RP04,05,06

DUAL CONTROLLER LOGIC
CZRJECO

AH-9201C-MC

FICHE 1 OF 1

APR 1978
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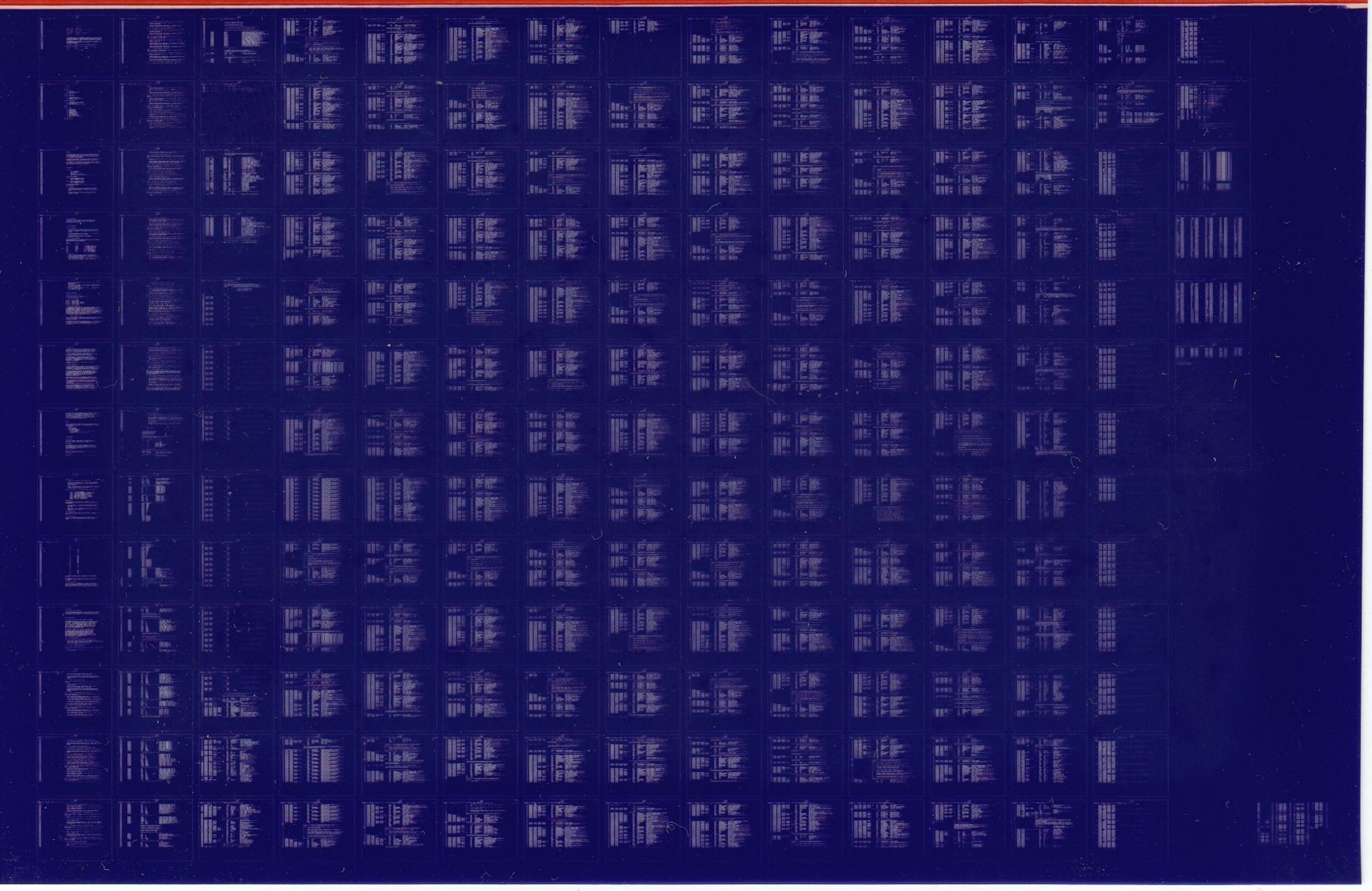
MADE IN USA



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I D E N T I F I C A T I O N

PRODUCT CODE: AC-9200C-MC

PRODUCT NAME: CZRJECO RP04/5/6 DL CTRLR LGC

DATE CREATED: MARCH 1978

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: C. HESS

CONTENTS

1. ABSTRACT

THE RP04/5/6 DUAL CONTROLLER LOGIC TEST PERFORMS A SERIES OF TESTS WHICH VERIFY THAT THE RP04/5/6 DUAL CONTROLLER LOGIC IS FUNCTIONING PROPERLY. ONLY THE CONTROL LOGIC IS TESTED BY THIS PROGRAM; DATA HANDLING IN THE DUAL CONTROLLER MODE IS NOT TESTED BY THIS PROGRAM.

BOTH PORTS OF THE DRIVE ARE CABLED TO THE SAME MASSBUS BY A SPECIAL ADAPTER CABLE. THIS ARRANGEMENT ALLOWS THE DUAL CONTROLLER LOGIC TO BE TESTED FROM ONE PDP-11/RH11 OR RH70.

THIS PROGRAM IS THE FIRST PART OF THE DUAL CONTROLLER OPTION LOGIC TEST. ALL OF THE DUAL CONTROLLER OPTION LOGIC, EXCEPT THE LOGIC ASSOCIATED WITH THE UNLOAD COMMAND AND THE CONTROLLER SELECT SWITCH, IS TESTED BY THIS PROGRAM.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 PROCESSOR
16K OF MEMORY
KW11-L OR KW11-P CLOCK
TELETYPE
RH11 OR RH70 WITH AN RP04/5/6
RP04/5/6 DUAL CONTROLLER OPTION TEST CABLE

2.2 PRELIMINARY PROGRAMS

RP04/5/6 DISKLESS CONTROLLER TEST
PART 1 (MAINDEC-11-DZRJG)
PART 2 (MAINDEC-11-DZRJH)

RP04/5/6 FUNCTIONAL CONTROLLER TEST
PART 1 (MAINDEC-11-DZRJI)
PART 2 (MAINDEC-11-DZRJJ)

THE PRELIMINARY PROGRAMS MUST BE RUN TWICE: ONCE FROM EACH CONTROLLER (PORT).

2.3 OTHER PROGRAMS

A. THE OPERATION OF THE UNLOAD COMMAND AND THE OPERATION OF THE 'CONTROLLER SELECT' SWITCH ARE TESTED BY THE RP04/5/6 DUAL CONTROLLER LOGIC TEST, PART 2 (MAINDEC-11-DZRJF).

B. DYNAMIC OPERATION OF THE DUAL CONTROLLER OPTION IS TESTED BY THE RP04/5/6 MULTIDRIVE EXERCISER PROGRAM (MAINDEC-11-DZRJD).

3. LOADING PROCEDURES

THE PROGRAM MAY BE LOADED BY THE ABSOLUTE PAPER TAPE LOADER OR IT MAY BE LOADED FROM THE APPROPIATE MEDIA USING THE ASSOCIATED 'XXDP' LOADER. THE PROGRAM MAY NOT BE INCLUDED IN AN 'XXDP' CHAIN.

4. STARTING PROCEDURES

4.1 STARTING ADDRESSES

A. THE NORMAL STARTING ADDRESS OF THE PROGRAM IS LOCATION 200 (8). STARTING AT THIS ADDRESS ALLOWS THE OPERATOR TO SELECT (OR RESELECT) THE ADDRESS OF THE DRIVE TO BE TESTED.

B. THE RESTART ADDRESS IS LOCATION 200 (8). THE PROGRAM WILL USE THE CURRENT DRIVE (DCL) ADDRESS.

C. THE PROGRAM CAN BE STARTED AT LOCATION 204 (8) TO ALLOW THE ADDRESS OF THE RH11 OR RH70 TO BE CHANGED.

4.2 UNIBUS & VECTOR ADDRESSES

THE PROGRAM ASSUMES THE FOLLOWING UNIBUS AND VECTOR ADDRESSES. THESE ADDRESSES MAY BE CHANGED PRIOR TO STARTING THE PROGRAM FROM ANY OF THE STARTING ADDRESSES.

MEMORY LOCATION	CONTENTS	FUNCTION
1142	177560	TTY KEYBOARD STATUS REG
1144	177562	TTY KEYBOARD BUFFER REG
1146	177564	TTY PRINTER STATUS REG
1150	177566	TTY PRINTER BUFFER REG
1210	172540	KW11-P STATUS REG
1212	172542	KW11-P COUNTER BUFFER
1214	104	KW11-P VECTOR ADDRESS
1216	177546	KW11-L STATUS REGISTER
1220	100	KW11-L VECTOR ADDRESS

4.3 OPERATOR ACTION

A. CONNECT THE DUAL CONTROLLER TEST CABLE BETWEEN BUS A & BUS B ON THE DRIVE BEING TESTED. (SEE SECTION 5.4)
B. LOAD THE PROGRAM INTO MEMORY IN THE PROCESSOR CONTROLLING THE MASSBUS USED FOR TESTING.
C. SWITCH THE 'CONTROLLER SELECT' SWITCH ON THE DRIVE TO BE TESTED TO THE 'A/B' POSITION. CYCLE THE DRIVE UP.
D. LOAD THE APPROPIATE STARTING ADDRESS (200(8), 204(8) OR 210(8)).

INTO THE SWITCH REGISTER (OR THE 'SOFTWARE' SWITCH REGISTER, REFER TO SECTION 5.2).

E. PRESS START.

F. ENTER THE DRIVE NUMBER. (THIS MUST BE THE NUMBER DISPLAYED BY THE DRIVE, IF AN RP04, OR THE NUMBER OF THE ADDRESS PLUG IF THE DRIVE IS AN RP05/6).

G. ENTER THE NUMBER OF THE TEST TO BE RUN. ('CARRIAGE RETURN' OR '0' WILL RUN ALL TESTS.)

H. THE PROGRAM MAY BE STOPPED AT ANY TIME AND RESTARTED FROM LOCATION 200.

5. OPERATING PROCEDURES

5.1 OPERATIONAL SWITCH SETTINGS

WITH ALL SWITCHES SET TO ZERO, THE PROGRAM WILL TYPE ALL ERRORS AND CONTINUE TESTING.

THE SWITCH SETTINGS ARE:

SW<15>=1...HALT ON ERROR
SW<14>=1...LOOP ON TEST
SW<13>=1...INHIBIT ERROR TYPEOUTS
SW<11>=1...INHIBIT TEST ITERATIONS
SW<10>=1...RING TTY BELL ON ERROR
SW<09>=1...LOOP ON ERROR

5.2 'SOFTWARE' SWITCH REGISTER

IF THE PROGRAM IS BEING RUN ON A SWITCHLESS PROCESSOR (I.E. AN 11/34) THE PROGRAM WILL DETERMINE THAT THE HARDWARE SWITCH REGISTER IS NOT PRESENT AND WILL USE A 'SOFTWARE' SWITCH REGISTER. THE 'SOFTWARE' SWITCH REGISTER IS LOCATED AT LOCATION 176 (8). THE SETTINGS OF THE 'SOFTWARE' SWITCHES ARE CONTROLLED THROUGH A KEYBOARD ROUTINE WHICH IS CALLED BY TYPING A 'CONTROL G'. THE PROGRAM WILL RECOGNIZE THE 'CONTROL G' AT ANY TIME EXCEPT WHEN THE PROGRAM IS AT A HIGHER PRIORITY PROCESSING AN RP04/5/6 INTERRUPT. THE 'SOFTWARE' SWITCH VALUES ARE ENTERED AS AN OCTAL NUMBER IN RESPONSE TO THE PROMPT FROM THE SWITCH ENTRY ROUTINE:

'SWR = NNNNNN NEW ='

EACH TIME SWITCH SETTING ARE ENTERED, THE ENTIRE SWITCH REGISTER IMAGE MUST BE ENTERED. LEADING ZEROS ARE NOT REQUIRED. 'RUBOUT' AND 'CONTROL U' FUNCTIONS MAY BE USED TO CORRECT TYPING ERRORS DURING SWITCH ENTRY.

ON PROCESSORS WITH HARDWARE SWITCH REGISTERS, THE 'SOFTWARE' SWITCH REGISTER MAY BE USED. IF THE PROGRAM FINDS ALL 16 SWITCHES IN THE 'UP' POSITION, ALL SWITCH REGISTER REFERENCES WILL BE TO THE 'SOFTWARE' REGISTER AND THE PROCEDURES DESCRIBED ABOVE MUST BE FOLLOWED.

5.3 TEST SELECTION

INDIVIDUAL TESTS ARE SELECTED IN RESPONSE TO THE 'ENTER TEST NUMBER:' MESSAGE. ANY VALID TEST NUMBER CAN BE ENTERED. EACH ENTRY MUST BE TERMINATED BY A CARRIAGE RETURN (CR). THE LOOP ON TEST SWITCH, SW<15>, MUST BE SET TO ALLOW CONTINUOUS EXECUTION OF THE SELECTED TEST.

TO RUN ALL TESTS IN SEQUENCE, ENTER EITHER A '0' FOLLOWED BY A CARRIAGE RETURN OR A CARRIAGE RETURN BY ITSELF. THE PROGRAM WILL THEN EXECUTE ALL TESTS IN SEQUENCE.

THE 'RUBOUT KEY' (RO) CAN BE USED TO DELETE THE LAST CHARACTER ENTERED. SUCCESSIVELY STRIKING THE RO KEY WILL DELETE CHARACTERS UNTIL THE PREVIOUS CHARACTERS HAVE BEEN DELETED. CHARACTERS DELETED BY THE RO KEY WILL BE TYPED AND WILL BE SEPARATED BY '\' FROM THE CHARACTERS ENTERED BY THE OPERATOR.

THE OPERATOR CAN DELETE AN ENTIRE ENTRY BY TYPING A 'CONTROL U' (↑U).

5.4 TEST CABLE CONNECTION

TO TEST THE RP04/5/6 DUAL CONTROLLER OPTION WITH THIS PROGRAM, A SPECIAL TEST CABLE MUST BE USED. (THE TEST CABLE IS P/N 7010507-02). THE TEST CABLE CONNECTS MASSBUS A & MASSBUS B TOGETHER AT THE DRIVE BEING TESTED AND IS CONSTRUCTED SO THAT BIT 0 OF THE MASSBUS UNIT SELECT LINES IS COMPLEMENTED.

WITH THE DRIVE CABLE CONNECTED TO THE RP04 UNDER TEST, THE DRIVE APPEARS AS TWO UNITS ON THE MASSBUS: EACH PORT OF THE DRIVE WILL RESPOND TO A DIFFERENT MASSBUS ADDRESS. THE ADDRESS OF EACH PORT WILL DEPEND UPON THE DRIVE'S ADDRESS (THE ADDRESS SELECTED BY THE SWITCHES ON THE 'DP' BOARD - MODULE M7775 FOR RP04'S, OR BY THE ADDRESS PLUG FOR RP05/6'S.)

THE PROGRAM WILL TYPEOUT THE APPARENT ADDRESSES OF BOTH PORTS. (ONE PORT WILL HAVE THE ADDRESS OF THE DRIVE; THE OTHER PORT WILL HAVE THE ADDRESS DEVELOPED BY THE CABLE).

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**************************************************************
* ANY OTHER DRIVE ON THE MASSBUS WHICH HAS AN ADDRESS        *
* IN CONFLICT WITH EITHER OF THE TEST ADDRESSES MUST BE      *
* POWERED DOWN.                                              *
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THE TEST CABLE CONNECTION TO THE DRIVE UNDER TEST WILL DEPEND ON WHICH PROCESSOR/RH11 IS TO TEST THE DRIVE. IF THE DRIVE IS TO BE TESTED BY THE PROCESSOR ON PORT A, THE TEST CABLE IS CONNECTED FROM 'BUS A OUT' TO 'BUS B IN'. IF THE DRIVE IS TO BE TESTED BY THE PORT B PROCESSOR, THE TEST CABLE IS CONNECTED FROM 'BUS B OUT' TO 'BUS A IN'.

WHEN THE DUAL PORT TEST CABLE IS CONNECTED, THE ATTENTION

BITS FOR PORTS A & B ARE ASSERTED IN THE SAME BIT POSITION WHEN 'RPAS' (ATTENTION SUMMARY REGISTER) IS READ. THE ATTENTION BIT POSITION IS DETERMINED BY THE ADDRESS OF THE DRIVE THE ATTENTION BIT THAT APPEARS FOR THE DRIVE IS THE INCLUSIVE 'OR' OF THE PORT A & PORT B ATTENTION BITS. BECAUSE OF THIS, THE PROGRAM LOOKS AT ONLY THE ATTENTION BIT IN 'RPDS' (DRIVE STATUS REGISTER) TO DETERMINE THE STATE OF THE SELECTED PORTS'S ATTENTION BIT.

6. ERRORS

WHEN THE PROGRAM ENCOUNTERS AN ERROR, THE ERROR ROUTINE IS CALLED AND IF SW<13> IS NOT SET, THE ERROR MESSAGE PERTAINING TO THE ERROR WILL BE TYPED. EACH ERROR TYPEOUT WILL CONTAIN THE FOLLOWING:

A. AN ERROR MESSAGE
B. A DATA HEADER LINE
C. A DATA LINE CONTAINING:
    1. THE TEST NUMBER
    2. THE PC (PROGRAM COUNTER VALUE) WHERE THE ERROR CALL WAS MADE
    3. CONTENTS OF THE APPROPIATE REGISTERS

7. MISCELLANEOUS

7.1 RESTRICTIONS

TO RUN THIS PROGRAM, THE SYSTEM MUST HAVE EITHER A KW11-P OR A KW11-L CLOCK. ADDITIONALLY, THE DRIVE UNDER TEST MUST HAVE THE DUAL PORT TEST CABLE CONNECTED.

7.2 LIMITATIONS

THIS PROGRAM DOES NOT TEST DATA TRANSFERS THROUGH EITHER PORT, DOES NOT TEST THE DYNAMIC OPERATION OF THE DUAL CONTROLLER OPTION, AND DOES NOT TEST THE UNLOAD COMMAND OR THE OPERATION OF THE CONTROLLER SELECT SWITCH ON THE DRIVE. (REFER TO PARAGRAPH 2.2 & 2.3)

7.3 EXECUTION TIME

PASS 1 OF THE PROGRAM TAKES ABOUT 45 SECONDS. PASS 2 AND SUBSEQUENT PASSES TAKE 2.5 MINUTES.

7.4 STACK POINTER

THE STACK IS INITIALLY SET TO 1100 AND EXTENDS DOWNWARD IN MEMORY.

7.5 SUBROUTINE CALLS

THE SUBROUTINE CALLS USED BY THE PROGRAM ARE:

A. 'SCOPE' (IOT INSTRUCTION). THIS CALL IS PLACED BETWEEN EACH TEST IN THE INSTRUCTION. THIS ROUTINE ESTABLISHES THE ITERATION COUNT AND THE LOOP ON TEST AND LOOP ON ERROR ADDRESSES.

B. 'ERROR' (EMT INSTRUCTION). THIS CALL IS USED TO REPORT ALL ERRORS. THE CALL IS FOLLOWED BY A NUMBER WHICH IDENTIFIES THE ERROR MESSAGE WHICH WILL BE TYPED.

THE TRAP INSTRUCTION IS USED FOR THE FOLLOWING SUBROUTINE CALLS:

TYPE - TTY TYPEOUT ROUTINE
TYPOC - TYPE OCTAL NUMBER (WITH LEADING ZERO)
TYPOS - TYPE OCTAL NUMBER (NO LEADING ZEROS)
TYPON - TYPE OCTAL NUMBER PER LAST CALL
TYPDS - TYPE DECIMAL NUMBER WITH SIGN
RDCHR - READ CHARACTER FROM TTY KEYBOARD
RDLIN - READ A LINE FROM THE TTY KEYBOARD.
RDOCT - READ AN OCTAL NUMBER FROM THE TTY KEYBOARD
SAVREG - ROUTINE TO SAVE R0-R5
RESREG - ROUTINE TO RESTORE R0-R5

7.6 REQUIRED TESTS

IF THE PROGRAM IS BEING EXECUTED IN SINGLE TEST MODE, THE OPERATOR MUST CALL AND RUN THE FOLLOWING TESTS BEFORE OTHER TESTS ARE RUN:

A. TEST 2 AND TEST 3. THESE TESTS DETERMINE AND STORE FOR LATER USE THE TIMEOUT NON-SHOT VALUE MEASURED THROUGH EACH PORT.

B. TEST 4 AND TEST 5. THESE TESTS SET 'VV-A' AND 'VV-B', RESPECTIVLY. THESE TESTS MUST BE PERFORMED AT LEASE ONCE BEFORE TESTS 6 - 46 ARE RUN.

7.7 DISK SURFACE USAGE

THIS DIAGNOSTIC DOES NOT USE THE DISK SURFACE. HOWEVER, THE DRIVE MUST BE CYCLED UP AND BE ON LINE FOR THE DIAGNOSTIC TO BE RUN.

7.8 TEST ITERATIONS

EACH TEST IS PERFORMED ONCE ON THE FIRST PASS THROUGH THE PROGRAM. ON THE SECOND AND SUBSEQUENT PASSES THROUGH THE PROGRAM, EACH TEST IS PERFORMED THE FOLLOWING NUMBER OF TIMES:

ITERATION COUNT

TEST NO. (IN DECIMAL)

01	1
02	10
03	10
04	1
05	1
06	4000
07	4000
10	100
11	100
12	4000
13	4
14	4
15	4
16	4000
17	4000
20	4000
21	4000
22	4000
23	4000
24	4000
25	4000
26	4000
27	4000
30	4000
31	4
32	4
33	4000
34	4000
35	4
36	4
37	4
40	4
41	4000
42	4000
43	4000
44	4000
45	20
46	20

IF AN ERROR OCCURS IN A TEST, THAT TEST WILL BE PERFORMED ONLY ONCE. THE OCCURENCE OF AN ERROR FORCES THE ITERATION COUNT TO '1'.

TEST PERFORMED IN THE SINGLE TEST MODE WILL BE ITERATED THE NUMBER OF TIMES SPECIFIED BY THE ITERATION COUNT FOR THE TEST.

7.9 LOOP ON ERROR OPTION

IF SW<09> IS SET, THE PROGRAM WILL LOOP ON A FAILING TEST UNTIL EITHER THE SWITCH IS RESET OR THE ERROR STOPS OCCURING. BECAUSE THE PROGRAM MUST RESET THE RPO4 TO A KNOWN STATE BEFORE LOOPING ON THE ERROR, THE TEST FOR SW<09> IS PERFORMED AT THE END OF THE TEST - NOT AT THE POINT WHERE THE ERROR

WAS DETECTED.

7.10 SPECIAL M7775 'DP' BOARD TESTS

THE PROGRAM CONTAINS 2 SPECIAL TESTS FOR THE M7775 'DP' BOARD TO VERIFY THE PROPER OPERATION OF THE PORT TIMEOUT ONE-SHOT. THESE TESTS ARE NOT RUN AS PART OF THE NORMAL SEQUENCE AND MUST BE SELECTED BY THE OPERATOR. THE TESTS ARE TEST 45 AND TEST 46.

8. TEST DESCRIPTIONS

8.1 METHOD USED TO VERIFY THAT THE DRIVE IS IN NEUTRAL

THE PROGRAM DETERMINES THAT THE DRIVE IS IN NEUTRAL BY CHECKING THE CONTENTS OF THE DRIVE STATUS REGISTER (RPDS1) THROUGH BOTH PORTS. THE PROGRAM MASKS OUT THE PORT DEPENDENT BITS ('ATA' & 'VV') AND VERIFIES THAT CORRECT STATUS IS READ THROUGH BOTH PORTS. (THE CORRECT STATUS IS 'MOL', 'PGM', 'DPR', & 'DRY'.) IF NEITHER PORT SEES ALL ZEROS FROM RPDS1, THE PROGRAM CONCLUDES THAT THE DRIVE IS IN NEUTRAL AND THAT ANY BIT DESCREPANCY BETWEEN PORTS INDICATES A FAILURE IN THE PATH FOR THAT BIT.

8.2 METHOD USED TO VERIFY THAT THE DRIVE HAS BEEN SEIZED

THE PROGRAM VERIFIES THAT THE DRIVE HAS BEEN SEIZED BY CHECKING THE DRIVE STATUS REGISTER (RPDS1) THROUGH THE SEIZING PORT AND VERIFING THAT CORRECT STATUS IS SEEN. WHEN RPDS1 IS READ THROUGH THE OPPOSITE PORT, ZEROS SHOULD BE SEEN. IF BOTH CONDITIONS EXIST, (I.E., CORRECT STATUS THROUGH THE SEIZING PORT AND ZEROS THROUGH THE OPPOSITE PORT), THE PROGRAM CONCLUDES THAT THE DRIVE HAS BEEN SEIZED BY THE SPECIFIED PORT.

8.3 TEST 1 - DRIVE ACCESS TEST

VERIFY THAT THE DRIVE CAN BE ACCESSED THROUGH BOTH PORTS

A. SELECT DRIVE, VERIFY THAT THE DRIVE IS PRESENT, THAT THE DRIVE IS A DUAL PORT RP04/5/6, THAT THE DRIVE IS ONLINE (RPDS1 HAS 'MOL', 'PGM', 'DPR', & 'DRY' BITS SET), AND THE THE DRIVE SERIAL NUMBER READ THROUGH BOTH PORTS IS THE SAME.

B. THE TEST IS REPEATED THROUGH BOTH PORTS.

8.4 TEST 2 - PORT 'A' SEIZE/TIMEOUT TEST

VERIFY THAT THE DRIVE CAN BE SEIZED AND THAT THE PORT TIMEOUT RELEASES THE DRIVE.

A. WRITE 0'S INTO RPDS1 THROUGH PORT 'A'; VERIFY THAT THE DRIVE HAS BEEN SEIZED.

B. READ EACH DRIVE REGISTER, EXCEPT RPCS1, THROUGH PORT 'B';
VERIFY THAT 0'S ARE READ FROM EACH REGISTER.

C. WAIT FOR THE PORT TIMEOUT TO OCCUR AND RELEASE THE DRIVE.
MEASURE THE DURATION OF THE TIMEOUT ONE SHOT AND SAVE THE
VALUE FOR LATER USE. VERIFY THAT TIMEOUT RETURNED THE DRIVE TO
NEUTRAL.

8.5 TEST 3 - PORT 'B' SEIZE/TIMEOUT TEST

VERIFY THAT THE DRIVE CAN BE SEIZED AND THAT THE PORT TIMEOUT RELEASES
THE DRIVE.

A. WRITE 0'S INTO RPDS1 THROUGH PORT 'B'; VERIFY THAT THE DRIVE
HAS BEEN SEIZED.

B. READ EACH DRIVE REGISTER, EXCEPT RPCS1, THROUGH PORT 'A';
VERIFY THAT 0'S ARE READ FROM EACH REGISTER.

C. WAIT FOR THE PORT TIMEOUT TO OCCUR AND RELEASE THE DRIVE.
MEASURE THE DURATION OF THE TIMOUT ONE SHOT AND SAVE THE
VALUE FOR LATER USE. VERIFY THAT TIMEOUT RETURNED THE DRIVE TO
NEUTRAL.

8.6 TEST 4 - PORT 'A' COMMAND SEIZE TEST & SET 'VV-A'

VERIFY THAT THE DRIVE IS SEIZED WHEN A COMMAND IS ISSUED. SET 'VV'
FOR THE PORT UNDER TEST.

A. ISSUE A DRIVE CLEAR COMMAND THROUGH PORT 'A'. VERIFY THAT THE
DRIVE WAS SEIZIED BY PORT 'A' AND THAT THE 'GO' BIT RESET.

B. ISSUE A READIN PRESET COMMAND THROUGH PORT 'A'. VERIFY THAT THE
'VV' BIT WAS SET FOR PORT 'A' AND THAT THE 'VV' BIT WAS NOT SET

FOR PORT 'B'. (NOTE THAT THE 'VV' BIT NOT BEING SET FOR PORT
'B' CAN ONLY BE TESTED THE FIRST TIME THROUGH THE PROGRAM.)

C. STALL FOR 2 SECONDS THEN VERIFY THAT THE PORT TIMEOUT RELEASED
THE DRIVE AND THE THE DRIVE RETURNED TO NEUTRAL.

8.7 TEST 5 - PORT 'B' COMMAND SEIZE TEST & SET 'VV-B'

VERIFY THAT THE DRIVE IS SEIZED WHEN A COMMAND IS ISSUED. SET 'VV'
FOR THE PORT UNDER TEST.

A. ISSUE A DRIVE CLEAR COMMAND THROUGH PORT 'B'. VERIFY THAT THE
DRIVE WAS SEIZIED BY PORT 'B' AND THAT TEH 'GO' BIT RESET.

B. ISSUE A READIN PRESET COMMAND THROUGH PORT 'B'. VERIFY THAT THE
'VV' BIT FOR PORT 'B' WAS SET.

C. STALL FOR 2 SECONDS THEN VERIFY THAT THE PORT TIMEOUT RELEASED
THE DRIVE AND THE THE DRIVE RETURNED TO NEUTRAL.

8.8 TEST 6 - TEST RELEASE, DRIVE SEIZED BY PORT 'A'

```
6139
6140                    TEST THE OPERATION OF THE RELEASE COMMAND, DRIVE SEIZED
6141
6142                    A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
6143
6144                    B.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
6145                        RETURNED TO NEUTRAL, AND THAT NO ERRORS ARE INDICATED BY THE
6146                        DRIVE.
6147
6148            8.9     TEST 7 - TEST RELEASE, DRIVE SEIZED BY PORT 'B'
6149
6150                    TEST THE OPERATION OF THE RELEASE COMMAND, DRIVE SEIZED
6151
6152                    A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
6153
6154                    B.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
6155                        RETURNED TO NEUTRAL, AND THAT NO ERRORS ARE INDICATED BY THE
6156                        DRIVE.
6157
6158            8.10    TEST 10 - TEST RELEASE THROUGH PORT 'A', DRIVE IN NEUTRAL
6159
6160                    TEST OPERATION OF RELEASE COMMAND, DRIVE IN NEUTRAL
6161
6162                    A.  ISSUE A RELEASE COMMAND THROUGH PORT 'A' WITH THE DRIVE IN
6163                        NEUTRAL; VERIFY THAT THE DRIVE REMAINS IN NEUTRAL.
6164
6165            8.11    TEST 11 - TEST RELEASE THROUGH PORT 'B', DRIVE IN NEUTRAL
6166
6167                    TEST OPERATION OF RELEASE COMMAND, DRIVE IN NEUTRAL
6168
6169                    A.  ISSUE A RELEASE COMMAND THROUGH PORT 'B' WITH THE DRIVE IN
6170                        NEUTRAL; VERIFY THAT THE DRIVE REMAINS IN NEUTRAL.
6171
6172            8.12    TEST 12 - TEST THAT 'CLEAR' DOES NOT CAUSE RELEASE FROM PORT 'A'
6173
6174                    VERIFY THAT A MASSBUS CLEAR OR DRIVE CLEAR WILL NOT CAUSE THE SEIZING
6175                    PORT TO RELEASE THE DRIVE.
6176
6177                    A.  SEIZE THE DRIVE BY WRITING 0'S INTO RPDS1 THROUGH PORT 'A'.
6178                        VERIFY THAT THE DRIVE HAS BEEN SEIZED.
6179
6180                    B.  ISSUE A DRIVE CLEAR THROUGH PORT 'A' AND VERIFY THAT THE DRIVE
6181                        DOES NOT RETURN TO NEUTRAL.
6182
6183                    C.  ISSUE A MASSBUS CLEAR THROUGH THE RH11 AND VERIFY THAT THE DRIVE
6184                        DOES NOT RETURN TO NEUTRAL.
6185
6186                    D.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
6187                        RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
6188
6189            8.13    TEST 13 - TEST THAT 'CLEAR' DOES NOT CAUSE RELEASE FROM PORT 'B'
6190
6191                    VERIFY THAT A MASSBUS CLEAR OR DRIVE CLEAR WILL NOT CAUSE THE SEIZING
6192                    PORT TO RELEASE THE DRIVE.
6193
6194                    A.  SEIZE THE DRIVE BY WRITING 0'S INTO RPDS1 THROUGH PORT 'B'.
```

VERIFY THAT THE DRIVE HAS BEEN SEIZED.

B. ISSUE A DRIVE CLEAR THROUGH PORT 'B' AND VERIFY THAT THE DRIVE DOES NOT RETURN TO NEUTRAL.

C. ISSUE A MASSBUS CLEAR THROUGH THE RH11 AND VERIFY THAT THE DRIVE DOES NOT RETURN TO NEUTRAL.

D. RELEASE THE DRIVE THROUGH PORT 'B'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.14 TEST 14 - TEST RESET ATTENTION 'A' BY MASSBUS CLEAR

VERIFY THAT A MASSBUS INITIALIZE CLEARS ONLY THE ATTENTION BIT OF THE SEIZING PORT.

A. SET EACH PORT 'S ATTENTION BIT. VERIFY THAT BOTH ATTENTION BITS SET.

B. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

C. ISSUE A MASSBUS CLEAR.

D. RELEASE THE DRIVE THROUGH PORT 'A'. VERIFY THAT THE ATTENTION BIT FOR PORT 'A' HAS BEEN CLEARED AND THE ATTENTION BIT FOR PORT 'B' IS STILL SET.

8.15 TEST 15 - TEST RESET ATTENTION 'B' BY MASSBUS CLEAR

VERIFY THAT A MASSBUS INITIALIZE CLEARS ONLY THE ATTENTION BIT OF THE SEIZING PORT.

A. SET EACH PORT'S ATTENTION BIT. VERIFY THAT BOTH ATTENTION BITS SET.

B. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

C. ISSUE A MASSBUS CLEAR.

D. RELEASE THE DRIVE THROUGH PORT 'B'. VERIFY THAT THE ATTENTION BIT FOR PORT 'B' HAS BEEN CLEARED AND THE ATTENTION BIT FOR PORT 'A' IS STILL SET.

8.16 TEST 16 - TEST CLEAR ATTENTION BY MASSBUS INIT - DRIVE IN NEUTRAL

VERIFY THAT MASSBUS CLEAR DOES NOT RESET ATTENTION BITS WHEN THE DRIVE IS IN NEUTRAL.

A. SET THE ATTENTION BITS FOR BOTH PORTS.

B. VERIFY THAT THE DRIVE IS IN NEUTRAL.

C. ISSUE A MASSBUS INIT. VERIFY THAT NEITHER ATTENTION BIT HAS RESET.

8.17 TEST 17 - TEST SEIZE BY RPCS1 READ THROUGH PORT 'A'

```
6251
6252                                    VERIFY THAT READING THE CONTROL REGISTER (RPCS1) SEIZES THE DRIVE.
6253
6254                                    A.  READ THE CONTROL REGISTER (RPCS1) THROUGH PORT 'A'; VERIFY THAT
6255                                        THE DRIVE IS SEIZED.
6256
6257                                    B.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'; VERIFY THAT THE DRIVE
6258                                        RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
6259
6260                            8.18    TEST 20 - TEST SEIZE BY RPCS1 READ THROUGH PORT 'B'
6261
6262                                    VERIFY THAT READING THE CONTROL REGISTER (RPCS1) SEIZES THE DRIVE.
6263
6264                                    A.  READ THE CONTROL REGISTER (RPCS1) THROUGH PORT 'B'; VERIFY THAT
6265                                        THE DRIVE IS SEIZED.
6266
6267                                    B.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'; VERIFY THAT THE DRIVE
6268                                        RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
6269
6270                            8.19    TEST 21 - TEST 'PORT REQUEST' FROM PORT 'A'
6271
6272                                    VERIFY THAT WRITING A DRIVE REGISTER SETS 'PORT REQUEST' WHEN THE
6273                                    DRIVE IS SEIZED BY THE OTHER PORT.
6274
6275                                    A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
6276
6277                                    B.  WRITE 0'S INOT RPDS1 FROM PORT 'A'; VERIFY THAT THE DRIVE IS STILL
6278                                        SEIZED BY PORT 'B'.
6279
6280                                    C.  ISSUE A RELEASE COMMAND FROM PORT 'B' AND VERIFY THAT THE DRIVE
6281                                        SWITCHED TO PORT 'A'.  VERIFY THAT THE ATTENTION BIT IS SET FOR
6282                                        PORT 'A' AND IS NOT SET FOR PORT 'B'.
6283
6284                                    D.  ISSUE A RELEASE COMMAND THROUGH PORT 'A' AND VERIFY THAT THE DRIVE
6285                                        RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
6286
6287                            8.20    TEST 22 - TEST PORT REQUEST FROM PORT 'B'
6288
6289                                    VERIFY THAT WRITING A DRIVE REGISTER SETS 'PORT REQUEST' WHEN THE
6290                                    DRIVE IS SEIZED BY THE OTHER PORT.
6291
6292                                    A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
6293
6294                                    B.  WRITE 0'S INTO RPDS1 FROM PORT 'B'; VERIFY THAT THE DRIVE IS STILL
6295                                        SEIZED BY PORT 'A'.
6296
6297                                    C.  ISSUE A RELEASE COMMAND FROM PORT 'A' AND VERIFY THAT THE DRIVE
6298                                        SWITCHED TO PORT 'B'.  VERIFY THAT THE ATTENTION BIT IS SET FOR
6299                                        PORT 'B' AND IS NOT SET FOR PORT 'A'.
6300
6301                                    D.  ISSUE A RELEASE COMMAND THROUGH PORT 'B' AND VERIFY THAT THE DRIVE
6302                                        RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
6303
6304                            8.21    TEST 23 - TEST NO 'PORT REQUEST' WHEN READ RPCS1 THROUGH PORT 'A'
6305
6306                                    VERIFY THAT READING THE CONTROL REGISTER (RPCS1) DOES NOT SET 'PORT
```

REQUEST'.

A. SEIZE THE DRIVE THROUGH PORT 'B' BY READING RPCS1. VERIFY THAT THE DRIVE HAS BEEN SEIZED.

B. READ THE CONTROL REGISTER FROM PORT 'A'. VERIFY THAT 'DVA' IS NOT SET.

C. ISSUE A RELEASE COMMAND THROUGH PORT 'B'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.22 TEST 24 - TEST NO 'PORT REQUEST' WHEN READ RPCS1 THROUGH PORT 'B'

VERIFY THAT READING THE CONTROL REGISTER (RPCS1) DOES NOT SET 'PORT REQUEST'.

A. SEIZE THE DRIVE THROUGH PORT 'A' BY READING RPCS1. VERIFY THAT THE DRIVE HAS BEEN SEIZED.

B. READ THE CONTROL REGISTER FROM PORT 'B'. VERIFY THAT 'DVA' IS NOT SET.

C. ISSUE A RELEASE COMMAND THROUGH PORT 'A'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.23 TEST 25 - TEST RELEASE BY PORT 'A' WHEN SEIZED BY PORT 'B'

VERIFY THAT A COMMAND ISSUED BY ONE PORT IS NOT RECOGNIZED IF THE DRIVE IS SEIZED BY THE OTHER PORT.

A. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

B. ISSUE A RELEASE COMMAND THROUGH PORT 'B'.

C. VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT 'B'.

D. RELEASE THE DRIVE THROUGH PORT 'B'. VERIFY THAT THE DRIVE SWITCHED TO PORT 'A'.

E. RELEASE THE DRIVE THROUGH PORT 'A'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.24 TEST 26 - TEST RELEASE BY PORT 'B' WHEN SEIZED BY PORT 'A'

VERIFY THAT A COMMAND ISSUED BY ONE PORT IS NOT RECOGNIZED IF THE DRIVE IS SEIZED BY THE OTHER PORT.

A. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

B. ISSUE A RELEASE COMMAND THROUGH PORT 'B'.

C. VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT 'A'.

D. RELEASE THE DRIVE THROUGH PORT 'A'. VERIFY THAT THE DRIVE SWITCHED TO PORT 'B'.

E. RELEASE THE DRIVE THROUGH PORT 'B'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.25 TEST 27 - TEST SEIZE BY WRITING ATTENTION BIT

TEST THAT WRITING THE APPOPRIATE DRIVE BIT INTO THE ATTENTION REGISTER (RPAS) SEIZES THE DRIVE. VERIFY THAT REQUEST IS SET FOR THE OTHER PORT.

A. WRITE THE APPROPRIATE DRIVE BIT INTO RPAS; VERIFY THAT THE DRIVE IS SEIZED.

B. ISSUE A RELEASE COMMAND THROUGH THE SEIZING PORT; VERIFY THAT THE DRIVE SWITCHES TO THE OPPOSITE PORT. ISSUE A RELEASE THROUGH THE OPPOSITE PORT AND VERIFY THAT THE DRIVE IS IN NEUTRAL.

8.26 TEST 30 - TEST NO SEIZE WHEN '0' WRITTEN INTO ATTENTION BIT

VERIFY THAT THE DRIVE IS NOT SEIZED WHEN A 'ZERO' IS WRITTEN INTO THE DRIVE'S ATTENTION BIT.

A. SELECT A DRIVE NOT BEING TESTED AND WRITE ALL BITS, EXCEPT THE BIT OF THE DRIVE BEING TESTED, INOT THE ATTENTION REGISTER.

B. VERIFY THAT THE DRIVE IS STILL IN NEUTRAL.

8.27 TEST 31 - TEST PORT 'A' TIMEOUT DOES NOT RESET DRIVE

VERIFY THAT PORT TIMEOUT DOES NOT INITIALIZE THE DRIVE.

A. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

B. WRITE 1'S INTO RPER1 THROUGH PORT 'A'.

C. WAIT FOR THE DRIVE TO TIMEOUT. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL; THAT ATTENTION IS SET FOR PORT 'A' AND IS NOT SET FOR PORT 'B'; AND THAT BOTH PORTS SEE 1'S IN THE ERROR REGISTER.

8.28 TEST 32 - TEST PORT 'B' TIMEOUT DOES NOT RESET DRIVE

VERIFY THAT PORT TIMEOUT DOES NOT INITIALIZE THE DRIVE.

A. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

B. WRITE 1'S INTO RPER1 THROUGH PORT 'B'.

C. WAIT FOR THE DDRIVE TO TIMEOUT. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL; THAT ATTENTION IS SET FOR PORT 'B' AND IS NOT SET FOR PORT 'A'; AND THAT BOTH PORTS SEE 1'S IN THE ERROR REGISTER.

8.29 TEST 33 - TEST RELEASE THROUGH PORT 'A' WITH ERRORS SET

VERIFY THAT A RELEASE COMMAND PERFORMS NO ACTION IF ISSUED WHEN ERROR BITS ARE SET IN THE DRIVE.

A. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

B. WRITE 1'S INTO RPER1 THROUGH PORT 'A'.

C. ISSUE A RELEASE COMMAND THROUGH PORT 'A'. VERIFY THAT THE 'GO' BIT HAS RESET, THAT THE DRIVE HAS NOT RETURNED TO NEUTRAL, AND THAT RPER1 HAS NOT BEEN CLEARED.

D. CLEAR RPER1 BY ISSUING A DRIVE CLEAR COMMAND THROUGH PORT 'A'.

E. ISSUE A RELEASE COMMAND THROUGH PORT 'A'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.30 TEST 34 - TEST RELEASE THROUGH PORT 'B' WITH ERRORS SET

VERIFY THAT A RELEASE COMMAND PERFORMS NO ACTION IF ISSUED WHEN ERROR BITS ARE SET IN THE DRIVE.

A. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

B. WRITE 1'S INTO RPER1 THROUGH PORT 'B'.

C. ISSUE A RELEASE COMMAND THROUGH PORT 'B'. VERIFY THAT THE 'GO' BIT HAS RESET, THAT THE DRIVE HAS NOT RETURNED TO NEUTRAL, AND THAT RPER1 HAS NOT BEEN CLEARED.

D. CLEAR RPER1 BY ISSUING A DRIVE CLEAR COMMAND THROUGH PORT 'B'.

E. ISSUE A RELEASE COMMAND THROUGH PORT 'B'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.31 TEST 35 - TEST TIMEOUT RETRIGGER THROUGH PORT 'A'

VERIFY THAT THE PORT TIMEOUT ONE-SHOT CAN BE RETRIGGERED.

A. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

B. WAIT 500 MS AND WRITE 0'S INTO RPDS1 THROUGH PORT 'A'.

C. VERIFY THAT THE TIMEOUT OCCURS WITHN + OR - 25% OF THE SPECIFIED TIME. (THE MEASUREMENT IS MADE FROM STEP 'B'.)

D. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.33 TEST 37 - TEST PORT 'A' ATTENTION AFTER A COMMAND

TEST THE OPERATION OF THE PORT A AND PORT B ATTENTION BITS AFTER A COMMAND.

A. ISSUE A RECALIBRATE COMMAND THROUGH PORT 'A'.

B. WAIT FOR THE RECALIBRATE COMMAND TO COMPLETE ('DRY' TO BECOME '1'). VERIFY THAT THE ATTENTION BIT FOR PORT 'A' IS SET AND THAT THE ATTENTION BIT FOR PORT 'B' IS NOT SET.

C. RELEASE THE DRIVE THROUGH PORT 'A'. VERIFY THAT THE DRIVE RETURNED

TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.34 TEST 40 - TEST PORT 'B' ATTENTION AFTER A COMMAND

TEST THE OPERATION OF THE PROT A AND PORT B ATTENTION BITS AFTER A COMMAND.

A. ISSUE A RECALIBRATE COMMAND THROUGH PORT 'B'.

B. WAIT FOR THE RECALIBRATE COMMAND TO COMPLETE ('DRY' TO BECOME '1'). VERIFY THAT THE ATTENTION BIT FOR PORT 'B' IS SET AND THAT THE ATTENTION BIT FOR PORT 'A' IS NOT SET.

C. RELEASE THE DRIVE THROUGH PORT 'B'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.35 TEST 41 - TEST PORT INTERACTION FROM PORT 'A'

VERIFY THAT THERE IS NO INTERACTION BETWEEN PORTS.

A. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

B. WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'A'.

C. READ RPER1, RPER2, & RPER3 THROUGH PORT 'B'. VERIFY THAT PORT 'B' SEES 0'S FROM EACH OF THESE REGISTERS.

D. CLEAR RPER1, RPER2, & RPER3 THROUGH PORT 'A'.

E. WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'B'. VERIFY THAT PORT 'A' SEES 0'S FROM EACH OF THESE REGISTERS.

F. RELEASE THE DRIVE THROUGH PORT 'A'. VERIFY THAT THE DRIVE HAS SWITCHED TO PORT 'B' AND THAT THE ATTENTION BIT FOR PORT 'B' IS SET AND THE ATTENTION BIT FOR PORT 'B' IS NOT SET.

G. ISSUE A RELEASE COMMAND THROUGH PORT 'B'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.36 TEST 42 - TEST PORT INTERACTION FROM PORT 'B'

VERIFY THAT THERE IS NO INTERACTION BETWEEN PORTS.

A. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

B. WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'B'.

C. READ RPER1, RPER2, & RPER3 THROUGH PORT 'A'. VERIFY THAT PORT 'A' SEES 0'S FROM EACH OF THESE REGISTERS.

D. CLEAR RPER1, RPER2, & RPER3 THROUGH PORT 'B'.

E. WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'A'. VERIFY THAT PORT 'B' SEES 0'S FROM EACH OF THESE REGISTERS.

F. RELEASE THE DRIVE THROUGH PORT 'B'. VERIFY THAT THE DRIVE HAS

SWITCHED TO PORT 'A' AND THAT THE ATTENTION BIT FOR PORT 'A' IS SET AND THE ATTENTION BIT FOR PORT 'B' IS NOT SET.

G. ISSUE A RELEASE COMMAND THROUGH PORT 'A'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.37 TEST 43 - TEST PORT 'A' ALTERNATE ATTENTION BIT PATH

VERIFY THAT THE ALTERNATE ATTENTION REGISTER READ PATH IS OPERATIONAL.

A. SET THE ATTENTION BIT FOR PORT 'A'.

B. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

C. READ THE ATTENTION REGISTER & VERIFY THAT THE ATTENTION BIT FOR THE DRIVE IS SET.

8.38 TEST 44 - TEST PORT 'B' ALTERNATE ATTENTION BIT PATH

VERIFY THAT THE ALTERNATE ATTENTION REGISTER READ PATH IS OPERATIONAL.

A. SET THE ATTENTION BIT FOR PORT 'B'.

B. SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

C. READ THE ATTENTION REGISTER & VERIFY THAT THE ATTENTION BIT FOR THE DRIVE IS SET.

8.39 TEST 45 - TEST NO TIMEOUT THROUGH PORT 'A'

VERIFY THAT THE TIMEOUT ONE-SHOT IS NOT TRIGGERED WHEN THE DRIVE SWITCHES PORTS AND SEIZING PORT PERFORMS NO REGISTER ACCESSES. THIS TEST IS FOR DRIVES WHICH HAVE THE M7775 'DP' BOARD AND IS NOT RUN AS PART THE TEST SEQUENCE. TO RUN THIS TEST, IT MUST BE SELECTED SEPARATELY.

A. SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.

B. SET PORT REQUEST BY WRITING 0'S INTO RPDS1 FROM PORT 'A'.

C. ISSUE A RELEASE COMMAND FROM PORT 'B'. VERIFY THAT THE DRIVE HAS SWITCHED TO THE OTHER PORT AND THAT THE 'ATA' BIT DID NOT SET FOR PORT 'B'. REGISTERS WILL NOT BE CHECKED THROUGH PORT 'A'.

