD	.+2
(1)	000176	000000	.WORD	0
(1)	000200	000202	.WORD	.+2
(1)	000202	000000	.WORD	0
(1)	000204	000206	.WORD	.+2
(1)	000206	000000	.WORD	0
(1)	000210	000212	.WORD	.+2
(1)	000212	000000	.WORD	0
(1)	000214	000216	.WORD	.+2
(1)	000216	000000	.WORD	0
(1)	000220	000222	.WORD	.+2
(1)	000222	000000	.WORD	0
(1)	000224	000226	.WORD	.+2
(1)	000226	000000	.WORD	0
(1)	000230	000232	.WORD	.+2
(1)	000232	000000	.WORD	0
(1)	000234	000236	.WORD	.+2
(1)	000236	000000	.WORD	0
(1)	000240	000242	.WORD	.+2
(1)	000242	000000	.WORD	0
(1)	000244	000246	.WORD	.+2
(1)	000246	000000	.WORD	0
(1)	000250	000252	.WORD	.+2
(1)	000252	000000	.WORD	0
(1)	000254	000256	.WORD	.+2
(1)	000256	000000	.WORD	0
(1)	000260	000262	.WORD	.+2
(1)	000262	000000	.WORD	0
(1)	000264	000266	.WORD	.+2
(1)	000266	000000	.WORD	0
(1)	000270	000272	.WORD	.+2
(1)	000272	000000	.WORD	0
(1)	000274	000276	.WORD	.+2
(1)	000276	000000	.WORD	0
(1)	000300	000302	.WORD	.+2
(1)	000302	000000	.WORD	0
(1)	000304	000306	.WORD	.+2
(1)	000306	000000	.WORD	0
(1)	000310	000312	.WORD	.+2
(1)	000312	000000	.WORD	0
(1)	000314	000316	.WORD	.+2
(1)	000316	000000	.WORD	0
(1)	000320	000322	.WORD	.+2

(1)	000322	000000	.WORD	0
(1)	000324	000326	.WORD	.+2
(1)	000326	000000	.WORD	0
(1)	000330	000332	.WORD	.+2
(1)	000332	000000	.WORD	0
(1)	000334	000336	.WORD	.+2
(1)	000336	000000	.WORD	0
(1)	000340	000342	.WORD	.+2
(1)	000342	000000	.WORD	0
(1)	000344	000346	.WORD	.+2
(1)	000346	000000	.WORD	0
(1)	000350	000352	.WORD	.+2
(1)	000352	000000	.WORD	0
(1)	000354	000356	.WORD	.+2
(1)	000356	000000	.WORD	0
(1)	000360	000362	.WORD	.+2
(1)	000362	000000	.WORD	0
(1)	000364	000366	.WORD	.+2
(1)	000366	000000	.WORD	0
(1)	000370	000372	.WORD	.+2
(1)	000372	000000	.WORD	0
(1)	000374	000376	.WORD	.+2
(1)	000376	000000	.WORD	0
(1)	000400	000402	.WORD	.+2
(1)	000402	000000	.WORD	0
(1)	000404	000406	.WORD	.+2
(1)	000406	000000	.WORD	0
(1)	000410	000412	.WORD	.+2
(1)	000412	000000	.WORD	0
(1)	000414	000416	.WORD	.+2
(1)	000416	000000	.WORD	0
(1)	000420	000422	.WORD	.+2
(1)	000422	000000	.WORD	0
(1)	000424	000426	.WORD	.+2
(1)	000426	000000	.WORD	0
(1)	000430	000432	.WORD	.+2
(1)	000432	000000	.WORD	0
(1)	000434	000436	.WORD	.+2
(1)	000436	000000	.WORD	0
(1)	000440	000442	.WORD	.+2
(1)	000442	000000	.WORD	0
(1)	000444	000446	.WORD	.+2
(1)	000446	000000	.WORD	0
(1)	000450	000452	.WORD	.+2
(1)	000452	000000	.WORD	0
(1)	000454	000456	.WORD	.+2
(1)	000456	000000	.WORD	0
(1)	000460	000462	.WORD	.+2
(1)	000462	000000	.WORD	0
(1)	000464	000466	.WORD	.+2
(1)	000466	000000	.WORD	0
(1)	000470	000472	.WORD	.+2
(1)	000472	000000	.WORD	0
(1)	000474	000476	.WORD	.+2
(1)	000476	000000	.WORD	0
(1)	000500	000502	.WORD	.+2

(1)	000502	000000	.WORD	0
(1)	000504	000506	.WORD	.+2
(1)	000506	000000	.WORD	0
(1)	000510	000512	.WORD	.+2
(1)	000512	000000	.WORD	0
(1)	000514	000516	.WORD	.+2
(1)	000516	000000	.WORD	0
(1)	000520	000522	.WORD	.+2
(1)	000522	000000	.WORD	0
(1)	000524	000526	.WORD	.+2
(1)	000526	000000	.WORD	0
(1)	000530	000532	.WORD	.+2
(1)	000532	000000	.WORD	0
(1)	000534	000536	.WORD	.+2
(1)	000536	000000	.WORD	0
(1)	000540	000542	.WORD	.+2
(1)	000542	000000	.WORD	0
(1)	000544	000546	.WORD	.+2
(1)	000546	000000	.WORD	0
(1)	000550	000552	.WORD	.+2
(1)	000552	000000	.WORD	0
(1)	000554	000556	.WORD	.+2
(1)	000556	000000	.WORD	0
(1)	000560	000562	.WORD	.+2
(1)	000562	000000	.WORD	0
(1)	000564	000566	.WORD	.+2
(1)	000566	000000	.WORD	0
(1)	000570	000572	.WORD	.+2
(1)	000572	000000	.WORD	0
(1)	000574	000576	.WORD	.+2
(1)	000576	000000	.WORD	0
(1)	000600	000602	.WORD	.+2
(1)	000602	000000	.WORD	0
(1)	000604	000606	.WORD	.+2
(1)	000606	000000	.WORD	0
(1)	000610	000612	.WORD	.+2
(1)	000612	000000	.WORD	0
(1)	000614	000616	.WORD	.+2
(1)	000616	000000	.WORD	0
(1)	000620	000622	.WORD	.+2
(1)	000622	000000	.WORD	0
(1)	000624	000626	.WORD	.+2
(1)	000626	000000	.WORD	0
(1)	000630	000632	.WORD	.+2
(1)	000632	000000	.WORD	0
(1)	000634	000636	.WORD	.+2
(1)	000636	000000	.WORD	0
(1)	000640	000642	.WORD	.+2
(1)	000642	000000	.WORD	0
(1)	000644	000646	.WORD	.+2
(1)	000646	000000	.WORD	0
(1)	000650	000652	.WORD	.+2
(1)	000652	000000	.WORD	0
(1)	000654	000656	.WORD	.+2
(1)	000656	000000	.WORD	0
(1)	000660	000662	.WORD	.+2

(1)	000662	000000	.WORD	0
(1)	000664	000666	.WORD	.+2
(1)	000666	000000	.WORD	0
(1)	000670	000672	.WORD	.+2
(1)	000672	000000	.WORD	0
(1)	000674	000676	.WORD	.+2
(1)	000676	000000	.WORD	0
(1)	000700	000702	.WORD	.+2
(1)	000702	000000	.WORD	0
(1)	000704	000706	.WORD	.+2
(1)	000706	000000	.WORD	0
(1)	000710	000712	.WORD	.+2
(1)	000712	000000	.WORD	0
(1)	000714	000716	.WORD	.+2
(1)	000716	000000	.WORD	0
(1)	000720	000722	.WORD	.+2
(1)	000722	000000	.WORD	0
(1)	000724	000726	.WORD	.+2
(1)	000726	000000	.WORD	0
(1)	000730	000732	.WORD	.+2
(1)	000732	000000	.WORD	0
(1)	000734	000736	.WORD	.+2
(1)	000736	000000	.WORD	0
(1)	000740	000742	.WORD	.+2
(1)	000742	000000	.WORD	0
(1)	000744	000746	.WORD	.+2
(1)	000746	000000	.WORD	0
(1)	000750	000752	.WORD	.+2
(1)	000752	000000	.WORD	0
(1)	000754	000756	.WORD	.+2
(1)	000756	000000	.WORD	0
(1)	000760	000762	.WORD	.+2
(1)	000762	000000	.WORD	0
(1)	000764	000766	.WORD	.+2
(1)	000766	000000	.WORD	0
(1)	000770	000772	.WORD	.+2
(1)	000772	000000	.WORD	0
(1)	000774	000776	.WORD	.+2
(1)	000776	000000	.WORD	0

```
563                                     .SBTTL TEST SUPERVISOR
564
565
566             000200             .             -             200
567
568 000200 000167 001574             JMP             BEGIN             ;TEST STARTS AT 200
569 000204 012706 002000             MOV             #ISP,SP
570 000210             MTPS             #P7
571 (1) 000210 012737 000340 177776             MOV             #P7,@#PS
572 000220 000167 002646             RESET
573 000224 012706 002000             JMP             RESTRT
574 000230             MOV             #ISP,SP
575 (1) 000230 012737 000340 177776             MTPS             #P7
576 000236 000167 003104             MOV             #P7,@#PS
577             002000             JMP             BCONT             ;GO TO TEST SELECT
578             .             =             2000
579 002000 000005             BEGIN: RESET             ;CLEAR ALL
580 002002 012706 002000             MOV             #ISP,SP             ;SET UP STACK
581 002006             MTPS             #P7             ;DISABLE C.P. INTERRUPT
582 (1) 002006 012737 000340 177776             MOV             #P7,@#PS
583 002014 005067 034032             CLR             SWRFLG             ;CLEAR SWR FLAG
584 002020 012737 004210 000004             MOV             #SRTST,@#4             ;SET UP TO TRAP IF NO HSWR
585 002026 012737 000340 000006             MOV             #P7,@#6
586 002034 012767 177570 030346             MOV             #HWSWR,SR             ;SET SR TO HDWARE SW REG
587 002042 005777 030342             TST             @SR             ;SEE IF IT'S THERE
588 (1) 002046 012700 035447             PNTM             TSTHDR             ;PRINT TEST HEADER
589 (1) 002052 004767 030572             MOV             #TSTHDR,R0             ;PRINT MESSAGE
590 002056             JSR             PC,TYP0UT             ;POINTED TO BY TSTHDR
591 (1) 002056 012700 035065             PROMT: PNTM             TMTR             ;PRINT 'TRANSMITTER'
592 (1) 002062 004767 030562             MOV             #TMTR,R0             ;PRINT MESSAGE
593 002066             JSR             PC,TYP0UT             ;POINTED TO BY TMTR
594 (1) 002066 012700 035103             PNTM             FRAD             ;PRINT '1ST BUS ADDR'
595 (1) 002072 004767 030552             MOV             #FRAD,R0             ;PRINT MESSAGE
596 002076 016700 034104             JSR             PC,TYP0UT             ;POINTED TO BY FRAD
597 002102 004767 031060             MOV             TXMADR,R0             ;PRINT DEFAULT ADDR
598 002106             JSR             PC,OCTPNT
599 (1) 002106 012700 032401             PNTM             TWOSP             ;PRINT MESSAGE
600 (1) 002112 004767 030532             MOV             #TWOSP,R0             ;POINTED TO BY TWOSP
601 002116 016767 034064 031040             JSR             PC,TYP0UT             ;LOAD DEFAULT ADDR
602 002124 004767 030562             MOV             TXMADR,KBBUF             ;GET KBD INPUT
603 002130 016767 031030 034050             JSR             PC,INPKB             ;REPLACE XMTR ADDR
604 002136 026727 034044 164000             MOV             KBBUF,TXMADR             ;REPLACE XMTR ADDR
605 002144 103006             CMP             TXMADR,#164000             ;IS IT WITHIN LIMITS?
606 002146             BHS             PRMT1             ;YES, CARRY ON
607 (1) 002146 012700 035125             PNTM             TOOLOW             ;NO ERROR, ASK AGAIN
608 (1) 002152 004767 030472             MOV             #TOLOW,R0             ;PRINT MESSAGE
609 002156 000167 177674             JSR             PC,TYP0UT             ;POINTED TO BY TOOLOW
610 002162 012737 004456 000004             JMP             PROMT
611 002170 005777 034012             PRMT1: MOV             #DVATST,@#4
612 (1) 002174 012700 035074             TST             @TXMADR             ;IS IT A GOOD ADDRESS?
613 (1) 002200 004767 030444             PRMT2: PNTM             RECVR             ;PRINT 'RECEIVER'
614 002204             MOV             #RECVR,R0             ;PRINT MESSAGE
615             JSR             PC,TYP0UT             ;POINTED TO BY RECVR
616             PNTM             FRAD             ;PRINT 1ST UNIBUS ADDR'
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(1)	002204	012700	035103		MOV	#FRAD,RO	:PRINT MESSAGE
(1)	002210	004767	030434		JSR	PC,TYPOUT	:POINTED TO BY FRAD
604	002214	016700	033770		MOV	RCVADR,RO	:PRINT DEFAULT ADDRESS
605	002220	004767	030742		JSR	PC,OCTPNT	
606	002224				PNTM	TWOSP	
(1)	002224	012700	032401		MOV	#TWOSP,RO	:PRINT MESSAGE
(1)	002230	004767	030414		JSR	PC,TYPOUT	:POINTED TO BY TWOSP
607	002234	016767	033750	030722	MOV	RCVADR,KBBUF	:LOAD DEFAULT ADDRESS
608	002242	004767	030444		JSR	PC,INPKB	:GET KBD INPUT
609	002246	016767	030712	033734	MOV	KBBUF,RCVADR	:LOAD NEW ADDRESS
610	002254	026727	033730	164000	CMP	RCVADR,#164000	:IS IT WITHIN LIMITS?
611	002262	103006			BHIS	PRMT3	:YES, CARRY ON
612	002264				PNTM	TOOLOW	
(1)	002264	012700	035125		MOV	#TOOLOW,RO	:PRINT MESSAGE
(1)	002270	004767	030354		JSR	PC,TYPOUT	:POINTED TO BY TOOLOW
613	002274	000167	177674		JMP	PRMT2	
614	002300	005777	033704		PRMT3:	TST @RCVADR	:IS IT A GOOD ADDRESS?
615	002304	012737	004476	000004	MOV	#ERRTRP,@#4	:SET UP FOR FURTHER TRAPS
616	002312				PRMT4:	PNTM TMTR	:PRINT 'TRANSMITTER'
(1)	002312	012700	035065		MOV	#TMTR,RO	:PRINT MESSAGE
(1)	002316	004767	030326		JSR	PC,TYPOUT	:POINTED TO BY TMTR
617	002322				PNTM	VCTR	:PRINT 'VECTOR IS'
(1)	002322	012700	035245		MOV	#VCTR,RO	:PRINT MESSAGE
(1)	002326	004767	030316		JSR	PC,TYPOUT	:POINTED TO BY VCTR
618	002332	016700	033644		MOV	TXMVEC,RO	:PRINT DEFAULT VECTOR
619	002336	004767	030624		JSR	PC,OCTPNT	
620	002342				PNTM	TWOSP	
(1)	002342	012700	032401		MOV	#TWOSP,RO	:PRINT MESSAGE
(1)	002346	004767	030276		JSR	PC,TYPOUT	:POINTED TO BY TWOSP
621	002352	016767	033624	030604	MOV	TXMVEC,KBBUF	:LOAD DEFAULT VECTOR
622	002360	004767	030326		JSR	PC,INPKB	:GET KBD INPUT
623	002364	016767	030574	033610	MOV	KBBUF,TXMVEC	:REPLACE XMTR VECTOR
624	002372	026727	030566	000776	CMP	KBBUF,#776	:IS IT WITHIN LIMITS?
625	002400	101406			BLOS	PRMT5	
626	002402				PNTM	AGAIN	:NO, TELL HIM
(1)	002402	012700	035211		MOV	#AGAIN,RO	:PRINT MESSAGE
(1)	002406	004767	030236		JSR	PC,TYPOUT	:POINTED TO BY AGAIN
627	002412	000167	177674		JMP	PRMT4	
628	002416				PRMT5:	PNTM RECVR	:PRINT 'RECEIVER'
(1)	002416	012700	035074		MOV	#RECVR,RO	:PRINT MESSAGE
(1)	002422	004767	030222		JSR	PC,TYPOUT	:POINTED TO BY RECVR
629	002426				PNTM	VCTR	:PRINT 'VECTOR IS'
(1)	002426	012700	035245		MOV	#VCTR,RO	:PRINT MESSAGE
(1)	002432	004767	030212		JSR	PC,TYPOUT	:POINTED TO BY VCTR
630	002436	016700	033542		MOV	RCVVEC,RO	:PRINT DEFAULT VECTOR
631	002442	004767	030520		JSR	PC,OCTPNT	
632	002446				PNTM	TWOSP	
(1)	002446	012700	032401		MOV	#TWOSP,RO	:PRINT MESSAGE
(1)	002452	004767	030172		JSR	PC,TYPOUT	:POINTED TO BY TWOSP
633	002456	016767	033522	030500	MOV	RCVVEC,KBBUF	:LOAD DEFAULT VECTOR
634	002464	004767	030222		JSR	PC,INPKB	:GET KEYBOARD INPUT
635	002470	016767	030470	033506	MOV	KBBUF,RCVVEC	:LOAD NEW VECTOR
636	002476	026727	030462	000776	CMP	KBBUF,#776	:IS IT WITHIN LIMITS?
637	002504	101406			BLOS	PRMT6	
638	002506				PNTM	AGAIN	
(1)	002506	012700	035211		MOV	#AGAIN,RO	:PRINT MESSAGE

(1)	002512	004767	030132		JSR	PC,TYPOUT	:POINTED TO BY AGAIN
639	002516	000167	177674		JMP	PRMT5	
640	002522			PRMT6:	PNTM	TMTR	:PRINT 'TRANSMITTER'
(1)	002522	012700	035065		MOV	#TMTR,R0	:PRINT MESSAGE
(1)	002526	004767	030116		JSR	PC,TYPOUT	:POINTED TO BY TMTR
641	002532				PNTM	PRIORITY	:PRINT 'PRIORITY LEVEL IS'
(1)	002532	012700	035256		MOV	#PRIORITY,R0	:PRINT MESSAGE
(1)	002536	004767	030106		JSR	PC,TYPOUT	:POINTED TO BY PRIORITY
642	002542	016700	033350		MOV	FKPRIO,R0	:PRINT DEFAULT PRIORITY
643	002546	004767	030414		JSR	PC,OCTPNT	
644	002552				PNTM	TWOSP	
(1)	002552	012700	032401		MOV	#TWOSP,R0	:PRINT MESSAGE
(1)	002556	004767	030066		JSR	PC,TYPOUT	:POINTED TO BY TWOSP
645	002562	016767	033330	030374	MOV	FKPRIO,KBBUF	:LOAD DEFAULT PRIORITY
646	002570	004767	030116		JSR	PC,INPKB	:GET KBD INPUT
647	002574	026727	030364	000007	CMP	KBBUF,#7	:IS IT WITHIN LIMITS
648	002602	003406			BLE	PRMT7	:LOW ENOUGH, O.K.
649	002604				PNTM	AGAIN	
(1)	002604	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE
(1)	002610	004767	030034		JSR	PC,TYPOUT	:POINTED TO BY AGAIN
650	002614	000167	177702		JMP	PRMT6	
651	002620	026727	030340	000004	PRMT7:	CMP	KBBUF,#4
652	002626	002006			BGE	PRMT8	:HIGH ENOUGH?
653	002630				PNTM	AGAIN	
(1)	002630	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE
(1)	002634	004767	030010		JSR	PC,TYPOUT	:POINTED TO BY AGAIN
654	002640	000167	177656		JMP	PRMT6	
655	002644	016767	030314	033244	PRMT8:	MOV	KBBUF,FKPRIO
656	002652	006367	030306		ASL	KBBUF	
657	002656	006367	030302		ASL	KBBUF	
658	002662	006367	030276		ASL	KBBUF	
659	002666	006367	030272		ASL	KBBUF	
660	002672	006367	030266		ASL	KBBUF	:SHIFT INTO PLACE
661	002676	016767	030262	033222	MOV	KBBUF,XPRIO	:LOAD NEW PRIORITY.
662	002704				PNTM	RECVR	:PRINT 'RECEIVER'
(1)	002704	012700	035074		MOV	#RECVR,R0	:PRINT MESSAGE
(1)	002710	004767	027734		JSR	PC,TYPOUT	:POINTED TO BY RECVR
663	002714				PNTM	PRIORITY	:PRINT 'PRIORITY LEVEL IS'
(1)	002714	012700	035256		MOV	#PRIORITY,R0	:PRINT MESSAGE
(1)	002720	004767	027724		JSR	PC,TYPOUT	:POINTED TO BY PRIORITY
664	002724	016700	033170		MOV	FKPRIO,R0	:PRINT DEFAULT PRIORITY
665	002730	004767	030232		JSR	PC,OCTPNT	
666	002734				PNTM	TWOSP	
(1)	002734	012700	032401		MOV	#TWOSP,R0	:PRINT MESSAGE
(1)	002740	004767	027704		JSR	PC,TYPOUT	:POINTED TO BY TWOSP
667	002744	016767	033150	030212	MOV	FKPRIO,KBBUF	:LOAD DEFAULT PRIORITY
668	002752	004767	027734		JSR	PC,INPKB	:GET KBD INPUT
669	002756	026727	030202	000007	CMP	KBBUF,#7	:LOW ENOUGH, O.K.
670	002764	003406			BLE	3\$	
671	002766				PNTM	AGAIN	
(1)	002766	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE
(1)	002772	004767	027652		JSR	PC,TYPOUT	:POINTED TO BY AGAIN
672	002776	000167	177702		JMP	PRMT9	
673	003002	026727	030156	000004	3\$:	CMP	KBBUF,#4
674	003010	002006			BGE	4\$	:HIGH ENOUGH?
675	003012				PNTM	AGAIN	

(1)	003012	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE	
(1)	003016	004767	027626		JSR	PC,TYPOUT	:POINTED TO BY AGAIN	
676	003022	000167	177656		JMP	PRMT9		
677	003026	016767	030132	033064	4\$:	MOV	KBBUF,FKPRI1	
678	003034	006367	030124		ASL	KBBUF		
679	003040	006367	030120		ASL	KBBUF		
680	003044	006367	030114		ASL	KBBUF		
681	003050	006367	030110		ASL	KBBUF		
682	003054	006367	030104		ASL	KBBUF	:SHIFT INTO PLACE	
683	003060	016767	030100	033042	MOV	KBBUF,RPRI0	:LOAD NEW PRIORITY	
684	003066	004767	001172		JSR	PC,DEVGEN	:GENERATE PCL-11 ADDRESSES	
685	003072			RESTR:	PNTM	TMTR	:PRINT 'TRANSMITTER'	
(1)	003072	012700	035065		MOV	#TMTR,R0	:PRINT MESSAGE	
(1)	003076	004767	027546		JSR	PC,TYPOUT	:POINTED TO BY TMTR	
686	003102				PNTM	TDMAD	:PRINT 'TDM BUS ADDRESS'	
(1)	003102	012700	035300		MOV	#TDMAD,R0	:PRINT MESSAGE	
(1)	003106	004767	027536		JSR	PC,TYPOUT	:POINTED TO BY TDMAD	
687	003112	012700	000001		MOV	#1,R0	:PRINT '1' AS DEFAULT	
688	003116	004767	030044		JSR	PC,OCTPNT		
689	003122				PNTM	TWOSP		
(1)	003122	012700	032401		MOV	#TWOSP,R0	:PRINT MESSAGE	
(1)	003126	004767	027516		JSR	PC,TYPOUT	:POINTED TO BY TWOSP	
690	003132	012767	000001	030024	MOV	#1,KBBUF	:LOAD DEFAULT OF '1'	
691	003140	004767	027546		JSR	PC,INPKB	:GET KBD INPUT.	
692	003144	005767	030014		TST	KBBUF	:DON'T ALLOW 0	
693	003150	001006			BNE	ADOK		
694	003152				PNTM	AGAIN		
(1)	003152	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE	
(1)	003156	004767	027466		JSR	PC,TYPOUT	:POINTED TO BY AGAIN	
695	003162	000167	177704		JMP	RESTR		
696	003166	026727	027772	000040	ADOK:	CMP	KBBUF,#40	:CAN'T BE 40 OR HIGHER
697	003174	103406			BLO	ADGD		
698	003176				PNTM	AGAIN		
(1)	003176	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE	
(1)	003202	004767	027442		JSR	PC,TYPOUT	:POINTED TO BY AGAIN	
699	003206	000167	177660		JMP	RESTR		
700	003212	116767	027746	032667	ADGD:	MOV#	KBBUF,TRAD+1	:SAVE ADDR IN UPPER BYTE
701	003220			PRMT10:	PNTM	RECV	:PRINT 'RECIEVER'	
(1)	003220	012700	035074		MOV	#RECV,R0	:PRINT MESSAGE	
(1)	003224	004767	027420		JSR	PC,TYPOUT	:POINTED TO BY RECV	
702	003230				PNTM	TDMAD	:PRINT 'TDM BUS ADDRESS'	
(1)	003230	012700	035300		MOV	#TDMAD,R0	:PRINT MESSAGE	
(1)	003234	004767	027410		JSR	PC,TYPOUT	:POINTED TO BY TDMAD	
703	003240	012700	000001		MOV	#1,R0	:PRINT '1' AS DEFAULT	
704	003244	004767	027716		JSR	PC,OCTPNT		
705	003250				PNTM	TWOSP		
(1)	003250	012700	032401		MOV	#TWOSP,R0	:PRINT MESSAGE	
(1)	003254	004767	027370		JSR	PC,TYPOUT	:POINTED TO BY TWOSP	
706	003260	012767	000001	027676	MOV	#1,KBBUF	:LOAD DEFAULT OF 1	
707	003266	004767	027420		JSR	PC,INPKB	:GET KBD INPUT	
708	003272	005767	027666		TST	KBBUF	:DON'T ALLOW 0	
709	003276	001006			BNE	ADOK		
710	003300				PNTM	AGAIN		
(1)	003300	012700	035211		MOV	#AGAIN,R0	:PRINT MESSAGE	
(1)	003304	004767	027340		JSR	PC,TYPOUT	:POINTED TO BY AGAIN	
711	003310	000167	177704		JMP	PRMT10		

712	003314	026727	027644	000040	ADROK:	CMP	KBBUF,#40		:CAN'T BE 40 OR HIGHER
713	003322	103406				BLO	ADRGD		
714	003324					PNTM	AGAIN		
(1)	003324	012700	035211			MOV	#AGAIN,R0		:PRINT MESSAGE
(1)	003330	004767	027314			JSR	PC,TYPOUT		:POINTED TO BY AGAIN
715	003334	000167	177660			JMP	PRMT10		
716	003340	116767	027620	032537	ADRGD:	MOVB	KBBUF,RCAD+1		:SAVE ADDR IN UPPER BYTE
717	003346				BCONT:	PNTM	TSTSEL		:PRINT 'SELECT TEST <CR> = HELP'
(1)	003346	012700	035533			MOV	#TSTSEL,R0		:PRINT MESSAGE
(1)	003352	004767	027272			JSR	PC,TYPOUT		:POINTED TO BY TSTSEL
718	003356	012767	000077	027600		MOV	#77,KBBUF		:DEFAULT TO HELP
719	003364	004767	027322			JSR	PC,INPKB		:GET KEYBOARD INPUT
720	003370	026727	027570	000005		CMP	KBBUF,#5		:DID HE TYPE 5 OR HIGHER?
721	003376	103005				BHIS	BHLPMSG		:YES, GIVE ASSISTANCE.
722	003400	005767	027560			TST	KBBUF		:HOPE IT WASN'T '0'
723	003404	001402				BEQ	BHLPMSG		: 'CAUSE THAT'S NO GOOD EITHER
724	003406	000167	000014			JMP	TESTGO		:EVERYTHING OK. GO TO TESTS
725	003412				BHLPMSG:	PNTM	HLPMSG		:NO GOOD, PRINT HELP MESSAGE.
(1)	003412	012700	035570			MOV	#HLPMSG,R0		:PRINT MESSAGE
(1)	003416	004767	027226			JSR	PC,TYPOUT		:POINTED TO BY HLPMSG
726	003422	000167	177720			JMP	BCONT		
727									
728	003426	016767	027532	032444	TESTGO:	MOV	KBBUF,TESTNO		:SAVE TEST NUMBER
729	003434	005767	032412			TST	SWRFLG		:GOT ANY SWITCHES?
730	003440	001402				BEQ	1\$		:YES, YOU'RE ON YOUR OWN
731	003442	004767	026256			JSR	PC,SWDMP		:OTHERWISE, SHOW SW OPTIONS.
732	003446	005067	032414	1\$:		CLR	PSNO1		:CLEAR END PASS COUNTER
733	003452	005067	032412			CLR	PSNO2		:CLEAR END PASS A COUNTER
734	003456	005067	032410			CLR	PSNO3		:CLEAR END PASS B COUNTER
735	003462	005067	032406			CLR	PSNO4		:CLEAR END PASS C COUNTER
736	003466	026727	032406	000001		CMP	TESTNO,#1		:SELECT TEST 1?
737	003474	001012				BNE	2\$		:NO.
738	003476	005067	032400			CLR	\$4FLAG		:CLEAR END PASS INHIBIT FLAG
739	003502					PNTM	TXHDR		:PRINT XMTR TEST HEADER
(1)	003502	012700	034671			MOV	#TXHDR,R0		:PRINT MESSAGE
(1)	003506	004767	027136			JSR	PC,TYPOUT		:POINTED TO BY TXHDR
740	003512	004767	000220	11\$:		JSR	PC,TEST1		:YES, GO DO IT (LOOP)
741	003516	000167	177770			JMP	11\$		
742	003522	026727	032352	000002	2\$:	CMP	TESTNO,#2		:SELECT TEST 2?
743	003530	001012				BNE	3\$		:NO.
744	003532	005067	032344			CLR	\$4FLAG		:CLEAR END PASS INHIBIT FLAG
745	003536					PNTM	RCHDR		:PRINT RCVR TEST HEADER
(1)	003536	012700	034725			MOV	#RCHDR,R0		:PRINT MESSAGE
(1)	003542	004767	027102			JSR	PC,TYPOUT		:POINTED TO BY RCHDR
746	003546	004767	011362	21\$:		JSR	PC,TEST2		:YES, GO DO IT (LOOP)
747	003552	000167	177770			JMP	21\$		
748	003556	026727	032316	000003	3\$:	CMP	TESTNO,#3		:SELECT TEST 3?
749	003564	001012				BNE	4\$		:NO.
750	003566	005067	032310			CLR	\$4FLAG		:CLEAR END PASS INHIBIT FLAG
751	003572					PNTM	XRHDR		:PRINT LOOP TEST HEADER
(1)	003572	012700	034756			MOV	#XRHDR,R0		:PRINT MESSAGE
(1)	003576	004767	027046			JSR	PC,TYPOUT		:POINTED TO BY XRHDR
752	003602	004767	017246	31\$:		JSR	PC,TEST3		:YES, GO DO IT.
753	003606	000167	177770			JMP	31\$		
754	003612	026727	032262	000004	4\$:	CMP	TESTNO,#4		:SELECT TEST 4?
755	003620	001044				BNE	5\$		:NO?????

756	003622	012767	177777	032252	MOV	#-1,\$4FLAG	;SET FLAG TO INHIBIT END PASS
757	003630				PNTM	ALTHDR	;PRINT TRIPLE TEST HEADER
(1)	003630	012700	035025		MOV	#ALTHDR,R0	;PRINT MESSAGE
(1)	003634	004767	027010		JSR	PC,TYPOUT	;POINTED TO BY ALTHDR
758	003640	004767	000072	41\$:	JSR	PC,TEST1	
759	003644	004767	011264	.	JSR	PC,TEST2	
760	003650	004767	017200		JSR	PC,TEST3	;DO ALL TESTS (LOOP)
761	003654	005267	032214		INC	PSN04	;UPDATE PASS COUNTER
762	003660				PNTM	PEND	;PRINT END PASS #
(1)	003660	012700	034443		MOV	#PEND,R0	;PRINT MESSAGE
(1)	003664	004767	026760		JSR	PC,TYPOUT	;POINTED TO BY PEND
763	003670	016700	032200		MOV	PSN04,R0	;GET PASS # TO R0
764	003674	004767	027372		JSR	PC,DECPNT	;PRINT IT IN DECIMAL
765	003700	012700	000040		MOV	#40,R0	;ALSO, PRINT 'C'
766	003704	004767	027562		JSR	PC,TTO	
767	003710	012700	000103		MOV	#'C',R0	;TO IDENTIFY END PASS OF
768	003714	004767	027552		JSR	PC,TTO	;TEST 4
769	003720	005000			CLR	R0	
770	003722	004767	027544		JSR	PC,TTO	;NULLS TO ALLOW PASS #
771	003726	004767	027540		JSR	PC,TTO	
772	003732	000167	177702	5\$:	JMP	41\$	

SEQ 0025

```

774                                     .SBTTL  TRANSMITTER TESTS
775
776                                ;TEST 1: TRANSMITTER LOGIC TESTS
777                                ; (00) RESET TEST
778                                ; (01) TCR REG. TEST
779                                ; (02) TSBC REG TEST
780                                ; (03) TSBA REG TEST
781                                ; (04) MASTER SECT. TEST
782                                ; (05) DATA SILO TEST
783                                ; (06) TSR REG. & ERRORS TEST
784                                ; (07) INTERRUPT TEST
785                                ; (10) C.R.C. TEST

```

788	003736				TEST1:	MTPS	#P7
(1)	003736	012737	000340	177776		MOV	#P7,@MPS
789	003744	012767	000010	032104		MOV	#10,ITER
790	003752	004767	025714			JSR	PC,MONIT
791	003756	032777	002000	026424		BIT	#B10,@SR
792	003764	001424				BEG	LOOP
793	003766	017767	026416	032064		MOV	@SR,SWI
794	003774	042767	177760	032056		BIC	#-20,SWI
795	004002	026727	032052	000010		CMP	SWI,#10
796	004010	003012				BGT	LOOP
797	004012	000241				CLC	
798	004014	006167	032040			ROL	SWI
799	004020	006167	032034			ROL	SWI
800	004024	062767	004036	032026		ADD	#LOOP,SWI
801	004032	000177	032022			JMP	@SWI
802	004036	004767	000602		LOOP:	JSR	PC,XINIT
803	004042	004767	001230			JSR	PC,TCTST
804	004046	004767	002012			JSR	PC,BCTST
805	004052	004767	002170			JSR	PC,BATST
806	004056	004767	002346			JSR	PC,MSRTST
807	004062	004767	004360			JSR	PC,SILTST
808	004066	004767	006026			JSR	PC,TSRTST
809	004072	004767	010064			JSR	PC,INTST
810	004076	004767	010544			JSR	PC,CRCST
811	004102	032777	004000	026300		BIT	#B11,@SR
812	004110	001003				BNE	XEND
813	004112	005367	031740			DEC	ITER
814	004116	001347				BNE	LOOP
815	004120	005767	031756		XEND:	TST	\$4FLAG
816	004124	001020				BNE	REPEAT
817	004126	005267	031734			INC	PSNO1
818	004132					PNTM	PEND
(1)	004132	012700	034443			MOV	#PEND,R0
(1)	004136	004767	026506			JSR	PC,TYPOUT
819	004142	016700	031720			MOV	PSNO1,R0
820	004146	004767	027120			JSR	PC,DECPNT
821	004152	005000				CLR	R0
822	004154	004767	027312			JSR	PC,TTO
823	004160	005000				CLR	R0
824	004162	004767	027304			JSR	PC,TTO
825	004166	000207			REPEAT:	RTS	PC
826							

```

;INITIAL ITERATION OF 10 PER PASS
;CHECK FOR KBD INPUT
      ;CHECK SW 10
;IF 0, RUN SEQUENTIALLY
;IF SET, GET TEST # FROM SWR
;MASK LOW DIGIT
;DON'T ALLOW SW = >10
;IF GREATER, START 1'ST TEST
;CLEAR 'C' BIT BEFORE ROTATE

```

```

;MULTIPLY BY 4
;GENERATE OFFSET
;GO TO SELECTED TEST
;DO INITIAL CLR TEST
;DO TCR REG TEST
;DO BYTE COUNT REG TST
;DO BYTE ADDR REG TEST
;DO MASTER SECTION TEST
;DO DATA SILO TEST
;DO TSR REG & ERRORS TEST
;DO INTERRUPT TEST
;DO CRC GENERATION TEST
;CHECK SWITCH 11
;PRINT END IF SET
;OTHERWISE, REITERATE

```

```

:SHOULD WE PRINT END PASS?
:NO, LEAVE
:UPDATE PASS NUMBER
:PRINT 'END PASS # '
:PRINT MESSAGE
:POINTED TO BY PEND

```

```

:PRINT PASSNO.

```

```
;PRINT NULLS TO ALLOW TIME
;FOR PASS # TO BE PRINTED
```

```

:RETURN TO SUPERVISOR

```

CZPLBCO PCL11 STND ALN V02C
CZPLBC.P11 07-JUN-79 15:47

MACY11 30A(1052) 20-JUN-79 07:50 N 2
TRANSMITTER TESTS PAGE 13-1

SEQ 0026

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827 ;NON-SWR PROCESSOR HALT SUBROUTINE
828
829 004170 005767 031656 SWHLT: TST SWRFLG ;ANY HARDWARE SWR?
830 004174 001403 BEQ 1$ ;IF YES GO HALT
831 004176 004767 025522 JSR PC,SWDMP ;IF NOT GO GET SW LOC
832 004202 000207 RTS PC
833 004204 000000 1$: HALT
834 004206 000207 RTS PC ;RETURN IF CONT KEY HIT
835
836 004210 012767 032406 026172 SRTST: MOV #SSWR,SR ;NO HDWARE SWR, USE MEM LOC
837 004216 012767 177777 031626 MOV #-1,SWRFLG ;SET SOFT SWR FLAG
838 004224 000002 RTI ;RETURN
839
840 ;THIS ROUTINE ENTERED FOR SCOPE ROUTINES
841
842 004226 004767 025440 SCPRTN: JSR PC,MONIT ;SEE IF ^S WAS TYPED
843 004232 005777 026152 TST @SR ;BIT 15 SET?
844 004236 100402 BMI SBAK ;YES, DON'T HALT
845 004240 HLT ;COMMON ERROR HALT. EXAMINE
846 (1) 004240 004767 177724 JSR PC,SWHLT
847 004244 012500 SBAK: MOV (R5)+,R0 ;R5 FOR PC OF ERROR
848 004246 032777 020000 026134 BIT #B13,@SR ;GET DIRECTION FOR SCOPE LOOP
849 004254 001402 BEQ SCONT ;SW 13 SET?
850 004256 012605 MOV (SP)+,R5 ;NO, DON'T LOOP
851 004260 000110 JMP (R0) ;YES, RESTORE R5
852 004262 000205 SCONT: RTS R5 ;AND LOOP
;JUST RETURN

```

.SBTTL UTILITY ROUTINES

:DEVICE ADDRESS GENERATION

854					
855					
856					
857					
858					
859	004264	016700	031716	DEVGEN: MOV	TXMADR,RO ;GET BASIC XMTR ADDRESS
860	004270	010067	031636	MOV	RO,TCR ;GENERATE TCR
861	004274	062700	000002	ADD	#2,RO
862	004300	010067	031630	MOV	RO,TSR ;GENERATE TSR
863	004304	062700	000002	ADD	#2,RO
864	004310	010067	031622	MOV	RO,TSDB ;GENERATE TSDB
865	004314	062700	000002	ADD	#2,RO
866	004320	010067	031614	MOV	RO,TSBC ;GENERATE TSBC
867	004324	062700	000002	ADD	#2,RO
868	004330	010067	031606	MOV	RO,TSBA ;GENERATE TSBA
869	004334	062700	000002	ADD	#2,RO
870	004340	010067	031600	MOV	RO,TMMR ;GENERATE TMMR
871	004344	005200		INC	RO
872	004346	010067	031574	MOV	RO,TMMRH ;GEN. TMMR HIGH BYTE
873	004352	005200		INC	RO
874	004354	010067	031570	MOV	RO,TSCRC ;GENERATE TSCRC
875	004360	016767	031616	MOV	TXMVEC,IXVEC ;GENERATE TXVEC
876	004366	016700	031616	MOV	RCVADR,RO ;GET BASIC RCVR ADDRESS
877	004372	010067	031554	MOV	RO,RCR ;GENERATE RCR
878	004376	062700	000002	ADD	#2,RO
879	004402	010067	031546	MOV	RO,RSR ;GENERATE RSR
880	004406	062700	000002	ADD	#2,RO
881	004412	010067	031540	MOV	RO,RDDB ;GENERATE RDDB
882	004416	062700	000002	ADD	#2,RO
883	004422	010067	031532	MOV	RO,RDBC ;GENERATE RDBC
884	004426	062700	000002	ADD	#2,RO
885	004432	010067	031524	MOV	RO,RDBA ;GENERATE RDBA
886	004436	062700	000004	ADD	#4,RO
887	004442	010067	031516	MOV	RO,RDCRC ;GENERATE RDCRC
888	004446	016767	031532	MOV	RCVVEC,RCVEC ;GENERATE PCVEC
889	004454	000207		RTS	PC ;RETURN.

:DEVICE TEST TRAP HANDLER

894	004456	012706	002000	DVATST: MOV	#ISP,SP	
895	004462			PNTM	INVLAD	:PRINT NON-EXST ADDR MSG
(1)	004462	012700	035326	MOV	#INVLAD,RO	:PRINT MESSAGE
(1)	004466	004767	026156	JSR	PC,TYP0UT	:POINTED TO BY INVLAD
896	004472	000167	175360	JMP	PROMT	:RETURN TO ASK ALL AGAIN

:ROUTINE TO CATCH TRAPS TO 4

902	004476	011667	031374	ERRTRP: MOV	(SP),TEMP	:SAVE STACK FOR ADDRESS OF TRAP
903	004502	012737	000340	MOV	#P7,2APS	:RAISE PRIORITY
904	004510	012706	002000	MOV	#ISP,SP	:FIX THE STACK
905	004514			PNTM	TRAP4	:PRINT 'TRAPPED TO 4 ' MSG
(1)	004514	012700	035401	MOV	#TRAP4,RO	:PRINT MESSAGE
(1)	004520	004767	026124	JSR	PC,TYP0UT	:POINTED TO BY TRAP4


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906 004524 162767 000002 031344 SUB #2,TEMP
907 004532 016700 031340 MOV TEMP,R0
908 004536 004767 026424 JSR PC,OCTPNT
909 004542 000167 176600 JMP BCONT ;PRINT WHERE FROM.
910
911
912 ;STANDARD DELAY SUBROUTINE
913 ;MODIFY LOCATION 'DLCON' TO CHANGE
914 ;DELAY PERIOD.
915
916 004546 012567 031274 DELAY: MOV (R5)+,DILLY ;GET DELAY PARAMETER
917 004552 005767 025634 TST DLCON ;IS DLCON = 0?
918 004556 001003 BNE DLWT ;IF NOT, CARRY ON
919 004560 012767 000001 025624 MOV #1,DLCON ;IF SO, MAKE IT = 1
920 004566 016767 025620 031254 DLWT: MOV DLCON,DLY ;GET DELAY CONSTANT
921 004574 005367 031250 DLWT1: DEC DLY
922 004600 001375 BNE DLWT1
923 004602 005367 031240 DEC DILLY
924 004606 001367 BNE DLWT
925 004610 000205 RTS R5
926
927 ;REGISTER SAVE & RESTORE ROUTINES
928
929 004612 010446 REGSAV: MOV R4,-(SP)
930 004614 010346 MOV R3,-(SP)
931 004616 010246 MOV R2,-(SP)
932 004620 010146 MOV R1,-(SP)
933 004622 010046 MOV R0,-(SP)
934 004624 000115 JMP @R5
935
936 004626 030026 REGRES: BIT R0,(SP)+
937 004630 012600 MOV (SP)+,R0
938 004632 012601 MOV (SP)+,R1
939 004634 012602 MOV (SP)+,R2
940 004636 012603 MOV (SP)+,R3
941 004640 012604 MOV (SP)+,R4
942 004642 000205 RTS R5
  
```

```
944                                     .SBTTL INITIALIZE TEST
945
946                                     ;CHECK INITIAL CONDITIONS AFTER A RESET
947
948 004644 000005 XINIT: RESET ;CLEAR ALL
949 004646 017767 031266 025770 MOV @TSBC,BAD ;GET BYTE COUNT REGISTER
950 004654 005067 025766 CLR GOOD
951 004660 005767 025760 TST BAD ;WAS TSBC = 0?
952 004664 001414 BEQ XA1
953 004666 DATERR \N ;ERROR:TSBC NOT CLEARED BY RESET
(1) ;***** ERROR 1 *****
(1) 004666 032777 040000 025514 BIT #B14,@SR
(1) 004674 001005 BNE .+14
(1) 004676 012767 000001 025736 MOV #1,ERRNUM
(1) 004704 004767 025570 JSR PC,DERR
(1) 000002 N - N+1
954 004710 SCOPE XINIT
(1) 004710 004567 177312 JSR R5,SCPRTN
(1) 004714 004644 XINIT
955 004716 017767 031220 025720 XA1: MOV @TSBA,BAD ;GET BYTE ADDRESS REGISTER
956 004724 005067 025716 CLR GOOD
957 004730 005767 025710 TST BAD ;WAS TSBA = 0?
958 004734 001414 BEQ XA2
959 004736 DATERR \N ;ERROR:TSBA NOT CLEARED BY RESET
(1) ;***** ERROR 2 *****
(1) 004736 032777 040000 025444 BIT #B14,@SR
(1) 004744 001005 BNE .+14
(1) 004746 012767 000002 025666 MOV #2,ERRNUM
(1) 004754 004767 025520 JSR PC,DERR
(1) 000003 N - N+1
960 004760 SCOPE XINIT
(1) 004760 004567 177242 JSR R5,SCPRTN
(1) 004764 004644 XINIT
961 004766 017767 031152 025650 XA2: MOV @TMMR,BAD ;GET TMMR REGISTER
962 004774 042767 000377 025642 BIC #377,BAD ;MASK OFF ANY ADDR SILO DATA
963 005002 012767 050000 025636 MOV #50000,GOOD ;SET UP GOOD FOR COMPARE
964 005010 026767 025632 025626 CMP GOOD,BAD ;IGNORE BIT 8 WHEN DETERMINING
965 005016 001420 BEQ XA3 ;ERROR
966 005020 022767 050400 025616 CMP #50400,BAD
967 005026 001414 BEQ XA3
968 005030 DATERR \N ;ERROR:TMMR NOT INITIATED BY RESET
(1) ;***** ERROR 3 *****
(1) 005030 032777 040000 025352 BIT #B14,@SR
(1) 005036 001005 BNE .+14
(1) 005040 012767 000003 025574 MOV #3,ERRNUM
(1) 005046 004767 025426 JSR PC,DERR
(1) 000004 N = N+1
969 005052 SCOPE XINIT
(1) 005052 004567 177150 JSR R5,SCPRTN
(1) 005056 004644 XINIT
970 005060 017767 031050 025556 XA3: MOV @TSR,BAD ;GET TSR REGISTER
971 005066 012767 000400 025552 MOV #400,GOOD ;SET UP GOOD FOR COMPARE
972 005074 026767 025546 025542 XA4: CMP GOOD,BAD
973 005102 001414 BEQ XA5
974 005104 DATERR \N ;ERROR:TSR NOT INITIALIZED BY RESET
(1) ;***** ERROR 4 *****
```


(1)	005104	032777	040000	025276		BIT	#B14,@SR	
(1)	005112	001005				BNE	.+14	
(1)	005114	012767	000004	025520		MOV	#4,ERRNUM	
(1)	005122	004767	025352			JSR	PC,DERR	
(1)		000005			N	-	N+1	
975	005126					SCOPE	XINIT	
(1)	005126	004567	177074			JSR	R5,SCPRTN	
(1)	005132	004644				XINIT		
976	005134	017767	030772	025502	XA5:	MOV	@TCR,BAD	;GET TCR REGISTER
977	005142	005067	025500			CLR	GOOD	
978	005146	005767	025472			TST	BAD	;WAS TCR = 0?
979	005152	001414				BEQ	XA6	
980	005154					DATERR	\N	;ERROR:TCR NOT CLR'D BY RESET
(1)								;***** ERROR 5 *****
(1)	005154	032777	040000	025226		BIT	#B14,@SR	
(1)	005162	001005				BNE	.+14	
(1)	005164	012767	000005	025450		MOV	#5,ERRNUM	
(1)	005172	004767	025302			JSR	PC,DERR	
(1)		000006			N	-	N+1	
981	005176					SCOPE	XINIT	
(1)	005176	004567	177024			JSR	R5,SCPRTN	
(1)	005202	004644				XINIT		
982	005204	017767	030740	025432	XA6:	MOV	@TSCRC,BAD	
983	005212	005067	025430			CLR	GOOD	;CHECK CRC REGISTER
984	005216	005767	025422			TST	BAD	;WAS IT 0?
985	005222	001414				BEQ	XA7	;YES,CONTINUE
986	005224					DATERR	\N	;ERROR:TSCRC NOT CLEARED BY RESET
(1)								;***** ERROR 6 *****
(1)	005224	032777	040000	025156		BIT	#B14,@SR	
(1)	005232	001005				BNE	.+14	
(1)	005234	012767	000006	025400		MOV	#6,ERRNUM	
(1)	005242	004767	025232			JSR	PC,DERR	
(1)		000007			N	=	N+1	
987	005246					SCOPE	XINIT	
(1)	005246	004567	176754			JSR	R5,SCPRTN	
(1)	005252	004644				XINIT		
988	005254	004767	024412		XA7:	JSR	PC,MONIT	
989	005260	032777	010000	025122		BIT	#B12,@SR	;CHECK EXIT SW (SW 12)
990	005266	001402				BEQ	XART	
991	005270	000167	177350			JMP	XINIT	;IF SET, STAY IN THIS TEST
992	005274	000207			XART:	RTS	PC	

```
994                                     .SBTTL  TCR TEST
995
996                                     ;TRANSMITTER COMMAND REGISTER TEST
997
998 005276 005077 030630 TCRTEST: CLR @TCR ;CLEAR TCR REG
999 005302 012767 017400 025336 XD1: MOV #17400,GOOD ;SET ALL DEST. CODE BITS
1000 005310 016777 025332 030614 MOV GOOD,@TCR
1001 005316 017767 030610 025320 MOV @TCR,BAD ;AND READ THEM BACK
1002 005324 026767 025316 025312 CMP GOOD,BAD ;ALL DEST CODE BITS SET?
1003 005332 001414 BEQ XD2
1004 005334 DATERR \N ;ERROR:CANNOT SET SOME DEST. CODE BITS
(1) ;***** ERROR 7 *****
(1) 005334 032777 040000 025046 BIT #B14,@SR
(1) 005342 001005 BNE .+14
(1) 005344 012767 000007 025270 MOV #7,ERRNUM
(1) 005352 004767 025122 JSR PC,DERR
(1) 000010 = N+1
1005 005356 SCOPE XD1
(1) 005356 004567 176644 JSR R5,SCRPTN
(1) 005362 005302 XD1
1006 005364 005067 025256 XD2: CLR GOOD ;NOW CLR DEST. CODE BITS AFTER
1007 005370 005077 030536 CLR @TCR ;SETTING THEM
1008 005374 017767 030532 025242 MOV @TCR,BAD ;READ THEM BACK
1009 005402 042767 160377 025234 BIC #160377,BAD ;IGNORE ALL BUT DEST. CODE BITS
1010 005410 026767 025232 025226 CMP GOOD,BAD ;ALL CLEAR?
1011 005416 001414 BEQ XD3
1012 005420 DATERR \N ;ERROR:CANNOT CLR SOME DEST.CODE BITS
(1) ;***** ERROR 10 *****
(1) 005420 032777 040000 024762 BIT #B14,@SR
(1) 005426 001005 BNE .+14
(1) 005430 012767 000010 025204 MOV #10,ERRNUM
(1) 005436 004767 025036 JSR PC,DERR
(1) 000011 = N+1
1013 005442 SCOPE XD2
(1) 005442 004567 176560 JSR R5,SCRPTN
(1) 005446 005364 XD2
1014 005450 005077 030456 XD3: CLR @TCR
1015 005454 005077 030454 CLR @TSR ;CLEAR POSSIBLE TIMEOUT
1016 005460 012767 120365 025160 MOV #120365,GOOD ;SET ST TXM,INH ADR INC,EA 16&17,
1017 005466 016777 025154 030436 MOV GOOD,@TCR ;IE,RD SILO,SND WD,BRIB
1018 005474 017767 030432 025142 MOV @TCR,BAD ;SEE IF THEY ALL SET
1019 005502 026767 025140 025134 CMP GOOD,BAD
1020 005510 001414 BEQ XD4
1021 005512 DATERR \N ;ERROR:BAD BITS IN TCR
(1) ;***** ERROR 11 *****
(1) 005512 032777 040000 024670 BIT #B14,@SR
(1) 005520 001005 BNE .+14
(1) 005522 012767 000011 025112 MOV #11,ERRNUM
(1) 005530 004767 024744 JSR PC,DERR
(1) 000012 = N+1
1022 005534 SCOPE XD3
(1) 005534 004567 176466 JSR R5,SCRPTN
(1) 005540 005450 XD3
1023 005542 012777 137765 030362 XD4: MOV #137765,@TCR ;SET ALL SETTABLE BITS IN TCR
1024 005550 012777 177777 030362 MOV #-1,@TSBC ;AND IN TSBC
1025 005556 012777 177777 030356 MOV #-1,@TSBA ;AND IN TSBA
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1026	005564	012777	037240	030342	MOV	#37240,@TSR	;AND IN TSR
1027	005572	052777	000002	030332	BIS	#2,@TCR	;BOARD IN !
1028	005600	017767	030326	025036	MOV	@TCR,BAD	;CHK TCR
1029	005606	005067	025034		CLR	GOOD	
1030	005612	026767	025030	025024	CMP	GOOD,BAD	;TCR = 0?
1031	005620	001414			BEQ	XD5	
1032	005622				DATERR	\N	;ERROR:TCR NOT CLR'D BY BOARD INIT
(1)							;***** ERROR 12 *****
(1)	005622	032777	040000	024560	BIT	#B14,@SR	
(1)	005630	001005			BNE	.+14	
(1)	005632	012767	000012	025002	MOV	#12,ERRNUM	
(1)	005640	004767	024634		JSR	PC,DERR	
(1)		000013			=	N+1	
1033	005644				SCOPE	XD4	
(1)	005644	004567	176356		JSR	R5,SCPRTN	
(1)	005650	005542			XD4		
1034	005652	017767	030262	024764	XD5: MOV	@TSBC,BAD	;CHECK TSBC
1035	005660	026767	024762	024756	CMP	GOOD,BAD	;TSBC = 0?
1036	005666	001414			BEQ	XD6	
1037	005670				DATERR	\N	;ERROR:TSBC NOT CLR'D BY BD INIT
(1)							;***** ERROR 13 *****
(1)	005670	032777	040000	024512	BIT	#B14,@SR	
(1)	005676	001005			BNE	.+14	
(1)	005700	012767	000013	024734	MOV	#13,ERRNUM	
(1)	005706	004767	024566		JSR	PC,DERR	
(1)		000014			=	N+1	
1038	005712				SCOPE	XD4	
(1)	005712	004567	176310		JSR	R5,SCPRTN	
(1)	005716	005542			XD4		
1039	005720	017767	030216	024716	XD6: MOV	@TSBA,BAD	;TSBA 0?
1040	005726	026767	024714	024710	CMP	GOOD,BAD	
1041	005734	001414			BEQ	XD7	
1042	005736				DATERR	\N	;ERROR:TSBA NOT CLR'D BY BD INIT
(1)							;***** ERROR 14 *****
(1)	005736	032777	040000	024444	BIT	#B14,@SR	
(1)	005744	001005			BNE	.+14	
(1)	005746	012767	000014	024666	MOV	#14,ERRNUM	
(1)	005754	004767	024520		JSR	PC,DERR	
(1)		000015			-	N+1	
1043	005760				SCOPE	XD4	
(1)	005760	004567	176242		JSR	R5,SCPRTN	
(1)	005764	005542			XD4		
1044	005766	017767	030142	024650	XD7: MOV	@TSR,BAD	;TSR OK?
1045	005774	012767	000400	024644	MOV	#400,GOOD	
1046	006002	026767	024640	024634	XD8: CMP	GOOD,BAD	
1047	006010	001414			BEQ	XD9	
1048	006012				DATERR	\N	;ERROR:TSR BAD AFTER BD INIT
(1)							;***** ERROR 15 *****
(1)	006012	032777	040000	024370	BIT	#B14,@SR	
(1)	006020	001005			BNE	.+14	
(1)	006022	012767	000015	024612	MOV	#15,ERRNUM	
(1)	006030	004767	024444		JSR	PC,DERR	
(1)		000016			-	N+1	
1049	006034				SCOPE	XD4	
(1)	006034	004567	176166		JSR	R5,SCPRTN	
(1)	006040	005542			XD4		

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SEG 0033

1050	006042	004767	023624		XD9:	JSR	PC,MONIT
1051	006046	032777	010000	024334		BIT	#B12,ASR
1052	006054	001402				BEQ	XDRT
1053	006056	000167	177214			JMP	TCRTST
1054	006062	000207			XDRT:	RTS	PC

:LEAVE IF SW 12 = 0
:OTHERWISE, MUST STAY

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1056                      .SBTTL TSBC TEST
1057
1058                      ;BYTE COUNT REG. DATA TEST
1059
1060 006064                BCTST: BDINIT XMTR                ;INIT XMTR MODULE
1061 006072 012767 177777 027762      MOV #-1,PAT          ;SET PATTERN
1062 006100 012767 000001 027756      MOV #B00,MASK        ;SET BIT MASK
1063 006106 016767 027750 024532      XB1: MOV PAT,GOOD     ;LOAD 'GOOD' WITH PATTERN
1064 006114 016777 024526 030016      MOV GOOD,@TSBC       ;LOAD PATTERN INTO TSBC
1065 006122 017767 030012 024514      MOV @TSBC,BAD        ;READ TSBC
1066 006130 026767 024512 024506      CMP GOOD,BAD
1067 006136 001414          BEQ XB2
1068 006140          DATERR \N                ;ERROR:BAD DATA IN TSBC
                                           ;***** ERROR 16 *****
(1)
(1) 006140 032777 040000 024242      BIT #B14,@SR
(1) 006146 001005          BNE .+14
(1) 006150 012767 000016 024464      MOV #16,ERRNUM
(1) 006156 004767 024316          JSR PC,DERR
(1)          000017          = N+1
1069 006162          N SCOPE XB1
(1) 006162 004567 176040          JSR R5,SCPRTN
(1) 006166 006106          XB1
1070 006170 032767 100000 027664      XB2: BIT #B15,PAT    ;DONE WHOLE REGISTER?
1071 006176 001412          BEQ XB3                ;IF YES, DONE
1072 006200 012767 177777 027654      MOV #-1,PAT
1073 006206 046767 027652 027646      BIC MASK,PAT      ;NO, PREPARE FOR NEXT BIT
1074 006214 006367 027644          ASL MASK            ;ROTATE MASK
1075 006220 000167 177662          JMP XB1            ;AND CONTINUE
1076 006224 004767 023442          XB3: JSR PC,MONIT
1077 006230 032777 010000 024152      BIT #B12,@SR      ;IF SO, CONSIDER LEAVING
1078 006236 001402          BEQ XBRT                ;EXIT IF SW 12 = 0
1079 006240 000167 177620          JMP BCTST          ;STAY HERE IF SW 12 = 1
1080 006244 000207          XBRT: RTS PC

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1082                                     .SBTTL TSBA TEST
1083
1084                                     ;BYTE ADDRESS REGISTER TEST
1085
1086 006246                                BATST: BDINIT XMTR                ;INIT XMTR MODULE
1087 006254 012767 177777 027600          MOV      #-1,PAT                ;SET PATTERN
1088 006262 012767 000001 027574          MOV      #B00,MASK            ;SET BIT MASK
1089 006270 016767 027566 024350          XC1:  MOV      PAT,GOOD          ;LOAD 'GOOD' WITH PATTERN
1090 006276 016777 024344 027636          MOV      GOOD,@TSBA        ;LOAD PATTERN INTO TSBA
1091 006304 017767 027632 024332          MOV      @TSBA,BAD          ;READ IT BACK
1092 006312 026767 024330 024324          CMP      GOOD,BAD
1093 006320 001414                      BEQ      XC2
1094 006322                      DATERR  \N                ;ERROR:BAD DATA IN TSBA
(1)                                     ;***** ERROR 17 *****
(1) 006322 032777 040000 024060          BIT      #B14,@SR
(1) 006330 001005                      BNE      .+14
(1) 006332 012767 000017 024302          MOV      #17,ERRNUM
(1) 006340 004767 024134                      JSR      PC,DERR
(1) 000020                      N                      - N+1
1095 006344                      SCOPE XC1
(1) 006344 004567 175656                      JSR      R5,SCPRTN
(1) 006350 006270                      XC1
1096 006352 032767 100000 027502          XC2:  BIT      #B15,PAT                ;DONE WHOLE REGISTER?
1097 006360 001412                      BEQ      XC3                ;IF YES, DONE
1098 006362 012767 177777 027472          MOV      #-1,PAT
1099 006370 046767 027470 027464          BIC      MASK,PAT                ;NO,PREPARE FOR NEXT BIT
1100 006376 006367 027462                      ASL      MASK                ;ROTATE MASK
1101 006402 000167 177662                      JMP      XC1                ;AND CONTINUE
1102 006406 004767 023260          XC3:  JSR      PC,MONIT
1103 006412 032777 010000 023770          BIT      #B12,@SR                ;IF SO, CONSIDER LEAVING
1104 006420 001402                      BEQ      XCRT                ;EXIT IF SW 12 - 0
1105 006422 000167 177620                      JMP      BATST                ;STAY HERE IF SW 12 - 1
1106 006426 000207          XCRT:  RTS      PC

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1108 .SBTTL MASTER SECTION TEST
1109
1110 ;TEST MASTER CONTROL AND ADDRESS SILO
1111
1112 MSRTST: BDINIT XMTR ;INIT BOADR
1113 006430 112777 000001 027502 MOV #1,@TMMRH ;SET MASTER FLOP
1114 006444 132777 000001 027474 BIT #1,@TMMRH ;IS MASTER SET?
1115 006452 001014 BNE XE1
1116 006454 EROR \N ;ERROR:COULD NOT SET MASTER FLOP
(1) ;***** ERROR 20 *****
(1) 006454 032777 040000 023'26 BIT #B14,@SR
(1) 006462 001005 BNE .+14
(1) 006464 012767 000020 024150 MOV #20,ERRNUM
(1) 006472 004767 023716 JSR PC,ERR
(1) 000021 N N+1
1117 006476 SCOPE MSRTST
(1) 006476 004567 175524 JSR R5,SCPRTN
(1) 006502 006430 MSRTST
1118 006504 004767 023162 XE1: JSR PC,MONIT
1119 006510 032777 001000 023672 BIT #B09,@SR ;CHECK SW 09
1120 006516 001024 BNE XE3 ;IF ON, SKIP SCOPE LOOP
1121 006520 012767 177777 027326 MOV #-1,PNTFLG ;SET PRINT ALLOW FLAG
1122 006526 PNTM SCSEC ;OTHERWISE PRINT 'SCOPE SECTION..ETC'
(1) 006526 012700 034457 MOV #SCSEC,R0 ;PRINT MESSAGE
(1) 006532 004767 024112 JSR PC,TYP0UT ;POINTED TO BY SCSEC
1123 006536 005067 027312 CLR PNTFLG ;CLEAR PRINT ALLOW FLAG
1124 006542 005767 027304 TST SWRFLG ;REAL SW REG?
1125 006546 001402 BEQ XE2 ;YES, SKIP
1126 006550 004767 023150 JSR PC,SWDMP
1127 006554 004767 023112 XE2: JSR PC,MONIT
1128 006560 032777 001000 023622 BIT #B09,@SR ;KEEP AN EYE ON SW 09
1129 006566 001772 BEQ XE2 ;STAY HERE 'TILL IT GETS SET
1130 006570 142777 000001 027350 XE3: BICB #1,@TMMRH ;CLR MASTER FLOP
1131 006576 132777 000001 027342 BITB #1,@TMMRH ;IS MASTER CLEAR?
1132 006604 001414 BEQ XE3A
1133 006606 EROR \N ;ERROR:COULD NOT CLR MASTER FLOP
(1) ;***** ERROR 21 *****
(1) 006606 032777 040000 023574 BIT #B14,@SR
(1) 006614 001005 BNE .+14
(1) 006616 012767 000021 024016 MOV #21,ERRNUM
(1) 006624 004767 023564 JSR PC,ERR
(1) 000022 N N+1
1134 006630 SCOPE XE3
(1) 006630 004567 175372 JSR R5,SCPRTN
(1) 006634 006570 XE3
1135 006636 152777 000004 027302 XE3A: BISB #4,@TMMRH ;SET 'NOW MASTER' FLOP
1136 006644 132777 000004 027274 BITB #4,@TMMRH ;IS IT SET?
1137 006652 001014 BNE XE3B ;YES, GO TO CLEAR IT
1138 006654 EROR \N ;ERROR:COULD NOT SET 'NOW MASTER FLOP
(1) ;***** ERROR 22 *****
(1) 006654 032777 040000 023526 BIT #B14,@SR
(1) 006662 001005 BNE .+14
(1) 006664 012767 000022 023750 MOV #22,ERRNUM
(1) 006672 004767 023516 JSR PC,ERR
(1) 000023 N N+1
1139 006676 SCOPE XE3A

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(1)	006676	004567	175324			JSR	R5,SCPRTN	
(1)	006702	006636				XE3A		
1140	006704	142777	000004	027234	XE3B:	BICB	#4,@TMMRH	;OKAY, NOW CLEAR 'NOW MASTER'
1141	006712	132777	000004	027226		BITB	#4,@TMMRH	;IS IT CLEAR?
1142	006720	001414				BEQ	XE5A	;YES, OKAY.
1143	006722					ERROR	\N	;ERROR:COULD NOT CLEAR 'NOW MASTER'
(1)								;***** ERROR 23 *****
(1)	006722	032777	040000	023460		BIT	#B14,@SR	
(1)	006730	001005				BNE	+.14	
(1)	006732	012767	000023	023702		MOV	#23,ERRNUM	
(1)	006740	004767	023450			JSR	PC,ERR	
(1)		000024			N	=	N+1	
1144	006744					SCOPE	XE3B	
(1)	006744	004567	175256			JSR	R5,SCPRTN	
(1)	006750	006704				XE3B		
1145	006752	112777	000002	027166	XE5A:	MOVB	#2,@TMMRH	;SET SECONDARY FLOP
1146	006760	132777	000001	027160		BITB	#1,@TMMRH	;IS MASTER SET?
1147	006766	001017				BNE	XE6	
1148	006770	142777	000002	027150		BICB	#2,@TMMRH	
1149	006776					ERROR	\N	;CLR SEC FOR RE-TRY
(1)								;ERROR:SETTING SEC DID NOT SET MASTER
(1)	006776	032777	040000	023404		BIT	#B14,@SR	;***** ERROR 24 *****
(1)	007004	001005				BNE	+.14	
(1)	007006	012767	000024	023626		MOV	#24,ERRNUM	
(1)	007014	004767	023374			JSR	PC,ERR	
(1)		000025			N	-	N+1	
1150	007020					SCOPE	XE5A	
(1)	007020	004567	175202			JSR	R5,SCPRTN	
(1)	007024	006752				XE5A		
1151	007026	132777	000002	027112	XE6:	BITB	#2,@TMMRH	;IS SEC CLR?
1152	007034	001417				BEQ	XE6A	
1153	007036	142777	000002	027102		BICB	#2,@TMMRH	
1154	007044					ERROR	\N	;CLR SEC FOR RETRY
(1)								;ERROR:SEC NOT CLR'D BY THE SETTING OF MASTER
(1)	007044	032777	040000	023336		BIT	#B14,@SR	;***** ERROR 25 *****
(1)	007052	001005				BNE	+.14	
(1)	007054	012767	000025	023560		MOV	#25,ERRNUM	
(1)	007062	004767	023326			JSR	PC,ERR	
(1)		000026			N	-	N+1	
1155	007066					SCOPE	XE5A	
(1)	007066	004567	175134			JSR	R5,SCPRTN	
(1)	007072	006752				XE5A		
1156	007074	132777	000004	027044	XE6A:	BITB	#4,@TMMRH	;IS 'NOW MASTER ' SET?
1157	007102	001017				BNE	XE7	;YES, OKAY
1158	007104	142777	000002	027034		BICB	#2,@TMMRH	;CLR SEC FOR RETRY.
1159	007112					ERROR	\N	;ERROR:'NOW MASTER' NOT SET VIA SECONDARY
(1)								;***** ERROR 26 *****
(1)	007112	032777	040000	023270		BIT	#B14,@SR	
(1)	007120	001005				BNE	+.14	
(1)	007122	012767	000026	023512		MOV	#26,ERRNUM	
(1)	007130	004767	023260			JSR	PC,ERR	
(1)		000027			N	=	N+1	
1160	007134					SCOPE	XE5A	
(1)	007134	004567	175066			JSR	R5,SCPRTN	
(1)	007140	006752				XE5A		


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1162                                     ;ADDRESS SILO TEST
1163
1164 007142 152777 000060 026776 XE7:  BISB  #60,@TMMRH          ;SET AUT ADR TO LD SILO &CLR SILO
1165 007150 132777 000020 026770      BITB  #20,@TMMRH          ;IS AUT ADR SET?
1166 007156 001014      BNE  XE7A
1167 007160      ERROR  \N          ;ERROR:COULD NOT SET TMMR BIT 12
(1)                                     ;***** ERROR 27 *****
(1) 007160 032777 040000 023222      BIT  #B14,@SR
(1) 007166 001005      BNE  .+14
(1) 007170 012767 000027 023444      MOV  #27,ERRNUM
(1) 007176 004767 023212      JSR  PC,ERR
(1)      000030      =  N+1
1168 007202      N      SCOPE  XE7
(1) 007202 004567 175020      JSR  R5,SCPRTN
(1) 007206 007142      XE7
1169 007210 132777 000200 026730 XE7A: BITB  #200,@TMMRH          ;CHECK FOR OUTPUT RDY
1170 007216 001414      BEQ  XE8
1171 007220      ERROR  \N          ;ERROR:TMMR BIT 13 DOES NOT CLR ADDR SILO
(1)                                     ;***** ERROR 30 *****
(1) 007220 032777 040000 023162      BIT  #B14,@SR
(1) 007226 001005      BNE  .+14
(1) 007230 012767 000030 023404      MOV  #30,ERRNUM
(1) 007236 004767 023152      JSR  PC,ERR
(1)      000031      =  N+1
1172 007242      N      SCOPE  XE7
(1) 007242 004567 174760      JSR  R5,SCPRTN
(1) 007246 007142      XE7
1173 007250 012704 177700      XE8:  MOV  #-64.,R4          ;R4 IS COUNTER
1174 007254 005003      CLR  R3          ;R3 IS DATA
1175 007256 132777 000100 026662      BITB  #100,@TMMRH          ;ADR SILO INPUT RDY?
1176 007264 001014      BNE  XE9
1177 007266      ERROR  \N          ;ERROR:ADR SILO INPUT NOT RDY
(1)                                     ;***** ERROR 31 *****
(1) 007266 032777 040000 023114      BIT  #B14,@SR
(1) 007274 001005      BNE  .+14
(1) 007276 012767 000031 023336      MOV  #31,ERRNUM
(1) 007304 004767 023104      JSR  PC,ERR
(1)      000032      =  N+1
1178 007310      N      SCOPE  XE8
(1) 007310 004567 174712      JSR  R5,SCPRTN
(1) 007314 007250      XE8
1179 007316 110377 026622      XE9:  MOVB  R3,@TMMR          ;LOAD ADDR SILO
1180 007322 005203      INC  R3
1181 007324 005204      INC  R4
1182 007326 001420      BEQ  XE11
1183 007330 132777 000100 026610 XE10: BITB  #100,@TMMRH          ;INPUT READY?
1184 007336 001367      BNE  XE9
1185 007340      ERROR  \N          ;ERROR:INPUT NOT RDY-PREMATURLY FULL?
(1)                                     ;***** ERROR 32 *****
(1) 007340 032777 040000 023042      BIT  #B14,@SR
(1) 007346 001005      BNE  .+14
(1) 007350 012767 000032 023264      MOV  #32,ERRNUM
(1) 007356 004767 023032      JSR  PC,ERR
(1)      000033      =  N+1
1186 007362      N      SCOPE  XE7
(1) 007362 004567 174640      JSR  R5,SCPRTN

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SEQ 0039

(1)	007366	007142				XE7			
1187	007370	132777	000100	026550	XE11:	BITB	#100,@TMMRH		
1188	007376	001414				BEQ	XE12		;SILO SHOULD BE FULL NOW
1189	007400					ERROR	\N		;INPUT READY?
(1)									;ERROR:SILO FULL-BUT STILL RDY FOR INPUT
(1)	007400	032777	040000	023002		BIT	#B14,@SR		;***** ERROR 33 *****
(1)	007406	001005				BNE	.+14		
(1)	007410	012767	000033	023224		MOV	#33,ERRNUM		
(1)	007416	004767	022772			JSR	PC,ERR		
(1)		000034			N	-	N+1		
1190	007422					SCOPE	XE7		
(1)	007422	004567	174600			JSR	R5,SCPRTN		
(1)	007426	007142				XE7			
1191	007430	132777	000200	026510	XE12:	BITB	#200,@TMMRH		;SILO OUTPUT RDY?
1192	007436	001014				BNE	XE13		
1193	007440					ERROR	\N		;ERROR:FULL SILO NOT RDY FOR OUTPUT
(1)									;***** ERROR 34 *****
(1)	007440	032777	040000	022742		BIT	#B14,@SR		
(1)	007446	001005				BNE	.+14		
(1)	007450	012767	000034	023164		MOV	#34,ERRNUM		
(1)	007456	004767	022732			JSR	PC,ERR		
(1)		000035			N	=	N+1		
1194	007462					SCOPE	XE7		
(1)	007462	004567	174540			JSR	R5,SCPRTN		
(1)	007466	007142				XE7			
1195	007470	005003			XE13:	CLR	R3		;R3 IS FOR DATA COMPARE
1196	007472	012704	177700			MOV	#-64.,R4		;R4 IS COUNTER
1197	007476	052777	000200	026426	XE14:	BIS	#B07,@TCR		;SET RD SILO
1198	007504	117767	026434	023132		MOVB	@TMMR,BAD		;READ WORD FROM ADDRESS SILO
1199	007512	005077	026414			CLR	@TCR		;CLEAR RD SILO BIT
1200	007516	042767	177400	023120		BIC	#177400,BAD		;ONLY INTERESTED IN LOW BYTE
1201	007524	010367	023116			MOV	R3,GOOD		
1202	007530	026767	023112	023106	XE15:	CMP	GOOD,BAD		;SILO OUTPUT OK?
1203	007536	001414				BEQ	XE16		
1204	007540					DATERR	\N		;ERROR:BAD DATA READ FROM ADDR SILO
(1)									;***** ERROR 35 *****
(1)	007540	032777	040000	022642		BIT	#B14,@SR		
(1)	007546	001005				BNE	.+14		
(1)	007550	012767	000035	023064		MOV	#35,ERRNUM		
(1)	007556	004767	022716			JSR	PC,DERR		
(1)		000036			N	-	N+1		
1205	007562					SCOPE	XE7		
(1)	007562	004567	174440			JSR	R5,SCPRTN		
(1)	007566	007142				XE7			
1206	007570	005203			XE16:	INC	R3		;KEEP R3 DOWN TO 5 BITS
1207	007572	042703	177740			BIC	#177740,R3		
1208	007576	005204				INC	R4		
1209	007600	001420				BEQ	XE18		;AFTER 64 WDS, EXIT
1210	007602	132777	000200	026336	XE17:	BITB	#200,@TMMRH		;SILO OUTPUT READY?
1211	007610	001332				BNE	XE14		
1212	007612					ERROR	\N		;ERROR:SILO OUT NOT RDY-SILO NOT EMPTY
(1)									;***** ERROR 36 *****
(1)	007612	032777	040000	022570		BIT	#B14,@SR		
(1)	007620	001005				BNE	.+14		
(1)	007622	012767	000036	023012		MOV	#36,ERRNUM		
(1)	007630	004767	022560			JSR	PC,ERR		

(1)		000037			N	=	N+1		
1213	007634					SCOPE	XE7		
(1)	007634	004567	174366			JSR	R5,SCPRTN		
(1)	007640	007142				XE7			
1214	007642	132777	000200	026276	XE18:	BITB	#200,@TMMRH		:SILO OUT RDY AFTER 64 READS?
1215	007650	001414				BEQ	XE19		
1216	007652					ERROR	\N		:ERROR:EMPTY SILO READY FOR OUTPUT
(1)									:***** ERROR 37 *****
(1)	007652	032777	040000	022530		BIT	#B14,@SR		
(1)	007660	001005				BNE	.+14		
(1)	007662	012767	000037	022752		MOV	#37,ERRNUM		
(1)	007670	004767	022520			JSR	PC,ERR		
(1)		000040			N	=	N+1		
1217	007674					SCOPE	XE7		
(1)	007674	004567	174326			JSR	R5,SCPRTN		
(1)	007700	007142				XE7			
1218	007702	005077	026224		XE19:	CLR	@TCR		:CLR RD SILO
1219	007706	112777	000000	026230		MOVB	#0,@TMMR		:LOAD A WORD INTO SILO
1220	007714	004567	174626			JSR	R5,DELAY		:WAIT FOR MIGRATION
1221	007720	000010				.WORD	10		
1222	007722	132777	000200	026216		BITB	#200,@TMMRH		:CHECK OUT RDY AFTER DELAY
1223	007730	001022				BNE	XE20		
1224	007732					ERROR	\N		:ERROR:SILO SETTLING TIME TOO LONG
(1)									:***** ERROR 40 *****
(1)	007732	032777	040000	022450		BIT	#B14,@SR		
(1)	007740	001005				BNE	.+14		
(1)	007742	012767	000040	022672		MCV	#40,ERRNUM		
(1)	007750	004767	022440			JSR	PC,ERR		
(1)		000041			N	=	N+1		
1225	007754	052777	000200	026150		BIS	#B07,@TCR		:SET RD SILO BIT
1226	007762	117767	026156	022654		MOVB	@TMMR,BAD		:GET RID OF THE WORD IN SILO
1227	007770					SCOPE	XE19		
(1)	007770	004567	174232			JSR	R5,SCPRTN		
(1)	007774	007702				XE19			
1228	007776	152777	000041	026142	XE20:	BISB	#41,@TMMRH		:SET 'CLR SILO' BIT & SET MASTER
1229	010004	132777	000200	026134		BITB	#200,@TMMRH		:SILO RDY?
1230	010012	001414				BEQ	XE21		
1231	010014					ERROR	\N		:ERROR:BIT 13 OF TMMR DID NOT CLR ADR SILO
(1)									:***** ERROR 41 *****
(1)	010014	032777	040000	022366		BIT	#B14,@SR		
(1)	010022	001005				BNE	.+14		
(1)	010024	012767	000041	022610		MOV	#41,ERRNUM		
(1)	010032	004767	022356			JSR	PC,ERR		
(1)		000042			N	=	N+1		
1232	010036					SCOPE	XE20		
(1)	010036	004567	174164			JSR	R5,SCPRTN		
(1)	010042	007776				XE20			
1233	010044	112777	000037	026072	XE21:	MOVB	#37,@TMMR		:LOAD SILO WITH TEST WORD
1234	010052	132777	000200	026066	XE22:	BITB	#200,@TMMRH		:SILO OUT RDY?
1235	010060	001774				BEQ	XE22		:WAIT FOR IT
1236	010062	142777	000020	026056	XE22A:	BICB	#20,@TMMRH		:CLR AUT ADR
1237	010070	016704	022316			MOV	DLCON,R4		
1238	010074	012703	177000		XE22B:	MOV	#177000,R3		:SET UP FOR ABOUT 5MS DELAY
1239	010100	132777	000200	026040	XE23:	BITB	#200,@TMMRH		:OUTPUT RDY?
1240	010106	001420				BEQ	XE24		:IF NO - CARRY ON
1241	010110	005203				INC	R3		:WAITED 5MS?

1242	010112	001372			BNE	XE23		:NOT YET
1243	010114	005304			DEC	R4		
1244	010116	001366			BNE	XE22B		
1245	010120				ERROR	\N		:ERROR:ADDRESS SILO IS NOT CYCLING
(1)								:***** ERROR 42 *****
(1)	010120	032777	040000	022262	BIT	#B14,@SR		
(1)	010126	001005			BNE	.+14		
(1)	010130	012767	000042	022504	MOV	#42,ERRNUM		
(1)	010136	004767	022252		JSR	PC,ERR		
(1)		000043			-	N+1		
1246	010142				SCOPE	XE22A		
(1)	010142	004567	174060		JSR	R5,SCPRTN		
(1)	010146	010062			XE22A			
1247	010150	142777	000001	025770	BICB	#1,@TMMRH		:CLEAR MASTER FOR SYNC.
1248	010156	004567	174364		JSR	R5,DELAY		
1249	010162	000010			.WORD	10		
1250	010164	132777	000200	025754	BITB	#200,@TMMRH		:OUTPUT READY
1251	010172	001014			BNE	XE25		
1252	010174				ERROR	\N		:ERROR:CYCLED WORD WAS LOST-OUT NOT RDY
(1)								:***** ERROR 43 *****
(1)	010174	032777	040000	022206	BIT	#B14,@SR		
(1)	010202	001005			BNE	.+14		
(1)	010204	012767	000043	022430	MOV	#43,ERRNUM		
(1)	010212	004767	022176		JSR	PC,ERR		
(1)		000044			=	N+1		
1253	010216				SCOPE	XE20		
(1)	010216	004567	174004		JSR	R5,SCPRTN		
(1)	010222	007776			XE20			
1254	010224	004567	174316		JSR	R5,DELAY		
1255	010230	000010			.WORD	10		
1256	010232	152777	000021	025706	BISB	#21,@TMMRH		:SET AUTO ADDR & MASTER
1257	010240	052777	000200	025664	BIS	#B07,@TCR		:SET RD SILO
1258	010246	117767	025672	022370	MOVB	@TMMR,BAD		:CHECK VALIDITY OF OUTPUT
1259	010254	042767	177400	022362	BIC	#177400,BAD		:ONLY INTERESTED IN LOW BYTE
1260	010262	012767	000037	022356	MOV	#37,GOOD		
1261	010270	026767	022352	022346	CMP	GOOD,BAD		:OUTPUT SHOULD BE 37
1262	010276	001417			BEQ	XE26		
1263	010300				DATERR	\N		:ERROR:CYCLED WORD IS BAD DATA
(1)								:***** ERROR 44 *****
(1)	010300	032777	040000	022102	BIT	#B14,@SR		
(1)	010306	001005			BNE	.+14		
(1)	010310	012767	000044	022324	MOV	#44,ERRNUM		
(1)	010316	004767	022156		JSR	PC,DERR		
(1)		000045			=	N+1		
1264	010322	042777	000200	025602	BIC	#B07,@TCR		:CLR RD SILO BIT FOR SCOPE
1265	010330				SCOPE	XE20		
(1)	010330	004567	173672		JSR	R5,SCPRTN		
(1)	010334	007776			XE20			
1266	010336	004567	174204		JSR	R5,DELAY		:WAIT ANOTHER SETTLING TIME
1267	010342	000010			.WORD	10		
1268	010344	132777	000200	025574	BITB	#200,@TMMRH		:IS SILO OUT RDY (SHOULDN'T BE)?
1269	010352	001417			BEQ	XE27		:NO, LEAVE
1270	010354				ERROR	\N		:ERROR:EXTRA WORD FOUND IN SILO
(1)								:***** ERROR 45 *****
(1)	010354	032777	040000	022026	BIT	#B14,@SR		
(1)	010362	001005			BNE	.+14		

(1)	010364	012767	000045	022250		MOV	#45,ERRNUM	
(1)	010372	004767	022016			JSR	PC,ERR	
(1)		000046			N	-	N+1	
1271	010376	042777	000200	025526		BIC	#07,@TCR	:CLR RD SILO
1272	010404					SCOPE	XE20	
(1)	010404	004567	173616			JSR	R5,SCRPTN	
(1)	010410	007776				XE20		
1273	010412	152777	000060	025526	XE27:	BISB	#60,@TMRH	:SET AUTO ADDRESS & CLR ADDR SILO
1274	010420	005077	025506			CLR	@TCR	:CLEAR RD SILO
1275	010424	004767	021242			JSR	PC,MONIT	
1276	010430	032777	010000	021752		BIT	#12,@SR	:OK TO EXIT IF SW 12 = 0
1277	010436	001402				BEQ	XERT	
1278	010440	000167	175764			JMP	MSRTST	:OTHERWISE, STAY HERE
1279	010444	000207			XERT:	RTS	PC	

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1281          .SBTTL DATA SILO TEST
1282
1283          ;TRANSMITTER DATA SILO TEST
1284
1285          SILTST: BDINIT XMTR          ;CLEAR BOARD
1286          JSR      R5,DELAY
1287          .WORD    10
1288          BIT      #B03,@TCR          ;SILO OUTPUT READY?
1289          BEQ      XF1
1290          ERROR    \N
1291          ;ERROR:BD INIT DID NOT CLEAR DATA SILO
1292          ;***** ERROR 46 *****
1293
1294          (1) 010472 032777 040000 021710      BIT      #B14,@SR
1295          (1) 010500 0C1005                    BNE      .+14
1296          (1) 010502 012767 000046 022132      MOV      #46,ERRNUM
1297          (1) 010510 004767 021700              JSR      PC,ERR
1298          (1) 010514 000047                    -        N+1
1299          1291 010514 004567 173506              SCOPE    SILTST
1300          (1) 010514 010446                    JSR      R5,SCPRTN
1301          (1) 010520 010446                    SILTST
1302          1292 010522 032777 000400 025404 XF1: BIT      #B08,@TSR
1303          1293 010530 001014                    BNE      XF2
1304          1294 010532                    ERROR    \N
1305          ;ERROR:BD INIT DID NOT SET INPUT READY
1306          ;***** ERROR 47 *****
1307
1308          (1) 010532 032777 040000 021650      BIT      #B14,@SR
1309          (1) 010540 001005                    BNE      .+14
1310          (1) 010542 012767 000047 022072      MOV      #47,ERRNUM
1311          (1) 010550 004767 021640              JSR      PC,ERR
1312          (1) 010554 000050                    =        N+1
1313          1295 010554 004567 173446              SCOPE    SILTST
1314          (1) 010554 010446                    JSR      R5,SCPRTN
1315          (1) 010560 010446                    SILTST
1316          1296 010562 012777 177777 025346 XF2: MOV      #-1,@TSDB
1317          1297 010570 004567 173752              JSR      R5,DELAY
1318          1298 010574 000010                    .WORD    10
1319          1299 010576 032777 000010 025326      BIT      #B03,@TCR
1320          1300 010604 001017                    BNE      XF3
1321          1301 010606                    ERROR    \N
1322          ;ERROR:NO SILO OUTPUT 37 US. AFTER LOAD
1323          ;***** ERROR 50 *****
1324
1325          (1) 010606 032777 040000 021574      BIT      #B14,@SR
1326          (1) 010614 001005                    BNE      .+14
1327          (1) 010616 012767 000050 022016      MOV      #50,ERRNUM
1328          (1) 010624 004767 021564              JSR      PC,ERR
1329          (1) 010630 000051                    -        N+1
1330          1302 010630                    BDINIT    XMTR
1331          1303 010636                    SCOPE      XF2
1332          (1) 010636 004567 173364              JSR      R5,SCPRTN
1333          (1) 010642 010562                    XF2
1334          1304 010644 017767 025266 021772 XF3: MOV      @TSDB,BAD
1335          1305 010652 012767 177777 021766      MOV      #-1,GOOD
1336          1306 010660 026767 021762 021756      CMP      GOOD,BAD
1337          1307 010666 001417                    BEQ      XF3A
1338          1308 010670                    DATEP     \N
1339          ;ERROR:DROPPED BITS IN DATA SILO
1340          ;***** ERROR 51 *****
1341
1342          (1) 010670 032777 040000 021512      BIT      #B14,@SR
1343          (1) 010676 001005                    BNE      .+14
1344          (1) 010700 012767 000051 021734      MOV      #51,ERRNUM
  
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(1)	010706	004767	021566		JSR	PC,DERR	
(1)		000052		N	=	N+1	
1309	010712				BDINIT	XMTR	:CLEAR SILO
1310	010720				SCOPE	XF2	
(1)	010720	004567	173302		JSR	R5,SCPRTN	
(1)	010724	010562			XF2		
1311	010726	052777	000200	025176	XF3A:	#B07,@TCR	:SET RD SILO BIT IN TCR
1312	010734	017703	025176		MOV	@TSDB,R3	:POP WORD FROM SILO
1313	010740	032777	000010	025164	BIT	#B03,@TCR	:SILO OUTPUT READY?
1314	010746	001414			BEQ	XF5	
1315	010750				ERROR	\N	:ERROR:WORD DID NOT GET POPPED FROM SILO
(1)							:***** ERROR 52 *****
(1)	010750	032777	040000	021432	BIT	#B14,@SR	
(1)	010756	001005			BNE	.+14	
(1)	010760	012767	000052	021654	MOV	#52,ERRNUM	
(1)	010766	004767	021422		JSR	PC,ERR	
(1)		000053		N	=	N+1	
1316	010772				SCOPE	XF3	
(1)	010772	004567	173230		JSR	R5,SCPRTN	
(1)	010776	010644			XF3		
1317	011000	032777	000400	025126	XF5:	#B08,@TSR	:IS INPUT READY?
1318	011006	001014			BIT	XF6	
1319	011010				BNE	\N	:ERROR:DATA SILO INPUT NOT READY
(1)					ERROR		:***** ERROR 53 *****
(1)	011010	032777	040000	021372	BIT	#B14,@SR	
(1)	011016	001005			BNE	.+14	
(1)	011020	012767	000053	021614	MOV	#53,ERRNUM	
(1)	011026	004767	021362		JSR	PC,ERR	
(1)		000054		N	=	N+1	
1320	011032				SCOPE	XF5	
(1)	011032	004567	173170		JSR	R5,SCPRTN	
(1)	011036	011000			XF5		
1321	011040	042777	000200	025064	XF6:	#B07,@TCR	:CLEAR RD SILO BIT
1322	011046	005077	025064		CLR	@TSDB	:LOAD 0'S INTO SILO
1323	011052	032777	000010	025052	XF6A:	#B03,@TCR	:OUTPUT RDY?
1324	011060	001774			BEQ	XF6A	:WAIT FOR IT
1325	011062	017767	025050	021554	MOV	@TSDB,BAD	:READ OUTPUT OF SILO
1326	011070	005067	021552		CLR	GOOD	
1327	011074	026767	021546	021542	CMP	GOOD,BAD	:OUTPUT = 0?
1328	011102	001417			BEQ	XF7	
1329	011104				DATERR	\N	:ERROR:BITS PICKED UP IN DATA SILO
(1)							:***** ERROR 54 *****
(1)	011104	032777	040000	021276	BIT	#B14,@SR	
(1)	011112	001005			BNE	.+14	
(1)	011114	012767	000054	021520	MOV	#54,ERRNUM	
(1)	011122	004767	021352		JSR	PC,DERR	
(1)		000055		N	=	N+1	
1330	011126				BDINIT	XMTR	:CLR SILO
1331	011134				SCOPE	XF6	
(1)	011134	004567	173066		JSR	R5,SCPRTN	
(1)	011140	011040			XF6		
1332	011142				XF7:	BDINIT	:CLR XMITTER BOARD
1333	011150	012777	177600	024762	MOV	#-128,@TSBC	:SET BYTE COUNT TO -128
1334	011156	012777	033564	024756	MOV	#SILDAT,@TSBA	:POINT DEVICE AT CORE BUFFER
1335	011164	052777	040000	024740	BIS	#B14,@TCR	:SET TX NPR
1336	011172	032777	040000	024732	BIT	#B14,@TCR	:IS TX NPR SET?