D. WAIT THE TIMEOUT INTERVAL + 25%. VERIFY THAT THE DRIVE HAS NOT BEEN RELEASED.

E. RELEASE THE DRIVE THROUGH PORT 'A'. VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.

8.40 TEST 46 - TEST NO TIMEOUT THROUGH PORT 'B'

VERIFY THAT THE TIMEOUT ONE-SHOT IS NOT TRIGGERED WHEN THE DRIVE SWITCHES PORTS AND SEIZING PORT PERFORMS NO REGISTER ACCESSES. THIS TEST IS FOR DRIVES WHICH HAVE THE M7775 'DP' BOARD AND IS NOT RUN AS PART THE TEST SEQUENCE. TO RUN THIS TEST, IT MUST

```
                                BE SELECTED SEPARATELY.

                                A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.

                                B.  SET PORT REQUEST BY WRITING 0'S INTO RPDS1 FROM PORT 'B'.

                                C.  ISSUE A RELEASE COMMAND FROM PORT 'A'.  VERIFY THAT THE DRIVE
                                    HAS SWITCHED TO THE OTHER PORT AND THAT THE 'ATA' BIT DID NOT
                                    SET FOR PORT 'A'.  REGISTERS WILL NOT BE CHECKED THROUGH PORT 'B'.

                                D.  WAIT THE TIMEOUT INTERVAL + 25%.  VERIFY THAT THE DRIVE HAS NOT
                                    BEEN RELEASED.

                                E.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
                                    RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.


                            9.      PROGRAM LISTING
                                    ---------------
                                    ∂


                            .TITLE  CZRJECO, DL CTRLR LGC
                            ;*COPYRIGHT (C) 1976,1977
                            ;*DIGITAL EQUIPMENT CORP.
                            ;*MAYNARD, MASS. 01754
                            ;*
                            ;*PROGRAM BY C. HESS
                            ;*
                            ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                            ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                            ;*

                            .SBTTL  OPERATIONAL SWITCH SETTINGS
                            ;*
                            ;*      SWITCH                  USE
                            ;*      ------          --------------------
                            ;*        15            HALT ON ERROR
                            ;*        14            LOOP ON TEST
                            ;*        13            INHIBIT ERROR TYPEOUTS
                            ;*        11            INHIBIT ITERATIONS
                            ;*        10            BELL ON ERROR
                            ;*         9            LOOP ON ERROR


                            .SBTTL  BASIC DEFINITIONS

                            ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                      STACK=  1100
                            .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                            .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                            ;*MISCELLANEOUS DEFINITIONS
000011                      HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                      LF=     12              ;;CODE FOR LINE FEED
```

```
(1)  000015                  CR=      15              ;;CODE FOR CARRIAGE RETURN
(1)  000200                  CRLF=    200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
(1)  177776                  PS=      177776          ;;PROCESSOR STATUS WORD
(1)                          .EQUIV   PS,PSW
(1)  177774                  STKLMT=  177774          ;;STACK LIMIT REGISTER
(1)  177772                  PIRQ=    177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
(1)  177570                  DSWR=    177570          ;;HARDWARE SWITCH REGISTER
(1)  177570                  DDISP=   177570          ;;HARDWARE DISPLAY REGISTER
(1)
(1)                          ;*GENERAL PURPOSE REGISTER DEFINITIONS
(1)  000000                  R0=      %0              ;;GENERAL REGISTER
(1)  000001                  R1=      %1              ;;GENERAL REGISTER
(1)  000002                  R2=      %2              ;;GENERAL REGISTER
(1)  000003                  R3=      %3              ;;GENERAL REGISTER
(1)  000004                  R4=      %4              ;;GENERAL REGISTER
(1)  000005                  R5=      %5              ;;GENERAL REGISTER
(1)  000006                  R6=      %6              ;;GENERAL REGISTER
(1)  000007                  R7=      %7              ;;GENERAL REGISTER
(1)  000006                  SP=      %6              ;;STACK POINTER
(1)  000007                  PC=      %7              ;;PROGRAM COUNTER
(1)
(1)                          ;*PRIORITY LEVEL DEFINITIONS
(1)  000000                  PR0=     0               ;;PRIORITY LEVEL 0
(1)  000040                  PR1=     40              ;;PRIORITY LEVEL 1
(1)  000100                  PR2=     100             ;;PRIORITY LEVEL 2
(1)  000140                  PR3=     140             ;;PRIORITY LEVEL 3
(1)  000200                  PR4=     200             ;;PRIORITY LEVEL 4
(1)  000240                  PR5=     240             ;;PRIORITY LEVEL 5
(1)  000300                  PR6=     300             ;;PRIORITY LEVEL 6
(1)  000340                  PR7=     340             ;;PRIORITY LEVEL 7
(1)
(1)                          ;*"SWITCH REGISTER" SWITCH DEFINITIONS
(1)  100000                  SW15=    100000
(1)  040000                  SW14=    40000
(1)  020000                  SW13=    20000
(1)  010000                  SW12=    10000
(1)  004000                  SW11=    4000
(1)  002000                  SW10=    2000
(1)  001000                  SW09=    1000
(1)  000400                  SW08=    400
(1)  000200                  SW07=    200
(1)  000100                  SW06=    100
(1)  000040                  SW05=    40
(1)  000020                  SW04=    20
(1)  000010                  SW03=    10
(1)  000004                  SW02=    4
(1)  000002                  SW01=    2
(1)  000001                  SW00=    1
(1)                          .EQUIV   SW09,SW9
(1)                          .EQUIV   SW08,SW8
(1)                          .EQUIV   SW07,SW7
(1)                          .EQUIV   SW06,SW6
(1)                          .EQUIV   SW05,SW5
(1)                          .EQUIV   SW04,SW4
(1)                          .EQUIV   SW03,SW3
(1)                          .EQUIV   SW02,SW2
```

```
(1)                             .EQUIV  SWO1,SW1
(1)                             .EQUIV  SWOO,SWO
(1)
(1)                             ;*DATA BIT DEFINITIONS (BITOO TO BIT15)
(1)             100000          BIT15=  100000
(1)             040000          BIT14=  40000
(1)             020000          BIT13=  20000
(1)             010000          BIT12=  10000
(1)             004000          BIT11=  4000
(1)             002000          BIT10=  2000
(1)             001000          BIT09=  1000
(1)             000400          BIT08=  400
(1)             000200          BIT07=  200
(1)             000100          BIT06=  100
(1)             000040          BIT05=  40
(1)             000020          BIT04=  20
(1)             000010          BIT03=  10
(1)             000004          BIT02=  4
(1)             000002          BIT01=  2
(1)             000001          BIT00=  1
(1)                             .EQUIV  BIT09,BIT9
(1)                             .EQUIV  BIT08,BIT8
(1)                             .EQUIV  BIT07,BIT7
(1)                             .EQUIV  BIT06,BIT6
(1)                             .EQUIV  BIT05,BIT5
(1)                             .EQUIV  BIT04,BIT4
(1)                             .EQUIV  BIT03,BIT3
(1)                             .EQUIV  BIT02,BIT2
(1)                             .EQUIV  BIT01,BIT1
(1)                             .EQUIV  BIT00,BIT0
(1)
(1)                             ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)             000004          ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
(1)             000010          RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
(1)             000014          TBITVEC=14              ;;"T" BIT
(1)             000014          TRTVEC= 14              ;;TRACE TRAP
(1)             000014          BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
(1)             000020          IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)             000024          PWRVEC= 24              ;;POWER FAIL
(1)             000030          EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
(1)             000034          TRAPVEC=34              ;;"TRAP" TRAP
(1)             000060          TKVEC=  60              ;;TTY KEYBOARD VECTOR
(1)             000064          TPVEC=  64              ;;TTY PRINTER VECTOR
(1)             000240          PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
7148
7149                            ;;*****************************************************************
7150
7151                            .SBTTL  RH11 REGISTERS
7152
7153                            ;;*****************************************************************
7154
7155                            ;CONTROL AND STATUS REGISTER 1 (RPCS1)
7156
7157             000100         IE=     100                     ;INTERRUPT ENABLE (BIT #6)
7158             000200         RDY=    200                     ;READY (BIT #7)
7159             000400         A16=    400                     ;HIGH ORDER BUS ADDRESS BIT (BIT #8)
```

```
                        ;HIGH ORDER BUS ADDRESS BIT (BIT #9)
                        ;PORT SELECT (BIT #10)
                        ;MASSBUSS PARITY ERROR (BIT #13)
                        ;TRANSFER ERROR (BIT #14)
                        ;SPECIAL CONDITION (BIT #15)

                        ;WORD COUNT REGISTER (RPWC)
                        ;(EACH BIT IS CALLED BY BIT NUMBER)

                        ;BUS ADDRESS REGISTER (RPBA)
                        ;(EACH BIT IS CALLED BY BIT NUMBER)

                        ;CONTROL AND STATUS REGISTER 2 (RPCS2)

                        ;UNIT SELECT (BIT #0)
                        ;UNIT SELECT (BIT #1)
                        ;UNIT SELECT (BIT #2)
                        ;BUS ADDRESS INCREMENT INHIBIT (BIT #3)
                        ;MASSBUS PARITY TEST (BIT #4)
                        ;CLEAR (BIT #5)
                        ;INPUT READY (BIT #6)
                        ;OUTPUT READY (BIT #7)
                        ;MASS BUS PARITY ERROR (BIT #8)
                        ;MISSED TRANSFER ERROR (BIT #9)
                        ;PROGRAM ERROR (BIT #10)
                        ;NON EXISTENT MEMORY (BIT #11)
                        ;NON EXISTENT DRIVE (BIT #12)
                        ;UNIBUS PARITY ERROR (BIT #13)
                        ;WRITE CHECK ERROR (BIT #14)
                        ;DATA LATE (BIT #15)

                        ;DATA BUFFER REGISTER (RPDB)
                        ;(EACH BIT IS CALLED BY BIT NUMBER)


                        ;;*************************************************************

                        .SBTTL  RP04/5/6 REGISTERS

                        ;;*************************************************************

                        ;CONTROL AND STATUS 1 REGISTER. (#00)

                        ;GO BIT (BIT #0)
                        ;FUNCTION CODE BIT #1
                        ;FUNCTION CODE BIT #2
                        ;FUNCTION CODE BIT #3
                        ;FUNCTION CODE BIT #4
                        ;FUNCTION CODE BIT #5
                        ;DEVICE AVAILABLE (BIT #11)

                        ;DRIVE STATUS REGISTER (RPDS1) (#01)

                        ;DFS=   1                DRIVE FORWARD 5"/SEC.  (BIT #0)
                        ;DFF20=  2               DRIVE FORWARD 20"/SEC.  (BIT #1)
                        ;DIGB=   4               DRIVE TO INNER GUARD BAND (BIT #2)
```

```
                                ;GO REVERSE (BIT #3)
                                ;DIFFERENCE LESS THAN 64 (BIT #4)
                                ;DIFFERENCE EQUALS 1 (BIT #5)
                                ;VOLUME VALID (BIT #6)
                                ;DRIVE READY (BIT #7)
                                ;DRIVE PRESENT (BIT #8)
                                ;PROGRAMABLE (BIT #9)
                                ;LAST SECTOR TRANSFERRED (BIT #10)
                                ;WRITE LOCK (BIT #11)
                                ;MEDIUM ON-LINE (BIT #12)
                                ;POSITIONING OPERATION IN PROGRESS (BIT #13)
                                ;COMPOSITE ERROR (BIT #14)
                                ;ATTENTION ACTIVE (BIT #15)

                        ;ERROR REGISTER #01 (RPER1) (#02)

                                ;ILLEGAL FUNCTION (BIT #0)
                                ;ILLEGAL REGISTER (BIT #1)
                                ;REGISTER MODIFICATION REFUSED (BIT #2)
                                ;PARITY ERROR (BIT #3)
                                ;FORMAT ERROR (BIT #4)
                                ;WRITE CLOCK FAIL (BIT #5)
                                ;ECC HARD ERROR (BIT #6)
                                ;HEADER COMPARE ERROR (BIT #7)
                                ;HEADER CRC ERROR (BIT #8)
                                ;ADDRESS OVERFLOW ERROR (BIT #9)
                                ;INVALID ADDRESS ERROR (BIT #10)
                                ;WRITE LOCK ERROR (BIT #11)
                                ;DRIVE TIMING ERROR (BIT #12)
                                ;OPERATION INCOMPLETE (BIT #13)
                                ;DRIVE UNSAFE (BIT #14)
                                ;DATA CHECK ERROR (BIT 15)

                        ;MAINTAINABILITY REGISTER (RPMR)(#03)

                                ;DIAGINOSTIC MODE (BIT #0)
                                ;MAINTAINABILITY CLOCK (BIT #1)
                                ;MAINTAINABILITY INDEX (BIT #2)
                                ;MAINTAINABILITY SECTOR CLOCK (BIT #3)
                                ;MAINTAINABILITY READ (BIT #4)
                                ;MAINTAINABILITY WRITE (BIT #5)
                                ;MAINTAINABILITY SYNC DETECTED (BIT #7)

                        ;ATTENTION SUMMARY PSEUDO-REGISTER (RPAS) (#04)

                                ;DEVICE 0 (BIT #0)
                                ;DEVICE 1 (BIT #1)
                                ;DEVICE 2 (BIT #2)
                                ;DEVICE 3 (BIT #3)
                                ;DEVICE 4 (BIT #4)
                                ;DEVICE 5 (BIT #5)
                                ;DEVICE 6 (BIT #6)
                                ;DEVICE 7 (BIT #7)

                        ;DESIRED SECTOR/TRACK ADDRESS REGISTER (RPDA) (#05)
                        ;(EACH BIT IS CALLED BY BIT NUMBER)
```

```
                        ;DRIVE TYPE REGISTER (RPDT) (#06)

000001          DT00=   1               ;DRIVE TYPE NUMBER BIT 1
000002          DT01=   2               ;DRIVE TYPE NUMBER BIT 2
000004          DT02=   4               ;DRIVE TYPE NUMBER BIT 3
000010          DT03=   10              ;DRIVE TYPE NUMBER BIT 4
000020          DT04=   20              ;DRIVE TYPE NUMBER BIT 5
000040          DT05=   40              ;DRIVE TYPE NUMBER BIT 6
000100          DT06=   100             ;DRIVE TYPE NUMBER BIT 7
000200          DT07=   200             ;DRIVE TYPE NUMBER BIT 8
000400          DT08=   400             ;DRIVE TYPE NUMBER BIT 9
004000          DRQ=    4000            ;DRIVE REQUEST REQUIRED (BIT #11)
020000          MOH=    20000           ;MOVING HEAD (BIT #13)
040000          TAP=    40000           ;TAPE DRIVE (BIT #14)
100000          NBA=    100000          ;NOT BLOCK ADDRESSED (BIT #15)

                        ;LOOK-AHEAD REGISTER (RPLA) (#07)

000001          EXT1=   1               ;EXTENSION 1 (BIT #0)
000002          EXT2=   2               ;EXTENSION 2 (BIT #1)
000004          EXT4=   4               ;EXTENSION 3 (BIT #2)
000010          EXT10=  10              ;EXTENSION 4 (BIT #3)
000020          EXT20=  20              ;EXTENSION 5 (BIT #4)
000040          EXT40=  40              ;EXTENSION 6 (BIT #5)
000100          SC1=    100             ;SECTOR COUNT FIELD 0 (BIT #6)
000200          SC2=    200             ;SECTOR COUNT FIELD 1 (BIT #7)
000400          SC4=    400             ;SECTOR COUNT FIELD 2 (BIT #8)
001000          SC10=   1000            ;SECTOR COUNT FIELD 3 (BIT #9)
002000          SC20=   2000            ;SECTOR COUNT FIELD 4 (BIT #10)
004000          TRK1=   4000            ;TRACK FIELD 1 (BIT #11)
010000          TRK2=   10000           ;TRACK FIELD 2 (BIT #12)
020000          TRK4=   20000           ;TRACK FIELD 3 (BIT #13)
040000          TRK10=  40000           ;TRACK FIELD 4 (BIT #14)
100000          TRK20=  100000          ;TRACK FIELD 5 (BIT #15)

                        ;RP04 ERROR REGISTER #2 (RPER2) (#10)

000001          WCU=    1               ;WRITE CURRENT UNSAFE (BIT #0)
000002          CSF=    2               ;CURRENT SINK FAILURE (BIT #1)
000004          WSU=    4               ;WRITE SELECT UNSAFE (BIT #2)
000010          CSU=    10              ;CURRENT SWITCH UNSAFE (BIT #3)
000020          MSE=    20              ;MOTOR SEQUENCE ERROR (BIT #4)
000040          TDF=    40              ;TRANSITIONS DETECTOR FAILURE (BIT #5)
000100          TUF=    100             ;TRANSITIONS UNSAFE (BIT #6)
000200          FEN=    200             ;FAILSAFE ENABLED (BIT #7)
000400          WRU=    400             ;WRITE READY UNSAFE (BIT #8)
001000          MHS=    1000            ;MULTIPLE HEAD SELECT (BIT #9)
002000          NHS=    2000            ;NO HEAD SELECTION (BIT #10)
004000          IXE=    4000            ;INDEX ERROR (BIT #11)
010000          VU30=   10000           ;30VOLT UNSAFE (BIT #12)
020000          PLU=    20000           ;PLO UNSAFE (BIT #13)
100000          ACU=    100000          ;AC UNSAFE (BIT #15)

                        ;RP05/6 ERROR REGISTER #02 (RPER2) (#10)
```

```
                        ;WRITE CURRENT UNSAFE (BIT #0)
                        ;CURRENT SINK FAILURE (BIT #1)
                        ;WRITE SELECT UNSAFE (BIT #2)
                        ;CURRENT SWITCH UNSAFE (BIT #3)
                        ;READ AND WRITE (BIT #4)
                        ;TRANSITIONS DETECTOR FAILURE (BIT #5)
                        ;TRANSITIONS UNSAFE (BIT #6)
                        ;ABNORMAL STOP (BIT #7)
                        ;WRITE READY UNSAFE (BIT #8)
                        ;MUTLTIPLE HEAD SELECT (BIT #9)
                        ;NO HEAD SELECTION (BIT #10)
                        ;INDEX ERROR (BIT #11)
                        ;PLO UNSAFE (BIT #12)

                        ;OFFSET REGISTER (RPOF) (#11)

                        ;OFFSET 25 MICRO INCHES (BIT #0)
                        ;OFFSET 50 MICRO INCHES (BIT #1)
                        ;OFFSET 100 MICRO INCHES (BIT #2)
                        ;OFFSET 200 MICRO INCHES (BIT #3)
                        ;OFFSET 400 MICRO INCHES (BIT #4)
                        ;OFFSET 800 MICRO INCHES (BIT #5)
                        ;OFFSET NEGATIVE (REVERSE) (BIT #5)
                        ;HEADER COMPARE INHIBIT (BIT #10)
                        ;ERROR CORRECTION CODE INHIBIT (BIT #11)
                        ;FORMAT BIT (BIT #12

                        ;DESIRED CYLINDER ADDRESS (RPCA) (#12)
                        ;(EACH BIT IS CALLED BY BIT NUMBER)

                        ;CURRENT CYLINDER ADDRESS (RPCC) (#13)
                        ;(EACH BIT IS CALLED BY BIT NUMBER)

                        ;SERIAL NUMBER REGISTER (RPSN) (#14)
                        ;(EACH IS CALLED BY BIT NUMBER)

                        ;RP04 ERROR REGISTER #03 (RPER3) (#15)

                        ;PACK SPEED UNSAFE (BIT #0)
                        ;VELOCITY UNSAFE (BIT #1)
                        ;ANY UNSAFE EXCEPT READ/WRITE (BIT #3)
                        ;DISK PACK ROTATION ERROR (BIT #4)
                        ;AC LOW (BIT #5)
                        ;DC LOW (BIT #6)
                        ;SEEK INCOMPLETE (BIT #14)
                        ;OFF CYLINDER (BIT #15)

                        ;RP05/6 ERROR REGISTER #03 (RPER3) (#15)

                        ;DC UNSAFE (BIT #0)
                        ;WRITE AND OFFSET (BIT #1)
                        ;AC LOW (BIT #5)
                        ;DC LOW (BIT #6)
                        ;OPERATOR PLUG ERROR (BIT #13)
                        ;SEEK INCOMPLETE (BIT #14)
                        ;OFF CYLINDER ERROR (BIT #15)
```

```
                                ;ECC POSITION REGISTER (RPEC1) (#16)
                                ;(EACH BIT IS CALLED BY BIT NUMBER)

                                ;ECC PATTERN REGISTER (RPEC2) (#17)
                                ;(EACH BIT IS CALLED BY BIT NUMBER)

                                ;;*****************************************************************

                                .SBTTL  DEFINITIONS OF THE RH11/RP04/5/6 ADDRESS INDEXES

                                ;;*****************************************************************

000000                          RPCS1=0                 ;CONTROL AND STATUS REGISTER #1 (DRIVE REG. 00)
000002                          RPWC=2                  ;WORD COUNT REGISTER (NOT A DRIVE REG)
000004                          RPBA=4                  ;UNIBUS ADDRESS REGISTER (NOT A DRIVE REG)
000006                          RPDA=6                  ;DESIRED SECTOR/TRACK ADDRESS REGISTER (DRIVE REG. 05)
000010                          RPCS2=10                ;CONTROL AND STATUS REGISTER #2 (NOT A DRIVE REG)
000012                          RPDS1=12                ;DRIVE STATUS REGISTER (DRIVE REG 01)
000014                          RPER1=14                ;ERROR REGISTER #1 (DRIVE REG. 02)
000016                          RPAS=16                 ;ATTENTION SUMMARY PSEUDO REGISTER (DRIVE REG. 04)
000020                          RPLA=20                 ;LOOK AHEAD REGISTER (DRIVE REG. 07)
000022                          RPDB=22                 ;DATA BUFFER REGISTER (NOT A DRIVE REG.)
000024                          RPMR=24                 ;MAINTAINABILITY REGISTER (DRIVE REG. 03)
000026                          RPDT=26                 ;DRIVE TYPE REGISTER (DRIVE REG. 06)
000030                          RPSN=30                 ;SERIAL NUMBER REGISTER (DRIVE REG. 10)
000032                          RPOF=32                 ;OFFSET REGISTER (DRIVE REG. 11)
000034                          RPCA=34                 ;DESIRED CYLINDER ADDRESS REGISTER (DRIVE REG. 12)
000036                          RPCC=36                 ;CURRENT CYLINDER ADDRESS REGISTER (DRIVE REG. 13)
000040                          RPER2=40                ;ERROR REGISTER #2 (DRIVE REG. 14)
000042                          RPER3=42                ;ERROR REGISTER #3 (DRIVE REG. 15)
000044                          RPEC1=44                ;ECC POSITION REGISTER (DRIVE REG. 16)
000046                          RPEC2=46                ;ECC PATTERN REGISTER (DRIVE REG.  17)

                                .SBTTL  TRAP CATCHER
 (1)
 (1)    000000                          .=0
 (1)                            ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
 (1)                            ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
 (1)                            ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
 (1)    000174                          .=174
 (1)  000174  000000    DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
 (1)  000176  000000    SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER

                                .SBTTL  ACT11 HOOKS
 (1)
 (2)                            ;;*****************************************************************
 (1)                            ;HOOKS REQUIRED BY ACT11
 (1)    000200                          $SVPC=.                 ;SAVE PC
 (1)    000046                          .=46
 (1)  000046  056454                    $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
 (1)    000052                          .=52
 (1)  000052  020000                    .WORD   20000           ;;2)SET LOC.52 TO 20000
 (1)    000200                          .=$SVPC                 ;; RESTORE PC
```

```
                                        .SBTTL  STARTING ADDRESS = 200

000200  000137  002064                          JMP     START           ;START THE PROGRAM

                                        .SBTTL  START THE PROGRAM AND CHANGE THE RH11 ADDRESS = 204

000204  000137  002072                          JMP     START1          ;START AND CHANGE THE RH11 ADDRESS
```

```
  7473
    (1)
    (2)
    (1)                                 .SBTTL  COMMON TAGS
    (1)
    (1)                                 ;;*****************************************************************
    (1)                                 ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
    (1)                                 ;*USED IN THE PROGRAM.
    (1)
    (1)                                 .=1100
    (1)  001100                         $CMTAG:                         ;;START OF COMMON TAGS
    (1)  001100  000000                 $PASS:  .WORD   0               ;;CONTAINS PASS COUNT
    (1)  001102     000                 $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
    (1)  001103     000                 $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
    (1)  001104  000000                 $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
    (1)  001106  000000                 $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
    (1)  001110  000000                 $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
    (1)  001112  000000                 $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
    (1)  001114     000                 $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
    (1)  001115     001                 $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
    (1)  001116  000000                 $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
    (1)  001120  000000                 $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
    (1)  001122  000000                 $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
    (1)  001124  000000                 $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
    (1)  001126  000000                 $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
    (1)  001130  000000                         .WORD   0               ;;RESERVED--NOT TO BE USED
    (1)  001132  000000                         .WORD   0
    (1)  001134     000                 $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
    (1)  001135     000                 $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
    (1)  001136  000000                         .WORD   0
    (1)  001140  177570                 SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
    (1)  001142  177570                 DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
    (1)  001144  177560                 $TKS:   177560                  ;;TTY KBD STATUS
    (1)  001146  177562                 $TKB:   177562                  ;;TTY KBD BUFFER
    (1)  001150  177564                 $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
    (1)  001152  177566                 $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
    (1)  001154     000                 $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
    (1)  001155     002                 $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
    (1)  001156     012                 $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
    (1)  001157     000                 $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
    (1)  001160  000000                 $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
    (1)                                                                 ;;WHICH  ($REGO) WAS OBTAINED
    (3)  001162  000000                 $REGO:  .WORD   0               ;;CONTAINS (($REGAD)+0)
    (3)  001164  000000                 $TMP0:  .WORD   0               ;;USER DEFINED
    (3)  001166  000000                 $TMP1:  .WORD   0               ;;USER DEFINED
    (3)  001170  000000                 $TMP2:  .WORD   0               ;;USER DEFINED
    (3)  001172  000000                 $TMP3:  .WORD   0               ;;USER DEFINED
    (3)  001174  000000                 $TMP4:  .WORD   0               ;;USER DEFINED
    (1)  001176  000000                 $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
    (1)  001200  000000                 $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
    (1)  001202  177607  000377         $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
    (1)  001206     077                 $QUES:  .ASCII  /?/             ;;QUESTION MARK
    (1)  001207     015                 $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
    (1)  001210  000012                 $LF:    .ASCIZ  <12>            ;;LINE FEED
    (2)                                 ;;*****************************************************************
    (3)     000015                      CR      =       15
    (3)     000012                      LF      =       12
    (3)  001212  172540                 $LKCSR: .WORD   172540          ;ADDR OF KW11-P STATUS REGISTER
    (3)  001214  172542                 $LKCSB: .WORD   172542          ;ADDR OF KW11-P COUNTER BUFFER
```

```
(3)  001216  000104                $LPVEC: .WORD   104             ;ADDR OF KW11-P VECTOR
(3)  001220  177546                $LKS:   .WORD   177546          ;ADDR OF KW11-L STATUS REGISTER
(3)  001222  000100                $LLVEC: .WORD   100             ;ADDR OF KW11-L VECTOR
(3)  001224  000000                PORTA:  .WORD   0               ;ADDRESS OF PORT A
(3)  001226  000000                PORTB:  .WORD   0               ;ADDRESS OF PORT B
(3)  001230  000000                PORTC:  .WORD   0               ;ADDRESS OF DIFFERENT DRIVE
(3)  001232  000000                ASR1:   .WORD   0               ;ATA-A OR ATA-B = 1
(3)  001234  000000                PTNBR:  .WORD   0               ;CONTAINS THE PORT ADDRESS FOR ERROR TYPEOUTS
(3)  001236  000000                SEIZPT: .WORD   0               ;CONTAINS THE ADDRESS OF THE SEIZING PORT
(3)  001240  000000                OPPRT:  .WORD   0               ;CONTAINS THE ADDRESS OF THE 'OPPOSITE' PORT
(3)  001242  000000                TSTNUM: .WORD   0               ;NUMBER OF THE CURRENT TEST
(3)  001244  000000                CKERR:  .WORD   0               ;IF -1, A REGISTER MISCOMPARISON OCCURRED
(3)  001246  000000                NOSEIZ: .WORD   0               ;IF -1, THE PORT IN 'SEIZPT' DID NOT SEIZE THE DRIVE
(3)  001250  000000                RELERR: .WORD   0               ;IF -1, THE PORT IN 'SEIZPT' DID NOT RELEASE THE DRIVE
(3)  001252  000000                TIME:   .WORD   0               ;ELAPSED TIME COUNTER
(3)  001254  000000                WATCH:  .WORD   0               ;WATCH DOG TIMER LOCATION
(3)  001256  000000                TIMEA:  .WORD   0               ;THE TIMEOUT ONE-SHOT VALUE MEASURED THROUGH PORT A
(3)  001260  000000                TIMEAP: .WORD   0               ;PORT A TIMEOUT VALUE + 25%
(3)  001262  000000                TIMEAM: .WORD   0               ;PORT A TIMEOUT VALUE - 25%
(3)  001264  000000                TIMEB:  .WORD   0               ;THE TIMEOUT ONE-SHOT VALUE MEASURED THROUGH PORT B
(3)  001266  000000                TIMEBP: .WORD   0               ;PORT A TIMEOUT VALUE + 25%
(3)  001270  000000                TIMEBM: .WORD   0               ;PORT B TIME VALUE - 25%
(3)  001272  000000                TIMES:  .WORD   0               ;STORAGE FOR TIMEOUT ONE-SHOT RETRIGGER TEST
(3)  001274  000000                KYBCTL: .WORD   0               ;SINGLE TEST INDICATOR
(3)  001276  000000                CHGADR: .WORD   0               ;CHANGE THE RH11 ADDRESS INDICATOR
(3)
(4)                                ;;*****************************************************************
(3)
(3)                                .SBTTL  RH11/RP04/5/6 UNIBUS AND VECTOR ADDRESSES
(3)
(4)                                ;;*****************************************************************
(3)
(3)  001300  176700                $RPADR: .WORD   176700          ;RH11/RP04/5/6 UNIBUS ADDRESS
(3)  001302  000254                $RPVEC: .WORD   254             ;RH11 INTERRUPT VECTOR ADDRESS
(3)
```

```
                        .SBTTL  ERROR POINTER TABLE

                        ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                        ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                        ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                        ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                        ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                        ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                        ;*      DH              ;;POINTS TO THE DATA HEADER
                        ;*      DT              ;;POINTS TO THE DATA
                        ;*      DF              ;;POINTS TO THE DATA FORMAT

(1) 001304              $ERRTB:
7474
7475                    ;ERROR 1
7476
7477  001304  062526            EM1                     ;WRONG DRIVE TYPE
7478  001306  066564            DH1
7479  001310  070322            DT1
7480  001312  070572            DF1
7481
7482                    ;ERROR 2
7483
7484  001314  062547            EM2                     ;DRIVE NOT ON LINE
7485  001316  066564            DH1
7486  001320  070322            DT1
7487  001322  070572            DF1
7488
7489                    ;ERROR 3
7490
7491  001324  062571            EM3                     ;SERIAL NUMBERS NOT THE SAME
7492  001326  066635            DH3
7493  001330  070336            DT3
7494  001332  070572            DF1
7495
7496                    ;ERROR 4
7497
7498  001334  062653            EM4                     ;DRIVE NOT SEIZED BY PORT 'N'
7499  001336  066704            DH4
7500  001340  070404            DT7
7501  001342  070605            DF7
7502
7503                    ;ERROR 5
7504
7505  001344  062704            EM5                     ;WRONG STATUS SEEN BY THE SEIZING PORT
7506  001346  067027            DH5
7507  001350  070352            DT5
7508  001352  070577            DF5
7509
7510                    ;ERROR 6
7511
7512  001354  062752            EM6                     ;REGISTER CONTENTS WERE SEEN BY OPPOSITE PORT - DRIVE WA
7513  001356  067277            DH13
7514  001360  070424            DT13
```

```
7515  001362  070577                        DF5
7516
7517                                  ;ERROR 7
7518
7519  001364  063052                        EM7                 ;REGISTER CONTENTS INCORRECT AFTER RELEASE/TIMEOUT
7520  001366  067103                        DH7
7521  001370  070404                        DT7
7522  001372  070605                        DF7
7523
7524                                  ;ERROR 10
7525
7526  001374  063133                        EM10                ;REGISTER CONTENTS INCORRECT
7527  001376  067027                        DH5
7528  001400  070352                        DT5
7529  001402  070577                        DF5
7530
7531                                  ;ERROR 11
7532
7533  001404  063163                        EM11                ;CONTROL BUS PARITY ERROR WHILE READING REGISTER
7534  001406  067226                        DH11
7535  001410  070322                        DT1
7536  001412  070572                        DF1
7537
7538                                  ;ERROR 12
7539
7540  001414  063247                        EM12                ;DRIVE NOT SEIZED BY DRIVE CLEAR COMMAND
7541  001416  067773                        DH36
7542  001420  070512                        DT37
7543  001422  070620                        DF36
7544
7545                                  ;ERROR 13
7546
7547  001424  063317                        EM13                ;'VOLUME VALID' BIT NOT SET BY READIN PRESET
7548  001426  067277                        DH13
7549  001430  070424                        DT13
7550  001432  070577                        DF5
7551
7552                                  ;ERROR 14
7553
7554  001434  063404                        EM14                ;'VOLUME VALID' SET ON THE OPPOSITE PORT
7555  001436  067277                        DH13
7556  001440  070424                        DT13
7557  001442  070577                        DF5
7558
7559                                  ;ERROR 15
7560
7561  001444  063447                        EM15                ;THE ATTN BIT WRONG AFTER TIMEOUT - REQUEST NOT SET
7562  001446  067103                        DH7
7563  001450  070404                        DT7
7564  001452  070605                        DF7
7565
7566                                  ;ERROR 16
7567
7568  001454  063526                        EM16                ;ATTN BIT WRONG AFTER RELEASE - REQUEST WAS SET
7569  001456  067103                        DH7
7570  001460  070404                        DT7
```

```
7571  001462  070605                        DF7
7572
7573                                  ;ERROR 17
7574
7575  001464  063601                        EM17          ;ATTN BIT WRONG AFTER RELEASE - REQUEST NOT SET
7576  001466  067103                        DH7
7577  001470  070404                        DT7
7578  001472  070605                        DF7
7579
7580                                  ;ERROR 20
7581
7582  001474  063660                        EM20          ;DRIVE NOT SEIZED WHEN ATTN BIT FOR PORT CLEARED
7583  001476  067773                        DH36
7584  001500  070512                        DT37
7585  001502  070620                        DF36
7586
7587                                  ;ERROR 21
7588
7589  001504  063740                        EM21          ;DRIVE SEIZED WHEN ZERO WRITTEN IN ATTN BIT FOR PORT
7590  001506  067773                        DH36
7591  001510  070512                        DT37
7592  001512  070620                        DF36
7593
7594                                  ;ERROR 22
7595
7596  001514  064013                        EM22          ;DRIVE NOT IN NEUTRAL AFTER TIMEOUT, REQUEST NOT SET
7597  001516  067417                        DH22
7598  001520  070442                        DT22
7599  001522  070614                        DF31
7600
7601                                  ;ERROR 23
7602
7603  001524  064100                        EM23          ;TIMEOUT CLEARED THE DRIVE'S ERROR BIT
7604  001526  067515                        DH23
7605  001530  070454                        DT23
7606  001532  070572                        DF1
7607
```

```
 7609                                   ;ERROR 24
 7610
 7611  001534  064146                          EM24                    ;RELEASE COMMAND RELEASED DRIVE WITH ERRORS SET
 7612  001536  067515                          DH23
 7613  001540  070454                          DT23
 7614  001542  070572                          DF1
 7615
 7616
 7617                                   ;ERROR 25
 7618
 7619  001544  064225                          EM25                    ;TIMEOUT ONE-SHOT DID NOT RETRIGGER
 7620  001546  067773                          DH36
 7621  001550  070502                          DT36
 7622  001552  070620                          DF36
 7623
 7624
 7625                                   ;ERROR 26
 7626
 7627  001554  064270                          EM26                    ;DRIVE NOT IN NEUTRAL AFTER RELEASE, REQUEST NOT SET
 7628  001556  067417                          DH22
 7629  001560  070442                          DT22
 7630  001562  070614                          DF31
 7631
 7632                                   ;ERROR 27
 7633
 7634  001564  064355                          EM27                    ;REGISTER WRONG AFTER RELEASE WITH REQUEST SET
 7635  001566  067103                          DH7
 7636  001570  070404                          DT7
 7637  001572  070605                          DF7
 7638
 7639                                   ;ERROR 30
 7640
 7641  001574  064433                          EM30                    ;DRIVE SEIZED BY RELEASE ISSUED WHEN DRIVE IN NEUTRAL
 7642  001576  067773                          DH36
 7643  001600  070502                          DT36
 7644  001602  070620                          DF36
 7645
 7646                                   ;ERROR 31
 7647
 7648  001604  064530                          EM31                    ;DRIVE NOT SEIZED BY PORT AFTER RELEASE WIITH REQUEST SE
 7649  001606  067674                          DH31
 7650  001610  070470                          DT31
 7651  001612  070614                          DF31
 7652
 7653                                   ;ERROR 32
 7654
 7655  001614  064605                          EM32                    ;ATTN BIT WRONG AFTER RECALIBRATE COMMAND
 7656  001616  067027                          DH5
 7657  001620  070352                          DT5
 7658  001622  070577                          DF5
 7659
 7660                                   ;ERROR 33
 7661
 7662  001624  064656                          EM33                    ;DRIVE RETURNS TO NEUTRAL IF DRIVE CLEAR GIVEN WHILE DRI
 7663  001626  067773                          DH36
 7664  001630  070502                          DT36
```

```
7665  001632  070620                    DF36
7666
7667                                ;ERROR 34
7668
7669  001634  064760                    EM34          ;DRIVE RETURNS TO NEUTRAL IF MASSBUS INIT GIVEN WHILE DR
7670  001636  067773                    DH36
7671  001640  070502                    DT36
7672  001642  070620                    DF36
7673
7674                                ;ERROR 35
7675
7676  001644  065063                    EM35          ;DRIVE RETURNED TO NEUTRAL WITHOUT TRIGGERING TIMEOUT ON
7677  001646  067773                    DH36
7678  001650  070512                    DT37
7679  001652  070620                    DF36
7680
7681                                ;ERROR 36
7682
7683  001654  065142                    EM36          ;TIMEOUT HAS NOT OCCURRED WITHIN 2 SECONDS
7684  001656  067773                    DH36
7685  001660  070502                    DT36
7686  001662  070620                    DF36
7687
7688                                ;ERROR 37
7689
7690  001664  065214                    EM37          ;DRIVE IS NON-EXISTENT
7691  001666  067773                    DH36
7692  001670  070512                    DT37
7693  001672  070620                    DF36
7694
7695                                ;ERROR 40
7696
7697  001674  065262                    EM40          ;ATTENTION FOR PORT NOT RESET BY MASSBUS CLEAR
7698  001676  066564                    DH1
7699  001700  070454                    DT23
7700  001702  070572                    DF1
7701
7702                                ;ERROR 41
7703
7704  001704  065337                    EM41          ;TIMEOUT CLEARED ATTENTION BIT
7705  001706  067515                    DH23
7706  001710  070454                    DT23
7707  001712  070572                    DF1
7708
7709                                ;ERROR 42
7710
7711  001714  065401                    EM42          ;DRIVE NOT IN NEUTRAL OR SEIZED
7712  001716  070022                    DH42
7713  001720  070522                    DT42
7714  001722  070623                    DF42
7715
7716                                ;ERROR 43
7717
7718  001724  065467                    EM43          ;DRIVE IN NEUTRAL AFTER ATTENTION BIT WRITTEN
7719  001726  070022                    DH42
7720  001730  070522                    DT42
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7721  001732  070623                        DF42
7722
7723                                ;ERROR 44
7724
7725  001734  065544                        EM44            ;WRITE ATTENTION BIT DID NOT SET PORT REQUEST
7726  001736  070041                        DH44
7727  001740  070470                        DT31
7728  001742  070614                        DF31
7729
7730                                ;ERROR 45
7731
7732  001744  065621                        EM45            ;CONTROLLER SELECT SWITCH ON DRIVE NOT IN 'A/B'
7733  001746  066564                        DH1
7734  001750  070322                        DT1
7735  001752  070572                        DF1
7736
7737                                ;ERROR 46
7738
7739  001754  065700                        EM46            ;CAN'T ACCESS DRIVE THROUGH EITHER PORT
7740  001756  070137                        DH46
7741  001760  070530                        DT46
7742  001762  070614                        DF31
7743
7744                                ;ERROR 47
7745
7746  001764  065747                        EM47            ;ATTN BIT FOR SEIZING PORT NOT CLEARED BY MASSBUS INIT
7747  001766  067515                        DH23
7748  001770  070454                        DT23
7749  001772  070572                        DF1
7750
7751                                ;ERROR 50
7752
7753  001774  066035                        EM50            ;ATTN BIT FOR OPPOSITE PORT CLEARED BY MASSBUS INIT
7754  001776  067277                        DH13
7755  002000  070424                        DT13
7756  002002  070577                        DF5
7757
7758                                ;ERROR 51
7759
7760  002004  066120                        EM51            ;ATTN BIT CLEARED BY MASSBUS INIT, DRIVE IN NEUTRAL
7761  002006  067027                        DH5
7762  002010  070352                        DT5
7763  002012  070577                        DF5
7764
7765                                ;ERROR 52
7766
7767  002014  066203                        EM52            ;ATTN BIT SET AFTER TIMEOUT, 'ERR' SET, NO REQUEST
7768  002016  067277                        DH13
7769  002020  070424                        DT13
7770  002022  070577                        DF5
7771
7772                                ;ERROR 53               ;CAN'T READ ATTN BIT FROM OPPOSITE PORT
7773
7774  002024  066301                        EM53
7775  002026  067515                        DH23
7776  002030  070322                        DT1
```