1337	011200	001014			BNE	XF8	
1338	011202				ERROR	\N	;ERROR:CANNOT SET TX NPR
(1)							;***** ERROR 55 *****
(1)	011202	032777	040000	021200	BIT	#B14,@SR	
(1)	011210	001005			BNE	+.14	
(1)	011212	012767	000055	021422	MOV	#55,ERRNUM	
(1)	011220	004767	021170		JSR	PC,ERR	
(1)		000056			-	N+1	
1339	011224				SCOPE	XF7	
(1)	011224	004567	172776		JSR	R5,SCPRTN	
(1)	011230	011142			XF7		
1340	011232	016704	021154		MOV	DLCON,R4	
1341	011236	012703	177500		MOV	#177500,R3	;SET UP 2 MS DELAY
1342	011242	005777	024672		TST	@TSBC	;IS BYTE COUNT 0?
1343	011246	001420			BEQ	XF10	
1344	011250	005203			INC	R3	;WAITED 2 MS?
1345	011252	001373			BNE	XF9	;NO, KEEP LOOKING
1346	011254	005304			DEC	R4	
1347	011256	001367			BNE	XF8A	
1348	011260				ERROR	\N	;ERROR: NPR NOT COMPLETE AFTER 2 MS
(1)							;***** ERROR 56 *****
(1)	011260	032777	040000	021122	BIT	#B14,@SR	
(1)	011266	001005			BNE	+.14	
(1)	011270	012767	000056	021344	MOV	#56,ERRNUM	
(1)	011276	004767	021112		JSR	PC,ERR	
(1)		000057			=	N+1	
1349	011302				SCOPE	XF7	
(1)	011302	004567	172720		JSR	R5,SCPRTN	
(1)	011306	011142			XF7		
1350	011310	032777	000400	024616	XF10: BIT	#B08,@TSR	;INPUT READY?
1351	011316	001414			BEQ	XF11	
1352	011320				ERROR	\N	;ERROR:SILO FULL BUT INPUT RDY SET
(1)							;***** ERROR 57 *****
(1)	011320	032777	040000	021062	BIT	#B14,@SR	
(1)	011326	001005			BNE	+.14	
(1)	011330	012767	000057	021304	MOV	#57,ERRNUM	
(1)	011336	004767	021052		JSR	PC,ERR	
(1)		000060			=	N+1	
1353	011342				SCOPE	XF10	
(1)	011342	004567	172660		JSR	R5,SCPRTN	
(1)	011346	011310			XF10		
1354	011350	032777	000010	024554	XF11: BIT	#B03,@TCR	;OUTPUT READY?
1355	011356	001014			BNE	XF12	
1356	011360				ERROR	\N	;ERROR:FULL SILO NOT RDY FOR OUTPUT
(1)							;***** ERROR 60 *****
(1)	011360	032777	040000	021022	BIT	#B14,@SR	
(1)	011366	001005			BNE	+.14	
(1)	011370	012767	000060	021244	MOV	#60,ERRNUM	
(1)	011376	004767	021012		JSR	PC,ERR	
(1)		000061			=	N+1	
1357	011402				SCOPE	XF11	
(1)	011402	004567	172620		JSR	R5,SCPRTN	
(1)	011406	011350			XF11		
1358	011410	052777	000200	024514	XF12: BIS	#B07,@TCR	;SET RD SILO BIT
1359	011416	012704	033564		MOV	#SILDAT,R4	;R4 IS DATA POINTER
1360	011422	012703	177700		MOV	#-64.,R3	;R3 IS COUNTER

1361	011426	017767	024504	021210	XF13:	MOV	@TSDB,BAD		:POP WORD FROM SILO TO 'BAD'
1362	011434	012467	021206			MOV	(R4)+,GOOD		:AND POP A WORD FROM BUFFER
1363	011440	026767	021202	021176		IMP	GOOD,BAD		:DATA OK?
1364	011446	001422				BEQ	XF14		
1365	011450					DATERR	\N		:ERROR:DATA FROM SILO IS WRONG
(1)									:***** ERROR 61 *****
(1)	011450	032777	040000	020732		BIT	#B14,@SR		
(1)	011456	001005				BNE	.,+14		
(1)	011460	012767	000061	021154		MOV	#61,ERRNUM		
(1)	011466	004767	021006			JSR	PC,DERR		
(1)		000062			N	=	N+1		
1366	011472	042777	000200	024432		BIC	#B07,@TCR		:CLR RD SILO BIT
1367	011500					SCOPE	XF7		:GO TO RE-FILL SILO FOR RE-TRY
(1)	011500	004567	172522			JSR	R5,SCPRTN		
(1)	011504	011142				XF7			
1368	011506	052777	000200	024416		BIS	#B07,@TCR		:RE-SET RD SILO BIT
1369	011514	005203			XF14:	INC	R3		:ALL DONE?
1370	011516	001343				BNE	XF13		:IF NOT, POP ANOTHER WORD
1371	011520				XF17:	BDINIT	XMTR		:CLEAR THE BOARD
1372	011526	012777	177774	024404		MOV	#-4,@TSBC		:SET BYTE COUNT TO -4
1373	011534	012777	033564	024400		MOV	#SILDAT,@TSBA		:POINT NPR TO DATA BUFFER
1374	011542	012767	033564	021076		MOV	#SILDAT,GOOD		
1375	011550	052777	040004	024354		BIS	#40004,@TCR		:SET TX NPR AND INH ADR INC
1376	011556	005777	024356		XF18:	TST	@TSBC		:WAIT FOR NPR TO FINISH
1377	011562	001375				BNE	XF18		
1378	011564	017767	024352	021052		MOV	@TSBA,BAD		:READ BYTE ADDRESS
1379	011572	026767	021050	021044		CMP	GOOD,BAD		:HAS IT CHANGED?
1380	011600	001417				BEQ	XF19		
1381	011602					DATERR	\N		:ERROR:TSBA SHD NOT CHANGE WITH INH ADR INC SET
(1)									:***** ERROR 62 *****
(1)	011602	032777	040000	020600		BIT	#B14,@SR		
(1)	011610	001005				BNE	.,+14		
(1)	011612	012767	000062	021022		MOV	#62,ERRNUM		
(1)	011620	004767	020654			JSR	PC,DERR		
(1)		000063			N	=	N+1		
1382	011624					BDINIT	XMTR		
1383	011632					SCOPE	XF17		
(1)	011632	004567	172370			JSR	R5,SCPRTN		
(1)	011636	011520				XF17			

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1385          .SBTTL DATA SILO BLOCK COUNTER TEST
1386
1387          ;THIS TESTS THAT, AFTER PULLING 200 (OCTAL) WORDS THRU THE SILO
1388          ;THE BLOCK COUNTER COUNTS THE 200 WORDS AND HOLDS SILO OUTPUT READY
1389          ;IN A FALSE STATE.
1390
1391 011640      XF19: BDINIT  XMTR          ;CLEAR THE BOARD
1392 011646 142777 000001 024272      BICB  #B00,@TMMRH ;CLEAR MASTER FOR THIS TEST
1393 011654 004767 000136              JSR   PC,XFSR   ;FILL THE DATA SILO
1394 011660 012702 000100              MOV   #64,R2
1395 011664 004767 000176              JSR   PC,XFEMT  ;POP ALL 64 WORDS OUT
1396 011670 004767 000122              JSR   PC,XFSR   ;FILL SILO AGAIN
1397 011674 012702 000020              MOV   #20,R2
1398 011700 004767 000162              JSR   PC,XFEMT  ;POP 20 (OCTAL) WORDS OUT
1399 011704 004767 000106              JSR   PC,XFSR   ;FILL SILO AGAIN
1400 011710 012702 000060              MOV   #60,R2
1401 011714 004767 000146              JSR   PC,XFEMT  ;POP 60 (OCTAL) WORDS OUT
1402                                     ; LEAVING 20 (OCTAL) IN SILO
1403                                     ; AND HAVING PULLED OUT 200 TOTAL (OCTAL)
1404 011720 032777 000010 024204      BIT   #B03,@TTP  ;NOW CHECK OUTPUT READY
1405 011726 001414                      BEQ   XF19A      ;IF IT'S CLEAR, OKAY
1406 011730                      ERROR  \N              .ERROR:OUTPUT RDY AFTER 200 WORD BLOCK
1407 (1)                      ;***** ERROR 63 *****
1408 (1) 011730 032777 040000 020452      BIT   #B14,@SR
1409 (1) 011736 001005                      BNE   .+14
1410 (1) 011740 012767 000063 020674      MOV   #63,ERRNUM
1411 (1) 011746 004767 020442              JSR   PC,ERR
1412 (1)                      =
1413 (1)                      N
1414 011752                      SCOPE
1415 (1) 011752 004567 172250              JSR   XF19
1416 (1) 011756 011640                      JSR   R5,SCPRTN
1417
1418 011760      XF19A: BDINIT  XMTR          ;CLEAN UP.
1419 011766 152777 000020 024152      XF20: BICB  #20,@TMMRH ;SET AUT ADR
1420 011774 004767 017672              JSR   PC,MONIT
1421 012000 032777 010000 020402      BIT   #B12,@SR
1422 012006 001402                      BEQ   XFRT
1423 012010 000167 176432              JMP   SILTST
1424 012014 000207      XFRT: RTS          PC
1425
1426          ;ROUTINE TO FILL DATA SILO VIA NPR
1427
1428 012016      XFSR: MOV   #-128,@TSBC      ;SET BYTE COUNT FOR FILL-UP
1429 012024 012777 033564 024110      MOV   #SILDAT,@TSBA ;POINT DEVICE AT CORE BUFFER
1430 012032 052777 040000 024072      BIS   #B14,@TCR ;START NPR
1431 012040 016704 020346              MOV   DLCON,R4
1432 012044 012703 175000      XFSR1: MOV   #175000,R3 ;SET UP TO WAIT FOR CMPL
1433 012050 005203      XFSRW: INC   R3
1434 012052 001376              BNE   XFSRW ;WAIT FOR NPR COMPLETION
1435 012054 005304              DEC   R4
1436 012056 001372              BNE   XFSR1
1437 012060 005077 024046      CLR   @TCR ;CLEAR TXNPR
1438 012064 000207      RTS          PC ;RETURN WITH SILO FULL
1439
1440          ;ROUTINE TO POP (R2) NUMBER OF WORDS FROM DATA SILO
1441
1442 012066      XFEMT: BIS   #B07,@TCR ;SET RD SILO

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CZPLBCO PCL11 STND ALN V02C MACY11 30A(1052) 20-JUN-79 07:50 J 4
CZPLBC.P11 07-JUN-79 15:47 DATA SILO BLOCK COUNTER TEST PAGE 22-1

SEQ 0048

1433	012074	010203				MOV	R2,R3	
1434	012076	017767	024034	020540	XFMW:	MOV	@TSD8,BAD	:POP A WORD OUT
1435	012104	005303				DEC	R3	:KEEP TRACK OF # OF WORDS
1436	012106	001373				BNE	XFMW	
1437	012110	042777	000200	024014		BIC	#B07,@TCR	:LEAVE WITH RD SILO CLEAR
1438	012116	000207				RTS	PC	

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1440 .SBTTL TSRTST
1441
1442 ;STATUS REGISTER AND ERRORS TEST
1443
1444 012120 TSRTST: BDINIT XMTR ;CLR BOARD
1445 012126 052777 000200 024000 BIS #B07,@TSR ;SET SUCC XFER
1446 012134 032777 000200 023772 BIT #B07,@TSR ;IS IT SET?
1447 012142 001014 BNE XH1
1448 012144 ERROR \N ;ERROR:CANNOT SET TSR BIT 07
(1) ;***** ERROR 64 *****
(1) 012144 032777 040000 020236 BIT #B14,@SR
(1) 012152 001005 BNE .+14
(1) 012154 012767 000064 020460 MOV #64,ERRNUM
(1) 012162 004767 020226 JSR PC,ERR
(1) 000065 = N+1
1449 012166 N SCOPE TSRTST
(1) 012166 004567 172034 JSR R5,SCPRTN
(1) 012172 012120 TSRTST
1450 012174 042777 000200 023732 XH1: BIC #B07,@TSR ;CLR SUCC XFER
1451 012202 032777 000200 023724 BIT #B07,@TSR ;IS IT CLR?
1452 012210 001414 BEQ XH2
1453 012212 ERROR \N ;ERROR:CANNOT CLR SUCC XFR
(1) ;***** ERROR 65 *****
(1) 012212 032777 040000 020170 BIT #B14,@SR
(1) 012220 001005 BNE .+14
(1) 012222 012767 000065 020412 MOV #65,ERRNUM
(1) 012230 004767 020160 JSR PC,ERR
(1) 000066 = N+1
1454 012234 N SCOPE XH1
(1) 012234 004567 171766 JSR R5,SCPRTN
(1) 012240 012174 XH1
1455 012242 XH2: BDINIT XMTR ;CLEAR BOARD
1456 012250 012777 177777 023660 MOV #-1,@TSDB ;LOAD WORD INTO SILO
1457 012256 032777 000010 023646 BIT #B03,@TCR ;OUTPUT READY?
1458 012264 001774 BEQ .-6 ;WAIT FOR WORD TO HIT BOTTOM
1459 012266 152777 000001 023652 BISB #1,@TMMRH ;SET MASTER FOR TIME SLICES
1460 012274 012777 120000 023630 MOV #120000,@TCR ;SET RIB AND SND WD
1461 012302 016704 020104 MOV DLCON,R4
1462 012306 012703 177763 XH2B: MOV #177763,R3 ;SET UP FOR 100 U.S. ALARM
1463 012312 032777 000020 023614 XH2A: BIT #B04,@TSR ;TDM BUS BSY SET?
1464 012320 001020 BNE XH3
1465 012322 005203 INC R3 ;WAIT 100 US.
1466 012324 001372 BNE XH2A
1467 012326 005304 DEC R4
1468 012330 001366 BNE XH2B
1469 012332 ERROR \N ;ERROR:TDM BUS BSY NOT SET
(1) ;***** ERROR 66 *****
(1) 012332 032777 040000 020050 BIT #B14,@SR
(1) 012340 001005 BNE .+14
(1) 012342 012767 000066 020272 MOV #66,ERRNUM
(1) 012350 004767 020040 JSR PC,ERR
(1) 000067 = N+1
1470 012354 N SCOPE XH2
(1) 012354 004567 171646 JSR R5,SCPRTN
(1) 012360 012242 XH2
1471 012362 032777 000100 023544 XH3: BIT #B06,@TSR ;IS BUSY SET?

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1472	012370	001014			BNE	XH4	
1473	012372				ERROR	\N	;ERROR:BUSY NOT SET WITH SND WD & RIB
(1)							;***** ERROR 67 *****
(1)	012372	032777	040000	020010	BIT	#B14,@SR	
(1)	012400	001005			BNE	+.14	
(1)	012402	012767	000067	020232	MOV	#67,ERRNUM	
(1)	012410	004767	020000		JSR	PC,ERR	
(1)		000070			=	N+1	
1474	012414				N		
(1)	012414	004567	171606		SCOPE	XH2	
(1)	012420	012242			JSR	R5,SCPRTN	
1475	012422	042777	100000	023502	XH4:	BIC	#B15,@TCR
1476	012430	000240			NOP		;CLEAR RIB
1477	012432	032777	020000	023472	BIT	#B13,@TCR	;WAIT FOR TIME SLICE
1478	012440	001414			BEQ	XH5	;IS SND WD CLR?
1479	012442				ERROR	\N	;ERROR:INTR REQ DID NOT CLR SND WD
(1)							;***** ERROR 70 *****
(1)	012442	032777	040000	017740	BIT	#B14,@SR	
(1)	012450	001005			BNE	+.14	
(1)	012452	012767	000070	020162	MOV	#70,ERRNUM	
(1)	012460	004767	017730		JSR	PC,ERR	
(1)		000071			=	N+1	
1480	012464				N		
(1)	012464	004567	171536		SCOPE	XH2	
(1)	012470	012242			JSR	R5,SCPRTN	
1481	012472	032777	000100	023434	XH5:	BIT	#B06,@TSR
1482	012500	001414			BEQ	XH6	;IS BUSY CLR?
1483	012502				ERROR	\N	;ERROR:SND WD=0 DID NOT CLR BUSY
(1)							;***** ERROR 71 *****
(1)	012502	032777	040000	017700	BIT	#B14,@SR	
(1)	012510	001005			BNE	+.14	
(1)	012512	012767	000071	020122	MOV	#71,ERRNUM	
(1)	012520	004767	017670		JSR	PC,ERR	
(1)		000072			=	N+1	
1484	012524				N		
(1)	012524	004567	171476		SCOPE	XH2	
(1)	012530	012242			JSR	R5,SCPRTN	
1485	012532	005077	023376		XH6:	CLR	@TSR
1486	012536	052777	120000	023366	BIS	#120000,@TCR	;CLEAR TSR
1487	012544	052777	001000	023362	BIS	#B09,@TSR	;SET RIB & SND WD
1488	012552	032777	001000	023354	BIT	#B09,@TSR	;SET OVERRUN ERR BIT
1489	012560	001014			BNE	XH7	;IS IT SET?
1490	012562				ERROR	\N	;ERROR:CANNOT SET TSR BIT 09
(1)							;***** ERROR 72 *****
(1)	012562	032777	040000	017620	BIT	#B14,@SR	
(1)	012570	001005			BNE	+.14	
(1)	012572	012767	000072	020042	MOV	#72,ERRNUM	
(1)	012600	004767	017610		JSR	PC,ERR	
(1)		000073			=	N+1	
1491	012604				N		
(1)	012604	004567	171416		SCOPE	XH6	
(1)	012610	012532			JSR	R5,SCPRTN	
1492	012612	032777	100000	023314	XH7:	BIT	#B15,@TSR
1493	012620	001014			BNE	XH8	;IS ERROR BIT SET (BIT 15)
1494	012622				ERROR	\N	;ERROR:OVERRUN DID NOT SET ERROR BIT 15 IN TSR
(1)							;***** ERROR 73 *****

(1)	012622	032777	040000	017560		BIT	#B14,@SR	
(1)	012630	001005				BNE	.+14	
(1)	012632	012767	000073	020002		MOV	#73,ERRNUM	
(1)	012640	004767	017550			JSR	PC,ERR	
(1)		000074			N	=	N+1	
1495	012644					SCOPE	XH6	
(1)	012644	004567	171356			JSR	R5,SCPRTN	
(1)	012650	012532				XH6		
1496	012652	032777	020000	023252	XH8:	BIT	#B13,@TCR	;IS SND WD CLR?
1497	012660	001414				BEQ	XH8A	
1498	012662					ERROR	\N	;ERROR:TSR BIT 15 DID NOT CAUSE INTR REQ ;***** ERROR 74 *****
(1)								
(1)	012662	032777	040000	017520		BIT	#B14,@SR	
(1)	012670	001005				BNE	.+14	
(1)	012672	012767	000074	017742		MOV	#74,ERRNUM	
(1)	012700	004767	017510			JSR	PC,ERR	
(1)		000075			N	=	N+1	
1499	012704					SCOPE	XH6	
(1)	012704	004567	171316			JSR	R5,SCPRTN	
(1)	012710	012532				XH6		
1500	012712				XH8A:	BDINIT	XMTR	;CLEAR ALL IN XMTR
1501	012720	012777	000000	023210		MOV	#0,@TSDB	;LOAD A WORD INTO SILO
1502	012726	032777	001000	023200		BIT	#B09,@TSR	;IS OVERRUN SET??
1503	012734	001414				BEQ	XH9	
1504	012736					ERROR	\N	;ERROR:LOADING EMPTY SILO GIVES OVERRUN ERROR! ;***** ERROR 75 *****
(1)								
(1)	012736	032777	040000	017444		BIT	#B14,@SR	
(1)	012744	001005				BNE	.+14	
(1)	012746	012767	000075	017666		MOV	#75,ERRNUM	
(1)	012754	004767	017434			JSR	PC,ERR	
(1)		000076			N	=	N+1	
1505	012760					SCOPE	XH8A	
(1)	012760	004567	171242			JSR	R5,SCPRTN	
(1)	012764	012712				XH8A		
1506	012766	005077	023142		XH9:	CLR	@TSR	
1507	012772	052777	002000	023134		BIS	#B10,@TSR	;SET TIMEOUT BIT IN TSR
1508	013000	032777	002000	023126		BIT	#B10,@TSR	;IS IT SET?
1509	013006	001014				BNE	XH10	
1510	013010					ERROR	\N	;ERROR:CANNOT SET TSR BIT 10 ;***** ERROR 76 *****
(1)								
(1)	013010	032777	040000	017372		BIT	#B14,@SR	
(1)	013016	001005				BNE	.+14	
(1)	013020	012767	000076	017614		MOV	#76,ERRNUM	
(1)	013026	004767	017362			JSR	PC,ERR	
(1)		000077			N	=	N+1	
1511	013032					SCOPE	XH9	
(1)	013032	004567	171170			JSR	R5,SCPRTN	
(1)	013036	012766				XH9		
1512	013040	032777	100000	023066	XH10:	BIT	#B15,@TSR	;IS ERROR BIT SET?
1513	013046	001014				BNE	XH11	
1514	013050					ERROR	\N	;ERROR:TIMEOUT DID NOT SET TSR BIT 15 ;***** ERROR 77 *****
(1)								
(1)	013050	032777	040000	017332		BIT	#B14,@SR	
(1)	013056	001005				BNE	.+14	
(1)	013060	012767	000077	017554		MOV	#77,ERRNUM	
(1)	013066	004767	017322			JSR	PC,ERR	


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(1) 1515 013072 000100 N = N+1
(1) 1516 013072 004567 171130 JSR XH9
(1) 1517 013076 012766 XH9 R5,SCPRTN
1518 013100 005077 023030 XH11: CLR @TSR ;CLR TSR
1519 013104 052777 004000 023022 BIS #B11,@TSR ;SET MST DWN
1520 013112 032777 004000 023014 BIT #B11,@TSR ;IS IT SET?
1521 013120 001014 BNE XH12
1522 013122 032777 040000 017260 ERROR \N ;ERROR:CANNOT SET TSR BIT 11
(1) 1523 013122 032777 040000 017260 BIT #B14,@SR ;***** ERROR 100 *****
(1) 1524 013130 001005 BNE .+14
(1) 1525 013132 012767 000100 017502 MOV #100,ERRNUM
(1) 1526 013140 004767 017250 JSR PC,ERR
(1) 1527 013140 000101 N = N+1
1528 013144 032777 040000 017260 JSR XH11
(1) 1529 013144 004567 171056 XH11 R5,SCPRTN
(1) 1530 013150 013100 XH11
1531 013152 032777 100000 022754 XH12: BIT #B15,@TSR ;IS ERROR BIT SET?
1532 013160 001014 BNE XH13
1533 013162 032777 040000 017220 ERROR \N ;ERROR:MST DWN DIDN'T SET TSR BIT 15
(1) 1534 013162 032777 040000 017220 BIT #B14,@SR ;***** ERROR 101 *****
(1) 1535 013170 001005 BNE .+14
(1) 1536 013172 012767 000101 017442 MOV #101,ERRNUM
(1) 1537 013200 004767 017210 JSR PC,ERR
(1) 1538 013204 000102 N = N+1
1539 013204 004567 171016 JSR XH11
(1) 1540 013210 013100 XH11 R5,SCPRTN
1541 013212 005077 022716 XH13: CLR @TSR
1542 013216 052777 010000 022710 BIS #B12,@TSR ;SET TXM ERR
1543 013224 032777 010000 022702 BIT #B12,@TSR ;IS IT SET?
1544 013232 001014 BNE XH14
1545 013234 032777 040000 017146 ERROR \N ;ERROR:CANNOT SET TSR BIT 12
(1) 1546 013234 032777 040000 017146 BIT #B14,@SR ;***** ERROR 102 *****
(1) 1547 013242 001005 BNE .+14
(1) 1548 013244 012767 000102 017370 MOV #102,ERRNUM
(1) 1549 013252 004767 017136 JSR PC,ERR
(1) 1550 013252 000103 N = N+1
1551 013256 032777 040000 017106 JSR XH13
(1) 1552 013256 004567 170744 XH13 R5,SCPRTN
(1) 1553 013262 013212 XH13
1554 013264 032777 100000 022642 XH14: BIT #B15,@TSR ;IS ERROR BIT SET?
1555 013272 001014 BNE XH15
1556 013274 032777 040000 017106 ERROR \N ;ERROR:TXM ERR DIDN'T SET TSR BIT 15
(1) 1557 013274 032777 040000 017106 BIT #B14,@SR ;***** ERROR 103 *****
(1) 1558 013302 001005 BNE .+14
(1) 1559 013304 012767 000103 017330 MOV #103,ERRNUM
(1) 1560 013312 004767 017076 JSR PC,ERR
(1) 1561 013312 000104 N = N+1
1562 013316 032777 040000 017106 JSR XH13
(1) 1563 013316 004567 170704 XH13 R5,SCPRTN
(1) 1564 013322 013212 XH13
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1536	013324	005077	022604		XH15:	CLR	@TSR		
1537	013330	052777	020000	022576		BIS	#B13,@TSR		:SET MEM OFL
1538	013336	032777	020000	022570		BIT	#B13,@TSR		:IS IT SET?
1539	013344	001014				BNE	XH16		
1540	013346					ERROR	\N		:ERROR:CANNOT SET TSR BIT 13
(1)									:***** ERROR 104 *****
(1)	013346	032777	040000	017034		BIT	#B14,@SR		
(1)	013354	001005				BNE	.+14		
(1)	013356	012767	000104	017256		MOV	#104,ERRNUM		
(1)	013364	004767	017024			JSR	PC,ERR		
(1)		000105			N	=	N+1		
1541	013370					SCOPE	XH15		
(1)	013370	004567	170632			JSR	R5,SCPRTN		
(1)	013374	013324				XH15			
1542	013376	032777	100000	022530	XH16:	BIT	#B15,@TSR		:IS ERROR BIT SET?
1543	013404	001014				BNE	XH17		
1544	013406					ERROR	\N		:ERROR:MEM OFL DIDN'T SET TSR BIT 15
(1)									:***** ERROR 105 *****
(1)	013406	032777	040000	016774		BIT	#B14,@SR		
(1)	013414	001005				BNE	.+14		
(1)	013416	012767	000105	017216		MOV	#105,ERRNUM		
(1)	013424	004767	016764			JSR	PC,ERR		
(1)		000106			N	=	N+1		
1545	013430					SCOPE	XH15		
(1)	013430	004567	170572			JSR	R5,SCPRTN		
(1)	013434	013324				XH15			


```

1547                                     ;ERROR GENERATION TESTS
1548
1549 013436                                XH17: BDINIT XMTR                ;CLEAR BOARD
1550 013444 012777 177774 022466        MOV    #-4,@TSBC          ;SET UP TO GENERATE NXM ERR
1551 013452 012777 160000 022462        MOV    #160000,@TSBA       ;LOAD NON-EXST ADDR INTO TSBA
1552 013460 052777 040060 022444        BIS    #40060,@TCR        ;START NPR AND SET EXT ADD BITS
1553 013466 000240
1554 013470 000240
1555 013472 005777 022442                TST    @TSBC
1556 013476 001014                      BNE    XH18                ;DID BYTE COUNT GO TO 0 ?
1557 013500                      ERROR   VN                      ;ERROR:TXM NPR COMPL TO NEX ADDRESS
                                                                ;***** ERROR 106 *****
(1)
(1) 013500 032777 040000 016702        BIT    #B14,@SR
(1) 013506 001005                      BNE    .+14
(1) 013510 012767 000106 017124        MOV    #106,ERRNUM
(1) 013516 004767 016672                JSR    PC,ERR
(1)                                =    N+1
1558 013522                                SCOPE XH17
(1) 013522 004567 170500                JSR    R5,SCPRTN
(1) 013526 013436                      XH17
1559 013530 032777 040000 022376 XH18: BIT    #B14,@TSR
1560 013536 001014                      BNE    XH19
1561 013540                      ERROR   VN                      ;NOW CHECK NXL ERR BIT
                                                                ;ERROR:NPR TO NON-EXST ADDR DIDN'T SET NXL ERR
                                                                ;***** ERROR 107 *****
(1)
(1) 013540 032777 040000 016642        BIT    #B14,@SR
(1) 013546 001005                      BNE    .+14
(1) 013550 012767 000107 017064        MOV    #107,ERRNUM
(1) 013556 004767 016632                JSR    PC,ERR
(1)                                =    N+1
1562 013562                                SCOPE XH17
(1) 013562 004567 170440                JSR    R5,SCPRTN
(1) 013566 013436                      XH17
1563 013570 032777 100000 022336 XH19: BIT    #B15,@TSR
1564 013576 001014                      BNE    XH20
1565 013600                      ERROR   VN                      ;IS ERROR BIT (15) SET?
                                                                ;ERROR:NXL ERR DIDN'T SET TSR BIT 15
                                                                ;***** ERROR 110 *****
(1)
(1) 013600 032777 040000 016602        BIT    #B14,@SR
(1) 013606 001005                      BNE    .+14
(1) 013610 012767 000110 017024        MOV    #110,ERRNUM
(1) 013616 004767 016572                JSR    PC,ERR
(1)                                =    N+1
1566 013622                                SCOPE XH17
(1) 013622 004567 170400                JSR    R5,SCPRTN
(1) 013626 013436                      XH17
1567 013630                                XH20: BDINIT XMTR
1568 013636 016777 177774 022272 XH20L: MOV    XH20L,@TSDB      ;CLEAR BOARD
1569 013644 000240                      NOP                      ;FILL THE SILO WITH GARBAGE
1570 013646 000240                      NOP
1571 013650 032777 000400 022256        BIT    #B08,@TSR
1572 013656 001367                      BNE    XH20L
1573 013660 016777 177752 022250        MOV    XH20L,@TSDB
1574 013666 032777 001000 022240        BIT    #B09,@TSR
1575 013674 001014                      BNE    XH21
1576 013676                      ERROR   VN                      ;SILO INPUT READY?
                                                                ;IF YES, KEEP LOADING
                                                                ;NO,SILO FULL;LOAD 1 MORE WORD
                                                                ;IS TSR BIT 9 SET?
                                                                ;ERROR:LOADING FULL SILO DIDN'T SET TSR-09
                                                                ;***** ERROR 111 *****
(1)
(1) 013676 032777 040000 016504        BIT    #B14,@SR

```

Line	Address	Offset	Label	Operation	Comments
(1)	013704	001005		BNE	.+14
(1)	013706	012767	000111	MOV	#111,ERRNUM
(1)	013714	004767	016474	JSR	PC,ERR
(1)		000112		=	N+1
1577	013720			SCOPE	XH20L
(1)	013720	004567	170302	JSR	R5,SCPRTN
(1)	013724	013636		XH20L	
1578	013726			BDINIT	XMTR
1579	013734	052777	120000	BIS	#120000,@TCR
1580	013742	016702	016444	MOV	DLCON,R2
1581	013746	005003		CLR	R3
1582	013750	012704	177773	MOV	#-5,R4
1583	013754	032777	002000	BIT	#B10,@TSR
1584	013762	001022		BNE	XH22A
1585	013764	005203		INC	R3
1586	013766	001372		BNE	XH22
1587	013770	005204		INC	R4
1588	013772	001370		BNE	XH22
1589	013774	005302		DEC	R2
1590	013776	001363		BNE	XH21A
1591	014000			ERROR	\N
(1)					;ERROR:NO TIMEOUT IN A SECOND
(1)					;***** ERROR 112 *****
(1)	014000	032777	040000	BIT	#B14,@SR
(1)	014006	001005		BNE	.+14
(1)	014010	012767	000112	MOV	#112,ERRNUM
(1)	014016	004767	016372	JSR	PC,ERR
(1)		000113		=	N+1
1592	014022			SCOPE	XH21
(1)	014022	004567	170200	JSR	R5,SCPRTN
(1)	014026	013726		XH21	
1593	014030			BDINIT	XMTR
1594	014036	105077	022104	CLRB	@TMMRH
1595	014042	012777	177777	MOV	#-1,@TSDB
1596	014050	004567	170472	JSR	R5,DELAY
1597	014054	000010		.WORD	10
1598	014056	052777	120000	BIS	#120000,@TCR
1599	014064	004567	170456	JSR	R5,DELAY
1600	014070	000010		.WORD	10
1601	014072	032777	004000	BIT	#B11,@TSR
1602	014100	001014		BNE	XH23
1603	014102			ERROR	\N
(1)					;CHECK FOR MASTER DOWN
(1)					;ERROR:ATTEMPT TO SEND WORD WITH MASTER CLEAR
(1)					;DID NOT SET MASTER DOWN
(1)					;***** ERROR 113 *****
(1)	014102	032777	040000	BIT	#B14,@SR
(1)	014110	001005		BNE	.+14
(1)	014112	012767	000113	MOV	#113,ERRNUM
(1)	014120	004767	016270	JSR	PC,ERR
(1)		000114		=	N+1
1604	014124			SCOPE	XH22A
(1)	014124	004567	170076	JSR	R5,SCPRTN
(1)	014130	014030		XH22A	
1605	014132			BDINIT	XMTR
1606	014140	004767	015526	JSR	PC,MONIT
1607	014144	032777	010000	BIT	#B12,@SR
1608	014152	001402		BEQ	XHRT
1609	014154	000167	175740	JMP	TSRTST
1610	014160	000207		XHRT:	RTS
					PC
					;IS SW 12 = 1?
					;IF SO, TRY THIS TEST OVER

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1612                                     .SBTTL  INTERRUPT TEST
1613
1614                                     ;TRANSMITTER INTERRUPT TEST
1615
1616 014162                                INTST:  MTPS      #P7                ;DIS-ALLOW INTERRUPT
(1) 014162 012737 000340 177776          MOV      #P7,@#PS
1617 014170                                BDINIT  XMTR                ;CLP THE BOARD
1618 014176 016700 021720          MOV      TXVEC,R0
1619 014202 012760 000340 000002          MOV      #340,2(R0)          ;SET NEW PS = P7
1620 014210 012777 014240 021704          MOV      #ERRINT,@TXVEC      ;SET-UP FOR ERROR INTERRUPT
1621 014216 052777 000100 021706          BIS      #B06,@TCR          ;SET INTERRUPT ENABLE
1622 014224                                MTPS      #0                ;ALLOW INTERRUPT
(1) 014224 012737 000000 177776          MOV      #0,@#PS
1623 014232 000240                                NOP
1624 014234 000167 000046                                JMP      XJ0                ;SKIP ERROR IF NO INTERRUPT
1625 014240                                ERRINT: MTPS      #P7                ;INTERRUPT OFF
(1) 014240 012737 000340 177776          MOV      #P7,@#PS
1626 014246 022626                                CMP      (SP)+,(SP)+          ;CORRECT STACK
1627 014250 042777 000100 021654          BIC      #B06,@TCR          ;CLR INTERRUPT ENABLE
1628 014256                                ERROR      \N                ;ERROR:ERRONEOUS INTERRUPT;NO FLAGS SET
(1)                                     ;***** ERROR 114 *****
(1) 014256 032777 040000 016124          BIT      #B14,@SR
(1) 014264 001005                                BNE      .+14
(1) 014266 012767 000114 016346          MOV      #114,ERRNUM
(1) 014274 004767 016114          JSR      PC,ERR
(1)                                     N      =      N+1
1629 014300                                SCOPE
(1) 014300 004567 167722          JSR      R5,SCPRTN
(1) 014304 014162                                INTST
1630 014306 005067 021602          XJ0:  CLR      TMPRIO          ;START WITH C.P. AT PRIORITY 0
1631 014312 012777 014566 021602          MOV      #INTA,@TXVEC      ;SET VECTOR FOR GOOD INTERRUPT
1632 014320                                XJ1:  MTPS      #P7                ;INTERRUPT OFF
(1) 014320 012737 000340 177776          MOV      #P7,@#PS
1633 014326 052777 000100 021576          BIS      #B06,@TCR          ;ENABLE XMTR INTERRUPT
1634 014334 052777 000200 021572          BIS      #B07,@TSR          ;FORCE INTR WITH SUCC XFER
1635 014342                                MTPS      TMPRIO          ;ALLOW INTERRUPT
(1) 014342 016737 021546 177776          MOV      TMPRIO,@#PS
1636 014350 000240                                NOP
1637 014352 000240                                NOP
1638 014354 005767 021534          TST      TMPRIO          ;WAIT FOR IT
1639 014360 001014          BNE      XJ2                ;IS PSW = 0?
1640 014362                                ERROR      \N                ;ERROR:NO INTERRUPT FROM TRANSMITTER
(1)                                     ;***** ERROR 115 *****
(1) 014362 032777 040000 016020          BIT      #B14,@SR
(1) 014370 001005                                BNE      .+14
(1) 014372 012767 000115 016242          MOV      #115,ERRNUM
(1) 014400 004767 016010          JSR      PC,ERR
(1)                                     N      =      N+1
1641 014404                                SCOPE
(1) 014404 004567 167616          JSR      R5,SCPRTN
(1) 014410 014162                                INTST
1642 014412 026767 021510 021474          XJ2:  CMP      XPRIO,TMPRIO          ;HAVE WE REACHED EXPECTED PRIORITY?
1643 014420 001414          BEQ      XJ3
1644 014422                                ERROR      \N                ;ERROR:DEVICE NOT JUMPERED TO EXPECTED PRIORITY
(1)                                     ;***** ERROR 116 *****
(1) 014422 032777 040000 015760          BIT      #B14,@SR

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(1)	014430	001005			BNE	+.14	
(1)	014432	012767	000116	016202	MOV	#116,ERRNUM	
(1)	014440	004767	015750		JSR	PC,ERR	
(1)		000117		N	=	N+1	
1645	014444				SCOPE	INTST	
(1)	014444	004567	167556		JSR	R5,SCPRTN	
(1)	014450	014162			INTST		
1646	014452	022767	000340	021434	XJ3:	CMP	#340,TMPRIO
1647	014460	001426			BEQ	XJ4	;IS PSW - 7?
1648	014462				BDINIT	XMTR	
1649	014470	062767	000040	021416	ADD	#40,TMPRIO	
1650	014476	012777	014610	021416	XJ3S:	MOV	#INTB,@TXVEC
1651	014504	052777	000100	021420	BIS	#B06,@TCR	;SET VECTOR FOR ERROR INTR.
1652	014512	052777	000200	021414	BIS	#B07,@TSR	;ENABLE XMTR INTERRUPT
1653	014520				MTPS	TMPRIO	;FORCE INTERRUPT REQUEST
(1)	014520	016737	021370	177776	MOV	TMPRIO,@#PS	;SET CP TO NEXT PRIORITY
1654	014526	000240			NOP		
1655	014530	000240			NOP		;WAIT FOR POSSIBLE INTERRUPT
1656	014532	000167	177714		JMP	XJ3	
1657	014536				XJ4:	BDINIT	XMTR
1658	014544	004767	015122		JSR	PC,MONIT	;CLEAR BOARD
1659	014550	032777	010000	015632	BIT	#B12,@SR	;SW 12 - 1?
1660	014556	001402			BEQ	XJRT	
1661	014560	000167	177376		JMP	INTST	;YES, DO TEST OVER
1662	014564	000207			XJRT:	RTS	;NO, LEAVE THIS TEST
1663							
1664	014566				INTA:	BDINIT	XMTR
1665	014574	062767	000040	021312	ADD	#40,TMPRIO	;CLR INTERRUPT ETC
1666	014602	022626			CMP	(SP)+,(SP)+	;INCR TEMP PRIORITY
1667	014604	000167	177510		JMP	XJ1	;CORRECT STACK POINTER
1668							;TRY AGAIN
1669	014610	022626			INTB:	CMP	(SP)+,(SP)+
1670	014612				ERROR	\N	;CORRECT STACK
(1)							;ERROR:GOT INTR WHEN C.P. AT HIGHER PRIORITY
(1)	014612	032777	040000	015570	BIT	#B14,@SR	;***** ERROR 117 *****
(1)	014620	001005			BNE	+.14	
(1)	014622	012767	000117	016012	MOV	#117,ERRNUM	
(1)	014630	004767	015560		JSR	PC,ERR	
(1)		000120		N	=	N+1	
1671	014634				SCOPE	XJ3S	
(1)	014634	004567	167366		JSR	R5,SCPRTN	
(1)	014640	014476			XJ3S		
1672	014642	000167	177604		JMP	XJ3	