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 7777  002032  070572                    DF1
 7778
 7779                              ;ERROR 54
 7780
 7781  002034  066362                    EM54                ;RELEASE COMMAND RECOGNIZED WHEN ISSUED BY NON-SEIZING P
 7782  002036  067417                    DH22
 7783  002040  070542                    DT54
 7784  002042  070614                    DF31
 7785
 7786                              ;ERROR 55
 7787
 7788  002044  066455                    EM55                ;TIMEOUT ONE-SHOT IS LESS THAN 500 MS
 7789  002046  070235                    DH55
 7790  002050  070554                    DT55
 7791  002052  070625                    DF55
 7792
 7793                              ;ERROR 56
 7794
 7795  002054  066522                    EM56                ;RH11 DIDN'T RESPOND TO ADDRESSING
 7796  002056  070313                    DH56
 7797  002060  070566                    DT56
 7798  002062  070631                    DF56
 7799
 7800
 7801
 7808                              ;;*****************************************************************
 7809
 7810                              .SBTTL  STARTUP AND INITIALIZATION ROUTINES
 7811
 7812                              ;;*****************************************************************
 7813
 7814  002064  005037  001276      START:  CLR     CHGADR          ;CLEAR THE 'CHANGE RH11 ADDRESS' INDICATOR
 7815  002070  000403              BR      START2          ;GO TO THE START
 7816  002072  012737  177777  001276  START1: MOV     #-1,CHGADR      ;SET THE 'CHANGE RH11 ADDRESS' INDICATOR
 7817  002100  000005              START2: RESET           ;CLEAR THE BUS
 7818                              .SBTTL  INITIALIZE THE COMMON TAGS
  (1)                              ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
  (1)  002102  012706  001100              MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
  (1)  002106  005026              CLR     (R6)+           ;;CLEAR MEMORY LOCATION
  (1)  002110  022706  001140              CMP     #$WR,R6 ;;DONE?
  (1)  002114  001374              BNE     .-6             ;;LOOP BACK IF NO
  (1)  002116  012706  001100              MOV     #STACK,SP       ;;SETUP THE STACK POINTER
  (1)                              ;;INITIALIZE A FEW VECTORS
  (1)  002122  012737  056720  000020      MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
  (1)  002130  012737  000340  000022      MOV     #340,@#IOTVEC+2 ;;LEVEL 7
  (1)  002136  012737  057152  000030      MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
  (1)  002144  012737  000340  000032      MOV     #340,@#EMTVEC+2 ;;LEVEL 7
  (1)  002152  012737  061752  000034      MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
  (1)  002160  012737  000340  000036      MOV     #340,@#TRAPVEC+2;LEVEL 7
  (1)  002166  013737  056320  056312      MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
  (1)  002174  005037  001176              CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
  (1)  002200  005037  001200              CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
  (1)  002204  112737  000001  001115      MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
  (1)  002212  012737  002212  001106      MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
  (1)  002220  012737  002220  001110      MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
  (2)                              ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
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                                                ;;EQUAL TO A "-1".  SETUP FOR A SOFTWARE SWITCH REGISTER.
(2)                                             MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
(2)  002226  013746  000004                     MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
(2)  002232  012737  002266  000004             MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
(2)  002240  012737  177570  001140             MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
(2)  002246  012737  177570  001142             CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
(2)  002254  022777  177777  176656             BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
(2)  002262  001012                                                     ;;AND  THE HARDWARE SWR IS NOT = -1
(2)  002264  000403                             BR      65$             ;;BRANCH IF NO TIMEOUT
(2)  002266  012716  002274             64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
(2)  002272  000002                             RTI
(2)  002274  012737  000176  001140     65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
(2)  002302  012737  000174  001142             MOV     #DISPREG,DISPLAY
(2)  002310  012637  000004             66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
(1)
7819 002314  005227  177777                     INC     #-1             ;FIRST START ?
7820 002320  001006                             BNE     1$              ;BR IF NOT
7821 002322  023737  000042  000046             CMP     @#42,@#46       ;ACT11?
7822 002330  001402                             BEQ     1$              ;BR IF YES
7823 002332  104401  062040                     TYPE    ,TITLE          ;TYPE PROGRAM NAME
7824 002336  004737  060362             1$:     JSR     PC,$TKINT       ;SETUP THE TTY KEYBOARD
7825                                    .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
(1)  002342  005737  000042                     TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
(1)  002346  001006                             BNE     67$             ;;BRANCH IF YES
(1)  002350  023727  001140  000176             CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
(1)  002356  001005                             BNE     68$             ;;BRANCH IF NO
(1)  002360  104406                             GTSWR                   ;;GET SOFT-SWR SETTINGS
(1)  002362  000403                             BR      68$
(1)  002364  112737  000001  001134     67$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
(1)  002372                              68$:
7826 002372  004737  003004                     JSR     PC,CHANGE       ;CHECK/CHANGE THE RH11 ADDRESS
7827 002376  023737  000042  000046             CMP     @#42,@#46       ;ACT11?
7828 002404  001414                             BEQ     2$              ;BR IF YES
7829 002406  104401  062137                     TYPE    ,ENTERA         ;ENTER DRIVE ADDRESS
7830 002412  104412                             RDOCT                   ;GET THE ADDRESS
7831 002414  012637  001224                     MOV     (SP)+,PORTA     ;STORE THE ADDRESS
7832 002420  023727  001224  000007             CMP     PORTA,#7        ;SEE IF ADDRESS TOO LARGE
7833 002426  101403                             BLOS    2$              ;BR IF NOT
7834 002430  104401  062167                     TYPE    ,ADRERR         ;TYPE ADDRESS ERROR MESSAGE
7835 002434  000740                             BR      1$              ;TRY AGAIN
7836 002436  013737  001224  001226     2$:     MOV     PORTA,PORTB     ;GENERATE THE PORT B ADDRESS
7837 002444  005237  001226                     INC     PORTB           ;INCREMENT THE ADDRESS
7838 002450  042737  000016  001226             BIC     #16,PORTB       ;LEAVE BIT 0
7839 002456  013746  001224                     MOV     PORTA,-(SP)     ;PUT PORT A ADDRESS ON THE STACK
7840 002462  042716  177771                     BIC     #^C6,(SP)       ;SAVE BITS 1 & 2
7841 002466  052637  001226                     BIS     (SP)+,PORTB     ;SET BITS 1 & 2 IN PORT B ADDRESS
7842 002472  104401  062211                     TYPE    ,PORTAIS        ;'PORT A ADDRESS IS '
7843 002476  013746  001224                     MOV     PORTA,-(SP)     ;;SAVE PORTA FOR TYPEOUT
(1)                                                                     ;;TYPE PORT A ADDRESS
(1)  002502  104403                             TYPOS                   ;;GO TYPE--OCTAL ASCII
(1)  002504     001                             .BYTE   1               ;;TYPE 1 DIGIT(S)
(1)  002505     000                             .BYTE   0               ;;SUPPRESS LEADING ZEROS
7844 002506  104401  062237                     TYPE    ,PORTBIS        ;'PORT B ADDRESS IS '
7845 002512  013746  001226                     MOV     PORTB,-(SP)     ;;SAVE PORTB FOR TYPEOUT
(1)                                                                     ;;TYPE PORT B ADDRESS
(1)  002516  104403                             TYPOS                   ;;GO TYPE--OCTAL ASCII
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(1)  002520  001                          .BYTE   1               ;;TYPE 1 DIGIT(S)
(1)  002521  000                          .BYTE   0               ;;SUPPRESS LEADING ZEROS
7846 002522  104401  001207               TYPE    $CRLF           ;ANOTHER CR-LF
7847 002526  013737  001224  001230       MOV     PORTA,PORTC     ;GENERATE ADDRESS OF DRIVE NOT TESTED
7848 002534  062737  000006  001230       ADD     #6,PORTC        ;COMPLEMENT SOME BITS
7849 002542  042737  177770  001230       BIC     #^C7,PORTC      ;SAVE ONLY LOWER BITS
7850 002550  013701  001224               MOV     PORTA,R1        ;USE PORT A ADDRESS AS INDEX
7851 002554  116137  070746  001232       MOVB    ATABIT(R1),ASR1 ;GET ATTENTION BIT FOR DRIVE
7854 002562  005037  001256               CLR     TIMEA           ;CLEAR TIMEOUT ONE-SHOT VALUE LOCATION
(1)  002566  005037  001260               CLR     TIMEAP          ;CLEAR TIMEOUT ONE-SHOT VALUE LOCATION
(1)  002572  005037  001264               CLR     TIMEB           ;CLEAR TIMEOUT ONE-SHOT VALUE LOCATION
(1)  002576  005037  001266               CLR     TIMEBP          ;CLEAR TIMEOUT ONE-SHOT VALUE LOCATION
7855 002602  004737  056474               JSR     PC,CKCLK        ;SETUP CLOCK
7856 002606  000137  002622               JMP     EXEC            ;CLOCK HAS BEEN STARTED
7857 002612  104401  062265               TYPE    ,NOCLOCK        ;NO CLOCK ON SYSTEM
7858 002616  000000                  3$:  HALT                    ;FATAL ERROR
7859 002620  000776                       BR      3$              ;INTERLOCK THE HALT
7860
7861                                 ;ROUTINE TO GET THE TEST NUMBER FROM THE OPERATOR
7862
7863 002622  000005                  EXEC:RESET                   ;CLEAR EVERYTHING
7864 002624  005037  177776               CLR     PS              ;CLEAR THE PROCESSOR STATUS WORD
7865 002630  104401  001207               TYPE    $CRLF           ;CR-LF
7866 002634  013700  001300               MOV     $RPADR,R0       ;RH11 ADDRESS FOR INDEXING
7867 002640  012706  001100               MOV     #STACK,SP       ;LOAD STACK POINTER
7868 002644  004737  056474               JSR     PC,CKCLK        ;START THE CLOCK
7869 002650  000240                       NOP                     ;RETURN IF NO CLOCK
7870 002652  004737  060362               JSR     PC,$TKINT       ;INITIALIZE THE KEYBOARD
7871 002656  005037  001274               CLR     KYBCTL          ;CLEAR SINGLE TEST INDICATOR
7872 002662  005037  001100               CLR     $PASS           ;CLEAR THE PASS COUNT
7873 002666  112737  000001  001115       MOVB    #1,$ERMAX       ;SET ERROR MAX TO 1
7874 002674  012737  002674  001106       MOV     #.,$LPADR       ;INITIAL SETTING FOR LOOP ADDRESS
7875 002702  012737  002702  001110       MOV     #.,$LPERR       ;INITIAL SETTING FOR LOOP ON ERROR ADDRESS
7876 002710  023737  000042  000046  1$:  CMP     @#42,@#46       ;ACT11?
7877 002716  001405                       BEQ     5$              ;BR IF YES
7878 002720  104401  062334               TYPE    ,TESTNO         ;ASK FOR TEST NUMBER
7879 002724  104412                       RDOCT                   ;GET THE NUMBER
7880 002726  012601                       MOV     (SP)+,R1        ;PUT ENTRY INTO R1
7881 002730  001002                       BNE     2$              ;BR IF NOT ZERO
7882 002732  000137  003120          5$:  JMP     TST1            ;ENTER ZERO - PERFORM ALL TESTS
7883 002736  020137  070756          2$:  CMP     R1,MAXTN        ;SEE IF NUMBER GREATER THAN MAXIMUM
7884 002742  003403                       BLE     3$              ;BR IF LESS OR EQUAL
7885 002744  104401  062354               TYPE    ,BADNO          ;BAD ENTRY
7886 002750  000757                       BR      1$              ;TRY AGAIN
7887 002752  005301                  3$:  DEC     R1              ;DECREMENT ENTRY
7888 002754  006301                       ASL     R1              ;SHIFT IT LEFT
7889 002756  016137  070632  003002       MOV     TSTADR(R1),4$   ;GET THE TEST ADDRESS
7890 002764  005237  001274               INC     KYBCTL          ;SET SINGLE TEST INDICATOR
7891 002770  012737  000001  001104       MOV     #1,$ICNT        ;PRESET ITERATION COUNT
7892 002776  000177  000000               JMP     @4$             ;GO TO THE SELECTED TEST
7893 003002  000000                  4$:  .WORD   0               ;TEST ADDRESS GOES HERE
7894
7895                                 ;CHANGE THE RH11 UNIBUS ADDRESS USED BY THE PROGRAM
7896
7897 003004  005737  001276          CHANGE: TST  CHGADR          ;CHANGE THE ADDRESS ?
7898 003010  001421                       BEQ     3$              ;BR IF NOT
```

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 7899  003012  005037  001276          1$:     CLR     CHGADR          ;CLEAR THE INDICATOR
 7900  003016  104401  062414                  TYPE    ,ADDRIS         ;TYPE OUT WHAT THE PRESENT ADDRESS IS
 7901  003022  013746  001300                  MOV     $RPADR,-(SP)    ;PUT THE ADDRESS ON THE STACK
 7902  003026  104402                          TYPOC                   ;TYPE THE ACTUAL ADDRESS
 7903  003030  104401  001207                  TYPE    ,$CRLF          ;CR-LF
 7904  003034  104401  062474                  TYPE    ,NTRH11         ;ASK FOR NEW ADDRESS
 7905  003040  104412                          RDOCT
 7906  003042  005716                          TST     (SP)            ;0 OR 'CR' ENTERED ?
 7907  003044  001402                          BEQ     2$              ;BR IF EITHER ENTERED (NO ADDRESS CHANGE)
 7908  003046  011637  001300                  MOV     (SP),$RPADR     ;NEW RH11 ADDRESS
 7909  003052  005726                  2$:     TST     (SP)+           ;CORRECT THE STACK POINTER
 7910  003054  012737  003074  000004  3$:     MOV     #4$,@#4         ;LOAD TRAP ADDRESS
 7911  003062  013700  001300                  MOV     $RPADR,R0       ;RH11 ADDRESS
 7912  003066  005760  000002                  TST     RPWC(R0)        ;SEE IF RH11 RESPONDS AT THAT ADDRESS
 7913  003072  000404                          BR      5$              ;BR, RH11 ALIVE AT PRESENT ADDRESS
 7914  003074  104056                  4$:     ERROR   56              ;NO RESPONSE TO ADDRESS
 7915  003076  062706  000004                  ADD     #4,SP           ;RESET THE STACK POINTER
 7916  003102  000745                          BR      1$              ;GET ADDRESS AGAIN
 7917  003104  012737  000006  000004  5$:     MOV     #6,@#4          ;RESTORE THE VECTOR
 7918  003112  000207                          RTS     PC              ;RETURN
 7919
 7920                                  ;;*****************************************************************
 7921
 7922                                  .SBTTL  *** TESTS ***
 7923
 7924                                  ;;*****************************************************************
 7925
 7938
 7939  003114  013700  001300          TST1AA: MOV     $RPADR,R0       ;;RESTORE R0 AFTER END OF PASS
 7940
 7941                                  ;;*****************************************************************
   (3)                                ;*TEST 1         DRIVE ACCESS TEST
   (4)                                ;*
   (4)                                ;*VERIFY THAT THE DRIVE CAN BE ACCESSED THROUGH BOTH PORTS
   (4)                                ;*
   (4)                                ;*  A.  SELECT DRIVE, VERIFY THAT THE DRIVE IS PRESENT, THAT THE
   (4)                                ;*      DRIVE IS A DUAL PORT RP04, THAT THE DRIVE IS ONLINE (RPDS1 HAS
   (4)                                ;*      'MOL'  'PGM'  'DPR', & 'DRY' BITS SET), AND THE THE DRIVE SERIAL
   (4)                                ;*      NUMBER READ THROUGH BOTH PORTS IS THE SAME.
   (4)                                ;*
   (4)                                ;*  B.  THE TEST IS REPEATED THROUGH BOTH PORTS.
   (4)                                ;*
   (3)                                ;*****************************************************************
   (2)  003120                        TST1:
   (3)  003120  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  003124  001406                          BEQ     2$              ;BR IF NOT
   (3)  003126  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
   (3)  003130  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  003134  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  003142  112737  000001  001102  2$:     MOVB    #1,$TSTNM       ;TEST NUMBER
   (3)  003150  012737  003172  001106          MOV     #TEST1,$LPADR   ;LOAD LOOP ON TEST ADDRESS
   (3)  003156  012737  003172  001110          MOV     #TEST1,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
   (1)  003164  012737  000001  001176          MOV     #1,$TIMES       ;;DO 1 ITERATION
 7942   003172  012706  001100          TEST1:  MOV     #STACK,SP       ;LOAD THE STACK POINTER
 7943
 7944                                  ;;*****************************************************************
```

```
                                ;VERIFY THAT DRIVE IS PRESENT THROUGH PORTS A & B
                                
003176  113760  001224  000010          MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A
003204  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
003212  005760  000012                  TST     RPDS1(R0)         ;SEE IF DRIVE (PORT A) PRESENT
003216  005037  001244                  CLR     CKERR             ;CLEAR THE 'CHECK ERROR' INDICATOR
003222  016037  000010  001126          MOV     RPCS2(R0),$BDDAT  ;GET CONTENTS OF RPCS2
003230  012737  000010  001122          MOV     #RPCS2,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
003236  060037  001122                  ADD     R0,$BDADR         ;ADD RH11 BASE ADDRESS
003242  005037  001124                  CLR     $GDDAT            ;WHAT REGISTER SHOULD BE
003246  013737  001126  001164          MOV     $BDDAT,$TMP0      ;MOVE REGISTER CONTENTS TO '$TMP0'
003254  042737  167777  001164          BIC     #^CNED,$TMP0   ;SAVE SPECIFIED BITS
003262  023737  001124  001164          CMP     $GDDAT,$TMP0      ;COMPARE THE BITS
003270  001414                          BEQ     64$               ;BR IF OK
003272  013737  001126  001174          MOV     $BDDAT,$TMP4      ;COPY 'BAD DATA'
003300  042737  010000  001174          BIC     #NED,$TMP4        ;CLEAR THE MASKED BITS
003306  053737  001174  001124          BIS     $TMP4,$GDDAT      ;'OR' WITH GOOD DATA FOR TYPEOUT
003314  104037                          ERROR   37                ;TYPE MESSAGE 37
003316  005137  001244                  COM     CKERR             ;SET THE REGISTER COMPARE ERROR INDICATOR
003322  000240                  64$:    NOP
003324  005737  001244                  TST     CKERR             ;WAS 'NED' SET ?
003330  001403                          BEQ     .+10              ;BR IF NOT
003332  012760  000040  000010          MOV     #CLR,RPCS2(R0)    ;ISSUE MASSBUS INIT TO CLEAR 'NED'
003340  113760  001226  000010          MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B
003346  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
003354  005760  000012                  TST     RPDS1(R0)         ;SEE IF DRIVE (PORT B) PRESENT
003360  005037  001244                  CLR     CKERR             ;CLEAR THE 'CHECK ERROR' INDICATOR
003364  016037  000010  001126          MOV     RPCS2(R0),$BDDAT  ;GET CONTENTS OF RPCS2
003372  012737  000010  001122          MOV     #RPCS2,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
003400  060037  001122                  ADD     R0,$BDADR         ;ADD RH11 BASE ADDRESS
003404  005037  001124                  CLR     $GDDAT            ;WHAT REGISTER SHOULD BE
003410  013737  001126  001164          MOV     $BDDAT,$TMP0      ;MOVE REGISTER CONTENTS TO '$TMP0'
003416  042737  167777  001164          BIC     #^CNED,$TMP0   ;SAVE SPECIFIED BITS
003424  023737  001124  001164          CMP     $GDDAT,$TMP0      ;COMPARE THE BITS
003432  001414                          BEQ     66$               ;BR IF OK
003434  013737  001126  001174          MOV     $BDDAT,$TMP4      ;COPY 'BAD DATA'
003442  042737  010000  001174          BIC     #NED,$TMP4        ;CLEAR THE MASKED BITS
003450  053737  001174  001124          BIS     $TMP4,$GDDAT      ;'OR' WITH GOOD DATA FOR TYPEOUT
003456  104037                          ERROR   37                ;TYPE MESSAGE 37
003460  005137  001244                  COM     CKERR             ;SET THE REGISTER COMPARE ERROR INDICATOR
003464  000240                  66$:    NOP
003466  005737  001244                  TST     CKERR             ;WAS 'NED' SET ?
003472  001403                          BEQ     .+10              ;BR IF NOT
003474  012760  000040  000010          MOV     #CLR,RPCS2(R0)    ;ISSUE MASSBUS INIT TO CLEAR 'NED'

                                ;;*****************************************************************
                                ;CONFIRM THAT DRIVE IS AN RP04/5/6 AND IS DUAL PORT

003502  113760  001224  000010          MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A
003510  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
003516  005037  001244                  CLR     CKERR             ;CLEAR THE 'CHECK ERROR' INDICATOR
003522  016037  000026  001126          MOV     RPDT(R0),$BDDAT   ;GET CONTENTS OF RPDT
003530  012737  000026  001122          MOV     #RPDT,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
003536  060037  001122                  ADD     R0,$BDADR         ;ADD RH11 BASE ADDRESS
003542  012737  024020  001124          MOV     #24020,$GDDAT  ;WHAT REGISTER SHOULD BE
003550  013737  001126  001164          MOV     $BDDAT,$TMP0      ;MOVE REGISTER CONTENTS TO '$TMP0'
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   (2)  003556  042737  000003  001164          BIC     #↑C177774,$TMPO  ;SAVE SPECIFIED BITS
   (2)  003564  023737  001124  001164          CMP     $GDDAT,$TMPO     ;COMPARE THE BITS
   (2)  003572  001414                          BEQ     68$              ;BR IF OK
   (2)  003574  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
   (2)  003602  042737  177774  001174          BIC     #177774,$TMP4    ;CLEAR THE MASKED BITS
   (2)  003610  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
   (2)  003616  104001                          ERROR   1                ;TYPE MESSAGE 1
   (2)  003620  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
   (2)  003624  000240                  68$:    NOP
   (2)  003626  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
   (2)  003634  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
   (2)  003642  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
   (2)  003646  016037  000026  001126          MOV     RPDT(R0),$BDDAT  ;GET CONTENTS OF RPDT
   (2)  003654  012737  000026  001122          MOV     #RPDT,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
   (2)  003662  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
   (2)  003666  012737  024020  001124          MOV     #24020,$GDDAT  ;WHAT REGISTER SHOULD BE
   (2)  003674  013737  001126  001164          MOV     $BDDAT,$TMPO     ;MOVE REGISTER CONTENTS TO '$TMPO'
   (2)  003702  042737  000003  001164          BIC     #↑C177774,$TMPO  ;SAVE SPECIFIED BITS
   (2)  003710  023737  001124  001164          CMP     $GDDAT,$TMPO     ;COMPARE THE BITS
   (2)  003716  001414                          BEQ     70$              ;BR IF OK
   (2)  003720  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
   (2)  003726  042737  177774  001174          BIC     #177774,$TMP4    ;CLEAR THE MASKED BITS
   (2)  003734  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
   (2)  003742  104001                          ERROR   1                ;TYPE MESSAGE 1
   (2)  003744  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
   (2)  003750  000240                  70$:    NOP
  7963
  7964                                  ;;*****************************************************************
  7965                                  ;VERIFY THROUGH BOTH PORTS THAT THE DRIVE IS ON LINE AND IN NEUTRAL
  7966
  7971  003752  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
   (2)  003760  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
   (2)  003766  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
   (2)  003772  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
   (2)  004000  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
   (2)  004006  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
   (2)  004012  012737  001000  001124          MOV     #PGM,$GDDAT  ;WHAT REGISTER SHOULD BE
   (2)  004020  013737  001126  001164          MOV     $BDDAT,$TMPO     ;MOVE REGISTER CONTENTS TO '$TMPO'
   (2)  004026  042737  176777  001164          BIC     #↑CPGM,$TMPO  ;SAVE SPECIFIED BITS
   (2)  004034  023737  001124  001164          CMP     $GDDAT,$TMPO     ;COMPARE THE BITS
   (2)  004042  001414                          BEQ     72$              ;BR IF OK
   (2)  004044  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
   (2)  004052  042737  001000  001174          BIC     #PGM,$TMP4       ;CLEAR THE MASKED BITS
   (2)  004060  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
   (2)  004066  104045                          ERROR   45               ;TYPE MESSAGE 45
   (2)  004070  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
   (2)  004074  000240                  72$:    NOP
   (2)  004076  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
   (2)  004102  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
   (2)  004110  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
   (2)  004116  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
   (2)  004122  012737  010600  001124          MOV     #MOL!DPR!DRY,$GDDAT  ;WHAT REGISTER SHOULD BE
   (2)  004130  013737  001126  001164          MOV     $BDDAT,$TMPO     ;MOVE REGISTER CONTENTS TO '$TMPO'
   (2)  004136  042737  167177  001164          BIC     #↑C10600,$TMPO   ;SAVE SPECIFIED BITS
   (2)  004144  023737  001124  001164          CMP     $GDDAT,$TMPO     ;COMPARE THE BITS
   (2)  004152  001414                          BEQ     74$              ;BR IF OK
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    (2)  004154  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
    (2)  004162  042737  010600  001174          BIC     #10600,$TMP4     ;CLEAR THE MASKED BITS
    (2)  004170  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
    (2)  004176  104002                          ERROR   2                ;TYPE MESSAGE 2
    (2)  004200  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
    (2)  004204  000240                  74$:    NOP
    (2)  004206  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
    (2)  004214  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
    (2)  004222  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
    (2)  004226  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
    (2)  004234  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
    (2)  004242  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
    (2)  004246  012737  001000  001124          MOV     #PGM,$GDDAT  ;WHAT REGISTER SHOULD BE
    (2)  004254  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
    (2)  004262  042737  176777  001164          BIC     #^CPGM,$TMP0  ;SAVE SPECIFIED BITS
    (2)  004270  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
    (2)  004276  001414                          BEQ     76$              ;BR IF OK
    (2)  004300  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
    (2)  004306  042737  001000  001174          BIC     #PGM,$TMP4       ;CLEAR THE MASKED BITS
    (2)  004314  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
    (2)  004322  104045                          ERROR   45               ;TYPE MESSAGE 45
    (2)  004324  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
    (2)  004330  000240                  76$:    NOP
    (2)  004332  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
    (2)  004336  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
    (2)  004344  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
    (2)  004352  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
    (2)  004356  012737  010600  001124          MOV     #MOL!DPR!DRY,$GDDAT  ;WHAT REGISTER SHOULD BE
    (2)  004364  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
    (2)  004372  042737  167177  001164          BIC     #^C10600,$TMP0   ;SAVE SPECIFIED BITS
    (2)  004400  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
    (2)  004406  001414                          BEQ     78$              ;BR IF OK
    (2)  004410  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
    (2)  004416  042737  010600  001174          BIC     #10600,$TMP4     ;CLEAR THE MASKED BITS
    (2)  004424  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
    (2)  004432  104002                          ERROR   2                ;TYPE MESSAGE 2
    (2)  004434  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
    (2)  004440  000240                  78$:    NOP
 7972
 7973                                    ;;*****************************************************************
 7974                                    ;VERIFY THAT DRIVE SERIAL NUMBER SEEN THROUGH BOTH PORTS IS THE SAME
 7975
 7976  004442  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
 7977  004450  016037  000030  001124          MOV     RPSN(R0),$GDDAT  ;STORE THE PORT A SERIAL NUMBER
 7978  004456  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
 7979  004464  016037  000030  001126          MOV     RPSN(R0),$BDDAT  ;STORE THE PORT B SERIAL NUMBER
 7980  004472  023737  001124  001126          CMP     $GDDAT,$BDDAT    ;ARE THEY THE SAME ?
 7981  004500  001406                          BEQ     1$               ;BR IF THEY ARE
 7982  004502  104003                          ERROR   3                ;REPORT THE ERROR
 7983  004504  032777  100000  174426          BIT     #SW15,@SWR       ;HALT ON ERROR ?
 7984  004512  001001                          BNE     1$               ;BR IF SET - PROGRAM HAS ALREADY HALTED
 7985  004514  000000                          HALT                     ;HALT, POSSIBLE CABLE CONNECTION PROBLEM
 7986  004516  000004                  1$:     SCOPE                    ;LOOP ?
 7987
 8005
 8006                                    ;;*****************************************************************
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(3)                                     ;*TEST 2        PORT 'A' SEIZE/TIMEOUT TEST
(4)                                     ;*
(4)                                     ;*VERIFY THAT THE DRIVE CAN BE SEIZED AND THAT THE PORT TIMEOUT RELEASES
(4)                                     ;*      THE DRIVE.
(4)                                     ;*
(4)                                     ;*  A.  WRITE 0'S INTO RPDS1 THROUGH PORT 'A'; VERIFY THAT THE DRIVE
(4)                                     ;*      HAS BEEN SEIZED.
(4)                                     ;*
(4)                                     ;*  B.  READ EACH DRIVE REGISTER, EXCEPT RPCS1, THROUGH PORT 'B';
(4)                                     ;*      VERIFY THAT 0'S ARE READ FROM EACH REGISTER.
(4)                                     ;*
(4)                                     ;*  C.  WAIT FOR THE PORT TIMEOUT TO OCCUR AND RELEASE THE DRIVE.
(4)                                     ;*      MEASURE THE DURATION OF THE TIMEOUT ONE SHOT AND SAVE THE
(4)                                     ;*      VALUE FOR LATER USE.  VERIFY THAT TIMEOUT RETURNED THE DRIVE TO
(4)                                     ;*      NEUTRAL.
(4)                                     ;*
(3)                                     ;;*****************************************************************
(2)  004520                             TST2:
(3)  004520  005737  001274                     TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  004524  001406                             BEQ     2$              ;BR IF NOT
(3)  004526  100002                             BPL     1$              ;BR IF JUST ENTERED TEST
(3)  004530  000137  002622                     JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  004534  012737  177777  001274   1$:      MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  004542  112737  000002  001102   2$:      MOVB    #2,$TSTNM       ;TEST NUMBER
(3)  004550  012737  004572  001106           MOV     #TEST2,$LPADR   ;LOAD LOOP ON TEST ADDRESS
(3)  004556  012737  004572  001110           MOV     #TEST2,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
(1)  004564  012737  000012  001176           MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
8007 004572  012706  001100           TEST2:   MOV     #STACK,SP       ;LOAD THE STACK POINTER
8079 004576  012737  000240  177776           MOV     #<5*32.>,@#PS   ;SET PRIORITY TO 5 IN CASE LOOPING
(1)  004604  005037  001256                   CLR     TIMEA           ;CLEAR TIMEOUT VALUE FOR PORT A
(1)  004610  005037  001260                   CLR     TIMEAP  ;CLEAR UPPER TIMEOUT TOLERANCE
(1)  004614  005037  001262                   CLR     TIMEAM  ;CLEAR LOWER TIMEOUT TOLERANCE
(2)
(3)                                     ;;*****************************************************************
(2)                                     ;START THE TIMER
(2)
(2)  004620  005037  001252                   CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  004624  012737  003720  001254           MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(1)
(2)                                     ;;*****************************************************************
(2)
(2)                                             ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  004632  113760  001224  000010           MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  004640  013737  001224  001236           MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  004646  005060  000012                   CLR     RPDS1(R0)       ;WRITE RPDS1
(3)  004652  113760  001226  000010           MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  004660  013737  001226  001234           MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  004666  013737  001226  001240           MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  004674  016037  000012  001126           MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT A
(2)  004702  010037  001122                   MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2)  004706  062737  000012  001122           ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2)  004714  005037  001124                   CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2)  004720  023737  001124  001126           CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2)  004726  001403                           BEQ     64$             ;BR IF IT IS
(2)  004730  104004                           ERROR   4               ;REPORT THE ERROR
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(2)  004732  000137  006116            JMP     5$                  ;BYPASS REST OF THE SUBTEST
(2)  004736                        64$:
(3)  004736  113760  001224  000010    MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(3)  004744  013737  001224  001234    MOV     PORTA,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  004752  016037  000012  001126    MOV     RPDS1(R0),$BDDAT    ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  004760  012737  011600  001124    MOV     #MOL!PGM!DPR!DRY,$GDDAT   ;EXPECTED STATUS
(2)  004766  013737  001124  001166    MOV     $GDDAT,$TMP1   ;USE GOOD DATA AS A MASK
(2)  004774  005137  001166            COM     $TMP1               ;COMPLEMENT THE EXPECTED STATUS
(2)  005000  013737  001126  001164    MOV     $BDDAT,$TMP0        ;SAVE THE ACTUAL STATUS
(2)  005006  043737  001166  001164    BIC     $TMP1,$TMP0         ;CLEAR UNWANTED BITS
(2)  005014  023737  001124  001164    CMP     $GDDAT,$TMP0        ;ARE THE EXPECTED STATUS BITS SET ?
(2)  005022  001401                    BEQ     65$                 ;BR IF THEY ARE
(2)  005024  104005                    ERROR 5                     ;REPORT THE ERROR
(2)  005026  000240                65$: NOP
(1)
(2)                                    ;;*****************************************************************
(1)                                    ;READ THE DRIVE REGISTERS THROUGH PORT B AND STORE THEM ON THE STACK
(1)
(2)  005030  113760  001226  000010    MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B
(2)  005036  013737  001226  001234    MOV     PORTB,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  005044  016046  000046            MOV     RPEC2(R0),-(SP) ;STORE REGISTER RPEC2, PORT B, FOR CHECK
(2)  005050  016046  000044            MOV     RPEC1(R0),-(SP) ;STORE REGISTER RPEC1, PORT B, FOR CHECK
(2)  005054  016046  000042            MOV     RPER3(R0),-(SP) ;STORE REGISTER RPER3, PORT B, FOR CHECK
(2)  005060  016046  000030            MOV     RPSN(R0),-(SP)  ;STORE REGISTER RPSN, PORT B, FOR CHECK
(2)  005064  016046  000036            MOV     RPCC(R0),-(SP)  ;STORE REGISTER RPCC, PORT B, FOR CHECK
(2)  005070  016046  000034            MOV     RPCA(R0),-(SP)  ;STORE REGISTER RPCA, PORT B, FOR CHECK
(2)  005074  016046  000032            MOV     RPOF(R0),-(SP)  ;STORE REGISTER RPOF, PORT B, FOR CHECK
(2)  005100  016046  000040            MOV     RPER2(R0),-(SP) ;STORE REGISTER RPER2, PORT B, FOR CHECK
(2)  005104  016046  000020            MOV     RPLA(R0),-(SP)  ;STORE REGISTER RPLA, PORT B, FOR CHECK
(2)  005110  016046  000026            MOV     RPDT(R0),-(SP)  ;STORE REGISTER RPDT, PORT B, FOR CHECK
(2)  005114  016046  000006            MOV     RPDA(R0),-(SP)  ;STORE REGISTER RPDA, PORT B, FOR CHECK
(2)  005120  016046  000024            MOV     RPMR(R0),-(SP)  ;STORE REGISTER RPMR, PORT B, FOR CHECK
(2)  005124  016046  000014            MOV     RPER1(R0),-(SP) ;STORE REGISTER RPER1, PORT B, FOR CHECK.
(1)
(2)                                    ;;*****************************************************************
(1)                                    ;WAIT FOR PORT A TO TIMEOUT
(1)
(1)  005130  005760  000012        1$: TST     RPDS1(R0)           ;WAIT FOR THE DRIVE TO TIMEOUT
(1)  005134  001006                    BNE     2$                  ;BR WHEN TIMEOUT OCCURS
(1)  005136  005737  001254            TST     WATCH               ;CHECK WATCH
(1)  005142  001372                    BNE     1$                  ;BR IF NOT ZERO
(1)  005144  104036                    ERROR   36                  ;NO TIMEOUT WITHIN 2 SECONDS
(1)  005146  000137  005536            JMP     4$                  ;BYPASS TIMEOUT TIME CHECK
(1)  005152  012737  000340  177776 2$: MOV     #<7*32.>,@#PS       ;SET PRIORITY TO 7 TO STOP CLOCK
(1)  005160  013737  001252  001256    MOV     TIME,TIMEA          ;SAVE THE ELAPSED TIME FOR PORT A
(1)  005166  004537  056660            JSR     R5,TOLER            ;CALCULATE THE TOLERANCE
(1)  005172  001256                    .WORD   TIMEA               ;TIMEOUT VALUE FOR PORT A
(1)  005174  012637  001260            MOV     (SP)+,TIMEAP        ;+25% TOLERANCE
(1)  005200  012637  001262            MOV     (SP)+,TIMEAM        ;-25% TOLERANCE
(1)
(2)                                    ;;*****************************************************************
(1)                                    ;VERIFY THAT THE TIMEOUT ONE-SHOT IS AT LEAST 500 MS
(1)
(1)  005204  023727  001252  000764    CMP     TIME,#500.          ;WAS MEASURED TIME AT LEAST 500 MS?
(1)  005212  103001                    BHIS    3$                  ;BR IF IT  WAS
(1)  005214  104055                    ERROR   55                  ;REPORT TIMEOUT TOO SHORT
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(1)
(2)                                 ;;*****************************************************************
(1)                                 ;VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AFTER PORT A TIMED OUT
(1)
(1)  005216  012737  000240  177776  3$:     MOV     #<5*32.>,@#PS   ;RESTORE PRIORITY TO 5
(2)
(2)                                 ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  005224  005037  001250                 CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  005230  012737  000012  001122         MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  005236  060037  001122                 ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  005242  012737  011600  001124         MOV     #MOL!PGM!DPR!DRY,$GDDAT  ;COMPARISON CONSTANT
(2)  005250  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  005256  016037  000012  001170         MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  005264  013737  001170  001164         MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  005272  042737  100100  001164         BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  005300  113760  001226  000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  005306  016037  000012  001172         MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  005314  013737  001172  001166         MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  005322  042737  100100  001166         BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  005330  023737  001164  001166         CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  005336  001006                        BNE     66$             ;BR IF NOT
(2)  005340  005737  001164                 TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  005344  001037                        BNE     68$             ;BR IF NOT
(2)  005346  104046                        ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  005350  000137  005534                 JMP     70$             ;BYPASS THE REST OF THE CHECKS
(2)  005354  013737  001170  001126  66$:   MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  005362  013737  001226  001234         MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  005370  113760  001226  000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  005376  005737  001164                 TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  005402  001414                        BEQ     67$             ;BR IF ZERO
(2)  005404  013737  001224  001234         MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  005412  013737  001172  001126         MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(2)  005420  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  005426  005737  001166                 TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  005432  001004                        BNE     68$             ;BR IF NOT
(2)  005434  012737  177777  001250  67$:   MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(2)  005442  104022                        ERROR   22              ;TYPE ERROR MESSAGE 22
(2)  005444  013737  001170  001126  68$:   MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  005452  013737  001224  001234         MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(2)  005460  042737  100100  001170         BIC     #ATA!VV,$TMP2   ;DON'T CHECK ATTN BIT OR VV BIT
(2)  005466  023737  001124  001170         CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  005474  001401                        BEQ     69$             ;BR IF OK FROM PORT A.
(2)  005476  104007                        ERROR   7               ;REPORT ERROR
(2)  005500  013737  001172  001126  69$:   MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  005506  013737  001226  001234         MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  005514  042737  100100  001172         BIC     #ATA!VV,$TMP3   ;DON'T CHECK ATTN BIT OR VV BIT
(2)  005522  023737  001124  001172         CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(2)  005530  001401                        BEQ     70$             ;BR IF OK
(2)  005532  104007                        ERROR   7               ;REPORT ERROR
(2)  005534  000240                 70$:   NOP
(1)
(2)                                 ;;*****************************************************************
(1)                                 ;CHECK THE REGISTERS STORED THROUGH PORT B.  ALL REGISTERS SHOULD BE ZERO.
(1)                                 ;THE REGISTERS ARE STORED ON THE STACK.
(1)
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(1)  005536  013737  001226  001234  4$:     MOV     PORTB,PTNBR     ;CHANGE 'PORT NUMBER' TO THE OPPOSITE PORT
(2)  005544  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPER1
(2)  005550  062737  000014  001122          ADD     #RPER1,$BDADR   ;ADDRESS OF RPER1 FOR TYPEOUT
(2)  005556  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPER1
(2)  005562  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005564  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005566  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPMR
(2)  005572  062737  000024  001122          ADD     #RPMR,$BDADR    ;ADDRESS OF RPMR FOR TYPEOUT
(2)  005600  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPMR
(2)  005604  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005606  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005610  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPDA
(2)  005614  062737  000006  001122          ADD     #RPDA,$BDADR    ;ADDRESS OF RPDA FOR TYPEOUT
(2)  005622  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPDA
(2)  005626  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005630  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005632  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPDT
(2)  005636  062737  000026  001122          ADD     #RPDT,$BDADR    ;ADDRESS OF RPDT FOR TYPEOUT
(2)  005644  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPDT
(2)  005650  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005652  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005654  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPLA
(2)  005660  062737  000020  001122          ADD     #RPLA,$BDADR    ;ADDRESS OF RPLA FOR TYPEOUT
(2)  005666  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPLA
(2)  005672  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005674  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005676  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPER2
(2)  005702  062737  000040  001122          ADD     #RPER2,$BDADR   ;ADDRESS OF RPER2 FOR TYPEOUT
(2)  005710  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPER2
(2)  005714  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005716  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005720  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPOF
(2)  005724  062737  000032  001122          ADD     #RPOF,$BDADR    ;ADDRESS OF RPOF FOR TYPEOUT
(2)  005732  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPOF
(2)  005736  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005740  104006                          ERROR   6               ;REPORT THAT PORT B SAW NON-ZERO REGISTER
(2)  005742  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPCA
(2)  005746  062737  000034  001122          ADD     #RPCA,$BDADR    ;ADDRESS OF RPCA FOR TYPEOUT
(2)  005754  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPCA
(2)  005760  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  005762  104006                          ERROR   6               ;REPORT THAT PORT B SEES NON-ZERO REGISTER
(2)  005764  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPCC
(2)  005770  062737  000036  001122          ADD     #RPCC,$BDADR    ;ADDRESS OF RPCC FOR TYPEOUT
(2)  005776  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPCC
(2)  006002  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  006004  104006                          ERROR   6               ;REPORT THAT PORT B SEES NON-ZERO REGISTER
(2)  006006  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPSN
(2)  006012  062737  000030  001122          ADD     #RPSN,$BDADR    ;ADDRESS OF RPSN FOR TYPEOUT
(2)  006020  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPSN
(2)  006024  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  006026  104006                          ERROR   6               ;REPORT THAT PORT B SEES NON-ZERO REGISTER
(2)  006030  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPER3
(2)  006034  062737  000042  001122          ADD     #RPER3,$BDADR   ;ADDRESS OF RPER3 FOR TYPEOUT
(2)  006042  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPER3
(2)  006046  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  006050  104006                          ERROR   6               ;REPORT THAT PORT B SEES NON-ZERO REGISTER
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(2)  006052  010037  001122                    MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPEC1
(2)  006056  062737  000044  001122            ADD     #RPEC1,$BDADR   ;ADDRESS OF RPEC1 FOR TYPEOUT
(2)  006064  012637  001126                    MOV     (SP)+,$EDDAT    ;CHECK THE STORED CONTENTS OF RPEC1
(2)  006070  001401                            BEQ     .+4             ;CONTENTS ZERO ?
(2)  006072  104006                            ERROR   6               ;REPORT THAT PORT B SEES NON-ZERO REGISTER
(2)  006074  010037  001122                    MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPEC2
(2)  006100  062737  000046  001122            ADD     #RPEC2,$BDADR   ;ADDRESS OF RPEC2 FOR TYPEOUT
(2)  006106  012637  001126                    MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPEC2
(2)  006112  001401                            BEQ     .+4             ;CONTENTS ZERO ?
(2)  006114  104006                            ERROR   6               ;REPORT THAT PORT B SEES NON-ZERO REGISTER
(1)  006116  000004                    5$:     SCOPE                   ;LOOP ?
8097
8098
(3)                                    ;;*****************************************************************
(4)                                    ;*TEST 3        PORT 'B' SEIZE/TIMEOUT TEST
(4)                                    ;*
(4)                                    ;*VERIFY THAT THE DRIVE CAN BE SEIZED AND THAT THE PORT TIMEOUT RELEASES
(4)                                    ;*      THE DRIVE.
(4)                                    ;*
(4)                                    ;*  A.  WRITE 0'S INTO RPDS1 THROUGH PORT 'B';  VERIFY THAT THE DRIVE
(4)                                    ;*      HAS BEEN SEIZED.
(4)                                    ;*
(4)                                    ;*  B.  READ EACH DRIVE REGISTER, EXCEPT RPCS1, THROUGH PORT 'A';
(4)                                    ;*      VERIFY THAT 0'S ARE READ FROM EACH REGISTER.
(4)                                    ;*
(4)                                    ;*  C.  WAIT FOR THE PORT TIMEOUT TO OCCUR AND RELEASE THE DRIVE.
(4)                                    ;*      MEASURE THE DURATION OF THE TIMEOUT ONE SHOT AND SAVE THE
(4)                                    ;*      VALUE FOR LATER USE.  VERIFY THAT TIMEOUT RETURNED THE DRIVE TO
(4)                                    ;*      NEUTRAL.
(4)                                    ;*
(3)                                    ;;*****************************************************************
(2)  006120                            TST3:
(3)  006120  005737  001274                    TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  006124  001406                            BEQ     2$              ;BR IF NOT
(3)  006126  100002                            BPL     1$              ;BR IF JUST ENTERED TEST
(3)  006130  000137  002622                    JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  006134  012737  177777  001274    1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  006142  112737  000003  001102    2$:     MOVB    #3,$TSTNM       ;TEST NUMBER
(3)  006150  012737  006172  001106            MOV     #TEST3,$LPADR   ;LOAD LOOP ON TEST ADDRESS
(3)  006156  012737  006172  001110            MOV     #TEST3,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
(1)  006164  012737  000012  001176            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
8099 006172  012706  001100            TEST3:  MOV     #STACK,SP       ;LOAD THE STACK POINTER
8100 006176  012737  000240  177776            MOV     #<5*32.>,@#PS   ;SET PRIORITY TO 5 IN CASE LOOPING
(1)  006204  005037  001264                    CLR     TIMEB           ;CLEAR TIMEOUT VALUE FOR PORT B
(1)  006210  005037  001266                    CLR     TIMEBP  ;CLEAR UPPER TIMEOUT TOLERANCE
(1)  006214  005037  001270                    CLR     TIMEBM  ;CLEAR LOWER TIMEOUT TOLERANCE
(2)
(3)                                    ;;*****************************************************************
(2)                                    ;START THE TIMER
(2)
(2)  006220  005037  001252                    CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  006224  012737  003720  001254            MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(1)
(2)                                    ;;*****************************************************************
(2)
(2)                                            ;SEIZE THE DRIVE THROUGH PORT B
(2)
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(2)  006232  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  006240  013737  001226  001236          MOV     PORTB,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2)  006246  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(3)  006252  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(3)  006260  013737  001224  001234          MOV     PORTA,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  006266  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  006274  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;SEE IF DRIVE SEIZED BY PORT B
(2)  006302  010037  001122                  MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2)  006306  062737  000012  001122          ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2)  006314  005037  001124                  CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2)  006320  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2)  006326  001403                          BEQ     64$             ;BR IF IT IS
(2)  006330  104004                          ERROR   4               ;REPORT THE ERROR
(2)  006332  000137  007516                  JMP     5$              ;BYPASS REST OF THE SUBTEST
(2)  006336                          64$:
(3)  006336  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  006344  013737  001226  001234          MOV     PORTB,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  006352  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  006360  012737  011600  001124          MOV     #MOL!PGM!DPR!DRY,$GDDAT  ;EXPECTED STATUS
(2)  006366  013737  001124  001166          MOV     $GDDAT,$TMP1  ;USE GOOD DATA AS A MASK
(2)  006374  005137  001166                  COM     $TMP1           ;COMPLEMENT THE EXPECTED STATUS
(2)  006400  013737  001126  001164          MOV     $BDDAT,$TMP0    ;SAVE THE ACTUAL STATUS
(2)  006406  043737  001166  001164          BIC     $TMP1,$TMP0     ;CLEAR UNWANTED BITS
(2)  006414  023737  001124  001164          CMP     $GDDAT,$TMP0    ;ARE THE EXPECTED STATUS BITS SET ?
(2)  006422  001401                          BEQ     65$             ;BR IF THEY ARE
(2)  006424  104005                          ERROR 5                 ;REPORT THE ERROR
(2)  006426  000240                  65$:    NOP
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;READ THE DRIVE REGISTERS THROUGH PORT A AND STORE THEM ON THE STACK
(1)
(2)  006430  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  006436  013737  001224  001234          MOV     PORTA,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  006444  016046  000046                  MOV     RPEC2(R0),-(SP) ;STORE REGISTER RPEC2, PORT A, FOR CHECK
(2)  006450  016046  000044                  MOV     RPEC1(R0),-(SP) ;STORE REGISTER RPEC1, PORT A, FOR CHECK
(2)  006454  016046  000042                  MOV     RPER3(R0),-(SP) ;STORE REGISTER RPER3, PORT A, FOR CHECK
(2)  006460  016046  000030                  MOV     RPSN(R0),-(SP)  ;STORE REGISTER RPSN, PORT A, FOR CHECK
(2)  006464  016046  000036                  MOV     RPCC(R0),-(SP)  ;STORE REGISTER RPCC, PORT A, FOR CHECK
(2)  006470  016046  000034                  MOV     RPCA(R0),-(SP)  ;STORE REGISTER RPCA, PORT A, FOR CHECK
(2)  006474  016046  000032                  MOV     RPOF(R0),-(SP)  ;STORE REGISTER RPOF, PORT A, FOR CHECK
(2)  006500  016046  000040                  MOV     RPER2(R0),-(SP) ;STORE REGISTER RPER2, PORT A, FOR CHECK
(2)  006504  016046  000020                  MOV     RPLA(R0),-(SP)  ;STORE REGISTER RPLA, PORT A, FOR CHECK
(2)  006510  016046  000026                  MOV     RPDT(R0),-(SP)  ;STORE REGISTER RPDT, PORT A, FOR CHECK
(2)  006514  016046  000006                  MOV     RPDA(R0),-(SP)  ;STORE REGISTER RPDA, PORT A, FOR CHECK
(2)  006520  016046  000024                  MOV     RPMR(R0),-(SP)  ;STORE REGISTER RPMR, PORT A, FOR CHECK
(2)  006524  016046  000014                  MOV     RPER1(R0),-(SP) ;STORE REGISTER RPER1, PORT A, FOR CHECK
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;WAIT FOR PORT B TO TIMEOUT
(1)
(1)  006530  005760  000012          1$:     TST     RPDS1(R0)       ;WAIT FOR THE DRIVE TO TIMEOUT
(1)  006534  001006                          BNE     2$              ;BR WHEN TIMEOUT OCCURS
(1)  006536  005737  001254                  TST     WATCH           ;CHECK WATCH
(1)  006542  001372                          BNE     1$              ;BR IF NOT ZERO
(1)  006544  104036                          ERROR   36              ;NO TIMEOUT WITHIN 2 SECONDS
(1)  006546  000137  007136                  JMP     4$              ;BYPASS TIMEOUT TIME CHECK
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(1)  006552  012737  000340  177776  2$:     MOV     #<7*32.>,@#PS   ;SET PRIORITY TO 7 TO STOP CLOCK
(1)  006560  013737  001252  001264          MOV     TIME,TIMEB      ;SAVE THE ELAPSED TIME FOR PORT B
(1)  006566  004537  056660                  JSR     R5,TOLER        ;CALCULATE THE TOLERANCE
(1)  006572  001264                          .WORD   TIMEB           ;TIMEOUT VALUE FOR PORT B
(1)  006574  012637  001266                  MOV     (SP)+,TIMEBP    ;+25% TOLERANCE
(1)  006600  012637  001270                  MOV     (SP)+,TIMEBM    ;-25% TOLERANCE
(1)
(2)                                ;;*****************************************************************
(1)                                ;VERIFY THAT THE TIMEOUT ONE-SHOT IS AT LEAST 500 MS
(1)
(1)  006604  023727  001252  000764          CMP     TIME,#500.      ;WAS MEASURED TIME AT LEAST 500 MS?
(1)  006612  103001                          BHIS    3$              ;BR IF IT  WAS
(1)  006614  104055                          ERROR   55              ;REPORT TIMEOUT TOO SHORT
(1)
(2)                                ;;*****************************************************************
(1)                                ;VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AFTER PORT B TIMED OUT
(1)
(1)  006616  012737  000240  177776  3$:     MOV     #<5*32.>,@#PS   ;RESTORE PRIORITY TO 5
(2)
(2)                                ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  006624  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  006630  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  006636  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  006642  012737  011600  001124          MOV     #MOL!PGM!DPR!DRY,$GDDAT  ;COMPARISON CONSTANT
(2)  006650  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  006656  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  006664  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  006672  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  006700  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  006706  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  006714  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  006722  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  006730  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  006736  001006                          BNE     66$             ;BR IF NOT
(2)  006740  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  006744  001037                          BNE     68$             ;BR IF NOT
(2)  006746  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  006750  000137  007134                  JMP     70$             ;BYPASS THE REST OF THE CHECKS
(2)  006754  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  006762  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  006770  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  006776  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  007002  001414                          BEQ     67$             ;BR IF ZERO
(2)  007004  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  007012  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(2)  007020  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  007026  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  007032  001004                          BNE     68$             ;BR IF NOT
(2)  007034  012737  177777  001250  67$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(2)  007042  104022                          ERROR   22              ;TYPE ERROR MESSAGE 22
(2)  007044  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  007052  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(2)  007060  042737  100100  001170          BIC     #ATA!VV,$TMP2   ;DON'T CHECK ATTN BIT OR VV BIT
(2)  007066  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  007074  001401                          BEQ     69$             ;BR IF OK FROM PORT A.
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(2)  007076  104007                          ERROR   7           ;REPORT ERROR
(2)  007100  013737  001172  001126  69$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  007106  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  007114  042737  100100  001172          BIC     #ATA!VV,$TMP3   ;DON'T CHECK ATTN BIT OR VV BIT
(2)  007122  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(2)  007130  001401                          BEQ     70$             ;BR IF OK
(2)  007132  104007                          ERROR   7           ;REPORT ERROR
(2)  007134  000240                  70$:    NOP
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;CHECK THE REGISTERS STORED THROUGH PORT A.  ALL REGISTERS SHOULD BE ZERO.
(1)                                  ;THE REGISTERS ARE STORED ON THE STACK.
(1)
(1)  007136  013737  001224  001234  4$:     MOV     PORTA,PTNBR     ;CHANGE 'PORT NUMBER' TO THE OPPOSITE PORT
(2)  007144  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPER1
(2)  007150  062737  000014  001122          ADD     #RPER1,$BDADR   ;ADDRESS OF RPER1 FOR TYPE_OUT
(2)  007156  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPER1
(2)  007162  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007164  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007166  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPMR
(2)  007172  062737  000024  001122          ADD     #RPMR,$BDADR    ;ADDRESS OF RPMR FOR TYPEOUT
(2)  007200  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPMR
(2)  007204  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007206  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007210  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPDA
(2)  007214  062737  000006  001122          ADD     #RPDA,$BDADR    ;ADDRESS OF RPDA FOR TYPEOUT
(2)  007222  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPDA
(2)  007226  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007230  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007232  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPDT
(2)  007236  062737  000026  001122          ADD     #RPDT,$BDADR    ;ADDRESS OF RPDT FOR TYPEOUT
(2)  007244  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPDT
(2)  007250  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007252  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007254  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPLA
(2)  007260  062737  000020  001122          ADD     #RPLA,$BDADR    ;ADDRESS OF RPLA FOR TYPEOUT
(2)  007266  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPLA
(2)  007272  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007274  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007276  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPER2
(2)  007302  062737  000040  001122          ADD     #RPER2,$BDADR   ;ADDRESS OF RPER2 FOR TYPEOUT
(2)  007310  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPER2
(2)  007314  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007316  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007320  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPOF
(2)  007324  062737  000032  001122          ADD     #RPOF,$BDADR    ;ADDRESS OF RPOF FOR TYPEOUT
(2)  007332  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPOF
(2)  007336  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007340  104006                          ERROR   6           ;REPORT THAT PORT A SAW NON-ZERO REGISTER
(2)  007342  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPCA
(2)  007346  062737  000034  001122          ADD     #RPCA,$BDADR    ;ADDRESS OF RPCA FOR TYPEOUT
(2)  007354  012637  001126                  MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPCA
(2)  007360  001401                          BEQ     .+4             ;CONTENTS ZERO ?
(2)  007362  104006                          ERROR   6           ;REPORT THAT PORT A SEES NON-ZERO REGISTER
(2)  007364  010037  001122                  MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPCC
(2)  007370  062737  000036  001122          ADD     #RPCC,$BDADR    ;ADDRESS OF RPCC FOR TYPEOUT
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(2)  007376  012637  001126              MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPCC
(2)  007402  001401                      BEQ     .+4             ;CONTENTS ZERO ?
(2)  007404  104006                      ERROR   6               ;REPORT THAT PORT A SEES NON-ZERO REGISTER
(2)  007406  010037  001122              MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPSN
(2)  007412  062737  000030  001122      ADD     #RPSN,$BDADR    ;ADDRESS OF RPSN FOR TYPEOUT
(2)  007420  012637  001126              MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPSN
(2)  007424  001401                      BEQ     .+4             ;CONTENTS ZERO ?
(2)  007426  104006                      ERROR   6               ;REPORT THAT PORT A SEES NON-ZERO REGISTER
(2)  007430  010037  001122              MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPER3
(2)  007434  062737  000042  001122      ADD     #RPER3,$BDADR   ;ADDRESS OF RPER3 FOR TYPEOUT
(2)  007442  012637  001126              MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPER3
(2)  007446  001401                      BEQ     .+4             ;CONTENTS ZERO ?
(2)  007450  104006                      ERROR   6               ;REPORT THAT PORT A SEES NON-ZERO REGISTER
(2)  007452  010037  001122              MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPEC1
(2)  007456  062737  000044  001122      ADD     #RPEC1,$BDADR   ;ADDRESS OF RPEC1 FOR TYPEOUT
(2)  007464  012637  001126              MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPEC1
(2)  007470  001401                      BEQ     .+4             ;CONTENTS ZERO ?
(2)  007472  104006                      ERROR   6               ;REPORT THAT PORT A SEES NON-ZERO REGISTER
(2)  007474  010037  001122              MOV     R0,$BDADR       ;BASE ADDRESS FOR REGISTER RPEC2
(2)  007500  062737  000046  001122      ADD     #RPEC2,$BDADR   ;ADDRESS OF RPEC2 FOR TYPEOUT
(2)  007506  012637  001126              MOV     (SP)+,$BDDAT    ;CHECK THE STORED CONTENTS OF RPEC2
(2)  007512  001401                      BEQ     .+4             ;CONTENTS ZERO ?
(2)  007514  104006                      ERROR   6               ;REPORT THAT PORT A SEES NON-ZERO REGISTER
(1)  007516  000004              5$:     SCOPE                   ;LOOP ?
8101
8119
8120
(3)                                ;**********************************************************************
(4)                                ;*TEST 4        PORT 'A' COMMAND SEIZE TEST & SET 'VV-A'
(4)                                ;*
(4)                                ;*VERIFY THAT THE DRIVE IS SEIZED WHEN A COMMAND IS ISSUED.  SET 'VV'
(4)                                ;*      FOR THE PORT UNDER TEST.
(4)                                ;*
(4)                                ;*  A.  ISSUE A DRIVE CLEAR COMMAND THROUGH PORT 'A'.  VERIFY THAT THE
(4)                                ;*      DRIVE WAS SEIZIED BY PORT 'A' AND THAT THE 'GO' BIT RESET.
(4)                                ;*
(4)                                ;*  B.  ISSUE A READIN PRESET COMMAND THROUGH PORT 'A'.  VERIFY THAT THE
(4)                                ;*      'VV' BIT WAS SET FOR PORT 'A' AND THAT THE 'VV' BIT WAS NOT SET
(4)                                ;*      FOR PORT 'B'.  (NOTE THAT THE 'VV' BIT NOT BEING SET FOR PORT
(4)                                ;*      'B' CAN ONLY BE TESTED THE FIRST TIME THROUGH THE PROGRAM.)
(4)                                ;*
(4)                                ;*  C.  STALL FOR 2 SECONDS THEN VERIFY THAT THE PORT TIMEOUT RELEASED
(4)                                ;*      THE DRIVE AND THE THE DRIVE RETURNED TO NEUTRAL.
(4)                                ;*
(3)                                ;**********************************************************************
(2)  007520                        TST4:
(3)  007520  005737  001274              TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  007524  001406                      BEQ     2$              ;BR IF NOT
(3)  007526  100002                      BPL     1$              ;BR IF JUST ENTERED TEST
(3)  007530  000137  002622              JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  007534  012737  177777  001274  1$: MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  007542  112737  000004  001102  2$: MOVB    #4,$TSTNM       ;TEST NUMBER
(3)  007550  012737  007572  001106      MOV     #TEST4,$LPADR   ;LOAD LOOP ON TEST ADDRESS
(3)  007556  012737  007572  001110      MOV     #TEST4,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
(1)  007564  012737  000001  001176      MOV     #1,$TIMES       ;;DO 1 ITERATION
8121 007572  012706  001100        TEST4: MOV    #STACK,SP       ;LOAD THE STACK POINTER
8171 007576  113760  001224  000010      MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
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(2)  007604  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)
(3)                                  ;;*****************************************************************
(2)                                  ;START THE TIMER
(2)
(2)  007612  005037  001252                  CLR     TIME                ;CLEAR THE ELAPSED TIME COUNTER
(2)  007616  012737  003720  001254          MOV     #2000.,WATCH        ;SET WATCH TO 2000 MS
(1)  007624  013737  001224  001236          MOV     PORTA,SEIZPT        ;'SEIZED' PORT ADDRESS
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;ISSUE DRIVE CLEAR COMMAND
(1)
(1)  007632  012760  000011  000000          MOV     #11,RPCS1(R0)       ;ISSUE A DRIVE CLEAR
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;VERIFY THAT DRIVE SEIZED BY PORT A.
(1)
(2)  007640  113760  001226  000010          MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B
(2)  007646  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  007654  005037  001244                  CLR     CKERR               ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  007660  016037  000012  001126          MOV     RPDS1(R0),$BDDAT    ;GET CONTENTS OF RPDS1
(2)  007666  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  007674  060037  001122                  ADD     R0,$BDADR           ;ADD RH11 BASE ADDRESS
(2)  007700  005037  001124                  CLR     $GDDAT              ;WHAT REGISTER SHOULD BE
(2)  007704  023737  001124  001126          CMP     $GDDAT,$BDDAT       ;IS THE REGISTER OK ?
(2)  007712  001403                          BEQ     64$                 ;BR IF OK
(2)  007714  104012                          ERROR   12                  ;TYPE MESSAGE 12
(2)  007716  005137  001244                  COM     CKERR               ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  007722  000240                  64$:    NOP
(2)  007724  113760  001224  000010          MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(2)  007732  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  007740  005037  001244                  CLR     CKERR               ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  007744  016037  000012  001126          MOV     RPDS1(R0),$BDDAT    ;GET CONTENTS OF RPDS1
(2)  007752  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  007760  060037  001122                  ADD     R0,$BDADR           ;ADD RH11 BASE ADDRESS
(2)  007764  012737  011600  001124          MOV     #MOL!PGM!DPR!DRY,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  007772  013737  001126  001164          MOV     $BDDAT,$TMP0        ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  010000  042737  106177  001164          BIC     #^C71600,$TMP0      ;SAVE SPECIFIED BITS
(2)  010006  023737  001124  001164          CMP     $GDDAT,$TMP0        ;COMPARE THE BITS
(2)  010014  001414                          BEQ     66$                 ;BR IF OK
(2)  010016  013737  001126  001174          MOV     $BDDAT,$TMP4        ;COPY 'BAD DATA'
(2)  010024  042737  071600  001174          BIC     #71600,$TMP4        ;CLEAR THE MASKED BITS
(2)  010032  053737  001174  001124          BIS     $TMP4,$GDDAT        ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  010040  104010                          ERROR   10                  ;REPORT THE ERROR
(2)  010042  005137  001244                  COM     CKERR               ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  010046  000240                  66$:    NOP
(2)  010050  005037  001244                  CLR     CKERR               ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  010054  016037  000000  001126          MOV     RPCS1(R0),$BDDAT    ;GET CONTENTS OF RPCS1
(2)  010062  012737  000000  001122          MOV     #RPCS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  010070  060037  001122                  ADD     R0,$BDADR           ;ADD RH11 BASE ADDRESS
(2)  010074  012737  004210  001124          MOV     #4210,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  010102  013737  001126  001164          MOV     $BDDAT,$TMP0        ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  010110  042737  100000  001164          BIC     #^C77777,$TMP0      ;SAVE SPECIFIED BITS
(2)  010116  023737  001124  001164          CMP     $GDDAT,$TMP0        ;COMPARE THE BITS
(2)  010124  001414                          BEQ     68$                 ;BR IF OK
(2)  010126  013737  001126  001174          MOV     $BDDAT,$TMP4        ;COPY 'BAD DATA'
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(2)  010134  042737  077777  001174          BIC     #77777,$TMP4     ;CLEAR THE MASKED BITS
(2)  010142  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  010150  104010                          ERROR   10               ;REPORT THE ERROR
(2)  010152  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  010156  000240                  68$:    NOP
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;ISSUE READIN PRESET COMMAND AND SET FMT22
(1)
(1)  010160  012760  000023  000000          MOV     #23,RPCS1(R0)    ;ISSUE A READIN PRESET
(1)  010166  012760  010000  000032          MOV     #FMT22,RPOF(R0)  ;SET FMT22
 8172
(2)                                          ;;*****************************************************************
(1)                                          ;VERIFY THAT THE DRIVE STATUS IS CORRECT
(1)
(2)  010174  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  010200  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  010206  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  010214  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  010220  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  010226  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  010234  042737  106077  001164          BIC     #^C71700,$TMP0   ;SAVE SPECIFIED BITS
(2)  010242  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  010250  001414                          BEQ     70$              ;BR IF OK
(2)  010252  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  010260  042737  071700  001174          BIC     #71700,$TMP4     ;CLEAR THE MASKED BITS
(2)  010266  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  010274  104013                          ERROR   13               ;TYPE MESSAGE 13
(2)  010276  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  010302  000240                  70$:    NOP
(2)  010304  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  010312  013737  001226  001234          MOV     PORTB,PTNBR      ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;WAIT FOR TIMEOUT TO RELEASE DRIVE
(1)
(1)  010320  005760  000012          1$:     TST     RPDS1(R0)        ;WAIT FOR THE PORT TO TIME OUT
(1)  010324  001006                          BNE     2$               ;BR WHEN TIMEOUT OCCURS
(1)  010326  005737  001254                  TST     WATCH            ;CHECK THE WATCH
(1)  010332  001372                          BNE     1$               ;BR IF NOT ZERO
(1)  010334  104036                          ERROR   36               ;NO TIMEOUT WITHIN 2 SECONDS
(1)  010336  000137  010654                  JMP     3$               ;BYPASS ATTN REGISTER CHECK
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;SEE IF DRIVE RETURNED TO NEUTRAL
(1)
(1)  010342                          2$:
(2)
(2)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  010342  005037  001250                  CLR     RELERR           ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  010346  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  010354  060037  001122                  ADD     R0,$BDADR        ;ADD THE I/O BASE ADDRESS
(2)  010360  012737  011600  001124          MOV     #MOL!PGM!DPR!DRY,$GDDAT  ;COMPARISON CONSTANT
(2)  010366  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(2)  010374  016037  000012  001170          MOV     RPDS1(R0),$TMP2  ;GET THE DRIVE STATUS REGISTER FROM PORT A.
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    (2)  010402  013737  001170  001164          MOV     $TMP2,$TMPO     ;COPY IT INTO '$TMPO'
    (2)  010410  042737  100100  001164          BIC     #ATA!VV,$TMPO   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
    (2)  010416  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
    (2)  010424  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
    (2)  010432  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
    (2)  010440  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
    (2)  010446  023737  001164  001166          CMP     $TMPO,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
    (2)  010454  001006                          BNE     72$             ;BR IF NOT
    (2)  010456  005737  001164                  TST     $TMPO           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
    (2)  010462  001037                          BNE     74$             ;BR IF NOT
    (2)  010464  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
    (2)  010466  000137  010652                  JMP     76$             ;BYPASS THE REST OF THE CHECKS
    (2)  010472  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
    (2)  010500  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
    (2)  010506  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
    (2)  010514  005737  001164                  TST     $TMPO           ;SEE IF STATUS EQ 0 FROM PORT A.
    (2)  010520  001414                          BEQ     73$             ;BR IF ZERO
    (2)  010522  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
    (2)  010530  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
    (2)  010536  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
    (2)  010544  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
    (2)  010550  001004                          BNE     74$             ;BR IF NOT
    (2)  010552  012737  177777  001250  73$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
    (2)  010560  104022                          ERROR   22              ;TYPE ERROR MESSAGE 22
    (2)  010562  013737  001170  001126  74$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
    (2)  010570  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
    (2)  010576  042737  100100  001170          BIC     #ATA!VV,$TMP2   ;DON'T CHECK ATTN BIT OR VV BIT
    (2)  010604  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
    (2)  010612  001401                          BEQ     75$             ;BR IF OK FROM PORT A.
    (2)  010614  104007                          ERROR   7               ;REPORT ERROR
    (2)  010616  013737  001172  001126  75$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
    (2)  010624  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
    (2)  010632  042737  100100  001172          BIC     #ATA!VV,$TMP3   ;DON'T CHECK ATTN BIT OR VV BIT
    (2)  010640  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
    (2)  010646  001401                          BEQ     76$             ;BR IF OK
    (2)  010650  104007                          ERROR   7               ;REPORT ERROR
    (2)  010652  000240                  76$:    NOP
    (1)  010654  000004                  3$:     SCOPE                   ;LOOP ?
8188
8189
    (3)                                  ;;*****************************************************************
    (4)                                  ;*TEST 5        PORT 'B' COMMAND SEIZE TEST & SET 'VV-B'
    (4)                                  ;*
    (4)                                  ;*VERIFY THAT THE DRIVE IS SEIZED WHEN A COMMAND IS ISSUED.  SET 'VV'
    (4)                                  ;*      FOR THE PORT UNDER TEST.
    (4)                                  ;*
    (4)                                  ;*  A.  ISSUE A DRIVE CLEAR COMMAND THROUGH PORT 'B'.  VERIFY THAT THE
    (4)                                  ;*      DRIVE WAS SEIZIED BY PORT 'B' AND THAT THE 'GO' BIT RESET.
    (4)                                  ;*
    (4)                                  ;*  B.  ISSUE A READIN PRESET COMMAND THROUGH PORT 'B'.  VERIFY THAT THE
    (4)                                  ;*      'VV' BIT FOR PORT 'B' WAS SET.
    (4)                                  ;*
    (4)                                  ;*  C.  STALL FOR 2 SECONDS THEN VERIFY THAT THE PORT TIMEOUT RELEASED
    (4)                                  ;*      THE DRIVE AND THE THE DRIVE RETURNED TO NEUTRAL.
    (4)                                  ;*
    (3)                                  ;;*****************************************************************
    (2)  010656                          TST5:
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(3)  010656  005737  001274            TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  010662  001406                    BEQ     2$              ;BR IF NOT
(3)  010664  100002                    BPL     1$              ;BR IF JUST ENTERED TEST
(3)  010666  000137  002622            JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  010672  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  010700  112737  000005  001102  2$:     MOVB    #5,$TSTNM       ;TEST NUMBER
(3)  010706  012737  010730  001106          MOV     #TEST5,$LPADR   ;LOAD LOOP ON TEST ADDRESS
(3)  010714  012737  010730  001110          MOV     #TEST5,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
(1)  010722  012737  000001  001176          MOV     #1,$TIMES       ;;DO 1 ITERATION
8190 010730  012706  001100          TEST5:  MOV     #STACK,SP       ;LOAD THE STACK POINTER
8191 010734  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  010742  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)
(3)                                  ;;*****************************************************************
(2)                                  ;START THE TIMER
(2)
(2)  010750  005037  001252          CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  010754  012737  003720  001254  MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(1)  010762  013737  001226  001236  MOV     PORTB,SEIZPT    ;'SEIZED' PORT ADDRESS
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;ISSUE DRIVE CLEAR COMMAND
(1)
(1)  010770  012760  000011  000000  MOV     #11,RPCS1(R0)   ;ISSUE A DRIVE CLEAR
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;VERIFY THAT DRIVE SEIZED BY PORT B.
(1)
(2)  010776  113760  001224  000010  MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  011004  013737  001224  001234  MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  011012  005037  001244          CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  011016  016037  000012  001126  MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  011024  012737  000012  001122  MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  011032  060037  001122          ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  011036  005037  001124          CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  011042  023737  001124  001126  CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
(2)  011050  001403                  BEQ     64$             ;BR IF OK
(2)  011052  104012                  ERROR   12              ;TYPE MESSAGE 12
(2)  011054  005137  001244          COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  011060  000240          64$:    NOP
(2)  011062  113760  001226  000010  MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  011070  013737  001226  001234  MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  011076  005037  001244          CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  011102  016037  000012  001126  MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  011110  012737  000012  001122  MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  011116  060037  001122          ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  011122  012737  011600  001124  MOV     #MOL!PGM!DPR!DRY,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  011130  013737  001126  001164  MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  011136  042737  106177  001164  BIC     #^C71600,$TMP0  ;SAVE SPECIFIED BITS
(2)  011144  023737  001124  001164  CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  011152  001414                  BEQ     66$             ;BR IF OK
(2)  011154  013737  001126  001174  MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  011162  042737  071600  001174  BIC     #71600,$TMP4    ;CLEAR THE MASKED BITS
(2)  011170  053737  001174  001124  BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  011176  104010                  ERROR   10              ;REPORT THE ERROR
(2)  011200  005137  001244          COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
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(2)  011204  000240                        66$:    NOP
(2)  011206  005037  001244                        CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  011212  016037  000000  001126              MOV     RPCS1(RC),$BDDAT   ;GET CONTENTS OF RPCS1
(2)  011220  012737  000000  001122              MOV     #RPCS1,$BDADR      ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  011226  060037  001122                      ADD     RC,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  011232  012737  004210  001124              MOV     #4210,$GDDAT       ;WHAT REGISTER SHOULD BE
(2)  011240  013737  001126  001164              MOV     $BDDAT,$TMP0       ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  011246  042737  100000  001164              BIC     #^C77777,$TMP0     ;SAVE SPECIFIED BITS
(2)  011254  023737  001124  001164              CMP     $GDDAT,$TMP0       ;COMPARE THE BITS
(2)  011262  001414                              BEQ     68$                ;BR IF OK
(2)  011264  013737  001126  001174              MOV     $BDDAT,$TMP4       ;COPY 'BAD DATA'
(2)  011272  042737  077777  001174              BIC     #77777,$TMP4       ;CLEAR THE MASKED BITS
(2)  011300  053737  001174  001124              BIS     $TMP4,$GDDAT       ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  011306  104010                              ERROR   10                 ;REPORT THE ERROR
(2)  011310  005137  001244                      COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  011314  000240                        68$:    NOP
(1)
(2)                                        ;;*****************************************************************
(1)                                        ;ISSUE READIN PRESET COMMAND AND SET FMT22
(1)
(1)  011316  012760  000023  000000              MOV     #23,RPCS1(RC)      ;ISSUE A READIN PRESET
(1)  011324  012760  010000  000032              MOV     #FMT22,RPOF(RC)    ;SET FMT22
8195
(2)
(1)                                        ;;*****************************************************************
(1)                                        ;VERIFY THAT THE DRIVE STATUS IS CORRECT
(1)
(2)  011332  005037  001244                      CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  011336  016037  000012  001126              MOV     RPDS1(RC),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  011344  012737  000012  001122              MOV     #RPDS1,$BDADR      ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  011352  060037  001122                      ADD     RC,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  011356  012737  011700  001124              MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  011364  013737  001126  001164              MOV     $BDDAT,$TMP0       ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  011372  042737  106077  001164              BIC     #^C71700,$TMP0     ;SAVE SPECIFIED BITS
(2)  011400  023737  001124  001164              CMP     $GDDAT,$TMP0       ;COMPARE THE BITS
(2)  011406  001414                              BEQ     70$                ;BR IF OK
(2)  011410  013737  001126  001174              MOV     $BDDAT,$TMP4       ;COPY 'BAD DATA'
(2)  011416  042737  071700  001174              BIC     #71700,$TMP4       ;CLEAR THE MASKED BITS
(2)  011424  053737  001174  001124              BIS     $TMP4,$GDDAT       ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  011432  104013                              ERROR   13                 ;TYPE MESSAGE 13
(2)  011434  005137  001244                      COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  011440  000240                        70$:    NOP
(2)  011442  113760  001224  000010              MOVB    PORTA,RPCS2(RC)    ;SELECT PORT A
(2)  011450  013737  001224  001234              MOV     PORTA,PTNBR        ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                        ;;*****************************************************************
(1)                                        ;WAIT FOR TIMEOUT TO RELEASE DRIVE
(1)
(1)  011456  005760  000012               1$:     TST     RPDS1(RC)          ;WAIT FOR THE PORT TO TIME OUT
(1)  011462  001006                              BNE     2$                 ;BR WHEN TIMEOUT OCCURS
(1)  011464  005737  001254                      TST     WATCH              ;CHECK THE WATCH
(1)  011470  001372                              BNE     1$                 ;BR IF NOT ZERO
(1)  011472  104036                              ERROR   36                 ;NO TIMEOUT WITHIN 2 SECONDS
(1)  011474  000137  012012                      JMP     3$                 ;BYPASS ATTN REGISTER CHECK
(1)
(2)                                        ;;*****************************************************************
(1)                                        ;SEE IF DRIVE RETURNED TO NEUTRAL
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(1)
(1)  011500                          2$:
(2)
(2)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  011500  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  011504  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  011512  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  011516  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(2)  011524  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  011532  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  011540  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  011546  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  011554  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  011562  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  011570  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  011576  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  011604  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  011612  001006                         BNE     72$             ;BR IF NOT
(2)  011614  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  011620  001037                         BNE     74$             ;BR IF NOT
(2)  011622  104046                         ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  011624  000137  012010                  JMP     76$             ;BYPASS THE REST OF THE CHECKS
(2)  011630  013737  001170  001126  72$:   MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  011636  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  011644  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  011652  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  011656  001414                         BEQ     73$             ;BR IF ZERO
(2)  011660  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  011666  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(2)  011674  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  011702  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  011706  001004                         BNE     74$             ;BR IF NOT
(2)  011710  012737  177777  001250  73$:   MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(2)  011716  104026                         ERROR   26              ;TYPE ERROR MESSAGE 26
(2)  011720  013737  001170  001126  74$:   MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  011726  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(2)  011734  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(2)  011742  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  011750  001401                         BEQ     75$             ;BR IF OK FROM PORT A.
(2)  011752  104007                         ERROR   7               ;REPORT ERROR
(2)  011754  013737  001172  001126  75$:   MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  011762  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  011770  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(2)  011776  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(2)  012004  001401                         BEQ     76$             ;BR IF OK
(2)  012006  104007                         ERROR   7               ;REPORT ERROR
(2)  012010  000240                  76$:   NOP
(1)  012012  000004                  3$:    SCOPE                   ;LOOP ?
8196
8208
8209
(3)                                          ;;*****************************************************************
(4)                                          ;*TEST 6        TEST RELEASE, DRIVE SEIZED BY PORT 'A'
(4)                                          ;*
(4)                                          ;*TEST THE OPERATION OF THE RELEASE COMMAND, DRIVE SEIZED
(4)                                          ;*
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(4)                                     ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(4)                                     ;*
(4)                                     ;*  B.  ISSUE A RELEASE COMMAND THROUGH PORT'A'.  VERIFY THAT THE DRIVE
(4)                                     ;*      RETURNED TO NEUTRAL, AND THAT NO ERRORS ARE INDICATED BY THE
(4)                                     ;*      DRIVE.
(4)                                     ;*
(3)                                     ;;*****************************************************************
(3) 012014                              ;TST6:
(3) 012014  005737  001274              TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3) 012020  001406                      BEQ     2$              ;BR IF NOT
(3) 012022  100002                      BPL     1$              ;BR IF JUST ENTERED TEST
(3) 012024  000137  002622              JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3) 012030  012737  177777  001274  1$: MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3) 012036  112737  000006  001102  2$: MOVB    #6,$TSTNM       ;TEST NUMBER
(3) 012044  012737  012066  001106      MOV     #TEST6,$LPADR   ;LOAD LOOP ON TEST ADDRESS
(3) 012052  012737  012066  001110      MOV     #TEST6,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
(1) 012060  012737  007640  001176      MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8210 012066 012706  001100          TEST6: MOV  #STACK,SP       ;LOAD THE STACK POINTER
8240
(3)                                     ;;*****************************************************************
(3)                                     ;START THE TIMER
(3)
(2) 012072  005037  001252              CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2) 012076  012737  003720  001254      MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(1)
(2)                                     ;;*****************************************************************
(2)
(2)                                     ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2) 012104  113760  001224  000010      MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2) 012112  013737  001224  001236      MOV     PORTA,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2) 012120  005060  000012              CLR     RPDS1(R0)       ;WRITE RPDS1
(2) 012124  013737  001226  001240      MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                     ;;*****************************************************************
(2)
(2)                                     ;RELEASE THE DRIVE FROM PORT A
(2)
(3) 012132  113760  001224  000010      MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3) 012140  013737  001224  001234      MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2) 012146  012760  000013  000000      MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                     ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3) 012154  005037  001250              CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3) 012160  012737  000012  001122      MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3) 012166  060037  001122              ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3) 012172  012737  011700  001124      MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3) 012200  113760  001224  000010      MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3) 012206  016037  000012  001170      MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3) 012214  013737  001170  001164      MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3) 012222  042737  100100  001164      BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3) 012230  113760  001226  000010      MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3) 012236  016037  000012  001172      MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3) 012244  013737  001172  001166      MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3) 012252  042737  100100  001166      BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
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(3)  012260  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  012266  001006                          BNE     66$             ;BR IF NOT
(3)  012270  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  012274  001037                          BNE     68$             ;BR IF NOT
(3)  012276  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  012300  000137  012464                  JMP     70$             ;BYPASS THE REST OF THE CHECKS
(3)  012304  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  012312  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  012320  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  012326  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  012332  001414                          BEQ     67$             ;BR IF ZERO
(3)  012334  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  012342  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  012350  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  012356  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  012362  001004                          BNE     68$             ;BR IF NOT
(3)  012364  012737  177777  001250  67$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  012372  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  012374  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  012402  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  012410  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(3)  012416  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  012424  001401                          BEQ     69$             ;BR IF OK FROM PORT A.
(3)  012426  104007                          ERROR   7               ;REPORT ERROR
(3)  012430  013737  001172  001126  69$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  012436  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  012444  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(3)  012452  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  012460  001401                          BEQ     70$             ;BR IF OK
(3)  012462  104007                          ERROR   7               ;REPORT ERROR
(3)  012464  000240                  70$:    NOP
(1)  012466  005737  001250                  TST     RELERR          ;DID DRIVE RETURN TO NEUTRAL ?
(1)  012472  001402                          BEQ     .+6             ;BR IF IN NEUTRAL
(1)  012474  000137  012750                  JMP     1$              ;GO WAIT FOR DRIVE TO TIMEOUT
(2)  012500  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  012506  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  012514  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  012520  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  012526  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  012534  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  012540  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  012544  013737  001126  001164          MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  012552  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  012560  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  012566  001414                          BEQ     71$             ;BR IF OK
(2)  012570  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  012576  042737  100000  001174          BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  012604  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  012612  104017                          ERROR   17              ;TYPE MESSAGE 17
(2)  012614  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  012620  000240                  71$:    NOP
(2)  012622  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  012630  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  012636  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  012642  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  012650  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
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(2)  012656  060037  001122                    ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  012662  005037  001124                    CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  012666  013737  001126  001164            MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  012674  042737  077777  001164            BIC     #↑CATA,$TMP0    ;SAVE SPECIFIED BITS
(2)  012702  020737  001124  001164            CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  012710  001414                            BEQ     73$             ;BR IF OK
(2)  012712  013737  001126  001174            MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  012720  042737  100000  001174            BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  012726  053737  001174  001124            BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  012734  104017                            ERROR   17              ;TYPE MESSAGE 17
(2)  012736  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  012742  000240                    73$:    NOP
(1)  012744  000137  013002                    JMP     2$              ;GO CHECK FOR LOOP ON ERROR
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;IF RELEASE COMMAND DIDN'T RELEASE THE DRIVE, WAIT FOR THE PORT TIMEOUT
(1)                                     ;TO RELEASE THE DRIVE
(1)
(1)  012750                             1$:
(2)  012750  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  012756  013737  001226  001234            MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  012764  005760  000012                    TST     RPDS1(R0)       ;WAIT FOR TIMEOUT TO RELEASE DRIVE
(1)  012770  001004                            BNE     2$              ;BR WHEN DRIVE RELEASED
(1)  012772  005737  001254                    TST     WATCH           ;CHECK THE WATCH
(1)  012776  001364                            BNE     1$              ;BR IF NOT ZERO
(1)  013000  104036                            ERROR   36              ;NO TIMEOUT WITHIN 2 SECONDS
(1)  013002  000004                    2$:     SCOPE                   ;LOOP ?
8252
8253                                    ;;*****************************************************************
(3)                                     ;*TEST 7        TEST RELEASE, DRIVE SEIZED BY PORT 'B'
(4)                                     ;*
(4)                                     ;*TEST THE OPERATION OF THE RELEASE COMMAND, DRIVE SEIZED
(4)                                     ;*
(4)                                     ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                                     ;*
(4)                                     ;*  B.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
(4)                                     ;*      RETURNED TO NEUTRAL, AND THAT NO ERRORS ARE INDICATED BY THE
(4)                                     ;*      DRIVE.
(4)                                     ;*
(3)                                     ;*****************************************************************
(2)  013004                             TST7:
(3)  013004  005737  001274                    TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  013010  001406                            BEQ     2$              ;BR IF NOT
(3)  013012  100002                            BPL     1$              ;BR IF JUST ENTERED TEST
(3)  013014  000137  002622                    JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  013020  012737  177777  001274    1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  013026  112737  000007  001102    2$:     MOVB    #7,$TSTNM       ;TEST NUMBER
(3)  013034  012737  013056  001106            MOV     #TEST7,$LPADR   ;LOAD LOOP ON TEST ADDRESS
(3)  013042  012737  013056  001110            MOV     #TEST7,$LPERR   ;LOAD LOOP ON ERROR ADDRESS
(1)  013050  012737  007640  001176            MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8254 013056  012706  001100            TEST7:  MOV     #STACK,SP       ;LOAD THE STACK POINTER
8255
(3)                                     ;;*****************************************************************
(2)                                     ;START THE TIMER
(2)
(2)  013062  005037  001252                    CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
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(2)  013066  012737  003720  001254          MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(1)
(2)                                        ;;*****************************************************************
(2)
(2)                                          ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  013074  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  013102  013737  001226  001236          MOV     PORTB,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2)  013110  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(2)  013114  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                        ;;*****************************************************************
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  013122  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  013130  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  013136  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  013144  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  013150  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  013156  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  013162  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT   ;COMPARISON CONSTANT
(3)  013170  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  013176  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  013204  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  013212  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  013220  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  013226  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  013234  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  013242  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  013250  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  013256  001006                          BNE     66$             ;BR IF NOT
(3)  013260  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  013264  001037                          BNE     68$             ;BR IF NOT
(3)  013266  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  013270  000137  013454                  JMP     70$             ;BYPASS THE REST OF THE CHECKS
(3)  013274  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  013302  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  013310  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  013316  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  013322  001414                          BEQ     67$             ;BR IF ZERO
(3)  013324  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  013332  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  013340  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  013346  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  013352  001004                          BNE     68$             ;BR IF NOT
(3)  013354  012737  177777  001250  67$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  013362  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  013364  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  013372  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  013400  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(3)  013406  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  013414  001401                          BEQ     69$             ;BR IF OK FROM PORT A.
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(3)  013416  104007                          ERROR   7                       ;REPORT ERROR
(3)  013420  013737  001172  001126  69$:    MOV     $TMP3,$BDDAT            ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  013426  013737  001226  001234          MOV     PORTB,PTNBR             ;CHANGE PORT NUMBER
(3)  013434  042737  100000  001172          BIC     #ATA,$TMP3              ;DON'T CHECK THE ATTN BIT
(3)  013442  023737  001124  001172          CMP     $GDDAT,$TMP3            ;SEE IF READ OK FROM PORT B.
(3)  013450  001401                          BEQ     70$                     ;BR IF OK
(3)  013452  104007                          ERROR   7                       ;REPORT ERROR
(3)  013454  000240                  70$:    NOP
(1)  013456  005737  001250                  TST     RELERR                  ;DID DRIVE RETURN TO NEUTRAL ?
(1)  013462  001402                          BEQ     .+6                     ;BR IF IN NEUTRAL
(1)  013464  000137  013740                  JMP     1$                      ;GO WAIT FOR DRIVE TO TIMEOUT *
(2)  013470  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  013476  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  013504  005037  001244                  CLR     CKERR                   ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  013510  016037  000012  001126          MOV     RPDS1(R0),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  013516  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF _RROR MESSAGE
(2)  013524  060037  001122                  ADD     R0,$BDADR               ;ADD RH11 BASE ADDRESS
(2)  013530  005037  001124                  CLR     $GDDAT                  ;WHAT REGISTER SHOULD BE
(2)  013534  013737  001126  001164          MOV     $BDDAT,$TMP0            ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  013542  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  013550  023737  001124  001164          CMP     $GDDAT,$TMP0            ;COMPARE THE BITS
(2)  013556  001414                          BEQ     71$                     ;BR IF OK
(2)  013560  013737  001126  001174          MOV     $BDDAT,$TMP4            ;COPY 'BAD DATA'
(2)  013566  042737  100000  001174          BIC     #ATA,$TMP4              ;CLEAR THE MASKED BITS
(2)  013574  053737  001174  001124          BIS     $TMP4,$GDDAT            ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  013602  104017                          ERROR   17                      ;TYPE MESSAGE 17
(2)  013604  005137  001244                  COM     CKERR                   ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  013610  000240                  71$:    NOP
(2)  013612  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  013620  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  013626  005037  001244                  CLR     CKERR                   ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  013632  016037  000012  001126          MOV     RPDS1(R0),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  013640  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  013646  060037  001122                  ADD     R0,$BDADR               ;ADD RH11 BASE ADDRESS
(2)  013652  005037  001124                  CLR     $GDDAT                  ;WHAT REGISTER SHOULD BE
(2)  013656  013737  001126  001164          MOV     $BDDAT,$TMP0            ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  013664  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  013672  023737  001124  001164          CMP     $GDDAT,$TMP0            ;COMPARE THE BITS
(2)  013700  001414                          BEQ     73$                     ;BR IF OK
(2)  013702  013737  001126  001174          MOV     $BDDAT,$TMP4            ;COPY 'BAD DATA'
(2)  013710  042737  100000  001174          BIC     #ATA,$TMP4              ;CLEAR THE MASKED BITS
(2)  013716  053737  001174  001124          BIS     $TMP4,$GDDAT            ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  013724  104017                          ERROR   17                      ;TYPE MESSAGE 17
(2)  013726  005137  001244                  COM     CKERR                   ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  013732  000240                  73$:    NOP
(1)  013734  000137  013772                  JMP     2$                      ;GO CHECK FOR LOOP ON ERROR
(1)
(2)                                   ;;*****************************************************************
(1)                                   ;IF RELEASE COMMAND DIDN'T RELEASE THE DRIVE, WAIT FOR THE PORT TIMEOUT
(1)                                   ;TO RELEASE THE DRIVE
(1)
(1)  013740                           1$:
(2)  013740  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  013746  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  013754  005760  000012                  TST     RPDS1(R0)               ;WAIT FOR TIMEOUT TO RELEASE DRIVE
(1)  013760  001004                          BNE     2$                      ;BR WHEN DRIVE RELEASED
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(1)  013762  005737  001254            TST     WATCH           ;CHECK THE WATCH
(1)  013766  001364                    BNE     1$              ;BR IF NOT ZERO
(1)  013770  104036                    ERROR   36              ;NO TIMEOUT WITHIN 2 SECONDS
(1)  013772  000004            2$:     SCOPE                   ;LOOP ?
8256
8265
8266                                ;;**********************************************************************
(3)                                 ;*TEST 10        TEST RELEASE THROUGH PORT 'A', DRIVE IN NEUTRAL
(4)                                 ;*
(4)                                 ;*TEST OPERATION OF RELEASE COMMAND, DRIVE IN NEUTRAL
(4)                                 ;*
(4)                                 ;*  A.  ISSUE A RELEASE COMMAND THROUGH PORT 'A' WITH THE DRIVE IN
(4)                                 ;*      NEUTRAL; VERIFY THAT THE DRIVE REMAINS IN NEUTRAL.
(4)                                 ;*
(3)                                 ;;**********************************************************************
(2)  013774                         TST10:
(3)  013774  005737  001274                TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  014000  001406                        BEQ     2$              ;BR IF NOT
(3)  014002  100002                        BPL     1$              ;BR IF JUST ENTERED TEST
(3)  014004  000137  002622                JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  014010  012737  177777  001274  1$:    MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  014016  112737  000010  001102  2$:    MOVB    #10,$TSTNM      ;TEST NUMBER
(3)  014024  012737  014046  001106        MOV     #TEST10,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  014032  012737  014046  001110        MOV     #TEST10,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  014040  012737  000144  001176        MOV     #100.,$TIMES    ;;DO 100. ITERATIONS
8267 014046  012706  001100        TEST10: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8283 014052  113760  001224  000010        MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  014060  013737  001224  001234        MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  014066  013737  001224  001236        MOV     PORTA,SEIZPT    ;ADDR OF PORT WHICH WILL ISSUE RELEASE
(1)
(2)                                 ;;**********************************************************************
(1)                                 ;ISSUE A RELEASE COMMAND
(1)
(1)  014074  012760  000013  000000        MOV     #13,RPCS1(R0)   ;ISSUE A RELEASE COMMAND
(1)
(2)                                 ;;**********************************************************************
(1)                                 ;VERIFY THAT THE DRIVE IS STILL IN NEUTRAL
(1)
(2)
(2)                                 ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  014102  005037  001250                CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  014106  012737  000012  001122        MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  014114  060037  001122                ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  014120  012737  011700  001124        MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(2)  014126  113760  001224  000010        MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  014134  016037  000012  001170        MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  014142  013737  001170  001164        MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  014150  042737  100100  001164        BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  014156  113760  001226  000010        MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  014164  016037  000012  001172        MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  014172  013737  001172  001166        MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  014200  042737  100100  001166        BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  014206  023737  001164  001166        CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  014214  001006                        BNE     64$             ;BR IF NOT
(2)  014216  005737  001164                TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
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(2)  014222  001037                          BNE     66$                ;BR IF NOT
(2)  014224  104046                          ERROR   46                 ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  014226  000137  014412                  JMP     68$                ;BYPASS THE REST OF THE CHECKS
(2)  014232  013737  001170  001126  64$:    MOV     $TMP2,$BDDAT       ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  014240  013737  001226  001234          MOV     PORTB,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  014246  113760  001226  000010          MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(2)  014254  005737  001164                  TST     $TMP0              ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  014260  001414                          BEQ     65$                ;BR IF ZERO
(2)  014262  013737  001224  001234          MOV     PORTA,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  014270  013737  001172  001126          MOV     $TMP3,$BDDAT       ;'BAD DATA' FOR ERROR TYPE OUT
(2)  014276  113760  001224  000010          MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(2)  014304  005737  001166                  TST     $TMP1              ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  014310  001004                          BNE     66$                ;BR IF NOT
(2)  014312  012737  177777  001250  65$:    MOV     #-1,RELERR         ;SET 'RELEASE ERROR' INDICATOR
(2)  014320  104030                          ERROR   30                 ;TYPE ERROR MESSAGE 30
(2)  014322  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT       ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  014330  013737  001224  001234          MOV     PORTA,PTNBR        ;CHANGE PORT NUMBER
(2)  014336  042737  100000  001170          BIC     #ATA,$TMP2         ;DON'T CHECK THE ATTN BIT
(2)  014344  023737  001124  001170          CMP     $GDDAT,$TMP2       ;ALL BITS OK ?
(2)  014352  001401                          BEQ     67$                ;BR IF OK FROM PORT A.
(2)  014354  104007                          ERROR   7                  ;REPORT ERROR
(2)  014356  013737  001172  001126  67$:    MOV     $TMP3,$BDDAT       ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  014364  013737  001226  001234          MOV     PORTB,PTNBR        ;CHANGE PORT NUMBER
(2)  014372  042737  100000  001172          BIC     #ATA,$TMP3         ;DON'T CHECK THE ATTN BIT
(2)  014400  023737  001124  001172          CMP     $GDDAT,$TMP3       ;SEE IF READ OK FROM PORT B.
(2)  014406  001401                          BEQ     68$                ;BR IF OK
(2)  014410  104007                          ERROR   7                  ;REPORT ERROR
(2)  014412  000240                  68$:    NOP
(1)  014414  000004                          SCOPE                      ;LOOP ?
8292
8293                                    ;;*****************************************************************
(3)                                     ;*TEST 11       TEST RELEASE THROUGH PORT 'B', DRIVE IN NEUTRAL
(4)                                     ;*
(4)                                     ;*TEST OPERATION OF RELEASE COMMAND, DRIVE IN NEUTRAL
(4)                                     ;*
(4)                                     ;*   A.   ISSUE A RELEASE COMMAND THROUGH PORT 'B' WITH THE DRIVE IN
(4)                                     ;*        NEUTRAL; VERIFY THAT THE DRIVE REMAINS IN NEUTRAL.
(4)                                     ;*
(3)                                     ;;*****************************************************************
(2)  014416                             TST11:
(3)  014416  005737  001274                     TST     KYBCTL             ;PERFORMING ONLY SINGLE TESTS ?
(3)  014422  001406                             BEQ     2$                 ;BR IF NOT
(3)  014424  100002                             BPL     1$                 ;BR IF JUST ENTERED TEST
(3)  014426  000137  002622                     JMP     EXEC               ;RETURN & GET NEXT TEST NUMBER
(3)  014432  012737  177777  001274  1$:       MOV     #-1,KYBCTL         ;SET SINGLE TEST INDICATOR
(3)  014440  112737  000011  001102  2$:       MOVB    #11,$TSTNM         ;TEST NUMBER
(3)  014446  012737  014470  001106             MOV     #TEST11,$LPADR     ;LOAD LOOP ON TEST ADDRESS
(3)  014454  012737  014470  001110             MOV     #TEST11,$LPERR     ;LOAD LOOP ON ERROR ADDRESS
(1)  014462  012737  000144  001176             MOV     #100.,$TIMES       ;;DO 100. ITERATIONS
8294 014470  012706  001100          TEST11:    MOV     #STACK,SP          ;LOAD THE STACK POINTER
8295 014474  113760  001226  000010             MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B
(2)  014502  013737  001226  001234             MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  014510  013737  001226  001236             MOV     PORTB,SEIZPT     ;ADDR OF PORT WHICH WILL ISSUE RELEASE
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;ISSUE A RELEASE COMMAND
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(1)
(1)  014516  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE A RELEASE COMMAND
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;VERIFY THAT THE DRIVE IS STILL IN NEUTRAL
(1)
(2)
(2)                                  ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  014524  005037  001250          CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  014530  012737  000012  001122  MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  014536  060037  001122          ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  014542  012737  011700  001124  MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(2)  014550  113760  001224  000010  MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  014556  016037  000012  001170  MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  014564  013737  001170  001164  MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  014572  042737  100100  001164  BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  014600  113760  001226  000010  MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  014606  016037  000012  001172  MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  014614  013737  001172  001166  MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  014622  042737  100100  001166  BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  014630  023737  001164  001166  CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  014636  001006                  BNE     64$             ;BR IF NOT
(2)  014640  005737  001164          TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  014644  001037                  BNE     66$             ;BR IF NOT
(2)  014646  104046                  ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  014650  000137  015034          JMP     68$             ;BYPASS THE REST OF THE CHECKS
(2)  014654  013737  001170  001126  64$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  014662  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  014670  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  014676  005737  001164          TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  014702  001414                  BEQ     65$             ;BR IF ZERO
(2)  014704  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  014712  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(2)  014720  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  014726  005737  001166          TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  014732  001004                  BNE     66$             ;BR IF NOT
(2)  014734  012737  177777  001250  65$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(2)  014742  104030                  ERROR   30              ;TYPE ERROR MESSAGE 30
(2)  014744  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  014752  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(2)  014760  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(2)  014766  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  014774  001401                  BEQ     67$             ;BR IF OK FROM PORT A.
(2)  014776  104007                  ERROR   7               ;REPORT ERROR
(2)  015000  013737  001172  001126  67$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  015006  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  015014  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(2)  015022  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(2)  015030  001401                  BEQ     68$             ;BR IF OK
(2)  015032  104007                  ERROR   7               ;REPORT ERROR
(2)  015034  000240          68$:    NOP
(1)  015036  000004                  SCOPE                   ;LOOP ?
8296
8318
8319                                 ;;*****************************************************************
```

```
                                        ;*TEST 12       TEST THAT 'CLEAR' DOES NOT CAUSE RELEASE FROM PORT 'A'
                                        ;*
                                        ;*VERIFY THAT A MASSBUS CLEAR OR DRIVE CLEAR WILL NOT CAUSE THE SEIZING
                                        ;*      PORT TO RELEASE THE DRIVE.
                                        ;*
                                        ;*  A.  SEIZE THE DRIVE BY WRITING 0'S INTO RPDS1 THROUGH PORT 'A'.
                                        ;*      VERIFY THAT THE DRIVE HAS BEEN SEIZED.
                                        ;*
                                        ;*  B.  ISSUE A DRIVE CLEAR THROUGH PORT 'A' AND VERIFY THAT THE DRIVE
                                        ;*      DOES NOT RETURN TO NEUTRAL.
                                        ;*
                                        ;*  C.  ISSUE A MASSBUS CLEAR THROUGH THE RH11 AND VERIFY THAT THE DRIVE
                                        ;*      DOES NOT RETURN TO NEUTRAL.
                                        ;*
                                        ;*  D.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
                                        ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
                                        ;*
                                        ;;*****************************************************************
(2)  015040                             TST12:
(3)  015040  005737  001274                     TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  015044  001406                             BEQ     2$              ;BR IF NOT
(3)  015046  100002                             BPL     1$              ;BR IF JUST ENTERED TEST
(3)  015050  000137  002622                     JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  015054  012737  177777  001274  1$:       MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  015062  112737  000012  001102  2$:       MOVB    #12,$TSTNM      ;TEST NUMBER
(3)  015070  012737  015112  001106             MOV     #TEST12,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  015076  012737  015112  001110             MOV     #TEST12,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  015104  012737  007640  001176             MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8320 015112  012706  001100             TEST12: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8354
(2)                                     ;;*****************************************************************
(2)
(2)                                             ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  015116  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  015124  013737  001224  001236             MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  015132  005060  000012                     CLR     RPDS1(R0)       ;WRITE RPDS1
(3)  015136  113760  001226  000010             MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  015144  013737  001226  001234             MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  015152  013737  001226  001240             MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  015160  016037  000012  001126             MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT A
(2)  015166  010037  001122                     MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2)  015172  062737  000012  001122             ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2)  015200  005037  001124                     CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2)  015204  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2)  015212  001403                             BEQ     64$             ;BR IF IT IS
(2)  015214  104004                             ERROR   4               ;REPORT THE ERROR
(2)  015216  000137  016414                     JMP     1$              ;BYPASS REST OF THE SUBTEST
(2)  015222                             64$:
(3)  015222  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(3)  015230  013737  001224  001234             MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  015236  016037  000012  001126             MOV     RPDS1(R0),$BDDAT ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  015244  012737  011700  001124             MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT ;EXPECTED STATUS
(2)  015252  013737  001124  001166             MOV     $GDDAT,$TMP1    ;USE GOOD DATA AS A MASK
(2)  015260  005137  001166                     COM     $TMP1           ;COMPLEMENT THE EXPECTED STATUS
(2)  015264  013737  001126  001164             MOV     $BDDAT,$TMP0    ;SAVE THE ACTUAL STATUS
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                        T12     TEST THAT 'CLEAR' DOES NOT CAUSE RELEASE FROM PORT 'A'                  SEQ 0068

(2) 015272 043737 001166 001164         BIC     $TMP1,$TMPO     ;CLEAR UNWANTED BITS
(2) 015300 023737 001124 001164         CMP     $GDDAT,$TMPO    ;ARE THE EXPECTED STATUS BITS SET ?
(2) 015306 001401                       BEQ     65$             ;BR IF THEY ARE
(2) 015310 104005                       ERROR 5                 ;REPORT THE ERROR
(2) 015312 000240               65$:    NOP
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;DRIVE CLEAR THROUGH PORT A FIRST
(1)
(1) 015314 012760 000011 000000         MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR THROUGH PORT A
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;VERIFY THAT DRIVE STILL SEIZED BY PORT A
(1)
(2) 015322 113760 001226 000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2) 015330 013737 001226 001234         MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2) 015336 005037 001244                CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2) 015342 016037 000012 001126         MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2) 015350 012737 000012 001122         MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2) 015356 060037 001122                ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2) 015362 005037 001124                CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2) 015366 013737 001126 001164         MOV     $BDDAT,$TMPO    ;MOVE REGISTER CONTENTS TO '$TMPO'
(2) 015374 042737 100000 001164         BIC     #^C77777,$TMPO  ;SAVE SPECIFIED BITS
(2) 015402 023737 001124 001164         CMP     $GDDAT,$TMPO    ;COMPARE THE BITS
(2) 015410 001414                       BEQ     66$             ;BR IF OK
(2) 015412 013737 001126 001174         MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2) 015420 042737 077777 001174         BIC     #77777,$TMP4    ;CLEAR THE MASKED BITS
(2) 015426 053737 001174 001124         BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2) 015434 104033                       ERROR   33              ;TYPE MESSAGE 33
(2) 015436 005137 001244                COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2) 015442 000240               66$:    NOP
(2) 015444 113760 001224 000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2) 015452 013737 001224 001234         MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2) 015460 005037 001244                CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2) 015464 016037 000012 001126         MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2) 015472 012737 000012 001122         MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2) 015500 060037 001122                ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2) 015504 012737 011700 001124         MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2) 015512 013737 001126 001164         MOV     $BDDAT,$TMPO    ;MOVE REGISTER CONTENTS TO '$TMPO'
(2) 015520 042737 100000 001164         BIC     #^C77777,$TMPO  ;SAVE SPECIFIED BITS
(2) 015526 023737 001124 001164         CMP     $GDDAT,$TMPO    ;COMPARE THE BITS
(2) 015534 001414                       BEQ     68$             ;BR IF OK
(2) 015536 013737 001126 001174         MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2) 015544 042737 077777 001174         BIC     #77777,$TMP4    ;CLEAR THE MASKED BITS
(2) 015552 053737 001174 001124         BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2) 015560 104033                       ERROR   33              ;TYPE MESSAGE 33
(2) 015562 005137 001244                COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2) 015566 000240               68$:    NOP
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;NOW ISSUE MASSBUS INIT
(1)
(1) 015570 012760 000040 000010         MOV     #CLR,RPCS2(R0)  ;ISSUE MASSBUS INIT
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;CONFIRM THAT DRIVE STILL SEIZED BY PORT A
```

```
(1)
(2)  015576  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  015604  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  015612  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  015616  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  015624  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  015632  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  015636  005037  001124                  CLR     $GDDAT           ;WHAT REGISTER SHOULD BE
(2)  015642  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  015650  042737  100000  001164          BIC     #^C77777,$TMP0   ;SAVE SPECIFIED BITS
(2)  015656  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  015664  001414                          BEQ     70$              ;BR IF OK
(2)  015666  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  015674  042737  077777  001174          BIC     #77777,$TMP4     ;CLEAR THE MASKED BITS
(2)  015702  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  015710  104034                          ERROR   34               ;TYPE MESSAGE 34
(2)  015712  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  015716  000240                  70$:    NOP
(2)  015720  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  015726  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  015734  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  015740  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  015746  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  015754  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  015760  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  015766  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  015774  042737  100000  001164          BIC     #^C77777,$TMP0   ;SAVE SPECIFIED BITS
(2)  016002  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  016010  001414                          BEQ     72$              ;BR IF OK
(2)  016012  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  016020  042737  077777  001174          BIC     #77777,$TMP4     ;CLEAR THE MASKED BITS
(2)  016026  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  016034  104034                          ERROR   34               ;TYPE MESSAGE 34
(2)  016036  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  016042  000240                  72$:    NOP
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  016044  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  016052  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  016060  012760  000013  000000          MOV     #13,RPCS1(R0)    ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  016066  005037  001250                  CLR     RELERR           ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  016072  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  016100  060037  001122                  ADD     R0,$BDADR        ;ADD THE I/O BASE ADDRESS
(3)  016104  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  016112  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  016120  016037  000012  001170          MOV     RPDS1(R0),$TMP2  ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  016126  013737  001170  001164          MOV     $TMP2,$TMP0      ;COPY IT INTO '$TMP0'
(3)  016134  042737  100100  001164          BIC     #ATA!VV,$TMP0    ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  016142  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B.
(3)  016150  016037  000012  001172          MOV     RPDS1(R0),$TMP3  ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  016156  013737  001172  001166          MOV     $TMP3,$TMP1      ;COPY IT INTO '$TMP1'
(3)  016164  042737  100100  001166          BIC     #ATA!VV,$TMP1    ;CLEAR PORT DEPENDENT BITS FROM THE COPY
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    (3)  016172  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
    (3)  016200  001006                           BNE     74$             ;BR IF NOT
    (3)  016202  005737  001164                   TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
    (3)  016206  001045                           BNE     76$             ;BR IF NOT
    (3)  016210  104046                           ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
    (3)  016212  000137  016412                   JMP     78$             ;BYPASS THE REST OF THE CHECKS
    (3)  016216  013737  001170  001126  74$:     MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
    (3)  016224  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
    (3)  016232  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
    (3)  016240  005737  001164                   TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
    (3)  016244  001414                           BEQ     75$             ;BR IF ZERO
    (3)  016246  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
    (3)  016254  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
    (3)  016262  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
    (3)  016270  005737  001166                   TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
    (3)  016274  001012                           BNE     76$             ;BR IF NOT
    (3)  016276  012737  177777  001250  75$:     MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
    (3)  016304  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
    (3)  016312  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
    (3)  016320  104026                           ERROR   26              ;TYPE ERROR MESSAGE 26
    (3)  016322  013737  001170  001126  76$:     MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
    (3)  016330  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
    (3)  016336  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
    (3)  016344  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
    (3)  016352  001401                           BEQ     77$             ;BR IF OK FROM PORT A.
    (3)  016354  104007                           ERROR   7               ;REPORT ERROR
    (3)  016356  013737  001172  001126  77$:     MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
    (3)  016364  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
    (3)  016372  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
    (3)  016400  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
    (3)  016406  001401                           BEQ     78$             ;BR IF OK
    (3)  016410  104007                           ERROR   7               ;REPORT ERROR
    (3)  016412  000240                   78$:    NOP
    (1)  016414  000004                   1$:     SCOPE                   ;LOOP ?
 8373
 8374
    (3)                                          ;;*****************************************************************
    (3)                                          ;*TEST 13       TEST THAT 'CLEAR' DOES NOT CAUSE RELEASE FROM PORT 'B'
    (3)                                          ;*
    (3)                                          ;*VERIFY THAT A MASSBUS CLEAR OR DRIVE CLEAR WILL NOT CAUSE THE SEIZING
    (3)                                          ;*      PORT TO RELEASE THE DRIVE.
    (3)                                          ;*
    (3)                                          ;*  A.  SEIZE THE DRIVE BY WRITING 0'S INTO RPDS1 THROUGH PORT 'B'.
    (3)                                          ;*      VERIFY THAT THE DRIVE HAS BEEN SEIZED.
    (3)                                          ;*
    (3)                                          ;*  B.  ISSUE A DRIVE CLEAR THROUGH PORT 'B' AND VERIFY THAT THE DRIVE
    (3)                                          ;*      DOES NOT RETURN TO NEUTRAL.
    (3)                                          ;*
    (3)                                          ;*  C.  ISSUE A MASSBUS CLEAR THROUGH THE RH11 AND VERIFY THAT THE DRIVE
    (3)                                          ;*      DOES NOT RETURN TO NEUTRAL.
    (3)                                          ;*
    (3)                                          ;*  D.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
    (3)                                          ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
    (3)                                          ;*
    (3)                                          ;;*****************************************************************
    (3)  016416                          TST13:
    (3)  016416  005737  001274                   TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
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(3)  016422  001406                          BEQ     2$              ;BR IF NOT
(3)  016424  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
(3)  016426  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  016432  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  016440  112737  000013  001102  2$:     MOVB    #13,$TSTNM      ;TEST NUMBER
(3)  016446  012737  016470  001106          MOV     #TEST13,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  016454  012737  016470  001110          MOV     #TEST13,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  016462  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8375 016470  012706  001100          TEST13: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8376
(2)                                  ;;**************************************************************
(2)
(2)                                  ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  016474  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  016502  013737  001226  001236          MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  016510  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(3)  016514  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(3)  016522  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  016530  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  016536  016037  000012  001126          MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT B
(2)  016544  010037  001122                  MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2)  016550  062737  000012  001122          ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2)  016556  005037  001124                  CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2)  016562  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2)  016570  001403                          BEQ     64$             ;BR IF IT IS
(2)  016572  104004                          ERROR   4               ;REPORT THE ERROR
(2)  016574  000137  017772                  JMP     1$              ;BYPASS REST OF THE SUBTEST
(2)  016600                          64$:
(3)  016600  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  016606  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  016614  016037  000012  001126          MOV     RPDS1(R0),$BDDAT ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  016622  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT ;EXPECTED STATUS
(2)  016630  013737  001124  001166          MOV     $GDDAT,$TMP1    ;USE GOOD DATA AS A MASK
(2)  016636  005137  001166                  COM     $TMP1           ;COMPLEMENT THE EXPECTED STATUS
(2)  016642  013737  001126  001164          MOV     $BDDAT,$TMP0    ;SAVE THE ACTUAL STATUS
(2)  016650  043737  001166  001164          BIC     $TMP1,$TMP0     ;CLEAR UNWANTED BITS
(2)  016656  023737  001124  001164          CMP     $GDDAT,$TMP0    ;ARE THE EXPECTED STATUS BITS SET ?
(2)  016664  001401                          BEQ     65$             ;BR IF THEY ARE
(2)  016666  104005                          ERROR 5                 ;REPORT THE ERROR
(2)  016670  000240                  65$:    NOP
(1)
(2)                                  ;;**************************************************************
(1)                                  ;DRIVE CLEAR THROUGH PORT B FIRST
(1)
(1)  016672  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR THROUGH PORT B
(1)
(2)                                  ;;**************************************************************
(1)                                  ;VERIFY THAT DRIVE STILL SEIZED BY PORT B
(1)
(2)  016700  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  016706  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  016714  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  016720  016037  000012  001126          MOV     RPDS1(R0),$BDDAT ;GET CONTENTS OF RPDS1
(2)  016726  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  016734  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
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(2)  016740  005037  001124                    CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  016744  013737  001126  001164            MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  016752  042737  100000  001164            BIC     #^C77777,$TMP0  ;SAVE SPECIFIED BITS
(2)  016760  023737  001124  001164            CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  016766  001414                            BEQ     66$             ;BR IF OK
(2)  016770  013737  001126  001174            MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  016776  042737  077777  001174            BIC     #77777,$TMP4    ;CLEAR THE MASKED BITS
(2)  017004  053737  001174  001124            BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  017012  104033                            ERROR   33              ;TYPE MESSAGE 33
(2)  017014  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  017020  000240                    66$:    NOP
(2)  017022  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  017030  013737  001226  001234            MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  017036  005037  001244                    CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  017042  016037  000012  001126            MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  017050  012737  000012  001122            MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF _RROR MESSAGE
(2)  017056  060037  001122                    ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  017062  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  017070  013737  001126  001164            MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  017076  042737  100000  001164            BIC     #^C77777,$TMP0  ;SAVE SPECIFIED BITS
(2)  017104  023737  001124  001164            CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  017112  001414                            BEQ     68$             ;BR IF OK
(2)  017114  013737  001126  001174            MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  017122  042737  077777  001174            BIC     #77777,$TMP4    ;CLEAR THE MASKED BITS
(2)  017130  053737  001174  001124            BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  017136  104033                            ERROR   33              ;TYPE MESSAGE 33
(2)  017140  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  017144  000240                    68$:    NOP
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;NOW ISSUE MASSBUS INIT
(1)
(1)  017146  012760  000040  000010            MOV     #CLR,RPCS2(R0)  ;ISSUE MASSBUS INIT
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;CONFIRM THAT DRIVE STILL SEIZED BY PORT B
(1)
(2)  017154  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  017162  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  017170  005037  001244                    CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  017174  016037  000012  001126            MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  017202  012737  000012  001122            MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  017210  060037  001122                    ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  017214  005037  001124                    CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  017220  013737  001126  001164            MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  017226  042737  100000  001164            BIC     #^C77777,$TMP0  ;SAVE SPECIFIED BITS
(2)  017234  023737  001124  001164            CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  017242  001414                            BEQ     70$             ;BR IF OK
(2)  017244  013737  001126  001174            MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  017252  042737  077777  001174            BIC     #77777,$TMP4    ;CLEAR THE MASKED BITS
(2)  017260  053737  001174  001124            BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  017266  104034                            ERROR   34              ;TYPE MESSAGE 34
(2)  017270  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  017274  000240                    70$:    NOP
(2)  017276  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  017304  013737  001226  001234            MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
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(2)  017312  005037  001244                    CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  017316  016037  000012  001126            MOV     RPDS1(R0),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  017324  012737  000012  001122            MOV     #RPDS1,$BDADR      ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  017332  060037  001122                    ADD     R0,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  017336  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  017344  013737  001126  001164            MOV     $BDDAT,$TMP0       ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  017352  042737  100000  001164            BIC     #^C77777,$TMP0     ;SAVE SPECIFIED BITS
(2)  017360  023737  001124  001164            CMP     $GDDAT,$TMP0       ;COMPARE THE BITS
(2)  017366  001414                            BEQ     72$                ;BR IF OK
(2)  017370  013737  001126  001174            MOV     $BDDAT,$TMP4       ;COPY 'BAD DATA'
(2)  017376  042737  077777  001174            BIC     #77777,$TMP4       ;CLEAR THE MASKED BITS
(2)  017404  053737  001174  001124            BIS     $TMP4,$GDDAT       ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  017412  104034                            ERROR   34                 ;TYPE MESSAGE 34
(2)  017414  005137  001244                    COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  017420  000240                    72$:    NOP
(2)
(2)                                            ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  017422  113760  001226  000010            MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B
(2)  017430  013737  001226  001234            MOV     PORTB,PTNBR        ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  017436  012760  000013  000000            MOV     #13,RPCS1(R0)      ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                            ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  017444  005037  001250                    CLR     RELERR             ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  017450  012737  000012  001122            MOV     #RPDS1,$BDADR      ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  017456  060037  001122                    ADD     R0,$BDADR          ;ADD THE I/O BASE ADDRESS
(3)  017462  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  017470  113760  001224  000010            MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  017476  016037  000012  001170            MOV     RPDS1(R0),$TMP2    ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  017504  013737  001170  001164            MOV     $TMP2,$TMP0        ;COPY IT INTO '$TMP0'
(3)  017512  042737  100100  001164            BIC     #ATA!VV,$TMP0      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  017520  113760  001226  000010            MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  017526  016037  000012  001172            MOV     RPDS1(R0),$TMP3    ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  017534  013737  001172  001166            MOV     $TMP3,$TMP1        ;COPY IT INTO '$TMP1'
(3)  017542  042737  100100  001166            BIC     #ATA!VV,$TMP1      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  017550  023737  001164  001166            CMP     $TMP0,$TMP1        ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  017556  001006                            BNE     74$                ;BR IF NOT
(3)  017560  005737  001164                    TST     $TMP0              ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  017564  001045                            BNE     76$                ;BR IF NOT
(3)  017566  104046                            ERROR   46                 ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  017570  000137  017770                    JMP     78$                ;BYPASS THE REST OF THE CHECKS
(3)  017574  013737  001170  001126  74$:     MOV     $TMP2,$BDDAT       ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  017602  013737  001226  001234            MOV     PORTB,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  017610  113760  001226  000010            MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  017616  005737  001164                    TST     $TMP0              ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  017622  001414                            BEQ     75$                ;BR IF ZERO
(3)  017624  013737  001224  001234            MOV     PORTA,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  017632  013737  001172  001126            MOV     $TMP3,$BDDAT       ;'BAD DATA' FOR ERROR TYPE OUT
(3)  017640  113760  001224  000010            MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  017646  005737  001166                    TST     $TMP1              ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  017652  001012                            BNE     76$                ;BR IF NOT
(3)  017654  012737  177777  001250  75$:     MOV     #-1,RELERR         ;SET 'RELEASE ERROR' INDICATOR
(3)  017662  012760  000011  000000            MOV     #11,RPCS1(R0)      ;CLEAR THE DRIVE
(3)  017670  012760  000013  000000            MOV     #13,RPCS1(R0)      ;RELEASE THE DRIVE
(3)  017676  104026                            ERROR   26                 ;TYPE ERROR MESSAGE 26
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   (3)  017700  013737  001170  001126  76$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
   (3)  017706  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
   (3)  017714  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
   (3)  017722  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
   (3)  017730  001401                          BEQ     77$             ;BR IF OK FROM PORT A.
   (3)  017732  104007                          ERROR   7               ;REPORT ERROR
   (3)  017734  013737  001172  001126  77$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
   (3)  017742  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
   (3)  017750  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
   (3)  017756  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
   (3)  017764  001401                          BEQ     78$             ;BR IF OK
   (3)  017766  104007                          ERROR   7               ;REPORT ERROR
   (3)  017770  000240                  78$:    NOP
   (1)  017772  000004                  1$:     SCOPE                   ;LOOP ?
 8377
 8396
 8397                                           ;;*****************************************************************
   (3)                                          ;*TEST 14       TEST RESET ATTENTION 'A' BY MASSBUS CLEAR
   (4)                                          ;*
   (4)                                          ;*VERIFY THAT A MASSBUS INITIALIZE CLEARS ONLY THE ATTENTION BIT OF THE
   (4)                                          ;*      SEIZING PORT.
   (4)                                          ;*
   (4)                                          ;*  A.  SET EACH PORT 'S ATTENTION BIT.  VERIFY THAT BOTH ATTENTION BITS
   (4)                                          ;*      SET.
   (4)                                          ;*
   (4)                                          ;*  B.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
   (4)                                          ;*
   (4)                                          ;*  C.  ISSUE A MASSBUS CLEAR.
   (4)                                          ;*
   (4)                                          ;*
   (4)                                          ;*  D.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE ATTENTION
   (4)                                          ;*      BIT FOR PORT 'A' HAS BEEN CLEARED AND THE ATTENTION BIT FOR PORT
   (4)                                          ;*      'B' IS STILL SET.
   (4)                                          ;*
   (3)                                          ;;*****************************************************************
   (2)  017774                          TST14:
   (3)  017774  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  020000  001406                          BEQ     2$              ;BR IF NOT
   (3)  020002  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
   (3)  020004  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  020010  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  020016  112737  000014  001102  2$:     MOVB    #14,$TSTNM      ;TEST NUMBER
   (3)  020024  012737  020046  001106          MOV     #TEST14,$LPADR  ;LOAD LOOP ON TEST ADDRESS
   (3)  020032  012737  020046  001110          MOV     #TEST14,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
   (1)  020040  012737  000004  001176          MOV     #4,$TIMES       ;;DO 4 ITERATIONS
8398    020046  012706  001100          TEST14: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8438                                            ;;*****************************************************************
   (2)
   (2)                                          ;SET ATTENTION BITS FOR BOTH PORTS
   (2)
   (2)  020052  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT 64$
   (2)  020060  012760  177777  000014          MOV     #-1,RPER1(R0)   ;FORCE ERRORS
   (2)  020066  005060  000014                  CLR     RPER1(R0)       ;CLEAR THE ERRORS
   (2)  020072  013760  001226  000010          MOV     PORTB,RPCS2(R0) ;SELECT THE OTHER PORT
   (2)  020100  005760  000012          64$:    TST     RPDS1(R0)       ;WAIT FOR DRIVE TO TIMEOUT
   (2)  020104  001775                          BEQ     64$             ;BR IF DRIVE HASN'T TIMED OUT
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(2)  020106  012760  177777  000014          MOV     #-1,RPER1(R0)    ;FORCE ERRORS ON PORT 65$
(2)  020114  005060  000014                  CLR     RPER1(R0)        ;CLEAR THE ERRORS
(2)  020120  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT "64$" AGAIN
(2)  020126  005760  000012          65$:    TST     RPDS1(R0)        ;WAIT FOR DRIVE TO TIMEOUT
(2)  020132  001775                          BEQ     65$              ;BR IF DRIVE HASN'T TIMED OUT
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;CONFIRM THAT BOTH ATTENTION BITS ARE SET
(1)
(3)  020134  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  020142  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  020150  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)  020154  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(3)  020162  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)  020170  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(3)  020174  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(3)  020202  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(3)  020210  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(3)  020216  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(3)  020224  001414                          BEQ     66$              ;BR IF OK
(3)  020226  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(3)  020234  042737  100000  001174          BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(3)  020242  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(3)  020250  104010                          ERROR   10               ;REPORT THE ERROR
(3)  020252  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)  020256  000240                  66$:    NOP
(2)  020260  005737  001244                  TST     CKERR            ;WAS ATTN BIT FOR PORT A SET ?
(2)  020264  001402                          BEQ     .+6              ;BR IF IT WAS
(2)  020266  000137  021274                  JMP     1$               ;BYPASS REST OF TEST IF NOT
(3)  020272  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  020300  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  020306  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)  020312  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(3)  020320  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)  020326  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(3)  020332  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(3)  020340  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(3)  020346  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(3)  020354  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(3)  020362  001414                          BEQ     68$              ;BR IF OK
(3)  020364  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(3)  020372  042737  100000  001174          BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(3)  020400  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(3)  020406  104010                          ERROR   10               ;REPORT THE ERROR
(3)  020410  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)  020414  000240                  68$:    NOP
(2)  020416  005737  001244                  TST     CKERR            ;WAS ATTN BIT FOR PORT B SET ?
(2)  020422  001402                          BEQ     .+6              ;BR IF IT WAS
(2)  020424  000137  021274                  JMP     1$               ;BYPASS REST OF TEST IF NOT
(1)
(2)                                  ;;*****************************************************************
(2)
(2)                                  ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  020430  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  020436  013737  001224  001236          MOV     PORTA,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
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(2)  020444  005060  000012            CLR     RPDS1(R0)          ;WRITE RPDS1
(2)  020450  013737  001226  001240    MOV     PORTB,OPPRT        ;'OPPOSITE' PORT ADDRESS
(2)
(2)                                ;;*****************************************************************
(1)                                ;ISSUE MASSBUS INIT TO PORT A
(1)
(1)  020456  012760  000040  000010    MOV     #CLR,RPCS2(R0)     ;MASSBUS INIT
(1)  020464  113760  001224  000010    MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A AGAIN
(1)
(2)                                ;;*****************************************************************
(1)                                ;VERIFY THAT ATTENTION BIT FOR PORT A CLEARED
(1)
(2)  020472  005037  001244            CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  020476  016037  000012  001126    MOV     RPDS1(R0),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  020504  012737  000012  001122    MOV     #RPDS1,$BDADR      ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  020512  060037  001122            ADD     R0,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  020516  005037  001124            CLR     $GDDAT             ;WHAT REGISTER SHOULD BE
(2)  020522  013737  001126  001164    MOV     $BDDAT,$TMP0       ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  020530  042737  077777  001164    BIC     #^CATA,$TMP0   ;SAVE SPECIFIED BITS
(2)  020536  023737  001124  001164    CMP     $GDDAT,$TMP0       ;COMPARE THE BITS
(2)  020544  001414                    BEQ     72$                ;BR IF OK
(2)  020546  013737  001126  001174    MOV     $BDDAT,$TMP4       ;COPY 'BAD DATA'
(2)  020554  042737  100000  001174    BIC     #ATA,$TMP4         ;CLEAR THE MASKED BITS
(2)  020562  053737  001174  001124    BIS     $TMP4,$GDDAT       ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  020570  104047                    ERROR   47                 ;TYPE MESSAGE 47
(2)  020572  005137  001244            COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  020576  000240                72$:NOP
(1)
(2)                                ;;*****************************************************************
(2)
(2)                                    ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  020600  113760  001224  000010    MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A
(3)  020606  013737  001224  001234    MOV     PORTA,PTNBR    ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  020614  012760  000013  000000    MOV     #13,RPCS1(R0)      ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                    ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  020622  005037  001250            CLR     RELERR             ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  020626  012737  000012  001122    MOV     #RPDS1,$BDADR      ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  020634  060037  001122            ADD     R0,$BDADR          ;ADD THE I/O BASE ADDRESS
(3)  020640  012737  011700  001124    MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  020646  113760  001224  000010    MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  020654  016037  000012  001170    MOV     RPDS1(R0),$TMP2    ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  020662  013737  001170  001164    MOV     $TMP2,$TMP0        ;COPY IT INTO '$TMP0'
(3)  020670  042737  100100  001164    BIC     #ATA!VV,$TMP0      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  020676  113760  001226  000010    MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  020704  016037  000012  001172    MOV     RPDS1(R0),$TMP3    ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  020712  013737  001172  001166    MOV     $TMP3,$TMP1        ;COPY IT INTO '$TMP1'
(3)  020720  042737  100100  001166    BIC     #ATA!VV,$TMP1      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  020726  023737  001164  001166    CMP     $TMP0,$TMP1        ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  020734  001006                    BNE     74$                ;BR IF NOT
(3)  020736  005737  001164            TST     $TMP0              ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  020742  001045                    BNE     76$                ;BR IF NOT
(3)  020744  104046                    ERROR   46                 ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  020746  000137  021146            JMP     78$                ;BYPASS THE REST OF THE CHECKS
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(3)  020752  013737  001170  001126  74$:   MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  020760  013737  001226  001234         MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  020766  113760  001226  000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  020774  005737  001164                 TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  021000  001414                         BEQ     75$             ;BR IF ZERO
(3)  021002  013737  001224  001234         MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  021010  013737  001172  001126         MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  021016  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  021024  005737  001166                 TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  021030  001012                         BNE     76$             ;BR IF NOT
(3)  021032  012737  177777  001250  75$:   MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  021040  012760  000011  000000         MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  021046  012760  000013  000000         MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  021054  104026                         ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  021056  013737  001170  001126  76$:   MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  021064  013737  001224  001234         MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  021072  042737  100000  001170         BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(3)  021100  023737  001124  001170         CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  021106  001401                         BEQ     77$             ;BR IF OK FROM PORT A.
(3)  021110  104007                         ERROR   7               ;REPORT ERROR
(3)  021112  013737  001172  001126  77$:   MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  021120  013737  001226  001234         MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  021126  042737  100000  001172         BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(3)  021134  023737  001124  001172         CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  021142  001401                         BEQ     78$             ;BR IF OK
(3)  021144  104007                         ERROR   7               ;REPORT ERROR
(3)  021146  000240                 78$:    NOP
(1)
(2)                                         ;;*****************************************************************
(1)                                         ;CHECK ATTENTION BIT ON THE OPPOSITE PORT (PORT B)
(1)
(2)  021150  113760  001226  000010         MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  021156  013737  001226  001234         MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  021164  005037  001244                 CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  021170  016037  000012  001126         MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  021176  012737  000012  001122         MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  021204  060037  001122                 ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  021210  012737  100000  001124         MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  021216  013737  001126  001164         MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  021224  042737  077777  001164         BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  021232  023737  001124  001164         CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  021240  001414                         BEQ     79$              ;BR IF OK
(2)  021242  013737  001126  001174         MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  021250  042737  100000  001174         BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(2)  021256  053737  001174  001124         BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  021264  104050                         ERROR   50               ;TYPE MESSAGE 50
(2)  021266  005137  001244                 COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  021272  000240                 79$:    NOP
(1)  021274  000004                 1$:     SCOPE                    ;LOOP ?
8456
8457                                        ;;*****************************************************************
(3)                                         ;*TEST 15       TEST RESET ATTENTION 'B' BY MASSBUS CLEAR
(4)                                         ;*
(4)                                         ;*VERIFY THAT A MASSBUS INITIALIZE CLEARS ONLY THE ATTENTION BIT OF THE
(4)                                         ;*      SEIZING PORT.
(4)                                         ;*
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(4)                                     ;*  A.  SET EACH PORT'S ATTENTION BIT.  VERIFY THAT BOTH ATTENTION BITS
(4)                                     ;*      SET.
(4)                                     ;*
(4)                                     ;*  B.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                                     ;*
(4)                                     ;*  C.  ISSUE A MASSBUS CLEAR.
(4)                                     ;*
(4)                                     ;*  D.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE ATTENTION
(4)                                     ;*      BIT FOR PORT 'B' HAS BEEN CLEARED AND THE ATTENTION BIT FOR PORT
(4)                                     ;*      'A' IS STILL SET.
(4)                                     ;*
(3)                                     ;;*****************************************************************
(2)  021276                             TST15:
(3)  021276  005737  001274                     TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  021302  001406                             BEQ     2$              ;BR IF NOT
(3)  021304  100002                             BPL     1$              ;BR IF JUST ENTERED TEST
(3)  021306  000137  002622                     JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  021312  012737  177777  001274  1$:       MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  021320  112737  000015  001102  2$:       MOVB    #15,$TSTNM      ;TEST NUMBER
(3)  021326  012737  021350  001106            MOV     #TEST15,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  021334  012737  021350  001110            MOV     #TEST15,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  021342  012737  000004  001176            MOV     #4,$TIMES       ;;DO 4 ITERATIONS
8458 021350  012706  001100             TEST15: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8459                                    ;;*****************************************************************
(2)
(2)                                             ;SET ATTENTION BITS FOR BOTH PORTS
(2)
(2)  021354  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT 64$
(2)  021362  012760  177777  000014            MOV     #-1,RPER1(R0)   ;FORCE ERRORS
(2)  021370  005060  000014                     CLR     RPER1(R0)       ;CLEAR THE ERRORS
(2)  021374  013760  001226  000010            MOV     PORTB,RPCS2(R0) ;SELECT THE OTHER PORT
(2)  021402  005760  000012             64$:    TST     RPDS1(R0)       ;WAIT FOR DRIVE TO TIMEOUT
(2)  021406  001775                             BEQ     64$             ;BR IF DRIVE HASN'T TIMED OUT
(2)  021410  012760  177777  000014            MOV     #-1,RPER1(R0)   ;FORCE ERRORS ON PORT 65$
(2)  021416  005060  000014                     CLR     RPER1(R0)       ;CLEAR THE ERRORS
(2)  021422  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT "64$" AGAIN
(2)  021430  005760  000012             65$:    TST     RPDS1(R0)       ;WAIT FOR DRIVE TO TIMEOUT
(2)  021434  001775                             BEQ     65$             ;BR IF DRIVE HASN'T TIMED OUT
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;CONFIRM THAT BOTH ATTENTION BITS ARE SET
(1)
(3)  021436  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  021444  013737  001226  001234            MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  021452  005037  001244                     CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)  021456  016037  000012  001126            MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(3)  021464  012737  000012  001122            MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)  021472  060037  001122                     ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(3)  021476  012737  100000  001124            MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(3)  021504  013737  001126  001164            MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(3)  021512  042737  077777  001164            BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(3)  021520  023737  001124  001164            CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(3)  021526  001414                             BEQ     66$             ;BR IF OK
(3)  021530  013737  001126  001174            MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(3)  021536  042737  100000  001174            BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(3)  021544  053737  001174  001124            BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
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(3)  021552  104010                          ERROR   10                  ;REPORT THE ERROR
(3)  021554  005137  001244                  COM     CKERR               ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)  021560  000240                  66$:    NOP
(2)  021562  005737  001244                  TST     CKERR               ;WAS ATTN BIT FOR PORT B SET ?
(2)  021566  001402                          BEQ     .+6                 ;BR IF IT WAS
(2)  021570  000137  022576                  JMP     1$                  ;BYPASS REST OF TEST IF NOT
(3)  021574  113760  001224  000010          MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(3)  021602  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  021610  005037  001244                  CLR     CKERR               ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)  021614  016037  000012  001126          MOV     RPDS1(R0),$BDDAT    ;GET CONTENTS OF RPDS1
(3)  021622  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)  021630  060037  001122                  ADD     R0,$BDADR           ;ADD RH11 BASE ADDRESS
(3)  021634  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(3)  021642  013737  001126  001164          MOV     $BDDAT,$TMP0        ;MOVE REGISTER CONTENTS TO '$TMP0'
(3)  021650  042737  077777  001164          BIC     #↑CATA,$TMP0  ;SAVE SPECIFIED BITS
(3)  021656  023737  001124  001164          CMP     $GDDAT,$TMP0        ;COMPARE THE BITS
(3)  021664  001414                          BEQ     68$                 ;BR IF OK
(3)  021666  013737  001126  001174          MOV     $BDDAT,$TMP4        ;COPY 'BAD DATA'
(3)  021674  042737  100000  001174          BIC     #ATA,$TMP4          ;CLEAR THE MASKED BITS
(3)  021702  053737  001174  001124          BIS     $TMP4,$GDDAT        ;'OR' WITH GOOD DATA FOR TYPEOUT
(3)  021710  104010                          ERROR   10                  ;REPORT THE ERROR
(3)  021712  005137  001244                  COM     CKERR               ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)  021716  000240                  68$:    NOP
(2)  021720  005737  001244                  TST     CKERR               ;WAS ATTN BIT FOR PORT A SET ?
(2)  021724  001402                          BEQ     .+6                 ;BR IF IT WAS
(2)  021726  000137  022576                  JMP     1$                  ;BYPASS REST OF TEST IF NOT
(1)
(2)                                   ;;*****************************************************************
(2)
(2)                                     ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  021732  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  021740  013737  001226  001236          MOV     PORTB,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2)  021746  005060  000012                  CLR     RPDS1(R0)           ;WRITE RPDS1
(2)  021752  013737  001224  001240          MOV     PORTA,OPPRT         ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                   ;;*****************************************************************
(1)                                   ;ISSUE MASSBUS INIT TO PORT B
(1)
(1)  021760  012760  000040  000010          MOV     #CLR,RPCS2(R0)  ;MASSBUS INIT
(1)  021766  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B AGAIN
(1)
(2)                                   ;;*****************************************************************
(1)                                   ;VERIFY THAT ATTENTION BIT FOR PORT B CLEARED
(1)
(2)  021774  005037  001244                  CLR     CKERR               ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  022000  016037  000012  001126          MOV     RPDS1(R0),$BDDAT    ;GET CONTENTS OF RPDS1
(2)  022006  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  022014  060037  001122                  ADD     R0,$BDADR           ;ADD RH11 BASE ADDRESS
(2)  022020  005037  001124                  CLR     $GDDAT              ;WHAT REGISTER SHOULD BE
(2)  022024  013737  001126  001164          MOV     $BDDAT,$TMP0        ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  022032  042737  077777  001164          BIC     #↑CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  022040  023737  001124  001164          CMP     $GDDAT,$TMP0        ;COMPARE THE BITS
(2)  022046  001414                          BEQ     72$                 ;BR IF OK
(2)  022050  013737  001126  001174          MOV     $BDDAT,$TMP4        ;COPY 'BAD DATA'
(2)  022056  042737  100000  001174          BIC     #ATA,$TMP4          ;CLEAR THE MASKED BITS
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(2)  022064  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  022072  104047                          ERROR   47              ;TYPE MESSAGE 47
(2)  022074  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  022100  000240                  72$:    NOP
(1)
(2)                                       ;;*****************************************************************
(2)
(2)                                       ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  022102  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  022110  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  022116  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                       ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  022124  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  022130  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  022136  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  022142  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  022150  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  022156  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  022164  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  022172  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  022200  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  022206  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  022214  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  022222  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  022230  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  022236  001006                          BNE     74$             ;BR IF NOT
(3)  022240  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  022244  001045                          BNE     76$             ;BR IF NOT
(3)  022246  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  022250  000137  022450                  JMP     78$             ;BYPASS THE REST OF THE CHECKS
(3)  022254  013737  001170  001126  74$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  022262  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  022270  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  022276  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  022302  001414                          BEQ     75$             ;BR IF ZERO
(3)  022304  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  022312  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  022320  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  022326  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  022332  001012                          BNE     76$             ;BR IF NOT
(3)  022334  012737  177777  001250  75$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  022342  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  022350  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  022356  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  022360  013737  001170  001126  76$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  022366  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  022374  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(3)  022402  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  022410  001401                          BEQ     77$             ;BR IF OK FROM PORT A.
(3)  022412  104007                          ERROR   7               ;REPORT ERROR
(3)  022414  013737  001172  001126  77$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  022422  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  022430  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
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   (3)  022436  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
   (3)  022444  001401                           BEQ     78$             ;BR IF OK
   (3)  022446  104007                           ERROR   7               ;REPORT ERROR
   (3)  022450  000240                   78$:    NOP
   (1)
   (2)                                          ;;*****************************************************************
   (1)                                          ;CHECK ATTENTION BIT ON THE OPPOSITE PORT (PORT A)
   (1)
   (2)  022452  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
   (2)  022460  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
   (2)  022466  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
   (2)  022472  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
   (2)  022500  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
   (2)  022506  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
   (2)  022512  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
   (2)  022520  013737  001126  001164          MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
   (2)  022526  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
   (2)  022534  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
   (2)  022542  001414                          BEQ     79$             ;BR IF OK
   (2)  022544  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
   (2)  022552  042737  100000  001174          BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
   (2)  022560  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
   (2)  022566  104050                          ERROR   50              ;TYPE MESSAGE 50
   (2)  022570  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
   (2)  022574  000240                   79$:    NOP
   (1)  022576  000004                   1$:     SCOPE                   ;LOOP ?
 8460
 8464
 8478
 8479                                           ;;*****************************************************************
   (3)                                          ;*TEST 16       TEST CLEAR ATTENTION BY MASSBUS INIT - DRIVE IN NEUTRAL
   (4)                                          ;*
   (4)                                          ;*VERIFY THAT MASSBUS CLEAR DOES NOT RESET ATTENTION BITS WHEN THE
   (4)                                          ;*      DRIVE IS IN NEUTRAL.
   (4)                                          ;*
   (4)                                          ;*  A.  SET THE ATTENTION BITS FOR BOTH PORTS.
   (4)                                          ;*
   (4)                                          ;*  B.  VERIFY THAT THE DRIVE IS IN NEUTRAL.
   (4)                                          ;*
   (4)                                          ;*  C.  ISSUE A MASSBUS INIT.  VERIFY THAT NEITHER ATTENTION BIT HAS
   (4)                                          ;*      RESET.
   (4)                                          ;*
   (3)                                          ;;*****************************************************************
   (2)  022600                                  TST16:
   (3)  022600  005737  001274                          TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  022604  001406                                  BEQ     2$              ;BR IF NOT
   (3)  022606  100002                                  BPL     1$              ;BR IF JUST ENTERED TEST
   (3)  022610  000137  002622                          JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  022614  012737  177777  001274   1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  022622  112737  000016  001102   2$:     MOVB    #16,$TSTNM      ;TEST NUMBER
   (3)  022630  012737  022652  001106           MOV     #TEST16,$LPADR  ;LOAD LOOP ON TEST ADDRESS
   (3)  022636  012737  022652  001110           MOV     #TEST16,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
   (1)  022644  012737  000004  001176           MOV     #4,$TIMES       ;;DO 4 ITERATIONS
8480    022652  012706  001100           TEST16: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8515                                            ;;*****************************************************************
   (2)
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(2)                                          ;SET ATTENTION BITS FOR BOTH PORTS
(2)
(2)   022656  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT 64$
(2)   022664  012760  177777  000014         MOV     #-1,RPER1(R0)   ;FORCE ERRORS
(2)   022672  005060  000014                 CLR     RPER1(R0)       ;CLEAR THE ERRORS
(2)   022676  013760  001226  000010         MOV     PORTB,RPCS2(R0) ;SELECT THE OTHER PORT
(2)   022704  005760  000012         64$:    TST     RPDS1(R0)       ;WAIT FOR DRIVE TO TIMEOUT
(2)   022710  001775                 BEQ     64$             ;BR IF DRIVE HASN'T TIMED OUT
(2)   022712  012760  177777  000014         MOV     #-1,RPER1(R0)   ;FORCE ERRORS ON PORT 65$
(2)   022720  005060  000014                 CLR     RPER1(R0)       ;CLEAR THE ERRORS
(2)   022724  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT "64$" AGAIN
(2)   022732  005760  000012         65$:    TST     RPDS1(R0)       ;WAIT FOR DRIVE TO TIMEOUT
(2)   022736  001775                 BEQ     65$             ;BR IF DRIVE HASN'T TIMED OUT
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;CONFIRM THAT BOTH ATTENTION BITS ARE SET
(1)
(3)   022740  113760  001224  000010         MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)   022746  013737  001224  001234         MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)   022754  005037  001244                 CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)   022760  016037  000012  001126         MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(3)   022766  012737  000012  001122         MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)   022774  060037  001122                 ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(3)   023000  012737  100000  001124         MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(3)   023006  013737  001126  001164         MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(3)   023014  042737  077777  001164         BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(3)   023022  023737  001124  001164         CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(3)   023030  001414                 BEQ     66$             ;BR IF OK
(3)   023032  013737  001126  001174         MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(3)   023040  042737  100000  001174         BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(3)   023046  053737  001174  001124         BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(3)   023054  104010                 ERROR   10              ;REPORT THE ERROR
(3)   023056  005137  001244                 COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)   023062  000240         66$:    NOP
(2)   023064  005737  001244                 TST     CKERR           ;WAS ATTN BIT FOR PORT A SET ?
(2)   023070  001402                 BEQ     .+6             ;BR IF IT WAS
(2)   023072  000137  024036                 JMP     1$              ;BYPASS REST OF TEST IF NOT
(3)   023076  113760  001226  000010         MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)   023104  013737  001226  001234         MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)   023112  005037  001244                 CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)   023116  016037  000012  001126         MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(3)   023124  012737  000012  001122         MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)   023132  060037  001122                 ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(3)   023136  012737  100000  001124         MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(3)   023144  013737  001126  001164         MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(3)   023152  042737  077777  001164         BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(3)   023160  023737  001124  001164         CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(3)   023166  001414                 BEQ     68$             ;BR IF OK
(3)   023170  013737  001126  001174         MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(3)   023176  042737  100000  001174         BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(3)   023204  053737  001174  001124         BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(3)   023212  104010                 ERROR   10              ;REPORT THE ERROR
(3)   023214  005137  001244                 COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)   023220  000240         68$:    NOP
(2)   023222  005737  001244                 TST     CKERR           ;WAS ATTN BIT FOR PORT B SET ?
(2)   023226  001402                 BEQ     .+6             ;BR IF IT WAS
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(2)  023230  000137  024036                    JMP     1$                ;BYPASS REST OF TEST IF NOT
(1)
(2)                                  ;;*****************************************************************
(2)
(2)                                  ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  023234  005037  001250                    CLR     RELERR            ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  023240  012737  000012  001122            MOV     #RPDS1,$BDADR     ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  023246  060037  001122                    ADD     R0,$BDADR         ;ADD THE I/O BASE ADDRESS
(2)  023252  012737  111700  001124            MOV     #111700,$GDDAT    ;COMPARSION CONSTANT
(2)  023260  113760  001224  000010            MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A.
(2)  023266  016037  000012  001170            MOV     RPDS1(R0),$TMP2   ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  023274  013737  001170  001164            MOV     $TMP2,$TMP0       ;COPY IT INTO '$TMP0'
(2)  023302  042737  100100  001164            BIC     #ATA!VV,$TMP0     ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  023310  113760  001226  000010            MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B.
(2)  023316  016037  000012  001172            MOV     RPDS1(R0),$TMP3   ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  023324  013737  001172  001166            MOV     $TMP3,$TMP1       ;COPY IT INTO '$TMP1'
(2)  023332  042737  100100  001166            BIC     #ATA!VV,$TMP1     ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  023340  023737  001164  001166            CMP     $TMP0,$TMP1       ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  023346  001006                            BNE     70$               ;BR IF NOT
(2)  023350  005737  001164                    TST     $TMP0             ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  023354  001045                            BNE     72$               ;BR IF NOT
(2)  023356  104046                            ERROR   46                ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  023360  000137  023544                    JMP     74$               ;BYPASS THE REST OF THE CHECKS
(2)  023364  013737  001170  001126  70$:      MOV     $TMP2,$BDDAT      ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  023372  013737  001226  001234            MOV     PORTB,PTNBR       ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  023400  113760  001226  000010            MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B.
(2)  023406  005737  001164                    TST     $TMP0             ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  023412  001414                            BEQ     71$               ;BR IF ZERO
(2)  023414  013737  001224  001234            MOV     PORTA,PTNBR       ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  023422  013737  001172  001126            MOV     $TMP3,$BDDAT      ;'BAD DATA' FOR ERROR TYPE OUT
(2)  023430  113760  001224  000010            MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A.
(2)  023436  005737  001166                    TST     $TMP1             ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  023442  001012                            BNE     72$               ;BR IF NOT
(2)  023444  012737  177777  001250  71$:      MOV     #-1,RELERR        ;SET 'RELEASE ERROR' INDICATOR
(2)  023452  012760  000011  000000            MOV     #11,RPCS1(R0)     ;CLEAR THE DRIVE
(2)  023460  012760  000013  000000            MOV     #13,RPCS1(R0)     ;RELEASE THE DRIVE
(2)  023466  104026                            ERROR   26                ;TYPE ERROR MESSAGE 26
(2)  023470  013737  001170  001126  72$:      MOV     $TMP2,$BDDAT      ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  023476  013737  001224  001234            MOV     PORTA,PTNBR       ;CHANGE PORT NUMBER
(2)  023504  023737  001124  001170            CMP     $GDDAT,$TMP2      ;ALL BITS OK ?
(2)  023512  001401                            BEQ     73$               ;BR IF OK FROM PORT A.
(2)  023514  104007                            ERROR   7                 ;REPORT ERROR
(2)  023516  013737  001172  001126  73$:      MOV     $TMP3,$BDDAT      ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  023524  013737  001226  001234            MOV     PORTB,PTNBR       ;CHANGE PORT NUMBER
(2)  023532  023737  001124  001172            CMP     $GDDAT,$TMP3      ;SEE IF READ OK FROM PORT B.
(2)  023540  001401                            BEQ     74$               ;BR IF OK
(2)  023542  104007                            ERROR   7                 ;REPORT ERROR
(2)  023544  000240                    74$:    NOP
(1)  023546  005737  001250                    TST     RELERR            ;WAS DRIVE IN NEUTRAL ?
(1)  023552  001402                            BEQ     .+6               ;BR IF IT WAS
(1)  023554  000137  024036                    JMP     1$                ;BYPASS RESET OF TEST
(2)                                  ;;*****************************************************************
(1)                                  ;ISSUE THE MASSBUS INIT
(1)
(1)  023560  012760  000040  000010            MOV     #CLR,RPCS2(R0)    ;ISSUE A MASSBUS INIT
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(1)
(2)                                     ;;*****************************************************************
(1)                                     ;CHECK THE ATTENTION BITS OF BOTH PORTS
(1)
(2)  023566  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  023574  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  023602  005037  001244                  CLR     CKERR        ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  023606  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  023614  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  023622  060037  001122                  ADD     R0,$BDADR    ;ADD RH11 BASE ADDRESS
(2)  023626  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  023634  013737  001126  001164          MOV     $BDDAT,$TMP0   ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  023642  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  023650  023737  001124  001164          CMP     $GDDAT,$TMP0   ;COMPARE THE BITS
(2)  023656  001414                          BEQ     75$          ;BR IF OK
(2)  023660  013737  001126  001174          MOV     $BDDAT,$TMP4   ;COPY 'BAD DATA'
(2)  023666  042737  100000  001174          BIC     #ATA,$TMP4   ;CLEAR THE MASKED BITS
(2)  023674  053737  001174  001124          BIS     $TMP4,$GDDAT   ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  023702  104051                          ERROR   51           ;TYPE MESSAGE 51
(2)  023704  005137  001244                  COM     CKERR        ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  023710  000240                  75$:    NOP
(2)  023712  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  023720  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  023726  005037  001244                  CLR     CKERR        ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  023732  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  023740  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  023746  060037  001122                  ADD     R0,$BDADR    ;ADD RH11 BASE ADDRESS
(2)  023752  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  023760  013737  001126  001164          MOV     $BDDAT,$TMP0   ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  023766  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  023774  023737  001124  001164          CMP     $GDDAT,$TMP0   ;COMPARE THE BITS
(2)  024002  001414                          BEQ     77$          ;BR IF OK
(2)  024004  013737  001126  001174          MOV     $BDDAT,$TMP4   ;COPY 'BAD DATA'
(2)  024012  042737  100000  001174          BIC     #ATA,$TMP4   ;CLEAR THE MASKED BITS
(2)  024020  053737  001174  001124          BIS     $TMP4,$GDDAT   ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  024026  104051                          ERROR   51           ;TYPE MESSAGE 51
(2)  024030  005137  001244                  COM     CKERR        ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  024034  000240                  77$:    NOP
(1)  024036  000004                  1$:     SCOPE                ;LOOP ?
8516
8528
8529                                    ;;*****************************************************************
(3)                                     ;*TEST 17        TEST SEIZE BY RPCS1 READ THROUGH PORT 'A'
(4)                                     ;*
(4)                                     ;*VERIFY THAT READING THE CONTROL REGISTER (RPCS1) SEIZES THE DRIVE.
(4)                                     ;*
(4)                                     ;*  A.  READ THE CONTROL REGISTER (RPCS1) THROUGH PORT 'A'; VERIFY THAT
(4)                                     ;*      THE DRIVE IS SEIZED.
(4)                                     ;*
(4)                                     ;*  B.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'; VERIFY THAT THE DRIVE
(4)                                     ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                     ;*
(3)                                     ;*****************************************************************
(2)  024040                             TST17:
(3)  024040  005737  001274                  TST     KYBCTL       ;PERFORMING ONLY SINGLE TESTS ?
(3)  024044  001406                          BEQ     2$           ;BR IF NOT
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(3)  024046  100002                        BPL     1$                  ;BR IF JUST ENTERED TEST
(3)  024050  000137  002622                JMP     EXEC                ;RETURN & GET NEXT TEST NUMBER
(3)  024054  012737  177777  001274  1$:   MOV     #-1,KYBCTL          ;SET SINGLE TEST INDICATOR
(3)  024062  112737  000017  001102  2$:   MOVB    #17,$TSTNM          ;TEST NUMBER
(3)  024070  012737  024112  001106        MOV     #TEST17,$LPADR      ;LOAD LOOP ON TEST ADDRESS
(3)  024076  012737  024112  001110        MOV     #TEST17,$LPERR      ;LOAD LOOP ON ERROR ADDRESS
(1)  024104  012737  007640  001176        MOV     #4000.,$TIMES       ;;DO 4000. ITERATIONS
8530 024112  012706  001100        TEST17:  MOV     #STACK,SP           ;LOAD THE STACK POINTER
8541
 (2)
 (2)                                        ;CLEAR ATTENTION BITS FOR BOTH PORTS
 (2)
(2)  024116  113760  001224  000010        MOVB    PORTA,RPCS2(R0)     ;SELECT PORT #A
(2)  024124  005060  000012                CLR     RPDS1(R0)           ;SEIZE THE DRIVE
(2)  024130  012760  000011  000000        MOV     #11,RPCS1(R0)       ;ISSUE DRIVE CLEAR
(2)  024136  012760  000013  000000        MOV     #13,RPCS1(R0)       ;RELEASE THE DRIVE
(2)  024144  113760  001226  000010        MOVB    PORTB,RPCS2(R0)     ;SELECT PORT #B
(2)  024152  005060  000012                CLR     RPDS1(R0)           ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  024156  012760  000011  000000        MOV     #11,RPCS1(R0)       ;ISSUE DRIVE CLEAR
(2)  024164  012760  000013  000000        MOV     #13,RPCS1(R0)       ;RELEASE THE DRIVE
(1)
(2)                                        ;;*****************************************************************
(2)
(2)                                        ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  024172  113760  001224  000010        MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  024200  013737  001224  001236        MOV     PORTA,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2)  024206  005760  000000                TST     RPCS1(R0)        ;READ RHCS1
(3)  024212  113760  001226  000010        MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  024220  013737  001226  001234        MOV     PORTB,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  024226  013737  001226  001240        MOV     PORTB,OPPRT      ;'OPPOSITE' PORT ADDRESS
(2)  024234  016037  000012  001126        MOV     RPDS1(R0),$BDDAT  ;SEE IF DRIVE SEIZED BY PORT A
(2)  024242  010037  001122                MOV     R0,$BDADR        ;RH11 BASE ADDRESS
(2)  024246  062737  000012  001122        ADD     #RPDS1,$BDADR    ;GENERATE BAD REGISTER ADDRESS
(2)  024254  005037  001124                CLR     $GDDAT           ;REGISTER SHOULD BE ZERO
(2)  024260  023737  001124  001126        CMP     $GDDAT,$BDDAT    ;IS THE REGISTER ZERO
(2)  024266  001403                        BEQ     64$              ;BR IF IT IS
(2)  024270  104004                        ERROR   4                ;REPORT THE ERROR
(2)  024272  000137  024724                JMP     1$               ;BYPASS REST OF THE SUBTEST
(2)  024276                        64$:    MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A
(3)  024276  113760  001224  000010        MOV     PORTA,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  024304  013737  001224  001234        MOV     RPDS1(R0),$BDDAT  ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  024312  016037  000012  001126        MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;EXPECTED STATUS
(2)  024320  012737  011700  001124        MOV     $GDDAT,$TMP1   ;USE GOOD DATA AS A MASK
(2)  024326  013737  001124  001166        COM     $TMP1            ;COMPLEMENT THE EXPECTED STATUS
(2)  024334  005137  001166                MOV     $BDDAT,$TMP0     ;SAVE THE ACTUAL STATUS
(2)  024340  013737  001126  001164        BIC     $TMP1,$TMP0      ;CLEAR UNWANTED BITS
(2)  024346  043737  001166  001164        CMP     $GDDAT,$TMP0     ;ARE THE EXPECTED STATUS BITS SET ?
(2)  024354  023737  001124  001164        BEQ     65$              ;BR IF THEY ARE
(2)  024362  001401                        ERROR 5                  ;REPORT THE ERROR
(2)  024364  104005                NOP
(2)  024366  000240                65$:
(1)
(2)                                        ;;*****************************************************************
(2)
(2)                                        ;RELEASE THE DRIVE FROM PORT A
(2)
```

```
(3)  024370  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  024376  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  024404  012760  000013  000000          MOV     #13,RPCS1(R0)  ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                           ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  024412  005037  001250                   CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  024416  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  024424  060037  001122                   ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  024430  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  024436  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  024444  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  024452  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  024460  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  024466  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  024474  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  024502  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  024510  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  024516  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  024524  001006                          BNE     66$             ;BR IF NOT
(3)  024526  005737  001164                   TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  024532  001045                          BNE     68$             ;BR IF NOT
(3)  024534  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  024536  000137  024722                   JMP     70$             ;BYPASS THE REST OF THE CHECKS
(3)  024542  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  024550  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  024556  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  024564  005737  001164                   TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  024570  001414                          BEQ     67$             ;BR IF ZERO
(3)  024572  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  024600  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  024606  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  024614  005737  001166                   TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  024620  001012                          BNE     68$             ;BR IF NOT
(3)  024622  012737  177777  001250  67$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  024630  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  024636  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  024644  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  024646  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  024654  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  024662  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  024670  001401                          BEQ     69$             ;BR IF OK FROM PORT A.
(3)  024672  104007                          ERROR   7               ;REPORT ERROR
(3)  024674  013737  001172  001126  69$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  024702  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  024710  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  024716  001401                          BEQ     70$             ;BR IF OK
(3)  024720  104007                          ERROR   7               ;REPORT ERROR
(3)  024722  000240                  70$:    NOP
(1)  024724  000004                  1$:     SCOPE                   ;LOOP ?
8553
8554                                          ;;*****************************************************************
(3)                                           ;*TEST 20       TEST SEIZE BY RPCS1 READ THROUGH PORT 'B'
(4)                                           ;*
(4)                                           ;*VERIFY THAT READING THE CONTROL REGISTER (RPCS1) SEIZES THE DRIVE.
(4)                                           ;*
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                                        T20     TEST SEIZE BY RPCS1 READ THROUGH PORT 'B'                                SEQ 0087

                                        ;*  A.  READ THE CONTROL REGISTER (RPCS1) THROUGH PORT 'B'; VERIFY THAT
                                        ;*      THE DRIVE IS SEIZED.
                                        ;*
                                        ;*  B.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'; VERIFY THAT THE DRIVE
                                        ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
                                        ;*
                                        ;;*****************************************************************
(2) 024726                              $T20:
(3) 024726  005737  001274                      TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3) 024732  001406                              BEQ     2$              ;BR IF NOT
(3) 024734  100002                              BPL     1$              ;BR IF JUST ENTERED TEST
(3) 024736  000137  002622                      JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3) 024742  012737  177777  001274   1$:         MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3) 024750  112737  000020  001102   2$:         MOVB    #20,$TSTNM      ;TEST NUMBER
(3) 024756  012737  025000  001106               MOV     #TEST20,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3) 024764  012737  025000  001110               MOV     #TEST20,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1) 024772  012737  007640  001176               MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8555 025000 012706  001100          TEST20:     MOV     #STACK,SP       ;LOAD THE STACK POINTER
8556
(2)                                             ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2) 025004  113760  001224  000010              MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2) 025012  005060  000012                      CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2) 025016  012760  000011  000000              MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2) 025024  012760  000013  000000              MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2) 025032  113760  001226  000010              MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2) 025040  005060  000012                      CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2) 025044  012760  000011  000000              MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2) 025052  012760  000013  000000              MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)
(2)                                     ;;*****************************************************************
(2)
(2)                                             ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2) 025060  113760  001226  000010              MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2) 025066  013737  001226  001236              MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2) 025074  005760  000000                      TST     RPCS1(R0)       ;READ RHCS1
(3) 025100  113760  001224  000010              MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(3) 025106  013737  001224  001234              MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2) 025114  013737  001224  001240              MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2) 025122  016037  000012  001126              MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT B
(2) 025130  010037  001122                      MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2) 025134  062737  000012  001122              ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2) 025142  005037  001124                      CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2) 025146  023737  001124  001126              CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2) 025154  001403                              BEQ     64$             ;BR IF IT IS
(2) 025156  104004                              ERROR   4               ;REPORT THE ERROR
(2) 025160  000137  025612                      JMP     1$              ;BYPASS REST OF THE SUBTEST
(2) 025164                          64$:
(3) 025164  113760  001226  000010              MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3) 025172  013737  001226  001234              MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2) 025200  016037  000012  001126              MOV     RPDS1(R0),$BDDAT ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2) 025206  012737  011700  001124              MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT ;EXPECTED STATUS
(2) 025214  013737  001124  001166              MOV     $GDDAT,$TMP1    ;USE GOOD DATA AS A MASK
(2) 025222  005137  001166                      COM     $TMP1           ;COMPLEMENT THE EXPECTED STATUS
(2) 025226  013737  001126  001164              MOV     $BDDAT,$TMP0    ;SAVE THE ACTUAL STATUS
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(2)  025234  043737  001166  001164          BIC     $TMP1,$TMPO     ;CLEAR UNWANTED BITS
(2)  025242  023737  001124  001164          CMP     $GDDAT,$TMPO    ;ARE THE EXPECTED STATUS BITS SET ?
(2)  025250  001401                           BEQ     65$             ;BR IF THEY ARE
(2)  025252  104005                           ERROR 5                 ;REPORT THE ERROR
(2)  025254  000240                  65$:     NOP
(1)
(2)                                   ;;*****************************************************************
(2)
(2)                                   ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  025256  113760  001226  000010          MOVB    PORTB,RPCS2(RO)  ;SELECT PORT B
(3)  025264  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  025272  012760  000013  000000          MOV     #13,RPCS1(RO)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                   ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  025300  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  025304  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  025312  060037  001122                  ADD     RO,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  025316  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  025324  113760  001224  000010          MOVB    PORTA,RPCS2(RO) ;SELECT PORT A.
(3)  025332  016037  000012  001170          MOV     RPDS1(RO),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  025340  013737  001170  001164          MOV     $TMP2,$TMPO     ;COPY IT INTO '$TMPO'
(3)  025346  042737  100100  001164          BIC     #ATA!VV,$TMPO   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  025354  113760  001226  000010          MOVB    PORTB,RPCS2(RO) ;SELECT PORT B.
(3)  025362  016037  000012  001172          MOV     RPDS1(RO),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  025370  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  025376  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  025404  023737  001164  001166          CMP     $TMPO,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  025412  001006                          BNE     66$             ;BR IF NOT
(3)  025414  005737  001164                  TST     $TMPO           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  025420  001045                          BNE     68$             ;BR IF NOT
(3)  025422  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  025424  000137  025610                  JMP     70$             ;BYPASS THE REST OF THE CHECKS
(3)  025430  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  025436  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  025444  113760  001226  000010          MOVB    PORTB,RPCS2(RO) ;SELECT PORT B.
(3)  025452  005737  001164                  TST     $TMPO           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  025456  001414                          BEQ     67$             ;BR IF ZERO
(3)  025460  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  025466  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  025474  113760  001224  000010          MOVB    PORTA,RPCS2(RO) ;SELECT PORT A.
(3)  025502  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  025506  001012                          BNE     68$             ;BR IF NOT
(3)  025510  012737  177777  001250  67$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  025516  012760  000011  000000          MOV     #11,RPCS1(RO)   ;CLEAR THE DRIVE
(3)  025524  012760  000013  000000          MOV     #13,RPCS1(RO)   ;RELEASE THE DRIVE
(3)  025532  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  025534  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  025542  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  025550  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  025556  001401                          BEQ     69$             ;BR IF OK FROM PORT A.
(3)  025560  104007                          ERROR   7               ;REPORT ERROR
(3)  025562  013737  001172  001126  69$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  025570  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  025576  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
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                        T20     TEST SEIZE BY RPCS1 READ THROUGH PORT 'B'                                SEQ 0089

   (3)  025604  001401                  BEQ     70$             ;BR IF OK
   (3)  025606  104007                  ERROR   7               ;REPORT ERROR
   (3)  025610  000240          70$:    NOP
   (1)  025612  000004          1$:     SCOPE                   ;LOOP ?
  8557
  8576
  8577                          ;;*****************************************************************
   (3)                          ;*TEST 21       TEST 'PORT REQUEST' FROM PORT 'A'
   (4)                          ;*
   (4)                          ;*VERIFY THAT WRITING A DRIVE REGISTER SETS 'PORT REQUEST' WHEN THE
   (4)                          ;*      DRIVE IS SEIZED BY THE OTHER PORT.
   (4)                          ;*
   (4)                          ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
   (4)                          ;*
   (4)                          ;*  B.  WRITE 0'S INTO RPDS1 FROM PORT 'A'; VERIFY THAT THE DRIVE IS STILL
   (4)                          ;*      SEIZED BY PORT 'B'.
   (4)                          ;*
   (4)                          ;*  C.  ISSUE A RELEASE COMMAND FROM PORT 'B' AND VERIFY THAT THE DRIVE
   (4)                          ;*      SWITCHED TO PORT 'A'.  VERIFY THAT THE ATTENTION BIT IS SET FOR
   (4)                          ;*      PORT 'A' AND IS NOT SET FOR PORT 'B'.
   (4)                          ;*
   (4)                          ;*  D.  ISSUE A RELEASE COMMAND THROUGH PORT 'A' AND VERIFY THAT THE DRIVE
   (4)                          ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
   (4)                          ;*
   (3)                          ;;*****************************************************************
   (2)  025614                  TST21:
   (3)  025614  005737  001274          TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  025620  001406                  BEQ     2$              ;BR IF NOT
   (3)  025622  100002                  BPL     1$              ;BR IF JUST ENTERED TEST
   (3)  025624  000137  002622          JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  025630  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  025636  112737  000021  001102  2$:     MOVB    #21,$TSTNM      ;TEST NUMBER
   (3)  025644  012737  025666  001106          MOV     #TEST21,$LPADR  ;LOAD LOOP ON TEST ADDRESS
   (3)  025652  012737  025666  001110          MOV     #TEST21,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
   (1)  025660  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
  8578  025666  012706  001100          TEST21: MOV     #STACK,SP       ;LOAD THE STACK POINTER
  8610
   (2)                                  ;CLEAR ATTENTION BITS FOR BOTH PORTS
   (2)
   (2)  025672  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
   (2)  025700  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
   (2)  025704  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  025712  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (2)  025720  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
   (2)  025726  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
   (2)  025732  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  025740  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (1)
   (2)                          ;;*****************************************************************
   (2)
   (2)                                  ;SEIZE THE DRIVE THROUGH PORT B
   (2)
   (2)  025746  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
   (2)  025754  013737  001226  001236          MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
   (2)  025762  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
   (2)  025766  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
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(2)  025774  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  026002  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;SET PORT REQUEST
(1)
(1)  026010  005060  000012                  CLR     RPDS1(R0)        ;SET PORT REQUEST FOR PORT A
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;RELEASE THROUGH PORT B.  DRIVE SHOULD SWITCH TO PORT A.
(1)
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  026014  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  026022  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  026030  012760  000013  000000          MOV     #13,RPCS1(R0)    ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                          ;VERIFY THAT DRIVE IS SEIZED BY PORT A WHEN RELEASED BY PORT B
(3)
(3)  026036  005037  001250                  CLR     RELERR           ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  026042  012737  111700  001124          MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT   ;COMPARISON CONSTANT
(3)  026050  012737  000012  001122          MOV     #RPDS1,$BDADR    ;REGISTER ADDRESS INCREMENT
(3)  026056  060037  001122                  ADD     R0,$BDADR        ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  026062  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(4)  026070  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  026076  016037  000012  001164          MOV     RPDS1(R0),$TMP0  ;READ STATUS REGISTER FROM PORT A
(4)  026104  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(4)  026112  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  026120  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT B
(3)  026126  001404                          BEQ     66$              ;BR IF STATUS FROM PORT B ZERO
(3)  026130  005737  001164                  TST     $TMP0            ;IS STATUS FROM PORT A ZERO ?
(3)  026134  001401                          BEQ     66$              ;BR IF ZERO
(3)  026136  104031                          ERROR   31               ;REPORT DRIVE IN NEUTRAL
(3)  026140  013737  001164  001126  66$:    MOV     $TMP0,$BDDAT     ;CHECK STATUS FROM PORT A
(3)  026146  013737  001224  001234          MOV     PORTA,PTNBR      ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  026154  023737  001124  001126          CMP     $GDDAT,$BDDAT    ;COMPARE WITH CONSTANT
(3)  026162  001401                          BEQ     67$              ;BR IF OK
(3)  026164  104027                          ERROR   27               ;REPORT REGISTER ERROR
(3)  026166  000240                  67$:    NOP
(2)  026170  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  026176  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  026204  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  026210  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  026216  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  026224  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  026230  005037  001124                  CLR     $GDDAT           ;WHAT REGISTER SHOULD BE
(2)  026234  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  026242  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  026250  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  026256  001414                          BEQ     68$              ;BR IF OK
(2)  026260  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  026266  042737  100000  001174          BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(2)  026274  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  026302  104016                          ERROR   16               ;TYPE MESSAGE 16
(2)  026304  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
```