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1674 .SBTTL C.R.C. CHECK
1675
1676 ;CYCLIC REDUNDANCY CHECK CHARACTER TEST
1677
1678 014646 CRCTST: BDINIT XMTR ;CLEAR BOARD
1679 014654 012777 177600 021256 MOV #-128,@TSBC ;SET UP BYTE COUNT TO FILL SILO
1680 014662 012777 033564 021252 MOV #SILDAT,@TSBA
1681 014670 052777 040000 021234 BIS #B14,@TCR ;START NPR
1682 014676 005777 021236 XK1: TST @TSBC ;IS BYTE COUNT 0?
1683 014702 001375 BNE XK1 ;WAIT FOR NPR TO FINISH
1684 014704 032777 040000 021220 BIT #B14,@TCR ;NOW CHECK TX NPR BIT
1685 014712 001414 BEQ XK2
1686 014714 ERROR \N ;ERROR:TX NPR NOT CLR'D BY TSBC OFL
(1) ;***** ERROR 120 *****
(1) 014714 032777 040000 015466 BIT #B14,@SR
(1) 014722 001005 BNE .+14
(1) 014724 012767 000120 015710 MOV #120,ERRNUM
(1) 014732 004767 015456 JSR PC,ERR
(1) 000121 N - N+1
1687 014736 SCOPE CRCTST
(1) 014736 004567 167264 JSR R5,SCPRTN
(1) 014742 014646 CRCTST
1688 014744 052777 000200 021160 XK2: BIS #B07,@TCR ;SET RD SILO BIT
1689 014752 012767 177700 021130 MOV #-64,COUNT ;COUNT READS
1690 014760 012704 033764 MOV #SILCRC,R4 ;R4 POINTS TO GOOD CRC'S
1691 014764 000240 XK3: NOP
1692 014766 017767 021156 015650 MOV @TSCRC,BAD ;GET CRC CHAR FOR LAST SILO WORD
1693 014774 017703 021136 MOV @TSD8,R3 ;R3 HOLDS SILO DATA WORD
1694 015000 011467 015642 MOV (R4),GOOD ;GET GOOD CRC FROM BUFFER
1695 015004 026767 015636 015632 CMP GOOD,BAD ;IS CRC OK?
1696 015012 001427 BEQ XK4
1697 015014 032777 040000 015366 BIT #B14,@SR ;PRINT ALLOWED?
1698 015022 001020 BNE XK3S ;IF NOT, SKIP IT
1699 015024 PNTM SLOWD ;PRINT 'SILO OUTPUT WORD WAS '
(1) 015024 012700 034364 MOV #SLOWD,R0 ;PRINT MESSAGE
(1) 015030 004767 015614 JSR PC,TYP0UT ;POINTED TO BY SLOWD
1700 015034 010300 MOV R3,R0
1701 015036 004767 016124 JSR PC,OCTPNT
1702 015042 DATERR \N ;PRINT SILO DATA WORD
(1) ;ERROR:BAD CRC FOR ABOVE WORD
(1) ;***** ERROR 121 *****
(1) 015042 032777 040000 015340 BIT #B14,@SR
(1) 015050 001005 BNE .+14
(1) 015052 012767 000121 015562 MOV #121,ERRNUM
(1) 015060 004767 015414 JSR PC,DERR
(1) 000122 N = N+1
1703 015064 XK3S: SCOPE CRCTST
(1) 015064 004567 167136 JSR R5,SCPRTN
(1) 015070 014646 CRCTST
1704 015072 062704 000002 XK4: ADD #2,R4 ;UPDATE CRC POINTER
1705 015076 005267 021006 INC COUNT ;HAVE WE CHECKED 64 WORDS?
1706 015102 001330 BNE YK3 ;NO, CONTINUE
1707 015104 004767 014562 JSR PC,MONIT
1708 015110 032777 010000 015272 BIT #B12,@SR ;CHECK SW 12
1709 015116 001402 BEQ XKRT ;IF CLR, EXIT
1710 015120 000167 177522 JMP CRCTST ;IF SET STAY
1711 015124 XKRT: BDINIT XMTR
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CZPLBCO PCL11 SIND ALN VO2C MACV11 30A(1052) 20-JUN-79 07:50 ^{H 5} PAGE 26-1
CZPLBC.P11 07-JUN-79 15:47 C.R.C. CHECK

1712 015132 000207
1713

RTS PC


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1715 .SBTTL RECEIVER TESTS
1716
1717 ;TEST 2: RECEIVER TESTS
1718 ; (00) RESET TEST
1719 ; (01) RCR REG TEST
1720 ; (02) RDBC REG TEST
1721 ; (03) RDBA REG TEST
1722 ; (04) DATA SILO TESTS
1723 ; (05) RSR & ERRORS TESTS
1724 ; (06) INTERRUPT TEST
1725 ; (07) C.R.C. TEST
1726
1727
1728 000200 N = 200 ;RECEIVER ERRORS START AT 200
1729
1730 TEST2: MTPS #P7
1731 (1) 015134 012737 000340 177776 MOV #P7,@#PS
1732 015142 012767 000010 020706 MOV #10,ITER ;INITIAL ITERATION OF 10 PER PASS
1733 015150 004767 014516 JSR PC,MONIT
1734 015154 032777 002000 015226 BIT #B10,@SR ;CHECK SW 10
1735 015162 001420 BEQ LOOPR ;IF 0, RUN SEQUENTIALLY
1736 015172 042767 177770 020666 MOV @SR,SWI ;IF SET, GET TEST # FROM SWR
1737 015200 000241 CLC ;MASK LOW DIGIT
1738 015202 006167 020652 ROL SWI ;CLR C BIT BEFORE ROTATE
1739 015206 006167 020646 ROL SWI ;MULTIPLY BY 4
1740 015212 062767 015224 020640 ADD #LOOPR,SWI ;GENERATE OFFSET
1741 015220 000177 020634 JMP @SWI ;GO TO SELECTED TEST
1742 015224 004767 000142 LOOPR: JSR PC,RINIT ;DO INITIAL CLEAR TEST
1743 015230 004767 000476 JSR PC,RCRTST ;DO RCR REG TEST
1744 015234 004767 001176 JSR PC,RBCTST ;DO BYTE COUNT REG TEST
1745 015240 004767 001354 JSR PC,RBATST ;DO BYTE ADDR REG TEST
1746 015244 004767 001532 JSR PC,SLOTST ;DO RECVR DATA SILO TEST
1747 015250 004767 003056 JSR PC,RSRTST ;DO RSR REG & ERRORS TEST
1748 015254 004767 004646 JSR PC,RINTST ;DO INTERRUPT TEST
1749 015260 004767 005360 JSR PC,RCRCTS ;DO RCVR CRC GENERATION TEST
1750 015264 032777 004000 015116 BIT #B11,@SR ;CHECK SW 11
1751 015272 001003 BNE REFD ;PRINT END IF SET
1752 015274 005367 020556 DEC ITER ;OTHERWISE, REITERATE
1753 015300 001351 BNE LOOPR
1754 015302 005767 020574 REFD: TST $4FLAG ;CAN WE PRINT END PASS?
1755 015306 001030 BNE REPEAT ;NO, LEAVE
1756 015310 005267 020554 INC PSNO2 ;UPDATE PASS NO.
1757 015314 PNTM PEND ;PRINT 'END PASS # '
1758 (1) 015314 012700 034443 MOV #PEND,R0 ;PRINT MESSAGE
1759 (1) 015320 004767 015324 JSR PC,TYP0UT ;POINTED TO BY PEND
1760 015324 016700 020540 MOV PSNO2,R0 ;PRINT PASS NO.
1761 015330 004767 015736 JSR PC,DECPNT
1762 015334 012700 000040 MOV #40,R0 ;PRINT A SPACE
1763 015340 004767 016126 JSR PC,ITO ;PRINT 'A' (TO INDICATE PCVR TST)
1764 015344 012700 000101 MOV #101,R0
1765 015350 004767 016116 JSR PC,ITO
1766 015354 005000 CLR R0
1767 015356 004767 016110 JSR PC,ITO
1768 015362 005000 CLR R0
1769 015364 004767 016102 JSR PC,ITO ;NULLS IN CASE RESET FOLLOWS

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CZPLBCO PCL11 STD ALN V02C MACY11 30A(1052) 20-JUN-79 07:50 ^{J 5} PAGE 27-1
CZPLBC.P11 07-JUN-79 15:47 RECEIVER TESTS

SEQ 0061

1768 015370 000207

REPEAT: RTS PC

;RETURN


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1770          .SBTTL INITIALIZE TEST
1771
1772          ;CHECK INITIAL CONDITIONS AFTER RESET
1773
1774 015372 000005 RINIT: RESET          ;CLEAR THE WORLD
1775 015374 017767 020560 015242 MOV @RDBC,BAD ;GET BYTE COUNT REG
1776 015402 005067 015240 CLR GOOD
1777 015406 005767 015232 TST BAD ;WAS RDBC 0?
1778 015412 001414 BEQ RA1
1779 015414 DATERR \N ;ERROR:RDBC NOT CLR'D BY RESET
(1) ;***** ERROR 200 *****
(1) 015414 032777 040000 014766 BIT #B14,@SR
(1) 015422 001005 BNE .+14
(1) 015424 012767 000200 015210 MOV #200,ERRNUM
(1) 015432 004767 015042 JSR PC,DERR
(1) 000201 = N+1
1780 015436 SCOPE RINIT
(1) 015436 004567 166564 JSR R5,SCPRTN
(1) 015442 015372 RINIT
1781 015444 017767 020512 015172 RA1: MOV @RDBA,BAD ;GET BYTE ADDRESS REG
1782 015452 005067 015170 CLR GOOD
1783 015456 005767 015162 TST BAD ;WAS RDBA 0?
1784 015462 001414 BEQ RA2
1785 015464 DATERR \N ;ERROR:RDBA NOT CLR'D BY RESET
(1) ;***** ERROR 201 *****
(1) 015464 032777 040000 014716 BIT #B14,@SR
(1) 015472 001005 BNE .+14
(1) 015474 012767 000201 015140 MOV #201,ERRNUM
(1) 015502 004767 014772 JSR PC,DERR
(1) 000202 = N+1
1786 015506 SCOPE RINIT
(1) 015506 004567 166514 JSR R5,SCPRTN
(1) 015512 015372 RINIT
1787 015514 017767 020432 015122 RA2: MOV @RCR,BAD ;GET RCR REGISTER
1788 015522 012767 000010 015116 MOV #10,GOOD ;SET UP GOOD FOR COMPARE
1789 015530 026767 015112 015106 CMP GOOD,BAD
1790 015536 001414 BEQ RA3
1791 015540 DATERR \N ;ERROR:RCR NOT INITIALIZED BY RESET
(1) ;***** ERROR 202 *****
(1) 015540 032777 040000 014642 BIT #B14,@SR
(1) 015546 001005 BNE .+14
(1) 015550 012767 000202 015064 MOV #202,ERRNUM
(1) 015556 004767 014716 JSR PC,DERR
(1) 000203 = N+1
1792 015562 SCOPE RINIT
(1) 015562 004567 166440 JSR R5,SCPRTN
(1) 015566 015372 RINIT
1793 015570 017767 020370 015046 RA3: MOV @RDCRC,BAD ;GET CRC REG
1794 015576 005067 015044 CLR GOOD
1795 015602 005767 015036 TST BAD ;IS CRC REG 0?
1796 015606 001414 BEQ RA4
1797 015610 DATERR \N ;ERROR:RCVR CRC NOT CLR'D BY RESET
(1) ;***** ERROR 203 *****
(1) 015610 032777 040000 014572 BIT #B14,@SR
(1) 015616 001005 BNE .+14
(1) 015620 012767 000203 015014 MOV #203,ERRNUM
  
```

(1)	015626	004767	014646		JSR	PC,DERR	
(1)		000204		N	=	N+1	
1798	015632				SCOPE	RINIT	
(1)	015632	004567	166370		JSR	R5,SCPRTN	
(1)	015636	015372			RINIT		
1799	015640	017767	020310	014776	RA4:	MOV @RSR,BAD	:GET RSR REG
1800	015646	005067	014774		CLR	GOOD	
1801	015652	005767	014766		TST	BAD	:IS RSR REG 0?
1802	015656	001414			BEQ	RA5	
1803	015660				DATERR	\N	:ERROR:RSR REG NOT CLR'D BY RESET
(1)							:***** ERROR 204 *****
(1)	015660	032777	040000	014522	BIT	#B14,@SR	
(1)	015666	001005			BNE	.+14	
(1)	015670	012767	000204	014744	MOV	#204,ERRNUM	
(1)	015676	004767	014576		JSR	PC,DERR	
(1)		000205		N	=	N+1	
1804	015702				SCOPE	RINIT	
(1)	015702	004567	166320		JSR	R5,SCPRTN	
(1)	015706	015372			RINIT		
1805	015710	004767	013756		RA5:	JSR PC,MONIT	
1806	015714	032777	010000	014466	BIT	#B12,@SR	:CHK SW 12 FOR EXIT VISA
1807	015722	001402			BEQ	RART	
1808	015724	000167	177442		JMP	RINIT	:IF SET,STAY IN THIS TEST
1809	015730	000207		RART:	RTS	PC	:OTHERWISE, EXIT

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1811 .SBTTL RCR TEST
1812
1813 ;RECEIVER COMMAND REGISTER TEST
1814
1815 015732 005077 020214 RCRTEST: CLR @RCR ;CLEAR RCR REGISTER
1816 015736 012767 160375 014702 RD1: MOV #160375,GOOD ;SET ALL SETTABLE BITS IN RCR
1817 015744 016777 014676 020200 MOV GOOD,@RCR
1818 015752 017767 020174 014664 MOV @RCR,BAD ;AND READ THEM BACK
1819 015760 026767 014662 014656 CMP GOOD,BAD ;ALL BITS SET?
1820 015766 001414 BEQ RD2
1821 015770 DATERR \N ;ERROR:CANNOT SET ALL SETTABLE RCR BITS
(1) ;***** ERROR 205 *****
(1) 015770 032777 040000 014412 BIT #B14,@SR
(1) 015776 001005 BNE .+14
(1) 016000 012767 000205 014634 MOV #205,ERRNUM
(1) 016006 004767 014466 JSR PC,DERR
(1) 000206 = N+1
1822 016012 N SCOPE RD1
(1) 016012 004567 166210 JSR R5,SCPRTN
(1) 016016 015736 RD1
1823 016020 005067 014622 RD2: CLR GOOD ;NOW CLR BITS AFTER SETTING THEM
1824 016024 005077 020122 CLR @RCR
1825 016030 017767 020116 014606 MOV @RCR,BAD ;READ THEM BACK
1826 016036 042767 017412 014600 BIC #17412,BAD ;IGNORE R/O BITS
1827 016044 026767 014576 014572 CMP GOOD,BAD ;ALL CLR?
1828 016052 001414 BEQ RD3
1829 016054 DATERR \N ;ERROR:CANNOT CLR ALL RCR BITS
(1) ;***** ERROR 206 *****
(1) 016054 032777 040000 014326 BIT #B14,@SR
(1) 016062 001005 BNE .+14
(1) 016064 012767 000206 014550 MOV #206,ERRNUM
(1) 016072 004767 014402 JSR PC,DERR
(1) 000207 = N+1
1830 016076 N SCOPE RD2
(1) 016076 004567 166124 JSR R5,SCPRTN
(1) 016102 016020 RD2
1831 016104 012777 160375 020040 RD3: MOV #160375,@RCR ;SET ALL SETTABLE BITS IN RCR
1832 016112 012777 177777 020040 MOV #-1,@RDBC ;AND IN RDBC
1833 016120 012777 177777 020034 MOV #-1,@RDBA ;AND IN RDBA
1834 016126 012777 037200 020020 MOV #37200,@RSR ;AND IN RSR
1835 016134 052777 000002 020010 BIS #B01,@RCR ;BOARD INIT
1836 016142 017767 020004 014474 MOV @RCR,BAD ;CHECK RCR
1837 016150 012767 000010 014470 MOV #10,GOOD ;SEE IF RCR - 10
1838 016156 026767 014464 014460 CMP GOOD,BAD
1839 016164 001414 BEQ RD4
1840 016166 DATERR \N ;ERROR:RCR NOT INIT'D BY BD INIT
(1) ;***** ERROR 207 *****
(1) 016166 032777 040000 014214 BIT #B14,@SR
(1) 016174 001005 BNE .+14
(1) 016176 012767 000207 014436 MOV #207,ERRNUM
(1) 016204 004767 014270 JSR PC,DERR
(1) 000210 = N+1
1841 016210 N SCOPE RD3
(1) 016210 004567 166012 JSR R5,SCPRTN
(1) 016214 016104 RD3
1842 016216 017767 017732 014420 RD4: MOV @RSR,BAD ;CHECK RSR

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1843	016224	005067	014416		CLR	GOOD	
1844	016230	026767	014412	014406	CMP	GOOD,BAD	:RSR = 0?
1845	016236	001414			BEQ	RD5	
1846	016240				DATERR	\N	:ERROR:RSR NOT CLR'D BY BD INIT
(1)							:***** ERROR 210 *****
(1)	016240	032777	040000	014142	BIT	#B14,@SR	
(1)	016246	001005			BNE	.+14	
(1)	016250	012767	000210	014364	MOV	#210,ERRNUM	
(1)	016256	004767	014216		JSR	PC,DERR	
(1)		000211		N	=	N+1	
1847	016262				SCOPE	RD3	
(1)	016262	004567	165740		JSR	R5,SCPRTN	
(1)	016266	016104			RD3		
1848	016270	017767	017664	014346	RD5: MOV	@RDBC,BAD	:CHECK RDBC
1849	016276	005067	014344		CLR	GOOD	
1850	016302	026767	014340	014334	CMP	GOOD,BAD	:RDBC = 0?
1851	016310	001414			BEQ	RD6	
1852	016312				DATERR	\N	:ERROR:RDBC NOT CLR'D BY BD INIT
(1)							:***** ERROR 211 *****
(1)	016312	032777	040000	014070	BIT	#B14,@SR	
(1)	016320	001005			BNE	.+14	
(1)	016322	012767	000211	014312	MOV	#211,ERRNUM	
(1)	016330	004767	014144		JSR	PC,DERR	
(1)		000212		N	=	N+1	
1853	016334				SCOPE	RD3	
(1)	016334	004567	165666		JSR	R5,SCPRTN	
(1)	016340	016104			RD3		
1854	016342	017767	017614	014274	RD6: MOV	@RDBA,BAD	:CHECK RDBA
1855	016350	005067	014272		CLR	GOOD	
1856	016354	026767	014266	014262	CMP	GOOD,BAD	:RDBA = 0?
1857	016362	001414			BEQ	RD7	
1858	016364				DATERR	\N	:ERROR:RDBA NOT CLR'D BY BD INIT
(1)							:***** ERROR 212 *****
(1)	016364	032777	040000	014016	BIT	#B14,@SR	
(1)	016372	001005			BNE	.+14	
(1)	016374	012767	000212	014240	MOV	#212,ERRNUM	
(1)	016402	004767	014072		JSR	PC,DERR	
(1)		000213		N	=	N+1	
1859	016406				SCOPE	RD3	
(1)	016406	004567	165614		JSR	R5,SCPRTN	
(1)	016412	016104			RD3		
1860	016414	004767	013252		RD7: JSR	PC,MONIT	
1861	016420	032777	010000	013762	BIT	#B12,@SR	:CHECK SW 12
1862	016426	001402			BEQ	RDRT	
1863	0 6430	000167	177276		JMP	RCRTST	:STAY IN THIS LOOP IF SW 12 = 1
1864	016434	000207			RDRT: RTS	PC	

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1866                                     .SBTTL RDBC TEST
1867
1868                                     ;BYTE COUNT REG DATA TEST
1869
1870 016436                                RBCST: BDINIT RCVR                :INIT RCVR MODULE
1871 016444 012767 177777 017410          MOV      #-1,PAT                :SET PATTERN
1872 016452 012767 000001 017404          MOV      #B00,MASK              :SET BIT MASK
1873 016460 016767 017376 014160  RB1:  MOV      PAT,GOOD              :LOAD 'GOOD' WITH PATTERN
1874 016466 016777 014154 017464          MOV      GOOD,@RDBC            :LOAD PATTERN INTO RDBC
1875 016474 017767 017460 014142          MOV      @RDBC,BAD              :READ RDBC
1876 016502 026767 014140 014134          CMP      GOOD,BAD              :DATA OK?
1877 016510 001414          BEQ      RB2
1878 016512          DATERR VN                .ERROR:BAD DATA IN RDBC
                                           :***** ERROR 213 *****
(1)
(1) 016517 032777 040000 013670          BIT      #B14,@SR
(1) 016520 001003          BNE      .+14
(1) 016522 012767 000213 014112          MOV      #213,ERRNUM
(1) 016530 004767 013744          JSR      PC,DERR
(1)          000214          =      N+1
1879 016534          N          SCOPE RB1
(1) 016534 004567 165466          JSR      R5,SCRPTN
(1) 016540 016460          RB1
1880 016542 032767 100000 017312  RD1:  BIT      #B15,PAT                :DONE WHOLE REGISTER?
1881 016550 001412          BEQ      RB3                :IF YES, DONE
1882 016552 012767 177777 017302          MOV      #-1,PAT
1883 016560 046767 017300 017274          BIC      MASK,PAT                :NO, PREPARE FOR NEXT BIT
1884 016566 006367 017272          ASL      MASK                :ROTATE MASK
1885 016572 000167 177662          JMP      RB1                :AND CONTINUE
1886 016576 004767 013070          RB3:  JSR      PC,MONIT
1887 016602 032777 010000 013600          BIT      #B12,@SR                :IF SO, CONSIDER LEAVING
1888 016610 001402          BEQ      RBRT                :EXIT IF SW 12 = 0
1889 016612 000167 177620          JMP      RBCST                :STAY HERE IF SW 12 = 1
1890 016616 000207          RBRT:  RTS      PC

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1892                                     .SBTTL  RDBA TEST
1893
1894                                     ;BYTE ADDRESS REG DATA TEST
1895
1896 016620                                RBATST: BDINIT  RCVR      ;INIT RECEIVER MODULE
1897 016626 012767 177777 017226          MOV      #-1,PAT      ;SET PATTERN
1898 016634 012767 000001 017222          MOV      #B00,MASK    ;SET BIT MASK
1899 016642 016767 017214 013776  RC1:    MOV      PAT,GOOD     ;LOAD 'GOOD' WITH PATTERN
1900 016650 016777 013772 017304          MOV      GOOD,@RDBA    ;LOAD PATTERN INTO RDBA
1901 016656 017767 017300 013760          MOV      @RDBA,BAD     ;READ RDBA
1902 016664 026767 013756 013752          CMP      GOOD,BAD
1903 016672 001414                                BEQ      RC2
1904 016674                                DATERR  \N      ;ERROR:BAD DATA IN RDBA REG
                                     ;***** ERROR 214 *****
(1)
(1) 016674 032777 040000 013506          BIT      #B14,@SR
(1) 016702 001005                                BNE      .+14
(1) 016704 012767 000214 013730          MOV      #214,ERRNUM
(1) 016712 004767 013562                                JSR      PC,DERR
(1)                                =      N+1
1905 016716                                N      SCOPE
(1) 016716 004567 165304                                JSR      RC1
(1) 016722 016642                                RC1      R5,SCPRTN
1906 016724 032767 100000 017130  RC2:    BIT      #B15,PAT      ;DONE WHOLE REGISTER?
1907 016732 001412                                BEQ      RC3      ;IF YES, DONE
1908 016734 012767 177777 017120          MOV      #-1,PAT
1909 016742 046767 017116 017112          BIC      MASK,PAT      ;NO, PREPARE FOR NEXT BIT
1910 016750 006367 017110                                ASL      MASK      ;ROTATE MASK
1911 016754 000167 177662                                JMP      RC1      ;AND CONTINUE
1912 016760 004767 012706  RC3:    JSR      PC,MONIT
1913 016764 032777 010000 013416          BIT      #B12,@SR      ;EXIT IF SW 12 = 0
1914 016772 001402                                BEQ      RCRT
1915 016774 000167 177620                                JMP      RBATST      ;STAY HERE IF SW 12 = 1
1916 017000 000207  RCRT:    RTS      PC

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1918 .SBTTL DATA SILO TEST
1919
1920 ;RECEIVER DATA SILO TEST
1921
1922 017002 SLOTST: BDINIT RCVR ;CLEAR RCVR MODULE
1923 017010 004567 165532 JSR R5,DELAY
1924 017014 000010 .WORD 10
1925 017016 032777 000400 017130 BIT #B08,@RSR ;SILO OUTPUT READY?
1926 017024 001414 BEQ RE1
1927 017026 ERROR \N ;ERROR:BD INIT DID NOT CLR SILO
(1) ;***** ERROR 215 *****
(1) 017026 032777 040000 013354 BIT #B14,@SR
(1) 017034 001005 BNE .+14
(1) 017036 012767 000215 013576 MOV #215,ERRNUM
(1) 017044 004767 013344 JSR PC,ERR
(1) 000216 = N+1
1928 017050 N SCOPE SLOTST
(1) 017050 004567 165152 JSR R5,SCPRTN
(1) 017054 017002 SLOTST
1929 017056 032777 000010 017066 RE1: BIT #B03,@RCR ;SILO INPUT RDY?
1930 017064 001014 BNE RE2
1931 017066 ERROR \N ;ERROR:BD INIT DID NOT SET SILO INPUT RDY
(1) ;***** ERROR 216 *****
(1) 017066 032777 040000 013314 BIT #B14,@SR
(1) 017074 001005 BNE .+14
(1) 017076 012767 000216 013536 MOV #216,ERRNUM
(1) 017104 004767 013304 JSR PC,ERR
(1) 000217 = N+1
1932 017110 N SCOPE SLOTST
(1) 017110 004567 165112 JSR R5,SCPRTN
(1) 017114 017002 SLOTST
1933 017116 052777 000200 017026 RE2: BIS #B07,@RCR ;SET LD SILO BIT
1934 017124 012777 177777 017024 MOV #-1,@Rddb ;LOAD 177777 INTO DATA SILO
1935 017132 042777 000200 017012 BIC #B07,@RCR ;CLR LD SILO BIT
1936 017140 004567 165402 JSR R5,DELAY
1937 017144 000010 .WORD 10
1938 017146 032777 000400 017000 BIT #B08,@RSR ;SILO OUTPUT RDY NOW?
1939 017154 001017 BNE RE3
1940 017156 ERROR \N ;ERROR:NO SILO OUTPUT AFTER LOAD
(1) ;***** ERROR 217 *****
(1) 017156 032777 040000 013224 BIT #B14,@SR
(1) 017164 001005 BNE .+14
(1) 017166 012767 000217 013446 MOV #217,ERRNUM
(1) 017174 004767 013214 JSR PC,ERR
(1) 000220 = N+1
1941 017200 N BDINIT RCVR ;CLR SILO
1942 017206 SCOPE RE2
(1) 017206 004567 165014 JSR R5,SCPRTN
(1) 017212 017116 RE2
1943 017214 017767 016736 013422 RE3: MOV @Rddb,BAD ;POP WORD FROM SILO
1944 017222 012767 177777 013416 MOV #-1,GOOD
1945 017230 026767 013412 013406 CMP GOOD,BAD ;SILO OUTPUT = 177777
1946 017236 001417 BEQ RE4
1947 017240 DATERR \N ;ERROR:DROPPED BITS IN DATA SILO
(1) ;***** ERROR 220 *****
(1) 017240 032777 040000 013142 BIT #B14,@SR

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(1)	017246	001005			BNE	+.14	
(1)	017250	012767	000220	013364	MOV	#220,ERRNUM	
(1)	017256	004767	013216		JSR	PC,DERR	
(1)		000221		N	=	N+1	
1948	017262				BDINIT	RCVR	
1949	017270				SCOPE	RE2	
(1)	017270	004567	164732		JSR	R5,SCPRTN	
(1)	017274	017116			RE2		
1950	017276	032777	000400	016650	RE4:	BIT	#B08,@RSR
1951	017304	001414			BEQ	RE5	
1952	017306				ERROR	\N	
(1)							:SILO OUTPUT RDY?
(1)	017306	032777	040000	013074	BIT	#B14,@SR	
(1)	017314	001005			BNE	+.14	
(1)	017316	012767	000221	013316	MOV	#221,ERRNUM	
(1)	017324	004767	013064		JSR	PC,ERR	
(1)		000222		N	=	N+1	
1953	017330				SCOPE	RE3	
(1)	017330	004567	164672		JSR	R5,SCPRTN	
(1)	017334	017214			RE3		
1954	017336	032777	000010	016606	RE5:	BIT	#B03,@RCR
1955	017344	001014			BNE	RE6	
1956	017346				ERROR	\N	
(1)							:SILO INPUT RDY?
(1)	017346	032777	040000	013034	BIT	#B14,@SR	
(1)	017354	001005			BNE	+.14	
(1)	017356	012767	000222	013256	MOV	#222,ERRNUM	
(1)	017364	004767	013024		JSR	PC,ERR	
(1)		000223		N	=	N+1	
1957	017370				SCOPE	RE5	
(1)	017370	004567	164632		JSR	R5,SCPRTN	
(1)	017374	017336			RE5		
1958	017376	052777	000200	016546	RE6:	BIS	#B07,@RCR
1959	017404	005077	016546		CLR	@Rddb	
1960	017410	042777	000200	016534	BIC	#B07,@RCR	
1961	017416	032777	000400	016530	RE7:	BIT	#B08,@RSR
1962	017424	001774			BEQ	RE7	
1963	017426	017767	016524	013210	MOV	@Rddb,BAD	
1964	017434	005067	013206		CLR	GOOD	
1965	017440	026767	013202	013176	CMP	GOOD,BAD	
1966	017446	001417			BEQ	RE7A	
1967	017450				DATERR	\N	
(1)							:SILO OUTPUT = 0?
(1)	017450	032777	040000	012732	BIT	#B14,@SR	
(1)	017456	001005			BNE	+.14	
(1)	017460	012767	000223	013154	MOV	#223,ERRNUM	
(1)	017466	004767	013006		JSR	PC,DERR	
(1)		000224		N	=	N+1	
1968	017472				BDINIT	RCVR	
1969	017500				SCOPE	RE6	
(1)	017500	004567	164522		JSR	R5,SCPRTN	
(1)	017504	017376			RE6		
1970	017506	004767	000476		JSR	PC,CLRCBF	
1971	017512				BDINIT	RCVR	
1972	017520	052777	000200	016424	BIS	#B07,@RCR	
1973	017526	012704	033564		MOV	#SILDAT,R4	
				RE7A:			:MAKE SURE BUFF IS CLR
				RE8:			:CLR RCVR BOARD
							:SET LD SILO BIT
							:R4 POINTS TO DATA FOR SILO

;ERROR:WORD DID NOT GET POPPED FROM SILO
 ;***** ERROR 221 *****

;SILO INPUT RDY?
 ;ERROR:SILO INPUT NOT READY
 ;***** ERROR 222 *****

;SET LD SILO BIT
 ;LOAD 0'S INTO SILO
 ;CLR LD SILO BIT
 ;SILO OUTPUT RDY?
 ;WAIT FOR IT
 ;READ SILO OUTPUT
 ;SILO OUTPUT = 0?
 ;ERROR:PICKED UP BITS IN DATA SILO
 ;***** ERROR 223 *****

;CLR SILO

1974	017532	012703	177700			MOV	#-64.,R3		:R3 COUNTS WORDS
1975	017536	012477	016414		RE9:	MOV	(R4)+, @RDD8		:LOAD DATA INTO SILO
1976	017542	005203				INC	R3		
1977	017544	001374				BNE	RE9		:KEEP LOADING FOR 64 WORDS
1978	017546	032777	000010	016376		BIT	#B03, @RCR		:FULL...IS SILO INPUT RDY?
1979	017554	001414				BEQ	RE10		
1980	017556					ERROR	\N		:ERROR:FULL SILO STILL RDY FOR INPUT
(1)									:***** ERROR 224 *****
(1)	017556	032777	040000	012624		BIT	#B14, @SR		
(1)	017564	001005				BNE	.+14		
(1)	017566	012767	000224	013046		MOV	#224, ERRNUM		
(1)	017574	004767	012614			JSR	PC, ERR		
(1)		000225			N	-	N+1		
1981	017600					SCOPE	RE8		
(1)	017600	004567	164422			JSR	R5, SCPRTN		
(1)	017604	017512				RE8			
1982	017606	042777	000200	016336	RE10:	BIC	#B07, @RCR		:CLR LD SILO BIT
1983	017614	012777	177600	016336		MOV	#-128., @RDBC		:SET UP BYTE COUNT FOR 64 WORDS
1984	017622	012777	034164	016332		MOV	#CMPBUF, @RDBA		:POINT INTERF AT 64 WD BUFFER
1985	017630	052777	040000	016314		BIS	#B14, @RCR		:SET RC NPR
1986	017636	016704	012550			MOV	DLCON, R4		
1987	017642	012703	177500		RE10A:	MOV	#177500, R3		:SET UP FOR 2 MS DELAY
1988	017646	005777	016306		RE11:	TST	@RDBC		:IS BYTE COUNT 0?
1989	017652	001420				BEQ	RE12		
1990	017654	005203				INC	R3		:WAITED 2 MS ?
1991	017656	001373				BNE	RE11		:NO, KEEP LOOKING
1992	017660	005304				DEC	R4		
1993	017662	001367				BNE	RE10A		
1994	017664					ERROR	\N		:ERROR:NPR NOT COMPLETE AFTER 2 MS
(1)									:***** ERROR 225 *****
(1)	017664	032777	040000	012516		BIT	#B14, @SR		
(1)	017672	001005				BNE	.+14		
(1)	017674	012767	000225	012740		MOV	#225, ERRNUM		
(1)	017702	004767	012506			JSR	PC, ERR		
(1)		000226			N	=	N+1		
1995	017706					SCOPE	RE8		
(1)	017706	004567	164314			JSR	R5, SCPRTN		
(1)	017712	017512				RE8			
1996	017714	042777	040000	016230	RE12:	BIC	#B14, @RCR		:CLEAR RC NPR
1997	017722	012702	033564			MOV	#SILDAT, R2		:SET UP TO CHECK SILO OUTPUT
1998	017726	012703	034164			MOV	#CMPBUF, R3		:R2 & R3 ARE DATA POINTERS
1999	017732	012704	177700			MOV	#-64., R4		:R4 IS COUNTER
2000	017736	012267	012704		RE13:	MOV	(R2)+, GOOD		:GET GOOD DATA
2001	017742	012367	012676			MOV	(R3)+, BAD		:GET SILO DATA
2002	017746	026767	012674	012670		CMP	GOOD, BAD		:COMPARE MEM BUFFERS
2003	017754	001414				BEQ	RE14		
2004	017756					DATERR	\N		:ERROR:DATA FROM SILO IS WRONG
(1)									:***** ERROR 226 *****
(1)	017756	032777	040000	012424		BIT	#B14, @SR		
(1)	017764	001005				BNE	.+14		
(1)	017766	012767	000226	012646		MOV	#226, ERRNUM		
(1)	017774	004767	012500			JSR	PC, DERR		
(1)		000227			N	-	N+1		
2005	020000					SCOPE	RE8		
(1)	020000	004567	164222			JSR	R5, SCPRTN		
(1)	020004	017512				RE8			

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SEQ 0071

2006	C20006	005204			RE14:	INC	R4	:DONE COMPARE?
2007	020010	001352				BNE	RE13	
2008	020012	032777	000400	016134		BIT	#B08,@RSR	:YES,SEE IF SILO WAS EMPTIED
2009	020020	001414				BEQ	RE15	
2010	020022					ERROR	\N	:ERROR:SILO OUT RDY, BUT SILO SHD BE EMPTY
(1)								:***** ERROR 227 *****
(1)	020022	032777	040000	012360		BIT	#B14,@SR	
(1)	020030	001005				BNE	+.14	
(1)	020032	012767	000227	012602		MOV	#227,ERRNUM	
(1)	020040	004767	012350			JSR	PC,ERR	
(1)		000230			N	=	N+1	
2011	020044					SCOPE	RE8	
(1)	020044	004567	164156			JSR	R5,SCPRTN	
(1)	020050	017512				RE8		

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2013 .SETTL DATA SILO BLOCK COUNTER TEST
2014
2015 ;THIS TESTS THAT, AFTER PUTTING 200 (OCTAL) WORDS INTO THE DATA SILO
2016 ;THE BLOCK COUNTER COUNTS THE 200 WORDS AND HOLDS SILO INPUT READY
2017 ;IN THE FALSE STATE.
2018
2019 020052 RE15: BDINIT RCVR ;CLEAR THE BOARD
2020 020060 012702 000100 MOV #64.,R2
2021 020064 004767 000140 JSR PC,RESR ;PUT 100 (OCTAL) WORDS INTO SILO
2022 020070 004767 000166 JSR PC,REEMT ;EMPTY IT VIA NPR
2023 020074 012702 000020 MOV #20,R2
2024 020100 004767 000124 JSR PC,RESR ;PUT 20 (OCTAL) WORDS INTO SILO
2025 020104 004767 000152 JSR PC,REEMT ;EMPTY IT AGAIN
2026 020110 012702 000060 MOV #60,R2
2027 020114 004767 000110 JSR PC,RESR ;PUT 60 (OCTAL) WORDS INTO SILO
2028 ; MAKING A TOTAL OF 200 IN WHILE
2029 ; THERE IS ROOM FOR 20 MORE.
2030 020120 032777 000010 016024 BIT #B03,@RCR ;IS SILO INPUT READY?
2031 020126 001414 BEQ PE16 ;IF NOT, OKAY
2032 020130 ERROR \N ;ERROR: INPUT READY AFTER A 200 WORD BLOCK
2033 (1) ;***** ERROR 230 *****
2034 (1) 020130 032777 040000 012252 BIT #B14,@SR
2035 (1) 020136 001005 BNE .+14
2036 (1) 020140 012767 000230 012474 MOV #230,ERRNUM
2037 (1) 020146 004767 012242 JSR PC,ERR
2038 (1) 000231 N - N+1
2039 020152 SCOPE RE15
2040 (1) 020152 004567 164050 JSR R5,SCPRTN
2041 (1) 020156 020052 RE15
2042 020160 RE16: BDINIT RCVR
2043 020166 004767 011500 JSR PC,MONIT
2044 020172 032777 010000 012210 BIT #B12,@SR ;CHECK SW 12
2045 020200 001402 BEQ RERT ;STAY IN THIS TEST IF SW 12 = 1
2046 020202 000167 176574 JMP SLOST
2047 020206 000207 RERT: RTS PC
2048 020210 012703 177700 CLRCBF: MOV #-64.,R3 ;ROUTINE TO CLR BUFFER AREA
2049 020214 012704 034164 MOV #CMPBUF,R4
2050 020220 005024 RECB: CLR (R4)+
2051 020222 005203 INC R3
2052 020224 001375 BNE RECB
2053 020226 000207 RTS PC
2054 ;ROUTINE TO FILL DATA SILO WITH (R2) NUMBER OF WORDS
2055
2056 020230 052777 000200 015714 RESR: BIS #B07,@RCR ;SET LOAD SILO
2057 020236 010203 MOV R2,R3
2058 020240 012777 012345 015710 RESRW: MOV #12345,@RDDB ;LOAD A WORD
2059 020246 005303 DEC R3 ;KEEP TRACK OF # OF WORDS
2060 020250 001373 BNE RESRW
2061 020252 042777 000200 015672 BIC #B07,@RCR ;LEAVE WITH LD SILO CLR
2062 020260 000207 RTS PC
2063 ;ROUTINE TO EMPTY DATA SILO VIA RC NPR
2064
2065 020262 012777 177600 015670 REEMT: MOV #-128.,@RDBC ;SET BYTE COUNT TO EMPTY SILO
2066 020270 012777 034164 015664 MOV #CMPBUF,@RDBA ;POINT SILO AT DAT BUFFER

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SEQ 0073

2061	020276	052777	040000	015646	BIS	#B14,@RCR	:START NPR
2062	020304	016704	012102		MOV	DLCON,R4	
2063	020310	012703	175000		REEMT1: MOV	#175000,R3	:SET UP TO WAIT FOR COMPL
2064	020314	005203			REMTW: INC	R3	
2065	020316	001376			BNE	REMTW	:WAIT FOR NPR COMPLETION
2066	020320	005077	015626		CLR	@RCR	:CLEAR RC NPR
2067	020324	005304			DEC	R4	
2068	020326	001370			BNE	REEMT1	
2069	020330	000207			RTS	PC	:RETURN WITH SILO EMPTY

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2071 .SBTTL RSR TEST
2072
2073 ;RCVR STATUS REG & ERRORS TEST
2074
2075 020332 RSRTST: BDINIT RCVR ;CLEAR THE BOARD
2076 020340 052777 020000 015604 BIS #B13,@RCR ;SET RCV WD
2077 020346 032777 000100 015600 BIT #B06,@RSR ;IS BUSY SET?
2078 020354 001014 BNE RF1
2079 020356 ERROR \N ;ERROR:RCV WD DID NOT SET BUSY
(1) ;***** ERROR 231 *****
(1) 020356 032777 040000 012024 BIT #B14,@SR
(1) 020364 001005 BNE .+14
(1) 020366 012767 000231 012246 MOV #231,ERRNUM
(1) 020374 004767 012014 JSR PC,ERR
(1) 000232 N = N+1
2080 020400 SCOPE RSRTST
(1) 020400 004567 163622 JSR R5,SCPRTN
(1) 020404 020332 RSRTST
2081 020406 052777 000200 015540 RF1: BIS #B07,@RSR ;SET SUC XFR
2082 020414 032777 000200 015532 BIT #B07,@RSR ;IS SUC XFR SET?
2083 020422 001014 BNE RF2
2084 020424 ERROR \N ;ERROR:CANNOT SET RSR BIT 07
(1) ;***** ERROR 232 *****
(1) 020424 032777 040000 011756 BIT #B14,@SR
(1) 020432 001005 BNE .+14
(1) 020434 012767 000232 012200 MOV #232,ERRNUM
(1) 020442 004767 011746 JSR PC,ERR
(1) 000233 N = N+1
2085 020446 SCOPE RF1
(1) 020446 004567 163554 JSR R5,SCPRTN
(1) 020452 020406 RF1
2086 020454 032777 020000 015470 RF2: BIS #B13,@RCR ;IS RCV WD CLR?
2087 020462 001414 BEQ RF3
2088 020464 ERROR \N ;ERROR:SUC XFR DID NOT CLR RCV WD
(1) ;***** ERROR 233 *****
(1) 020464 032777 040000 011716 BIT #B14,@SR
(1) 020472 001005 BNE .+14
(1) 020474 012767 000233 012140 MOV #233,ERRNUM
(1) 020502 004767 011706 JSR PC,ERR
(1) 000234 N = N+1
2089 020506 SCOPE RSRTST
(1) 020506 004567 163514 JSR R5,SCPRTN
(1) 020512 020332 RSRTST
2090 020514 042777 000200 015432 RF3: BIC #B07,@RSR ;CLR SUC XFR
2091 020522 032777 000200 015424 BIT #B07,@RSR ;SEE IF IT CLR'D
2092 020530 001414 BEQ RF4
2093 020532 ERROR \N ;ERROR:CANNOT CLR SUC XFR
(1) ;***** ERROR 234 *****
(1) 020532 032777 040000 011650 BIT #B14,@SR
(1) 020540 001005 BNE .+14
(1) 020542 012767 000234 012072 MOV #234,ERRNUM
(1) 020550 004767 011640 JSR PC,ERR
(1) 000235 N = N+1
2094 020554 SCOPE RF3
(1) 020554 004567 163446 JSR R5,SCPRTN
(1) 020560 020514 RF3
  
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2095	020562				RF4:	BDINIT	RCVR		:CLEAR THE BOARD
2096	020570	052777	020200	015354		BIS	#20200,@RCR		:SET LD SILO & RCV WD
2097	020576	012703	177774			MOV	#-4,R3		
2098	020602	012777	177777	015346	RF5:	MOV	#-1,@RDBB		:MOVE 4 -1'S INTO SILO
2099	020610	000240				NOP			
2100	020612	000240				NOP			
2101	020614	005203				INC	R3		
2102	020616	001371				BNE	RF5		
2103	020620	012777	177776	015332	RF6:	MOV	#-2,@RDBC		:SET BYTE COUNT FOR 1 WORD
2104	020626	052777	000004	015316		BIS	#B02,@RCR		:SET INH ADDR INC
2105	020634	012777	034164	015320		MOV	#CMPBUF,@RDBA		:POINT NPR TO MEM BUFF.
2106	020642	052777	040000	015302		BIS	#B14,@RCR		:START NPR
2107	020650	005777	015304		RF7:	TST	@RDBC		:BYTE COUNT 0?
2108	020654	001375				BNE	RF7		
2109	020656	032777	000400	015270		BIT	#B08,@RSR		:SILO OUTPUT RDY?
2110	020664	001014				BNE	RF8		
2111	020666					ERROR	\N		:ERROR:SILO SHOULD NOT BE EMPTY
(1)									:***** ERROR 235 *****
(1)	020666	032777	040000	011514		BIT	#B14,@SR		
(1)	020674	001005				BNE	.+14		
(1)	020676	012767	000235	011736		MOV	#235,ERRNUM		
(1)	020704	004767	011504			JSR	PC,ERR		
(1)		000236			N	=	N+1		
2112	020710					SCOPE	RF4		
(1)	020710	004567	163312			JSR	R5,SCPRTN		
(1)	020714	020562				RF4			
2113	020716	012767	034164	011722	RF8:	MOV	#CMPBUF,GOOD		:BYTE ADDRESS SHD NOT INCREMENT
2114	020724	017767	015232	011712		MOV	@RDBA,BAD		:READ BYTE ADDRESS
2115	020732	026767	011710	011704		CMP	GOOD,BAD		:SAME AS BEFORE?
2116	020740	001414				BEQ	RF9		
2117	020742					DATERR	\N		:ERROR:RCR BIT 2 DID NOT INH ADR INCREMENT
(1)									:***** ERROR 236 *****
(1)	020742	032777	040000	011440		BIT	#B14,@SR		
(1)	020750	001005				BNE	.+14		
(1)	020752	012767	000236	011662		MOV	#236,ERRNUM		
(1)	020760	004767	011514			JSR	PC,DERR		
(1)		000237			N	=	N+1		
2118	020764					SCOPE	RF4		
(1)	020764	004567	163236			JSR	R5,SCPRTN		
(1)	020770	020562				RF4			
2119	020772	032777	001000	015154	RF9:	BIT	#B09,@RSR		:IS BYTE COUNT OFL SET?
2120	021000	001014				BNE	RF9A		
2121	021002					ERROR	\N		:ERROR:RDBC -0, SILO NOT EMPTY, BUT BC OFL - 0
(1)									:***** ERROR 237 *****
(1)	021002	032777	040000	011400		BIT	#B14,@SR		
(1)	021010	001005				BNE	.+14		
(1)	021012	012767	000237	011622		MOV	#237,ERRNUM		
(1)	021020	004767	011370			JSR	PC,ERR		
(1)		000240			N	=	N+1		
2122	021024					SCOPE	RF4		
(1)	021024	004567	163176			JSR	R5,SCPRTN		
(1)	021030	020562				RF4			
2123	021032	032777	100000	015114	RF9A:	BIT	#B15,@RSR		:IS RSR BIT 15 SET?
2124	021040	001014				BNE	RF10		:IF YES, CHECK FOR INTR REQ
2125	021042					ERROR	\N		:ERROR:BYTE COUNT OFL DID NOT SET RSR BIT 15
(1)									:***** ERROR 240 *****

(1)	021042	032777	040000	011340	BIT	#B14,@SR	
(1)	021050	001005			BNE	+.14	
(1)	021052	012767	000240	011562	MOV	#240,ERRNUM	
(1)	021060	004767	011330		JSR	PC,ERR	
(1)		000241			=	N+1	
2126	021064				SCOPE	RF4	
(1)	021064	004567	163136		JSR	R5,SCPRTN	
(1)	021070	020562			RF4		
2127	021072	032777	020000	015052	RF10: BIT	#B13,@RCR	;IS RCV WD = 0?
2128	021100	001414			BEQ	RF11	
2129	021102				ERROR	\N	;ERROR:BC OFL DID NOT REQUEST INTERRUPT
(1)							;***** ERROR 241 *****
(1)	021102	032777	040000	011300	BIT	#B14,@SR	
(1)	021110	001005			BNE	+.14	
(1)	021112	012767	000241	011522	MOV	#241,ERRNUM	
(1)	021120	004767	011270		JSR	PC,ERR	
(1)		000242			-	N+1	
2130	021124				SCOPE	RF4	
(1)	021124	004567	163076		JSR	R5,SCPRTN	
(1)	021130	020562			RF4		
2131	021132				RF11: BDINIT	RCVR	
2132	021140	052777	020000	015004	BIS	#B13,@RCR	;SET RCV WD
2133	021146	052777	002000	015000	BIS	#B10,@RSR	;SET TIMEOUT
2134	021154	032777	002000	014772	BIT	#B10,@RSR	;IS TIMEOUT SET?
2135	021162	001014			BNE	RF12	
2136	021164				ERRCR	\N	;ERROR:CANNOT SET RSR BIT 10
(1)							;***** ERROR 242 *****
(1)	021164	032777	040000	011216	BIT	#B14,@SR	
(1)	021172	001005			BNE	+.14	
(1)	021174	012767	000242	011440	MOV	#242,ERRNUM	
(1)	021202	004767	011206		JSR	PC,ERR	
(1)		000243			=	N+1	
2137	021206				SCOPE	RF11	
(1)	021206	004567	163014		JSR	R5,SCPRTN	
(1)	021212	021132			RF11		
2138	021214	032777	100000	014732	RF12: BIT	#B15,@RSR	;IS ERROR BIT SET?
2139	021222	001014			BNE	RF13	
2140	021224				ERROR	\N	;ERROR:TIMEOUT DIDN'T SET RSR BIT 15
(1)							;***** ERROR 243 *****
(1)	021224	032777	040000	011156	BIT	#B14,@SR	
(1)	021232	001005			BNE	+.14	
(1)	021234	012767	000243	011400	MOV	#243,ERRNUM	
(1)	021242	004767	011146		JSR	PC,ERR	
(1)		000244			-	N+1	
2141	021246				SCOPE	RF11	
(1)	021246	004567	162754		JSR	R5,SCPRTN	
(1)	021252	021132			RF11		
2142	021254	032777	020000	014670	RF13: BIT	#B13,@RCR	;IS RCV WD CLR?
2143	021262	001414			BEQ	RF14	
2144	021264				ERROR	\N	;ERROR:RSR BIT 15 DIDN'T REQUEST INTERRUPT
(1)							;***** ERROR 244 *****
(1)	021264	032777	040000	011116	BIT	#B14,@SR	
(1)	021272	001005			BNE	+.14	
(1)	021274	012767	000244	011340	MOV	#244,ERRNUM	
(1)	021302	004767	011106		JSR	PC,ERR	
(1)		000245			-	N+1	

Address	Offset	Value	Label	Operation	Comment
2145	021306	004567	162714	SCOPE	RF11
(1)	021306	021132		JSR	R5,SCPRTN
(1)	021312	021132		RF11	
2146	021314	005077	014634	CLR	@RSR ;CLEAR RSR
2147	021320	052777	004000	BIS	#B11,@RSR ;SET PAR (PARITY ERROR) BIT
2148	021326	032777	004000	BIT	#B11,@RSR ;IS IT SET?
2149	021334	001014		BNE	RF15
2150	021336			ERROR	\N ;ERROR:CANNOT SET RSR BIT 11
(1)					***** ERROR 245 *****
(1)	021336	032777	040000	BIT	#B14,@SR
(1)	021344	001005	011044	BNE	.+14
(1)	021346	012767	000245	MOV	#245,ERRNUM
(1)	021354	004767	011034	JSR	PC,ERR
(1)		000246		=	N+1
2151	021360			SCOPE	RF14
(1)	021360	004567	162642	JSR	R5,SCPRTN
(1)	021364	021314		RF14	
2152	021366	032777	100000	BIT	#B15,@RSR ;IS ERROR BIT SET?
2153	021374	001014		BNE	RF16
2154	021376			ERROR	\N ;ERROR:PAR ERR DIDN'T SET RSR BIT '5
(1)					***** ERROR 246 *****
(1)	021376	032777	040000	BIT	#B14,@SR
(1)	021404	001005	011004	BNE	.+14
(1)	021406	012767	000246	MOV	#246,ERRNUM
(1)	021414	004767	010774	JSR	PC,ERR
(1)		000247		=	N+1
2155	021420			SCOPE	RF14
(1)	021420	004567	162602	JSR	R5,SCPRTN
(1)	021424	021314		RF14	
2156	021426	005077	014522	CLR	@RSR ;CLEAR RSR
2157	021432	052777	010000	BIS	#B12,@RSR ;SET TXM ERR
2158	021440	032777	010000	BIT	#B12,@RSR ;IS IT SET?
2159	021446	001014		BNE	RF17
2160	021450			ERROR	\N ;ERROR:CANNOT SET RSR BIT 12
(1)					***** ERROR 247 *****
(1)	021450	032777	040000	BIT	#B14,@SR
(1)	021456	001005	010732	BNE	.+14
(1)	021460	012767	000247	MOV	#247,ERRNUM
(1)	021466	004767	010722	JSR	PC,ERR
(1)		000250		=	N+1
2161	021472			SCOPE	RF16
(1)	021472	004567	162530	JSR	R5,SCPRTN
(1)	021476	021426		RF16	
2162	021500	032777	100000	BIT	#B15,@RSR ;IS ERROR BIT SET?
2163	021506	001014	014446	BNE	RF18
2164	021510			ERROR	\N ;ERROR:TXM ERR DIDN'T SET RSR BIT 15
(1)					***** ERROR 250 *****
(1)	021510	032777	040000	BIT	#B14,@SR
(1)	021516	001005	010672	BNE	.+14
(1)	021520	012767	000250	MOV	#250,ERRNUM
(1)	021526	004767	010662	JSR	PC,ERR
(1)		000251		=	N+1
2165	021532			SCOPE	RF16
(1)	021532	004567	162470	JSR	R5,SCPRTN
(1)	021536	021426		RF16	
2166	021540	005077	014410	CLR	@RSR ;CLEAR RSR

2167	021544	052777	020000	014402	BIS	#B13,@RSR	;SET MEM OFL
2168	021552	032777	020000	014374	BIT	#B13,@RSR	;IS IT SET?
2169	021560	001014			BNE	RF19	
2170	021562				ERROR	\N	;ERROR:CANNOT SET RSR BIT 13
(1)							;***** ERROR 251 *****
(1)	021562	032777	040000	010620	BIT	#B14,@SR	
(1)	021570	001005			BNE	.+14	
(1)	021572	012767	000251	011042	MOV	#251,ERRNUM	
(1)	021600	004767	010610		JSR	PC,ERR	
(1)		000252			=	N+1	
2171	021604				SCOPE	RF18	
(1)	021604	004567	162416		JSR	R5,SCPRTN	
(1)	021610	021540			RF18		
2172	021612	032777	100000	014334	RF19:	BIT	#B15,@RSR
2173	021620	001014			BNE	RF20	;IS ERROR BIT SET?
2174	021622				ERROR	\N	;ERRGR:MEM OFL DIDN'T SET RSR BIT 15
(1)							;***** ERROR 252 *****
(1)	021622	032777	040000	010560	BIT	#B14,@SR	
(1)	021630	001005			BNE	.+14	
(1)	021632	012767	000252	011002	MOV	#252,ERRNUM	
(1)	021640	004767	010550		JSR	PC,ERR	
(1)		000253			=	N+1	
2175	021644				SCOPE	RF18	
(1)	021644	004567	162356		JSR	R5,SCPRTN	
(1)	021650	021540			RF18		