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(2)  026310  000240                    68$:    NOP
(2)  026312  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  026320  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  026326  005037  001244                    CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  026332  016037  000012  001126            MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  026340  012737  000012  001122            MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  026346  060037  001122                    ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  026352  012737  100000  001124            MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  026360  013737  001126  001164            MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  026366  042737  077777  001164            BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  026374  023737  001124  001164            CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  026402  001414                            BEQ     70$              ;BR IF OK
(2)  026404  013737  001126  001174            MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  026412  042737  100000  001174            BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(2)  026420  053737  001174  001124            BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  026426  104016                            ERROR   16               ;TYPE MESSAGE 16
(2)  026430  005137  001244                    COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  026434  000240                    70$:    NOP
(1)
(2)                                    ;;*****************************************************************
(2)
(2)                                    ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  026436  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  026444  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  026452  012760  000013  000000            MOV     #13,RPCS1(R0)    ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                    ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  026460  005037  001250                    CLR     RELERR           ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  026464  012737  000012  001122            MOV     #RPDS1,$BDADR    ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  026472  060037  001122                    ADD     R0,$BDADR        ;ADD THE I/O BASE ADDRESS
(3)  026476  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  026504  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  026512  016037  000012  001170            MOV     RPDS1(R0),$TMP2  ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  026520  013737  001170  001164            MOV     $TMP2,$TMP0      ;COPY IT INTO '$TMP0'
(3)  026526  042737  100100  001164            BIC     #ATA!VV,$TMP0    ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  026534  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B.
(3)  026542  016037  000012  001172            MOV     RPDS1(R0),$TMP3  ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  026550  013737  001172  001166            MOV     $TMP3,$TMP1      ;COPY IT INTO '$TMP1'
(3)  026556  042737  100100  001166            BIC     #ATA!VV,$TMP1    ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  026564  023737  001164  001166            CMP     $TMP0,$TMP1      ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  026572  001006                            BNE     72$              ;BR IF NOT
(3)  026574  005737  001164                    TST     $TMP0            ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  026600  001045                            BNE     74$              ;BR IF NOT
(3)  026602  104046                            ERROR   46               ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  026604  000137  026770                    JMP     76$              ;BYPASS THE REST OF THE CHECKS
(3)  026610  013737  001170  001126  72$:     MOV     $TMP2,$BDDAT     ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  026616  013737  001226  001234            MOV     PORTB,PTNBR      ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  026624  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B.
(3)  026632  005737  001164                    TST     $TMP0            ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  026636  001414                            BEQ     73$              ;BR IF ZERO
(3)  026640  013737  001224  001234            MOV     PORTA,PTNBR      ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  026646  013737  001172  001126            MOV     $TMP3,$BDDAT     ;'BAD DATA' FOR ERROR TYPE OUT
(3)  026654  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  026662  005737  001166                    TST     $TMP1            ;SEE IF STATUS EQ ZERO FROM PORT B.
```

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(3)  026666  001012                        BNE     74$             ;BR IF NOT
(3)  026670  012737  177777  001250  73$:  MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  026676  012760  000011  000000        MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  026704  012760  000013  000000        MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  026712  104026                        ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  026714  013737  001170  001126  74$:  MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  026722  013737  001224  001234        MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  026730  023737  001124  001170        CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  026736  001401                        BEQ     75$             ;BR IF OK FROM PORT A.
(3)  026740  104007                        ERROR   7               ;REPORT ERROR
(3)  026742  013737  001172  001126  75$:  MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  026750  013737  001226  001234        MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  026756  023737  001124  001172        CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  026764  001401                        BEQ     76$             ;BR IF OK
(3)  026766  104007                        ERROR   7               ;REPORT ERROR
(3)  026770  000240                 76$:   NOP
(1)  026772  000004                 1$:    SCOPE                   ;LOOP ?
```

```
                        ;;*****************************************************************
                        ;*TEST 22       TEST PORT REQUEST FROM PORT 'B'
                        ;*
                        ;*VERIFY THAT WRITING A DRIVE REGISTER SETS 'PORT REQUEST' WHEN THE
                        ;*      DRIVE IS SEIZED BY THE OTHER PORT.
                        ;*
                        ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
                        ;*
                        ;*  B.  WRITE 0'S INTO RPDS1 FROM PORT 'B'; VERIFY THAT THE DRIVE IS STILL
                        ;*      SEIZED BY PORT 'A'.
                        ;*
                        ;*  C.  ISSUE A RELEASE COMMAND FROM PORT 'A' AND VERIFY THAT THE DRIVE
                        ;*      SWITCHED TO PORT 'B'.  VERIFY THAT THE ATTENTION BIT IS SET FOR
                        ;*      PORT 'B' AND IS NOT SET FOR PORT 'A'.
                        ;*
                        ;*  D.  ISSUE A RELEASE COMMAND THROUGH PORT 'B' AND VERIFY THAT THE DRIVE
                        ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
                        ;*
                        ;;*****************************************************************
026774                  TST22:
026774  005737  001274          TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
027000  001406                  BEQ     2$              ;BR IF NOT
027002  100002                  BPL     1$              ;BR IF JUST ENTERED TEST
027004  000137  002622          JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
027010  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
027016  112737  000022  001102  2$:     MOVB    #22,$TSTNM      ;TEST NUMBER
027024  012737  027046  001106          MOV     #TEST22,$LPADR  ;LOAD LOOP ON TEST ADDRESS
027032  012737  027046  001110          MOV     #TEST22,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
027040  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
027046  012706  001100          TEST22: MOV     #STACK,SP       ;LOAD THE STACK POINTER

                        ;CLEAR ATTENTION BITS FOR BOTH PORTS

027052  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
027060  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
027064  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
027072  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
027100  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
027106  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
027112  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
027120  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE

                        ;;*****************************************************************

                        ;SEIZE THE DRIVE THROUGH PORT A

027126  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
027134  013737  001224  001236          MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
027142  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
027146  013737  001226  001240          MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
027154  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
027162  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT

                        ;;*****************************************************************
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```
(1)                                     ;SET PORT REQUEST
(1)
(1)  027170  005060  000012                     CLR     RPDS1(RC)       ;SET PORT REQUEST FOR PORT B
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;RELEASE THROUGH PORT A.  DRIVE SHOULD SWITCH TO PORT B.
(1)
(2)
(2)                                             ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  027174  113760  001224  000010             MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  027202  013737  001224  001234             MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  027210  012760  000013  000000             MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                             ;VERIFY THAT DRIVE IS SEIZED BY PORT B WHEN RELEASED BY PORT A
(3)
(3)  027216  005037  001250                     CLR     RELERR          ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  027222  012737  111700  001124             MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  027230  012737  000012  001122             MOV     #RPDS1,$BDADR   ;REGISTER ADDRESS INCREMENT
(3)  027236  060037  001122                     ADD     R0,$BDADR       ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  027242  113760  001226  000010             MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(4)  027250  013737  001226  001234             MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  027256  016037  000012  001164             MOV     RPDS1(R0),$TMP0 ;READ STATUS REGISTER FROM PORT B
(4)  027264  113760  001224  000010             MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(4)  027272  013737  001224  001234             MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  027300  016037  000012  001126             MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT A
(3)  027306  001404                             BEQ     66$             ;BR IF STATUS FROM PORT A ZERO
(3)  027310  005737  001164                     TST     $TMP0           ;IS STATUS FROM PORT B ZERO ?
(3)  027314  001401                             BEQ     66$             ;BR IF ZERO
(3)  027316  104031                             ERROR   31              ;REPORT DRIVE IN NEUTRAL
(3)  027320  013737  001164  001126  66$:       MOV     $TMP0,$BDDAT    ;CHECK STATUS FROM PORT B
(3)  027326  013737  001226  001234             MOV     PORTB,PTNBR     ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  027334  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;COMPARE WITH CONSTANT
(3)  027342  001401                             BEQ     67$             ;BR IF OK
(3)  027344  104027                             ERROR   27              ;REPORT REGISTER ERROR
(3)  027346  000240                     67$:    NOP
(2)  027350  113760  001224  000010             MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  027356  013737  001224  001234             MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  027364  005037  001244                     CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  027370  016037  000012  001126             MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  027376  012737  000012  001122             MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  027404  060037  001122                     ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  027410  005037  001124                     CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  027414  013737  001126  001164             MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  027422  042737  077777  001164             BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  027430  023737  001124  001164             CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  027436  001414                             BEQ     68$             ;BR IF OK
(2)  027440  013737  001126  001174             MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  027446  042737  100000  001174             BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  027454  053737  001174  001124             BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  027462  104016                             ERROR   16              ;TYPE MESSAGE 16
(2)  027464  005137  001244                     COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  027470  000240                     68$:    NOP
(2)  027472  113760  001226  000010             MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  027500  013737  001226  001234             MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  027506  005037  001244                     CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
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(2)  027512  016037  000012  001126          MOV     RPDS1(R0),$BDDAT ;GET CONTENTS OF RPDS1
(2)  027520  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  027526  060037  001122                  ADD     R0,$BDADR      ;ADD RH11 BASE ADDRESS
(2)  027532  012737  100000  001124          MOV     #ATA,$GDDAT    ;WHAT REGISTER SHOULD BE
(2)  027540  013737  001126  001164          MOV     $BDDAT,$TMP0   ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  027546  042737  077777  001164          BIC     #^CATA,$TMP0   ;SAVE SPECIFIED BITS
(2)  027554  023737  001124  001164          CMP     $GDDAT,$TMP0   ;COMPARE THE BITS
(2)  027562  001414                          BEQ     70$            ;BR IF OK
(2)  027564  013737  001126  001174          MOV     $BDDAT,$TMP4   ;COPY 'BAD DATA'
(2)  027572  042737  100000  001174          BIC     #ATA,$TMP4     ;CLEAR THE MASKED BITS
(2)  027600  053737  001174  001124          BIS     $TMP4,$GDDAT   ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  027606  104016                          ERROR   16             ;TYPE MESSAGE 16
(2)  027610  005137  001244                  COM     CKERR          ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  027614  000240                  70$:    NOP
(1)
(2)                                       ;;*************************************************************
(2)
(2)                                       ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  027616  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  027624  013737  001226  001234          MOV     PORTB,PTNBR    ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  027632  012760  000013  000000          MOV     #13,RPCS1(R0)  ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                       ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  027640  005037  001250                  CLR     RELERR         ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  027644  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  027652  060037  001122                  ADD     R0,$BDADR      ;ADD THE I/O BASE ADDRESS
(3)  027656  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  027664  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  027672  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  027700  013737  001170  001164          MOV     $TMP2,$TMP0    ;COPY IT INTO '$TMP0'
(3)  027706  042737  100100  001164          BIC     #ATA!VV,$TMP0  ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  027714  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  027722  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  027730  013737  001172  001166          MOV     $TMP3,$TMP1    ;COPY IT INTO '$TMP1'
(3)  027736  042737  100100  001166          BIC     #ATA!VV,$TMP1  ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  027744  023737  001164  001166          CMP     $TMP0,$TMP1    ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  027752  001006                          BNE     72$            ;BR IF NOT
(3)  027754  005737  001164                  TST     $TMP0          ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  027760  001045                          BNE     74$            ;BR IF NOT
(3)  027762  104046                          ERROR   46             ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  027764  000137  030150                  JMP     76$            ;BYPASS THE REST OF THE CHECKS
(3)  027770  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT   ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  027776  013737  001226  001234          MOV     PORTB,PTNBR    ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  030004  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  030012  005737  001164                  TST     $TMP0          ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  030016  001414                          BEQ     73$            ;BR IF ZERO
(3)  030020  013737  001224  001234          MOV     PORTA,PTNBR    ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  030026  013737  001172  001126          MOV     $TMP3,$BDDAT   ;'BAD DATA' FOR ERROR TYPE OUT
(3)  030034  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  030042  005737  001166                  TST     $TMP1          ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  030046  001012                          BNE     74$            ;BR IF NOT
(3)  030050  012737  177777  001250  73$:    MOV     #-1,RELERR     ;SET 'RELEASE ERROR' INDICATOR
(3)  030056  012760  000011  000000          MOV     #11,RPCS1(R0)  ;CLEAR THE DRIVE
(3)  030064  012760  000013  000000          MOV     #13,RPCS1(R0)  ;RELEASE THE DRIVE
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   (3)  030072  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
   (3)  030074  013737  001170  001126  74$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
   (3)  030102  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
   (3)  030110  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
   (3)  030116  001401                          BEQ     75$             ;BR IF OK FROM PORT A.
   (3)  030120  104007                          ERROR   7               ;REPORT ERROR
   (3)  030122  013737  001172  001126  75$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
   (3)  030130  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
   (3)  030136  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
   (3)  030144  001401                          BEQ     76$             ;BR IF OK
   (3)  030146  104007                          ERROR   7               ;REPORT ERROR
   (3)  030150  000240                  76$:    NOP
   (1)  030152  000004                  1$:     SCOPE                   ;LOOP ?
  8634
  8650
  8651                                  ;;*******************************************************
   (3)                                  ;*TEST 23       TEST NO 'PORT REQUEST' WHEN READ RPCS1 THROUGH PORT 'A'
   (4)                                  ;*
   (4)                                  ;*VERIFY THAT READING THE CONTROL REGISTER (RPCS1) DOES NOT SET 'PORT
   (4)                                  ;*      REQUEST'.
   (4)                                  ;*
   (4)                                  ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY READING RPCS1.  VERIFY THAT
   (4)                                  ;*      THE DRIVE HAS BEEN SEIZED.
   (4)                                  ;*
   (4)                                  ;*  B.  READ THE CONTROL REGISTER FROM PORT 'A'.  VERIFY THAT 'DVA' IS NOT
   (4)                                  ;*      SET.
   (4)                                  ;*
   (4)                                  ;*  C.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
   (4)                                  ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
   (4)                                  ;*
   (3)                                  ;;*******************************************************
   (2)  030154                          TST23:
   (3)  030154  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  030160  001406                          BEQ     2$              ;BR IF NOT
   (3)  030162  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
   (3)  030164  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  030170  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  030176  112737  000023  001102  2$:     MOVB    #23,$TSTNM      ;TEST NUMBER
   (3)  030204  012737  030226  001106          MOV     #TEST23,$LPADR  ;LOAD LOOP ON TEST ADDRESS
   (3)  030212  012737  030226  001110          MOV     #TEST23,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
   (1)  030220  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8652    030226  012706  001100          TEST23: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8671
   (2)                                  ;CLEAR ATTENTION BITS FOR BOTH PORTS
   (2)
   (2)  030232  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
   (2)  030240  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
   (2)  030244  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  030252  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (2)  030260  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
   (2)  030266  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
   (2)  030272  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  030300  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (1)
   (2)                                  ;;*******************************************************
   (2)
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(2)                                         ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  030306  113760  001226  000010        MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  030314  013737  001226  001236        MOV     PORTB,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2)  030322  005760  000000                TST     RPCS1(R0)       ;READ RHCS1
(3)  030326  113760  001224  000010        MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  030334  013737  001224  001234        MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  030342  013737  001224  001240        MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  030350  016037  000012  001126        MOV     RPDS1(R0),$BDDAT  ;SEE IF DRIVE SEIZED BY PORT B
(2)  030356  010037  001122                MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2)  030362  062737  000012  001122        ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2)  030370  005037  001124                CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2)  030374  023737  001124  001126        CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2)  030402  001403                        BEQ     64$             ;BR IF IT IS
(2)  030404  104004                        ERROR   4               ;REPORT THE ERROR
(2)  030406  000137  031162                JMP     1$              ;BYPASS REST OF THE SUBTEST
(2)  030412                         64$:
(3)  030412  113760  001226  000010        MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  030420  013737  001226  001234        MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  030426  016037  000012  001126        MOV     RPDS1(R0),$BDDAT  ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  030434  012737  011700  001124        MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;EXPECTED STATUS
(2)  030442  013737  001124  001166        MOV     $GDDAT,$TMP1  ;USE GOOD DATA AS A MASK
(2)  030450  005137  001166                COM     $TMP1           ;COMPLEMENT THE EXPECTED STATUS
(2)  030454  013737  001126  001164        MOV     $BDDAT,$TMP0    ;SAVE THE ACTUAL STATUS
(2)  030462  043737  001166  001164        BIC     $TMP1,$TMP0     ;CLEAR UNWANTED BITS
(2)  030470  023737  001124  001164        CMP     $GDDAT,$TMP0    ;ARE THE EXPECTED STATUS BITS SET ?
(2)  030476  001401                        BEQ     65$             ;BR IF THEY ARE
(2)  030500  104005                        ERROR 5                 ;REPORT THE ERROR
(2)  030502  000240                 65$:    NOP
(2)  030504  113760  001224  000010        MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  030512  013737  001224  001234        MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                         ;;*****************************************************************
(1)                                         ;READ RPCS1 THROUGH PORT A - TRY TO SET PORT REQUEST
(1)
(2)  030520  005037  001244                        CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  030524  016037  000000  001126                MOV     RPCS1(R0),$BDDAT  ;GET CONTENTS OF RPCS1
(2)  030532  012737  000000  001122                MOV     #RPCS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  030540  060037  001122                        ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  030544  005037  001124                        CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  030550  013737  001126  001164                MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  030556  042737  173700  001164                BIC     #^C4077,$TMP0   ;SAVE SPECIFIED BITS
(2)  030564  023737  001124  001164                CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  030572  001414                                BEQ     66$             ;BR IF OK
(2)  030574  013737  001126  001174                MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  030602  042737  004077  001174                BIC     #4077,$TMP4     ;CLEAR THE MASKED BITS
(2)  030610  053737  001174  001124                BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  030616  104010                                ERROR   10              ;REPORT THE ERROR
(2)  030620  005137  001244                        COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  030624  000240                         66$:   NOP
(1)
(2)                                         ;;*****************************************************************
(1)                                         ;DRIVE SHOULD RETURN TO NEUTRAL
(1)
(2)
(2)                                                 ;RELEASE THE DRIVE FROM PORT B
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CZRJECO, DL CTRLR LGC   MACY11 30A(1052)  28-DEC-77  10:17  PAGE 67-5
CZRJEC.P11    21-DEC-77 14:19             T23     TEST NO 'PORT REQUEST' WHEN READ RPCS1 THROUGH PORT 'A'                SEQ 0098

    (2)
    (3)  030626  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
    (3)  030634  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
    (2)  030642  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
    (3)
    (3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
    (3)
    (3)  030650  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
    (3)  030654  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
    (3)  030662  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
    (3)  030666  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT   ;COMPARISON CONSTANT
    (3)  030674  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
    (3)  030702  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
    (3)  030710  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
    (3)  030716  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
    (3)  030724  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
    (3)  030732  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
    (3)  030740  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
    (3)  030746  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
    (3)  030754  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
    (3)  030762  001006                          BNE     68$             ;BR IF NOT
    (3)  030764  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
    (3)  030770  001045                          BNE     70$             ;BR IF NOT
    (3)  030772  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
    (3)  030774  000137  031160                  JMP     72$             ;BYPASS THE REST OF THE CHECKS
    (3)  031000  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
    (3)  031006  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
    (3)  031014  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
    (3)  031022  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
    (3)  031026  001414                          BEQ     69$             ;BR IF ZERO
    (3)  031030  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
    (3)  031036  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
    (3)  031044  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
    (3)  031052  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
    (3)  031056  001012                          BNE     70$             ;BR IF NOT
    (3)  031060  012737  177777  001250  69$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
    (3)  031066  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
    (3)  031074  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
    (3)  031102  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
    (3)  031104  013737  001170  001126  70$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
    (3)  031112  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
    (3)  031120  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
    (3)  031126  001401                          BEQ     71$             ;BR IF OK FROM PORT A.
    (3)  031130  104007                          ERROR   7               ;REPORT ERROR
    (3)  031132  013737  001172  001126  71$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
    (3)  031140  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
    (3)  031146  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
    (3)  031154  001401                          BEQ     72$             ;BR IF OK
    (3)  031156  104007                          ERROR   7               ;REPORT ERROR
    (3)  031160  000240                  72$:    NOP
    (1)  031162  000004                  1$:     SCOPE                   ;LOOP ?
8687
8688
    (3)                                          ;;*****************************************************************
    (3)                                          ;*TEST 24       TEST NO 'PORT REQUEST' WHEN READ RPCS1 THROUGH PORT 'B'
    (4)                                          ;*
    (4)                                          ;*VERIFY THAT READING THE CONTROL REGISTER (RPCS1) DOES NOT SET 'PORT
```

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(4)                                     ;*      REQUEST'.
(4)                                     ;*
(4)                                     ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY READING RPCS1.  VERIFY THAT
(4)                                     ;*      THE DRIVE HAS BEEN SEIZED.
(4)                                     ;*
(4)                                     ;*  B.  READ THE CONTROL REGISTER FROM PORT 'B'.  VERIFY THAT 'DVA' IS NOT
(4)                                     ;*      SET.
(4)                                     ;*
(4)                                     ;*  C.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
(4)                                     ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                     ;*
(3)                                     ;;*****************************************************************
(2)  031164                             T$T24:
(3)  031164  005737  001274                     TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  031170  001406                             BEQ     2$              ;BR IF NOT
(3)  031172  100002                             BPL     1$              ;BR IF JUST ENTERED TEST
(3)  031174  000137  002622                     JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  031200  012737  177777  001274  1$:       MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  031206  112737  000024  001102  2$:       MOVB    #24,$TSTNM      ;TEST NUMBER
(3)  031214  012737  031236  001106            MOV     #TEST24,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  031222  012737  031236  001110            MOV     #TEST24,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  031230  012737  007640  001176            MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8689 031236  012706  001100          TEST24:    MOV     #STACK,SP       ;LOAD THE STACK POINTER
8690
(2)                                             ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  031242  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  031250  005060  000012                     CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  031254  012760  000011  000000            MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  031262  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  031270  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  031276  005060  000012                     CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  031302  012760  000011  000000            MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  031310  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)
(2)                                     ;;*****************************************************************
(2)
(2)                                             ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  031316  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  031324  013737  001224  001236            MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  031332  005760  000000                     TST     RPCS1(R0)       ;READ RHCS1
(3)  031336  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  031344  013737  001226  001234            MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  031352  013737  001226  001240            MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  031360  016037  000012  001126            MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT A
(2)  031366  010037  001122                     MOV     R0,$BDADR       ;RH11 BASE ADDRESS
(2)  031372  062737  000012  001122            ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
(2)  031400  005037  001124                     CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
(2)  031404  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
(2)  031412  001403                             BEQ     64$             ;BR IF IT IS
(2)  031414  104004                             ERROR   4               ;REPORT THE ERROR
(2)  031416  000137  032172                     JMP     1$              ;BYPASS REST OF THE SUBTEST
(2)  031422                          64$:
(3)  031422  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(3)  031430  013737  001224  001234            MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
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(2)  031436  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  031444  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;EXPECTED STATUS
(2)  031452  013737  001124  001166          MOV     $GDDAT,$TMP1  ;USE GOOD DATA AS A MASK
(2)  031460  005137  001166                  COM     $TMP1                 ;COMPLEMENT THE EXPECTED STATUS
(2)  031464  013737  001126  001164          MOV     $BDDAT,$TMP0          ;SAVE THE ACTUAL STATUS
(2)  031472  043737  001166  001164          BIC     $TMP1,$TMP0           ;CLEAR UNWANTED BITS
(2)  031500  023737  001124  001164          CMP     $GDDAT,$TMP0          ;ARE THE EXPECTED STATUS BITS SET ?
(2)  031506  001401                          BEQ     65$                   ;BR IF THEY ARE
(2)  031510  104005                          ERROR 5                       ;REPORT THE ERROR
(2)  031512  000240                  65$:    NOP
(2)  031514  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  031522  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;READ RPCS1 THROUGH PORT B - TRY TO SET PORT REQUEST
(1)
(2)  031530  005037  001244                  CLR     CKERR                 ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  031534  016037  000000  001126          MOV     RPCS1(R0),$BDDAT  ;GET CONTENTS OF RPCS1
(2)  031542  012737  000000  001122          MOV     #RPCS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  031550  060037  001122                  ADD     R0,$BDADR             ;ADD RH11 BASE ADDRESS
(2)  031554  005037  001124                  CLR     $GDDAT                ;WHAT REGISTER SHOULD BE
(2)  031560  013737  001126  001164          MOV     $BDDAT,$TMP0          ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  031566  042737  173700  001164          BIC     #^C4077,$TMP0  ;SAVE SPECIFIED BITS
(2)  031574  023737  001124  001164          CMP     $GDDAT,$TMP0          ;COMPARE THE BITS
(2)  031602  001414                          BEQ     66$                   ;BR IF OK
(2)  031604  013737  001126  001174          MOV     $BDDAT,$TMP4          ;COPY 'BAD DATA'
(2)  031612  042737  004077  001174          BIC     #4077,$TMP4           ;CLEAR THE MASKED BITS
(2)  031620  053737  001174  001124          BIS     $TMP4,$GDDAT          ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  031626  104010                          ERROR   10                    ;REPORT THE ERROR
(2)  031630  005137  001244                  COM     CKERR                 ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  031634  000240                  66$:    NOP
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;DRIVE SHOULD RETURN TO NEUTRAL
(1)
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  031636  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  031644  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  031652  012760  000013  000000          MOV     #13,RPCS1(R0)  ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  031660  005037  001250                  CLR     RELERR                ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  031664  012737  000012  001122          MOV     #RPDS1,$BDADR         ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  031672  060037  001122                  ADD     R0,$BDADR             ;ADD THE I/O BASE ADDRESS
(3)  031676  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  031704  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  031712  016037  000012  001170          MOV     RPDS1(R0),$TMP2  ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  031720  013737  001170  001164          MOV     $TMP2,$TMP0           ;COPY IT INTO '$TMP0'
(3)  031726  042737  100100  001164          BIC     #ATA!VV,$TMP0         ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  031734  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B.
(3)  031742  016037  000012  001172          MOV     RPDS1(R0),$TMP3  ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  031750  013737  001172  001166          MOV     $TMP3,$TMP1           ;COPY IT INTO '$TMP1'
(3)  031756  042737  100100  001166          BIC     #ATA!VV,$TMP1         ;CLEAR PORT DEPENDENT BITS FROM THE COPY
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   (3)  031764  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
   (3)  031772  001006                           BNE     68$             ;BR IF NOT
   (3)  031774  005737  001164                   TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
   (3)  032000  001045                           BNE     70$             ;BR IF NOT
   (3)  032002  104046                           ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
   (3)  032004  000137  032170                   JMP     72$             ;BYPASS THE REST OF THE CHECKS
   (3)  032010  013737  001170  001126  68$:     MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
   (3)  032016  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
   (3)  032024  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
   (3)  032032  005737  001164                   TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
   (3)  032036  001414                           BEQ     69$             ;BR IF ZERO
   (3)  032040  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
   (3)  032046  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
   (3)  032054  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
   (3)  032062  005737  001166                   TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
   (3)  032066  001012                           BNE     70$             ;BR IF NOT
   (3)  032070  012737  177777  001250  69$:     MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
   (3)  032076  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
   (3)  032104  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (3)  032112  104026                           ERROR   26              ;TYPE ERROR MESSAGE 26
   (3)  032114  013737  001170  001126  70$:     MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
   (3)  032122  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
   (3)  032130  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
   (3)  032136  001401                           BEQ     71$             ;BR IF OK FROM PORT A.
   (3)  032140  104007                           ERROR   7               ;REPORT ERROR
   (3)  032142  013737  001172  001126  71$:     MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
   (3)  032150  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
   (3)  032156  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
   (3)  032164  001401                           BEQ     72$             ;BR IF OK
   (3)  032166  104007                           ERROR   7               ;REPORT ERROR
   (3)  032170  000240                   72$:    NOP
   (1)  032172  000004                   1$:     SCOPE                   ;LOOP ?
 8691
 8710
 8711
   (3)                                   ;;*****************************************************************
   (4)                                   ;*TEST 25       TEST RELEASE BY PORT 'A' WHEN SEIZED BY PORT 'B'
   (4)                                   ;*
   (4)                                   ;*VERIFY THAT A COMMAND ISSUED BY ONE PORT IS NOT RECOGNIZED IF THE DRIVE
   (4)                                   ;*      IS SEIZED BY THE OTHER PORT.
   (4)                                   ;*
   (4)                                   ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
   (4)                                   ;*
   (4)                                   ;*  B.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'.
   (4)                                   ;*
   (4)                                   ;*  C.  VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT 'B'.
   (4)                                   ;*
   (4)                                   ;*  D.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE SWITCHED
   (4)                                   ;*      TO PORT 'A'.
   (4)                                   ;*
   (4)                                   ;*  E.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE RETURNED
   (4)                                   ;*      TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
   (4)                                   ;*
   (3)                                   ;*****************************************************************
   (2)  032174                           TST25:
   (3)  032174  005737  001274                   TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  032200  001406                           BEQ     2$              ;BR IF NOT
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   (3)  032202  100002                          6PL     1$              ;BR IF JUST ENTERED TEST
   (3)  032204  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  032210  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  032216  112737  000025  001102  2$:     MOVB    #25,$TSTNM      ;TEST NUMBER
   (3)  032224  012737  032246  001106          MOV     #TEST25,$LPADR  ;LOAD LOOP ON TEST ADDRESS
   (3)  032232  012737  032246  001110          MOV     #TEST25,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
   (1)  032240  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
  8712  032246  012706  001100          TEST25: MOV     #STACK,SP       ;LOAD THE STACK POINTER
  8738
   (2)                                          ;CLEAR ATTENTION BITS FOR BOTH PORTS
   (2)
   (2)  032252  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
   (2)  032260  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
   (2)  032264  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  032272  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (2)  032300  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
   (2)  032306  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
   (2)  032312  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  032320  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (1)
   (2)                                  ;;**************************************************************
   (2)
   (2)                                          ;SEIZE THE DRIVE THROUGH PORT B
   (2)
   (2)  032326  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
   (2)  032334  013737  001226  001236          MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
   (2)  032342  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
   (3)  032346  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
   (3)  032354  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
   (2)  032362  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
   (2)  032370  016037  000012  001126          MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT B
   (2)  032376  010037  001122                  MOV     R0,$BDADR       ;RH11 BASE ADDRESS
   (2)  032402  062737  000012  001122          ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
   (2)  032410  005037  001124                  CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
   (2)  032414  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
   (2)  032422  001403                          BEQ     64$             ;BR IF IT IS
   (2)  032424  104004                          ERROR   4               ;REPORT THE ERROR
   (2)  032426  000137  033400                  JMP     1$              ;BYPASS REST OF THE SUBTEST
   (2)  032432                          64$:
   (3)  032432  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
   (3)  032440  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
   (2)  032446  016037  000012  001126          MOV     RPDS1(R0),$BDDAT ;SEE IF SEIZING PORT SEES CORRECT STATUS
   (2)  032454  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT ;EXPECTED STATUS
   (2)  032462  013737  001124  001166          MOV     $GDDAT,$TMP1    ;USE GOOD DATA AS A MASK
   (2)  032470  005137  001166                  COM     $TMP1           ;COMPLEMENT THE EXPECTED STATUS
   (2)  032474  013737  001126  001164          MOV     $BDDAT,$TMP0    ;SAVE THE ACTUAL STATUS
   (2)  032502  043737  001166  001164          BIC     $TMP1,$TMP0     ;CLEAR UNWANTED BITS
   (2)  032510  023737  001124  001164          CMP     $GDDAT,$TMP0    ;ARE THE EXPECTED STATUS BITS SET ?
   (2)  032516  001401                          BEQ     65$             ;BR IF THEY ARE
   (2)  032520  104005                          ERROR 5                 ;REPORT THE ERROR
   (2)  032522  000240                  65$:    NOP
   (1)
   (2)                                  ;;**************************************************************
   (1)                                  ;TRY TO EXECUTE A RELEASE COMMAND THROUGH PORT A
   (1)
   (2)  032524  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
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(2)  032532  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  032540  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE A RELEASE COMMAND THROUGH PORT A
(1)
(2)                                        ;;*****************************************************************
(1)                                        ;VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT B
(1)
(2)  032546  005037  001244                      CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  032552  016037  000012  001126              MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  032560  012737  000012  001122              MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  032566  060037  001122                      ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  032572  005037  001124                      CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  032576  023737  001124  001126              CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
(2)  032604  001403                              BEQ     66$             ;BR IF OK
(2)  032606  104010                              ERROR   10              ;REPORT THE ERROR
(2)  032610  005137  001244                      COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  032614  016037  000000  001126  66$:       MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RPCS1
(2)  032622  012737  000000  001122              MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
(2)  032630  060037  001122                      ADD     R0,$BDADR       ;ADDRESS BASE
(2)  032634  032737  020000  001126              BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
(2)  032642  001404                              BEQ     67$             ;BR IF NOT
(2)  032644  104011                              ERROR   11              ;REPORT THE ERROR
(2)  032646  012760  040000  000000              MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
(2)  032654  000240                      67$:    NOP
(1)  032656  005737  001244                      TST     CKERR           ;WAS RPDS1 NON ZERO ?
(1)  032662  001402                              BEQ     .+6             ;CONTENTS OF RPDS1 SEEN BY PORT A
(1)  032664  000137  033400                      JMP     1$              ;DRIVE IN NEUTRAL, BYPASS REST OF TEST
(1)
(2)                                        ;;*****************************************************************
(2)
(2)                                        ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  032670  113760  001226  000010              MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  032676  013737  001226  001234              MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  032704  012760  000013  000000              MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                        ;VERIFY THAT DRIVE IS SEIZED BY PORT A WHEN RELEASED BY PORT B
(3)
(3)  032712  005037  001250                      CLR     RELERR          ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  032716  012737  111700  001124              MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  032724  012737  000012  001122              MOV     #RPDS1,$BDADR   ;REGISTER ADDRESS INCREMENT
(3)  032732  060037  001122                      ADD     R0,$BDADR       ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  032736  113760  001224  000010              MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(4)  032744  013737  001224  001234              MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  032752  016037  000012  001164              MOV     RPDS1(R0),$TMP0 ;READ STATUS REGISTER FROM PORT A
(4)  032760  113760  001226  000010              MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(4)  032766  013737  001226  001234              MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  032774  016037  000012  001126              MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT B
(3)  033002  001404                              BEQ     68$             ;BR IF STATUS FROM PORT B ZERO
(3)  033004  005737  001164                      TST     $TMP0           ;IS STATUS FROM PORT A ZERO ?
(3)  033010  001401                              BEQ     68$             ;BR IF ZERO
(3)  033012  104031                              ERROR   31              ;REPORT DRIVE IN NEUTRAL
(3)  033014  013737  001164  001126  68$:       MOV     $TMP0,$BDDAT    ;CHECK STATUS FROM PORT A
(3)  033022  013737  001224  001234              MOV     PORTA,PTNBR     ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  033030  023737  001124  001126              CMP     $GDDAT,$BDDAT   ;COMPARE WITH CONSTANT
(3)  033036  001401                              BEQ     69$             ;BR IF OK
(3)  033040  104027                              ERROR   27              ;REPORT REGISTER ERROR
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(3)  033042  000240                  69$:    NOP
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  033044  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  033052  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  033060  012760  000013  000000          MOV     #13,RPCS1(R0)  ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  033066  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  033072  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  033100  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  033104  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT   ;COMPARISON CONSTANT
(3)  033112  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  033120  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  033126  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  033134  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  033142  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  033150  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  033156  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  033164  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  033172  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  033200  001006                          BNE     70$             ;BR IF NOT
(3)  033202  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  033206  001045                          BNE     72$             ;BR IF NOT
(3)  033210  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  033212  000137  033376                  JMP     74$             ;BYPASS THE REST OF THE CHECKS
(3)  033216  013737  001170  001126  70$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  033224  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  033232  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  033240  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  033244  001414                          BEQ     71$             ;BR IF ZERO
(3)  033246  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  033254  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  033262  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  033270  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  033274  001012                          BNE     72$             ;BR IF NOT
(3)  033276  012737  177777  001250  71$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  033304  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  033312  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  033320  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  033322  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  033330  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  033336  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  033344  001401                          BEQ     73$             ;BR IF OK FROM PORT A.
(3)  033346  104007                          ERROR   7               ;REPORT ERROR
(3)  033350  013737  001172  001126  73$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  033356  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  033364  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  033372  001401                          BEQ     74$             ;BR IF OK
(3)  033374  104007                          ERROR   7               ;REPORT ERROR
(3)  033376  000240                  74$:    NOP
(1)  033400  000004                  1$:     SCOPE                   ;LOOP ?
8757
8758                                         ;;*************************************************************
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                                        ;*TEST 26       TEST RELEASE BY PORT 'B' WHEN SEIZED BY PORT 'A'
                                        ;*
                                        ;*VERIFY THAT A COMMAND ISSUED BY ONE PORT IS NOT RECOGNIZED IF THE DRIVE
                                        ;*      IS SEIZED BY THE OTHER PORT.
                                        ;*
                                        ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
                                        ;*
                                        ;*  B.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.
                                        ;*
                                        ;*  C.  VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT 'A'.
                                        ;*
                                        ;*  D.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE SWITCHED
                                        ;*      TO PORT 'B'.
                                        ;*
                                        ;*  E.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE RETURNED
                                        ;*      TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
                                        ;*
                                        ;*****************************************************************
033402                                  TST26:
033402  005737  001274                        TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
033406  001406                                BEQ     2$              ;BR IF NOT
033410  100002                                BPL     1$              ;BR IF JUST ENTERED TEST
033412  000137  002622                        JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
033416  012737  177777  001274    1$:         MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
033424  112737  000026  001102    2$:         MOVB    #26,$TSTNM      ;TEST NUMBER
033432  012737  033454  001106                MOV     #TEST26,$LPADR  ;LOAD LOOP ON TEST ADDRESS
033440  012737  033454  001110                MOV     #TEST26,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
033446  012737  007640  001176                MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
033454  012706  001100            TEST26:     MOV     #STACK,SP       ;LOAD THE STACK POINTER

                                        ;CLEAR ATTENTION BITS FOR BOTH PORTS

033460  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
033466  005060  000012                    CLR     RPDS1(R0)       ;SEIZE THE DRIVE
033472  012760  000011  000000            MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
033500  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
033506  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
033514  005060  000012                    CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
033520  012760  000011  000000            MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
033526  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE

                                ;;*************************************************************

                                        ;SEIZE THE DRIVE THROUGH PORT A

033534  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
033542  013737  001224  001236            MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
033550  005060  000012                    CLR     RPDS1(R0)       ;WRITE RPDS1
033554  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
033562  013737  001226  001234            MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
033570  013737  001226  001240            MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
033576  016037  000012  001126            MOV     RPDS1(R0),$BDDAT ;SEE IF DRIVE SEIZED BY PORT A
033604  010037  001122                    MOV     R0,$BDADR       ;RH11 BASE ADDRESS
033610  062737  000012  001122            ADD     #RPDS1,$BDADR   ;GENERATE BAD REGISTER ADDRESS
033616  005037  001124                    CLR     $GDDAT          ;REGISTER SHOULD BE ZERO
033622  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;IS THE REGISTER ZERO
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                        T26     TEST RELEASE BY PORT 'B' WHEN SEIZED BY PORT 'A'                                SEQ 0106