```

2177 ;ERROR GENERATION TESTS
2178
2179 021652 RF20: BDINIT RCVR ;CLEAR THE BOARD
2180 021660 052777 000200 014264 BIS #B07,2RCR ;SET LD SILO BIT
2181 021666 012777 177777 014262 MOV #-1,2RDOB ;LOAD A WORD INTO SILO
2182 021674 032777 000400 014252 RF21: BIT #B08,2RSR ;SILO OUTPUT RDY?
2183 021702 001774 BEQ RF21 ;WAIT FOR IT
2184 021704 042777 000200 014240 BIC #B07,2RCR ;CLEAR LD SILO BIT
2185 021712 012777 177774 014240 MOV #-4,2RDOB ;SET BYTE COUNT FOR 1 WD XFER
2186 021720 012777 160000 014234 MOV #160000,2RDBA ;PUT NON-EXST LOC IN RDBA
2187 021726 052777 040060 014216 BIS #40060,2RCR ;START NPR AND SET EXT ADD BITS
2188 021734 000240 NOP
2189 021736 000240 NOP
2190 021740 005777 014214 TST 2RDOB ;IS BYTE COUNT 0?
2191 021744 001014 BNE RF22
2192 021746 ERROR RF22 \N ;ERROR:RCV NPR COMPL TO NEX ADDRESS
(1) ;***** ERROR 253 *****
(1) 021746 032777 040000 010434 BIT #B14,2SR
(1) 021754 001005 BNE .+14
(1) 021756 012767 000253 010656 MOV #253,ERRNUM
(1) 021764 004767 010424 JSR PC,ERR
(1) 000254 = N+1
2193 021770 N SCOPE RF20
(1) 021770 004567 162232 JSR R5,SCPRTN
(1) 021774 021652 RF20
2194 021776 032777 040000 014150 RF22: BIT #B14,2RSR ;IS NON EXST LOC SET?
2195 022004 001014 BNE RF23
2196 022006 ERROR RF23 \N ;ERROR:NPR TO NXM DIDN'T SET NON-EXST LOC
(1) ;***** ERROR 254 *****
(1) 022006 032777 040000 010374 BIT #B14,2SR
(1) 022014 001005 BNE .+14
(1) 022016 012767 000254 010616 MOV #254,ERRNUM
(1) 022024 004767 010364 JSR PC,ERR
(1) 000255 = N+1
2197 022030 N SCOPE RF20
(1) 022030 004567 162172 JSR R5,SCPRTN
(1) 022034 021652 RF20
2198 022036 032777 100000 014110 RF23: BIT #B15,2RSR ;IS ERROR BIT SET?
2199 022044 001014 BNE RF24
2200 022046 ERROR RF24 \N ;ERROR:NON-EXST LOC DIDN'T SET RSR BIT 15
(1) ;***** ERROR 255 *****
(1) 022046 032777 040000 010334 BIT #B14,2SR
(1) 022054 001005 BNE .+14
(1) 022056 012767 000255 010556 MOV #255,ERRNUM
(1) 022064 004767 010324 JSR PC,ERR
(1) 000256 = N+1
2201 022070 N SCOPE RF20
(1) 022070 004567 162132 JSR R5,SCPRTN
(1) 022074 021652 RF20
2202 022076 RF24: BDINIT RCVR ;CLR BOARD BEFORE LEAVING
2203 022104 004767 007562 JSR PC,MONIT
2204 022110 032777 010000 010272 BIT #B12,2SR ;IS SW 12 SET?
2205 022116 001402 BEQ RFRT
2206 022120 000167 176206 JMP RSRTST ;YES,REPEAT THIS TEST
2207 022124 000207 RFRT: RTS PC

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2209          .SBTTL INTERRUPT TEST
2210
2211          ;RECEIVER INTERRUPT TEST
2212
2213 022126      RINTST: MTPS      #P/          ;DIS-ALLOW INTERRUPT
(1) 022126      MOV          #P7,@#PS
2214 022134      BDINIT      RCVR          ;CLEAR THE BOARD
2215 022142      MOV          RCVEC,R0
2216 022146      MOV          #340,2(R0)      ;SET NEW PS = P7
2217 022154      MOV          #EROINT,@RCVEC    ;SET-UP FOR ERROR INTERRUPT
2218 022162      BIS          #B06,@RCR        ;SET INTERRUPT ENABLE
2219 022170      MTPS          #0              ;ALLOW INTERRUPT
(1) 022170      MOV          #0,@#PS
2220 022176      NOP
2221 022200      JMP          RH0              SKIP ERROR IF NO INTERRUPT
2222 022204      EROINT: MTPS      #P7          ;INTERRUPT OFF
(1) 022204      MOV          #P7,@#PS
2223 022212      CMP          (SP)+,(SP)+      ;CORRECT STACK
2224 022214      BIC          #B06,@RCR        ;CLR INTERRUPT ENABLE
2225 022222      ERROR        \N              ;ERROR:ERRONEOUS INTERRUPT;NO FLAGS SET
(1)
(1) 022222      032777      040000      010160      BIT          #B14,@SR
(1) 022230      001005      .+14
(1) 022232      012767      000256      010402      MOV          #256,ERRNUM
(1) 022240      004767      010150      JSR          PC,ERR
(1)
2226 022244      N          =          N+1
(1) 022244      004567      161756      SCOPE      RINTST
(1) 022250      022126      JSR          R5,SCPRTN
2227 022252      005067      013636      RH0:      CLR          TMPRIO
2228 022256      012777      022556      013640      MOV          #INTRA,@RCVEC    ;START WITH CP AT PRIORITY 0
2229 022264      012737      000340      177776      RH1:      MTPS      #P7          ;SET VECTOR FOR GOOD INTERRUPT
(1) 022264      052777      000100      013652      MOV          #P7,@#PS          ;INTERRUPT OFF
2230 022272      052777      000200      013644      BIS          #B06,@RCR        ;ENABLE RCVR INTERRUPT
2231 022300      052777      177777      013642      BIS          #B07,@RCR        ;SET LD SILO BIT
2232 022314      042777      000200      013630      MOV          #-1,@R0DB      ;PUT A WORD INTO RCVR SILO
2233 022322      032777      000400      013624      BIC          #B07,@RCR        ;CLR LD SILO BIT
2234 022330      001774      RH1A:      BIT          #B08,@RSR        ;SILO OUTPUT READY?
2235 022332      BEQ          RH1A              ;WAIT FOR IT
2236 022332      MTPS          TMPRIO          ;ALLOW INTERRUPT
(1) 022332      016737      013556      177776      MOV          TMPRIO,@#PS
2237 022340      000240      NOP
2238 022342      000240      NOF
2239 022344      005767      013544      TS1          TMPRIO          ;NO INTERRUPT;IS PSW = 0?
2240 022350      001014      BNE          RH2
2241 022352      ERROR        \N              ;ERROR:NO INTERRUPT FROM RECEIVER
(1)
(1) 022352      032777      040000      010030      BIT          #B14,@SR
(1) 022360      001005      .+14
(1) 022362      012767      000257      010252      MOV          #257,ERRNUM
(1) 022370      004767      010020      JSR          PC,ERR
(1)
2242 022374      N          =          N+1
(1) 022374      004567      161626      SCOPE      RINTST
(1) 022400      022126      JSR          R5,SCPRTN
2243 022402      026767      013522      013504      RH2:      CMP          RPRIO,TMPRIO    ;HAVE WE REACHED EXPECTED PRIORITY?
  
```

2244	022410	001414			BEQ	RH3	
2245	022412				ERROR	\N	:ERROR:DEVICE NOT JUMPERED TO EXPECTED PRIORITY
(1)							:***** ERROR 260 *****
(1)	022412	032777	040000	007770	BIT	#B14,@SR	
(1)	022420	001005			BNE	.+14	
(1)	022422	012767	000260	010212	MOV	#260,ERRNUM	
(1)	022430	004767	007760		JSR	PC,ERR	
(1)		000261			=	N+1	
2246	022434				SCOPE	RINTST	
(1)	022434	004567	161566		JSR	R5,SCPRTN	
(1)	022440	022126			RINTST		
2247	022442	022767	000340	013444	RH3:	CMR	#340,TMPRIO
2248	022450	001426			BEQ	RH4	:IS PSW - 7?
2249	022452				BDINIT	RCVR	
2250	022460	062767	000040	013426	ADD	#40,TMPRIO	
2251	022466	012777	022600	013430	RH3S:	MOV	#INTRB,@RCVEC
2252	022474	052777	000100	013450	BIS	#B06,@RCR	:SET VECTOR FOR ERROR INTERRUPT
2253	022502	052777	000200	013444	BIS	#B07,@RSR	:ENABLE RCVR INTERRUPT
2254	022510				MTPS	TMPRIO	:FORCE INTERRUPT REQUEST
(1)	022510	016737	013400	177776	MOV	TMPRIO,@#PS	:SET CP TO NEXT PRIORITY
2255	022516	000240			NOP		
2256	022520	000240			NOP		
2257	022522	000167	177714		JMP	RH3	
2258	022526				RH4:	BDINIT	:CLEAR THE BOARD
2259	022534	004767	007132		JSR	PC,MONIT	
2260	022540	032777	010000	007642	BIT	#B12,@SR	:SW 12 = 1?
2261	022546	001402			BEQ	RHRT	
2262	022550	000167	177352		JMP	RINTST	:YES,DO THIS TEST OVER
2263	022554	000207			RHRT:	RTS	:NO,EXIT
2264							
2265	022556				INTRA:	BDINIT	:CLR INTERRUPT ETC.
2266	022564	062767	000040	013322	ADD	#40,TMPRIO	:INCR TEMP PRIORITY
2267	022572	022626			CMR	(SP)+,(SP)+	:CORRECT STACK POINTER
2268	022574	000167	177464		JMP	RH1	:TRY AGAIN
2269							
2270	022600	022626			INTRB:	CMR	(SP)+,(SP)+
2271	022602				BDINIT	RCVR	:POP THE STACK
2272	022610				ERROR	\N	:CLR EVRYTHING
(1)							:ERROR:GOT INTR WHITH CP AT HIGHER PRIORITY
(1)	022610	032777	040000	007572	BIT	#B14,@SR	:***** ERROR 261 *****
(1)	022616	001005			BNE	.+14	
(1)	022620	012767	000261	010014	MOV	#261,ERRNUM	
(1)	022626	004767	007562		JSR	PC,ERR	
(1)		000262			=	N+1	
2273	022632				SCOPE	RH3S	
(1)	022632	004567	161370		JSR	R5,SCPRTN	
(1)	022636	022466			RH3S		
2274	022640	000167	177576		JMP	RH3	

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2276          .SBTTL C.R.C. CHECK
2277
2278          ;CYCLIC REDUNDANCY CHECK CHARACTER TEST
2279
2280 022644 RCRCTS: BDINIT RCVR          ;CLR THE BOARD
2281 022652 052777 000200 013272 BIS      #B07,@PCR      ;SET LD SILO BIT
2282 022660 012702 033764      MOV      #SILCRC,R2      ;R2 POINTS TO GOOD CRC'S
2283 022664 012703 033564      MOV      #SILDAT,R3      ;R3 POINTS TO MEM DATA
2284 022670 012704 177700      MOV      #-64.,R4        ;R4 IS WORD COUNTER
2285 022674 011367 013212      MOV      (R3),DATWD      ;SAVE INPUT WORD
2286 022700 016777 013206 013250 RJ1:    MOV      DATWD,@RDDDB ;LOAD SILO
2287 022706 011267 007734      MOV      (R2),GOOD      ;GET GOOD CRC FOR COMPARISON
2288 022712 017767 013246 007724      MOV      @RDCRC,BAD ;GET GENERATED CRC
2289 022720 026767 007727 007716      CMP      GOOD,BAD  ;IS CRC OK?
2290 022726 001430      BEQ      RJ2
2291 022730 032777 040000 007452      BIT      #B14,@SR
2292 022736 001021      BNE      RJ1S
2293 022740      PNTM      SLIWD
2294 (1) 022740 012700 034414      MOV      #SLIWD,R0
2295 (1) 022744 004767 007700      JSR      PC,TYPOUT
2296 022750 016700 013136      MOV      DATWD,R0
2297 022754 004767 010206      JSR      PC,OCTPNT
2298 022760      DATERR \N          ;PRINT SILO INPUT WORD
2299 (1) (1) 022760 032777 040000 007422      BIT      #B14,@SR
2300 (1) 022766 001005      BNE      .+14
2301 (1) 022770 012767 000262 007644      MOV      #262,ERRNUM
2302 (1) 022776 004767 007476      JSR      PC,DERR
2303 (1) 022780 000263      =      N+1
2304 023002      N
2305 (1) 023002 004567 161220      RJ1S:  SCOPE  RCRCTS
2306 (1) 023006 022644      JSR      R5,SCPRTN
2307 023010 062702 000002      RJ2:    ADD      #2,R2
2308 023014 062703 000002      ADD      #2,R3
2309 023020 005204      INC      R4
2310 023022 001324      BNE      RJ1
2311 023024 004767 006642      JSR      PC,MONIT
2312 023030 032777 010000 007352      BIT      #B12,@SR
2313 023036 001402      BEQ      RJRT
2314 023040 000167 177600      JMP      RCRCTS
2315 023044      RJRT:  BDINIT  RCVR
2316 023052 000207      RTS      PC
  
```

```

;PRINT ALLOWED?
;IF NOT, SKIP IT
;PRINT 'SILO INPUT WORD WAS '
;PRINT MESSAGE
;POINTED TO BY SLIWD
;PRINT SILO INPUT WORD
;ERROR:BAD CRC FOR ABOVE WORD
;***** ERROR 262 *****
  
```

```

;UPDATE CRC POINTER
;UPDATE DATA POINTER
;HAVE WE CHECKED 64 WDS?
  
```

```

;CHECK SW 12
;IF 0, EXIT
;IF 1, STAY
;CLR BOARD BEFORE EXIT
  
```

```

2309          .SBTTL XMTR-RCVR LOOP TESTS
2310
2311          ;TEST 3 - XMTR - RCVR LOOP TESTS
2312          ; (00) NPR TESTS SILO TO SILO
2313          ; (01) DATA LOOPS TESTS
2314          ; (02) TXM ERRORS TESTS
2315          ; (03) REJECT & TRUNCATE TESTS
2316
2317          000300      N      =      300      ;LOOP TEST ERRORS START AT 300
2318
2319          023054      TEST3:  MTPS      #P7
2320          (1) 023054 012737 000340 177776      MOV      #P7,@MPS
2321          023062 012767 000010 012766      MOV      #10,ITER
2322          023070 004767 006576      JSR      PC,MONIT
2323          023074 032777 002000 007306      BIT      #B10,@SR
2324          023102 001424      BEQ      LOOPL
2325          023104 017767 007300 012746      MOV      @SR,SWI
2326          023112 042767 177770 012740      BIC      #-10,SWI
2327          023120 026727 012734 000003      CMP      SWI,#3
2328          023126 003012      BGT      LOOPL
2329          023130 000241      CLC
2330          023132 006167 012722      ROL      SWI
2331          023136 006167 012716      ROL      SWI
2332          023142 062767 023154 012710      ADD      #LOOPL,SWI
2333          023150 000177 012704      JMP      @SWI
2334          023154 004767 000120      LOOPL:  JSR      PC,NPRTST
2335          023160 004767 000710      JSR      PC,DATLPS
2336          023164 004767 003236      JSR      PC,TXMERS
2337          023170 004767 005520      JSR      PC,XRC20
2338          023174 032777 004000 007206      BIT      #B11,@SR
2339          023202 001003      BNE      TREND
2340          023204 005367 012646      DEC      ITER
2341          023210 001361      BNE      LOOPL
2342          023212 005767 012664      TREND:  TST      $4FLAG
2343          023216 001027      BNE      REPETL
2344          023220 005267 012646      INC      PSN03
2345          (1) 023224 012700 034443      PNTM
2346          (1) 023230 004767 007414      MOV      #PEND,R0
2347          023234 016700 012632      JSR      PC,TYPOUT
2348          023240 004767 010026      MOV      PSN03,R0
2349          023244 012700 000040      JSR      PC,DECPNT
2350          023250 004767 010216      MOV      #40,R0
2351          023254 012700 000102      JSR      PC,TTO
2352          023260 004767 010206      MOV      #B,R0
2353          023264 005000      JSR      PC,TTO
2354          023266 004767 010200      CLR      R0
2355          023272 004767 010174      JSR      PC,TTO
2356          023276 000207      REPETL: RTS      PC
  
```

```

;INITIAL ITERATION OF 10 PER PASS
;CHECK SW 10
;IF CLR, RUN ALL TESTS
;IF SET, START AT TEST # IN SW'S <1:0>
;DON'T ALLOW SWI > 3
;CLR C-BIT BEFORE ROTATE
;GENERATE CORRECT OFFSET
;GO TO SELECTED TEST
;CHECK NPR ..SILO TO SILO
;DO DATA LOOPS TEST
;CHECK TXM ERRORS
;DO REJECT AND TRUNCATE TEST
;CHECK SW 11
;PRINT END IF SET
;OTHERWISE, RE-ITERATE
;TEST END PASS INHIBIT FLAG
;CAN'T PRINT, EXIT.
;UPDATE PASS NO.
;PRINT 'END PASS # '
;PRINT MESSAGE
;POINTED TO BY PEND
;PRINT PASS NO.
;PRINT A SPACE
;PRINT 'B' (TO INDICATE 'LOOP TEST')
;PRINT NULLS TO ALLOW PRINT
;OF PASS NO. IN CASE RESET FOLLOWS
;RETURN
  
```



```

2356 .SBTTL NPR TESTS
2357
2358 023300 NPRTST: BDINIT RCVR ;CLEAR RECEIVER
2359 023306 BDINIT XMTR ;CLEAR XMTR
2360 023314 012777 010400 012622 MOV #10400,@TMMR ;SET MASTER AND AUTO ADDR
2361 023322 004767 000424 JSR PC,FILRCV ;FILL RCVR SILO
2362 023326 012777 177600 012624 MOV #-128,@RDBC ;SET UP RCVR TO INITIATE
2363 023334 016777 012576 012620 MOV TSDB,@RDBA ;NPR TO XMTR SILO
2364 023342 012777 040064 012602 MOV #40064,@RCR ;START NPR, INHIB ADDR INCR
2365 023350 016702 007036 MOV DLCON,R2
2366 023354 005003 NPTST1: CLR R3
2367 023356 012704 177777 MOV #-1,R4 ;SET UP FOR DELAY
2368 023362 022777 000200 012550 XRA1: CMP #128,@TSBC ;TRANSFERRED 64 WORDS?
2369 023370 001422 BEQ XRA2 ;NO, KEEP LOOKING FOR A SECOND
2370 023372 005203 INC R3
2371 023374 001372 BNE XRA1
2372 023376 005204 INC R4
2373 023400 001370 BNE XRA1
2374 023402 005302 DEC R2
2375 023404 001363 BNE NPTST1
2376 023406 ERROR \N ;ERROR:RCVR NPR NOT COMPLETE IN TIME
(1) ;***** ERROR 300 *****
(1) 023406 032777 040000 006774 BIT #B14,@SR
(1) 023414 001005 BNE .+14
(1) 023416 012767 000300 007216 MOV #300,ERRNUM
(1) 023424 004767 006764 JSR PC,ERR
(1) 000301 = N+1
2377 023430 N SCOPE NPRTST
(1) 023430 004567 160572 JSR R5,SCPRTN
(1) 023434 023300 NPRTST
2378 023436 004767 000352 XRA2: JSR PC,CHXDAT ;CHECK DATA IN XMTR SILO
2379 023442 000414 BR XRA2A ;DATA O.K., CONTINUE
2380 023444 DATERR \N ;ERROR:BAD DATA NPR'D TO XMTR SILO
(1) ;***** ERROR 301 *****
(1) 023444 032777 040000 006736 BIT #B14,@SR
(1) 023452 001005 BNE .+14
(1) 023454 012767 000301 007160 MOV #301,ERRNUM
(1) 023462 004767 007012 JSR PC,DERR
(1) 000302 = N+1
2381 023466 N SCOPE NPRTST
(1) 023466 004567 160534 JSR R5,SCPRTN
(1) 023472 023300 NPRTST
2382 023474 005777 012460 XRA2A: TST @RDBC ;CHECK THAT RDBC = 0
2383 023500 001421 BEQ XRA3
2384 023502 005067 007140 CLR GOOD
2385 023506 017767 012446 007130 MOV @RDBC,BAD
2386 023514 DATERR \N ;ERROR:RCV BYTE COUNT SHD BE 0 AT END
(1) ;***** ERROR 302 *****
(1) 023514 032777 040000 006666 BIT #B14,@SR
(1) 023522 001005 BNE .+14
(1) 023524 012767 000302 007110 MOV #302,ERRNUM
(1) 023532 004767 006742 JSR PC,DERR
(1) 000303 = N+1
2387 023536 N SCOPE NPRTST
(1) 023536 004567 160464 JSR R5,SCPRTN
(1) 023542 023300 NPRTST

```

Address	Hex	Label	Operation	Comments
2388	023544		XRA3: BDINIT	CLR XMTR
2389	023552		BDINIT	CLR RCVR
2390	023560	004767	JSR	FILL RECEIVER SILO
2391	023564	012777	MOV	SET UP FOR XMTR TO INITIATE
2392	023572	016777	MOV	NPR FROM RCVR SILO
2393	023600	012777	MOV	SET TX NPR, INHIB ADR INC
2394	023606	016702	MOV	
2395	023612	005003	XRA3A: CLR	
2396	023614	012704	MOV	SET UP FOR 1 SEC DELAY
2397	023620	005777	XRA4: TST	TRANSFERRED 64 WORDS?
2398	023624	001422	BEG	
2399	023626	005203	INC	IF NOT, WATCH FOR A SECOND
2400	023630	001373	BNE	
2401	023632	005204	INC	
2402	023634	001371	BNE	
2403	023636	005302	DEC	
2404	023640	001364	BNE	
2405	023642		ERROR	ERROR:XMTR NPR NOT COMPLETE IN 1 SEC
(1)				***** ERROR 303 *****
(1)	023642	032777	BIT	
(1)	023650	001005	BNE	
(1)	023652	012767	MOV	
(1)	023660	004767	JSR	
(1)		000304	N	
2406	023664		SCOPE	
(1)	023664	004567	JSR	
(1)	023670	023544	XRA3	
2407	023672	004767	XRA5: JSR	CHK DATA IN XMTR SILO
2408	023676	000414	BR	
2409	023700		DATERR	ERROR:BAD DATA NPR'D TO XMTR SILO
(1)				***** ERROR 304 *****
(1)	023700	032777	BIT	
(1)	023706	001005	BNE	
(1)	023710	012767	MOV	
(1)	023716	004767	JSR	
(1)		000305	N	
2410	023722		SCOPE	
(1)	023722	004567	JSR	
(1)	023726	023544	XRA3	
2411	023730	004767	XRA6: JSR	
2412	023734	032777	BIT	SW 12 - 1?
2413	023742	001402	BEQ	NO, EXIT
2414	023744	000167	JMP	YES, STAY HERE
2415	023750	000207	XRART: RTS	
2416	023752	012700	FILRCV: MOV	R0 IS DATA POINTER
2417	023756	012777	MOV	SET RCVR 'LD SILO'
2418	023764	012701	MOV	R1 IS WORD COUNTER
2419	023770	012077	LDLP: MOV	MOVE WORDS INTO SILO
2420	023774	004567	JSR	WAIT FOR INPUT RDY
2421	024000	000005	.WORD	
2422	024002	005301	DEC	LOADED ALL 64 WORDS?
2423	024004	001371	BNF	IF NOT, CONTINUE LOADING
2424	024006	005077	CLR	CLR RCVR AND EXIT
2425	024012	000207	RTS	
2426				
2427	024014	012702	CHXDAT: MOV	R2 IS WORD COUNTER

2428	024020	012701	033564		MOV	#SILDAT,R1	:R1 POINTS TO GOOD DATA
2429	024024	052777	000200	012100	BIS	#B07,@TCR	:SET 'RD SILO' IN XMTR
2430	024032	017767	012100	006604	XRCNT: MOV	@TSDB,BAD	:POP SILO WORD INTO BAD
2431	024040	012167	006602		MOV	(R1)+,GOOD	:POP LIST WORD INTO GOOD
2432	024044	026767	006576	006572	CMP	GOOD,BAD	
2433	024052	001005			BNE	XRERXT	:IF DATA BAD, ERROR EXIT
2434	024054	005302			DEC	R2	:DONE CHECKING SILO?
2435	024056	001365			BNE	XRCNT	:NO, CONTINUE
2436	024060	005077	012046		XRLV: CLR	@TCR	:CLR COMMAND REG
2437	024064	000207			RTS	PC	:EXIT
2438	024066	062716	000002		XRERXT: ADD	#2,(SP)	:FIX PC FOR ERROR RETURN
2439	024072	000772			BR	XRLV	

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2441          .SBTTL DATA LOOPS TESTS
2442
2443 024074      DATLPS: BDINIT  XMTR          ;CLR XMTR
2444 024102      BDINIT  RCVR          ;CLR RCVR
2445 024110      012777  177777  012020      MOV    #-1,@TSDB      ;LOAD A WORD INTO TXM SILO
2446 024116      012777  010400  012020      MOV    #10400,@TMMR    ;SET MASTER FLOP & SET AUTO ADDR
2447 024124      012777  177776  012026      MOV    #-2,@RDBC      ;SET BYTE COUNT FOR 1 WORD
2448 024132      016777  011746  011772      MOV    RCAD,@TCR      ;LOAD DESTINATION CODE
2449 024140      052777  020000  012004      BIS    #B13,@RCR      ;SET RCV WD
2450 024146      012777  177776  011764      MOV    #-2,@TSBC      ;SET XMTR BYTE CNT FOR 1 WORD
2451 024154      052777  020000  011750      BIS    #B13,@TCR      ;SET SEND WORD
2452 024162      016704  006224              MOV    DLCON,R4
2453 024166      012703  177500              DTLPS1: MOV    #177500,R3      ;SET UP 2 MS DELAY
2454 024172      005777  011756              XRB1:  TST    @RSR          ;ANY ERRORS?
2455 024176      100427                      BMI     2$              ;YES
2456 024200      032777  000400  011746      BIT     #B08,@RSR      ;IS DAT OUTP RDY SET IN RCVR?
2457 024206      001020                      BNE     1$
2458 024210      005203                      INC     R3              ;WAIT A COUPLE OF MS FOR IT
2459 024212      001367                      BNE     XRB1
2460 024214      005304                      DEC     R4
2461 024216      001363                      BNE     DTLPS1
2462 024220      ERROR  \N                      ;ERROR:DAT OUTP RDY IN RCVR NOT SET IN 2 MS.
(1)                                     ;***** ERROR 305 *****
(1) 024220      032777  040000  006162      BIT     #B14,@SR
(1) 024226      001005                      BNE     .+14
(1) 024230      012767  000305  006404      MOV    #305,ERRNUM
(1) 024236      004767  006152              JSR     PC,ERR
(1)                                     =      N+1
2463 024242      000306              N          SCOPE  DATLPS
(1) 024242      004567  157760              JSR     R5,SCPRTN
(1) 024246      024074      DATLPS
2464 024250      005777  011700      1$:  TST    @RSR          ;ANY HARD ERRORS?
2465 024254      100030              BPL     XRB2
2466 024256      ERROR  \N                      ;ERROR: HARD ERROR ON 1 WD XFER
(1)                                     ;***** ERROR 306 *****
(1) 024256      032777  040000  006124      BIT     #B14,@SR
(1) 024264      001005                      BNE     .+14
(1) 024266      012767  000306  006346      MOV    #306,ERRNUM
(1) 024274      004767  006114              JSR     PC,ERR
(1)                                     =      N+1
2467 024300      032777  040000  006102      BIT     #B14,@SR      ;CHECK FOR PRINT INHIBIT
2468 024306      001010                      BNE     XRB1S          ;SKIP EXT PRINTOUT IF SW 14 1
2469 024310      012700  034607      PNTM     RCSTAT      ;ELSE PRINT 'RECEIVER STATUS - '
(1) 024310      004767  006330      MOV    #RCSTAT,R0      ;PRINT MESSAGE
(1) 024314      017700  011630      JSR     PC,TYPOUT      ;POINTED TO BY RCSTAT
2470 024320      004767  006636      MOV    @RSR,R0
2471 024324      004767  006636      JSR     PC,OCTPNT      ;PRINT CONTENTS OF RSR
2472 024330      XRB1S: SCOPE  DATLPS
(1) 024330      004567  157672      JSR     R5,SCPRTN
(1) 024334      024074      DATLPS
2473 024336      105777  011572      XRB2:  TSTB   @TSR          ;IS SUC TXF SET IN XMTR?
2474 024342      100433                      BMI     XRB3
2475 024344      ERROR  \N                      ;ERROR:SUC TXF IN XMTR NOT SET IN 2 MS.
(1)                                     ;***** ERROR 307 *****
(1) 024344      032777  040000  006036      BIT     #B14,@SR
(1) 024352      001005                      BNE     .+14

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(1)	024354	012767	000307	006260	MOV	#307,ERRNUM	
(1)	024362	004767	006026		JSR	PC,ERR	
(1)		000310			=	N+1	
2476	024366	005777	011542		TST	@TSR	:ANY HARD ERRORS?
2477	024372	100014			BPL	XRBS2	
2478	024374	032777	040000	006006	BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2479	024402	001010			BNE	XRBS2	:IF NOT, SKIP IT.
2480	024404				PNTM	TXSTAT	:IF SO, PRINT 'TRANSMITTER STATUS = ''
(1)	024404	012700	034554		MOV	#TXSTAT,R0	:PRINT MESSAGE
(1)	024410	004767	006234		JSR	PC,TYPOUT	:POINTED TO BY TXSTAT
2481	024414	017700	011514		MOV	@TSR,R0	
2482	024420	004767	006542		JSR	PC,OCTPNT	:PRINT CONTENTS OF TSR
2483	024424				XRBS2: SCOPE	DATLPS	
(1)	024424	004567	157576		JSR	R5,SCPRTN	
(1)	024430	024074			DATLPS		
2484	024432	012767	177777	006206	XRBS3: MOV	#-1,GOOD	
2485	024440	017767	011512	006176	MOV	@RDBB,BAD	:CHECK DATA RECEIVED
2486	024446	026767	006174	006170	CMP	GOOD,BAD	:IS IT O.K. ?
2487	024454	001414			BEQ	XRBS4	
2488	024456				DATERR	\N	:ERROR:DATA RECEIVED IS WRONG (DROPPED BITS)
(1)							:***** ERROR 310 *****
(1)	024456	032777	040000	005724	BIT	#B14,@SR	
(1)	024464	001005			BNE	.+14	
(1)	024466	012767	000310	006146	MOV	#310,ERRNUM	
(1)	024474	004767	006000		JSR	PC,DERR	
(1)		000311			=	N+1	
2489	024500				SCOPE	DATLPS	
(1)	024500	004567	157522		JSR	R5,SCPRTN	
(1)	024504	024074			DATLPS		
2490	024506	016767	011374	006132	XRBS4: MOV	TRAD,GOOD	:GET TRANSMITTER IDB BUS ADDRESS
2491	024514	017767	011432	006122	MOV	@RCR,BAD	:READ IDENT BITS IN RCR
2492	024522	042767	160377	006114	BIC	#160377,BAD	:IGNORE ALL OTHER BITS
2493	024530	026767	006112	006106	CMP	GOOD,BAD	:D.C. RECEIVED OK?
2494	024536	001414			BEQ	XRBS4C	
2495	024540				DATERR	\N	:ERROR:XMTR IDENT BITS NOT REC'D BY RCR
(1)							:***** ERROR 311 *****
(1)	024540	032777	040000	005642	BIT	#B14,@SR	
(1)	024546	001005			BNE	.+14	
(1)	024550	012767	000311	006064	MOV	#311,ERRNUM	
(1)	024556	004767	005716		JSR	PC,DERR	
(1)		000312			=	N+1	
2496	024562				SCOPE	DATLPS	
(1)	024562	004567	157440		JSR	R5,SCPRTN	
(1)	024566	024074			DATLPS		
2497	024570				XRBS4C: BDINIT	XMTR	:CLR XMTR
2498	024576				BDINIT	RCVR	:CLR RCVR
2499	024604	012777	000000	011324	MOV	#0,@TSDB	:LOAD A WORD OF 0'S INTO SILO
2500	024612	012777	177776	011320	MOV	#-2,@TSBC	:SET BYTE CNT FOR 1 WORD
2501	024620	012777	177776	011332	MOV	#-2,@RDBC	
2502	024626	016777	011252	011276	MOV	RCAD,@TCR	:POINT XMTR AT RCVR
2503	024634	052777	020000	011310	BIS	#B13,@RCR	:SET RCV WD
2504	024642	052777	020000	011262	BIS	#B13,@TCR	:SET SND WD
2505	024650	016704	005536		MOV	DLCON,R4	
2506	024654	012703	177570		XRBS4D: MOV	#177570,R3	:SET UP 2 MS DELAY
2507	024660	005777	011270		XRBS5: TST	@RSR	:ANY ERRORS?
2508	024664	100427			BMI	2\$	:YES, ERROR