(2)  033630  001403                     BEQ     64$                     ;BR IF IT IS
(2)  033632  104004                     ERROR   4                       ;REPORT THE ERROR
(2)  033634  000137  034606             JMP     1$                      ;BYPASS REST OF THE SUBTEST
(2)  033640                     64$:
(3)  033640  113760  001224  000010     MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  033646  013737  001224  001234     MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  033654  016037  000012  001126     MOV     RPDS1(R0),$BDDAT  ;SEE IF SEIZING PORT SEES CORRECT STATUS
(2)  033662  012737  011700  001124     MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;EXPECTED STATUS
(2)  033670  013737  001124  001166     MOV     $GDDAT,$TMP1  ;USE GOOD DATA AS A MASK
(2)  033676  005137  001166             COM     $TMP1                   ;COMPLEMENT THE EXPECTED STATUS
(2)  033702  013737  001126  001164     MOV     $BDDAT,$TMP0            ;SAVE THE ACTUAL STATUS
(2)  033710  043737  001166  001164     BIC     $TMP1,$TMP0             ;CLEAR UNWANTED BITS
(2)  033716  023737  001124  001164     CMP     $GDDAT,$TMP0            ;ARE THE EXPECTED STATUS BITS SET ?
(2)  033724  001401                     BEQ     65$                     ;BR IF THEY ARE
(2)  033726  104005                     ERROR 5                         ;REPORT THE ERROR
(2)  033730  000240             65$:    NOP
(1)
(2)                             ;;*****************************************************************
(1)                             ;TRY TO EXECUTE A RELEASE COMMAND THROUGH PORT B
(1)
(2)  033732  113760  001226  000010     MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  033740  013737  001226  001234     MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  033746  012760  000013  000000     MOV     #13,RPCS1(R0)   ;ISSUE A RELEASE COMMAND THROUGH PORT B
(1)
(2)                             ;;*****************************************************************
(1)                             ;VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT A
(1)
(2)  033754  005037  001244             CLR     CKERR                   ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  033760  016037  000012  001126     MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  033766  012737  000012  001122     MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  033774  060037  001122             ADD     R0,$BDADR               ;ADD RH11 BASE ADDRESS
(2)  034000  005037  001124             CLR     $GDDAT                  ;WHAT REGISTER SHOULD BE
(2)  034004  023737  001124  001126     CMP     $GDDAT,$BDDAT           ;IS THE REGISTER OK ?
(2)  034012  001403                     BEQ     66$                     ;BR IF OK
(2)  034014  104010                     ERROR   10                      ;REPORT THE ERROR
(2)  034016  005137  001244             COM     CKERR                   ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  034022  016037  000000  001126  66$:    MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
(2)  034030  012737  000000  001122     MOV     #RPCS1,$BDADR           ;FORM ADDRESS OF REGISTER
(2)  034036  060037  001122             ADD     R0,$BDADR               ;ADDRESS BASE
(2)  034042  032737  020000  001126     BIT     #MCPE,$BDDAT            ;IS 'MCPE' SET ?
(2)  034050  001404                     BEQ     67$                     ;BR IF NOT
(2)  034052  104011                     ERROR   11                      ;REPORT THE ERROR
(2)  034054  012760  040000  000000     MOV     #TRE,RPCS1(R0)          ;CLEAR 'MCPE'
(2)  034062  000240             67$:    NOP
(1)  034064  005737  001244             TST     CKERR                   ;WAS RPDS1 NON ZERO ?
(1)  034070  001402                     BEQ     .+6                     ;CONTENTS OF RPDS1 SEEN BY PORT B
(1)  034072  000137  034606             JMP     1$                      ;DRIVE IN NEUTRAL, BYPASS REST OF TEST
(1)
(2)                             ;;*****************************************************************
(2)
(2)                                     ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  034076  113760  001224  000010     MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  034104  013737  001224  001234     MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  034112  012760  000013  000000     MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
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(3)                                                 ;VERIFY THAT DRIVE IS SEIZED BY PORT B WHEN RELEASED BY PORT A
(3)
(3)   034120  005037  001250                       CLR     RELERR              ;CLEAR 'RELEASE ERROR' INDICATOR
(3)   034124  012737  111700  001124               MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)   034132  012737  000012  001122               MOV     #RPDS1,$BDADR  ;REGISTER ADDRESS INCREMENT
(3)   034140  060037  001122                       ADD     R0,$BDADR           ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)   034144  113760  001226  000010               MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(4)   034152  013737  001226  001234               MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)   034160  016037  000012  001164               MOV     RPDS1(R0),$TMP0 ;READ STATUS REGISTER FROM PORT B
(4)   034166  113760  001224  000010               MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(4)   034174  013737  001224  001234               MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)   034202  016037  000012  001126               MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT A
(3)   034210  001404                               BEQ     68$                 ;BR IF STATUS FROM PORT A ZERO
(3)   034212  005737  001164                       TST     $TMP0               ;IS STATUS FROM PORT B ZERO ?
(3)   034216  001401                               BEQ     68$                 ;BR IF ZERO
(3)   034220  104031                               ERROR   31                  ;REPORT DRIVE IN NEUTRAL
(3)   034222  013737  001164  001126  68$:        MOV     $TMP0,$BDDAT        ;CHECK STATUS FROM PORT B
(3)   034230  013737  001226  001234               MOV     PORTB,PTNBR         ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)   034236  023737  001124  001126               CMP     $GDDAT,$BDDAT       ;COMPARE WITH CONSTANT
(3)   034244  001401                               BEQ     69$                 ;BR IF OK
(3)   034246  104027                               ERROR   27                  ;REPORT REGISTER ERROR
(3)   034250  000240                       69$:    NOP
(2)
(2)                                                 ;RELEASE THE DRIVE FROM PORT B
(2)
(3)   034252  113760  001226  000010               MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)   034260  013737  001226  001234               MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)   034266  012760  000013  000000               MOV     #13,RPCS1(R0)  ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                                 ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)   034274  005037  001250                       CLR     RELERR              ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)   034300  012737  000012  001122               MOV     #RPDS1,$BDADR       ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)   034306  060037  001122                       ADD     R0,$BDADR           ;ADD THE I/O BASE ADDRESS
(3)   034312  012737  011700  001124               MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)   034320  113760  001224  000010               MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)   034326  016037  000012  001170               MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)   034334  013737  001170  001164               MOV     $TMP2,$TMP0         ;COPY IT INTO '$TMP0'
(3)   034342  042737  100100  001164               BIC     #ATA!VV,$TMP0       ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)   034350  113760  001226  000010               MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)   034356  016037  000012  001172               MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)   034364  013737  001172  001166               MOV     $TMP3,$TMP1         ;COPY IT INTO '$TMP1'
(3)   034372  042737  100100  001166               BIC     #ATA!VV,$TMP1       ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)   034400  023737  001164  001166               CMP     $TMP0,$TMP1         ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)   034406  001006                               BNE     70$                 ;BR IF NOT
(3)   034410  005737  001164                       TST     $TMP0               ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)   034414  001045                               BNE     72$                 ;BR IF NOT
(3)   034416  104046                               ERROR   46                  ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)   034420  000137  034604                       JMP     74$                 ;BYPASS THE REST OF THE CHECKS
(3)   034424  013737  001170  001126  70$:        MOV     $TMP2,$BDDAT        ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)   034432  013737  001226  001234               MOV     PORTB,PTNBR         ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)   034440  113760  001226  000010               MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)   034446  005737  001164                       TST     $TMP0               ;SEE IF STATUS EQ 0 FROM PORT A.
(3)   034452  001414                               BEQ     71$                 ;BR IF ZERO
(3)   034454  013737  001224  001234               MOV     PORTA,PTNBR         ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)   034462  013737  001172  001126               MOV     $TMP3,$BDDAT        ;'BAD DATA' FOR ERROR TYPE OUT
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  (3)  034470  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
  (3)  034476  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
  (3)  034502  001012                          BNE     72$             ;BR IF NOT
  (3)  034504  012737  177777  001250  71$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
  (3)  034512  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
  (3)  034520  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (3)  034526  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
  (3)  034530  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
  (3)  034536  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
  (3)  034544  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
  (3)  034552  001401                          BEQ     73$             ;BR IF OK FROM PORT A.
  (3)  034554  104007                          ERROR   7               ;REPORT ERROR
  (3)  034556  013737  001172  001126  73$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
  (3)  034564  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
  (3)  034572  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
  (3)  034600  001401                          BEQ     74$             ;BR IF OK
  (3)  034602  104007                          ERROR   7               ;REPORT ERROR
  (3)  034604  000240                  74$:    NOP
  (1)  034606  000004                  1$:     SCOPE                   ;LOOP ?
8761
8776
8777
  (3)                                 ;;*********************************************************************
  (4)                                 ;*TEST 27       TEST SEIZE BY WRITING ATTENTION BIT
  (4)                                 ;*
  (4)                                 ;*TEST THAT WRITING THE APPROPRIATE DRIVE BIT INTO THE ATTENTION REGISTER
  (4)                                 ;*      (RPAS) SEIZES THE DRIVE.  VERIFY THAT REQUEST IS SET FOR THE OTHER
  (4)                                 ;*      PORT.
  (4)                                 ;*
  (4)                                 ;*  A.  WRITE THE APPROPRIATE DRIVE BIT INTO RPAS; VERIFY THAT THE DRIVE
  (4)                                 ;*      IS SEIZED.
  (4)                                 ;*
  (4)                                 ;*  B.  ISSUE A RELEASE COMMAND THROUGH THE SEIZING PORT; VERIFY THAT THE
  (4)                                 ;*      DRIVE SWITCHES TO THE OPPOSITE PORT.  ISSUE A RELEASE THROUGH THE
  (4)                                 ;*      OPPOSITE PORT AND VERIFY THAT THE DRIVE IS IN NEUTRAL.
  (4)                                 ;*
  (3)                                 ;;*********************************************************************
  (2)  034610                         TST27:
  (3)  034610  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
  (3)  034614  001406                          BEQ     2$              ;BR IF NOT
  (3)  034616  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
  (3)  034620  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
  (3)  034624  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
  (3)  034632  112737  000027  001102  2$:     MOVB    #27,$TSTNM      ;TEST NUMBER
  (3)  034640  012737  034662  001106          MOV     #TEST27,$LPADR  ;LOAD LOOP ON TEST ADDRESS
  (3)  034646  012737  034662  001110          MOV     #TEST27,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
  (1)  034654  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8778   034662  012706  001100          TEST27: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8832
  (2)                                 ;CLEAR ATTENTION BITS FOR BOTH PORTS
  (2)
  (2)  034666  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
  (2)  034674  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
  (2)  034700  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
  (2)  034706  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (2)  034714  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
  (2)  034722  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
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(2)  034726  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  034734  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;SELECT DRIVE OTHER THAN THAT BEING TESTED
(1)
(1)  034742  113760  001230  000010          MOVB    PORTC,RPCS2(R0) ;SELECT DRIVE NOT BEING TESTED
(1)  034750  013737  001224  001236          MOV     PORTA,SEIZPT    ;'SEIZED' PORT ADDRESS
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;WRITE THE DRIVE'S ATTENTION BIT
(1)
(1)  034756  013760  001232  000016          MOV     ASR1,RPAS(R0)   ;WRITE THE ATTENTION BIT OF THE DRIVE BEING TESTED
(2)  034764  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  034772  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;VERIFY THAT EITHER PORT A OR PORT B HAS THE DRIVE
(1)
(1)  035000  005760  000012                  TST     RPDS1(R0)       ;SEE THE REGISTER THROUGH PORT A ?
(1)  035004  001014                          BNE     1$              ;BR IF YES
(2)  035006  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  035014  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  035022  005760  000012                  TST     RPDS1(R0)       ;SEE REGISTER THROUGH PORT B ?
(1)  035026  001021                          BNE     2$              ;BR IF YES
(1)  035030  104042                          ERROR   42              ;DRIVE NOT IN NEUTRAL OR SEIZED
(1)  035032  000137  036602                  JMP     4$              ;BYPASS REST OF TEST
(1)  035036                          1$:
(2)  035036  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  035044  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  035052  005760  000012                  TST     RPDS1(R0)       ;REGISTER SHOULD BE ZERO THROUGH PORT B
(1)  035056  001002                          BNE     .+6             ;BR IF STATUS REG IS NOT ZERO
(1)  035060  000137  035732                  JMP     3$              ;STATUS REG IS ZERO
(1)  035064  104043                          ERROR   43              ;DRIVE IN NEUTRAL AFTER WRITE ATTN BIT
(1)  035066  000137  036602                  JMP     4$ .            ;BYPASS REST OF TEST
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;PORT B HAS THE DRIVE.  VERIFY THAT PORT A HAS PORT REQUEST SET
(1)
(1)  035072                          2$:
(2)  035072  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  035076  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  035104  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  035112  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  035116  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  035124  013737  001126  001164          MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  035132  042737  106077  001164          BIC     #^C71700,$TMP0  ;SAVE SPECIFIED BITS
(2)  035140  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  035146  001414                          BEQ     64$             ;BR IF OK
(2)  035150  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  035156  042737  071700  001174          BIC     #71700,$TMP4    ;CLEAR THE MASKED BITS
(2)  035164  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  035172  104010                          ERROR   10              ;REPORT THE ERROR
(2)  035174  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  035200  000240                  64$:    NOP
(1)  035202  013737  001226  001236          MOV     PORTB,SEIZPT    ;ADDRESS FOR ERROR MESSAGE
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(1)  035210  013737  001224  001240          MOV     PORTA,OPPRT     ;SAME AS ABOVE
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  035216  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  035224  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  035232  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                          ;VERIFY THAT DRIVE IS SEIZED BY PORT A WHEN RELEASED BY PORT B
(3)
(3)  035240  005037  001250                  CLR     RELERR          ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  035244  012737  111700  001124          MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  035252  012737  000012  001122          MOV     #RPDS1,$BDADR  ;REGISTER ADDRESS INCREMENT
(3)  035260  060037  001122                  ADD     R0,$BDADR       ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  035264  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(4)  035272  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  035300  016037  000012  001164          MOV     RPDS1(R0),$TMP0 ;READ STATUS REGISTER FROM PORT A
(4)  035306  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(4)  035314  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  035322  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT B
(3)  035330  001404                          BEQ     66$             ;BR IF STATUS FROM PORT B ZERO
(3)  035332  005737  001164                  TST     $TMP0           ;IS STATUS FROM PORT A ZERO ?
(3)  035336  001401                          BEQ     66$             ;BR IF ZERO
(3)  035340  104044                          ERROR   44              ;REPORT DRIVE NOT SEIZED BY PORT A
(3)  035342  013737  001164  001126  66$:    MOV     $TMP0,$BDDAT    ;CHECK STATUS FROM PORT A
(3)  035350  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  035356  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;COMPARE WITH CONSTANT
(3)  035364  001401                          BEQ     67$             ;BR IF OK
(3)  035366  104027                          ERROR   27              ;REPORT REGISTER ERROR
(3)  035370  000240                  67$:    NOP
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  035372  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  035400  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  035406  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  035414  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  035420  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  035426  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  035432  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  035440  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  035446  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  035454  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  035462  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  035470  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  035476  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  035504  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  035512  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  035520  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  035526  001006                          BNE     68$             ;BR IF NOT
(3)  035530  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  035534  001045                          BNE     70$             ;BR IF NOT
(3)  035536  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
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(3)  035540  000137  035724                    JMP     72$                ;BYPASS THE REST OF THE CHECKS
(3)  035544  013737  001170  001126  68$:     MOV     $TMP2,$BDDAT       ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  035552  013737  001226  001234           MOV     PORTB,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  035560  113760  001226  000010           MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  035566  005737  001164                    TST     $TMP0              ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  035572  001414                            BEQ     69$                ;BR IF ZERO
(3)  035574  013737  001224  001234           MOV     PORTA,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  035602  013737  001172  001126           MOV     $TMP3,$BDDAT       ;'BAD DATA' FOR ERROR TYPE OUT
(3)  035610  113760  001224  000010           MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  035616  005737  001166                    TST     $TMP1              ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  035622  001012                            BNE     70$                ;BR IF NOT
(3)  035624  012737  177777  001250  69$:     MOV     #-1,RELERR         ;SET 'RELEASE ERROR' INDICATOR
(3)  035632  012760  000011  000000           MOV     #11,RPCS1(R0)      ;CLEAR THE DRIVE
(3)  035640  012760  000013  000000           MOV     #13,RPCS1(R0)      ;RELEASE THE DRIVE
(3)  035646  104026                            ERROR   26                 ;TYPE ERROR MESSAGE 26
(3)  035650  013737  001170  001126  70$:     MOV     $TMP2,$BDDAT       ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  035656  013737  001224  001234           MOV     PORTA,PTNBR        ;CHANGE PORT NUMBER
(3)  035664  023737  001124  001170           CMP     $GDDAT,$TMP2       ;ALL BITS OK ?
(3)  035672  001401                            BEQ     71$                ;BR IF OK FROM PORT A.
(3)  035674  104007                            ERROR   7                  ;REPORT ERROR
(3)  035676  013737  001172  001126  71$:     MOV     $TMP3,$BDDAT       ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  035704  013737  001226  001234           MOV     PORTB,PTNBR        ;CHANGE PORT NUMBER
(3)  035712  023737  001124  001172           CMP     $GDDAT,$TMP3       ;SEE IF READ OK FROM PORT B.
(3)  035720  001401                            BEQ     72$                ;BR IF OK
(3)  035722  104007                            ERROR   7                  ;REPORT ERROR
(3)  035724  000240                    72$:    NOP
(1)  035726  000137  036602                    JMP     4$
(1)
(2)                                            ;*****************************************************************
(1)                                            ;THE DRIVE IS SEIZED BY PORT A.  VERIFY THAT PORT B HAS PORT REQUEST SET
(1)
(1)  035732                            3$:
(2)  035732  113760  001224  000010           MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A
(2)  035740  013737  001224  001234           MOV     PORTA,PTNBR        ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  035746  005037  001244                    CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  035752  016037  000012  001126           MOV     RPDS1(R0),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  035760  012737  000012  001122           MOV     #RPDS1,$BDADR      ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  035766  060037  001122                    ADD     R0,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  035772  012737  011700  001124           MOV     #MOL!PGM!DPR!DRV,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  036000  013737  001126  001164           MOV     $BDDAT,$TMP0       ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  036006  042737  106077  001164           BIC     #^C71700,$TMP0     ;SAVE SPECIFIED BITS
(2)  036014  023737  001124  001164           CMP     $GDDAT,$TMP0       ;COMPARE THE BITS
(2)  036022  001414                            BEQ     73$                ;BR IF OK
(2)  036024  013737  001126  001174           MOV     $BDDAT,$TMP4       ;COPY 'BAD DATA'
(2)  036032  042737  071700  001174           BIC     #71700,$TMP4       ;CLEAR THE MASKED BITS
(2)  036040  053737  001174  001124           BIS     $TMP4,$GDDAT       ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  036046  104010                            ERROR   10                 ;REPORT THE ERROR
(2)  036050  005137  001244                    COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  036054  000240                    73$:    NOP
(1)  036056  013737  001224  001236           MOV     PORTA,SEIZPT       ;ADDRESS FOR ERROR MESSAGE
(1)  036064  013737  001226  001240           MOV     PORTB,OPPRT        ;SAME AS ABOVE
(2)
(2)                                            ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  036072  113760  001224  000010           MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A
(3)  036100  013737  001224  001234           MOV     PORTA,PTNBR        ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
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(2)  036106  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                           ;VERIFY THAT DRIVE IS SEIZED BY PORT B WHEN RELEASED BY PORT A
(3)
(3)  036114  005037  001250                  CLR     RELERR          ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  036120  012737  111700  001124          MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  036126  012737  000012  001122          MOV     #RPDS1,$BDADR   ;REGISTER ADDRESS INCREMENT
(3)  036134  060037  001122                  ADD     R0,$BDADR       ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  036140  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(4)  036146  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  036154  016037  000012  001164          MOV     RPDS1(R0),$TMP0 ;READ STATUS REGISTER FROM PORT B
(4)  036162  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(4)  036170  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  036176  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT A
(3)  036204  001404                          BEQ     75$             ;BR IF STATUS FROM PORT A ZERO
(3)  036206  005737  001164                  TST     $TMP0           ;IS STATUS FROM PORT B ZERO ?
(3)  036212  001401                          BEQ     75$             ;BR IF ZERO
(3)  036214  104044                          ERROR   44              ;REPORT DRIVE NOT SEIZED BY PORT B
(3)  036216  013737  001164  001126  75$:    MOV     $TMP0,$BDDAT    ;CHECK STATUS FROM PORT B
(3)  036224  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  036232  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;COMPARE WITH CONSTANT
(3)  036240  001401                          BEQ     76$             ;BR IF OK
(3)  036242  104027                          ERROR   27              ;REPORT REGISTER ERROR
(3)  036244  000240                  76$:    NOP
(2)
(2)                                           ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  036246  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  036254  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  036262  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                           ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  036270  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  036274  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  036302  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  036306  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  036314  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  036322  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  036330  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  036336  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  036344  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  036352  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  036360  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  036366  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  036374  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  036402  001006                          BNE     77$             ;BR IF NOT
(3)  036404  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  036410  001045                          BNE     79$             ;BR IF NOT
(3)  036412  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  036414  000137  036600                  JMP     81$             ;BYPASS THE REST OF THE CHECKS
(3)  036420  013737  001170  001126  77$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  036426  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  036434  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  036442  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  036446  001414                          BEQ     78$             ;BR IF ZERO
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  (3)  036450  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
  (3)  036456  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
  (3)  036464  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
  (3)  036472  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
  (3)  036476  001012                          BNE     79$             ;BR IF NOT
  (3)  036500  012737  177777  001250  78$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
  (3)  036506  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
  (3)  036514  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (3)  036522  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
  (3)  036524  013737  001170  001126  79$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
  (3)  036532  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
  (3)  036540  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
  (3)  036546  001401                          BEQ     80$             ;BR IF OK FROM PORT A.
  (3)  036550  104007                          ERROR   7               ;REPORT ERROR
  (3)  036552  013737  001172  001126  80$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
  (3)  036560  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
  (3)  036566  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
  (3)  036574  001401                          BEQ     81$             ;BR IF OK
  (3)  036576  104007                          ERROR   7               ;REPORT ERROR
  (3)  036600  000240                  81$:    NOP
  (1)  036602  000004                  4$:     SCOPE                   ;LOOP ?
 8833
 8845
 8846                                  ;*****************************************************************
  (3)                                  ;*TEST 30       TEST NO SEIZE WHEN '0' WRITTEN INTO ATTENTION BIT
  (4)                                  ;*
  (4)                                  ;*VERIFY THAT THE DRIVE IS NOT SEIZED WHEN A 'ZERO' IS WRITTEN INTO
  (4)                                  ;*      THE DRIVE'S ATTENTION BIT.
  (4)                                  ;*
  (4)                                  ;*  A.  SELECT A DRIVE NOT BEING TESTED AND WRITE ALL BITS, EXCEPT THE
  (4)                                  ;*      BIT OF THE DRIVE BEING TESTED, INTO THE ATTENTION REGISTER.
  (4)                                  ;*
  (4)                                  ;*  B.  VERIFY THAT THE DRIVE IS STILL IN NEUTRAL.
  (4)                                  ;*
  (3)                                  ;*****************************************************************
  (2)  036604                          TST30:
  (3)  036604  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
  (3)  036610  001406                          BEQ     2$              ;BR IF NOT
  (3)  036612  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
  (3)  036614  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
  (3)  036620  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
  (3)  036626  112737  000030  001102  2$:     MOVB    #30,$TSTNM      ;TEST NUMBER
  (3)  036634  012737  036656  001106          MOV     #TEST30,$LPADR  ;LOAD LOOP ON TEST ADDRESS
  (3)  036642  012737  036656  001110          MOV     #TEST30,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
  (1)  036650  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
 8847  036656  012706  001100          TEST30: MOV     #STACK,SP       ;LOAD THE STACK POINTER
 8865
  (2)                                  ;CLEAR ATTENTION BITS FOR BOTH PORTS
  (2)
  (2)  036662  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
  (2)  036670  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
  (2)  036674  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
  (2)  036702  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (2)  036710  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
  (2)  036716  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
  (2)  036722  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
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(2)  036730  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)  036736  113760  001230  000010          MOVB    PORTC,RPCS2(R0) ;SELECT DRIVE NOT BEING TESTED
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;WRITE ALL ATTENTION BITS EXCEPT BIT FOR DRIVE UNDER TEST
(1)
(1)  036744  013737  001232  001164          MOV     ASR1,$TMP0      ;STORE ATTN BIT FOR PORT A
(1)  036752  005137  001164                  COM     $TMP0           ;COMPLEMENT IT
(1)  036756  013760  001164  000016          MOV     $TMP0,RPAS(R0)  ;WRITE THE ATTN REGISTER
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;VERIFY THAT DRIVE REMAINDED IN NEUTRAL
(1)
(2)
(2)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  036764  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  036770  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  036776  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  037002  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(2)  037010  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  037016  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  037024  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  037032  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  037040  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  037046  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  037054  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  037062  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  037070  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  037076  001006                          BNE     64$             ;BR IF NOT
(2)  037100  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  037104  001045                          BNE     66$             ;BR IF NOT
(2)  037106  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  037110  000137  037274                  JMP     68$             ;BYPASS THE REST OF THE CHECKS
(2)  037114  013737  001170  001126  64$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  037122  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  037130  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  037136  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  037142  001414                          BEQ     65$             ;BR IF ZERO
(2)  037144  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  037152  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(2)  037160  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  037166  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  037172  001012                          BNE     66$             ;BR IF NOT
(2)  037174  012737  177777  001250  65$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(2)  037202  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(2)  037210  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  037216  104021                          ERROR   21              ;TYPE ERROR MESSAGE 21
(2)  037220  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  037226  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(2)  037234  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  037242  001401                          BEQ     67$             ;BR IF OK FROM PORT A.
(2)  037244  104007                          ERROR   7               ;REPORT ERROR
(2)  037246  013737  001172  001126  67$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  037254  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  037262  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
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(2)  037270  001401                        BEQ     68$             ;BR IF OK
(2)  037272  104007                        ERROR   7               ;REPORT ERROR
(2)  037274  000240                68$:    NOP
(1)  037276  000004                        SCOPE                   ;LOOP ?
8866
8880
8881                                ;;*****************************************************************
(3)                                 ;*TEST 31        TEST PORT 'A' TIMEOUT DOES NOT RESET DRIVE
(4)                                 ;*
(4)                                 ;*VERIFY THAT PORT TIMEOUT DOES NOT INITIALIZE THE DRIVE.
(4)                                 ;*
(4)                                 ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(4)                                 ;*
(4)                                 ;*  B.  WRITE 1'S INTO RPER1 THROUGH PORT 'A'.
(4)                                 ;*
(4)                                 ;*  C.  WAIT FOR THE DRIVE TO TIMEOUT.  VERIFY THAT THE DRIVE RETURNED TO
(4)                                 ;*      NEUTRAL; THAT ATTENTION IS SET FOR PORT 'A' AND IS NOT SET FOR
(4)                                 ;*      PORT 'B'; AND THAT BOTH PORTS SEE 1'S IN THE ERROR REGISTER.
(4)                                 ;*
(3)                                 ;;*****************************************************************
(2)  037300                         TST31:
(3)  037300  005737  001274                 TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  037304  001406                         BEQ     2$              ;BR IF NOT
(3)  037306  100002                         BPL     1$              ;BR IF JUST ENTERED TEST
(3)  037310  000137  002622                 JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  037314  012737  177777  001274  1$:    MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  037322  112737  000031  001102  2$:    MOVB    #31,$TSTNM      ;TEST NUMBER
(3)  037330  012737  037352  001106         MOV     #TEST31,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  037336  012737  037352  001110         MOV     #TEST31,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  037344  012737  000004  001176         MOV     #4,$TIMES       ;;DO 4 ITERATIONS
8882 037352  012706  001100         TEST31: MOV     #STACK,SP       ;LOAD THE STACK POINTER
8938
(2)                                 ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  037356  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  037364  005060  000012                 CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  037370  012760  000011  000000         MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  037376  012760  000013  000000         MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  037404  113760  001226  000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  037412  005060  000012                 CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  037416  012760  000011  000000         MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  037424  012760  000013  000000         MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)                                 ;;*****************************************************************
(2)
(2)                                 ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  037432  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  037440  013737  001224  001236         MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  037446  005060  000012                 CLR     RPDS1(R0)       ;WRITE RPDS1
(2)  037452  013737  001226  001240         MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                 ;;*****************************************************************
(1)                                 ;FORCE AN ERROR
(1)
(1)  037460  012760  177777  000014         MOV     #-1,RPER1(R0)   ;SET ERROR BITS
(2)
```

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(3)                                     ;;*****************************************************************
(2)                                     ;START THE TIMER
(2)
(2)  037466  005037  001252                     CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  037472  012737  003720  001254             MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(2)  037500  113760  001226  000010             MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  037506  013737  001226  001234             MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;WAIT FOR DRIVE TO TIMEOUT
(1)
(1)  037514  005760  000012             1$:     TST     RPDS1(R0)       ;WAIT FOR THE DRIVE TO BE RELEASED
(1)  037520  001004                             BNE     2$              ;BR IF DRIVE RELEASED
(1)  037522  005737  001254                     TST     WATCH           ;WATCH AT ZERO ?
(1)  037526  001372                             BNE     1$              ;BR IF NOT
(1)  037530  104036                             ERROR   36              ;DRIVE NOT RELEASED WITHIN 2 SECONDS
(1)  037532                             2$:
(2)  037532  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  037540  013737  001224  001234             MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;THE ERROR BIT ('ERR') IN RPDS1 SHOULD STILL BE SET
(1)
(2)  037546  005037  001244                     CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  037552  016037  000012  001126             MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  037560  012737  000012  001122             MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  037566  060037  001122                     ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  037572  012737  040000  001124             MOV     #ERR,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  037600  013737  001126  001164             MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  037606  042737  137777  001164             BIC     #^C40000,$TMP0  ;SAVE SPECIFIED BITS
(2)  037614  023737  001124  001164             CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  037622  001414                             BEQ     66$             ;BR IF OK
(2)  037624  013737  001126  001174             MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  037632  042737  040000  001174             BIC     #40000,$TMP4    ;CLEAR THE MASKED BITS
(2)  037640  053737  001174  001124             BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  037646  104023                             ERROR   23              ;TYPE MESSAGE 23
(2)  037650  005137  001244                     COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  037654  000240                     66$:    NOP
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;THE ERROR REGISTER SHOULD CONTAIN 1'S
(1)
(2)  037656  005037  001244                     CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  037662  016037  000014  001126             MOV     RPER1(R0),$BDDAT  ;GET CONTENTS OF RPER1
(2)  037670  012737  000014  001122             MOV     #RPER1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  037676  060037  001122                     ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  037702  012737  177777  001124             MOV     #177777,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  037710  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
(2)  037716  001403                             BEQ     68$             ;BR IF OK
(2)  037720  104010                             ERROR   10              ;REPORT THE ERROR
(2)  037722  005137  001244                     COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  037726  000240                     68$:    NOP
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;THE ATTENTION BIT FOR PORT A SHOULD STILL BE SET
(1)
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(2)  037730  005037  001244                    CLR     CKERR                ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  037734  016037  000012  001126            MOV     RPDS1(R0),$BDDAT     ;GET CONTENTS OF RPDS1
(2)  037742  012737  000012  001122            MOV     #RPDS1,$BDADR        ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  037750  060037  001122                    ADD     R0,$BDADR            ;ADD RH11 BASE ADDRESS
(2)  037754  012737  100000  001124            MOV     #ATA,$GDDAT          ;WHAT REGISTER SHOULD BE
(2)  037762  013737  001126  001164            MOV     $BDDAT,$TMP0         ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  037770  042737  077777  001164            BIC     #^CATA,$TMP0         ;SAVE SPECIFIED BITS
(2)  037776  023737  001124  001164            CMP     $GDDAT,$TMP0         ;COMPARE THE BITS
(2)  040004  001414                            BEQ     70$                  ;BR IF OK
(2)  040006  013737  001126  001174            MOV     $BDDAT,$TMP4         ;COPY 'BAD DATA'
(2)  040014  042737  100000  001174            BIC     #ATA,$TMP4           ;CLEAR THE MASKED BITS
(2)  040022  053737  001174  001124            BIS     $TMP4,$GDDAT         ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  040030  104041                            ERROR   41                   ;TYPE MESSAGE 41
(2)  040032  005137  001244                    COM     CKERR                ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  040036  000240                    70$:    NOP
(1)
(1)
(2)                                    ;;*****************************************************************
(2)
(2)                                    ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  040040  005037  001250                    CLR     RELERR               ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  040044  012737  000012  001122            MOV     #RPDS1,$BDADR        ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  040052  060037  001122                    ADD     R0,$BDADR            ;ADD THE I/O BASE ADDRESS
(2)  040056  012737  051700  001124            MOV     #51700,$GDDAT        ;COMPARSION CONSTANT
(2)  040064  113760  001224  000010            MOVB    PORTA,RPCS2(R0)      ;SELECT PORT A.
(2)  040072  016037  000012  001170            MOV     RPDS1(R0),$TMP2      ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  040100  013737  001170  001164            MOV     $TMP2,$TMP0          ;COPY IT INTO '$TMP0'
(2)  040106  042737  100100  001164            BIC     #ATA!VV,$TMP0        ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  040114  113760  001226  000010            MOVB    PORTB,RPCS2(R0)      ;SELECT PORT B.
(2)  040122  016037  000012  001172            MOV     RPDS1(R0),$TMP3      ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  040130  013737  001172  001166            MOV     $TMP3,$TMP1          ;COPY IT INTO '$TMP1'
(2)  040136  042737  100100  001166            BIC     #ATA!VV,$TMP1        ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  040144  023737  001164  001166            CMP     $TMP0,$TMP1          ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  040152  001006                            BNE     72$                  ;BR IF NOT
(2)  040154  005737  001164                    TST     $TMP0                ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  040160  001045                            BNE     74$                  ;BR IF NOT
(2)  040162  104046                            ERROR   46                   ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  040164  000137  040364                    JMP     76$                  ;BYPASS THE REST OF THE CHECKS
(2)  040170  013737  001170  001126    72$:    MOV     $TMP2,$BDDAT         ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  040176  013737  001226  001234            MOV     PORTB,PTNBR          ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  040204  113760  001226  000010            MOVB    PORTB,RPCS2(R0)      ;SELECT PORT B.
(2)  040212  005737  001164                    TST     $TMP0                ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  040216  001414                            BEQ     73$                  ;BR IF ZERO
(2)  040220  013737  001224  001234            MOV     PORTA,PTNBR          ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  040226  013737  001172  001126            MOV     $TMP3,$BDDAT         ;'BAD DATA' FOR ERROR TYPE OUT
(2)  040234  113760  001224  000010            MOVB    PORTA,RPCS2(R0)      ;SELECT PORT A.
(2)  040242  005737  001166                    TST     $TMP1                ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  040246  001012                            BNE     74$                  ;BR IF NOT
(2)  040250  012737  177777  001250    73$:    MOV     #-1,RELERR           ;SET 'RELEASE ERROR' INDICATOR
(2)  040256  012760  000011  000000            MOV     #11,RPCS1(R0)        ;CLEAR THE DRIVE
(2)  040264  012760  000013  000000            MOV     #13,RPCS1(R0)        ;RELEASE THE DRIVE
(2)  040272  104026                            ERROR   26                   ;TYPE ERROR MESSAGE 26
(2)  040274  013737  001170  001126    74$:    MOV     $TMP2,$BDDAT         ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  040302  013737  001224  001234            MOV     PORTA,PTNBR          ;CHANGE PORT NUMBER
(2)  040310  042737  100000  001170            BIC     #ATA,$TMP2           ;DON'T CHECK THE ATTN BIT
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(2)  040316  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  040324  001401                          BEQ     75$             ;BR IF OK FROM PORT A.
(2)  040326  104007                          ERROR   7               ;REPORT ERROR
(2)  040330  013737  001172  001126  75$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  040336  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  040344  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(2)  040352  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(2)  040360  001401                          BEQ     76$             ;BR IF OK
(2)  040362  104007                          ERROR   7               ;REPORT ERROR
(2)  040364  000240                  76$:    NOP
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;THE ATTENTION BIT FOR PORT B SHOULD NOT BE SET
(1)
(2)  040366  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  040374  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  040402  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  040406  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  040414  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  040422  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  040426  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  040432  013737  001126  001164          MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  040440  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  040446  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  040454  001414                          BEQ     77$             ;BR IF OK
(2)  040456  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  040464  042737  100000  001174          BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  040472  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  040500  104052                          ERROR   52              ;TYPE MESSAGE 52
(2)  040502  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  040506  000240                  77$:    NOP
(2)
(2)                                          ;CLEAR ATTENTION BIT FOR PORT A
(2)
(2)  040510  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT #A
(2)  040516  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  040522  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  040530  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)  040536  000004                  3$:     SCOPE                   ;LOOP ?
8952
8953                                         ;;*****************************************************************
(3)                                          ;*TEST 32       TEST PORT 'B' TIMEOUT DOES NOT RESET DRIVE
(4)                                          ;*
(4)                                          ;*VERIFY THAT PORT TIMEOUT DOES NOT INITIALIZE THE DRIVE.
(4)                                          ;*
(4)                                          ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                                          ;*
(4)                                          ;*  B.  WRITE 1'S INTO RPER1 THROUGH PORT 'B'.
(4)                                          ;*
(4)                                          ;*  C.  WAIT FOR THE DRIVE TO TIMEOUT.  VERIFY THAT THE DRIVE RETURNED TO
(4)                                          ;*      NEUTRAL; THAT ATTENTION IS SET FOR PORT 'B' AND IS NOT SET FOR
(4)                                          ;*      PORT 'A'; AND THAT BOTH PORTS SEE 1'S IN THE ERROR REGISTER.
(4)                                          ;*
(3)                                          ;;*****************************************************************
(2)  040540                          TST32:
(3)  040540  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
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(3)  040544  001406                          BEQ     2$                ;BR IF NOT
(3)  040546  100002                          BPL     1$                ;BR IF JUST ENTERED TEST
(3)  040550  000137  002622                  JMP     EXEC              ;RETURN & GET NEXT TEST NUMBER
(3)  040554  012737  177777  001274  1$:     MOV     #-1,KYBCTL        ;SET SINGLE TEST INDICATOR
(3)  040562  112737  000032  001102  2$:     MOVB    #32,$TSTNM        ;TEST NUMBER
(3)  040570  012737  040612  001106          MOV     #TEST32,$LPADR    ;LOAD LOOP ON TEST ADDRESS
(3)  040576  012737  040612  001110          MOV     #TEST32,$LPERR    ;LOAD LOOP ON ERROR ADDRESS
(1)  040604  012737  000004  001176          MOV     #4,$TIMES         ;;DO 4 ITERATIONS
8954 040612  012706  001100          TEST32: MOV     #STACK,SP         ;LOAD THE STACK POINTER
8955
(2)                                          ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  040616  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  040624  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  040630  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  040636  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  040644  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  040652  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  040656  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  040664  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)                                      ;;**************************************************************
(2)
(2)                                          ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  040672  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  040700  013737  001226  001236          MOV     PORTB,SEIZPT  ;STORE SEIZING PORT'S ADDRESS
(2)  040706  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(2)  040712  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                      ;;**************************************************************
(1)                                      ;FORCE AN ERROR
(1)
(1)  040720  012760  177777  000014          MOV     #-1,RPER1(R0)   ;SET ERROR BITS
(2)
(3)                                      ;;**************************************************************
(2)                                      ;START THE TIMER
(2)
(2)  040726  005037  001252                  CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  040732  012737  003720  001254          MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(2)  040740  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  040746  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                      ;;**************************************************************
(1)                                      ;WAIT FOR DRIVE TO TIMEOUT
(1)
(1)  040754  005760  000012          1$:     TST     RPDS1(R0)       ;WAIT FOR THE DRIVE TO BE RELEASED
(1)  040760  001004                          BNE     2$              ;BR IF DRIVE RELEASED
(1)  040762  005737  001254                  TST     WATCH           ;WATCH AT ZERO ?
(1)  040766  001372                          BNE     1$              ;BR IF NOT
(1)  040770  104036                          ERROR   36              ;DRIVE NOT RELEASED WITHIN 2 SECONDS
(1)  040772                          2$:
(2)  040772  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  041000  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                      ;;**************************************************************
(1)                                      ;THE ERROR BIT ('ERR') IN RPDS1 SHOULD STILL BE SET
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(1)
(2)  041006  005037  001244                    CLR     CKERR             ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  041012  016037  000012  001126            MOV     RPDS1(RC),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  041020  012737  000012  001122            MOV     #RPDS1,$BDADR     ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  041026  060037  001122                    ADD     RC,$BDADR         ;ADD RH11 BASE ADDRESS
(2)  041032  012737  040000  001124            MOV     #ERR,$GDDAT       ;WHAT REGISTER SHOULD BE
(2)  041040  013737  001126  001164            MOV     $BDDAT,$TMPC      ;MOVE REGISTER CONTENTS TO '$TMPC'
(2)  041046  042737  137777  001164            BIC     #^C40000,$TMPC    ;SAVE SPECIFIED BITS
(2)  041054  023737  001124  001164            CMP     $GDDAT,$TMPC      ;COMPARE THE BITS
(2)  041062  001414                            BEQ     66$               ;BR IF OK
(2)  041064  013737  001126  001174            MOV     $BDDAT,$TMP4      ;COPY 'BAD DATA'
(2)  041072  042737  040000  001174            BIC     #40000,$TMP4      ;CLEAR THE MASKED BITS
(2)  041100  053737  001174  001124            BIS     $TMP4,$GDDAT      ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  041106  104023                            ERROR   23                ;TYPE MESSAGE 23
(2)  041110  005137  001244                    COM     CKERR             ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  041114  000240                    66$:    NOP
(1)
(2)                                            ;;*****************************************************************
(1)                                            ;THE ERROR REGISTER SHOULD CONTAIN 1'S
(1)
(2)  041116  005037  001244                    CLR     CKERR             ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  041122  016037  000014  001126            MOV     RPER1(RC),$BDDAT  ;GET CONTENTS OF RPER1
(2)  041130  012737  000014  001122            MOV     #RPER1,$BDADR     ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  041136  060037  001122                    ADD     RC,$BDADR         ;ADD RH11 BASE ADDRESS
(2)  041142  012737  177777  001124            MOV     #177777,$GDDAT    ;WHAT REGISTER SHOULD BE
(2)  041150  023737  001124  001126            CMP     $GDDAT,$BDDAT     ;IS THE REGISTER OK ?
(2)  041156  001403                            BEQ     68$               ;BR IF OK
(2)  041160  104010                            ERROR   10                ;REPORT THE ERROR
(2)  041162  005137  001244                    COM     CKERR             ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  041166  000240                    68$:    NOP
(1)
(2)                                            ;;*****************************************************************
(1)                                            ;THE ATTENTION BIT FOR PORT B SHOULD STILL BE SET
(1)
(2)  041170  005037  001244                    CLR     CKERR             ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  041174  016037  000012  001126            MOV     RPDS1(RC),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  041202  012737  000012  001122            MOV     #RPDS1,$BDADR     ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  041210  060037  001122                    ADD     RC,$BDADR         ;ADD RH11 BASE ADDRESS
(2)  041214  012737  100000  001124            MOV     #ATA,$GDDAT       ;WHAT REGISTER SHOULD BE
(2)  041222  013737  001126  001164            MOV     $BDDAT,$TMPC      ;MOVE REGISTER CONTENTS TO '$TMPC'
(2)  041230  042737  077777  001164            BIC     #^CATA,$TMPC      ;SAVE SPECIFIED BITS
(2)  041236  023737  001124  001164            CMP     $GDDAT,$TMPC      ;COMPARE THE BITS
(2)  041244  001414                            BEQ     70$               ;BR IF OK
(2)  041246  013737  001126  001174            MOV     $BDDAT,$TMP4      ;COPY 'BAD DATA'
(2)  041254  042737  100000  001174            BIC     #ATA,$TMP4        ;CLEAR THE MASKED BITS
(2)  041262  053737  001174  001124            BIS     $TMP4,$GDDAT      ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  041270  104041                            ERROR   41                ;TYPE MESSAGE 41
(2)  041272  005137  001244                    COM     CKERR             ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  041276  000240                    70$:    NOP
(1)
(1)
(2)                                            ;;*****************************************************************
(2)
(2)                                            ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  041300  005037  001250                    CLR     RELERR            ;CLEAR THE 'RELEASE ERROR ' INDICATOR
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(2)  041304  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  041312  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  041316  012737  051700  001124          MOV     #51700,$GDDAT   ;COMPARSION CONSTANT
(2)  041324  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  041332  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  041340  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(2)  041346  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  041354  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  041362  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  041370  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(2)  041376  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  041404  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  041412  001006                          BNE     72$             ;BR IF NOT
(2)  041414  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  041420  001045                          BNE     74$             ;BR IF NOT
(2)  041422  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  041424  000137  041624                  JMP     76$             ;BYPASS THE REST OF THE CHECKS
(2)  041430  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  041436  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  041444  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(2)  041452  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  041456  001414                          BEQ     73$             ;BR IF ZERO
(2)  041460  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  041466  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(2)  041474  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  041502  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  041506  001012                          BNE     74$             ;BR IF NOT
(2)  041510  012737  177777  001250  73$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(2)  041516  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(2)  041524  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  041532  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(2)  041534  013737  001170  001126  74$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  041542  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(2)  041550  042737  100000  001170          BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(2)  041556  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(2)  041564  001401                          BEQ     75$             ;BR IF OK FROM PORT A.
(2)  041566  104007                          ERROR   7               ;REPORT ERROR
(2)  041570  013737  001172  001126  75$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  041576  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(2)  041604  042737  100000  001172          BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(2)  041612  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(2)  041620  001401                          BEQ     76$             ;BR IF OK
(2)  041622  104007                          ERROR   7               ;REPORT ERROR
(2)  041624  000240                  76$:    NOP
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;THE ATTENTION BIT FOR PORT A SHOULD NOT BE SET
(1)
(2)  041626  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  041634  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  041642  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  041646  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  041654  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  041662  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  041666  005037  001124                  CLR     $GDDAT           ;WHAT REGISTER SHOULD BE
(2)  041672  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
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(2)  041700  042737  077777  001164          BIC     #↑CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  041706  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  041714  001414                           BEQ     77$             ;BR IF OK
(2)  041716  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  041724  042737  100000  001174          BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  041732  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  041740  104052                           ERROR   52              ;TYPE MESSAGE 52
(2)  041742  005137  001244                   COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  041746  000240                  77$:     NOP
(2)
(2)                                           ;CLEAR ATTENTION BIT FOR PORT B
(2)
(2)  041750  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT #B
(2)  041756  005060  000012                   CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  041762  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  041770  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)  041776  000004                  3$:      SCOPE                   ;LOOP ?
8956
8976
8977
(3)                                           ;;*****************************************************************
(4)                                           ;*TEST 33       TEST RELEASE THROUGH PORT 'A' WITH ERRORS SET
(4)                                           ;*
(4)                                           ;*VERIFY THAT A RELEASE COMMAND PERFORMS NO ACTION IF ISSUED WHEN ERROR
(4)                                           ;*      BITS ARE SET IN THE DRIVE.
(4)                                           ;*
(4)                                           ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(4)                                           ;*
(4)                                           ;*  B.  WRITE 1'S INTO RPER1 THROUGH PORT 'A'.
(4)                                           ;*
(4)                                           ;*  C.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'.  VERIFY THAT THE 'GO'
(4)                                           ;*      BIT HAS RESET, THAT THE DRIVE HAS NOT RETURNED TO NEUTRAL, AND
(4)                                           ;*      THAT RPER1 HAS NOT BEEN CLEARED.
(4)                                           ;*
(4)                                           ;*  D.  CLEAR RPER1 BY ISSUING A DRIVE CLEAR COMMAND THROUGH PORT 'A'.
(4)                                           ;*
(4)                                           ;*  E.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
(4)                                           ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                           ;*
(3)                                           ;;*****************************************************************
(2)  042000                          TST33:
(3)  042000  005737  001274                   TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  042004  001406                           BEQ     2$              ;BR IF NOT
(3)  042006  100002                           BPL     1$              ;BR IF JUST ENTERED TEST
(3)  042010  000137  002622                   JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  042014  012737  177777  001274  1$:      MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  042022  112737  000033  001102  2$:      MOVB    #33,$TSTNM      ;TEST NUMBER
(3)  042030  012737  042052  001106          MOV     #TEST33,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  042036  012737  042052  001110          MOV     #TEST33,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  042044  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
8978 042052  012706  001100          TEST33:  MOV     #STACK,SP       ;LOAD THE STACK POINTER
9015
(2)                                           ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  042056  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  042064  005060  000012                   CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  042070  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
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(2)  042076  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE
(2)  042104  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT #B
(2)  042112  005060  000012                   CLR     RPDS1(R0)        ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  042116  012760  000011  000000          MOV     #11,RPCS1(R0)    ;ISSUE DRIVE CLEAR
(2)  042124  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE
(2)                                       ;;*****************************************************************
(2)
(2)                                       ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  042132  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  042140  013737  001224  001236          MOV     PORTA,SEIZPT     ;STORE SEIZING PORT'S ADDRESS
(2)  042146  005060  000012                   CLR     RPDS1(R0)        ;WRITE RPDS1
(2)  042152  013737  001226  001240          MOV     PORTB,OPPRT      ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                       ;;*****************************************************************
(1)                                       ;FORCE AN ERROR
(1)
(1)  042160  012760  177777  000014          MOV     #-1,RPER1(R0)    ;SET ERROR BITS
(1)  042166  012760  000013  000000          MOV     #13,RPCS1(R0)    ;ISSUE A RELEASE COMMAND
(2)  042174  005037  001244                   CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  042200  016037  000000  001126          MOV     RPCS1(R0),$BDDAT  ;GET CONTENTS OF RPCS1
(2)  042206  012737  000000  001122          MOV     #RPCS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  042214  060037  001122                   ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  042220  012737  004012  001124          MOV     #4012,$GDDAT     ;WHAT REGISTER SHOULD BE
(2)  042226  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  042234  042737  173765  001164          BIC     #^C4012,$TMP0    ;SAVE SPECIFIED BITS
(2)  042242  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  042250  001414                           BEQ     66$              ;BR IF OK
(2)  042252  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  042260  042737  004012  001174          BIC     #4012,$TMP4      ;CLEAR THE MASKED BITS
(2)  042266  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  042274  104025                           ERROR   25               ;TYPE MESSAGE 25
(2)  042276  005137  001244                   COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  042302  000240                   66$:    NOP
(1)  042304  005737  001244                   TST     CKERR            ;DID 'GO' BIT RESET ?
(1)  042310  001002                           BNE     .+6              ;BR IF NOT
(1)  042312  000137  042352                   JMP     1$               ;'GO' BIT RESET
(1)  042316  012760  000040  000010          MOV     #CLR,RPCS2(R0)   ;INIT THE RH11
(2)  042324  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  042332  013737  001224  001234          MOV     PORTA,PTNBR      ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  042340  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE THROUGH PORT A
(1)  042346  000137  043066                   JMP     2$               ;BYPASS THE REST OF THE TEST
(1)
(2)                                       ;;*****************************************************************
(1)                                       ;VERIFY THAT DRIVE IS STILL SEIZED BY PORT A
(1)
(1)  042352                               1$:
(2)  042352  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  042360  013737  001226  001234          MOV     PORTB,PTNBR      ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  042366  005037  001244                   CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  042372  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  042400  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  042406  060037  001122                   ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  042412  005037  001124                   CLR     $GDDAT           ;WHAT REGISTER SHOULD BE
(2)  042416  023737  001124  001126          CMP     $GDDAT,$BDDAT    ;IS THE REGISTER OK ?
(2)  042424  001403                           BEQ     68$              ;BR IF OK
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(2)  042426  104024                          ERROR   24                  ;TYPE MESSAGE 24
(2)  042430  005137  001244                  COM     CKERR               ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  042434  000240                  68$:    NOP
(2)  042436  113760  001224  000010         MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(2)  042444  013737  001224  001234         MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  042452  005037  001244                  CLR     CKERR               ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  042456  016037  000014  001126         MOV     RPER1(R0),$BDDAT    ;GET CONTENTS OF RPER1
(2)  042464  012737  000014  001122         MOV     #RPER1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  042472  060037  001122                  ADD     R0,$BDADR           ;ADD RH11 BASE ADDRESS
(2)  042476  012737  177777  001124         MOV     #177777,$GDDAT      ;WHAT REGISTER SHOULD BE
(2)  042504  023737  001124  001126         CMP     $GDDAT,$BDDAT       ;IS THE REGISTER OK ?
(2)  042512  001403                          BEQ     70$                 ;BR IF OK
(2)  042514  104010                          ERROR   10                  ;REPORT THE ERROR
(2)  042516  005137  001244                  COM     CKERR               ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  042522  000240                  70$:    NOP
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;CLEAR THE ERRORS THROUGH PORT A
(1)
(1)  042524  012760  000011  000000         MOV     #11,RPCS1(R0)   ;ISSUE A DRIVE CLEAR
(1)
(2)                                          ;;*****************************************************************
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  042532  113760  001224  000010         MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A
(3)  042540  013737  001224  001234         MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  042546  012760  000013  000000         MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  042554  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  042560  012737  000012  001122         MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  042566  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  042572  012737  011700  001124         MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  042600  113760  001224  000010         MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  042606  016037  000012  001170         MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  042614  013737  001170  001164         MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  042622  042737  100100  001164         BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  042630  113760  001226  000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  042636  016037  000012  001172         MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  042644  013737  001172  001166         MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  042652  042737  100100  001166         BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  042660  023737  001164  001166         CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  042666  001006                          BNE     72$             ;BR IF NOT
(3)  042670  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  042674  001045                          BNE     74$             ;BR IF NOT
(3)  042676  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  042700  000137  043064                  JMP     76$             ;BYPASS THE REST OF THE CHECKS
(3)  042704  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  042712  013737  001226  001234         MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  042720  113760  001226  000010         MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  042726  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  042732  001414                          BEQ     73$             ;BR IF ZERO
(3)  042734  013737  001224  001234         MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  042742  013737  001172  001126         MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
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(3)  042750  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  042756  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  042762  001012                          BNE     74$             ;BR IF NOT
(3)  042764  012737  177777  001250  73$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  042772  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  043000  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  043006  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  043010  013737  001170  001126  74$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  043016  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  043024  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  043032  001401                          BEQ     75$             ;BR IF OK FROM PORT A.
(3)  043034  104007                          ERROR   7               ;REPORT ERROR
(3)  043036  013737  001172  001126  75$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  043044  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  043052  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  043060  001401                          BEQ     76$             ;BR IF OK
(3)  043062  104007                          ERROR   7               ;REPORT ERROR
(3)  043064  000240                  76$:    NOP
(1)  043066  000004                  2$:     SCOPE                   ;LOOP ?
9035
9036
(3)                                  ;;*****************************************************************
(4)                                  ;*TEST 34       TEST RELEASE THROUGH PORT 'B' WITH ERRORS SET
(4)                                  ;*
(4)                                  ;*VERIFY THAT A RELEASE COMMAND PERFORMS NO ACTION IF ISSUED WHEN ERROR
(4)                                  ;*      BITS ARE SET IN THE DRIVE.
(4)                                  ;*
(4)                                  ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                                  ;*
(4)                                  ;*  B.  WRITE 1'S INTO RPER1 THROUGH PORT 'B'.
(4)                                  ;*
(4)                                  ;*  C.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.  VERIFY THAT THE 'GO'
(4)                                  ;*      BIT HAS RESET, THAT THE DRIVE HAS NOT RETURNED TO NEUTRAL, AND
(4)                                  ;*      THAT RPER1 HAS NOT BEEN CLEARED.
(4)                                  ;*
(4)                                  ;*  D.  CLEAR RPER1 BY ISSUING A DRIVE CLEAR COMMAND THROUGH PORT 'B'.
(4)                                  ;*
(4)                                  ;*  E.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
(4)                                  ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                  ;*
(3)                                  ;*****************************************************************
(2)  043070                          TST34:
(3)  043070  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  043074  001406                          BEQ     2$              ;BR IF NOT
(3)  043076  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
(3)  043100  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  043104  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  043112  112737  000034  001102  2$:     MOVB    #34,$TSTNM      ;TEST NUMBER
(3)  043120  012737  043142  001106          MOV     #TEST34,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  043126  012737  043142  001110          MOV     #TEST34,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  043134  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
9037 043142  012706  001100          TEST34: MOV     #STACK,SP       ;LOAD THE STACK POINTER
9038
(2)                                          ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  043146  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  043154  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
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(2)  043160  012760  000011  000000          MOV     #11,RPCS1(R0)    ;ISSUE DRIVE CLEAR
(2)  043166  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE
(2)  043174  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT #B
(2)  043202  005060  000012                  CLR     RPDS1(R0)        ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  043206  012760  000011  000000          MOV     #11,RPCS1(R0)    ;ISSUE DRIVE CLEAR
(2)  043214  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE
(2)                                      ;;*************************************************************
(2)
(2)                                      ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  043222  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  043230  013737  001226  001236          MOV     PORTB,SEIZPT     ;STORE SEIZING PORT'S ADDRESS
(2)  043236  005060  000012                  CLR     RPDS1(R0)        ;WRITE RPDS1
(2)  043242  013737  001224  001240          MOV     PORTA,OPPRT      ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                      ;;*************************************************************
(1)                                      ;FORCE AN ERROR
(1)
(1)  043250  012760  177777  000014          MOV     #-1,RPER1(R0)    ;SET ERROR BITS
(1)  043256  012760  000013  000000          MOV     #13,RPCS1(R0)    ;ISSUE A RELEASE COMMAND
(2)  043264  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  043270  016037  000000  001126          MOV     RPCS1(R0),$BDDAT  ;GET CONTENTS OF RPCS1
(2)  043276  012737  000000  001122          MOV     #RPCS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  043304  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  043310  012737  004012  001124          MOV     #4012,$GDDAT     ;WHAT REGISTER SHOULD BE
(2)  043316  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  043324  042737  173765  001164          BIC     #^C4012,$TMP0    ;SAVE SPECIFIED BITS
(2)  043332  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  043340  001414                          BEQ     66$              ;BR IF OK
(2)  043342  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  043350  042737  004012  001174          BIC     #4012,$TMP4      ;CLEAR THE MASKED BITS
(2)  043356  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  043364  104025                          ERROR   25               ;TYPE MESSAGE 25
(2)  043366  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  043372  000240                  66$:    NOP
(1)  043374  005737  001244                  TST     CKERR            ;DID 'GO' BIT RESET ?
(1)  043400  001002                          BNE     .+6              ;BR IF NOT
(1)  043402  000137  043442                  JMP     1$               ;'GO' BIT RESET
(1)  043406  012760  000040  000010          MOV     #CLR,RPCS2(R0)   ;INIT THE RH11
(2)  043414  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  043422  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  043430  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE THROUGH PORT B
(1)  043436  000137  044156                  JMP     2$               ;BYPASS THE REST OF THE TEST
(1)
(2)                                      ;;*************************************************************
(1)                                      ;VERIFY THAT DRIVE IS STILL SEIZED BY PORT B
(1)
(1)  043442                          1$:
(2)  043442  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  043450  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  043456  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  043462  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  043470  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  043476  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  043502  005037  001124                  CLR     $GDDAT           ;WHAT REGISTER SHOULD BE
(2)  043506  023737  001124  001126          CMP     $GDDAT,$BDDAT    ;IS THE REGISTER OK ?
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(2)  043514  001403                          BEQ     68$                ;BR IF OK
(2)  043516  104024                          ERROR   24                 ;TYPE MESSAGE 24
(2)  043520  005137  001244                  COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  043524  000240                  68$:    NOP
(2)  043526  113760  001226  000010          MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B
(2)  043534  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  043542  005037  001244                  CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  043546  016037  000014  001126          MOV     RPER1(R0),$BDDAT   ;GET CONTENTS OF RPER1
(2)  043554  012737  000014  001122          MOV     #RPER1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  043562  060037  001122                  ADD     R0,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  043566  012737  177777  001124          MOV     #177777,$GDDAT     ;WHAT REGISTER SHOULD BE
(2)  043574  023737  001124  001126          CMP     $GDDAT,$BDDAT      ;IS THE REGISTER OK ?
(2)  043602  001403                          BEQ     70$                ;BR IF OK
(2)  043604  104010                          ERROR   10                 ;REPORT THE ERROR
(2)  043606  005137  001244                  COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  043612  000240                  70$:    NOP
(1)
(2)                                   ;;*****************************************************************
(1)                                   ;CLEAR THE ERRORS THROUGH PORT B
(1)
(1)  043614  012760  000011  000000          MOV     #11,RPCS1(R0)      ;ISSUE A DRIVE CLEAR
(1)
(2)                                   ;;*****************************************************************
(2)
(2)                                           ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  043622  113760  001226  000010          MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B
(3)  043630  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  043636  012760  000013  000000          MOV     #13,RPCS1(R0)      ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                           ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  043644  005037  001250                  CLR     RELERR             ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  043650  012737  000012  001122          MOV     #RPDS1,$BDADR      ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  043656  060037  001122                  ADD     R0,$BDADR          ;ADD THE I/O BASE ADDRESS
(3)  043662  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  043670  113760  001224  000010          MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  043676  016037  000012  001170          MOV     RPDS1(R0),$TMP2    ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  043704  013737  001170  001164          MOV     $TMP2,$TMP0        ;COPY IT INTO '$TMP0'
(3)  043712  042737  100100  001164          BIC     #ATA!VV,$TMP0      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  043720  113760  001226  000010          MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  043726  016037  000012  001172          MOV     RPDS1(R0),$TMP3    ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  043734  013737  001172  001166          MOV     $TMP3,$TMP1        ;COPY IT INTO '$TMP1'
(3)  043742  042737  100100  001166          BIC     #ATA!VV,$TMP1      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  043750  023737  001164  001166          CMP     $TMP0,$TMP1        ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  043756  001006                          BNE     72$                ;BR IF NOT
(3)  043760  005737  001164                  TST     $TMP0              ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  043764  001045                          BNE     74$                ;BR IF NOT
(3)  043766  104046                          ERROR   46                 ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  043770  000137  044154                  JMP     76$                ;BYPASS THE REST OF THE CHECKS
(3)  043774  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT       ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  044002  013737  001226  001234          MOV     PORTB,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  044010  113760  001226  000010          MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  044016  005737  001164                  TST     $TMP0              ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  044022  001414                          BEQ     73$                ;BR IF ZERO
(3)  044024  013737  001224  001234          MOV     PORTA,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
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SEQ 0128

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                        T34     TEST RELEASE THROUGH PORT 'B' WITH ERRORS SET

(3)  044032 013737 001172 001126        MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  044040 113760 001224 000010        MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  044046 005737 001166               TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  044052 001012                      BNE     74$             ;BR IF NOT
(3)  044054 012737 177777 001250 73$:   MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  044062 012760 000011 000000        MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  044070 012760 000013 000000        MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  044076 104026                      ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  044100 013737 001170 001126 74$:   MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  044106 013737 001224 001234        MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  044114 023737 001124 001170        CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  044122 001401                      BEQ     75$             ;BR IF OK FROM PORT A.
(3)  044124 104007                      ERROR   7               ;REPORT ERROR
(3)  044126 013737 001172 001126 75$:   MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  044134 013737 001226 001234        MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  044142 023737 001124 001172        CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  044150 001401                      BEQ     76$             ;BR IF OK
(3)  044152 104007                      ERROR   7               ;REPORT ERROR
(3)  044154 000240              76$:    NOP
(1)  044156 000004              2$:     SCOPE                   ;LOOP ?
9039
9055
9056
(3)                             ;;*****************************************************************
(4)                             ;*TEST 35       TEST TIMEOUT RETRIGGER THROUGH PORT 'A'
(4)                             ;*
(4)                             ;*VERIFY THAT THE PORT TIMEOUT ONE-SHOT CAN BE RETRIGGERED.
(4)                             ;*
(4)                             ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(4)                             ;*
(4)                             ;*  B.  WAIT 500 MS AND WRITE 0'S INTO RPDS1 THROUGH PORT 'A'.
(4)                             ;*
(4)                             ;*  C.  VERIFY THAT THE TIMEOUT OCCURS WITHIN + OR - 25% OF THE SPECIFIED
(4)                             ;*      TIME.  (THE MEASUREMENT IS MADE FROM STEP 'B'.)
(4)                             ;*
(4)                             ;*  D.  VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION
(4)                             ;*      BIT IS SET.
(4)                             ;*
(3)                             ;;*****************************************************************
(2)  044160                     TST35:
(3)  044160 005737 001274               TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  044164 001406                      BEQ     2$              ;BR IF NOT
(3)  044166 100002                      BPL     1$              ;BR IF JUST ENTERED TEST
(3)  044170 000137 002622               JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  044174 012737 177777 001274 1$:    MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  044202 112737 000035 001102 2$:    MOVB    #35,$TSTNM      ;TEST NUMBER
(3)  044210 012737 044232 001106        MOV     #TEST35,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  044216 012737 044232 001110        MOV     #TEST35,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  044224 012737 000004 001176        MOV     #4,$TIMES       ;;DO 4 ITERATIONS
9057 044232 012706 001100       TEST35: MOV     #STACK,SP       ;LOAD THE STACK POINTER
9097
(2)                                     ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  044236 113760 001224 000010        MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  044244 005060 000012               CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  044250 012760 000011 000000        MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  044256 012760 000013 000000        MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
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(2)  044264  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  044272  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  044276  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  044304  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)
(2)                                      ;;*****************************************************************
(2)
(2)                                              ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  044312  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  044320  013737  001224  001236          MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  044326  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(2)  044332  013737  001226  001240          MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
(1)
(2)                                      ;;*****************************************************************
(1)                                      ;WAIT 500 MS
(1)
(2)
(3)                                      ;;*****************************************************************
(2)                                      ;START THE TIMER
(2)
(2)  044340  005037  001252                  CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  044344  012737  000764  001254          MOV     #500.,WATCH     ;SET WATCH TO 500 MS
(1)  044352  005737  001254          1$:     TST     WATCH           ;WATCH EQUAL TO ZERO
(1)  044356  001375                  BNE     1$                      ;BR IF NOT
(2)
(3)                                      ;;*****************************************************************
(2)                                      ;START THE TIMER
(2)
(2)  044360  005037  001252                  CLR     TIME            ;CLEAR THE ELAPSED TIME COUNTER
(2)  044364  012737  003720  001254          MOV     #2000.,WATCH    ;SET WATCH TO 2000 MS
(1)
(2)                                      ;;*****************************************************************
(1)                                      ;RETRIGGER THE TIMEOUT ONE-SHOT
(1)
(1)  044372  005760  000012                  TST     RPDS1(R0)       ;RETRIGGER THE ONE-SHOT
(2)  044376  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  044404  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  044412  005760  000012          2$:     TST     RPDS1(R0)       ;WAIT FOR TIMEOUT
(1)  044416  001004                  BNE     3$                      ;BR IF TIMEOUT OCCURRED
(1)  044420  005737  001254                  TST     WATCH           ;WATCH EQUAL TO ZERO ?
(1)  044424  001372                  BNE     2$                      ;BR IF NOT
(1)  044426  104036                  ERROR   36                      ;NO TIMEOUT WITHIN 2 SECONDS
(1)  044430  013737  001252  001272  3$:     MOV     TIME,TIMES      ;SAVE THE ELAPSED TIME VALUE
(1)
(2)                                      ;;*****************************************************************
(2)
(2)                                              ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  044436  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  044442  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  044450  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(2)  044454  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(2)  044462  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(2)  044470  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  044476  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
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(2)  044504  042737  100100  001164          BIC     #ATA!VV,$TMP0     ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  044512  113760  001226  000010          MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B.
(2)  044520  016037  000012  001172          MOV     RPDS1(R0),$TMP3   ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  044526  013737  001172  001166          MOV     $TMP3,$TMP1       ;COPY IT INTO '$TMP1'
(2)  044534  042737  100100  001166          BIC     #ATA!VV,$TMP1     ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  044542  023737  001164  001166          CMP     $TMP0,$TMP1       ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  044550  001006                          BNE     66$               ;BR IF NOT
(2)  044552  005737  001164                  TST     $TMP0             ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  044556  001045                          BNE     68$               ;BR IF NOT
(2)  044560  104046                          ERROR   46                ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  044562  000137  044746                  JMP     70$               ;BYPASS THE REST OF THE CHECKS
(2)  044566  013737  001170  001126  66$:    MOV     $TMP2,$BDDAT      ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  044574  013737  001226  001234          MOV     PORTB,PTNBR       ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  044602  113760  001226  000010          MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B.
(2)  044610  005737  001164                  TST     $TMP0             ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  044614  001414                          BEQ     67$               ;BR IF ZERO
(2)  044616  013737  001224  001234          MOV     PORTA,PTNBR       ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  044624  013737  001172  001126          MOV     $TMP3,$BDDAT      ;'BAD DATA' FOR ERROR TYPE OUT
(2)  044632  113760  001224  000010          MOVB    PORTA,RPCS2(R0)   ;SELECT PORT A.
(2)  044640  005737  001166                  TST     $TMP1             ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  044644  001012                          BNE     68$               ;BR IF NOT
(2)  044646  012737  177777  001250  67$:    MOV     #-1,RELERR        ;SET 'RELEASE ERROR' INDICATOR
(2)  044654  012760  000011  000000          MOV     #11,RPCS1(R0)     ;CLEAR THE DRIVE
(2)  044662  012760  000013  000000          MOV     #13,RPCS1(R0)     ;RELEASE THE DRIVE
(2)  044670  104022                          ERROR   22                ;TYPE ERROR MESSAGE 22
(2)  044672  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT      ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  044700  013737  001224  001234          MOV     PORTA,PTNBR       ;CHANGE PORT NUMBER
(2)  044706  023737  001124  001170          CMP     $GDDAT,$TMP2      ;ALL BITS OK ?
(2)  044714  001401                          BEQ     69$               ;BR IF OK FROM PORT A.
(2)  044716  104007                          ERROR   7                 ;REPORT ERROR
(2)  044720  013737  001172  001126  69$:    MOV     $TMP3,$BDDAT      ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(2)  044726  013737  001226  001234          MOV     PORTB,PTNBR       ;CHANGE PORT NUMBER
(2)  044734  023737  001124  001172          CMP     $GDDAT,$TMP3      ;SEE IF READ OK FROM PORT B.
(2)  044742  001401                          BEQ     70$               ;BR IF OK
(2)  044744  104007                          ERROR   7                 ;REPORT ERROR
(2)  044746  000240                  70$:    NOP
(1)
(2)                                         ;;*****************************************************************
(2)                                         ;;*****************************************************************
(1)                                         ;CHECK THE TIME FROM RETRIGGER TO TIMEOUT
(1)
(1)  044750  023737  001272  001260          CMP     TIMES,TIMEAP      ;MEASURED TIME GREATER THAN +25% TOLERANCE ?
(1)  044756  003004                          BGT     4$                ;BR IF GREATER
(1)  044760  023737  001272  001262          CMP     TIMES,TIMEAM      ;MEASURED TIME LESS THAN -25% TOLERANCE
(1)  044766  002001                          BGE     .+4               ;BR IF NOT
(1)  044770  104025                  4$:     ERROR   25                ;REPORT THE ERROR
(1)  044772  000004                          SCOPE                     ;LOOP ?
9113
9114
                                            ;;*****************************************************************
(3)                                         ;*TEST 36       TEST TIMEOUT RETRIGGER THROUGH PORT 'B'
(4)                                         ;*
(4)                                         ;*VERIFY THAT THE PORT TIMEOUT ONE-SHOT CAN BE RETRIGGERED.
(4)                                         ;*
(4)                                         ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                                         ;*
(4)                                         ;*  B.  WAIT 500 MS AND WRITE 0'B INTO RPDS1 THROUGH PORT 'A'.
(4)                                         ;*
```