2509	024666	032777	000400	011260	BIT	#B08,@RSR		;DATA OUTPUT READY YET?
2510	024674	001020			BNE	1\$		
2511	024676	005203			INC	R3		;WAIT A COUPLE OF MS FOR IT
2512	024700	001367			BNE	XR85		
2513	024702	005304			DEC	R4		
2514	024704	001363			BNE	XR84D		
2515	024706				ERROR	\N		;ERROR:DAT OUTP RDY IN RCVR NOT SET IN 2 MS.
(1)								;***** ERROR 312 *****
(1)	024706	032777	040000	005474	BIT	#B14,@SR		
(1)	024714	001005			BNE	+.14		
(1)	024716	012767	000312	005716	MOV	#312,ERRNUM		
(1)	024724	004767	005464		JSR	PC,ERR		
(1)		000313			=	N+1		
2516	024730				SCOPE	XR84C		
(1)	024730	004567	157272		JSR	R5,SCPRTN		
(1)	024734	024570			XR84C			
2517	024736	005777	011212		1\$: TST	@RSR		;ANY HARD ERRORS IN RCVR?
2518	024742	100030			BPL	XR86		
2519	024744				2\$: ERROR	\N		;ERROR:HARD ERROR ON 1 WD XFER
(1)								;***** ERROR 313 *****
(1)	024744	032777	040000	005436	BIT	#B14,@SR		
(1)	024752	001005			BNE	+.14		
(1)	024754	012767	000313	005660	MOV	#313,ERRNUM		
(1)	024762	004767	005426		JSR	PC,ERR		
(1)		000314			=	N+1		
2520	024766	032777	040000	005414	BIT	#B14,@SR		;CHECK IF PRINT ALLOWED
2521	024774	001013			BNE	XR86		;IF NOT, SKIP IT.
2522	024776				PNTM	RCSTAT		;IF SO, PRINT 'RECEIVER STATUS '
(1)	024776	012700	034607		MOV	#RCSTAT,R0		;PRINT MESSAGE
(1)	025002	004767	005642		JSR	PC,TYPOUT		;POINTED TO BY RCSTAT
2523	025006	017700	011142		MOV	@RSR,R0		
2524	025012	004767	006150		JSR	PC,OCTPNT		;PRINT CONTENTS OF RSR
2525	025016				SCOPE	XR84C		
(1)	025016	004567	157204		JSR	R5,SCPRTN		
(1)	025022	024570			XR84C			
2526	025024	105777	011104		XR86: TSTB	@TSR		;IS SUC TXF SET IN XMTR?
2527	025030	100433			BMI	XR87		
2528	025032				ERROR	\N		;ERROR:SUC TXF IN XMTR NOT SET IN 2 MS.
(1)								;***** ERROR 314 *****
(1)	025032	032777	040000	005350	BIT	#B14,@SR		
(1)	025040	001005			BNE	+.14		
(1)	025042	012767	000314	005572	MOV	#314,ERRNUM		
(1)	025050	004767	005340		JSR	PC,ERR		
(1)		000315			=	N+1		
2529	025054	005777	011054		TST	@TSR		;ANY HARD ERRORS IN XMTR?
2530	025060	100014			BPL	XR86S		
2531	025062	032777	040000	005320	BIT	#B14,@SR		;CHECK IF PRINT ALLOWED
2532	025070	001010			BNE	XR86S		;IF NOT, SKIP IT
2533	025072				PNTM	TXSTAT		;IF SO, PRINT 'TRANSMITTER STATUS = '
(1)	025072	012700	034554		MOV	#TXSTAT,R0		;PRINT MESSAGE
(1)	025076	004767	005546		JSR	PC,TYPOUT		;POINTED TO BY TXSTAT
2534	025102	017700	011026		MOV	@TSR,R0		
2535	025106	004767	006054		JSR	PC,OCTPNT		;PRINT CONTENTS OF TSR
2536	025112				XR86S: SCOPE	XR84C		
(1)	025112	004567	157110		JSR	R5,SCPRTN		
(1)	025116	024570			XR84C			

2537	025120	005067	005522		XR87:	CLR	GOOD	
2538	025124	017767	011026	005512		MOV	@RDD8,BAD	:CHECK DATA RECEIVED
2539	025132	026767	005510	005504		CMP	GOOD,BAD	:IS IT O.K.?
2540	025140	001414				BEQ	XR88	
2541	025142					DATERR	\N	:ERROR:DATA RECEIVED IS WRONG (PICKED UP BITS)
(1)								:***** ERROR 315 *****
(1)	025142	032777	040000	005240		BIT	#B14,@SR	
(1)	025150	001005				BNE	+.14	
(1)	025152	012767	000315	005462		MOV	#315,ERRNUM	
(1)	025160	004767	005314			JSR	PC,DERR	
(1)		000316			N		N+1	
2542	025164					SCOPE	XR84C	
(1)	025164	004567	157036			JSR	R5,SCPRTN	
(1)	025170	024570				XR84C		
2543	025172	004767	173012		XR88:	JSR	PC,CLRCBF	:MAKE SURE CMPBUF IS CLEAR
2544	025176					BDINIT	XMTR	:CLR XMTR
2545	025204					BDINIT	RCVR	:CLR RCVR
2546	025212	012777	033564	010722		MOV	#SILDAT,@TSBA	:GET XMTR DATA FROM SILDAT
2547	025220	012777	034164	010734		MOV	#CMPBUF,@RDBA	:PUT RCV'D DATA IN CMPBUF
2548	025226	012777	177600	010704		MOV	#-128,@TSBC	:SET UP TO SEND 64 WORDS
2549	025234	012777	177600	010716		MOV	#-128,@RDBC	:SET UP TO RECEIVE 64 WORDS
2550	025242	016777	010636	010662		MOV	RCAD,@TCR	:POINT XMTR AT RCVR
2551	025250	052777	060001	010674		BIS	#60001,@RCR	:SET RC NPR, RCV WD, & ST TXF IN RCVR
2552	025256	052777	060001	010646		BIS	#60001,@TCR	:AND IN XMTR
2553	025264	016702	005122			MOV	DLCON,R2	
2554	025270	005003			XR88A:	CLR	R3	
2555	025272	012704	177777			MOV	#-1,R4	:SET UP 1 SEC DELAY
2556	025276	105777	010632		XR89:	TSTB	@TSR	:IS SUC TXF SET IN XMTR?
2557	025302	100447				BMI	XR810	:YES, GO CHECK RECEIVER
2558	025304	005777	010624			TST	@TSR	:ERROR BIT SET?
2559	025310	100411				BMI	\$2\$	
2560	025312	005777	010636			TST	@RSR	:RCVR ERROR BIT SET?
2561	025316	100444				BMI	\$3\$	
2562	025320	005203				INC	R3	:NO, WATCH FOR A SECOND
2563	025322	001365				BNE	XR89	
2564	025324	005204				INC	R4	
2565	025326	001363				BNE	XR89	
2566	025330	005302				DEC	R2	
2567	025332	001356				BNE	XR88A	
2568	025334				\$2\$:	ERROR	\N	:ERROR:NO SUC TXF IN XMTR IN 1 SEC
(1)								:***** ERROR 316 *****
(1)	025334	032777	040000	005046		BIT	#B14,@SR	
(1)	025342	001005				BNE	+.14	
(1)	025344	012767	000316	005270		MOV	#316,ERRNUM	
(1)	025352	004767	005036			JSR	PC,ERR	
(1)		000317			N		N+1	
2569	025356	005777	010552			TST	@TSR	:ANY HARD ERRORS IN XMTR?
2570	025362	100014				BPL	XR89S	
2571	025364	032777	040000	005016		BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2572	025372	001010				BNE	XR89S	:IF NOT, SKIP IT
2573	025374					PNTM	TXSTAT	:IF SO, PRINT 'TRANSMITTER STATUS = '
(1)	025374	012700	034554			MOV	#TXSTAT,R0	:PRINT MESSAGE
(1)	025400	004767	005244			JSR	PC,TYP0UT	:POINTED TO BY TXSTAT
2574	025404	017700	010524			MOV	@TSR,R0	
2575	025410	004767	005552			JSR	PC,OCTPNT	:PRINT CONTENTS OF TSR
2576	025414				XR89S:	SCOPE	XR88	

(1)	025414	004567	156606		JSR	R5,SCPRTN	
(1)	025420	025172			XRB8		
2577	025422	105777	010526		TSTB	@RSR	:IS SUC TXF SET IN RCVR?
2578	025426	100433			BMI	XRB11	:YES, GO CHECK DATA
2579	025430				ERROR	\N	:ERROR:NO SUC TXF IN RCVR IN 1 SEC
(1)							:***** ERROR 317 *****
(1)	025430	032777	040000	004752	BIT	#B14,@SR	
(1)	025436	001005			BNE	.+14	
(1)	025440	012767	000317	005174	MOV	#317,ERRNUM	
(1)	025446	004767	004742		JSR	PC,ERR	
(1)		000320			=	N+1	
2580	025452	005777	010476		TST	@PSR	:ANY HARD ERRORS IN RCVR?
2581	025456	100014			BPL	XRB10S	
2582	025460	032777	040000	004722	BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2583	025466	001010			BNE	XRB10S	:IF NOT, SKIP IT
2584	025470				PNTM	RCSTAT	:IF SO, PRINT 'RECEIVER STATUS'
(1)	025470	012700	034607		MOV	#RCSTAT,R0	:PRINT MESSAGE
(1)	025474	004767	005150		JSR	PC,TYP0UT	:POINTED TO BY RCSTAT
2585	025500	017700	010450		MOV	@RSR,R0	
2586	025504	004767	005456		JSR	PC,OCTPNT	:PRINT CONTENTS OF RSR
2587	025510				XRB10S: SCOPE	XRB8	
(1)	025510	004567	156512		JSR	R5,SCPRTN	
(1)	025514	025172			XRB8		
2588	025516	012703	000100		XRB11: MOV	#64.,R3	:R3 IS WORD COUNTER
2589	025522	012701	033564		MOV	#SILDAT,R1	:R1 IS GOOD DATA POINTER
2590	025526	012702	034164		MOV	#CMPBUF,R2	:R2 IS 'BAD' DATA POINTER
2591	025532	012167	005110		XRB11L: MOV	(R1)+,GOOD	
2592	025536	012267	005102		MOV	(R2)+,BAD	
2593	025542	026767	005100	005074	CMP	GOOD,BAD	:DATA WORD OK?
2594	025550	001420			BEQ	XRB11C	:IF SO, CONTINUE
2595	025552				DATERR	\N	:ERROR:BAD DATA RECEIVED FROM XMTR
(1)							:***** ERROR 320 *****
(1)	025552	032777	040000	004630	BIT	#B14,@SR	
(1)	025560	001005			BNE	.+14	
(1)	025562	012767	000320	005052	MOV	#320,ERRNUM	
(1)	025570	004767	004704		JSR	PC,DERR	
(1)		000321			=	N+1	
2596	025574	005303			DEC	R3	:CHECKED ALL WORDS?
2597	025576	001355			BNE	XRB11L	
2598	025600				SCOPE	XRB8	:RE-TRY BECAUSE OF ERROR
(1)	025600	004567	156422		JSR	R5,SCPRTN	
(1)	025604	025172			XRB8		
2599	025606	000167	000004		JMP	XRB12	
2600	025612	005303			XRB11C: DEC	R3	:CHECKED ALL WORDS?
2601	025614	001346			BNE	XRB11L	
2602	025616				XRB12: BDINIT	XMTR	:CLR XMTR
2603	025624				BDINIT	RCVR	:CLR RCVR
2604	025632	012777	036200	010302	MOV	#TSTWRD,@TSBA	:POINT XMTR AT LOC WITH TEST WORD
2605	025640	012777	177200	010272	MOV	#-600,@TSBC	:SET UP FOR 300 WORD XFR
2606	025646	016777	010232	010256	MOV	RCAD,@TCR	:POINT XMTR AT RCVR
2607	025654	012777	020001	010270	MOV	#20001,@RCR	:SET RCV WD, RCV DAT, IN RCVR
2608	025662	052777	060005	010242	BIS	#60005,@TCR	:SET TX NPR, INH ADR INC, ST TXM, & SND WD
2609	025670	012701	000300		MOV	#300,R1	:R1 COUNTS WORDS RECEIVED
2610	025674	016704	004512		XRB12L: MOV	DLCON,R4	
2611	025700	012703	177700		XRB12K: MOV	#-100,R3	:SET UP 10 MS COUNTER
2612	025704	032777	000400	010242	XRB12M: BIT	#B08,@RSR	:RCVR SILO RDY FOR OUTPUT?

2613	025712	001063			BNE	XRB13	:YES. LOOK AT WORD
2614	025714	005203			INC	R3	
2615	025716	001372			BNE	XRB12M	:IF NOT, WAIT 10 MS.
2616	025720	005304			DEC	R4	
2617	025722	001366			BNE	XRB12K	
2618	025724				ERROR	W	-ERROR:NO DATA WORD IN RCVR SILO IN 10 MS. :***** ERROR 321 *****
(1)							
(1)	025724	032777	040000	004456	BIT	#B14,@SR	
(1)	025732	001005			BNE	.+14	
(1)	025734	012767	000321	004700	MOV	#321,ERRNUM	
(1)	025742	004767	004446		JSR	PC,ERR	
(1)		000322			-	N+1	
2619	025746	005777	010162		TST	@TSR	:ANY HARD ERRORS IN XMTR?
2620	025752	100014			BPL	XRB12R	
2621	025754	032777	040000	004426	BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2622	025762	001034			BNE	XRB12S	:IF NOT, SKIP IT
2623	025764				PNTM	TXSTAT	:IF SO, PRINT 'TRANSMITTER STATUS = '
(1)	025764	012700	034554		MOV	#TXSTAT,R0	:PRINT MESSAGE
(1)	025770	004767	004654		JSR	PC,TYP0UT	:POINTED TO BY TXSTAT
2624	025774	017700	010134		MOV	@TSR,R0	
2625	026000	004767	005162		JSR	PC,OCTPNT	:PRINT CONTENTS OF TSR
2626	026004	005777	010144		TST	@RSR	:ANY HARD ERRORS IN RCVR?
2627	026010	100010			BPL	XRB12T	
2628	026012				PNTM	RCSTAT	:IF SO, PRINT 'RECEIVER STATUS = '
(1)	026012	012700	034607		MOV	#RCSTAT,R0	:PRINT MESSAGE
(1)	026016	004767	004626		JSR	PC,TYP0UT	:POINTED TO BY RCSTAT
2629	026022	017700	010126		MOV	@RSR,R0	
2630	026026	004767	005134		JSR	PC,OCTPNT	:PRINT CONTENTS OF RSR
2631	026032				PNTM	RCBTCN	:PRINT 'NO. OF WORDS RECEIVED = '
(1)	026032	012700	034637		MOV	#RCBTCN,R0	:PRINT MESSAGE
(1)	026036	004767	004606		JSR	PC,TYP0UT	:POINTED TO BY RCBTCN
2632	026042	012700	000300		MOV	#300,R0	
2633	026046	160100			SUB	R1,R0	:CALCULATE WORDS RECV'D
2634	026050	004767	005112		JSR	PC,OCTPNT	:PRINT RESULT
2635	026054				SCOPE	XRB12	:START ALL OVER
(1)	026054	004567	156146		JSR	R5,SCPRTN	
(1)	026060	025616			XRB12		
2636	026062	016767	010112	004556	MOV	TSTWRD,GOOD	
2637	026070	017767	010062	004546	MOV	@R0DB,BAD	:GET WORD FROM SILO
2638	026076	026767	004544	004540	CMP	GOOD,BAD	:WAS IT = TEST WORD?
2639	026104	001431			BEQ	XRB13C	
2640	026106				DATERR	W	:ERROR:DATA WORD IN RCVR SILO WRONG :***** ERROR 322 *****
(1)							
(1)	026106	032777	040000	004274	BIT	#B14,@SR	
(1)	026114	001005			BNE	.+14	
(1)	026116	012767	000322	004516	MOV	#322,ERRNUM	
(1)	026124	004767	004350		JSR	PC,DERR	
(1)		000323			=	N+1	
2641	026130	032777	040000	004252	BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2642	026136	001011			BNE	XRB13L	:IF NOT, SKIP IT.
2643	026140				PNTM	RCBTCN	:PRINT 'NO. OF WORDS RECEIVED = '
(1)	026140	012700	034637		MOV	#RCBTCN,R0	:PRINT MESSAGE
(1)	026144	004767	004500		JSR	PC,TYP0UT	:POINTED TO BY RCBTCN
2644	026150	012700	000301		MOV	#301,R0	
2645	026154	160100			SUB	R1,R0	:CALCULATE WORDS RECV'D
2646	026156	004767	005004		JSR	PC,OCTPNT	:PRINT RESULT

2647	026162				XRB13L: SCOPE	XRB12	:START ALL OVER
(1)	026162	004567	156040		JSR	R5,SCPRTN	
(1)	026166	025616			XRB12		
2648	026170	005301			XRB13C: DEC	R1	:UPDATE RCVR WORD COUNT
2649	026172	001240			BNE	XRB12L	:GET ANOTHER WORD
2650	026174	016704	004212		MOV	DLCON,R4	
2651	026200	012703	177000		XRB13E: MOV	#177000,R3	:SET UP TO WAIT FOR TXFR
2652	026204	005203			XRB13D: INC	R3	
2653	026206	001376			BNE	XRB13D	:WAIT FOR LATEST POSSIBLE TIMSL
2654	026210	105777	007720		TSTB	@TSR	:XMTR SUC TXF SET?
2655	026214	100435			BMI	XRB14	:YES,GO CHECK RCVR
2656	026216	005304			DEC	R4	
2657	026220	001367			BNE	XRB13E	
2658	026222				ERROR	\N	:ERROR:XMTR SUC TXF NOT SET
(1)							:***** ERROR 323 *****
(1)	026222	032777	040000	004160	BIT	#B14,@SR	
(1)	026230	001005			BNE	.+14	
(1)	026232	012767	000323	004402	MOV	#323,ERRNUM	
(1)	026240	004767	004150		JSR	PC,ERR	
(1)		000324			=	N+1	
2659	026244	005777	007664		TST	@TSR	:ANY HARD ERRORS IN XMTR?
2660	026250	100014			BPL	XRB13S	
2661	026252	032777	040000	004130	BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2662	026260	001010			BNE	XRB13S	:IF NOT, SKIP IT.
2663	026262				PNTM	TXSTAT	:IF SO, PRINT 'TRANSMITTER STATUS = '
(1)	026262	012700	034554		MOV	#TXSTAT,R0	:PRINT MESSAGE
(1)	026266	004767	004356		JSR	PC,TYP0UT	:POINTED TO BY TXSTAT
2664	026272	017700	007636		MOV	@TSR,R0	
2665	026276	004767	004664		JSR	PC,OCTPNT	:PRINT CONTENTS OF TSR
2666	026302				XRB13S: SCOPE	XRB12	:START OVER
(1)	026302	004567	155720		JSR	R5,SCPRTN	
(1)	026306	025616			XRB12		
2667	026310	105777	007640		XRB14: TSTB	@RSR	:RCVR SUC TXF SET?
2668	026314	100433			BMI	XRB15	:YES, ALL DONE
2669	026316				ERROR	\N	:ERROR:RCVR SUC TXF NOT SET
(1)							:***** ERROR 324 *****
(1)	026316	032777	040000	004064	BIT	#B14,@SR	
(1)	026324	001005			BNE	.+14	
(1)	026326	012767	000324	004306	MOV	#324,ERRNUM	
(1)	026334	004767	004054		JSR	PC,ERR	
(1)		000325			=	N+1	
2670	026340	005777	007610		TST	@RSR	:ANY HARD ERRORS IN RCVR?
2671	026344	100014			BPL	XRB14S	
2672	026346	032777	040000	004034	BIT	#B14,@SR	:CHECK IF PRINT ALLOWED
2673	026354	001010			BNE	XRB14S	:IF NOT, SKIP IT.
2674	026356				PNTM	RCSTAT	:IF SO, PRINT 'RECEIVER STATUS = '
(1)	026356	012700	034607		MOV	#RCSTAT,R0	:PRINT MESSAGE
(1)	026362	004767	004262		JSR	PC,TYP0UT	:POINTED TO BY RCSTAT
2675	026366	017700	007562		MOV	@RSR,R0	
2676	026372	004767	004570		JSR	PC,OCTPNT	:PRINT CONTENTS OF RSR
2677	026376				XRB14S: SCOPE	XRB12	:START OVER
(1)	026376	004567	155624		JSR	R5,SCPRTN	
(1)	026402	025616			XRB12		
2678	026404	004767	003262		XRB15: JSR	PC,MONIT	
2679	026410	032777	010000	003772	BIT	#B12,@SR	:SW 12 = 1?
2680	026416	001402			BEQ	XRBRT	:NO. EXIT

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CZPLBC.P11 07-JUN-79 15:47 DATA LOOPS TESTS

SEG 0094

2681 026420 000167 175450
2682 026424 000207

XRBRT: JMP DATLPS
RTS PC

:YES, DON'T EXIT

.SBTTL TRANSMISSION ERRORS TESTS

;TEST TO CHECK FOR RCVR TIMEOUT.
;OPEN CHANNEL, THEN DON'T SEND ANY DATA FOR
; 3 SECONDS.

2684									
2685									
2686									
2687									
2688									
2689									
2690									
2691	026426					TXMERS: BDINIT	XMTR		;CLR XMTR
2692	026434					BDINIT	RCVR		;CLR RCVR
2693	026442	052777	010400	007474		BIS	#10400,@TMMR		;SET MASTER & AUTO ADDR
2694	026450	012777	177774	007462		MOV	#-4,@TSBC		;INDICATE 2 WD XFR
2695	026456	012777	177777	007452		MOV	#-1,@TSDB		;PUT 1 WD IN XMTR SILO
2696	026464	016777	007414	007440		MOV	RCAD,@TCR		;POINT XMTR AT RCVR
2697	026472	052777	020000	007452		BIS	#B13,@RCR		;SET RCV WD
2698	026500	052777	020000	007424		BIS	#B13,@TCR		;SET SND WD
2699	026506	016702	003700			MOV	DLCON,R2		
2700	026512	005003				TXMR1: CLR	R3		
2701	026514	012704	177775			MOV	#-3,R4		;SET UP 1 SEC DELAY
2702	026520	032777	002000	007426		XRC1: BIT	#B10,@RSR		;IS RCVR TIMEOUT SET?
2703	026526	001022				BNE	XRC2		
2704	026530	005203				INC	R3		;IF NOT, WAIT 3 SEC FOR IT
2705	026532	001372				BNE	XRC1		
2706	026534	005204				INC	R4		
2707	026536	001370				BNE	XRC1		
2708	026540	005302				DEC	R2		
2709	026542	001363				BNE	TXMR1		
2710	026544					ERROR	\N		;ERROR:NO TIMEOUT IN 3 SEC WITH NULL ON INPUT
(1)									;***** ERROR 325 *****
(1)	026544	032777	040000	003636		BIT	#B14,@SR		
(1)	026552	001005				BNE	.+14		
(1)	026554	012767	000325	004060		MOV	#325,ERRNUM		
(1)	026562	004767	003626			JSR	PC,ERR		
(1)		000326				=	N+1		
2711	026566					SCOPE	TXMERS		
(1)	026566	004567	155434			JSR	R5,SCPRTN		
(1)	026572	026426				TXMERS			
2712									
2713									
2714									
2715									
2716									
2717									
2718	026574					XRC2: BDINIT	XMTR		;CLR XMTR
2719	026602					BDINIT	RCVR		;CLR RCVR
2720	026610	012777	177774	007322		MOV	#-4,@TSBC		;SET UP FOR 1 WD XFR
2721	026616	016777	007262	007306		MOV	RCAD,@TCR		;POINT XMTR AT RCVR
2722	026624	012777	177777	007304		MOV	#-1,@TSDB		;PUT 1 WD INTO TXM SILO
2723	026632	052777	000200	007272		BIS	#B07,@TCR		;SET RD SILO
2724	026640	052777	020001	007304		BIS	#B13+B00,@RCR		;SET RCV WD AND RCV DATA
2725	026646	004567	155674			JSR	R5,DELAY		;WAIT FOR WORD TO HIT BOTTOM
2726	026652	000010				.WORD	10		
2727	026654	005777	007256			TST	@TSDB		;POP WORD OUT
2728	026660	042777	000200	007244		BIC	#B07,@TCR		;CLR RD SILO
2729	026666	016704	003520			MOV	DLCON,R4		
2730	026672	012703	177757			XRC2D: MOV	#177757,R3		;SET UP TO STALL 100 US.
2731	026676	005203				XRC2A: INC	R3		

;TEST TO DETERMINE THAT ADDRESSING RCVR AND GENERATING A NULL
;CYCLE FIRST PROPERLY GENERATES CORRECT RESPONSE CODES
;AND THAT THE RECEIVER DOES NOT RESPOND.
;CHANNEL IS OPENED BY POPPING A WORD FROM XMTR SILO.

2732	026700	001376			BNE	XRC2A		;STALL (WAIT FOR TIME SLICE
2733	026702	005304			DEC	R4		
2734	026704	001372			BNE	XRC2D		
2735	026706	012767	000000	003732	MOV	#0,GOOD		
2736	026714	017767	007234	003722	MOV	@RSR,BAD		;CHK RESPONSE CODES IN RCVR
2737	026722	042767	177760	003714	BIC	#177760,BAD		
2738	026730	026767	003712	003706	CMP	GOOD,BAD		;RSP CODES = 00 & 00 ?
2739	026736	001414			BEQ	XRC3		
2740	026740				DATERR	\N		;ERROR:RESPONSE CODES AT RECEIVER WRONG
(1)								;***** ERROR 326 *****
(1)	026740	032777	040000	003442	BIT	#B14,@SR		
(1)	026746	001005			BNE	.+14		
(1)	026750	012767	000326	003664	MOV	#326,ERRNUM		
(1)	026756	004767	003516		JSR	PC,DERP		
(1)		000327				N+1		
2741	026762				SCOPE	XRC2		
(1)	026762	004567	155240		JSR	R5,SCPRTN		
(1)	026766	026574			XRC2			
2742	026770	012767	000001	003650	MOV	#1,GOOD		
2743	026776	017767	007132	003640	MOV	@TSR,BAD		;CHECK RESPONSE CODES IN XMTR
2744	027004	042767	177760	003632	BIC	#177760,BAD		
2745	027012	026767	003630	003624	CMP	GOOD,BAD		;RSP CODES = 00 & 01 ?
2746	027020	001414			BEQ	XRC4		
2747	027022				DATERR	\N		;ERROR:RSP CODES AT XMTR WRONG
(1)								;***** ERROR 327 *****
(1)	027022	032777	040000	003360	BIT	#B14,@SR		
(1)	027030	001005			BNE	.+14		
(1)	027032	012767	000327	003602	MOV	#327,ERRNUM		
(1)	027040	004767	003434		JSR	PC,DERP		
(1)		000330				N+1		
2748	027044				SCOPE	XRC2		
(1)	027044	004567	155156		JSR	R5,SCPRTN		
(1)	027050	026574			XRC2			
2749	027052	032777	010000	007074	BIT	#B12,@RSR		;IS RSR BIT 12 (TXM ERR) SET?
2750	027060	001414			BEQ	XRC5		;ERROR:RCVR SHOULD NOT BE ADDRESSED
2751	027062				ERROR	\N		;UPON OPENING A CHANNEL WITH INVALID WORD
(1)								;***** ERROR 330 *****
(1)	027062	032777	040000	003320	BIT	#B14,@SR		
(1)	027070	001005			BNE	.+14		
(1)	027072	012767	000330	003542	MOV	#330,ERRNUM		
(1)	027100	004767	003310		JSR	PC,ERR		
(1)		000331				N+1		
2752	027104				SCOPE	XRC2		
(1)	027104	004567	155116		JSR	R5,SCPRTN		
(1)	027110	026574			XRC2			
2753								
2754								
2755								
2756								
2757								
2758								
2759	027112				XRC5:	BDINIT XMTR		;CLR XMTR
2760	027120				BDINIT	RCVR		;CLR RCVR
2761	027126	012777	177774	007004	MOV	#-4,@TSBC		;SET UP FOR 2 WD XFR
2762	027134	012777	177777	006774	MOV	#-1,@TSDB		;LOAD A WORD INTO XMTR SILO
2763	027142	016777	006736	006762	MOV	RCAD,@TCR		;POINT XMTR AT RCVR

;TEST TO DETERMINE THAT CHANNEL OPEN CAN BE ACHIEVED LEGALLY
;AND THAT, ONCE ACHIEVED, KNOCKING DOWN THE TRANSMITTER BY
;FAKING A XMTR TXM ERROR CAUSES THE CORRECT RESPONSES AND
;CAUSES A RECVR TXM ERROR.

(ZPLBC) PCL11 STND ALN V02C
(ZPLBC.P11 07-JUN-79 15:47

MACY11 30A(1052) 20-JUN-79 07:50
TRANSMISSION ERRORS TESTS

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PAGE 41-2

SEG 0097

2764	027150	012777	177777	006760		MOV	#-1,@TSLB	:LOAD 2ND WORD
2765	027156	052777	020000	006766		BIS	#B13,@RCR	:SET RCV WORD
2766	027164	052777	020000	006740		BIS	#B13,@TCR	:SET SND WORD
2767	027172	016704	003214			MOV	DLCON,R4	
2768	027176	012703	177500		XRC5A:	MOV	#177500,R3	:SET UP FOR DELAY
2769	027202	132777	000010	006736	XRC6:	BITB	#B03,@TMMRH	:CHECK FOR CHANNEL OPEN
2770	027210	001020				BNE	XRC6A	
2771	027212	005203				INC	R3	:WAIT A BIT
2772	027214	001372				BNE	XRC6	
2773	027216	005304				DEC	R4	
2774	027220	001366				BNE	XRC5A	
2775	027222					ERROR	\N	:ERROR:CANNOT GET 'CHAN OPEN' IN XMTR
(1)								:***** ERROR 331 *****
(1)	027222	032777	040000	003160		BIT	#B14,@SR	
(1)	027230	001005				BNE	+.14	
(1)	027232	012767	000331	003402		MOV	#331,ERRNUM	
(1)	027240	004767	003150			JSR	PC,ERR	
(1)		000332			N		N+1	
2776	027244					SCOPE	XRC5	
(1)	027244	004567	154756			JSR	R5,SCRPTN	
(1)	027250	027112				XRC5		
2777	027252	132777	000020	006674	XRC6A:	BITB	#B04,@RSR	:CHECK FOR CHANNEL OPEN IN RCVR
2778	027260	001014				BNE	XRC7	
2779	027262					ERROR	\N	:ERROR:CANNOT GET 'CHANNEL OPEN' IN RCVR
(1)								:***** ERROR 332 *****
(1)	027262	032777	040000	003120		BIT	#B14,@SR	
(1)	027270	001005				BNE	+.14	
(1)	027272	012767	000332	003342		MOV	#332,ERRNUM	
(1)	027300	004767	003110			JSR	PC,ERR	
(1)		000333			N		N+1	
2780	027304					SCOPE	XRC5	
(1)	027304	004567	154716			JSR	R5,SCRPTN	
(1)	027310	027112				XRC5		
2781								
2782	027312	052777	010000	006614	XRC7:	BIS	#B12,@TSR	:END - DOWN THE XMTR
2783	027320	016704	003066			MOV	DLCON,R4	
2784	027324	012703	177757		XRC7D:	MOV	#177757,R3	:SET RCV TO ALL 100 JS.
2785	027330	005203			XRC7A:	INC	R3	:WAIT FOR TIME SLIP
2786	027332	001376				BNE	XRC7A	
2787	027334	005304				DEC	R4	
2788	027336	001372				BNE	XRC7D	
2789	027340	012767	000004	003300		MOV	#4,GOOD	
2790	027346	017767	006602	003270		MOV	@RSR,BAD	
2791	027354	042767	177760	003262		BIC	#177760,BAD	
2792	027362	026767	003260	003254		CMP	GOOD,BAD	
2793	027370	001414				BEQ	XRC8	
2794	027372					DATERR	\N	:ERROR:DATA ERROR
(1)								:***** ERROR 333 *****
(1)	027372	032777	040000	003010		BIT	#B14,@SR	
(1)	027400	001005				BNE	+.14	
(1)	027402	012767	000333	003232		MOV	#333,ERRNUM	
(1)	027410	004767	003064			JSR	PC,DERR	
(1)		000334			N		N+1	
2795	027414					SCOPE	XRC5	
(1)	027414	004567	154606			JSR	R5,SCRPTN	
(1)	027420	027112				XRC5		

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2796 027422 032777 010000 006524 XRC8: BIT #B12,@RSR ;IS RSR BIT 12 (TXM ERR) SET
2797 027430 001014 BNE XRC9 ;ERROR:XMTR OFF LINE WHILE CHAN OPEN
2798 027432 ERROR \N ;DIDN'T SET RCVR TXM ERR
(1) ;***** ERROR 334 *****
(1) 027432 032777 040000 002750 BIT #B14,@SR
(1) 027440 001005 BNE .+14
(1) 027442 012767 000334 003172 MOV #334,ERRNUM
(1) 027450 004767 002740 JSR PC,ERR
(1) 000335 N = N+1
2799 027454 SCOPE XRC5
(1) 027454 004567 154546 JSR R5,SCPRTN
(1) 027460 027112 XRC5

2800
2801 ;TEST TO DETERMINE IF INCORRECT CRC WILL CAUSE A CHECK-FAIL
2802 ;AND GENERATE CORRECT RESPONSES IN RCVR AND XMTR THEREBY CAUSING
2803 ;TRANSMISSION ERRORS IN BOTH.
2804
2805 027462 XRC9: BDINIT XMTR ;CLR XMTR
2806 027470 BDINIT RCVR ;CLR RCVR
2807 027476 012777 177772 006434 MOV #-6,@TSBC ;SET UP FOR 3 WD XFR
2808 027504 012777 177777 006424 MOV #-1,@TSDB ;LOAD A WORD INTO XMTR SILO
2809 027512 012777 000002 006416 MOV #2,@TSDB ;LOAD 2ND WORD INTO XMTR SILO
2810 027520 012777 177772 006432 MOV #-6,@RDBC
2811 027526 012777 177775 006402 MOV #-3,@TSDB ;LOAD 3RD WORD INTO XMTR SILO
2812 027534 016777 006344 006370 MOV RCAD,@TCR ;POINT XMTR AT RCVR
2813 027542 052777 020000 006402 BIS #B13,@RCR ;SET RCV WD
2814 027550 052777 020000 006354 BIS #B13,@TCR ;SET SND WD
2815 027556 105777 006352 XRC10: TSTB @TSR ;WAIT FOR SUC TXF
2816 027562 100375 BPL XRC10
2817 027564 052777 000200 006340 BIS #B07,@TCR ;SET XMTR RD SILO
2818 027572 005777 006340 TST @TSDB ;POP A WORD FROM SILO
2819 027576 042777 000200 006326 BIC #B07,@TCR ;CLR RD SILO
2820 027604 052777 000200 006340 BIS #B07,@RCR ;SET RCVR LD SILO
2821 027612 012777 000014 006336 MOV #14,@Rddb ;LOAD DIFFERENT 2ND WORD
2822 027620 042777 000200 006324 BIC #B07,@RCR ;CLR LD SILO
2823 027626 042777 000200 006300 BIC #B07,@TSR ;CLR SUC TXF
2824 027634 042777 000200 006312 BIC #B07,@RSR
2825 027642 052777 000001 006302 BIS #B00,@RCR ;SET RCV DATA
2826 027650 052777 000001 006254 BIS #B00,@TCR ;SET ST TXM
2827 027656 016704 002530 MOV DLCON,R4
2828 027662 012703 177000 XRC10B: MOV #177000,R3 ;SET UP TO STALL
2829 027666 005203 XRC10A: INC R3
2830 027670 001376 BNE XRC10A ;STALL (WAIT FOR LAST 2 WORDS)
2831 027672 005304 DEC R4
2832 027674 001372 BNE XRC10B
2833 027676 012767 000013 002742 MOV #13,GOOD
2834 027704 017767 006244 002732 MOV @RSR,BAD ;CHECK RCVR RSP CODES
2835 027712 042767 177760 002724 BIC #177760,BAD ;ARE RSP CODES = 10 & 11 ?
2836 027720 026767 002722 002716 CMP GOOD,BAD
2837 027726 001414 BEQ XRC11
2838 027730 DATERR \N ;ERROR:RCVR RSP CODES WRONG
(1) ;***** ERROR 335 *****
(1) 027730 032777 040000 002452 BIT #B14,@SR
(1) 027736 001005 BNE .+14
(1) 027740 012767 000335 002674 MOV #335,ERRNUM
(1) 027746 004767 002526 JSR PC,DFRR
```

(1)	2839	027752	000336		N	=	N+1		
	(1)	027752	004567	154250		SCOPE	XRC9		
	(1)	027756	027462			JSR	R5,SCPRTN		
	2840	027760	017767	006150	002656	XRC11:	MOV	@TSR,BAD	
	2841	027766	042767	177760	002650		BIC	#177760,BAD	:CHK XMTR RSP CODES
	2842	027774	026767	002646	002642		CMP	GOOD,BAD	:ARE THEY 10 & 11 ?
	2843	030002	001414				BEQ	XRC12	
	2844	030004					DATERR	\N	:ERROR:XMTR RSP CODES WRONG
	(1)								:***** ERROR 336 *****
	(1)	030004	032777	040000	002376		BIT	#B14,@SR	
	(1)	030012	001005				BNE	.+14	
	(1)	030014	012767	000336	002620		MOV	#336,ERRNUM	
	(1)	030022	004767	002452			JSR	PC,DERR	
	(1)		000337			N	=	N+1	
	2845	030026					SCOPE	XRC9	
	(1)	030026	004567	154174			JSR	R5,SCPRTN	
	(1)	030032	027462				XRC9		
	2846	030034	032777	010000	006072	XRC12:	BIT	#B12,@TSR	:IS TXM ERR SET IN THE XMTR ?
	2847	030042	001014				BNE	XRC13	
	2848	030044					ERROR	\N	:ERROR:XMTR TXM ERR NOT SET WITH INVALID DATA
	(1)								:***** ERROR 337 *****
	(1)	030044	032777	040000	002336		BIT	#B14,@SR	
	(1)	030052	001005				BNE	.+14	
	(1)	030054	012767	000337	002560		MOV	#337,ERRNUM	
	(1)	030062	004767	002326			JSR	PC,ERR	
	(1)		000340			N	=	N+1	
	2849	030066					SCOPE	XRC9	
	(1)	030066	004567	154134			JSR	R5,SCPRTN	
	(1)	030072	027462				XRC9		
	2850	030074	032777	010000	006052	XRC13:	BIT	#B12,@RSR	:IS TXM ERR SET IN THE RCVR?
	2851	030102	001014				BNE	XRC14	
	2852	030104					ERROR	\N	:ERROR:RCVR TXM ERR NOT SET WITH INVALID DATA
	(1)								:***** ERROR 340 *****
	(1)	030104	032777	040000	002276		BIT	#B14,@SR	
	(1)	030112	001005				BNE	.+14	
	(1)	030114	012767	000340	002520		MOV	#340,ERRNUM	
	(1)	030122	004767	002266			JSR	PC,ERR	
	(1)		000341			N	=	N+1	
	2853	030126					SCOPE	XRC9	
	(1)	030126	004567	154074			JSR	R5,SCPRTN	
	(1)	030132	027462				XRC9		
	2854								
	2855								
	2856								
	2857								
	2858								
	2859								
	2860	030134				XRC14:	BDINIT	XMTR	
	2861	030142					BDINIT	RCVR	
	2862	030150	052777	000200	005774		BIS	#B07,@RCR	:SET LD SILO IN RCVR
	2863	030156	012703	000100			MOV	#64,R3	:R3 IS WORD COUNTER
	2864	030162	012704	033564			MOV	#SILDAT,R4	:R4 IS CURRENT ADDRESS
	2865	030166	012477	005764		XRC15:	MOV	(R4)+,@Rddb	:FILL UP RCVR SILO
	2866	030172	005303				DEC	R3	:FULL?
	2867	030174	001374				BNE	XRC15	

:TEST THAT IF THE CHANNEL IS OPENED AND THE RECEIVER RESPONDS
 :TO THE FIRST VALID WORD WITH A NULL, A XMTR TXM ERR RESULTS
 : NULL ON FIRST WORD IS ACHIEVED BY MANUALLY FILLING UP THE
 :RCVR SILO, THEN TRYING TO SEND A WORD FROM XMTR TO RCVR.

2868	030175	016777	005702	005726	MOV	RCAD,@TCR	:POINT XMTR AT RCVR
2869	030204	042777	000200	005740	BIC	#207,@RCR	:CLR LD SILO IN RCVR
2870	030212	012777	177777	005716	MOV	#-1,@TSDB	:LOAD A WORD INTO XMTR SILO
2871	030220	012777	177774	005712	MOV	#-4,@TSBC	:SET UP TO XFR 2 WDS
2872	030226	012777	177777	005702	MOV	#-1,@TSDB	:LOAD 2ND WORD INTO XMTR SILO
2873	030234	052777	020001	005710	BIS	#B13+B00,@RCR	:SET RCV WD & RCV DATA
2874	030242	052777	020001	005662	BIS	#B13+B00,@TCR	:SET SND WD & ST TXM
2875	030250	016704	002136		MOV	DLCON,R4	
2876	030254	012703	177000		XRC15B: MOV	#177000,R3	:SET UP TO STALL
2877	030260	005203			XRC15A: INC	R3	
2878	030262	001376			BNE	XRC15A	:STALL (WAIT FOR TIME SLICE)
2879	030264	005304			DEC	R4	
2880	030266	001372			BNE	XRC15B	
2881	030270	012767	000006	002350	MOV	#6,GOOD	:CHK TXM RSP CODES
2882	030276	017767	005632	002340	MOV	@TSR,BAD	
2883	030304	042767	177760	002332	BIC	#177760,BAD	
2884	030312	026767	002330	002324	CMP	GOOD,BAD	:ARE THEY 01 & 10 ?
2885	030320	001414			BEQ	XRC16	
2886	030322				DATERR	\N	:ERROR:XMTR RSP CODES WRONG
(1)							:***** ERROR 341 *****
(1)	030322	032777	040000	002060	BIT	#B14,@SR	
(1)	030330	001005			BNE	.+14	
(1)	030332	012767	000341	002302	MOV	#341,ERRNUM	
(1)	030340	004767	002134		JSR	PC,DERR	
(1)		000342			N	N+1	
2887	030344				SCOPE	XRC14	
(1)	030344	004567	153656		JSR	R5,SCPRTN	
(1)	030350	030134			XRC14		
2888	030352	032777	010000	005554	XRC16: BIT	#B12,@TSR	:IS XMTR TXM ERR SET?
2889	030360	001014			BNE	XRC17	:ERROR:XMISSION TO FULL RCVR SILO
2890	030362				ERROR	\N	:DID NOT SET TXM ERR IN XMTR
(1)							:***** ERROR 342 *****
(1)	030362	032777	040000	002020	BIT	#B14,@SR	
(1)	030370	001005			BNE	.+14	
(1)	030372	012767	000342	002242	MOV	#342,ERRNUM	
(1)	030400	004767	002010		JSR	PC,ERR	
(1)		000343			N	N+1	
2891	030404				SCOPE	XRC14	
(1)	030404	004567	153616		JSR	R5,SCPRTN	
(1)	030410	030134			XRC14		
2892							
2893							:TEST TO DETERMINE IF , WITH CHANNEL OPEN, THE RCVR IS KNOCKED DOWN
2894							:THE CORRECT RESPONSE CODES ARE GENERATED AND THE XMTR
2895							:GETS A TXM ERROR.
2896							: THE RCVR IS KNOCKED DOWN VIA FORCING A TIMEOUT IN THE RCVR.
2897							
2898	030412				XRC17: BDINIT	XMTR	
2899	030420				BDINIT	RCVR	
2900	030426	012777	177777	005502	MOV	#-1,@TSDB	:LOAD A WORD INTO XMTR SILO
2901	030434	012777	177774	005476	MOV	#-4,@TSBC	:SETUP FOR 2 WD XFR
2902	030442	012777	177777	005466	MOV	#-1,@TSDB	:LOAD 2ND WD INTO XMTR SILO
2903	030450	016777	005430	005454	MOV	RCAD,@TCR	:POINT XMTR AT RCVR
2904	030456	052777	020000	005466	BIS	#B13,@RCR	:SET RCV WD
2905	030464	052777	020000	005440	BIS	#B13,@TCR	:SET SND WD
2906	030472	132777	000010	005446	XRC18: BITB	#B03,@TMMRH	:IS CHANNEL OPEN SET?
2907	030500	001774			BEQ	XRC18	:WAIT FOR IT

2908	030502	016704	001704		MOV	DLCON,R4	
2909	030506	012703	177000		XRC18X: MOV	#177000,R3	:DELAY FOR SYNC
2910	030512	005203			XRC18L: INC	R3	
2911	030514	001376			BNE	XRC18L	
2912	030516	005304			DEC	R4	
2913	030520	001372			BNE	XRC18X	
2914	030522	052777	002000	005424	BIS	#B10,@RSR	:KNOCK DOWN RCVR WITH TIMEOUT
2915	030530	016704	001656		MOV	DLCON,R4	
2916	030534	012703	177000		XRC18Y: MOV	#177000,R3	:SET UP FOR STALL
2917	030540	005203			XRC18A: INC	R3	
2918	030542	001376			BNE	XRC18A	:STALL (WAIT FOR TIME SLICE)
2919	030544	005304			DEC	R4	
2920	030546	001372			BNE	XRC18Y	
2921	030550	012767	000001	002070	MOV	#1,GOOD	
2922	030556	017767	005352	002060	MOV	@TSR,BAD	:CHECK TXM RESP CODES
2923	030564	042767	177760	002052	BIC	#177760,BAD	
2924	030572	026767	002050	002044	CMP	GOOD,BAD	:ARE THEY 00 & 01 ?
2925	030600	001414			BEQ	XRC19	
2926	030602				DATERR	\N	:ERROR:XMTR RSP CODES WRONG
(1)							:***** ERROR 343 *****
(1)	030602	032777	040000	001600	BIT	#B14,@SR	
(1)	030610	001005			BNE	.+14	
(1)	030612	012767	000343	002022	MOV	#343,ERRNUM	
(1)	030620	004767	001654		JSR	PC,DERR	
(1)		000344			-	N+1	
2927	030624				N		
(1)	030624	004567	153376		SCOPE	XRC17	
(1)	030630	030412			JSR	R5,SCPRTN	
(1)	030630	030412			XRC17		
2928	030632	032777	010000	005274	XRC19: BIT	#B12,@TSR	:IS TX ERR SET IN XMTR
2929	030640	001014			BNE	XRC19A	:ERROR:XMIT TO OFFLINE RCVR DIDN'T
2930	030642				ERROR	\N	:CAUSE TXM ERR IN XMTR
(1)							:***** ERROR 344 *****
(1)	030642	032777	040000	001540	BIT	#B14,@SR	
(1)	030650	001005			BNE	.+14	
(1)	030652	012767	000344	001762	MOV	#344,ERRNUM	
(1)	030660	004767	001530		JSR	PC,ERR	
(1)		000345			=	N+1	
2931	030664				N		
(1)	030664	004567	153336		SCOPE	XRC17	
(1)	030670	030412			JSR	R5,SCPRTN	
(1)	030670	030412			XRC17		
2932	030672	004767	000774		XRC19A: JSR	PC,MONIT	
2933	030676	032777	010000	001504	BIT	#B12,@SR	:IS SW 12 SET?
2934	030704	001402			BEQ	XRCRET	:NO, EXIT
2935	030706	000167	175514		JMP	TXMERS	:YES, STAY HERE
2936	030712	000207			XRCRET: RTS	PC	


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2938 .SBTTL REJECT TEST
2939
2940
2941 ;TEST OF THE REJECT-RELATED HARDWARE
2942 ; CAUSE A REJECT IN THE RCVR AND CHECK ALL RELATED
2943 ;RESPONSES IN RCVR AND XMTR
2944
2945 030714 XRC20: BDINIT XMTR ;CLR XMTR
2946 030722 BDINIT RCVR ;CLR RCVR
2947 030730 012777 177777 005200 MOV #-1,@TSDB ;LOAD A WORD INTO SILO
2948 030736 012777 177774 005174 MOV #-4,@TSBC ;BYTE COUNT FOR 2 WD XFR
2949 030744 012777 177777 005164 MOV #-1,@TSDB ;LOAD 2ND WD INTO SILO
2950 030752 012777 177774 005200 MOV #-4,@RDBC
2951 030760 016777 005120 005144 MOV RCAD,@TCR ;POINT XMTR AT RCVR
2952 030766 052777 020000 005156 BIS #B13,@RCR ;SET RCV WD
2953 030774 052777 020001 005130 BIS #B13+B00,@TCR ;SET SND WD & ST TXM
2954 031002 032777 000400 005144 XRC21: BIT #B08,@RSR ;DAT OUTP RDY IN XMTR?
2955 031010 001774 BFC XRC21
2956 031012 052777 100000 005132 BIS #B15,@RCR ;SET R E J E C T
2957 031020 016704 001366 MOV DLCON,R4
2958 031024 012703 177500 XRC21A: MOV #177500,R3
2959 031030 032777 000040 005116 XRC22: BIT #B05,@RSR ;CHECK FOR RECOM IN RCVR
2960 031036 001020 BNE XRC23
2961 031040 005203 INC R3
2962 031042 001372 BNE XRC22 ;WAIT A COUPLE OF MS FOR IT
2963 031044 005304 DEC R4
2964 031046 001366 BNE XRC21A
2965 031050 ERROR \N ;ERROR:REJECT DID NOT RESULT IN SETTING RSR-05
(1) ;***** ERROR 345 *****
(1) 031050 032777 040000 001332 BIT #B14,@SR
(1) 031056 001005 BNE .+14
(1) 031060 012767 000345 001554 MOV #345,ERRNUM
(1) 031066 004767 001322 JSR PC,ERR
(1) 000346 = N+1
2966 031072 SCOPE XRC20
(1) 031072 004567 153130 JSR R5,SCPRTN
(1) 031076 030714 XRC20
2967 031100 032777 000001 005024 XRC23: BIT #B00,@TCR ;IS ST TXM CLR (CLR'D BY INTR REQ)?
2968 031106 001414 BEQ XRC24
2969 031110 ERROR \N ;ERROR: SORE DID NOT INTERRUPT XMTR
(1) ;***** ERROR 346 *****
(1) 031110 032777 040000 001272 BIT #B14,@SR
(1) 031116 001005 BNE .+14
(1) 031120 012767 000346 001514 MOV #346,ERRNUM
(1) 031126 004767 001262 JSR PC,ERR
(1) 000347 = N+1
2970 031132 SCOPE XRC20
(1) 031132 004567 153070 JSR R5,SCPRTN
(1) 031136 030714 XRC20
2971 031140 032777 100000 005004 XRC24: BIT #B15,@RCR ;CHECK IF REJECT GOT CLR'D
2972 031146 001414 BEQ XRC25
2973 031150 ERROR \N ;ERROR:RECOM DID NOT CLR REJECT
(1) ;***** ERROR 347 *****
(1) 031150 032777 040000 001232 BIT #B14,@SR
(1) 031156 001005 BNE .+14
(1) 031160 012767 000347 001454 MOV #347,ERRNUM
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SEQ 0103

(1) 031166 004767 001222
(1) 000350

2974 031172
(1) 031172 004567 153030
(1) 031176 030714

2975 031200 032777 000040 004726 XRC25:
2976 031206 001014
2977 031210

(1)
(1) 031210 032777 040000 001172
(1) 031216 001005

(1) 031220 012767 000350 001414
(1) 031226 004767 001162

(1) 000351
2978 031232
(1) 031232 004567 152770

(1) 031236 030714
2979 031240
2980 031246

2981 031254 052777 020000 004670
2982 031262 052777 000040 004664

2983 031270 032777 020000 004654
2984 031276 001414
2985 031300

(1)
(1) 031300 032777 040000 001102
(1) 031306 001005

(1) 031310 012767 000351 001324
(1) 031316 004767 001072

(1) 000352
2986 031322
(1) 031322 004567 152700

(1) 031326 031240

N

JSR PC,ERR
= N+1
SCOPE XRC20
JSR R5,SCPRTN
XRC20
BIT #B05,@TSR
BNE XRC26
ERROR \N

N

BIT #B14,@SR
BNE .+14
MOV #350,ERRNUM
JSR PC,ERR
= N+1
SCOPE XRC20
JSR R5,SCPRTN
XRC20

XRC26:

BDINIT RCVR
BDINIT XMTR
BIS #B13,@RCR
BIS #B05,@RSR
BIT #B13,@RCR
BEQ XRC27
ERROR \N

N

BIT #B14,@SR
BNE .+14
MOV #351,ERRNUM
JSR PC,ERR
= N+1
SCOPE XRC26
JSR R5,SCPRTN
XRC26

;CHECK IF REJECT SET SORE IN XMTR

;ERROR:REJECT DID NOT SET SORE IN XMTR
;***** ERROR 350 *****

;SET RCV WD IN RCVR

;SET RECOM

;CHECK IF RCV WD GOT CLR'D

;ERROR:RECOM DID NOT INTERRUPT RCVR
;***** ERROR 351 *****

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2988 .SBTTL TRUNCATION TEST
2989
2990
2991 ;TEST OF THE TRUNCATE-RELATED HARDWARE
2992 ; CAUSE A TRUNCATE IN THE RCVR AND CHECK ALL RELATED
2993 ;RESPONSES IN RCVR AND XMTR.
2994
2995 031330 XRC27: BDINIT XMTR ;CLR XMTR
2996 031336 BDINIT RCVR ;CLR RCVR
2997 031344 012777 177754 004566 MOV #-20.,@TSBC ;SET TXM BYTE CNT FOR 10 WORD XFR
2998 031352 012777 177770 004600 MOV #-8.,@RDBC ;SET RCVR BYTE CNT FOR 4 WORDS
2999 031360 012777 033564 004554 MOV #SILDAT,@TSBA ;POINT XMTR SILO AT DATA BUFFER
3000 031366 012777 034164 004566 MOV #CMPBUF,@RDBA ;POINT RCVR SILO TO DATA BUFFER
3001 031374 016777 004504 004530 MOV RCAD,@TCR ;POINT XMTR AT RCVR
3002 031402 052777 060001 004542 BIS #B14+B13+B00,@RCR ;SET RCV WD & RCV DATA & START NPR
3003 031410 052777 060001 004514 BIS #B14+B13+B00,@TCR ;SET SND WD & ST TXM & START NPR
3004 031416 032777 001000 004530 XRC29: BIT #B09,@RSR
3005 031424 001774 BEQ XRC29 ;WAIT FOR BYTE COUNT OVERFLOW
3006 031426 052777 100000 004516 BIS #B15,@RCR ;SET REJECT (TRUNCATE MESSAGE)
3007 031434 016704 000752 MOV DLCON,R4
3008 031440 012703 175000 XRC29A: MOV #175000,R3
3009 031444 105777 004464 XRC30: TSTB @TSR ;LOOK FOR XMTR SUC TXF
3010 031450 100420 BMI XRC31
3011 031452 005203 INC R3
3012 031454 001373 BNE XRC30 ;WAIT ABOUT 20 MS
3013 031456 005304 DEC R4
3014 031460 001367 BNE XRC29A
3015 031462 ERROR \N ;ERROR:NO SUC TXF AFTER TRUNCATION
(1) ;***** ERROR 352 *****
(1) 031462 032777 040000 000720 BIT #B14,@SR
(1) 031470 001005 BNE .+14
(1) 031472 012767 000352 001142 MOV #352,ERRNUM
(1) 031500 004767 000710 JSR PC,ERR
(1) 000353 = N+1
3016 031504 N SCOPE XRC27
(1) 031504 004567 152516 JSR R5,SCPRTN
(1) 031510 031330 XRC27
3017 031512 032777 000040 004414 XRC31: BIT #B05,@TSR ;IS SORE SET?
3018 031520 001014 BNE XRC32
3019 031522 ERROR \N ;ERROR:SORE NOT SET BY TRUNCATION
(1) ;***** ERROR 353 *****
(1) 031522 032777 040000 000660 BIT #B14,@SR
(1) 031530 001005 BNE .+14
(1) 031532 012767 000353 001102 MOV #353,ERRNUM
(1) 031540 004767 000650 JSR PC,ERR
(1) 000354 = N+1
3020 031544 N SCOPE XRC27
(1) 031544 004567 152456 JSR R5,SCPRTN
(1) 031550 031330 XRC27
3021 031552 105777 004376 XRC32: TSTB @RSR ;IS RCVR SUC TXF SET?
3022 031556 100414 BMI XRC33
3023 031560 ERROR \N ;ERROR:NO RCVR SUC TXF AFTER TRUNCATION
(1) ;***** ERROR 354 *****
(1) 031560 032777 040000 000622 BIT #B14,@SR
(1) 031566 001005 BNE .+14
(1) 031570 012767 000354 001044 MOV #354,ERRNUM

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(1)	031576	004767	000612		JSR	PC,ERR	
(1)		000355		N	=	N+1	
3024	031602				SCOPE	XRC27	
(1)	031602	004567	152420		JSR	R5,SCPRTN	
(1)	031606	031330			XRC27		
3025	031610	032777	000040	004336	XRC33:	#B05,BSR	:IS RECOM SET?
3026	031616	001014			BNE	XRC34	
3027	031620				ERROR	VM	:ERROR:RECOM NOT SET BY TRUNCATION
(1)							:***** ERROR 355 *****
(1)	031620	032777	040000	000562	BIT	#B14,BZ	
(1)	031626	001005			BNE	.+14	
(1)	031630	012767	000355	001004	MOV	#355,ERRNUM	
(1)	031636	004767	000552		JSR	PC,ERR	
(1)		000356		N	=	N+1	
3028	031642				SCOPE	XRC27	
(1)	031642	004567	152360		JSR	R5,SCPRTN	
(1)	031646	031330			XRC27		
3029	031650	004767	000016		XRC34:	JSR	PC,MONIT
3030	031654	032777	010000	000526	BIT	#B12,BSR	:IS SW 12 SET?
3031	031662	001402			BEQ	XRCRT	:NO, EXIT
3032	031664	000167	177024		JMP	XRC20	:YES, STAY HERE
3033	031670	000207			XRCRT:	RTS	PC

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3035          .SBTTL 'SWITCH' MONITOR ROUTINE
3036
3037          ;ENTER AT MONIT FROM EVERY SUB-TEST TO SEE IF CNTRL-S OR CNTRL-C WAS TYPED
3038          ;ENTER AT SWDMP FROM ERROR HALTS IF SW 15 = 0
3039          ;ALSO MONITORS THE FOLLOWING CONTROL FUNCTIONS:
3040          ;      CNTRL-T RESTART TEST SELECTOR
3041          ;      CNTRL-D ALLOW CHANGING OF DELAY
3042          ;      CNTRL-P CONTINUE (PROCEED)
3043
3044
3045          031672 005000          MONIT: CLR      R0
3046          031674 105777 004266      TSTB    @KBS          ;CHECK KEYBOARD FLAG
3047          031700 100402          BMI      MONIC          ;IF SET, CHECK WHAT CHAR.
3048          031702 000167 000372      JMP      EX5          ;OTHERWISE, EXIT
3049          031706 017700 004256      MONIC: MOV     @KBD,R0
3050          031712 042700 177600      MONCH: BIC     #177600,R0          ;TRIM OFF PARITY BIT
3051          031716 020027 000023      CMP      R0,#23          ;WAS IT ^S?
3052          031722 001056          BNE      EX1          ;NO, EXIT
3053          031724          SWDMP: PNTM     SWMSG          ;PRINT 'SWR - '
3054          (1) 031724 012700 032302      MOV     #SWMSG,R0          ;PRINT MESSAGE
3055          (1) 031730 004767 000714      JSR      PC,TYP0UT          ;POINTED TO BY SWMSG
3056          031734 017700 000450      MOV     @SR,R0          ;GET CONTENTS OF SR
3057          031740 004767 001222      JSR      PC,OCTPNT          ;PRINT IT
3058          031744          PNTM     TWOSP          ;SPACE AND PROMPT (:)
3059          (1) 031744 012700 032401      MOV     #TWOSP,R0          ;PRINT MESSAGE
3060          (1) 031750 004767 000674      JSR      PC,TYP0UT          ;POINTED TO BY TWOSP
3061          031754 017767 000430 001202      MOV     @SR,KBBUF          ;LOAD OLD SWITCHES
3062          031762 004767 000724      JSR      PC,INPKB          ;GET KBD INPUT
3063          031766 016777 001172 000414      MOV     KBBUF,@SR          ;LOAD NEW SWITCHES
3064          031774          CCRTN: PNTM     TYPCTP          ;PRINT 'CNTRL-P TO CONTINUE'
3065          (1) 031774 012700 032335      MOV     #TYPCTP,R0          ;PRINT MESSAGE
3066          (1) 032000 004767 000644      JSR      PC,TYP0UT          ;POINTED TO BY TYPCTP
3067          032004 105777 004156      CONTW1: TSTB    @KBS
3068          032010 100375          BPL      CONTW1
3069          032012 017700 004152      MOV     @KBD,R0
3070          032016 042700 177600      BIC     #177600,R0          ;TRIM OFF PARITY BIT
3071          032022 020027 000023      CMP      R0,#23          ;^S?
3072          032026 001736          BEQ      SWDMP          ;YES, GET SWR AGAIN
3073          032030 020027 000020      CMP      R0,#20          ;^P?
3074          032034 001363          BNE      CONTW1          ;NO, KEEP LOOKING
3075          032036 012700 000015      MOV     #15,R0          ;RETURN LINE
3076          032042 004767 001424      JSR      PC,TTO
3077          032046 005000          CLR      R0          ;FILL CHARACTERS
3078          032050 004767 001416      JSR      PC,TTO
3079          032054 004767 001412      JSR      PC,TTO
3080          032060 020027 000024      EX1:  CMP      R0,#24          ;WAS A ^T TYPED?
3081          032064 001004          BNE      EX2          ;NO, EXIT
3082          032066 012706 002000      MOV     #ISP,SP          ;YES, RENEW STACK
3083          032072 000167 151250      JMP      BCONT          ;BACK TO DISPATCHER
3084          032076 020027 000004      EX2:  CMP      R0,#4          ;CNTRL-D TYPED?
3085          032102 001026          BNE      EX3          ;NO, KEEP LOOKING
3086          032104          EX2A: PNTM     DELYMG          ;PRINT 'DELAY CONSTANT' = '
3087          (1) 032104 012700 032312      MOV     #DELYMG,R0          ;PRINT MESSAGE
3088          (1) 032110 004767 000534      JSR      PC,TYP0UT          ;POINTED TO BY DELYMG
3089          032114 016767 000272 001042      MOV     DLCON,KBBUF          ;DEFAULT OLD VALUE
3090          032122 016700 000264      MOV     DLCON,R0          ;GET CONSTANT

```

3083	032126	004767	001034		JSR	PC,OCTPNT	:PRINT IT
3084	032132				PNTM	TWOSP	:SPACE AND PROMPT
(1)	032132	012700	032401		MOV	#TWOSP,RO	:PRINT MESSAGE
(1)	032136	004767	000506		JSR	PC,TYPOUT	:POINTED TO BY TWOSP
3085	032142	004767	000544		JSR	PC,INPKB	:GET KBD INPUT
3086	032146	016767	001012	000236	MOV	KBBUF,DLCON	:LOAD NEW CONSTANT
3087	032154	000167	177614		JMP	CCRTN	:NOW WAIT FOR CNTRL-P
3088							
3089	032160	020027	000003		EX3:	CMP	RO,#3
3090	032164	001004			BNE	EX4	:WAS CNTRL-C TYPED?
3091	032166	012706	002000		MOV	#ISP,SP	:NO
3092	032172	000167	150674		JMP	RESTR	:YES, REFRESH STACK
3093	032176	020027	000006		EX4:	CMP	RO,#6
3094	032202	001036			BNE	EX5	:AND RESTART
3095	032204				EX4B:	PNTM	:WAS CNTRL-F TYPED?
(1)	032204	012700	032362		MOV	FILMSG	:NO, EXIT
(1)	032210	004767	000434		JSR	#FILMSG,RO	:PRINT 'FILL COUNT = '
3096	032214	016700	001340		MOV	PC,TYPOUT	:PRINT MESSAGE
3097	032220	004767	000742		MOV	FILL,RO	:POINTED TO BY FILMSG
3098	032224				JSR	PC,OCTPNT	:PRINT THE FILL COUNT
(1)	032224	012700	032401		PNTM	TWOSP	
(1)	032230	004767	000414		MOV	#TWOSP,RO	:PRINT MESSAGE
3099	032234	016767	001320	000722	JSR	PC,TYPOUT	:POINTED TO BY TWOSP
3100	032242	004767	000444		MOV	FILL,KBBUF	:LOAD DEFAULT
3101	032246	026727	000712	000500	JSR	PC,INPKB	:GET NEW INPUT
3102	032254	101406			CMP	KBBUF,#500	:NO NEED TO PASS 500
3103	032256				BLOS	2\$	
(1)	032256	012700	035211		PNTM	AGAIN	
(1)	032262	004767	000362		MOV	#AGAIN,RO	:PRINT MESSAGE
3104	032266	000167	177712		JSR	PC,TYPOUT	:POINTED TO BY AGAIN
3105	032272	016767	000666	001260	JMP	EX4B	
3106	032300	000207			MOV	KBBUF,FILL	:LOAD NEW FILL COUNT
3107					EX5:	RTS	
3108							
3109							
3110							
3111							
3112	032302	051446	051127	036440			
	032310	040040			SWRMSG:	.ASCII /&SWR = @/	
3113	032312	042046	046105	054501			
	032320	041440	047117	052123	DELYMG:	.ASCII /&DELAY CONSTANT - @/	
	032326	047101	020124	020075			
	032334	100					
3114	032335	046	047103	051124			
	032342	026514	020120	047524	TYPCTP:	.ASCII /&CNTRL-P TO CONTINUE@/	
	032350	041440	047117	044524			
	032356	052516	040105				
3115	032362	043046	046111	020114			
	032370	047503	047125	020124	FILMSG:	.ASCII /&FILL COUNT - @/	
	032376	020075	100				
3116	032401	040	035040	100			
3117					TWOSP:	.ASCII / :@/	
3118							
3119	032406						
3120							
3121							

:ASSOCIATED ASCII FOR THIS MODULE:

.EVEN
:OTHER VARIABLES:

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"SWITCH" MONITOR ROUTINE PAGE 44-2

SEQ C108

3122	032406	000000	SWREG: .WORD	0	: SOFTWARE SWITCH REGISTER
3123					
3124	032410	000000	SR: .WORD	0	: SWITCH REGISTER POINTER
3125					
3126	032412	000006	DLCON: .WORD	6	: DELAY CONSTANT

.SBTTL COMMON SUBROUTINES

;ERROR ROUTINE

3128									
3129									
3130									
3131									
3132	032414	011667	000220		ERR:	MOV	(SP),ERRAD		;GET ADDRESS OF ERROR CALL
3133	032420	162767	000022	000212		SUB	#22,ERRAD		;OFFSET IT
3134	032426				ERR1:	PNTM	ERRM		;PRINT '**ERROR '
(1)	032426	012700	032564			MOV	#ERRM,RO		;PRINT MESSAGE
(1)	032432	004767	000212			JSR	PC,TYPOUT		;POINTED TO BY ERRM
3135	032436	016700	000200			MOV	ERRNUM,RC		
3136	032442	004767	000520			JSR	PC,OCTPNT		;PRINT ERROR NUMBER (P)
3137	032446					PNTM	WDAT		;PRINT 'AT LOCATION '
(1)	032446	012700	032577			MOV	#WDAT,RO		;PRINT MESSAGE
(1)	032452	004767	000172			JSR	PC,TYPOUT		;POINTED TO BY WDAT
3138	032456	016700	000156			MOV	ERRAD,RO		
3139	032462	004767	000500			JSR	PC,OCTPNT		;PRINT ADDRESS OF ERROR
3140	032466	004767	177200			JSR	PC,MONIT		
3141	032472	004767	000652			JSR	PC,NULLS		;PRINT NULLS IN CASE OF 'RESET'
3142	032476	000207				RTS	PC		;RETURN

;DATA ERROR ROUTINE

3143									
3144									
3145									
3146	032500	011667	000134		DERR:	MOV	(SP),ERRAD		;GET ADDRESS OF ERROR CALL
3147	032504	162767	000022	000126		SUB	#22,ERRAD		;OFFSET IT
3148	032512	004767	177710			JSR	PC,ERR1		;PRINT '**ERROR (P) AT LOCATION XXX
3149	032516					PNTM	WDSDB		;PRINT 'SHOULD BE '
(1)	032516	012700	032615			MOV	#WDSDB,RO		;PRINT MESSAGE
(1)	032522	004767	000122			JSR	PC,TYPOUT		;POINTED TO BY WDSDB
3150	032526	016700	000114			MOV	GOOD,RO		
3151	032532	004767	000430			JSR	PC,OCTPNT		;PRINT GOOD DATA
3152	032536					PNTM	WDWAS		;PRINT ', WAS '
(1)	032536	012700	032631			MOV	#WDWAS,RO		;PRINT MESSAGE
(1)	032542	004767	000102			JSR	PC,TYPOUT		;POINTED TO BY WDWAS
3153	032546	016700	000072			MOV	BAD,RO		
3154	032552	004767	000410			JSR	PC,OCTPNT		;PRINT BAD DATA
3155	032556	004767	000566			JSR	PC,NULLS		;PRINT NULLS IN CASE OF 'RESET'
3156	032562	000207				RTS	PC		

;ASSOCIATED ASCII FOR THIS MODULE:

3160									
3161									
3162	032564	023046	025052	051105	ERRM:	.ASCII	/ && **ERROR @/		
	032572	047522	020122	100					
3163	032577	040	052101	046040	WDAT:	.ASCII	/ AT LOCATION @/		
	032604	041517	052101	047511					
	032612	020116	100						
3164	032615	046	044123	052517	WDSDB:	.ASCII	/ & SHOULD BE @/		
	032622	042114	041040	020105					
	032630	100							
3165	032631	054	053440	051501	WDWAS:	.ASCII	/, WAS @/		
	032636	040040							

.EVEN
;OTHER VARIABLES:

3166
3167
3168
3169

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SEQ 0110

3170				
3171	032640	000000	ERRAD:	.WORD 0
3172	032642	000000	ERRNUM:	.WORD 0
3173	032644	000000	BAD:	.WORD 0
3174	032646	000000	GOOD:	.WORD 0

.SBTTL MESSAGE PRINT ROUTINE

;MESSAGE TYP0UT ROUTINE (CALLED BY MACRO PNTM A)
 ;MESSAGES ARE IN THE FORMAT:
 ; MSG: .ASCII /2MESSAGE&@/
 ;WHERE: & IS TRANSLATED INTO CR. AND LF.
 ;USES THE SUBROUTINE 'TTO'
 ;WHICH PRINTS CR. & LF. UPON SEEING A CR. CODE.
 ;AND @ IS MESSAGE TERMINATOR
 ;ENTER WITH ADDRESS OF MESSAGE IN RO

3176
 3177
 3178
 3179
 3180
 3181
 3182
 3183
 3184
 3185
 3186
 3187
 3188
 3189
 3190 032650 010046
 3191 032652 117600 000000
 3192 032656 022700 000100
 3193 032662 001411
 3194 032664 022700 000046
 3195 032670 001002
 3196 032672 012700 000015
 3197 032676 004767 000570
 3198 032702 005216
 3199 032704 000762
 3200 032706 005726
 3201 032710 000207
 3202

TYP0UT: MOV RO, -(SP) ;STACK ADDRESS OF MESSAGE
 TPOFCH: MOVB @ (SP), RO ;FETCH ASCII BYTE
 CMP #100, RO ;IS IT @ (TERMINATOR)?
 BEQ TPOUTX ;YES-EXIT
 CMP #46, RO ;IS IT CR IF FLAG?
 BNE TPCONT ;NO-TYPE CHARACTER
 MOV #15, RO ;YES, CHANGE DATA TO CR
 TPCONT: JSR PC, TTO ;TYPE IT
 INC (SP) ;MOVE POINTER TO NEXT BYTE
 BR TPOFCH ;FETCH NEXT CHARACTER
 TPOUTX: TST (SP)+ ;POP STACK TO REACH RETURN VECTOR
 RTS PC

```

;KEYBOARD INPUT ROUTINE CALLED BY JSR PC.INPKB
;ENTERED WITH OLD CONTENTS IN KBBUF
;IF JUST <CR> TYPED, EXIT WITH SAME CONTENTS IN KBBUF
;IF NEW NUMBER TYPED, EXIT WITH NEW CONTENTS IN KBBUF

```

INPKB:	CLR NOKEFL	;CLEAR NO NUMBER FLAG
	MOV R1,-(SP)	;STACK OLD R1
	MOV KBBUF,-(SP)	;STACK 'OLD CONTENTS'
	CLR KBBUF	;CLEAR INPUT BUFFER
GETCHR:	JSR PC,KBRD	;FETCH A CHARACTER IN R0
	JSR PC,TTO	;ECHO IT
	CMP R0,#12	;WAS IT A <CR> OR <LF>?
	BNE 1\$	;NO
	JMP NRTRN	;YES, RETURN WITH PROPER KBBUF
1\$:	MOV R0,R1	;SET UP TO CHECK FOR A NUMBER
	BIC #177407,R1	;MASK ALL BUT # CODE
	CMP R1,#60	;IS IT A # FROM 0-7?
	BEQ 3\$	;YES, PACK IT
	CMP R0,#177	;WAS IT A DELETE/RUBOUT?
	BNE 2\$	;NO, MUST BE GARBAGE
	MOV #57,R0	;YES, BUT PRINT '\'
	JSR PC,TTO	
	CLC	;CLEAR THE C-BIT
	ROR KBBUF	;DELETE LAST DIGIT
	CLC	
	ROR KBBUF	; THAT WAS STUFFED
	CLC	
	ROR KBBUF	; INTO KBBUF
	TST KBBUF	;HAVE WE DELETED EVERYTHING?
	BNE 11\$	;NO
	CLR NOKEFL	;YES, BACK TO NO NUMBER INPUT
11\$:	JMP GETCHR	;GO FOR MORE INPUT
2\$:	MOV #77,R0	;ECHO '?' FOR ERRONEOUS INPUT
	JSR PC,TTO	
	JMP GETCHR	;AND GET ANOTHER CHARACTER
3\$:	MOV #-1,NOKEFL	;GOT A DIGIT. SET FLAG
	BIC #177770,R0	;GET THE DIGIT PART OF THE CHARACTER
	ASL KBBUF	;SHIFT KBBUF BUFFER
	ASL KBBUF	; TO ACCEPT THE
	ASL KBBUF	; NEW DIGIT.
	BIS R0,KBBUF	;ADD THE NEW DIGIT
	JMP GETCHR	;GO FOR MORE INPUT
NRTRN:	TST NOKEFL	;WAS THERE NEW DATA?
	BNE NEK	;YES, GO BACK WITH IT
	MOV (SP)+,KBBUF	;NO, RETRIEVE OLD DATA
	MOV (SP)+,R1	;RESTORE R1
	RTS PC	;AND RETURN
NEK:	TST (SP)+	;DUMP OLD DATA
	MOV (SP)+,R1	;RESTORE R1
	RTS PC	;AND RETURN
KBRD:	TSTB @KBS	;WAIT FOR INPUT FROM CONSOLE
	BPL KBRD	

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SEQ 0113

3260 033150 C17700 003014
3261 033154 042700 177600
3262 033160 000207

KBRET: MOV @KBD,RO
BIC #177600,RO
RTS PC

:PUT THE CHAR INTO RO
:TRIM PARITY

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SEQ 0114

3264
3265
3266 033162 000000
3267 033164 000000

;ASSOCIATED VARIABLE STORAGE:

NOKEFL: .WORD 0
KBBUF: .WORD 0

```

3269          .SBTTL BINARY TO ASCII CONVERSION ROUTINES
3270
3271          ;CONVERTS BINARY TO BINARY, BINARY TO
3272          ;OCTAL, AND BINARY TO DECIMAL; EITHER
3273          ;UNJUSTIFIED WITH LEADING ZERO'S SUPPRESSED
3274          ;OR RIGHT JUSTIFIED WITH LEADING 0'S
3275          ;SUPPRESSED
3276
3277
3278          ;REGULAR BIN-OCTAL UNJUSTIFIED:
3279
3280          OCTPNT: REGSAV
3281          (1) 033166 004567 151420          JSR      R5,REGSAV
3282          033172 005067 000356          CLR      RJFLG          ;CLEAR RIGHT JUSTIFY FLAG
3283          033176 012701 000010          MOV      #10,R1          ;SET RADIX FOR OCTAL
3284          033202 004767 000156          JSR      PC,NUMPNT          ;CONVERT & PRINT
3285          (1) 033206 004567 151414          REGRES
3286          033212 000207          JSR      R5,REGRES
3287          RTS      PC          ;RETURN
3288
3289          ;BIN-OCTAL JUSTIFIED:
3290          OCTJSP: REGSAV
3291          (1) 033214 004567 151372          JSR      R5,REGSAV
3292          033220 012767 177777 000326          MOV      #-1,RJFLG          ;SET RIGHT JUSTIFY FLAG
3293          033226 012701 000010          MOV      #10,R1          ;SET RADIX FOR OCTAL
3294          033232 004767 000126          JSR      PC,NUMPNT          ;CONVERT & PRINT
3295          (1) 033236 004567 151364          REGRES
3296          033242 000207          JSR      R5,REGRES
3297          RTS      PC
3298
3299          ;BIN-BIN
3300          BINPNT: REGSAV
3301          (1) 033244 004567 151342          JSR      R5,REGSAV
3302          033250 005067 000300          CLR      RJFLG          ;CLEAR RIGHT JUSTIFY FLAG
3303          033254 012701 000002          MOV      #2,R1          ;SET RADIX FOR BINARY
3304          033260 004767 000100          JSR      PC,NUMPNT          ;CONVERT & PRINT
3305          (1) 033264 004567 151336          REGRES
3306          033270 000207          JSR      R5,REGRES
3307          RTS      PC
3308
3309          ;BIN-DECIMAL UNJUSTIFIED:
3310          DECPNT: REGSAV
3311          (1) 033272 004567 151314          JSR      R5,REGSAV
3312          033276 005067 000252          CLR      RJFLG          ;CLEAR RIGHT JUSTIFY FLAG
3313          033302 012701 000012          MOV      #12,R1          ;SET RADIX FOR DECIMAL
3314          033306 004767 000052          JSR      PC,NUMPNT          ;CONVERT & PRINT
3315          (1) 033312 004567 151310          REGRES
3316          033316 000207          JSR      R5,REGRES
3317          RTS      PC
3318
3319          ;BIN-DECIMAL JUSTIFIED (6 PLACES)
3320          DECJSP: REGSAV

```


CZPLBCO PCL11 STD ALN V02C MACY11 30A(1052) 20-JUN-79 07:50 PAGE 49-1
CZPLBC.P11 07-JUN-79 15:47 BINARY TO ASCII CONVERSION ROUTINES

SEQ 0116

(1)	033320	004567	151266		JSR	R5,REGSAV	
3317	033324	012767	177777	000222	MOV	#-1,RJFLG	:SET RIGHT JUSTIFY FLAG
3318	033332	012701	000012		MOV	#12,R1	:SET RADIX FOR DECIMAL
3319	033336	004767	000022		JSR	PC,#MPNT	:CONVERT & PRINT
3320	033342				REGRES		
(1)	033342	004567	151260		JSR	R5,REGRES	
3321	033346	000207			RTS	PC	
3322							
3323							
3324	033350	005000			NULLS: CLR	R0	
3325	033352	004767	000114		JSR	PC,TTO	
3326	033356	004767	000110		JSR	PC,TTO	
3327	033362	000207			NULOUT: RTS	PC	

```

3329 ;UNSGNED CONVERT-PRINT ROUTINE (BIN - ASCII)
3330
3331 033364 010167 000166 NUPPNT: MOV R1,RADIX ;SAVE RADIX
3332 033370 005002 CLR R2 ;CLEAR TAB COUNTER
3333 033372 005001 DIVSET: CLR R1 ;CLEAR WORK REGISTER
3334 033374 020067 000156 DIVID: CMP R0,RADIX ;IS NUMBER BELOW RADIX?
3335 033400 103404 BLO GETDG ;IF YES, STORE DIGIT
3336 033402 166700 000150 SUB RADIX,R0 ;ELSE, KEEP SUBTRACTING
3337 033406 005201 INC R1 ;AND KEEP COUNT
3338 033410 000771 BR DIVID
3339 033412 010046 GETDG: MOV R0,-(SP) ;STACK REMAINDER
3340 033414 010100 MOV R1,R0
3341 033416 001403 BEQ PNTEXT ;PRINT IF HIGHEST ORDER STACKED
3342 033420 005202 INC R2 ;ELSE COUNT DIGITS FOR R. JUSTIFY
3343 033422 004767 177744 JSR PC,DIVSET
3344
3345 033426 012703 000006 PNTEXT: MOV #6,R3 ;GET DIGIT COUNT CONSTANT
3346 033432 160203 SUB R2,R3 ;HAVE WE PRODUCED 6 DIGITS?
3347 033434 003413 BLE PNT ;YES, JUSTIFICATION UNNECESSARY
3348 033436 005767 000112 TST RJFLG ;IS THE JUSTIFY FLAG SET?
3349 033442 001410 BEQ PNT ;NO-DON'T JUSTIFY
3350 033444 012700 000040 JUST: MOV #40,R0 ;YES, PRINT LEADING SPACES
3351 033450 004767 000016 JSR PC,TTO
3352 033454 005303 DEC R3
3353 033456 001372 BNE JUST
3354 033460 005067 000070 CLR RJFLG ;CLEAR JUSTIFY FLG WHEN DONE
3355 033464 012600 PNT: MOV (SP)+,R0 ;GET REST OF DIGITS OFF STACK
3356 033466 052700 000060 BIS #'0,R0 ;MAKE THEM ASCII
3357 ;TYPE OUT ROUTINE
3358 ;PRINTS A CHARACTER WHICH IS IN R0
3359 ;IF THE CHARACTER IS 'CR.', ALSO PRINT A 'LF.'
3360
3361
3362 033472 010077 002476 TTO: MOV R0,@TTB ;PRINT CONTENTS OF R0
3363 033476 105777 002470 TTOLP: TSTB @TTS ;WAIT TILL PRINT DONE
3364 033502 100375 BPL TTOLP
3365 033504 022700 000015 CMP #15,R0 ;WAS IT A <CR>?
3366 033510 001401 BEQ TTOLF ;YES, ECHO A LF AS WELL
3367 033512 000207 RTS PC ;NO, JUST RETURN
3368 033514 012700 000012 TTOLF: MOV #12,R0
3369 033520 004767 177746 JSR PC,TTO
3370 033524 016767 000030 000030 MOV FILL,FILCNT ;PREPARE TO PRINT NULLS
3371 033532 005000 CLR R0
3372 033534 004767 177732 1$: JSR PC,TTO
3373 033540 005367 000016 DEC FILCNT ;AS MANY AS FILL COUNT
3374 033544 003373 BGT 1$
3375 033546 012700 000012 MOV #12,R0 ;RESTORE LOST R0
3376 033552 000207 RTS PC ;AND RETURN
3377
3378
3379 ;ASSOCIATED VARIABLE STORAGE:
3380
3381 033554 000000 RJFLG: .WORD 0
3382 033556 000000 RADIX: .WORD 0
3383 033560 000010 FILL: .WORD 10
3384 033562 000000 FILCNT: .WORD 0

```


.SMTL TEST BUFFERS

.DATA D110 DATA-BUFFER

01.28: 125252

3386			
3387			
3388			
3389			
3390	033564	125252	
3391	033566	052525	
3392	033570	125252	
3393	033572	052525	
3394	033574	125252	
3395	033576	052525	
3396	033600	125252	
3397	033602	052525	
3398	033604	125252	
3399	033606	052525	
3400			
3401	033610	177400	
3402	033612	000377	
3403	033614	177400	
3404	033616	000377	
3405	033620	177400	
3406	033622	000377	
3407	033624	177400	
3408	033626	000377	
3409	033630	177400	
3410	033632	000377	
3411			
3412	033634	000000	
3413	033636	177777	
3414	033640	000000	
3415	033642	177777	
3416	033644	000000	
3417	033646	177777	
3418	033650	000000	
3419	033652	177777	
3420	033654	000000	
3421	033656	177777	
3422			
3423	033660	010421	
3424	033662	021042	
3425	033664	031463	
3426	033666	042104	
3427	033670	052525	
3428	033672	063146	
3429	033674	076567	
3430	033676	104210	
3431	033700	114631	
3432	033702	125252	
3433			
3434	033704	000001	
3435	033706	177776	
3436	033710	000002	
3437	033712	177775	
3438	033714	000003	
3439	033716	177774	
3440	033720	000004	
3441	033722	177773	

3442	033724	000005	000005
3443	033726	177772	177772
3444			
3445	033730	000000	000000
3446	033732	000000	000000
3447	033734	000000	000000
3448	033736	000000	000000
3449	033740	000000	000000
3450	033742	111111	111111
3451	033744	111111	111111
3452	033746	111111	111111
3453	033750	111111	111111
3454	033752	111111	111111
3455			
3456	033754	125252	125252
3457	033756	052525	052525
3458	033760	177777	177777
3459	033762	000000	000000

			LCRC TEST BUFFER
3461			
3462			
3463	033764	125252	SILCRC: 125252
3464	033766	050521	050521
3465	033770	124200	124200
3466	033772	000665	000665
3467	033774	141436	141436
3468	033776	164003	164003
3469	034000	075106	075106
3470	034002	027371	027371
3471	034004	002562	002562
3472	034006	135105	135105
3473			
3474	034010	002640	002640
3475	034012	045405	045405
3476	034014	060152	060152
3477	034016	013403	013403
3478	034020	153756	153756
3479	034022	072577	072577
3480	034024	164176	164176
3481	034026	025435	025435
3482	034030	111272	111272
3483	034032	052673	052673
3484			
3485	034034	157140	157140
3486	034036	102461	102461
3487	034040	066234	066234
3488	034042	016141	016141
3489	034044	175726	175726
3490	034046	121477	121477
3491	034050	036420	036420
3492	034052	122203	122203
3493	034054	045272	045272
3494	034056	016435	016435
3495			
3496	034060	010703	010703
3497	034062	103142	103142
3498	034064	177121	177121
3499	034066	016654	016654
3500	034070	033047	033047
3501	034072	042734	042734
3502	034074	046205	046205
3503	034076	014300	014300
3504	034100	024677	024677
3505	034102	103302	103302
3506			
3507	034104	106245	106245
3508	034106	124160	124160
3509	034110	132304	132304
3510	034112	015025	015025
3511	034114	017305	017305
3512	034116	044754	044754
3513	034120	044406	044406
3514	034122	061203	061203
3515	034124	140621	140621
3516	034126	054620	054620

3517			
3518	034130	110312	110312
3519	034132	130174	130174
3520	034134	116116	116116
3521	034136	120462	120462
3522	034140	021446	021446
3523	034142	114411	114411
3524	034144	133325	133325
3525	034146	050737	050737
3526	034150	106501	106501
3527	034152	007625	007625
3528			
3529	034154	117626	117626
3530	034156	041245	041245
3531	034160	031477	031477
3532	034162	014726	014726

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TEST BUFFERS

SEQ 0122

3534
3535
3536 034164 000100
;RECEIVER DATA COMPARE BUFFER
;EVEN
;PULSE: .BLKW 64.

```

3538 .SBTTL ASCII STORAGE
3539
3540 034364 023046 044523 047514 SLOWD: .ASCII /BBSILO OUTPUT WORD WAS @/
      034372 047440 052125 052520
      034400 020124 047527 042122
      034406 053440 051501 040040
3541 034414 023046 044523 047514 SLOWD: .ASCII /BBSILO INPUT WORD WAS @/
      034422 044440 050116 052125
      034430 053440 051117 020104
      034436 040527 020123 100
3542 034443 046 047105 020104 PEND: .ASCII /BEND PASS @/
      034450 040520 051523 021440
      034456 100
3543 034457 046 041523 050117 SCSEC: .ASCII /BSCOPE SECTION FOR SLICE TIMING@
      034464 020105 042523 052103
      034472 047511 020116 047506
      034500 020122 046123 041511
      034506 020105 044524 044515
      034514 043516 051446 052105
      034522 051440 020127 034460
      034530 052040 020117 054105
      034536 052111 052040 044510
      034544 020123 047514 050117
      034552 040056
3544 034554 052046 040522 051516 TSTAT: .ASCII /BTRANSMITTER STATUS REG = @/
      034562 044515 052124 051105
      034570 051440 040524 052524
      034576 020123 042522 020107
      034604 020075 100
3545 034607 046 042522 042503 RSTAT: .ASCII /BRECEIVER STATUS REG = @/
      034614 053111 051105 051440
      034622 040524 052524 020123
      034630 042522 020107 020075
      034636 100
3546 034637 046 047516 020056 RBTN: .ASCII /BNC. OF WORDS RECEIVED = @/
      034644 043117 053440 051117
      034652 051504 051040 041505
      034660 044505 042526 020104
      034666 020075 100
3547 034671 046 041520 030514 TMDR: .ASCII /BPCL11 TRANSMITTER TEST @/
      034676 020061 051124 047101
      034704 046523 052111 042524
      034712 020122 042524 052123
      034720 023040 020040 100
3548 034725 046 041520 030514 RMDR: .ASCII /BPCL11 RECEIVER TEST @/
      034732 020061 042522 042503
      034740 053111 051105 052040
      034746 051505 023124 020040
      034754 040040
3549 034756 052046 040522 051516 RMDR: .ASCII /BTRANSMITTER - RECEIVER LOOP TESTS @/
      034764 044515 052124 051105
      034772 026440 051040 041505
      035000 044505 042526 020122
      035006 047514 050117 052040
      035014 051505 051524 020046
      035022 020040 100
  