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                                ;*  C.  VERIFY THAT THE TIMEOUT OCCURS WITHIN + OR - 25% OF THE SPECIFIED
                                ;*      TIME.  (THE MEASUREMENT IS MADE FROM STEP 'B'.)
                                ;*
                                ;*  D.  VERIFY THAT THE DRIVE RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION
                                ;*      BIT IS SET.
                                ;*
                                ;;*****************************************************************
044774                          TST36:
044774  005737  001274                  TST     KYBCTL                  ;PERFORMING ONLY SINGLE TESTS ?
045000  001406                          BEQ     2$                      ;BR IF NOT
045002  100002                          BPL     1$                      ;BR IF JUST ENTERED TEST
045004  000137  002622                  JMP     EXEC                    ;RETURN & GET NEXT TEST NUMBER
045010  012737  177777  001274  1$:     MOV     #-1,KYBCTL              ;SET SINGLE TEST INDICATOR
045016  112737  000036  001102  2$:     MOVB    #36,$TSTNM              ;TEST NUMBER
045024  012737  045046  001106          MOV     #TEST36,$LPADR          ;LOAD LOOP ON TEST ADDRESS
045032  012737  045046  001110          MOV     #TEST36,$LPERR          ;LOAD LOOP ON ERROR ADDRESS
045040  012737  000004  001176          MOV     #4,$TIMES               ;;DO 4 ITERATIONS
045046  012706  001100          TEST36: MOV     #STACK,SP               ;LOAD THE STACK POINTER

                                        ;CLEAR ATTENTION BITS FOR BOTH PORTS

045052  113760  001224  000010          MOVB    PORTA,RPCS2(R0)         ;SELECT PORT #A
045060  005060  000012                  CLR     RPDS1(R0)               ;SEIZE THE DRIVE
045064  012760  000011  000000          MOV     #11,RPCS1(R0)           ;ISSUE DRIVE CLEAR
045072  012760  000013  000000          MOV     #13,RPCS1(R0)           ;RELEASE THE DRIVE
045100  113760  001226  000010          MOVB    PORTB,RPCS2(R0)         ;SELECT PORT #B
045106  005060  000012                  CLR     RPDS1(R0)               ;SEIZE THE DRIVE THROUGH PORT 'B'
045112  012760  000011  000000          MOV     #11,RPCS1(R0)           ;ISSUE DRIVE CLEAR
045120  012760  000013  000000          MOV     #13,RPCS1(R0)           ;RELEASE THE DRIVE

                                ;;*****************************************************************

                                        ;SEIZE THE DRIVE THROUGH PORT B

045126  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
045134  013737  001226  001236          MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
045142  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
045146  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS

                                ;;*****************************************************************
                                ;WAIT 500 MS

                                ;;*****************************************************************
                                ;START THE TIMER

045154  005037  001252                  CLR     TIME                    ;CLEAR THE ELAPSED TIME COUNTER
045160  012737  000764  001254          MOV     #500.,WATCH             ;SET WATCH TO 500 MS
045166  005737  001254          1$:     TST     WATCH                   ;WATCH EQUAL TO ZERO
045172  001375                          BNE     1$                      ;BR IF NOT

                                ;;*****************************************************************
                                ;START THE TIMER

045174  005037  001252                  CLR     TIME                    ;CLEAR THE ELAPSED TIME COUNTER
045200  012737  003720  001254          MOV     #2000.,WATCH            ;SET WATCH TO 2000 MS
```

```
(1)
(2)                                     ;;*****************************************************************
(1)                                     ;RETRIGGER THE TIMEOUT ONE-SHOT
(1)
(1)  045206  005760  000012                    TST     RPDS1(R0)           ;RETRIGGER THE ONE-SHOT
(2)  045212  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(2)  045220  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  045226  005760  000012            2$:     TST     RPDS1(R0)           ;WAIT FOR TIMEOUT
(1)  045232  001004                            BNE     3$                  ;BR IF TIMEOUT OCCURRED
(1)  045234  005737  001254                    TST     WATCH               ;WATCH EQUAL TO ZERO ?
(1)  045240  001372                            BNE     2$                  ;BR IF NOT
(1)  045242  104036                            ERROR   36                  ;NO TIMEOUT WITHIN 2 SECONDS
(1)  045244  013737  001252  001272    3$:     MOV     TIME,TIMES          ;SAVE THE ELAPSED TIME VALUE
(1)
(2)                                     ;;*****************************************************************
(2)
(2)                                     ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(2)  045252  005037  001250                    CLR     RELERR              ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(2)  045256  012737  000012  001122            MOV     #RPDS1,$BDADR       ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(2)  045264  060037  001122                    ADD     R0,$BDADR           ;ADD THE I/O BASE ADDRESS
(2)  045270  012737  011700  001124            MOV     #MOL!PGM!DPR!DRV!VV,$GDDAT  ;COMPARISON CONSTANT
(2)  045276  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A.
(2)  045304  016037  000012  001170            MOV     RPDS1(R0),$TMP2     ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(2)  045312  013737  001170  001164            MOV     $TMP2,$TMP0         ;COPY IT INTO '$TMP0'
(2)  045320  042737  100100  001164            BIC     #ATA!VV,$TMP0       ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  045326  113760  001226  000010            MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B.
(2)  045334  016037  000012  001172            MOV     RPDS1(R0),$TMP3     ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(2)  045342  013737  001172  001166            MOV     $TMP3,$TMP1         ;COPY IT INTO '$TMP1'
(2)  045350  042737  100100  001166            BIC     #ATA!VV,$TMP1       ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(2)  045356  023737  001164  001166            CMP     $TMP0,$TMP1         ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(2)  045364  001006                            BNE     66$                 ;BR IF NOT
(2)  045366  005737  001164                    TST     $TMP0               ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(2)  045372  001045                            BNE     68$                 ;BR IF NOT
(2)  045374  104046                            ERROR   46                  ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(2)  045376  000137  045562                    JMP     70$                 ;BYPASS THE REST OF THE CHECKS
(2)  045402  013737  001170  001126    66$:    MOV     $TMP2,$BDDAT        ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(2)  045410  013737  001226  001234            MOV     PORTB,PTNBR         ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  045416  113760  001226  000010            MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B.
(2)  045424  005737  001164                    TST     $TMP0               ;SEE IF STATUS EQ 0 FROM PORT A.
(2)  045430  001414                            BEQ     67$                 ;BR IF ZERO
(2)  045432  013737  001224  001234            MOV     PORTA,PTNBR         ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(2)  045440  013737  001172  001126            MOV     $TMP3,$BDDAT        ;'BAD DATA' FOR ERROR TYPE OUT
(2)  045446  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A.
(2)  045454  005737  001166                    TST     $TMP1               ;SEE IF STATUS EQ ZERO FROM PORT B.
(2)  045460  001012                            BNE     68$                 ;BR IF NOT
(2)  045462  012737  177777  001250    67$:    MOV     #-1,RELERR          ;SET 'RELEASE ERROR' INDICATOR
(2)  045470  012760  000011  000000            MOV     #11,RPCS1(R0)       ;CLEAR THE DRIVE
(2)  045476  012760  000013  000000            MOV     #13,RPCS1(R0)       ;RELEASE THE DRIVE
(2)  045504  104022                            ERROR   22                  ;TYPE ERROR MESSAGE 22
(2)  045506  013737  001170  001126    68$:    MOV     $TMP2,$BDDAT        ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(2)  045514  013737  001224  001234            MOV     PORTA,PTNBR         ;CHANGE PORT NUMBER
(2)  045522  023737  001124  001170            CMP     $GDDAT,$TMP2        ;ALL BITS OK ?
(2)  045530  001401                            BEQ     69$                 ;BR IF OK FROM PORT A.
(2)  045532  104007                            ERROR   7                   ;REPORT ERROR
(2)  045534  013737  001172  001126    69$:    MOV     $TMP3,$BDDAT        ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
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   (2)  045542  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
   (2)  045550  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
   (2)  045556  001401                           BEQ     70$             ;BR IF OK
   (2)  045560  104007                           ERROR   7               ;REPORT ERROR
   (2)  045562  000240                   70$:     NOP
   (1)
   (2)                                  ;;*****************************************************************
   (1)                                  ;CHECK THE TIME FROM RETRIGGER TO TIMEOUT
   (1)
   (1)  045564  023737  001272  001266           CMP     TIMES,TIMEBP    ;MEASURED TIME GREATER THAN +25% TOLERANCE ?
   (1)  045572  003004                           BGT     4$              ;BR IF GREATER
   (1)  045574  023737  001272  001270           CMP     TIMES,TIMEBM    ;MEASURED TIME LESS THAN -25% TOLERANCE
   (1)  045602  002001                           BGE     .+4             ;BR IF NOT
   (1)  045604  104025                   4$:     ERROR   25              ;REPORT THE ERROR
   (1)  045606  000004                           SCOPE                   ;LOOP ?
 9117
 9118
 9135
 9136                                   ;;*****************************************************************
   (3)                                  ;*TEST 37       TEST PORT 'A' ATTENTION AFTER A COMMAND
   (4)                                  ;*
   (4)                                  ;*
   (4)                                  ;*TEST THE OPERATION OF THE PORT A AND PORT B ATTENTION BITS AFTER A
   (4)                                  ;*      COMMAND.
   (4)                                  ;*
   (4)                                  ;*  A.  ISSUE A RECALIBRATE COMMAND THROUGH PORT 'A'.
   (4)                                  ;*
   (4)                                  ;*  B.  WAIT FOR THE RECALIBRATE COMMAND TO COMPLETE ('DRY' TO BECOME
   (4)                                  ;*      '1').  VERIFY THAT THE ATTENTION BIT FOR PORT 'A' IS SET AND
   (4)                                  ;*      THAT THE ATTENTION BIT FOR PORT 'B' IS NOT SET.
   (4)                                  ;*
   (4)                                  ;*  C.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE RETURNED
   (4)                                  ;*      TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
   (4)                                  ;*
   (3)                                  ;;*****************************************************************
   (2)  045610                          TST37:
   (3)  045610  005737  001274                   TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
   (3)  045614  001406                           BEQ     2$              ;BR IF NOT
   (3)  045616  100002                           BPL     1$              ;BR IF JUST ENTERED TEST
   (3)  045620  000137  002622                   JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
   (3)  045624  012737  177777  001274   1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
   (3)  045632  112737  000037  001102   2$:     MOVB    #37,$TSTNM      ;TEST NUMBER
   (3)  045640  012737  045662  001106           MOV     #TEST37,$LPADR  ;LOAD LOOP ON TEST ADDRESS
   (3)  045646  012737  045662  001110           MOV     #TEST37,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
   (1)  045654  012737  000004  001176           MOV     #4,$TIMES       ;;DO 4 ITERATIONS
9137    045662  012706  001100           TEST37: MOV     #STACK,SP       ;LOAD THE STACK POINTER
9169
   (2)                                  ;CLEAR ATTENTION BITS FOR BOTH PORTS
   (2)
   (2)  045666  113760  001224  000010           MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
   (2)  045674  005060  000012                   CLR     RPDS1(R0)       ;SEIZE THE DRIVE
   (2)  045700  012760  000011  000000           MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
   (2)  045706  012760  000013  000000           MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (2)  045714  113760  001226  000010           MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
   (2)  045722  005060  000012                   CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
   (2)  045726  012760  000011  000000           MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
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(2)  045734  012760  000013  000000          MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE
(2)  045742  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  045750  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  045756  013737  001224  001236          MOV     PORTA,SEIZPT     ;'SEIZED' PORT ADDRESS
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;DO A RECALIBRATE THROUGH PORT A
(1)
(1)  045764  012760  000007  000000          MOV     #7,RPCS1(R0)     ;ISSUE A RECALIBRATE INSTRUCTION THROUGH PORT A
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;WAIT FOR DRIVE TO FINISH
(1)
(1)  045772  032760  000200  000012          BIT     #DRY,RPDS1(R0)   ;WAIT FOR DRIVE TO FINISH
(1)  046000  001774                          BEQ     .-6              ;BR IF NOT FINISHED
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;CONFIRM THAT ATTENTION IS SET FOR PORT A
(1)
(2)  046002  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  046006  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  046014  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  046022  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  046026  012737  100000  001124          MOV     #ATA,$GDDAT  ;WHAT REGISTER SHOULD BE
(2)  046034  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  046042  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  046050  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  046056  001414                          BEQ     64$              ;BR IF OK
(2)  046060  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  046066  042737  100000  001174          BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(2)  046074  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  046102  104032                          ERROR   32               ;TYPE MESSAGE 32
(2)  046104  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  046110  000240                  64$:    NOP
(2)  046112  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  046120  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;CONFIRM THAT ATTENTION IS NOT SET FOR PORT B
(1)
(2)  046126  005037  001244                  CLR     CKERR            ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  046132  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  046140  012737  000012  001122          MOV     #RPDS1,$BDADR    ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  046146  060037  001122                  ADD     R0,$BDADR        ;ADD RH11 BASE ADDRESS
(2)  046152  005037  001124                  CLR     $GDDAT           ;WHAT REGISTER SHOULD BE
(2)  046156  013737  001126  001164          MOV     $BDDAT,$TMP0     ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  046164  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  046172  023737  001124  001164          CMP     $GDDAT,$TMP0     ;COMPARE THE BITS
(2)  046200  001414                          BEQ     66$              ;BR IF OK
(2)  046202  013737  001126  001174          MOV     $BDDAT,$TMP4     ;COPY 'BAD DATA'
(2)  046210  042737  100000  001174          BIC     #ATA,$TMP4       ;CLEAR THE MASKED BITS
(2)  046216  053737  001174  001124          BIS     $TMP4,$GDDAT     ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  046224  104032                          ERROR   32               ;TYPE MESSAGE 32
(2)  046226  005137  001244                  COM     CKERR            ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  046232  000240                  66$:    NOP
(1)
```

```
(2)                                     ;;*****************************************************************
(2)
(2)                                             ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  046234  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  046242  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  046250  012760  000013  000000            MOV     #13,RPCS1(R0)    ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                             ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  046256  005037  001250                     CLR     RELERR           ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  046262  012737  000012  001122            MOV     #RPDS1,$BDADR    ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  046270  060037  001122                     ADD     R0,$BDADR        ;ADD THE I/O BASE ADDRESS
(3)  046274  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT   ;COMPARISON CONSTANT
(3)  046302  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  046310  016037  000012  001170            MOV     RPDS1(R0),$TMP2  ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  046316  013737  001170  001164            MOV     $TMP2,$TMP0      ;COPY IT INTO '$TMP0'
(3)  046324  042737  100100  001164            BIC     #ATA!VV,$TMP0    ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  046332  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B.
(3)  046340  016037  000012  001172            MOV     RPDS1(R0),$TMP3  ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  046346  013737  001172  001166            MOV     $TMP3,$TMP1      ;COPY IT INTO '$TMP1'
(3)  046354  042737  100100  001166            BIC     #ATA!VV,$TMP1    ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  046362  023737  001164  001166            CMP     $TMP0,$TMP1      ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  046370  001006                            BNE     68$              ;BR IF NOT
(3)  046372  005737  001164                     TST     $TMP0            ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  046376  001045                            BNE     70$              ;BR IF NOT
(3)  046400  104046                            ERROR   46               ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  046402  000137  046566                     JMP     72$              ;BYPASS THE REST OF THE CHECKS
(3)  046406  013737  001170  001126  68$:      MOV     $TMP2,$BDDAT     ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  046414  013737  001226  001234            MOV     PORTB,PTNBR      ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  046422  113760  001226  000010            MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B.
(3)  046430  005737  001164                     TST     $TMP0            ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  046434  001414                            BEQ     69$              ;BR IF ZERO
(3)  046436  013737  001224  001234            MOV     PORTA,PTNBR      ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  046444  013737  001172  001126            MOV     $TMP3,$BDDAT     ;'BAD DATA' FOR ERROR TYPE OUT
(3)  046452  113760  001224  000010            MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  046460  005737  001166                     TST     $TMP1            ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  046464  001012                            BNE     70$              ;BR IF NOT
(3)  046466  012737  177777  001250  69$:      MOV     #-1,RELERR       ;SET 'RELEASE ERROR' INDICATOR
(3)  046474  012760  000011  000000            MOV     #11,RPCS1(R0)    ;CLEAR THE DRIVE
(3)  046502  012760  000013  000000            MOV     #13,RPCS1(R0)    ;RELEASE THE DRIVE
(3)  046510  104026                            ERROR   26               ;TYPE ERROR MESSAGE 26
(3)  046512  013737  001170  001126  70$:      MOV     $TMP2,$BDDAT     ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  046520  013737  001224  001234            MOV     PORTA,PTNBR      ;CHANGE PORT NUMBER
(3)  046526  023737  001124  001170            CMP     $GDDAT,$TMP2     ;ALL BITS OK ?
(3)  046534  001401                            BEQ     71$              ;BR IF OK FROM PORT A.
(3)  046536  104007                            ERROR   7                ;REPORT ERROR
(3)  046540  013737  001172  001126  71$:      MOV     $TMP3,$BDDAT     ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  046546  013737  001226  001234            MOV     PORTB,PTNBR      ;CHANGE PORT NUMBER
(3)  046554  023737  001124  001172            CMP     $GDDAT,$TMP3     ;SEE IF READ OK FROM PORT B.
(3)  046562  001401                            BEQ     72$              ;BR IF OK
(3)  046564  104007                            ERROR   7                ;REPORT ERROR
(3)  046566  000240                    72$:    NOP
(1)  046570  000004                            SCOPE                    ;LOOP ?
9185
9186                                    ;;*****************************************************************
```

```
                                        ;*TEST 40       TEST PORT 'B' ATTENTION AFTER A COMMAND
                                        ;*
                                        ;*TEST THE OPERATION OF THE PORT A AND PORT B ATTENTION BITS AFTER A
                                        ;*      COMMAND.
                                        ;*
                                        ;*  A.  ISSUE A RECALIBRATE COMMAND THROUGH PORT 'B'.
                                        ;*
                                        ;*  B.  WAIT FOR THE RECALIBRATE COMMAND TO COMPLETE ('DRY' TO BECOME
                                        ;*      '1').  VERIFY THAT THE ATTENTION BIT FOR PORT 'B' IS SET AND
                                        ;*      THAT THE ATTENTION BIT FOR PORT 'A' IS NOT SET.
                                        ;*
                                        ;*  C.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE RETURNED
                                        ;*      TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
                                        ;*
                                        ;;*****************************************************************
046572                                  TST40:
046572  005737  001274                          TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
046576  001406                                  BEQ     2$              ;BR IF NOT
046600  100002                                  BPL     1$              ;BR IF JUST ENTERED TEST
046602  000137  002622                          JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
046606  012737  177777  001274      1$:         MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
046614  112737  000040  001102      2$:         MOVB    #40,$TSTNM      ;TEST NUMBER
046622  012737  046644  001106                  MOV     #TEST40,$LPADR  ;LOAD LOOP ON TEST ADDRESS
046630  012737  046644  001110                  MOV     #TEST40,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
046636  012737  000004  001176                  MOV     #4,$TIMES       ;;DO 4 ITERATIONS
046644  012706  001100              TEST40:     MOV     #STACK,SP       ;LOAD THE STACK POINTER

                                        ;CLEAR ATTENTION BITS FOR BOTH PORTS

046650  113760  001224  000010                MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
046656  005060  000012                        CLR     RPDS1(R0)       ;SEIZE THE DRIVE
046662  012760  000011  000000                MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
046670  012760  000013  000000                MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
046676  113760  001226  000010                MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
046704  005060  000012                        CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
046710  012760  000011  000000                MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
046716  012760  000013  000000                MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
046724  113760  001226  000010                MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
046732  013737  001226  001234                MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
046740  013737  001226  001236                MOV     PORTB,SEIZPT    ;'SEIZED' PORT ADDRESS

                                        ;;*****************************************************************
                                        ;DO A RECALIBRATE THROUGH PORT B

046746  012760  000007  000000                MOV     #7,RPCS1(R0)    ;ISSUE A RECALIBRATE INSTRUCTION THROUGH PORT B

                                        ;;*****************************************************************
                                        ;WAIT FOR DRIVE TO FINISH

046754  032760  000200  000012                BIT     #DRY,RPDS1(R0)  ;WAIT FOR DRIVE TO FINISH
046762  001774                                BEQ     .-6             ;BR IF NOT FINISHED

                                        ;;*****************************************************************
                                        ;CONFIRM THAT ATTENTION IS SET FOR PORT B

046764  005037  001244                        CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
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(2)  046770  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  046776  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  047004  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  047010  012737  100000  001124          MOV     #ATA,$GDDAT   ;WHAT REGISTER SHOULD BE
(2)  047016  013737  001126  001164          MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  047024  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  047032  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  047040  001414                          BEQ     64$             ;BR IF OK
(2)  047042  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  047050  042737  100000  001174          BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  047056  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  047064  104032                          ERROR   32              ;TYPE MESSAGE 32
(2)  047066  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  047072  000240                  64$:    NOP
(2)  047074  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(2)  047102  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                  ;;*****************************************************************
(2)                                  ;CONFIRM THAT ATTENTION IS NOT SET FOR PORT A
(1)
(2)  047110  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  047114  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  047122  012737  000012  001122          MOV     #RPDS1,$BDADR  ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  047130  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  047134  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  047140  013737  001126  001164          MOV     $BDDAT,$TMP0    ;MOVE REGISTER CONTENTS TO '$TMP0'
(2)  047146  042737  077777  001164          BIC     #^CATA,$TMP0  ;SAVE SPECIFIED BITS
(2)  047154  023737  001124  001164          CMP     $GDDAT,$TMP0    ;COMPARE THE BITS
(2)  047162  001414                          BEQ     66$             ;BR IF OK
(2)  047164  013737  001126  001174          MOV     $BDDAT,$TMP4    ;COPY 'BAD DATA'
(2)  047172  042737  100000  001174          BIC     #ATA,$TMP4      ;CLEAR THE MASKED BITS
(2)  047200  053737  001174  001124          BIS     $TMP4,$GDDAT    ;'OR' WITH GOOD DATA FOR TYPEOUT
(2)  047206  104032                          ERROR   32              ;TYPE MESSAGE 32
(2)  047210  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  047214  000240                  66$:    NOP
(1)
(2)                                  ;;*****************************************************************
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(2)  047216  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(2)  047224  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  047232  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(2)
(2)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(2)
(3)  047240  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  047244  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  047252  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  047256  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  047264  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A.
(3)  047272  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  047300  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  047306  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  047314  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  047322  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
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(3)  047330  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  047336  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  047344  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  047352  001006                          BNE     68$             ;BR IF NOT
(3)  047354  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  047360  001045                          BNE     70$             ;BR IF NOT
(3)  047362  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  047364  000137  047550                  JMP     72$             ;BYPASS THE REST OF THE CHECKS
(3)  047370  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  047376  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  047404  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  047412  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  047416  001414                          BEQ     69$             ;BR IF ZERO
(3)  047420  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  047426  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  047434  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  047442  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  047446  001012                          BNE     70$             ;BR IF NOT
(3)  047450  012737  177777  001250  69$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  047456  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  047464  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  047472  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  047474  013737  001170  001126  70$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  047502  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  047510  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  047516  001401                          BEQ     71$             ;BR IF OK FROM PORT A.
(3)  047520  104007                          ERROR   7               ;REPORT ERROR
(3)  047522  013737  001172  001126  71$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  047530  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  047536  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  047544  001401                          BEQ     72$             ;BR IF OK
(3)  047546  104007                          ERROR   7               ;REPORT ERROR
(3)  047550  000240                  72$:    NOP
(1)  047552  000004                          SCOPE                   ;LOOP ?
 9189
 9214
 9215
(3)                          ;;*****************************************************************
(3)                          ;*TEST 41       TEST PORT INTERACTION FROM PORT 'A'
(3)                          ;*
(3)                          ;*VERIFY THAT THERE IS NO INTERACTION BETWEEN PORTS.
(3)                          ;*
(3)                          ;*   A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(3)                          ;*
(3)                          ;*   B.  WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'A'.
(3)                          ;*
(3)                          ;*   C.  READ RPER1, RPER2, & RPER3 THROUGH PORT 'B'.  VERIFY THAT PORT
(3)                          ;*       'B' SEES 0'S FROM EACH OF THESE REGISTERS.
(3)                          ;*
(3)                          ;*   D.  CLEAR RPER1, RPER2, & RPER3 THROUGH PORT 'A'.
(3)                          ;*
(3)                          ;*   E.  WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'B'.  VERIFY THAT
(3)                          ;*       PORT 'A' SEES 0'S FROM EACH OF THESE REGISTERS.
(3)                          ;*
(3)                          ;*   F.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE HAS
(3)                          ;*       SWITCHED TO PORT 'B' AND THAT THE ATTENTION BIT FOR PORT 'B' IS
(3)                          ;*       SET AND THE ATTENTION BIT FOR PORT 'A' IS NOT SET.
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(4)                                     ;*
(4)                                     ;*  G.  ISSUE A RELEASE COMMAND THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
(4)                                     ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                     ;*
(4)                                     ;*
(3)                                     ;*************************************************************************
(2)  047554                             TST41:
(3)  047554  005737  001274                     TST     KYBCTL                  ;PERFORMING ONLY SINGLE TESTS ?
(3)  047560  001406                             BEQ     2$                      ;BR IF NOT
(3)  047562  100002                             BPL     1$                      ;BR IF JUST ENTERED TEST
(3)  047564  000137  002622                     JMP     EXEC                    ;RETURN & GET NEXT TEST NUMBER
(3)  047570  012737  177777  001274     1$:     MOV     #-1,KYBCTL              ;SET SINGLE TEST INDICATOR
(3)  047576  112737  000041  001102     2$:     MOVB    #41,$TSTNM              ;TEST NUMBER
(3)  047604  012737  047626  001106             MOV     #TEST41,$LPADR          ;LOAD LOOP ON TEST ADDRESS
(3)  047612  012737  047626  001110             MOV     #TEST41,$LPERR          ;LOAD LOOP ON ERROR ADDRESS
(1)  047620  012737  007640  001176             MOV     #4000.,$TIMES           ;;DO 4000. ITERATIONS
 9216  047626  012706  001100         TEST41:  MOV     #STACK,SP               ;LOAD THE STACK POINTER
 9251
(2)                                             ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  047632  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  047640  005060  000012                     CLR     RPDS1(R0)               ;SEIZE THE DRIVE
(2)  047644  012760  000011  000000             MOV     #11,RPCS1(R0)           ;ISSUE DRIVE CLEAR
(2)  047652  012760  000013  000000             MOV     #13,RPCS1(R0)           ;RELEASE THE DRIVE
(2)  047660  113760  001226  000010             MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  047666  005060  000012                     CLR     RPDS1(R0)               ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  047672  012760  000011  000000             MOV     #11,RPCS1(R0)           ;ISSUE DRIVE CLEAR
(2)  047700  012760  000013  000000             MOV     #13,RPCS1(R0)           ;RELEASE THE DRIVE
(2)
(2)                                             ;SEIZE THE DRIVE THROUGH PORT A
(2)
(2)  047706  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  047714  013737  001224  001236             MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  047722  005060  000012                     CLR     RPDS1(R0)               ;WRITE RPDS1
(2)  047726  013737  001226  001240             MOV     PORTB,OPPRT             ;'OPPOSITE' PORT ADDRESS
(2)  047734  012760  177777  000014             MOV     #-1,RPER1(R0)           ;LOAD 1'S INTO RPER1 THROUGH PORT A
(2)  047742  012760  177777  000040             MOV     #-1,RPER2(R0)           ;LOAD 1'S INTO RPER2 THROUGH PORT A
(2)  047750  012760  177777  000042             MOV     #-1,RPER3(R0)           ;LOAD 1'S INTO RPER3 THROUGH PORT A
(2)  047756  113760  001226  000010             MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  047764  013737  001226  001234             MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  047772  004737  050630                     JSR     PC,TST41B               ;CHECK THE REGISTERS THROUGH PORT B
(2)  047776  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  050004  013737  001224  001234             MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  050012  005060  000042                     CLR     RPER3(R0)               ;CLEAR RPER3 ON PORT A
(2)  050016  005060  000040                     CLR     RPER2(R0)               ;CLEAR RPER2 ON PORT A
(2)  050022  005060  000014                     CLR     RPER1(R0)               ;CLEAR RPER1 ON PORT A
(1)  050026  013760  001232  000016             MOV     ASR1,RPAS(R0)           ;CLEAR THE ATTENTION BIT FOR PORT A
(2)  050034  113760  001226  000010             MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  050042  013737  001226  001234             MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  050050  012760  177777  000014             MOV     #-1,RPER1(R0)           ;LOAD 1'S INTO RPER1 THROUGH PORT B
(2)  050056  012760  177777  000040             MOV     #-1,RPER2(R0)           ;LOAD 1'S INTO RPER2 THROUGH PORT B
(2)  050064  012760  177777  000042             MOV     #-1,RPER3(R0)           ;LOAD 1'S INTO RPER3 THROUGH PORT B
(2)  050072  113760  001224  000010             MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  050100  013737  001224  001234             MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  050106  004737  050630                     JSR     PC,TST41B               ;CHECK THE REGISTERS THROUGH PORT A
(2)
(2)                                             ;RELEASE THE DRIVE FROM PORT A
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(2)
(3)  050112  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  050120  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  050126  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                          ;VERIFY THAT DRIVE IS SEIZED BY PORT B WHEN RELEASED BY PORT A
(3)
(3)  050134  005037  001250                  CLR     RELERR          ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  050140  012737  111700  001124          MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  050146  012737  000012  001122          MOV     #RPDS1,$BDADR   ;REGISTER ADDRESS INCREMENT
(3)  050154  060037  001122                  ADD     R0,$BDADR       ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  050160  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(4)  050166  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  050174  016037  000012  001164          MOV     RPDS1(R0),$TMP0 ;READ STATUS REGISTER FROM PORT B
(4)  050202  113760  001224  000010          MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(4)  050210  013737  001224  001234          MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  050216  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;DRIVE STATUS FROM PORT A
(3)  050224  001404                          BEQ     66$             ;BR IF STATUS FROM PORT A ZERO
(3)  050226  005737  001164                  TST     $TMP0           ;IS STATUS FROM PORT B ZERO ?
(3)  050232  001401                          BEQ     66$             ;BR IF ZERO
(3)  050234  104031                          ERROR   31              ;REPORT DRIVE IN NEUTRAL
(3)  050236  013737  001164  001126  66$:    MOV     $TMP0,$BDDAT    ;CHECK STATUS FROM PORT B
(3)  050244  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  050252  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;COMPARE WITH CONSTANT
(3)  050260  001401                          BEQ     67$             ;BR IF OK
(3)  050262  104027                          ERROR   27              ;REPORT REGISTER ERROR
(3)  050264  000240                  67$:    NOP
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  050266  113760  001226  000010          MOVB    PORTB,RPCS2(R0)  ;SELECT PORT B
(3)  050274  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  050302  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  050310  005037  001250                  CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  050314  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  050322  060037  001122                  ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  050326  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  050334  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  050342  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  050350  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  050356  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  050364  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  050372  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  050400  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  050406  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  050414  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  050422  001006                          BNE     68$             ;BR IF NOT
(3)  050424  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  050430  001045                          BNE     70$             ;BR IF NOT
(3)  050432  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  050434  000137  050620                  JMP     72$             ;BYPASS THE REST OF THE CHECKS
(3)  050440  013737  001170  001126  68$:    MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  050446  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
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  (3)  050454  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
  (3)  050462  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
  (3)  050466  001414                          BEQ     69$             ;BR IF ZERO
  (3)  050470  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
  (3)  050476  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
  (3)  050504  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
  (3)  050512  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
  (3)  050516  001012                          BNE     70$             ;BR IF NOT
  (3)  050520  012737  177777  001250  69$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
  (3)  050526  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
  (3)  050534  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (3)  050542  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
  (3)  050544  013737  001170  001126  70$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
  (3)  050552  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
  (3)  050560  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
  (3)  050566  001401                          BEQ     71$             ;BR IF OK FROM PORT A.
  (3)  050570  104007                          ERROR   7               ;REPORT ERROR
  (3)  050572  013737  001172  001126  71$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
  (3)  050600  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
  (3)  050606  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
  (3)  050614  001401                          BEQ     72$             ;BR IF OK
  (3)  050616  104007                          ERROR   7               ;REPORT ERROR
  (3)  050620  000240                  72$:    NOP
  (1)  050622  000004                          SCOPE                   ;LOOP ?
9252   050624  000137  051162                  JMP     TST42           ;GO TO THE NEXT TEST
  (1)
  (1)                                          ;CHECK THE REGISTERS ON THE SELECTED PORT
  (1)
  (1)  050630                          TST41B:
  (3)  050630  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
  (3)  050634  016037  000014  001126          MOV     RPER1(R0),$BDDAT  ;GET CONTENTS OF RPER1
  (3)  050642  012737  000014  001122          MOV     #RPER1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
  (3)  050650  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
  (3)  050654  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
  (3)  050660  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
  (3)  050666  001403                          BEQ     64$             ;BR IF OK
  (3)  050670  104006                          ERROR   6               ;TYPE MESSAGE 6
  (3)  050672  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
  (3)  050676  016037  000000  001126  64$:    MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
  (3)  050704  012737  000000  001122          MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
  (3)  050712  060037  001122                  ADD     R0,$BDADR       ;ADDRESS BASE
  (3)  050716  032737  020000  001126          BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
  (3)  050724  001404                          BEQ     65$             ;BR IF NOT
  (3)  050726  104011                          ERROR   11              ;REPORT THE ERROR
  (3)  050730  012760  040000  000000          MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
  (3)  050736  000240                  65$:    NOP
  (3)  050740  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
  (3)  050744  016037  000040  001126          MOV     RPER2(R0),$BDDAT  ;GET CONTENTS OF RPER2
  (3)  050752  012737  000040  001122          MOV     #RPER2,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
  (3)  050760  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
  (3)  050764  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
  (3)  050770  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
  (3)  050776  001403                          BEQ     66$             ;BR IF OK
  (3)  051000  104006                          ERROR   6               ;TYPE MESSAGE 6
  (3)  051002  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
  (3)  051006  016037  000000  001126  66$:    MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
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(3)  051014  012737  000000  001122          MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
(3)  051022  060037  001122                  ADD     R0,$BDADR       ;ADDRESS BASE
(3)  051026  032737  020000  001126          BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
(3)  051034  001404                          BEQ     67$             ;BR IF NOT
(3)  051036  104011                          ERROR   11              ;REPORT THE ERROR
(3)  051040  012760  040000  000000          MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
(3)  051046  000240                  67$:    NOP
(3)  051050  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(3)  051054  016037  000042  001126          MOV     RPER3(R0),$BDDAT  ;GET CONTENTS OF RPER3
(3)  051062  012737  000042  001122          MOV     #RPER3,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(3)  051070  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(3)  051074  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(3)  051100  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
(3)  051106  001403                          BEQ     68$             ;BR IF OK
(3)  051110  104006                          ERROR   6               ;TYPE MESSAGE 6
(3)  051112  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(3)  051116  016037  000000  001126  68$:    MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
(3)  051124  012737  000000  001122          MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
(3)  051132  060037  001122                  ADD     R0,$BDADR       ;ADDRESS BASE
(3)  051136  032737  020000  001126          BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
(3)  051144  001404                          BEQ     69$             ;BR IF NOT
(3)  051146  104011                          ERROR   11              ;REPORT THE ERROR
(3)  051150  012760  040000  000000          MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
(3)  051156  000240                  69$:    NOP
(1)  051160  000207                          RTS     PC              ;RETURN
 9277
 9278
(3)                                  ;*****************************************************************
(4)                                  ;*TEST 42       TEST PORT INTERACTION FROM PORT 'B'
(4)                                  ;*
(4)                                  ;*VERIFY THAT THERE IS NO INTERACTION BETWEEN PORTS.
(4)                                  ;*
(4)                                  ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                                  ;*
(4)                                  ;*  B.  WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'B'.
(4)                                  ;*
(4)                                  ;*  C.  READ RPER1, RPER2, & RPER3 THROUGH PORT 'A'.  VERIFY THAT PORT
(4)                                  ;*      'A' SEES 0'S FROM EACH OF THESE REGISTERS.
(4)                                  ;*
(4)                                  ;*  D.  CLEAR RPER1, RPER2, & RPER3 THROUGH PORT 'B'.
(4)                                  ;*
(4)                                  ;*  E.  WRITE 1'S INTO RPER1, RPER2, & RPER3 THROUGH PORT 'A'.  VERIFY THAT
(4)                                  ;*      PORT 'B' SEES 0'S FROM EACH OF THESE REGISTERS.
(4)                                  ;*
(4)                                  ;*  F.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE HAS
(4)                                  ;*      SWITCHED TO PORT 'A' AND THAT THE ATTENTION BIT FOR PORT 'A' IS
(4)                                  ;*      SET AND THE ATTENTION BIT FOR PORT 'B' IS NOT SET.
(4)                                  ;*
(4)                                  ;*  G.  ISSUE A RELEASE COMMAND THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
(4)                                  ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                  ;*
(3)                                  ;*****************************************************************
(2)  051162                          TST42:
(3)  051162  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  051166  001406                          BEQ     2$              ;BR IF NOT
(3)  051170  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
(3)  051172  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
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(3)  051176  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  051204  112737  000042  001102  2$:     MOVB    #42,$TSTNM      ;TEST NUMBER
(3)  051212  012737  051234  001106          MOV     #TEST42,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  051220  012737  051234  001110          MOV     #TEST42,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  051226  012737  007640  001176          MOV     #4000.,$TIMES   ;;DO 4000. ITERATIONS
9279 051234  012706  001100          TEST42: MOV     #STACK,SP       ;LOAD THE STACK POINTER
9280
(2)                                          ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  051240  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  051246  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  051252  012760  000011  000C00          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  051260  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  051266  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  051274  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  051300  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  051306  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)
(2)                                          ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  051314  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  051322  013737  001226  001236          MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  051330  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(2)  051334  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  051342  012760  177777  000014          MOV     #-1,RPER1(R0)   ;LOAD 1'S INTO RPER1 THROUGH PORT B
(2)  051350  012760  177777  000040          MOV     #-1,RPER2(R0)   ;LOAD 1'S INTO RPER2 THROUGH PORT B
(2)  051356  012760  177777  000042          MOV     #-1,RPER3(R0)   ;LOAD 1'S INTO RPER3 THROUGH PORT B
(2)  051364  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  051372  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  051400  004737  052236                  JSR     PC,TST42B       ;CHECK THE REGISTERS THROUGH PORT A
(2)  051404  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  051412  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  051420  005060  000042                  CLR     RPER3(R0)       ;CLEAR RPER3 ON PORT B
(2)  051424  005060  000040                  CLR     RPER2(R0)       ;CLEAR RPER2 ON PORT B
(2)  051430  005060  000014                  CLR     RPER1(R0)       ;CLEAR RPER1 ON PORT B
(1)  051434  013760  001232  000016          MOV     ASR1,RPAS(R0)   ;CLEAR THE ATTENTION BIT FOR PORT B
(2)  051442  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  051450  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  051456  012760  177777  000014          MOV     #-1,RPER1(R0)   ;LOAD 1'S INTO RPER1 THROUGH PORT A
(2)  051464  012760  177777  000040          MOV     #-1,RPER2(R0)   ;LOAD 1'S INTO RPER2 THROUGH PORT A
(2)  051472  012760  177777  000042          MOV     #-1,RPER3(R0)   ;LOAD 1'S INTO RPER3 THROUGH PORT A
(2)  051500  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  051506  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  051514  004737  052236                  JSR     PC,TST42B       ;CHECK THE REGISTERS THROUGH PORT B
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  051520  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(3)  051526  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  051534  012760  000013  000000          MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                          :VERIFY THAT DRIVE IS SEIZED BY PORT A WHEN RELEASED BY PORT B
(3)
(3)  051542  005037  001250                  CLR     RELERR          ;CLEAR 'RELEASE ERROR' INDICATOR
(3)  051546  012737  111700  001124          MOV     #ATA!MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  051554  012737  000012  001122          MOV     #RPDS1,$BDADR   ;REGISTER ADDRESS INCREMENT
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(3)  051562  060037  001122                    ADD     R0,$BDADR          ;REGISTER BASE ADDRESS FOR TYPEOUT
(4)  051566  113760  001224  000010            MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A
(4)  051574  013737  001224  001234            MOV     PORTA,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  051602  016037  000012  001164            MOV     RPDS1(R0),$TMP0    ;READ STATUS REGISTER FROM PORT A
(4)  051610  113760  001226  000010            MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B
(4)  051616  013737  001226  001234            MOV     PORTB,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(3)  051624  016037  000012  001126            MOV     RPDS1(R0),$BDDAT   ;DRIVE STATUS FROM PORT B
(3)  051632  001404                            BEQ     66$                ;BR IF STATUS FROM PORT B ZERO
(3)  051634  005737  001164                    TST     $TMP0              ;IS STATUS FROM PORT A ZERO ?
(3)  051640  001401                            BEQ     66$                ;BR IF ZERO
(3)  051642  104031                            ERROR   31                 ;REPORT DRIVE IN NEUTRAL
(3)  051644  013737  001164  001126  66$:      MOV     $TMP0,$BDDAT       ;CHECK STATUS FROM PORT A
(3)  051652  013737  001224  001234            MOV     PORTA,PTNBR        ;CHANGE PORT ADDRESS FOR TYPEOUT
(3)  051660  023737  001124  001126            CMP     $GDDAT,$BDDAT      ;COMPARE WITH CONSTANT
(3)  051666  001401                            BEQ     67$                ;BR IF OK
(3)  051670  104027                            ERROR   27                 ;REPORT REGISTER ERROR
(3)  051672  000240                    67$:    NOP
(2)
(2)                                            ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  051674  113760  001224  000010            MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A
(3)  051702  013737  001224  001234            MOV     PORTA,PTNBR   ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  051710  012760  000013  000000            MOV     #13,RPCS1(R0)      ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                            ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  051716  005037  001250                    CLR     RELERR             ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  051722  012737  000012  001122            MOV     #RPDS1,$BDADR      ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  051730  060037  001122                    ADD     R0,$BDADR          ;ADD THE I/O BASE ADDRESS
(3)  051734  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  051742  113760  001224  000010            MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  051750  016037  000012  001170            MOV     RPDS1(R0),$TMP2    ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  051756  013737  001170  001164            MOV     $TMP2,$TMP0        ;COPY IT INTO '$TMP0'
(3)  051764  042737  100100  001164            BIC     #ATA!VV,$TMP0      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  051772  113760  001226  000010            MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  052000  016037  000012  001172            MOV     RPDS1(R0),$TMP3    ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  052006  013737  001172  001166            MOV     $TMP3,$TMP1        ;COPY IT INTO '$TMP1'
(3)  052014  042737  100100  001166            BIC     #ATA!VV,$TMP1      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  052022  023737  001164  001166            CMP     $TMP0,$TMP1        ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  052030  001006                            BNE     68$                ;BR IF NOT
(3)  052032  005737  001164                    TST     $TMP0              ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  052036  001045                            BNE     70$                ;BR IF NOT
(3)  052040  104046                            ERROR   46                 ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  052042  000137  052226                    JMP     72$                ;BYPASS THE REST OF THE CHECKS
(3)  052046  013737  001170  001126  68$:      MOV     $TMP2,$BDDAT       ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  052054  013737  001226  001234            MOV     PORTB,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  052062  113760  001226  000010            MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  052070  005737  001164                    TST     $TMP0              ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  052074  001414                            BEQ     69$                ;BR IF ZERO
(3)  052076  013737  001224  001234            MOV     PORTA,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  052104  013737  001172  001126            MOV     $TMP3,$BDDAT       ;'BAD DATA' FOR ERROR TYPE OUT
(3)  052112  113760  001224  000010            MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  052120  005737  001166                    TST     $TMP1              ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  052124  001012                            BNE     70$                ;BR IF NOT
(3)  052126  012737  177777  001250  69$:      MOV     #-1,RELERR         ;SET 'RELEASE ERROR' INDICATOR
(3)  052134  012760  000011  000000            MOV     #11,RPCS1(R0)      ;CLEAR THE DRIVE
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   (3)  052142  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
   (3)  052150  104026                            ERROR   26              ;TYPE ERROR MESSAGE 26
   (3)  052152  013737  001170  001126  70$:      MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
   (3)  052160  013737  001224  001234            MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
   (3)  052166  023737  001124  001170            CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
   (3)  052174  001401                            BEQ     71$             ;BR IF OK FROM PORT A.
   (3)  052176  104007                            ERROR   7               ;REPORT ERROR
   (3)  052200  013737  001172  001126  71$:      MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
   (3)  052206  013737  001226  001234            MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
   (3)  052214  023737  001124  001172            CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
   (3)  052222  001401                            BEQ     72$             ;BR IF OK
   (3)  052224  104007                            ERROR   7               ;REPORT ERROR
   (3)  052226  000240                    72$:    NOP
   (1)  052230  000004                            SCOPE                   ;LOOP ?
9281    052232  000137  052570                    JMP     TST43           ;GO TO THE NEXT TEST
   (1)
   (1)                                            ;CHECK THE REGISTERS ON THE SELECTED PORT
   (1)
   (1)  052236                            TST42B:
   (3)  052236  005037  001244                    CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
   (3)  052242  016037  000014  001126            MOV     RPER1(R0),$BDDAT  ;GET CONTENTS OF RPER1
   (3)  052250  012737  000014  001122            MOV     #RPER1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
   (3)  052256  060037  001122                    ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
   (3)  052262  005037  001124                    CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
   (3)  052266  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
   (3)  052274  001403                            BEQ     64$             ;BR IF OK
   (3)  052276  104006                            ERROR   6               ;TYPE MESSAGE 6
   (3)  052300  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
   (3)  052304  016037  000000  001126  64$:      MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
   (3)  052312  012737  000000  001122            MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
   (3)  052320  060037  001122                    ADD     R0,$BDADR       ;ADDRESS BASE
   (3)  052324  032737  020000  001126            BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
   (3)  052332  001404                            BEQ     65$             ;BR IF NOT
   (3)  052334  104011                            ERROR   11              ;REPORT THE ERROR
   (3)  052336  012760  040000  000000            MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
   (3)  052344  000240                    65$:    NOP
   (3)  052346  005037  001244                    CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
   (3)  052352  016037  000040  001126            MOV     RPER2(R0),$BDDAT  ;GET CONTENTS OF RPER2
   (3)  052360  012737  000040  001122            MOV     #RPER2,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
   (3)  052366  060037  001122                    ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
   (3)  052372  005037  001124                    CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
   (3)  052376  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
   (3)  052404  001403                            BEQ     66$             ;BR IF OK
   (3)  052406  104006                            ERROR   6               ;TYPE MESSAGE 6
   (3)  052410  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
   (3)  052414  016037  000000  001126  66$:      MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
   (3)  052422  012737  000000  001122            MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
   (3)  052430  060037  001122                    ADD     R0,$BDADR       ;ADDRESS BASE
   (3)  052434  032737  020000  001126            BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
   (3)  052442  001404                            BEQ     67$             ;BR IF NOT
   (3)  052444  104011                            ERROR   11              ;REPORT THE ERROR
   (3)  052446  012760  040000  000000            MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
   (3)  052454  000240                    67$:    NOP
   (3)  052456  005037  001244                    CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
   (3)  052462  016037  000042  001126            MOV     RPER3(R0),$BDDAT  ;GET CONTENTS OF RPER3
   (3)  052470  012737  000042  001122            MOV     #RPER3,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
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  (3)  052476  060037  001122                    ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
  (3)  052502  005037  001124                    CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
  (3)  052506  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
  (3)  052514  001403                            BEQ     68$             ;BR IF OK
  (3)  052516  104006                            ERROR   6               ;TYPE MESSAGE 6
  (3)  052520  005137  001244                    COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
  (3)  052524  016037  000000  001126  62$:      MOV     RPCS1(R0),$BDDAT  ;GET THE CONTENTS OF RHCS1
  (3)  052532  012737  000000  001122            MOV     #RPCS1,$BDADR   ;FORM ADDRESS OF REGISTER
  (3)  052540  060037  001122                    ADD     R0,$BDADR       ;ADDRESS BASE
  (3)  052544  032737  020000  001126            BIT     #MCPE,$BDDAT    ;IS 'MCPE' SET ?
  (3)  052552  001404                            BEQ     69$             ;BR IF NOT
  (3)  052554  104011                            ERROR   11              ;REPORT THE ERROR
  (3)  052556  012760  040000  000000            MOV     #TRE,RPCS1(R0)  ;CLEAR 'MCPE'
  (3)  052564  000240                    69$:     NOP
  (1)  052566  000207                            RTS     PC              ;RETURN
9282
9295
9296
  (3)                                   ;;*********************************************************************
  (3)                                   ;*TEST 43        TEST PORT 'A' ALTERNATE ATTENTION BIT PATH
  (4)                                   ;*
  (4)                                   ;*VERIFY THAT THE ALTERNATE ATTENTION REGISTER READ PATH IS OPERATIONAL.
  (4)                                   ;*
  (4)                                   ;*  A.  SET THE ATTENTION BIT FOR PORT 'A'.
  (4)                                   ;*
  (4)                                   ;*  B.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
  (4)                                   ;*
  (4)                                   ;*  C.  READ THE ATTENTION REGISTER & VERIFY THAT THE ATTENTION BIT
  (4)                                   ;*      FOR THE DRIVE IS SET.
  (4)                                   ;*
  (3)                                   ;;*********************************************************************
  (2)  052570                           TST43:
  (3)  052570  005737  001274                    TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
  (3)  052574  001406                            BEQ     2$              ;BR IF NOT
  (3)  052576  100002                            BPL     1$              ;BR IF JUST ENTERED TEST
  (3)  052600  000137  002622                    JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
  (3)  052604  012737  177777  001274  1$:       MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
  (3)  052612  112737  000043  001102  2$:       MOVB    #43,$TSTNM      ;TEST NUMBER
  (3)  052620  012737  052642  001106            MOV     #TEST43,$LPADR  ;LOAD LOOP ON TEST ADDRESS
  (3)  052626  012737  052642  001110            MOV     #TEST43,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
  (1)  052634  012737  000031  001176            MOV     #25.,$TIMES     ;;DO 25. ITERATIONS
9297   052642  012706  001100          TEST43:   MOV     #STACK,SP       ;LOAD THE STACK POINTER
9330
  (2)                                   ;CLEAR ATTENTION BITS FOR BOTH PORTS
  (2)
  (2)  052646  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
  (2)  052654  005060  000012                    CLR     RPDS1(R0)       ;SEIZE THE DRIVE
  (2)  052660  012760  000011  000000            MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
  (2)  052666  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (2)  052674  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
  (2)  052702  005060  000012                    CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
  (2)  052706  012760  000011  000000            MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
  (2)  052714  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (1)  052722  113760  001224  000010            MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
  (1)  052730  012760  177777  000014            MOV     #-1,RPER1(R0)   ;SET ERRORS TO FORCE ATTN BIT ON PORT A
  (1)  052736  005060  000014                    CLR     RPER1(R0)       ;CLEAR THE ERRORS
  (1)  052742  113760  001226  000010            MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
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(1)  052750  005760  000012          1$:     TST     RPDS1(R0)           ;WAIT FOR DRIVE TO RETURN TO NEUTRAL
(1)  052754  001775                          BEQ     1$                  ;BR IF STILL SEIZED BY PORT A
(1)  052756  012737  000016  001122          MOV     #RPAS,$BDADR        ;FORM ADDRESS OF ATTN REG IF ERROR
(1)  052764  060037  001122                  ADD     R0,$BDADR           ;ADD THE ADDRESS BASE
(1)  052770  013737  001232  001124          MOV     ASR1,$GDDAT         ;GOOD DATA FOR ERROR MESSAGE
(1)  052776  013737  001232  001166          MOV     ASR1,$TMP1          ;MAKE DATA COMPARE MASK
(1)  053004  005137  001166                  COM     $TMP1               ;COMPLEMENT IT
(1)  053010  012737  053044  001110          MOV     #2$,$LPERR          ;LOAD LOOP ON ERROR ADDRESS
(2)  053016  113760  001226  000010          MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B
(2)  053024  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  053032  013737  001226  001236          MOV     PORTB,SEIZPT        ;'SEIZED' PORT ADDRESS
(1)  053040  005060  000012                  CLR     RPDS1(R0)           ;SEIZE THE DRIVE THROUGH PORT B
(1)  053044  016037  000016  001126  2$:     MOV     RPAS(R0),$BDDAT     ;GET THE CONTENTS OF THE ATTENTION REG
(1)  053052  013737  001126  001164          MOV     $BDDAT,$TMP0        ;PUT CONTENTS INTO WORKING LOCATION
(1)  053060  043737  001166  001164          BIC     $TMP1,$TMP0         ;CLEAR OTHER BITS
(1)  053066  023737  001124  001164          CMP     $GDDAT,$TMP0        ;SEE IF ATTN BIT FOR DRIVE SET
(1)  053074  001401                          BEQ     3$                  ;BR IF SET
(1)  053076  104053                          ERROR   53                  ;REPORT THE ERROR
(1)  053100                          3$:
(2)
(2)                                          ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  053100  113760  001226  000010          MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B
(3)  053106  013737  001226  001234          MOV     PORTB,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  053114  012760  000013  000000          MOV     #13,RPCS1(R0)    ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                          ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  053122  005037  001250                  CLR     RELERR              ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  053126  012737  000012  001122          MOV     #RPDS1,$BDADR       ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  053134  060037  001122                  ADD     R0,$BDADR           ;ADD THE I/O BASE ADDRESS
(3)  053140  012737  011700  001124          MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  053146  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  053154  016037  000012  001170          MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  053162  013737  001170  001164          MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  053170  042737  100100  001164          BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  053176  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  053204  016037  000012  001172          MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  053212  013737  001172  001166          MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  053220  042737  100100  001166          BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  053226  023737  001164  001166          CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  053234  001006                          BNE     64$             ;BR IF NOT
(3)  053236  005737  001164                  TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  053242  001045                          BNE     66$             ;BR IF NOT
(3)  053244  104046                          ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  053246  000137  053446                  JMP     68$             ;BYPASS THE REST OF THE CHECKS
(3)  053252  013737  001170  001126  64$:     MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  053260  013737  001226  001234          MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  053266  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  053274  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  053300  001414                          BEQ     65$             ;BR IF ZERO
(3)  053302  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  053310  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  053316  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  053324  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  053330  001012                          BNE     66$             ;BR IF NOT
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(3)  053332  012737  177777  001250  65$:   MOV     #-1,RELERR        ;SET 'RELEASE ERROR' INDICATOR
(3)  053340  012760  000011  000000          MOV     #11,RPCS1(R0)     ;CLEAR THE DRIVE
(3)  053346  012760  000013  000000          MOV     #13,RPCS1(R0)     ;RELEASE THE DRIVE
(3)  053354  104026                          ERROR   26                ;TYPE ERROR MESSAGE 26
(3)  053356  013737  001170  001126  66$:   MOV     $TMP2,$BDDAT      ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  053364  013737  001224  001234          MOV     PORTA,PTNBR       ;CHANGE PORT NUMBER
(3)  053372  042737  100000  001170          BIC     #ATA,$TMP2        ;DON'T CHECK THE ATTN BIT
(3)  053400  023737  001124  001170          CMP     $GDDAT,$TMP2      ;ALL BITS OK ?
(3)  053406  001401                          BEQ     67$               ;BR IF OK FROM PORT A.
(3)  053410  104007                          ERROR   7                 ;REPORT ERROR
(3)  053412  013737  001172  001126  67$:   MOV     $TMP3,$BDDAT      ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  053420  013737  001226  001234          MOV     PORTB,PTNBR       ;CHANGE PORT NUMBER
(3)  053426  042737  100000  001172          BIC     #ATA,$TMP3        ;DON'T CHECK THE ATTN BIT
(3)  053434  023737  001124  001172          CMP     $GDDAT,$TMP3      ;SEE IF READ OK FROM PORT B.
(3)  053442  001401                          BEQ     68$               ;BR IF OK
(3)  053444  104007                          ERROR   7                 ;REPORT ERROR
(3)  053446  000240                  68$:    NOP
(1)  053450  000004                          SCOPE                     ;LOOP ?
9343
9344
(3)                                  ;;**********************************************************************
(4)                                  ;*TEST 44       TEST PORT 'B' ALTERNATE ATTENTION BIT PATH
(4)                                  ;*
(4)                                  ;*VERIFY THAT THE ALTERNATE ATTENTION REGISTER READ PATH IS OPERATIONAL.
(4)                                  ;*
(4)                                  ;*  A.  SET THE ATTENTION BIT FOR PORT 'B'.
(4)                                  ;*
(4)                                  ;*  B.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(4)                                  ;*
(4)                                  ;*  C.  READ THE ATTENTION REGISTER & VERIFY THAT THE ATTENTION BIT
(4)                                  ;*      FOR THE DRIVE IS SET.
(4)                                  ;*
(3)                                  ;;**********************************************************************
(2)  053452                          TST44:
(3)  053452  005737  001274                  TST     KYBCTL            ;PERFORMING ONLY SINGLE TESTS ?
(3)  053456  001406                          BEQ     2$                ;BR IF NOT
(3)  053460  100002                          BPL     1$                ;BR IF JUST ENTERED TEST
(3)  053462  000137  002622                  JMP     EXEC              ;RETURN & GET NEXT TEST NUMBER
(3)  053466  012737  177777  001274  1$:    MOV     #-1,KYBCTL        ;SET SINGLE TEST INDICATOR
(3)  053474  112737  000044  001102  2$:    MOVB    #44,$TSTNM        ;TEST NUMBER
(3)  053502  012737  053524  001106          MOV     #TEST44,$LPADR    ;LOAD LOOP ON TEST ADDRESS
(3)  053510  012737  053524  001110          MOV     #TEST44,$LPERR    ;LOAD LOOP ON ERROR ADDRESS
(1)  053516  012737  000031  001176          MOV     #25.,$TIMES       ;;DO 25. ITERATIONS
9345 053524  012706  001100          TEST44: MOV     #STACK,SP         ;LOAD THE STACK POINTER
9346
(2)                                  ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  053530  113760  001224  000010          MOVB    PORTA,RPCS2(R0)   ;SELECT PORT #A
(2)  053536  005060  000012                  CLR     RPDS1(R0)         ;SEIZE THE DRIVE
(2)  053542  012760  000011  000000          MOV     #11,RPCS1(R0)     ;ISSUE DRIVE CLEAR
(2)  053550  012760  000013  000000          MOV     #13,RPCS1(R0)     ;RELEASE THE DRIVE
(2)  053556  113760  001226  000010          MOVB    PORTB,RPCS2(R0)   ;SELECT PORT #B
(2)  053564  005060  000012                  CLR     RPDS1(R0)         ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  053570  012760  000011  000000          MOV     #11,RPCS1(R0)     ;ISSUE DRIVE CLEAR
(2)  053576  012760  000013  000000          MOV     #13,RPCS1(R0)     ;RELEASE THE DRIVE
(1)  053604  113760  001226  000010          MOVB    PORTB,RPCS2(R0)   ;SELECT PORT B
(1)  053612  012760  177777  000014          MOV     #-1,RPER1(R0)     ;SET ERRORS TO FORCE ATTN BIT ON PORT B
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(1)  053620  005060  000014                    CLR     RPER1(R0)           ;CLEAR THE ERRORS
(1)  053624  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(1)  053632  005760  000012            1$:     TST     RPDS1(R0)           ;WAIT FOR DRIVE TO RETURN TO NEUTRAL
(1)  053636  001775                            BEQ     1$                  ;BR IF STILL SEIZED BY PORT B
(1)  053640  012737  000016  001122            MOV     #RPAS,$BDADR        ;FORM ADDRESS OF ATTN REG IF ERROR
(1)  053646  060037  001122                    ADD     R0,$BDADR           ;ADD THE ADDRESS BASE
(1)  053652  013737  001232  001124            MOV     ASR1,$GDDAT         ;GOOD DATA FOR ERROR MESSAGE
(1)  053660  013737  001232  001166            MOV     ASR1,$TMP1          ;MAKE DATA COMPARE MASK
(1)  053666  005137  001166                    COM     $TMP1               ;COMPLEMENT IT
(1)  053672  012737  053726  001110            MOV     #2$,$LPERR          ;LOAD LOOP ON ERROR ADDRESS
(2)  053700  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(2)  053706  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)  053714  013737  001224  001236            MOV     PORTA,SEIZPT        ;'SEIZED' PORT ADDRESS
(1)  053722  005060  000012                    CLR     RPDS1(R0)           ;SEIZE THE DRIVE THROUGH PORT A
(1)  053726  016037  000016  001126    2$:     MOV     RPAS(R0),$BDDAT     ;GET THE CONTENTS OF THE ATTENTION REG
(1)  053734  013737  001126  001164            MOV     $BDDAT,$TMP0        ;PUT CONTENTS INTO WORKING LOCATION
(1)  053742  043737  001166  001164            BIC     $TMP1,$TMP0         ;CLEAR OTHER BITS
(1)  053750  023737  001124  001164            CMP     $GDDAT,$TMP0        ;SEE IF ATTN BIT FOR DRIVE SET
(1)  053756  001401                            BEQ     3$                  ;BR IF SET
(1)  053760  104053                            ERROR   53                  ;REPORT THE ERROR
(1)  053762                            3$:
(2)
(2)                                            ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  053762  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A
(3)  053770  013737  001224  001234            MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  053776  012760  000013  000000            MOV     #13,RPCS1(R0)       ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                            ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  054004  005037  001250                    CLR     RELERR              ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  054010  012737  000012  001122            MOV     #RPDS1,$BDADR       ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  054016  060037  001122                    ADD     R0,$BDADR           ;ADD THE I/O BASE ADDRESS
(3)  054022  012737  011700  001124            MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  054030  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A.
(3)  054036  016037  000012  001170            MOV     RPDS1(R0),$TMP2     ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  054044  013737  001170  001164            MOV     $TMP2,$TMP0         ;COPY IT INTO '$TMP0'
(3)  054052  042737  100100  001164            BIC     #ATA!VV,$TMP0       ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  054060  113760  001226  000010            MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B.
(3)  054066  016037  000012  001172            MOV     RPDS1(R0),$TMP3     ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  054074  013737  001172  001166            MOV     $TMP3,$TMP1         ;COPY IT INTO '$TMP1'
(3)  054102  042737  100100  001166            BIC     #ATA!VV,$TMP1       ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  054110  023737  001164  001166            CMP     $TMP0,$TMP1         ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  054116  001006                            BNE     64$                 ;BR IF NOT
(3)  054120  005737  001164                    TST     $TMP0               ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  054124  001045                            BNE     66$                 ;BR IF NOT
(3)  054126  104046                            ERROR   46                  ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  054130  000137  054330                    JMP     68$                 ;BYPASS THE REST OF THE CHECKS
(3)  054134  013737  001170  001126    64$:    MOV     $TMP2,$BDDAT        ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  054142  013737  001226  001234            MOV     PORTB,PTNBR         ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  054150  113760  001226  000010            MOVB    PORTB,RPCS2(R0)     ;SELECT PORT B.
(3)  054156  005737  001164                    TST     $TMP0               ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  054162  001414                            BEQ     65$                 ;BR IF ZERO
(3)  054164  013737  001224  001234            MOV     PORTA,PTNBR         ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  054172  013737  001172  001126            MOV     $TMP3,$BDDAT        ;'BAD DATA' FOR ERROR TYPE OUT
(3)  054200  113760  001224  000010            MOVB    PORTA,RPCS2(R0)     ;SELECT PORT A.
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(3)  054206  005737  001166                    TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  054212  001012                            BNE     66$             ;BR IF NOT
(3)  054214  012737  177777  001250  65$:      MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  054222  012760  000011  000000            MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  054230  012760  000013  000000            MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  054236  104026                            ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  054240  013737  001170  001126  66$:      MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  054246  013737  001224  001234            MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  054254  042737  100000  001170            BIC     #ATA,$TMP2      ;DON'T CHECK THE ATTN BIT
(3)  054262  023737  001124  001170            CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  054270  001401                            BEQ     67$             ;BR IF OK FROM PORT A.
(3)  054272  104007                            ERROR   7               ;REPORT ERROR
(3)  054274  013737  001172  001126  67$:      MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  054302  013737  001226  001234            MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  054310  042737  100000  001172            BIC     #ATA,$TMP3      ;DON'T CHECK THE ATTN BIT
(3)  054316  023737  001124  001172            CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  054324  001401                            BEQ     68$             ;BR IF OK
(3)  054326  104007                            ERROR   7               ;REPORT ERROR
(3)  054330  000240                    68$:    NOP
(1)  054332  000004                            SCOPE                   ;LOOP ?
9347 054334  000137  056254                    JMP     $EOP            ;GO TO END OF TEST
9348
9349                            ;;*****************************************************************
9350
9351                            .SBTTL  *** SPECIAL TESTS FOR THE M7775 ('DP') BOARD ***
9352
9353                            ;;*****************************************************************
9354
9375
9376                            ;;*****************************************************************
(3)                             ;*TEST 45       TEST NO TIMEOUT THROUGH PORT 'A'
(4)                             ;*
(4)                             ;*VERIFY THAT THE TIMEOUT ONE-SHOT IS NOT TRIGGERED WHEN THE DRIVE
(4)                             ;*      SWITCHES PORTS AND SEIZING PORT PERFORMS NO REGISTER ACCESSES.
(4)                             ;*
(4)                             ;*  A.  SEIZE THE DRIVE THROUGH PORT 'B' BY WRITING 0'S INTO RPDS1.
(4)                             ;*
(4)                             ;*  B.  SET PORT REQUEST BY WRITING 0'S INTO RPDS1 FROM PORT 'A'.
(4)                             ;*
(4)                             ;*  C.  ISSUE A RELEASE COMMAND FROM PORT 'B'.  VERIFY THAT THE DRIVE
(4)                             ;*      HAS SWITCHED TO THE OTHER PORT AND THAT THE 'ATA' BIT DID NOT
(4)                             ;*      SET FOR PORT 'B'.  REGISTERS WILL NOT BE CHECKED THROUGH PORT 'A'.
(4)                             ;*
(4)                             ;*  D.  WAIT THE TIMEOUT INTERVAL + 25%.  VERIFY THAT THE DRIVE HAS NOT
(4)                             ;*      BEEN RELEASED.
(4)                             ;*
(4)                             ;*  E.  RELEASE THE DRIVE THROUGH PORT 'A'.  VERIFY THAT THE DRIVE
(4)                             ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                             ;*
(3)                             ;*****************************************************************
(2)  054340                     TST45:
(3)  054340  005737  001274                    TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  054344  001406                            BEQ     2$              ;BR IF NOT
(3)  054346  100002                            BPL     1$              ;BR IF JUST ENTERED TEST
(3)  054350  000137  002622                    JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  054354  012737  177777  001274  1$:       MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
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(3)  054362  112737  000045  001102  2$:     MOVB    #45,$TSTNM      ;TEST NUMBER
(3)  054370  012737  054412  001106          MOV     #TEST45,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  054376  012737  054412  001110          MOV     #TEST45,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
(1)  054404  012737  000004  001176          MOV     #4,$TIMES       ;;DO 4 ITERATIONS
9377 054412  012706  001100          TEST45: MOV     #STACK,SP       ;LOAD THE STACK POINTER
9425
(2)                                          ;CLEAR ATTENTION BITS FOR BOTH PORTS
(2)
(2)  054416  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
(2)  054424  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
(2)  054430  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  054436  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(2)  054444  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
(2)  054452  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
(2)  054456  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
(2)  054464  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(1)
(2)                                          ;;*****************************************************************
(2)
(2)                                          ;SEIZE THE DRIVE THROUGH PORT B
(2)
(2)  054472  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  054500  013737  001226  001236          MOV     PORTB,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
(2)  054506  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
(2)  054512  013737  001224  001240          MOV     PORTA,OPPRT     ;'OPPOSITE' PORT ADDRESS
(2)  054520  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
(2)  054526  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;SET REQUEST THROUGH PORT A
(1)
(1)  054534  005060  000012                  CLR     RPDS1(R0)       ;SET REQUEST FOR PORT A
(2)  054540  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
(2)  054546  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;RELEASE THE DRIVE THROUGH PORT B
(1)
(1)  054554  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE DRIVE THROUGH PORT B
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;WAIT THE MEASURED TIMEOUT FOR THE PORT (+ 25%)
(1)
(1)  054562  013737  001260  001254          MOV     TIMEAP,WATCH    ;SET WATCH TO MEASURED TIMEOUT VALUE + 25%
(1)
(2)                                          ;;*****************************************************************
(1)                                          ;VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT A
(1)
(2)  054570  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  054574  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  054602  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  054610  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  054614  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  054620  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
(2)  054626  001403                          BEQ     66$             ;BR IF OK
(2)  054630  104031                          ERROR   31              ;TYPE MESSAGE 31
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(2)  054632  005137  001244            COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  054636  000240                66$: NOP
(1)  054640  005737  001244            TST     CKERR           ;REGISTER OK ?
(1)  054644  001402                    BEQ     .+6             ;BR IF OK
(1)  054646  000137  055304            JMP     1$              ;BYPASS REST OF TEST IF NOT
(1)  054652  005737  001254            TST     WATCH           ;WATCH EQUAL ZERO ?
(1)  054656  001375                    BNE     .-4             ;BR IF NOT
(1)
(2)                                ;;*****************************************************************
(1)                                ;CONFIRM THAT THE DRIVE HAS NOT TIMED OUT
(1)
(1)  054660  013737  001224  001234        MOV     PORTA,PTNBR     ;PORT NUMBER FOR TYPEOUT
(2)  054666  005037  001244                CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  054672  016037  000012  001126        MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
(2)  054700  012737  000012  001122        MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  054706  060037  001122                ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
(2)  054712  005037  001124                CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
(2)  054716  023737  001124  001126        CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
(2)  054724  001403                        BEQ     68$             ;BR IF OK
(2)  054726  104035                        ERROR   35              ;TYPE MESSAGE 35
(2)  054730  005137  001244                COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  054734  000240                68$: NOP
(1)  054736  005737  001244            TST     CKERR           ;REGISTER OK ?
(1)  054742  001402                    BEQ     .+6             ;BR IF OK
(1)  054744  000137  055304            JMP     1$              ;BYPASS REST OF TEST IF NOT
(1)
(2)                                ;;*****************************************************************
(2)
(2)                                ;RELEASE THE DRIVE FROM PORT A
(2)
(3)  054750  113760  001224  000010        MOVB    PORTA,RPCS2(R0)  ;SELECT PORT A
(3)  054756  013737  001224  001234        MOV     PORTA,PTNBR  ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  054764  012760  000013  000000        MOV     #13,RPCS1(R0)   ;ISSUE RELEASE THROUGH PORT A
(3)
(3)                                ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  054772  005037  001250            CLR     RELERR          ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  054776  012737  000012  001122        MOV     #RPDS1,$BDADR   ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  055004  060037  001122                ADD     R0,$BDADR       ;ADD THE I/O BASE ADDRESS
(3)  055010  012737  011700  001124        MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  055016  113760  001224  000010        MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  055024  016037  000012  001170        MOV     RPDS1(R0),$TMP2 ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  055032  013737  001170  001164        MOV     $TMP2,$TMP0     ;COPY IT INTO '$TMP0'
(3)  055040  042737  100100  001164        BIC     #ATA!VV,$TMP0   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  055046  113760  001226  000010        MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  055054  016037  000012  001172        MOV     RPDS1(R0),$TMP3 ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  055062  013737  001172  001166        MOV     $TMP3,$TMP1     ;COPY IT INTO '$TMP1'
(3)  055070  042737  100100  001166        BIC     #ATA!VV,$TMP1   ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  055076  023737  001164  001166        CMP     $TMP0,$TMP1     ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  055104  001006                        BNE     70$             ;BR IF NOT
(3)  055106  005737  001164                TST     $TMP0           ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  055112  001045                        BNE     72$             ;BR IF NOT
(3)  055114  104046                        ERROR   46              ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  055116  000137  055302                JMP     74$             ;BYPASS THE REST OF THE CHECKS
(3)  055122  013737  001170  001126  70$:   MOV     $TMP2,$BDDAT    ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  055130  013737  001226  001234        MOV     PORTB,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
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(3)  055136  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B.
(3)  055144  005737  001164                  TST     $TMP0           ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  055150  001414                          BEQ     71$             ;BR IF ZERO
(3)  055152  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  055160  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  055166  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  055174  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  055200  001012                          BNE     72$             ;BR IF NOT
(3)  055202  012737  177777  001250  71$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  055210  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  055216  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  055224  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  055226  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  055234  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  055242  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  055250  001401                          BEQ     73$             ;BR IF OK FROM PORT A.
(3)  055252  104007                          ERROR   7               ;REPORT ERROR
(3)  055254  013737  001172  001126  73$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  055262  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  055270  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  055276  001401                          BEQ     74$             ;BR IF OK
(3)  055300  104007                          ERROR   7               ;REPORT ERROR
(3)  055302  000240                  74$:    NOP
(1)
(1)  055304  000004                  1$:     SCOPE                   ;LOOP ?
 9446
 9447
(3)                                          ;;*********************************************************************
(4)                                          ;*TEST 46       TEST NO TIMEOUT THROUGH PORT 'B'
(4)                                          ;*
(4)                                          ;*VERIFY THAT THE TIMEOUT ONE-SHOT IS NOT TRIGGERED WHEN THE DRIVE
(4)                                          ;*      SWITCHES PORTS AND SEIZING PORT PERFORMS NO REGISTER ACCESSES.
(4)                                          ;*
(4)                                          ;*  A.  SEIZE THE DRIVE THROUGH PORT 'A' BY WRITING 0'S INTO RPDS1.
(4)                                          ;*
(4)                                          ;*  B.  SET PORT REQUEST BY WRITING 0'S INTO RPDS1 FROM PORT 'B'.
(4)                                          ;*
(4)                                          ;*  C.  ISSUE A RELEASE COMMAND FROM PORT 'A'.  VERIFY THAT THE DRIVE
(4)                                          ;*      HAS SWITCHED TO THE OTHER PORT AND THAT THE 'ATA' BIT DID NOT
(4)                                          ;*      SET FOR PORT 'A'.  REGISTERS WILL NOT BE CHECKED THROUGH PORT 'B'.
(4)                                          ;*
(4)                                          ;*  D.  WAIT THE TIMEOUT INTERVAL + 25%.  VERIFY THAT THE DRIVE HAS NOT
(4)                                          ;*      BEEN RELEASED.
(4)                                          ;*
(4)                                          ;*  E.  RELEASE THE DRIVE THROUGH PORT 'B'.  VERIFY THAT THE DRIVE
(4)                                          ;*      RETURNED TO NEUTRAL AND THAT NEITHER ATTENTION BIT IS SET.
(4)                                          ;*
(3)                                          ;;*********************************************************************
(2)  055306                          TST46:
(3)  055306  005737  001274                  TST     KYBCTL          ;PERFORMING ONLY SINGLE TESTS ?
(3)  055312  001406                          BEQ     2$              ;BR IF NOT
(3)  055314  100002                          BPL     1$              ;BR IF JUST ENTERED TEST
(3)  055316  000137  002622                  JMP     EXEC            ;RETURN & GET NEXT TEST NUMBER
(3)  055322  012737  177777  001274  1$:     MOV     #-1,KYBCTL      ;SET SINGLE TEST INDICATOR
(3)  055330  112737  000046  001102  2$:     MOVB    #46,$TSTNM      ;TEST NUMBER
(3)  055336  012737  055360  001106          MOV     #TEST46,$LPADR  ;LOAD LOOP ON TEST ADDRESS
(3)  055344  012737  055360  001110          MOV     #TEST46,$LPERR  ;LOAD LOOP ON ERROR ADDRESS
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  (1)  055352  012737  000004  001176          MOV     #4,$TIMES       ;;DO 4 ITERATIONS
9448   055360  012706  001100          TEST46: MOV     #STACK,SP       ;LOAD THE STACK POINTER
9449
  (2)                                           ;CLEAR ATTENTION BITS FOR BOTH PORTS
  (2)
  (2)  055364  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT #A
  (2)  055372  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE
  (2)  055376  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
  (2)  055404  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (2)  055412  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT #B
  (2)  055420  005060  000012                  CLR     RPDS1(R0)       ;SEIZE THE DRIVE THROUGH PORT 'B'
  (2)  055424  012760  000011  000000          MOV     #11,RPCS1(R0)   ;ISSUE DRIVE CLEAR
  (2)  055432  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
  (1)
  (2)                                       ;;**********************************************************************
  (2)
  (2)                                           ;SEIZE THE DRIVE THROUGH PORT A
  (2)
  (2)  055440  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
  (2)  055446  013737  001224  001236          MOV     PORTA,SEIZPT    ;STORE SEIZING PORT'S ADDRESS
  (2)  055454  005060  000012                  CLR     RPDS1(R0)       ;WRITE RPDS1
  (2)  055460  013737  001226  001240          MOV     PORTB,OPPRT     ;'OPPOSITE' PORT ADDRESS
  (2)  055466  113760  001226  000010          MOVB    PORTB,RPCS2(R0) ;SELECT PORT B
  (2)  055474  013737  001226  001234          MOV     PORTB,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
  (1)
  (2)                                       ;;**********************************************************************
  (1)                                       ;SET REQUEST THROUGH PORT B
  (1)
  (1)  055502  005060  000012                  CLR     RPDS1(R0)       ;SET REQUEST FOR PORT B
  (2)  055506  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A
  (2)  055514  013737  001224  001234          MOV     PORTA,PTNBR     ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
  (1)
  (2)                                       ;;**********************************************************************
  (1)                                       ;RELEASE THE DRIVE THROUGH PORT A
  (1)
  (1)  055522  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE DRIVE THROUGH PORT A
  (1)
  (2)                                       ;;**********************************************************************
  (1)                                       ;WAIT THE MEASURED TIMEOUT FOR THE PORT (+ 25%)
  (1)
  (1)  055530  013737  001266  001254          MOV     TIMEBP,WATCH    ;SET WATCH TO MEASURED TIMEOUT VALUE + 25%
  (1)
  (2)                                       ;;**********************************************************************
  (1)                                       ;VERIFY THAT THE DRIVE IS STILL SEIZED BY PORT B
  (1)
  (2)  055536  005037  001244                  CLR     CKERR           ;CLEAR THE 'CHECK ERROR' INDICATOR
  (2)  055542  016037  000012  001126          MOV     RPDS1(R0),$BDDAT  ;GET CONTENTS OF RPDS1
  (2)  055550  012737  000012  001122          MOV     #RPDS1,$BDADR   ;FORM REGISTER ADDRESS OF ERROR MESSAGE
  (2)  055556  060037  001122                  ADD     R0,$BDADR       ;ADD RH11 BASE ADDRESS
  (2)  055562  005037  001124                  CLR     $GDDAT          ;WHAT REGISTER SHOULD BE
  (2)  055566  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;IS THE REGISTER OK ?
  (2)  055574  001403                          BEQ     66$             ;BR IF OK
  (2)  055576  104031                          ERROR   31              ;TYPE MESSAGE 31
  (2)  055600  005137  001244                  COM     CKERR           ;SET THE REGISTER COMPARE ERROR INDICATOR
  (2)  055604  000240                  66$:    NOP
  (1)  055606  005737  001244                  TST     CKERR           ;REGISTER OK ?
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(1)  055612  001402                        BEQ     .+6                ;BR IF OK
(1)  055614  000137  056252                JMP     1$                 ;BYPASS REST OF TEST IF NOT
(1)  055620  005737  001254                TST     WATCH              ;WATCH EQUAL ZERO ?
(1)  055624  001375                        BNE     .-4                ;BR IF NOT
(1)
(2)                                  ;;*****************************************************************
(1)                                  ;CONFIRM THAT THE DRIVE HAS NOT TIMED OUT
(1)
(1)  055626  013737  001226  001234        MOV     PORTB,PTNBR        ;PORT NUMBER FOR TYPEOUT
(2)  055634  005037  001244                CLR     CKERR              ;CLEAR THE 'CHECK ERROR' INDICATOR
(2)  055640  016037  000012  001126        MOV     RPDS1(R0),$BDDAT   ;GET CONTENTS OF RPDS1
(2)  055646  012737  000012  001122        MOV     #RPDS1,$BDADR      ;FORM REGISTER ADDRESS OF ERROR MESSAGE
(2)  055654  060037  001122                ADD     R0,$BDADR          ;ADD RH11 BASE ADDRESS
(2)  055660  005037  001124                CLR     $GDDAT             ;WHAT REGISTER SHOULD BE
(2)  055664  023737  001124  001126        CMP     $GDDAT,$BDDAT      ;IS THE REGISTER OK ?
(2)  055672  001403                        BEQ     68$                ;BR IF OK
(2)  055674  104035                        ERROR   35                 ;TYPE MESSAGE 35
(2)  055676  005137  001244                COM     CKERR              ;SET THE REGISTER COMPARE ERROR INDICATOR
(2)  055702  000240                  68$:  NOP
(1)  055704  005737  001244                TST     CKERR              ;REGISTER OK ?
(1)  055710  001402                        BEQ     .+6                ;BR IF OK
(1)  055712  000137  056252                JMP     1$                 ;BYPASS REST OF TEST IF NOT
(1)
(2)                                  ;;*****************************************************************
(2)
(2)                                        ;RELEASE THE DRIVE FROM PORT B
(2)
(3)  055716  113760  001226  000010        MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B
(3)  055724  013737  001226  001234        MOV     PORTB,PTNBR        ;MOVE PORT ADDRESS TO LOCATION FOR TYPEOUT
(2)  055732  012760  000013  000000        MOV     #13,RPCS1(R0)      ;ISSUE RELEASE THROUGH PORT B
(3)
(3)                                        ;VERIFY THAT THE DRIVE IS IN NEUTRAL
(3)
(3)  055740  005037  001250                CLR     RELERR             ;CLEAR THE 'RELEASE ERROR ' INDICATOR
(3)  055744  012737  000012  001122        MOV     #RPDS1,$BDADR      ;FORM THE ADDRESS OF RPDS1 FOR TYPEOUT
(3)  055752  060037  001122                ADD     R0,$BDADR          ;ADD THE I/O BASE ADDRESS
(3)  055756  012737  011700  001124        MOV     #MOL!PGM!DPR!DRY!VV,$GDDAT  ;COMPARISON CONSTANT
(3)  055764  113760  001224  000010        MOVB    PORTA,RPCS2(R0)    ;SELECT PORT A.
(3)  055772  016037  000012  001170        MOV     RPDS1(R0),$TMP2    ;GET THE DRIVE STATUS REGISTER FROM PORT A.
(3)  056000  013737  001170  001164        MOV     $TMP2,$TMP0        ;COPY IT INTO '$TMP0'
(3)  056006  042737  100100  001164        BIC     #ATA!VV,$TMP0      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  056014  113760  001226  000010        MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  056022  016037  000012  001172        MOV     RPDS1(R0),$TMP3    ;GET THE DRIVE STATUS REGISTER FROM PORT B.
(3)  056030  013737  001172  001166        MOV     $TMP3,$TMP1        ;COPY IT INTO '$TMP1'
(3)  056036  042737  100100  001166        BIC     #ATA!VV,$TMP1      ;CLEAR PORT DEPENDENT BITS FROM THE COPY
(3)  056044  023737  001164  001166        CMP     $TMP0,$TMP1        ;IS THE STATUS REGISTER THE SAME FROM BOTH PORTS ?
(3)  056052  001006                        BNE     70$                ;BR IF NOT
(3)  056054  005737  001164                TST     $TMP0              ;REGISTERS ARE THE SAME: ARE THEY ZERO ?
(3)  056060  001045                        BNE     72$                ;BR IF NOT
(3)  056062  104046                        ERROR   46                 ;REPORT DRIVE NOT IN NEUTRAL OR NOT SEIZED
(3)  056064  000137  056250                JMP     74$                ;BYPASS THE REST OF THE CHECKS
(3)  056070  013737  001170  001126  70$:  MOV     $TMP2,$BDDAT       ;SET UP POSSIBLE BAD DATA FOR ERROR MESSAGE
(3)  056076  013737  001226  001234        MOV     PORTB,PTNBR        ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  056104  113760  001226  000010        MOVB    PORTB,RPCS2(R0)    ;SELECT PORT B.
(3)  056112  005737  001164                TST     $TMP0              ;SEE IF STATUS EQ 0 FROM PORT A.
(3)  056116  001414                        BEQ     71$                ;BR IF ZERO
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(3)  056120  013737  001224  001234          MOV     PORTA,PTNBR     ;SEIZING PORT IF TEST SHOWS DRIVE NOT IN NEUTRAL
(3)  056126  013737  001172  001126          MOV     $TMP3,$BDDAT    ;'BAD DATA' FOR ERROR TYPE OUT
(3)  056134  113760  001224  000010          MOVB    PORTA,RPCS2(R0) ;SELECT PORT A.
(3)  056142  005737  001166                  TST     $TMP1           ;SEE IF STATUS EQ ZERO FROM PORT B.
(3)  056146  001012                          BNE     72$             ;BR IF NOT
(3)  056150  012737  177777  001250  71$:    MOV     #-1,RELERR      ;SET 'RELEASE ERROR' INDICATOR
(3)  056156  012760  000011  000000          MOV     #11,RPCS1(R0)   ;CLEAR THE DRIVE
(3)  056164  012760  000013  000000          MOV     #13,RPCS1(R0)   ;RELEASE THE DRIVE
(3)  056172  104026                          ERROR   26              ;TYPE ERROR MESSAGE 26
(3)  056174  013737  001170  001126  72$:    MOV     $TMP2,$BDDAT    ;LOOK FOR BIT FAILURES WHEN RPDS1 READ
(3)  056202  013737  001224  001234          MOV     PORTA,PTNBR     ;CHANGE PORT NUMBER
(3)  056210  023737  001124  001170          CMP     $GDDAT,$TMP2    ;ALL BITS OK ?
(3)  056216  001401                          BEQ     73$             ;BR IF OK FROM PORT A.
(3)  056220  104007                          ERROR   7               ;REPORT ERROR
(3)  056222  013737  001172  001126  73$:    MOV     $TMP3,$BDDAT    ;CHECK RPDS1 FOR BIT FAILURES - FROM PORT B.
(3)  056230  013737  001226  001234          MOV     PORTB,PTNBR     ;CHANGE PORT NUMBER
(3)  056236  023737  001124  001172          CMP     $GDDAT,$TMP3    ;SEE IF READ OK FROM PORT B.
(3)  056244  001401                          BEQ     74$             ;BR IF OK
(3)  056246  104007                          ERROR   7               ;REPORT ERROR
(3)  056250  000240                  74$:    NOP
(1)
(1)  056252  000004                  1$:     SCOPE                   ;LOOP ?
9450
9456                                 .SBTTL  END OF PASS ROUTINE
(1)
(2)                                  ;;*********************************************************************
(1)                                  ;*INCREMENT THE PASS NUMBER ($PASS)
(1)                                  ;*INDICATE END-OF-PROGRAM AFTER 1 PASSES THRU THE PROGRAM
(1)                                  ;*TYPE "END PASS #XXXXX TOTAL NUMBER OF ERRORS SINCE LAST REPORT YYYYY"
(1)                                  ;*WHERE XXXXX AND YYYYY ARE DECIMAL NUMBERS
(1)                                  ;*IF THERES A MONITOR GO TO IT
(1)                                  ;*IF THERE ISN'T JUMP TO TSTIAA
(1)
(1)  056254                          $EOP:
(3)  056254  005737  001274                  TST     KYBCTL          ;ENTERED TEST VIA KEYBOARD COMMAND ?
(3)  056260  001402                          BEQ     .+6             ;BR IF NOT
(3)  056262  000137  002622                  JMP     EXEC            ;RETURN TO KEYBOARD CONTROL
(1)  056266  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
(1)  056272  005037  001176                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
(1)  056276  005237  001100                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
(1)  056302  042737  100000  001100          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
(1)  056310  005327                          DEC     (PC)+           ;;LOOP?
(1)  056312  000001                  $EOPCT: .WORD   1
(1)  056314  003063                          BGT     $DOAGN          ;;YES
(1)  056316  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
(1)  056320  000001                  $ENDCT: .WORD   1
(1)  056322  056312                          $EOPCT
(2)  056324  104401  056332                  TYPE    ,65$            ;;TYPE ASCIZ STRING
(2)  056330  000407                          BR      64$             ;;GET OVER THE ASCIZ
(2)                                  ;;65$:  .ASCIZ  <12><15>/END PASS #/
(2)  056350                          64$:
(2)  056350  013746  001100                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
(2)                                                                  ;;TYPE PASS NUMBER
(2)  056354  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
(2)  056356  104401  056364                  TYPE    ,67$            ;;TYPE ASCIZ STRING
(2)  056362  000421                          BR      66$             ;;GET OVER THE ASCIZ
```