```


CZPLBCO PCL11 STD ALN V02C
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ASCII STORAGE

M 10

SEQ 0124

3550	035025	046	041520	035514	ALHDR: .ASCII	OP . TESTS 1 - 3 SEQUENCE @/
	035032	020061	042524	052123		
	035040	020123	020061	020055		
	035046	020063	042523	052521		
	035054	047105	042503	020046		
	035062	020040	100			
3551	035065	046	046530	051124	TMTR: .ASCII	/&XMT @/
	035072	040040				
3552	035074	051046	053103	020122	RETR: .ASCII	/&RCV @/
	035102	100				
3553	035103	061	052123	052440	FRAD: .ASCII	/1ST UNIBUS ADDR..@/
	035110	044516	052502	020123		
	035116	042101	051104	027056		
	035124	100				
3554	035125	046	044124	052101	TOOLDR: .ASCII	/&THAT WAS TOO LOW. I'LL GIVE YOU ANOTHER CHANCE...&@/
	035132	053440	051501	052040		
	035140	047517	046040	053517		
	035146	020041	023511	046114		
	035154	043440	053111	020105		
	035162	047531	020125	047101		
	035170	052117	042510	020122		
	035176	044103	047101	042503		
	035204	027056	023056	100		
3555	035211	046	044124	052101	AGAIN: .ASCII	/&THAT WON'T DO. TRY AGAIN!&@/
	035216	053440	047117	052047		
	035224	042040	027117	052040		
	035232	054522	040440	040507		
	035240	047111	023041	100		
3556	035245	126	041505	047524	VCTR: .ASCII	/VECTOR..@/
	035252	027122	040056			
3557	035256	051120	047511	044522	PRIORITY: .ASCII	/PRIORITY 4-7)..@/
	035264	054524	020040	032050		
	035272	033455	027051	040056		
3558	035300	042124	020115	052502	TDMA: .ASCII	/TDM BUS ADDR (1-37)..@/
	035306	020123	042101	051104		
	035314	024040	026461	033463		
	035322	027051	040056			
3559	035326	044446	053116	046101	INVLAD: .ASCII	/&INVALID DEVICE ADDRESS...(IT'S NOT THERE)@/
	035334	042111	042040	053105		
	035342	041511	020105	042101		
	035350	051104	051505	027123		
	035356	027056	044450	023524		
	035364	020123	047516	020124		
	035372	044124	051105	024505		
	035400	100				
3560	035401	046	051124	050101	TRAP4: .ASCII	/&TRAPPED TO LOCATION 4 FROM LOCATION @/
	035406	042520	020104	047524		
	035414	046040	041517	052101		
	035422	047511	020116	020064		
	035430	051106	046517	046040		
	035436	041517	052101	047511		
	035444	020116	100			
3561	035447	046	050046	046103	TSTHDR: .ASCII	/&&PCL11 STANDALONE TESTS V02C CZPLBCO 06-JUN-79&@/
	035454	030461	051440	040524		
	035462	042116	046101	047117		
	035470	020105	042524	052123		

	035476	020123	030126	041462	
	035504	020040	041440	050132	
	035512	041114	030103	020040	
	035520	033060	045055	047125	
	035526	033455	023071	100	
3562	035533	046	042523	042514	*S*SEL: .ASCII /&SELECT TEST (<CR> - HELP)..@/
	035540	052103	052040	051505	
	035546	020124	036050	051103	
	035554	020076	020075	042510	
	035562	050114	027051	040056	
3563	035570	023046	042522	050123	HELPMSG: .ASCII /&RESPOND WITH ONE OF THE FOLLOWING:/
	035576	047117	020104	044527	
	035604	044124	047440	042516	
	035612	047440	020106	044124	
	035620	020105	047506	046114	
	035626	053517	047111	075107	
3564	035634	020046	020040	020040	.ASCII /& 1 - RUN TRANSMITTER TEST/
	035642	020061	020075	052522	
	035650	020116	051124	047101	
	035656	046523	052111	042524	
	035664	020122	042524	052123	
3565	035672	020046	020040	020040	.ASCII /& 2 - RUN RECEIVER TEST/
	035700	020062	020075	052522	
	035706	020116	042522	042503	
	035714	053111	051105	052040	
	035722	051505	124		
3566	035725	046	020040	020040	.ASCII /& 3 - RUN XMTR-RCVR LOOP TEST/
	035732	031440	036440	051040	
	035740	047125	054040	052115	
	035746	026522	041522	051126	
	035754	046040	047517	020120	
	035762	042524	052123		
3567	035766	020046	020040	020040	.ASCII /& 4 - RUN TEST 1, THEN TEST 2, THEN TEST 3&@/
	035774	020064	020075	052522	
	036002	020116	042524	052123	
	036010	030440	020054	044124	
	036016	047105	052040	051505	
	036024	020124	026062	052040	
	036032	042510	020116	042524	
	036040	052123	031440	040046	

3569 .SBTTL CONSTANTS AND VARIABLE STORAGE
 3570 .EVEN

3573 ;. VARIABLES

3575	036046	000000	DILLY: .WORD	0
3576	036050	000000	DLV: .WORD	0
3577	036052	000000	SWRFLG: .WORD	0
3578	036054	000000	PNTFLG: .WORD	0
3579	036056	000000	ITER: .WORD	0
3580	036060	000000	SWI: .WORD	0
3581	036062	000000	PAT: .WORD	0
3582	036064	000000	MASK: .WORD	0
3583	036066	000000	PSNO1: .WORD	0
3584	036070	000000	PSNO2: .WORD	0
3585	036072	000000	PSNC3: .WORD	0
3586	036074	000000	PSNO4: .WORD	0
3587	036076	000000	TEMP: .WORD	0
3588	036100	000000	TESTNO: .WORD	0
3589	036102	000000	\$4FLAG: .WORD	0
3590	036104	000000	RCAD: .WORD	0
3591	036106	000000	TRAD: .WORD	0
3592	036110	000000	COUNT: .WORD	0
3593	036112	000000	DATWD: .WORD	0
3594	036114	000000	TMPRIO: .WORD	0

;RECEIVER ADDRESS
 ;TRANSMITTER ADDRESS

3596 ;. CONSTANTS:

3599	036116	000005	FKPRIO: .WORD	5
3600	036120	000005	FKPRI1: .WORD	5
3601	036122	000170	TXVEC: .WORD	170
3602	036124	000174	RCVEC: .WORD	174
3603	036126	000240	XPRI0: .WORD	240
3604	036130	000240	RPRI0: .WORD	240
3605	036132	164200	TCR: .WORD	164200
3606	036134	164202	TSR: .WORD	164202
3607	036136	164204	TSDB: .WORD	164204
3608	036140	164206	TSBC: .WORD	164206
3609	036142	164210	TSBA: .WORD	164210
3610	036144	164212	TMMR: .WORD	164212
3611	036146	164213	TMMRH: .WORD	164213
3612	036150	164214	TSCRC: .WORD	164214
3613	036152	164220	RCR: .WORD	164220
3614	036154	164222	RSR: .WORD	164222
3615	036156	164224	Rddb: .WORD	164224
3616	036160	164226	RDBC: .WORD	164226
3617	036162	164230	RDBA: .WORD	164230
3618	036164	164234	RDCRC: .WORD	164234
3619	036166	177560	KBS: .WORD	177560
3620	036170	177562	KBD: .WORD	177562
3621	036172	177564	TTS: .WORD	177564
3622	036174	177566	TTB: .WORD	177566
3623	036176	036176	MEM: .WORD	MEM
3624	036200	177777	TSTWRD: .WORD	177777

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K 10

SEQ 0127

3625
3626

(ZPLBCO PCL11 STND ALN VOZC
(ZPLBC.P11 07-JUN-79 15:47

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CONSTANTS AND VARIABLE STORAGE

L 10

SEQ 0128

3628 036202 000170
3629 036204 000174
3630 036206 164200
3631 036210 164220
3632 000001

TXMVEC: .WORD 170
RCVVEC: .WORD 174
TXMADR: .WORD 164200
RCVADR: .WORD 164220
.END

:170 IS XMTR DEFAULT VECTOR
:174 IS RCVR DEFAULT VECTOR
:164200 IS XMTR DEFAULT BASIC ADDR
:164220 IS RCVR DEFAULT BASIC ADDR

ADGD	003212	697	700#											
ADOK	003166	693	696#											
ADRGD	003340	713	716#											
ADROK	003314	709	712#											
AGAIN	035211	626	638	649	653	671	675	694	698	710	714	3103	3555#	
AL THDR	035025	757	3550#											
BAD	032644	949#	951	955*	957	961*	962*	964	966	970*	972	976*	978	982*
		984	1001*	1002	1008*	1009*	1010	1018*	1019	1028*	1030	1034*	1035	1039*
		1040	1044*	1046	1065*	1066	1091*	1092	1198*	1200*	1202	1226*	1258*	1259*
		1261	1304*	1306	1325*	1327	1361*	1363	1378*	1379	1434*	1692*	1695	1775*
		1777	1781*	1783	1787*	1789	1793*	1795	1799*	1801	1818*	1819	1825*	1826*
		1827	1836*	1838	1842*	1844	1848*	1850	1854*	1856	1875*	1876	1901*	1902
		1943*	1945	1963*	1965	2001*	2002	2114*	2115	2288*	2289	2385*	2430*	2432
		2485*	2486	2491*	2492*	2493	2538*	2539	2592*	2593*	2637*	2638	2736*	2737*
		2738	2743*	2744*	2745	2790*	2791*	2792	2834*	2835*	2836	2840*	2841*	2842
		2882*	2883*	2884	2922*	2923*	2924	3153	3173#					
BATST	006246	805	1086#	1105										
BCONT	003346	575	717#	726	909	3077								
BCTST	006064	804	1060#	1079										
BEGIN	002000	471	568	579#										
BHLPMG	003412	721	723	725#										
BINPNT	033244	3298#												
B00 =	000C01	467#	1062	1088	1392	1872	1898	2724	2825	2826	2873	2874	2953	2967
		3002	3003											
B01 =	000002	466#	1060	1086	1112	1285	1302	1309	1330	1332	1371	1382	1391	1408
		1444	1455	1500	1549	1567	1578	1593	1605	1617	1648	1657	1664	1678
		1711	1835	1870	1896	1922	1941	1948	1968	1971	2019	2034	2075	2095
		2131	2179	2202	2214	2249	2258	2265	2271	2280	2306	2358	2359	2388
		2389	2443	2444	2497	2498	2544	2545	2602	2603	2691	2692	2718	2719
		2759	2760	2805	2806	2860	2861	2898	2899	2945	2946	2979	2980	2995
		2996												
B02 =	000004	465#	2104											
B03 =	000010	464#	1288	1299	1313	1323	1354	1404	1457	1929	1954	1978	2030	2769
		2906												
B04 =	000020	463#	1463	2777										
B05 =	000040	462#	2959	2975	2982	3017	3025							
B06 =	000100	461#	1471	1481	1621	1627	1633	1651	2077	2218	2224	2230	2252	
B07 =	000200	460#	1197	1225	1257	1264	1271	1311	1321	1358	1366	1368	1432	1437
		1445	1446	1450	1451	1634	1652	1688	1933	1935	1958	1960	1972	1982
		2049	2054	2081	2082	2090	2091	2180	2184	2231	2233	2253	2281	2417
		2429	2723	2728	2817	2819	2820	2822	2823	2824	2862	2869		
B08 =	000400	459#	1292	1317	1350	1571	1925	1938	1950	1961	2008	2109	2182	2234
		2456	2509	2612	2954									
B09 =	001000	458#	1119	1128	1487	1488	1502	1574	2119	3004				
B10 =	002000	457#	791	1507	1508	1583	1733	2133	2134	2322	2702	2914		
B11 =	004000	456#	811	1517	1518	1601	1750	2147	2148	2337				
B12 =	010000	455#	989	1051	1077	1103	1276	1411	1527	1528	1607	1659	1708	1806
		1861	1887	1913	2036	2157	2158	2204	2260	2303	2412	2679	2749	2782
		2796	2846	2850	2888	2928	2933	3070						
B13 =	020000	454#	848	1477	1496	1537	1538	2076	2086	2127	2132	2142	2167	2168
		2449	2451	2503	2504	2697	2698	2724	2765	2766	2813	2814	2873	2874
		2904	2905	2952	2953	2981	2983	3002	3003					
B14 =	040000	453#	953	959	968	974	980	986	1004	1012	1021	1032	1037	1042
		1048	1068	1094	1116	1133	1138	1143	1149	1154	1159	1167	1171	1177
		1185	1189	1193	1204	1212	1216	1224	1231	1245	1252	1263	1270	1290
		1294	1301	1308	1315	1319	1329	1335	1336	1338	1348	1352	1356	1365

		1381	1406	1420	1448	1453	1469	1473	1479	1483	1490	1494	1498	1504
		1510	1514	1520	1524	1530	1534	1540	1544	1557	1559	1561	1565	1576
		1591	1603	1628	1640	1644	1670	1681	1684	1686	1697	1702	1779	1785
		1791	1797	1803	1821	1829	1840	1846	1852	1858	1878	1904	1927	1931
		1940	1947	1952	1956	1967	1980	1985	1994	1996	2004	2010	2032	2061
		2079	2084	2088	2093	2106	2111	2117	2121	2125	2129	2136	2140	2144
		2150	2154	2160	2164	2170	2174	2192	2194	2196	2200	2225	2241	2245
		2272	2291	2296	2376	2380	2386	2405	2409	2462	2466	2467	2475	2478
		2488	2495	2515	2519	2520	2528	2531	2541	2568	2571	2579	2582	2595
		2618	2621	2640	2641	2658	2661	2669	2672	2710	2740	2747	2751	2775
		2779	2794	2798	2838	2844	2848	2852	2886	2890	2926	2930	2965	2969
		2973	2977	2985	3002	3003	3015	3019	3023	3027				
B15	= 100000	452#	1070	1096	1475	1492	1512	1522	1532	1542	1563	1880	1906	2123
		2138	2152	2162	2172	2198	2956	2971	3006					
CCRTN	031774	3060#	3087											
CHXDAT	024014	2378	2407	2427#										
CLRCBF	020210	1970	2040#	2543										
CMPBUF	034164	1984	1998	2041	2060	2105	2113	2547	2590	3000	3536#			
CONTW1	032004	3061#	3062	3068										
COUNT	036110	1689*	1705*	3592#										
CRCTST	014646	810	1678#	1687	1703	1710								
DATLPS	024074	2334	2443#	2463	2472	2483	2489	2496	2681					
DATWD	036112	2285*	2286	2294	3593#									
DECJSP	033320	3316#												
DECPNT	033272	764	820	1759	2346	3307#								
DELAY	004546	916#	1220	1248	1254	1266	1286	1297	1596	1599	1923	1936	2420	2725
DELYMG	032312	3080	3113#											
DERR	032500	953	959	968	974	980	986	1004	1012	1021	1032	1037	1042	1048
"		1068	1094	1204	1263	1308	1329	1365	1381	1702	1779	1785	1791	1797
		1803	1821	1829	1840	1846	1852	1858	1878	1904	1947	1967	2004	2117
		2296	2380	2386	2409	2488	2495	2541	2595	2640	2740	2747	2794	2838
		2844	2886	2926	3146#									
DEVGEN	004264	684	859#											
DILLY	036046	916*	923*	3575#										
DIVID	033374	3334#	3338											
DIVSET	033372	3333#	3343											
DLCON	032412	917	919*	920	1237	1340	1421	1461	1580	1986	2062	2365	2394	2452
		2505	2553	2610	2650	2699	2729	2767	2783	2827	2875	2908	2915	2957
		3007	3081	3082	3086*	3126#								
DLWT	004566	918	920#	924										
DLWT1	004574	921#	922											
DLY	036050	920*	921*	3576#										
DTLPS1	024166	2453#	2461											
DVATST	004456	600	894#											
EROINT	022204	2217	2222#											
ERR	032414	1116	1133	1138	1143	1149	1154	1159	1167	1171	1177	1185	1189	1193
		1212	1216	1224	1231	1245	1252	1270	1290	1294	1301	1315	1319	1338
		1348	1352	1356	1406	1448	1453	1469	1473	1479	1483	1490	1494	1498
		1504	1510	1514	1520	1524	1530	1534	1540	1544	1557	1561	1565	1576
		1591	1603	1628	1640	1644	1670	1686	1927	1931	1940	1952	1956	1980
		1994	2010	2032	2079	2084	2088	2093	2111	2121	2125	2129	2136	2140
		2144	2150	2154	2160	2164	2170	2174	2192	2196	2200	2225	2241	2245
		2272	2376	2405	2462	2466	2475	2515	2519	2528	2568	2579	2618	2658
		2669	2710	2751	2775	2779	2798	2848	2852	2890	2930	2965	2969	2973
		2977	2985	3015	3019	3023	3027	3132#						
ERRAD	032640	3132*	3133*	3138	3146*	3147*	3171#							

[illegible]

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SEQ 0133

[illegible]

RC1	016642	1899#	1905	1911										
RC2	016724	1903	1906#											
RC3	016760	1907	1912#											
RDBA	036162	885*	1781	1833*	1854	1900*	1901	1984*	2060*	2105*	2114	2186*	2363*	2547*
		3000*	3617#											
RDBC	036160	883*	1775	1832*	1848	1874*	1875	1983*	1988	2059*	2103*	2107	2185*	2190
		2362*	2382	2385	2447*	2501*	2549*	2810*	2950*	2998*	3616#			
RDCRC	036164	887*	1793	2288	3618#									
RDDB	036156	881*	1934*	1943	1959*	1963	1975*	2051*	2098*	2181*	2232*	2286*	2392	2419*
		2485	2538	2637	2821*	2865*	3615#							
RDR1	016434	1862	1864#											
RD1	015736	1816#	1822											
RD2	016020	1820	1823#	1830										
RD3	016104	1828	1831#	1841	1847	1853	1859							
RD4	016216	1839	1842#											
RD5	016270	1845	1848#											
RD6	016342	1851	1854#											
RD7	016414	1857	1860#											
RECB	020220	2042#	2044											
RECVR	035074	602	628	662	701	3552#								
REEMT	020262	2022	2025	2059#										
REEMT1	020310	2063#	2068											
REGRES	004626	936#	3284	3293	3302	3311	3320							
REGSAV	004612	929#	3280	3289	3298	3307	3316							
RFMTW	020314	2064#	2065											
HEND	015302	1751	1754#											
REPEAT	004166	816	825#											
REFEET	015370	1755	1768#											
REPETL	023276	2342	2354#											
RFRT	020206	2037	2039#											
RESR	020230	2021	2024	2027	2049#									
RESRW	020240	2051#	2053											
RESTR1	003072	572	685#	695	699	3092								
RE1	017056	1926	1929#											
RE10	017606	1979	1982#											
RE10A	017642	1987#	1993											
RE11	017646	1988#	1991											
RE12	017714	1989	1996#											
RE13	017736	2000#	2007											
RE14	020006	2003	2006#											
RE15	020052	2009	2019#	2033										
RE16	020160	2031	2034#											
RE2	017116	1930	1933#	1942	1949									
RE3	017214	1939	1943#	1953										
RE4	017276	1946	1950#											
RE5	017336	1951	1954#	1957										
RE6	017376	1955	1958#	1969										
RE7	017416	1961#	1962											
RE7A	017506	1966	1970#											
RE8	017512	1971#	1981	1995	2005	2011								
RE9	017536	1975#	1977											
RFRT	022124	2205	2207#											
RF1	020406	2078	2081#	2085										
RF10	021072	2124	2127#											
RF11	021132	2128	2131#	2137	2141	2145								
RF12	021214	2135	2138#											

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SEQ 0135

RF13	021254	2139	2142#															
RF14	021314	2143	2146#	2151	2155													
RF15	021366	2149	2152#															
RF16	021426	2153	2156#	2161	2165													
RF17	021500	2159	2162#															
RF18	021540	2163	2166#	2171	2175													
RF19	021612	2169	2172#															
RF2	020454	2083	2086#															
RF20	021652	2173	2179#	2193	2197	2201												
RF21	021674	2182#	2183															
RF22	021776	2191	2194#															
RF23	022036	2195	2198#															
RF24	022076	2199	2202#															
RF3	020514	2087	2090#	2094														
RF4	020562	2092	2095#	2112	2118	2122	2126	2130										
RF5	020602	2098#	2102															
RF6	020620	2103#																
RF7	020650	2107#	2108															
RF8	020716	2110	2113#															
RF9	020772	2116	2119#															
RF9A	021032	2120	2123#															
RHRT	022554	2261	2263#															
RHO	022252	2221	2227#															
RH1	022264	2229#	2268															
RH1A	022327	2234#	2235															
RH2	022402	2240	2243#															
RH3	022442	2244	2247#	2257	2274													
RH3S	022466	2251#	2273															
RH4	022526	2248	2258#															
RINIT	015372	1742	1774#	1780	1786	1792	1798	1804	1808									
RINTST	022126	1748	2213#	2226	2242	2246	2262											
RJFLG	033554	3281*	3290*	3299*	3308*	3317*	3348	3354*	3381#									
RJRT	023044	2304	2306#															
RJ1	022674	2285#	2301															
RJ1S	023002	2292	2297#															
RJ2	023010	2290	2298#															
RPRIO	036130	683*	2243	3604#														
RSR	036154	879*	1799	1834*	1842	1925	1938	1950	1961	2008	2077	2081*	2082	2090*				
		2091	2109	2119	2123	2133*	2134	2138	2146*	2147*	2148	2152	2156*	2157*				
		2158	2162	2166*	2167*	2168	2172	2182	2194	2198	2234	2253*	2454	2456				
		2464	2470	2507	2509	2517	2523	2560	2577	2580	2585	2612	2626	2629				
		2667	2670	2675	2702	2736	2749	2777	2790	2796	2824*	2834	2850	2914*				
		2954	2959	2982*	3004	3021	3025	3614#										
		1747	2075#	2080	2089	2206												
		844	847#															
		849	852#															
		842#	954	960	969	975	981	987	1005	1013	1022	1033	1038	1043				
RSRTST	020332	1049	1069	1095	1117	1134	1139	1144	1150	1155	1160	1168	1172	1178				
SBAK	004244	1186	1190	1194	1205	1213	1217	1227	1232	1246	1253	1265	1272	1291				
SCONT	004262	1295	1303	1310	1316	1320	1331	1339	1349	1353	1357	1367	1383	1407				
SCRPTN	004226	1449	1454	1470	1474	1480	1484	1491	1495	1499	1505	1511	1515	1521				
		1525	1531	1535	1541	1545	1558	1562	1566	1577	1592	1604	1629	1641				
		1645	1671	1687	1703	1780	1786	1792	1798	1804	1822	1830	1841	1847				
		1853	1859	1879	1905	1928	1932	1942	1949	1953	1957	1969	1981	1995				
		2005	2011	2033	2080	2085	2089	2094	2112	2118	2122	2126	2130	2137				
		2141	2145	2151	2155	2161	2165	2171	2175	2193	2197	2201	2226	2242				

		2246	2273	2297	2377	2381	2387	2406	2410	2463	2472	2483	2489	2496
		2516	2525	2536	2542	2576	2587	2598	2635	2647	2666	2677	271*	2741
		2748	2752	2776	2780	2795	2799	2839	2845	2849	2853	2887	2891	2927
		2931	2966	2970	2974	2978	2986	3016	3020	3024	3028			
SSFC	034457	1122	3543#											
SILRC	033764	1690	2282	3463#										
SILDAT	033564	1334	1359	1373	1374	1419	1680	1973	1997	2283	2416	2428	2546	2589
		2864	2999	3390#										
SILTST	010446	807	1285#	1291	1295	1413								
SILWD	034414	2293	3541#											
SLOTST	017002	1746	1922#	1928	1932	2038								
SLOWD	034364	1699	3540#											
SW	032410	585*	586	791	793	811	836*	843	848	953	959	968	974	980
		986	989	1004	1012	1021	1032	1037	1042	1048	1051	1068	1077	1094
		1103	1116	1119	1128	1133	1138	1143	1149	1154	1159	1167	1171	1177
		1185	1189	1193	1204	1212	1216	1224	1231	1245	1252	1263	1270	1276
		1290	1294	1301	1308	1315	1319	1329	1338	1348	1352	1356	1365	1381
		1406	1411	1448	1453	1469	1473	1479	1483	1490	1494	1498	1504	1510
		1514	1520	1524	1530	1534	1540	1544	1557	1561	1565	1576	1591	1603
		1607	1628	1640	1644	1659	1670	1686	1697	1702	1708	1733	1735	1750
		1779	1785	1791	1797	1803	1806	1821	1829	1840	1846	1852	1858	1861
		1878	1887	1904	1913	1927	1931	1940	1947	1952	1956	1967	1980	1994
		2004	2010	2032	2036	2079	2084	2088	2093	2111	2117	2121	2125	2129
		2136	2140	2144	2150	2154	2160	2164	2170	2174	2192	2196	2200	2204
		2225	2241	2245	2260	2272	2291	2296	2303	2322	2324	2337	2376	2380
		2386	2405	2409	2412	2462	2466	2467	2475	2478	2488	2495	2515	2519
		2520	2528	2531	2541	2568	2571	2579	2582	2595	2618	2621	2640	2641
		2658	2661	2669	2672	2679	2710	2740	2747	2751	2775	2779	2794	2798
		2838	2844	2848	2852	2886	2890	2926	2930	2933	2965	2969	2973	2977
		2985	3015	3019	3023	3027	3030	3054	3057	3059*	3124#			
SRTST	004210	583	836#											
SSWA =	032406	427#	836											
SWOMP	031724	731	831	1126	3053#	3066								
SWHLI	004170	829#	845											
SWI	036060	793*	794*	795	798*	799*	800*	801	1735*	1736*	1738*	1739*	1740*	1741
		2324*	2325*	2326	2329*	2330*	2331*	2332	3580#					
SWREG	032406	427	3122#											
SWRFLG	036052	582*	729	829	837*	1124	3577#							
SWRMSG	032302	3053	3112#											
TCR	036132	860*	976	998*	1000*	1001	1007*	1008	1014*	1017*	1018	1023*	1027*	1028
		1060*	1086*	1112*	1197*	1199*	1218*	1225*	1257*	1264*	1271*	1274*	1285*	1288
		1299	1302*	1309*	1311*	1313	1321*	1323	1330*	1332*	1335*	1336	1354	1358*
		1366*	1368*	1371*	1375*	1382*	1391*	1404	1408*	1420*	1427*	1432*	1437*	1444*
		1455*	1457	1460*	1475*	1477	1486*	1496	1500*	1549*	1552*	1567*	1578*	1579*
		1593*	1598*	1605*	1617*	1621*	1627*	1633*	1648*	1651*	1657*	1664*	1678*	1681*
		1684	1688*	1711*	2359*	2388*	2393*	2429*	2436*	2443*	2448*	2451*	2497*	2502*
		2504*	2544*	2550*	2552*	2602*	2606*	2608*	2691*	2696*	2698*	2718*	2721*	2723*
		2728*	2759*	2763*	2766*	2805*	2812*	2814*	2817*	2819*	2826*	2860*	2868*	2874*
		2898*	2903*	2905*	2945*	2951*	2953*	2967	2980*	2995*	3001*	3003*	3605#	
TCRTST	005276	803	998#	1053										
IDMAD	035300	686	702	3558#										
TEMP	036076	902*	906*	907	3587#									
TESTGO	003426	724	728#											
TESTNO	036100	728*	736	742	748	754	3588#							
TEST1	003736	740	758	788#										
TEST2	015134	746	759	1730#										

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SEQ 0137

TEST3	023054	752	760	2319#										
TMP	036144	870*	961	1179*	1198	1219*	1226	1233*	1258	2360*	2446*	2693*	3610#	
TMPRH	036146	872*	1113*	1114	1130*	1131	1135*	1136	1140*	1141	1145*	1146	1148*	1151
		1153*	1156	1158*	1164*	1165	1169	1175	1183	1187	1191	1210	1214	1222
		1228*	1229	1234	1236*	1239	1247*	1250	1256*	1268	1273*	1392*	1409*	1459*
		1594*	2769	2906	3611#									
IMPRI0	036114	1630*	1635	1638	1642	1646	1649*	1653	1665*	2227*	2236	2239	2243	2247
		2250*	2254	2266*	3594#									
		588	616	640	685	3551#								
TMTR	035065	598	612	3554#										
TOLOW	035125	3195	3197#											
TPCONT	032676	3191#	3199											
TPOFCH	032652	3193	3200#											
TPOUTX	032706	700*	2490	3591#										
TRAD	036106	905	3560#											
TRAP4	035401	2338	2341#											
TREND	023212	868*	955	1025*	1039	1090*	1091	1334*	1373*	1378	1419*	1551*	1680*	2392*
TSBA	036142	2546*	2604*	2999*	3609#									
		866*	949	1024*	1034	1064*	1065	1333*	1342	1372*	1376	1418*	1550*	1555
TSBC	036140	1679*	1682	2368	2391*	2397	2450*	2500*	2548*	2605*	2694*	2720*	2761*	2807*
		2871*	2901*	2948*	2997*	3608#								
TSCRC	036150	874*	982	1692	3612#									
TSDB	036136	864*	1296*	1304	1312	1322*	1325	1361	1434	1456*	1501*	1568*	1573*	1595*
		1693	2363	2430	2445*	2499*	2695*	2722*	2727	2762*	2764*	2808*	2809*	2811*
		2818	2870*	2872*	2900*	2902*	2947*	2949*	3607#					
TSR	036134	862*	970	1015*	1026*	1044	1292	1317	1350	1445*	1446	1450*	1451	1463
		1471	1481	1485*	1487*	1488	1492	1502	1506*	1507*	1508	1512	1516*	1517*
		1518	1522	1526*	1527*	1528	1532	1536*	1537*	1538	1542	1559	1563	1571
		1574	1583	1601	1634*	1652*	2473	2476	2481	2526	2529	2534	2556	2558
		2569	2574	2619	2624	2654	2659	2664	2743	2782*	2815	2823*	2840	2846
		2882	2888	2922	2928	2975	3009	3017	3606#					
TSRTST	012120	808	1444#	1449	1609									
TSTHDR	035447	587	3561#											
TSTSEI	035533	717	3562#											
TSTWRD	036200	2604	2636	3624#										
TIB	036174	3362*	3622#											
TTO	033472	766	768	770	771	822	824	1761	1763	1765	1767	2348	2350	2352
		2353	3070	3072	3073	3197	3216	3227	3239	3325	3326	3351	3362#	3369
		3372												
TTOLF	033514	3366	3368#											
TTOLP	033476	3363#	3364											
TTS	036172	3363	3621#											
TWOSP	032401	592	606	620	632	644	666	689	705	3056	3084	3098	3116#	
TXHDR	034671	739	3547#											
TXMADR	036206	590	593	595*	596	601	859	3630#						
TXMERS	026426	2335	2691#	2711	2935									
TXMR1	026512	2700#	2709											
TXMVEC	036202	618	621	623*	875	3628#								
TXSTAT	034554	2480	2533	2573	2623	2663	3544#							
TXVEC	036122	875*	1618	1620*	1631*	1650*	3601#							
TYPCTP	032335	3060	3114#											
TYPOUT	032650	587	588	589	592	598	602	603	606	612	616	617	620	626
		628	629	632	638	640	641	644	649	653	662	663	666	671
		675	685	686	689	694	698	701	702	705	710	714	717	725
		739	745	751	757	762	818	895	905	1122	1699	1757	2293	2344
		2469	2480	2522	2533	2573	2584	2623	2628	2631	2643	2663	2674	3053

SEQ 0138

[illegible]

XE 3A	006636	1132	1135#	1139								
XE 3B	006704	1137	1140#	1144								
XE 5A	006752	1142	1145#	1150	1155	1160						
XE 6	007026	1147	1151#									
XE 6A	007074	1152	1156#									
XE 7	007142	1157	1164#	1168	1172	1186	1190	1194	1205	1213	1217	
XE 7A	007210	1166	1169#									
XE 8	007250	1170	1173#	1178								
XE 9	007316	1176	1179#	1184								
XF EMT	012066	1395	1398	1401	1432#							
XF MTW	012076	1434#	1436									
XF RT	012014	1412	1414#									
XF SR	012016	1393	1396	1399	1418#							
XF SRW	012050	1423#	1424									
XF SR1	012044	1422#	1426									
XF 1	010522	1289	1292#									
XF 10	011310	1343	1350#	1353								
XF 11	011350	1351	1354#	1357								
XF 12	011410	1355	1358#									
XF 13	011426	1361#	1370									
XF 14	011514	1364	1369#									
XF 17	011520	1371#	1383									
XF 18	011556	1376#	1377									
XF 19	011640	1380	1391#	1407								
XF 19A	011760	1405	1408#									
XF 2	010562	1293	1296#	1303	1310							
XF 20	011766	1409#										
XF 3	010644	1300	1304#	1316								
XF 3A	010726	1307	1311#									
XF 5	011000	1314	1317#	1320								
XF 6	011040	1318	1321#	1331								
XF 6A	011052	1323#	1324									
XF 7	011142	1328	1332#	1339	1349	1367						
XF 8	011232	1337	1340#									
XF 8A	011236	1341#	1347									
XF 9	011242	1342#	1345									
XH RT	014160	1608	1610#									
XH 1	012174	1447	1450#	1454								
XH 10	013040	1509	1512#									
XH 11	013100	1513	1516#	1521	1525							
XH 12	013152	1519	1522#									
XH 13	013212	1523	1526#	1531	1535							
XH 14	013264	1529	1532#									
XH 15	013324	1533	1536#	1541	1545							
XH 16	013376	1539	1542#									
XH 17	013436	1543	1549#	1558	1562	1566						
XH 18	013530	1556	1559#									
XH 19	013570	1560	1563#									
XH 2	012242	1452	1455#	1470	1474	1480	1484					
XH 2A	012312	1463#	1466									
XH 2B	012306	1462#	1468									
XH 20	013630	1564	1567#									
XH 20L	013636	1568#	1572	1573	1577							
XH 21	013726	1575	1578#	1592								
XH 21A	013746	1581#	1590									
XH 22	013754	1583#	1586	1588								

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CZPLBC.P11 07-JUN-79 15:47 CROSS REFERENCE TABLE -- USER SYMBOLS

XH22A	014030	1584	1593#	1604						
XH23	014132	1602	1605#							
XH3	012362	1464	1471#							
XH4	012422	1472	1475#							
XH5	012472	1478	1481#							
XH6	012532	1482	1485#	1491	1495	1499				
XH7	012612	1489	1492#							
XH8	012652	1493	1496#							
XH8A	012712	1497	1500#	1505						
XH9	012766	1503	1506#	1511	1515					
XINIT	004644	802	948#	954	960	969	975	981	987	991
XJRT	014564	1660	1662#							
XJO	014306	1624	1630#							
XJ1	014320	1632#	1667							
XJ2	014412	1639	1642#							
XJ3	014452	1643	1646#	1656	1672					
XJ3S	014476	1650#	1671							
XJ4	014536	1647	1657#							
XKRT	015124	1709	1711#							
XK1	014676	1682#	1683							
XK2	014744	1685	1688#							
XK3	014764	1691#	1706							
XK3S	015064	1698	1703#							
XK4	015072	1696	1704#							
XPRIO	036126	661*	1642	3603#						
XRART	023750	2413	2415#							
XRA1	023362	2368#	2371	2373						
XRA2	023436	2369	2378#							
XRA2A	023474	2379	2382#							
XRA3	023544	2383	2388#	2406	2410					
XRA3A	023612	2395#	2404							
XRA4	023620	2397#	2400	2402						
XRA5	023672	2398	2407#							
XRA6	023730	2408	2411#							
XRBR1	026424	2680	2682#							
XRBS2	024424	2477	2479	2485#						
XRBI	024172	2454#	2459							
XRBI5	024330	2468	2472#							
XRBI0	025422	2557	2577#							
XRBI0S	025510	2581	2583	2587#						
XRBI1	025516	2578	2588#							
XRBI1C	025612	2594	2600#							
XRBI1L	025532	2591#	2597	2601						
XRBI2	025616	2599	2602#	2635	2647	2666	2677			
XRBI2K	025700	2611#	2617							
XRBI2L	025674	2610#	2649							
XRBI2M	025704	2612#	2615							
XRBI2R	026004	2620	2626#							
XRBI2S	026054	2622	2635#							
XRBI2T	026032	2627	2631#							
XRBI3	026062	2613	2636#							
XRBI3C	026170	2639	2648#							
XRBI3D	026204	2652#	2653							
XRBI3E	026200	2651#	2657							
XRBI3L	026162	2642	2647#							
XRBI3S	026302	2660	2662	2666#					</	

XRB14	026310	2655	2667#				
XRB14S	026376	2671	2673	2677#			
XRB15	026404	2668	2678#				
XRB2	024336	2465	2473#				
XRB3	024432	2474	2484#				
XRB4	024506	2487	2490#				
XRB4C	024570	2494	2497#	2516	2525	2536	2542
XRB4D	024654	2506#	2514				
XRB5	024660	2507#	2512				
XRB6	025024	2518	2521	2526#			
XRB6S	025112	2530	2532	2536#			
XRB7	025120	2527	2537#				
XRB8	025172	2540	2543#	2576	2587	2598	
XRB8A	025270	2554#	2567				
XRB9	025276	2556#	2563	2565			
XRB9S	025414	2570	2572	2576#			
XRCNT	024032	2430#	2435				
XRCRET	030712	2934	2936#				
XRCRT	031670	3031	3033#				
XRC1	026520	2702#	2705	2707			
XRC10	027556	2815#	2816				
XRC10A	027666	2829#	2830				
XRC10B	027662	2828#	2832				
XRC11	027760	2837	2840#				
XRC12	030034	2843	2846#				
XRC13	030074	2847	2850#				
XRC14	030134	2851	2860#	2887	2891		
XRC15	030166	2865#	2867				
XRC15A	030260	2877#	2878				
XRC15B	030254	2876#	2880				
XRC16	030352	2885	2888#				
XRC17	030412	2889	2898#	2927	2931		
XRC18	030472	2906#	2907				
XRC18A	030540	2917#	2918				
XRC18L	030512	2910#	2911				
XRC18X	030506	2909#	2913				
XRC18Y	030534	2916#	2920				
XRC19	030632	2925	2928#				
XRC19A	030672	2929	2932#				
XRC2	026574	2703	2718#	2741	2748	2752	
XRC24	026676	2731#	2732				
XRC2D	026672	2730#	2734				
XRC20	030714	2336	2945#	2966	2970	2974	2978 3032
XRC21	031002	2954#	2955				
XRC21A	031024	2958#	2964				
XRC22	031030	2959#	2962				
XRC23	031100	2960	2967#				
XRC24	031140	2958	2971#				
XRC25	031200	2972	2975#				
XRC26	031240	2976	2979#	2986			
XRC27	031330	2984	2995#	3016	3020	3024	3028
XRC29	031416	3004#	3005				
XRC29A	031440	3008#	3014				
XRC3	026770	2739	2742#				
XRC30	031444	3009#	3012				
XRC31	031512	3010	3017#				

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEO 0148

[illegible]

BDINIT	477#	1060	1086	1112	1285	1302	1309	1330	1332	1371	1382	1391	1408	1444	1455
	1500	1549	1567	1578	1593	1605	1617	1548	1657	1664	1678	1711	1870	1896	1922
	1941	1948	1968	1971	2019	2034	2075	2095	2131	2179	2202	2214	2249	2258	2265
	2271	2280	2306	2358	2359	2388	2389	2443	2444	2497	2498	2544	2545	2602	2603
	2691	2692	2718	2719	2759	2760	2805	2806	2860	2861	2898	2899	2945	2946	2979
	2980	2995	2996												
DATERR	503#	953	959	968	974	980	986	1004	1012	1021	1032	1037	1042	1048	1068
	1094	1204	1263	1308	1329	1365	1381	1702	1779	1785	1791	1797	1803	1821	1829
	1840	1846	1852	1858	1878	1904	1947	1967	2004	2117	2296	2380	2386	2409	2488
	2495	2541	2595	2640	2740	2747	2794	2838	2844	2886	2926				
ERROR	494#	1116	1133	1138	1143	1149	1154	1159	1167	1171	1177	1185	1189	1193	1212
	1216	1224	1231	1245	1252	1270	1290	1294	1301	1315	1319	1338	1348	1352	1356
	1406	1448	1453	1469	1473	1479	1483	1490	1494	1498	1504	1510	1514	1520	1524
	1530	1534	1540	1544	1557	1561	1565	1576	1591	1603	1628	1640	1644	1670	1686
	1927	1931	1940	1952	1956	1980	1994	2010	2032	2079	2084	2088	2093	2111	2121
	2125	2129	2136	2140	2144	2150	2154	2160	2164	2170	2174	2192	2196	2200	2225
	2241	2245	2272	2376	2405	2462	2466	2475	2515	2519	2528	2568	2579	2618	2658
	2669	2710	2751	2775	2779	2798	2848	2852	2890	2930	2965	2969	2973	2977	2985
	3015	3019	3023	3027											
HLT	512#	845													
MTPS	536#	570	574	581	788	1616	1622	1625	1632	1635	1653	1730	2213	2219	2222
	2229	2236	2254	2319											
PNTM	518#	587	588	589	592	598	602	603	606	612	616	617	620	626	628
	629	632	638	640	641	644	649	653	662	663	666	671	675	685	686
	689	694	698	701	702	705	710	714	717	725	739	745	751	757	762
	818	895	905	1122	1699	1757	2293	2344	2469	2480	2522	2533	2573	2584	2623
	2628	2631	2643	2663	2674	3053	3056	3060	3080	3084	3095	3098	3103	3134	3137
	3149	3152													
REGRES	547#	3284	3293	3302	3311	3320									
REGSAV	543#	3280	3289	3298	3307	3316									
SCOPE	525#	954	960	969	975	981	987	1005	1013	1022	1033	1038	1043	1049	1069
	1095	1117	1134	1139	1144	1150	1155	1160	1168	1172	1178	1186	1190	1194	1205
	1213	1217	1227	1232	1246	1253	1265	1272	1291	1295	1303	1310	1316	1320	1331
	1339	1349	1353	1357	1367	1383	1407	1449	1454	1470	1474	1480	1484	1491	1495
	1499	1505	1511	1515	1521	1525	1531	1535	1541	1545	1558	1562	1566	1577	1592
	1604	1629	1641	1645	1671	1687	1703	1780	1786	1792	1798	1804	1822	1830	1841
	1847	1853	1859	1879	1905	1928	1932	1942	1949	1953	1957	1969	1981	1995	2005
	2011	2033	2080	2085	2089	2094	2112	2118	2122	2126	2130	2137	2141	2145	2151
	2155	2161	2165	2171	2175	2193	2197	2201	2226	2242	2246	2273	2297	2377	2381
	2387	2406	2410	2463	2472	2483	2489	2496	2516	2525	2536	2542	2576	2587	2598
	2635	2647	2666	2677	2711	2741	2748	2752	2776	2780	2795	2799	2839	2845	2849
	2853	2887	2891	2927	2931	2966	2970	2974	2978	2986	3016	3020	3024	3028	

. ABS. 036212 000

ERRORS DETECTED: 0

CZPLBC,CZPLBC/CR=CZPLBC
 RUN-TIME: 17 36 5 SECONDS
 RUN-TIME RATIO: 127/60=2.1
 CORE USED: 12K (23 PAGES)