```
(2)                                     ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
(2)     056426                          66$:
(2)     056426  013746  001112                MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
(2)                                                                     ;;TOTAL NUMBER OF ERRORS
(2)     056432  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
(1)     056434  104401  001207                TYPE    $CRLF           ;;TYPE CARRIAGE RETURN, LINE FEED
(1)     056440  005037  001112                CLR     $ERTTL          ;;CLEAR ERROR TOTAL
(1)     056444  013700  000042        $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
(1)     056450  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
(1)     056452  000005                          RESET                   ;;CLEAR THE WORLD
(1)     056454  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
(1)     056456  000240                          NOP                     ;;SAVE ROOM
(1)     056460  000240                          NOP                     ;;FOR
(1)     056462  000240                          NOP                     ;;ACT11
(1)     056464                          $DOAGN:
(1)     056464  000137                          JMP     @(PC)+          ;;RETURN
(1)     056466  003114                  $RTNAD: .WORD   TST1AA
(1)     056470     377      377     000 $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
(1)             056474                          .EVEN
 9457
 9458                                   ;;*****************************************************************
 9459
 9460                                   .SBTTL  *** SUBROUTINES ***
 9461
 9462                                   ;;*****************************************************************
 9463
 9464
 9465                                   ;ROUTINE TO CHECK FOR KW11-L OR KW11-P CLOCKS
 9466                                   ;IF CLOCK IS PRESENT, THE CLOCK WILL BE STARTED
 9467
 9468   056474  012737  056544  000004 CKCLK:  MOV     #CKCLK1,@#ERRVEC  ;SET UP VECTOR FOR CLOCK CHECK
 9469   056502  005037  000006                 CLR     @#ERRVEC+2        ;NEW PSW
 9470   056506  005777  122500                 TST     @$LKCSR         ;CHECK FOR KW11-P
 9471   056512  013701  001216                 MOV     $LPVEC,R1       ;KW11-P VECTOR ADDRESS
 9472   056516  012721  056626                 MOV     #CLOCK,(R1)+    ;SET UP KW11-P VECTOR
 9473   056522  012711  000300                 MOV     #300,(R1)       ;PSW - PRI 6
 9474   056526  012777  177777  122460         MOV     #-1,@$LKCSB     ;LOAD COUNTER BUFFER WITH 1'S
 9475   056534  012777  000135  122450         MOV     #135,@$LKCSR    ;SET CLOCK - CNT UP, 16MS, CONT INT
 9476   056542  000425                 BR      CKCLK3
 9477   056544  062706  000004         CKCLK1: ADD     #4,SP           ;RESTORE THE STACK POINTER
 9478   056550  012737  056606  000004         MOV     #CKCLK2,@#ERRVEC  ;CHANGE ERROR VECTOR TO CHECK FOR KW11-L
 9479   056556  005777  122436                 TST     @$LKS           ;LOOK FOR KW11-L
 9480   056562  013701  001222                 MOV     $LLVEC,R1       ;KW11-L VECTOR ADDRESS
 9481   056566  012721  056626                 MOV     #CLOCK,(R1)+    ;SET UP KW11-L VECTOR
 9482   056572  012711  000300                 MOV     #300,(R1)       ;PSW - PRI 6
 9483   056576  012777  000100  122414         MOV     #100,@$LKS      ;SET KW11-L INTERRUPT
 9484   056604  000404                 BR      CKCLK3
 9485   056606  062706  000004         CKCLK2: ADD     #4,SP           ;RESTORE THE STACK POINTER
 9486   056612  062716  000002                 ADD     #2,(SP)         ;INCREMENT RETURN, NO CLOCK
 9487   056616  012737  000006  000004 CKCLK3: MOV     #6,@#ERRVEC     ;RESTORE THE ERROR VECTOR
 9488   056624  000207                 RTS     PC
 9489
 9490                                   ;ROUTINE TO COUNT CLOCK TICKS
 9491
 9492   056626  062737  000021  001252 CLOCK:  ADD     #17.,TIME       ;ADD 17 MS TO ELAPSED TIME COUNTER
 9493   056634  005737  001254                 TST     WATCH           ;IS WATCH ALREADY ZERO ?
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```
 9494  056640  001406                        BEQ     1$                      ;BR IF IT IS
 9495  056642  162737  000021  001254        SUB     #17.,WATCH              ;SUBTRACT 17 MS FROM WATCH DOG COUNTER
 9496  056650  100002                        BPL     1$                      ;BR IF NOT MINUS
 9497  056652  005037  001254                CLR     WATCH                   ;CLEAR WATCH DOG COUNTER
 9498  056656  000002                1$:     RTI                             ;RETURN
 9499
 9500                                        ;ROUTINE TO CALCULATE + AND - 25% TIME TOLERANCE VALUES
 9501
 9502  056660  162706  000004        TOLER:  SUB     #4,SP   ;SETUP STACK
 9503  056664  016616  000004                MOV     4(SP),(SP)              ;SAVE STACK
 9504  056670  013546                        MOV     @(R5)+,-(SP)            ;GET TIME VALUE
 9505  056672  011666  000004                MOV     (SP),4(SP)              ;MOVE TIME VALUE
 9506  056676  011666  000006                MOV     (SP),6(SP)              ;MOVE VALUE AGAIN
 9507  056702  006216                        ASR     (SP)                    ;DIVIDE BY 2
 9508  056704  006216                        ASR     (SP)                    ;DIVIDE BY 2 AGAIN (FOR A TOTAL OF 4)
 9509  056706  061666  000004                ADD     (SP),4(SP)              ;CALCULATE UPPER LIMIT FOR TIMEOUT
 9510  056712  162666  000004                SUB     (SP)+,4(SP)             ;CALCULATE LOWER LIMIT FOR TIMEOUT
 9511  056716  000205                        RTS     R5                      ;RETURN WITH TOLERANCES ON THE STACK
 9512
 9513                                        ;;**************************************************************
 9514
 9515                                        .SBTTL  'SYSMAC' UTILITY ROUTINES
 9516
 9517                                        ;;**************************************************************
 9518
 9519                                        .SBTTL  SCOPE HANDLER ROUTINE
  (1)
  (2)                                       ;;**************************************************************
  (1)                                       ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
  (1)                                       ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
  (1)                                       ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
  (1)                                       ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
  (1)                                       ;*SW14=1        LOOP ON TEST
  (1)                                       ;*SW11=1        INHIBIT ITERATIONS
  (1)                                       ;*SW09=1        LOOP ON ERROR
  (1)                                       ;*CALL
  (1)                                       ;*      SCOPE           ;;SCOPE=IOT
  (1)
  (1)  056720                               $SCOPE:
  (1)  056720  104407                               CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
  (1)  056722  032777  040000  122210       1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
  (1)  056730  001101                               BNE     $OVER           ;;YES IF SW14=1
  (1)                                       ;#####START OF CODE FOR THE XOR TESTER#####
  (1)  056732  000416                       $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
  (1)                                               ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
  (1)  056734  013746  000004               MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
  (1)  056740  012737  056760  000004       MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
  (1)  056746  005737  177060               TST     @#177060        ;;TIME OUT ON XOR?
  (1)  056752  012637  000004               MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
  (1)  056756  000453                       BR      $SVLAD          ;;GO TO THE NEXT TEST
  (1)  056760  022626                       5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
  (1)  056762  012637  000004               MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
  (1)  056766  000413                       BR      7$              ;;LOOP ON THE PRESENT TEST
  (1)  056770                               6$:;#####END OF CODE FOR THE XOR TESTER#####
  (1)  056770  105737  001103               2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
  (1)  056774  001421                       BEQ     3$              ;;BR IF NO
```

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(1)  056776  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
(1)  057004  101015                           BHI     3$              ;;BR IF NO
(1)  057006  032777  001000  122124          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
(1)  057014  001404                           BEQ     4$              ;;BR IF NO
(1)  057016  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
(1)  057024  000443                           BR      $OVER
(1)  057026  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
(1)  057032  005037  001176                   CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
(1)  057036  000415                           BR      1$              ;;ESCAPE TO THE NEXT TEST
(1)  057040  032777  004000  122072  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
(1)  057046  001011                           BNE     1$              ;;BR IF YES
(1)  057050  005737  001100                   TST     $PASS           ;;IF FIRST PASS OF PROGRAM
(1)  057054  001406                           BEQ     1$              ;;      INHIBIT ITERATIONS
(1)  057056  005237  001104                   INC     $ICNT           ;;INCREMENT ITERATION COUNT
(1)  057062  023737  001176  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
(1)  057070  002021                           BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
(1)  057072  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
(1)  057100  013737  057150  001176          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
(1)  057106  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
(1)  057112  011637  001106                   MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
(1)  057116  011637  001110                   MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
(1)  057122  005037  001200                   CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
(1)  057126  112737  000001  001115          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
(1)  057134  013777  001102  122000  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
(1)  057142  013716  001106                   MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
(1)  057146  000002                           RTI                     ;;FIXES PS
(1)  057150  000004                  $MXCNT:  4                       ;;MAX. NUMBER OF ITERATIONS
9523                                 .SBTTL   ERROR HANDLER ROUTINE
(1)
(2)                                  ;;**************************************************************
(1)                                  ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
(1)                                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
(1)                                  ;*AND GO TO $ERRTYP ON ERROR
(1)                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
(1)                                  ;*SW15=1         HALT ON ERROR
(1)                                  ;*SW13=1         INHIBIT ERROR TYPEOUTS
(1)                                  ;*SW10=1         BELL ON ERROR
(1)                                  ;*CALL
(1)                                  ;*       ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
(1)
(1)  057152                          $ERROR:
(1)  057152  104407                           CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
(2)  057154  113737  001102  001242           MOVB    $TSTNM,TSTNUM
(1)  057162  105237  001103          7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
(1)  057166  001775                           BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
(1)  057170  013777  001102  121744           MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
(1)  057176  032777  002000  121734           BIT     #BIT10,@SWR     ;;BELL ON ERROR?
(1)  057204  001402                           BEQ     1$              ;;NO - SKIP
(1)  057206  104401  001202                   TYPE    ,$BELL          ;;RING BELL
(1)  057212  005237  001112          1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
(1)  057216  011637  001116                   MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
(1)  057222  162737  000002  001116           SUB     #2,$ERRPC
(1)  057230  117737  121662  001114           MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
(1)  057236  032777  020000  121674           BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
(1)  057244  001004                           BNE     20$             ;;SKIP TYPEOUTS
(1)  057246  004737  057304                   JSR     PC,$ERRTYP      ;;GO TO USER ERROR ROUTINE
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(1)  057252  104401  001207                    TYPE    ,$CRLF
(1)  057256                              20$:
(1)  057256  005777  121656              25:   TST     @SWR            ;;HALT ON ERROR
(1)  057262  100002                            BPL     3$              ;;SKIP IF CONTINUE
(1)  057264  000000                            HALT                    ;;HALT ON ERROR!
(1)  057266  104407                            CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
(1)  057270                              3$:
(1)  057270  022737  056454  000042            CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
(1)  057276  001001                            BNE     6$              ;;BRANCH IF NO
(1)  057300  000000                            HALT                    ;;YES
(1)  057302                              6$:
(1)  057302  000002                            RTI                     ;;RETURN
9524                                     .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
(1)
(2)                                      ;;*************************************************************
(1)                                      ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO D_TERMINE WHICH
(1)                                      ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
(1)                                      ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
(1)
(1)  057304                              $ERRTYP:
(1)  057304  104401  001207                    TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  057310  010046                            MOV     R0,-(SP)        ;;SAVE R0
(1)  057312  005000                            CLR     R0              ;;PICKUP THE ITEM INDEX
(1)  057314  153700  001114                    BISB    @#$ITEMB,R0
(1)  057320  001004                            BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
(1)                                                                    ;;TYPE THE PC OF THE ERROR
(2)  057322  013746  001116                    MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
(2)                                                                    ;;ERROR ADDRESS
(2)  057326  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  057330  000445                            BR      10$             ;;GET OUT
(1)  057332  005300                      1$:   DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
(1)  057334  006300                            ASL     R0              ;;      WORK FOR THE ERROR TABLE
(1)  057336  006300                            ASL     R0
(1)  057340  006300                            ASL     R0
(1)  057342  062700  001304                    ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
(1)  057346  012037  057356                    MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
(1)  057352  001404                            BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
(1)  057354  104401                            TYPE                    ;;TYPE THE "ERROR MESSAGE"
(1)  057356  000000                      2$:   .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
(1)  057360  104401  001207                    TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  057364  012037  057374              3$:   MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
(1)  057370  001404                            BEQ     5$              ;;SKIP TYPEOUT IF 0
(1)  057372  104401                            TYPE                    ;;TYPE THE "DATA HEADER"
(1)  057374  000000                      4$:   .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
(1)  057376  104401  001207                    TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  057402  010146                      5$:   MOV     R1,-(SP)        ;;SAVE R1
(1)  057404  012001                            MOV     (R0)+,R1        ;;PICKUP "DATA TABLE" POINTER
(1)  057406  001415                            BEQ     9$              ;;BR IF NO DATA TO BE TYPED
(1)  057410  012000                            MOV     (R0)+,R0        ;;PICKUP "DATA FORMAT" POINTER
(1)  057412  105720                      6$:   TSTB    (R0)+           ;;"OCTAL" OR "DECIMAL"
(1)  057414  001003                            BNE     7$              ;;BR IF DECIMAL
(2)  057416  013146                            MOV     @(R1)+,-(SP)    ;;SAVE @(R1)+ FOR TYPEOUT
(2)  057420  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  057422  000402                            BR      8$
(1)  057424                              7$:
(2)  057424  013146                            MOV     @(R1)+,-(SP)    ;;SAVE @(R1)+ FOR TYPEOUT
```

```
(2)  057426  104405                        TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
(1)  057430  005711                9$:     TST     (R1)            ;;IS THERE ANOTHER NUMBER?
(1)  057432  001403                        BEQ     9$              ;;BR IF NO
(1)  057434  104401  057454               TYPE    ,11$            ;;TYPE TWO(2) SPACES
(1)  057440  000764                        BR      6$              ;;LOOP
(1)
(1)  057442  012601                9$:     MOV     (SP)+,R1        ;;RESTORE R1
(1)  057444  012600                10$:    MOV     (SP)+,R0        ;;RESTORE R0
(1)  057446  104401  001207               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  057452  000207                        RTS     PC              ;;RETURN
(1)  057454  020040      000      11$:    .ASCIZ  /  /            ;;TWO(2) SPACES
(1)            057460                      .EVEN
9525                               .SBTTL  TYPE ROUTINE
(1)
(2)                                ;;**********************************************************************
(1)                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
(1)                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
(1)                                ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
(1)                                ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(1)                                ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(1)                                ;*
(1)                                ;*CALL:
(1)                                ;*1) USING A TRAP INSTRUCTION
(1)                                ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(1)                                ;*OR
(1)                                ;*      TYPE
(1)                                ;*      MESADR
(1)                                ;*
(1)
(1)  057460  105737  001157        $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
(1)  057464  100002                        BPL     1$              ;;BR IF YES
(1)  057466  000000                        HALT                    ;;HALT HERE IF NO TERMINAL
(1)  057470  000407                        BR      3$              ;;LEAVE
(1)  057472  010046                1$:     MOV     R0,-(SP)        ;;SAVE R0
(1)  057474  017600  000002               MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
(1)  057500  112046                2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(1)  057502  001005                        BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(1)  057504  005726                        TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(1)  057506  012600                60$:    MOV     (SP)+,R0        ;;RESTORE R0
(1)  057510  062716  000002        3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
(1)  057514  000002                        RTI                     ;;RETURN
(1)  057516  122716  000011        4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
(1)  057522  001430                        BEQ     8$
(1)  057524  122716  000200               CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
(1)  057530  001006                        BNE     5$
(1)  057532  005726                        TST     (SP)+           ;;POP  <CR><LF> EQUIV
(1)  057534  104401                        TYPE                    ;;TYPE A CR AND LF
(1)  057536  001207                        $CRLF
(1)  057540  105037  057674               CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
(1)  057544  000755                        BR      2$              ;;GET NEXT CHARACTER
(1)  057546  004737  057630        5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
(1)  057552  123726  001156        6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
(1)  057556  001350                        BNE     2$              ;;IF NO GO GET NEXT CHAR.
(1)  057560  013746  001154               MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
(1)                                                                ;;AND THE NULL CHAR.
(1)  057564  105366  000001        7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
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(1)  057570  002770                        BLT     6$                ;;BR IF NO--GO POP THE NULL OFF OF STACK
(1)  057572  004737  057630                JSR     PC,$TYPEC         ;;GO TYPE A NULL
(1)  057576  105337  057674                DECB    $CHARCNT          ;;DO NOT COUNT AS A COUNT
(1)  057602  000770                        BR      7$                ;;LOOP
(1)
(1)                                 :HORIZONTAL TAB PROCESSOR
(1)
(1)  057604  112716  000040        8$:     MOVB    #' ,(SP)          ;;REPLACE TAB WITH SPACE
(1)  057610  004737  057630        9$:     JSR     PC,$TYPEC         ;;TYPE A SPACE
(1)  057614  132737  000007  057674        BITB    #7,$CHARCNT       ;;BRANCH IF NOT AT
(1)  057622  001372                        BNE     9$                ;;TAB STOP
(1)  057624  005726                        TST     (SP)+             ;;POP SPACE OFF STACK
(1)  057626  000724                        BR      2$                ;;GET NEXT CHARACTER
(1)  057630  105777  121314        $TYPEC: TSTB    @$TPS             ;;WAIT UNTIL PRINTER IS READY
(1)  057634  100375                        BPL     $TYPEC
(1)  057636  116677  000002  121306        MOVB    2(SP),@$TPB       ;;LOAD CHAR TO BE TYPED ;;TO DATA REG.
(1)  057644  122766  000015  000002        CMPB    #CR,2(SP)         ;;IS CHARACTER A CARRIAGE RETURN?
(1)  057652  001003                        BNE     1$                ;;BRANCH IF NO
(1)  057654  105037  057674                CLRB    $CHARCNT          ;;YES--CLEAR CHARACTER COUNT
(1)  057660  000406                        BR      $TYPEX            ;;EXIT
(1)  057662  122766  000012  000002  1$:   CMPB    #LF,2(SP)         ;;IS CHARACTER A LINE FEED?
(1)  057670  001402                        BEQ     $TYPEX            ;;BRANCH IF YES
(1)  057672  105227                        INCB    (PC)+             ;;COUNT THE CHARACTER
(1)  057674  000000        $CHARCNT:.WORD  0                         ;;CHARACTER COUNT STORAGE
(1)  057676  000207        $TYPEX: RTS     PC
(1)
9526                                .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
(1)
(2)                                 ;;******************************************************************
(1)                                 ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
(1)                                 ;*OCTAL (ASCII) NUMBER AND TYPE IT.
(1)                                 ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
(1)                                 ;*CALL:
(1)                                 ;*      MOV     NUM,-(SP)         ;;NUMBER TO BE TYPED
(1)                                 ;*      TYPOS                     ;;CALL FOR TYPEOUT
(1)                                 ;*      .BYTE   N                 ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
(1)                                 ;*      .BYTE   M                 ;;M=1 OR 0
(1)                                 ;*                                ;;1=TYPE LEADING ZEROS
(1)                                 ;*                                ;;0=SUPPRESS LEADING ZEROS
(1)                                 ;*
(1)                                 ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
(1)                                 ;*$TYPOS OR $TYPOC
(1)                                 ;*CALL:
(1)                                 ;*      MOV     NUM,-(SP)         ;;NUMBER TO BE TYPED
(1)                                 ;*      TYPON                     ;;CALL FOR TYPEOUT
(1)                                 ;*
(1)                                 ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
(1)                                 ;*CALL:
(1)                                 ;*      MOV     NUM,-(SP)         ;;NUMBER TO BE TYPED
(1)                                 ;*      TYPOC                     ;;CALL FOR TYPEOUT
(1)
(1)  057700  017646  000000        $TYPOS: MOV     @(SP),-(SP)       ;;PICKUP THE MODE
(1)  057704  116637  000001  060123        MOVB    1(SP),$OFILL      ;;LOAD ZERO FILL SWITCH
(1)  057712  112637  060125                MOVB    (SP)+,$OMODE+1    ;;NUMBER OF DIGITS TO TYPE
(1)  057716  062716  000002                ADD     #2,(SP)           ;;ADJUST RETURN ADDRESS
(1)  057722  000406                        BR      $TYPON
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(1)  057724  112737  000001  060123  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
(1)  057732  112737  000006  060125          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
(1)  057740  112737  000005  060122  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
(1)  057746  010346                          MOV     R3,-(SP)        ;;SAVE R3
(1)  057750  010446                          MOV     R4,-(SP)        ;;SAVE R4
(1)  057752  010546                          MOV     R5,-(SP)        ;;SAVE R5
(1)  057754  113704  060125                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
(1)  057760  005404                          NEG     R4
(1)  057762  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
(1)  057766  110437  060124                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
(1)  057772  113704  060123                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
(1)  057776  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
(1)  060002  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
(1)  060004  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
(1)  060006  000404                          BR      3$              ;;GO DO MSB
(1)  060010  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
(1)  060012  006105                          ROL     R5
(1)  060014  006105                          ROL     R5
(1)  060016  010503                          MOV     R5,R3
(1)  060020  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
(1)  060022  105337  060124                  DECB    $OMODE          ;;TYPE THIS DIGIT?
(1)  060026  100016                          BPL     7$              ;;BR IF NO
(1)  060030  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
(1)  060034  001002                          BNE     4$              ;;TEST FOR 0
(1)  060036  005704                          TST     R4              ;;SUPPRESS THIS 0?
(1)  060040  001403                          BEQ     5$              ;;BR IF YES
(1)  060042  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
(1)  060044  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
(1)  060050  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
(1)  060054  110337  060120                  MOVB    R3,8$           ;;SAVE FOR TYPING
(1)  060060  104401  060120                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
(1)  060064  105337  060122          7$:     DECB    $OCNT           ;;COUNT BY 1
(1)  060070  003347                          BGT     2$              ;;BR IF MORE TO DO
(1)  060072  002402                          BLT     6$              ;;BR IF DONE
(1)  060074  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
(1)  060076  000744                          BR      2$              ;;GO DO THE LAST DIGIT
(1)  060100  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
(1)  060102  012604                          MOV     (SP)+,R4        ;;RESTORE R4
(1)  060104  012603                          MOV     (SP)+,R3        ;;RESTORE R3
(1)  060106  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
(1)  060114  012616                          MOV     (SP)+,(SP)
(1)  060116  000002                          RTI                     ;;RETURN
(1)  060120     000          8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
(1)  060121     000                  .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
(1)  060122     000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
(1)  060123     000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
(1)  060124  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
9527                                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
(1)
(2)                                 ;;******************************************************************
(1)                                 ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
(1)                                 ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
(1)                                 ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
(1)                                 ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
(1)                                 ;*REPLACED WITH SPACES.
(1)                                 ;*CALL:
```

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(1)                                     :*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
(1)                                     :*      TYPDS                   ;;GO TO THE ROUTINE
(1)
(1)   060126                            $TYPDS:
(3)   060126  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)   060130  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(3)   060132  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(3)   060134  010346                            MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(3)   060136  010546                            MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(1)   060140  012746  020200                    MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
(1)   060144  016605  000020                    MOV     20(SP),R5       ;;GET THE INPUT NUMBER
(1)   060150  100004                            BPL     1$              ;;BR IF INPUT IS POS.
(1)   060152  005405                            NEG     R5              ;;MAKE THE BINARY NUMBER POS.
(1)   060154  112766  000055  000001            MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
(1)   060162  005000                    1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
(1)   060164  012703  060342                    MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
(1)   060170  112723  000040                    MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
(1)   060174  005002                    2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
(1)   060176  016001  060332                    MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
(1)   060202  160105                    3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
(1)   060204  002402                            BLT     4$              ;;BR IF DONE
(1)   060206  005202                            INC     R2              ;;INCREASE THE BCD DIGIT BY 1
(1)   060210  000774                            BR      3$
(1)   060212  060105                    4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
(1)   060214  005702                            TST     R2              ;;CHECK IF BCD DIGIT=0
(1)   060216  001002                            BNE     5$              ;;FALL THROUGH IF 0
(1)   060220  105716                            TSTB    (SP)            ;;STILL DOING LEADING 0'S?
(1)   060222  100407                            BMI     7$              ;;BR IF YES
(1)   060224  106316                    5$:     ASLB    (SP)            ;;MSD?
(1)   060226  103003                            BCC     6$              ;;BR IF NO
(1)   060230  116663  000001  177777            MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
(1)   060236  052702  000060            6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
(1)   060242  052702  000040            7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
(1)   060246  110223                            MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
(1)   060250  005720                            TST     (R0)+           ;;JUST INCREMENTING
(1)   060252  020027  000010                    CMP     R0,#10          ;;CHECK THE TABLE INDEX
(1)   060256  002746                            BLT     2$              ;;GO DO THE NEXT DIGIT
(1)   060260  003002                            BGT     8$              ;;GO TO EXIT
(1)   060262  010502                            MOV     R5,R2           ;;GET THE LSD
(1)   060264  000764                            BR      6$              ;;GO CHANGE TO ASCII
(1)   060266  105726                    8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
(1)   060270  100003                            BPL     9$              ;;BR IF NO
(1)   060272  116663  177777  177776            MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
(1)   060300  105013                    9$:     CLRB    (R3)            ;;SET THE TERMINATOR
(3)   060302  012605                            MOV     (SP)+,R5        ;;POP STACK INTO R5
(3)   060304  012603                            MOV     (SP)+,R3        ;;POP STACK INTO R3
(3)   060306  012602                            MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)   060310  012601                            MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)   060312  012600                            MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)   060314  104401  060342                    TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
(1)   060320  016666  000002  000004            MOV     2(SP),4(SP)     ;;ADJUST THE STACK
(1)   060326  012616                            MOV     (SP)+,(SP)
(1)   060330  000002                            RTI                     ;;RETURN TO USER
(1)   060332  023420                    $DTBL:  10000.
(1)   060334  001750                            1000.
(1)   060336  000144                            100.
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                                        10.
                                $DBLK:  .BLKW   4
                                .SBTTL  TTY INPUT ROUTINE

                                ;*******************************************************************
                                .ENABL  LSB
060352  000000                  $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
060354  000000                  $TKQIN: .WORD   0               ;;INPUT POINTER
060356  000000                  $TKQOUT: .WORD  0               ;;OUTPUT POINTER
060360  000001                  $TKQSRT: .BLKB  1               ;;TTY KEYBOARD QUEUE
        060361                  $TKQEND=.
        060362                  .EVEN

                                ;*TK INITIALIZE ROUTINE
                                ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
                                ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
                                ;
                                ;*CALL:
                                ;*      JSR     PC,$TKINT
                                ;*      RETURN
                                ;
060362  005037  060352          $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
060366  012737  060360  060354          MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
060374  013737  060354  060356          MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
060402  012737  060432  000060          MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
060410  012737  000200  000062          MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
060416  005777  120524                  TST     @$TKB           ;;CLEAR DONE FLAG
060422  012777  000100  120514          MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
060430  000207                  RTS     PC                      ;;RETURN TO CALLER

                                ;*TK SERVICE ROUTINE
                                ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
                                ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
                                ;*IT IN THE QUEUE.
                                ;
060432  117746  120510          $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
060436  042716  177600                  BIC     #^C177,(SP)     ;;STRIP THE JUNK
060442  021627  000007          1$:     CMP     (SP),#7         ;;IS IT A CONTROL G?
060446  001004                  BNE     2$                      ;;BRANCH IF NO
060450  022737  000176  001140          CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
060456  001500                  BEQ     6$                      ;;GO TO SWR CHANGE

060460                          2$:
060460  022737  000001  060352          CMP     #1,$TKCNT       ;;IS THE QUEUE FULL?
060466  001004                  BNE     3$                      ;;BRANCH IF NO
060470  104401  001202                  TYPE    ,$BELL          ;;RING THE TTY BELL
060474  005726                  TST     (SP)+                   ;;CLEAN CHARACTER OFF OF STACK
060476  000451                  BR      5$                      ;;EXIT
060500  021627  000023          3$:     CMP     (SP),#23        ;;IS IT A CONTROL-S?
060504  001021                  BNE     32$                     ;;BRANCH IF NO
060506  005077  120432                  CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
060512  005726                  TST     (SP)+                   ;;CLEAN CHAR OFF STACK
060514  105777  120424          31$:    TSTB    @$TKS           ;;WAIT FOR A CHAR
060520  100375                  BPL     31$                     ;;LOOP UNTIL ITS THERE
060522  117746  120420                  MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
060526  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
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(1)  060532  022627  000021              CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
(1)  060536  001366                      BNE     31$             ;;BRANCH IF NO
(1)  060540  012777  000100  120376      MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
(1)  060546  000002                      RTI                     ;;RETURN
(1)  060550  005237  060352      32$:    INC     $TKCNT          ;;COUNT THIS CHARACTER
(1)  060554  021627  000140              CMP     (SP),#140       ;;IS IT UPPER CASE?
(1)  060560  002405                      BLT     4$              ;;BRANCH IF YES
(1)  060562  021627  000175              CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
(1)  060566  003002                      BGT     4$              ;;BRANCH IF YES
(1)  060570  042716  000040              BIC     #40,(SP)        ;;MAKE IT UPPER CASE
(1)  060574  112677  177554      4$:     MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
(1)  060600  005237  060354              INC     $TKQIN          ;;UPDATE THE POINTER
(1)  060604  023727  060354  060361      CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
(1)  060612  001003                      BNE     5$              ;;BRANCH IF NO
(1)  060614  012737  060360  060354      MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
(1)  060622  000002              5$:     RTI                     ;;RETURN
(1)
(2)                                      ;;**********************************************************************
(1)                                      ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
(1)                                      ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
(1)                                      ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
(1)                                      ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
(1)  060624  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
(1)  060632  001104                      BNE     15$             ;;EXIT IF NOT
(1)  060634  105777  120304              TSTB    @$TKS           ;;IS A CHAR WAITING?
(1)  060640  100101                      BPL     15$             ;;IF NOT, EXIT
(1)  060642  117746  120300              MOVB    @$TKB,-(SP)     ;;YES
(1)  060646  042716  177600              BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
(1)  060652  021627  000007              CMP     (SP),#7         ;;IS IT A CONTROL-G?
(1)  060656  001300                      BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
(1)                                                              ;;AND EXIT
(1)
(2)                                      ;;**********************************************************************
(1)                                      ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
(1)                                      ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
(1)                                      ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
(1)  060660  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
(1)  060666  001674                      BEQ     2$              ;;BRANCH IF YES
(1)  060670  005726                      TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
(1)  060672  004737  060362              JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
(1)  060676  005077  120242              CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
(1)  060702  112737  000001  001135      MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR
(1)
(1)  060710  104401  061466              TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
(1)  060714  104401  061473      $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
(2)  060720  013746  000176              MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
(2)  060724  104402                      TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  060726  104401  061504              TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
(1)  060732  005046              19$:    CLR     -(SP)           ;;CLEAR COUNTER
(1)  060734  005046                      CLR     -(SP)           ;;THE NEW SWR
(1)  060736  105777  120202      7$:     TSTB    @$TKS           ;;CHAR THERE?
(1)  060742  100375                      BPL     7$              ;;IF NOT TRY AGAIN
(1)
(1)  060744  117746  120176              MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
(1)  060750  042716  177600              BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
(1)
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(1)
(1)
(1)  060754  021627  000025          9$:    CMP     (SP),#25        ;;IS IT A CONTROL-U?
(1)  060760  001005                         BNE     10$             ;;BRANCH IF NOT
(1)  060762  104401  061461                 TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
(1)  060766  062706  000006          20$:   ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
(1)  060772  000757                         BR      19$             ;;LET'S TRY IT AGAIN
(1)
(1)
(1)  060774  021627  000015          10$:   CMP     (SP),#15        ;;IS IT A <CR>?
(1)  061000  001022                         BNE     16$             ;;BRANCH IF NO
(1)  061002  005766  000004                 TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
(1)  061006  001403                         BEQ     11$             ;;BRANCH IF YES
(1)  061010  016677  000002  120122         MOV     2(SP),@SWR      ;;SAVE NEW SWR
(1)  061016  062706  000006          11$:   ADD     #6,SP           ;;CLEAR UP STACK
(1)  061022  104401  001207          14$:   TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
(1)  061026  123727  001135  000001         CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
(1)  061034  001003                         BNE     15$             ;;BRANCH IF NOT
(1)  061036  012777  000100  120100         MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
(1)  061044  000002          15$:   RTI                             ;;RETURN
(1)  061046  004737  057630          16$:   JSR     PC,$TYPEC       ;;ECHO CHAR
(1)  061052  021627  000060                 CMP     (SP),#60        ;;CHAR < 0?
(1)  061056  002420                         BLT     18$             ;;BRANCH IF YES
(1)  061060  021627  000067                 CMP     (SP),#67        ;;CHAR > 7?
(1)  061064  003015                         BGT     18$             ;;BRANCH IF YES
(1)  061066  042726  000060                 BIC     #60,(SP)+       ;;STRIP-OFF ASCII
(1)  061072  005766  000002                 TST     2(SP)           ;;IS THIS THE FIRST CHAR
(1)  061076  001403                         BEQ     17$             ;;BRANCH IF YES
(1)  061100  006316                         ASL     (SP)            ;;NO, SHIFT PRESENT
(1)  061102  006316                         ASL     (SP)            ;;    CHAR OVER TO MAKE
(1)  061104  006316                         ASL     (SP)            ;;    ROOM FOR NEW ONE.
(1)  061106  005266  000002          17$:   INC     2(SP)           ;;KEEP COUNT OF CHAR
(1)  061112  056616  177776                 BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
(1)  061116  000707                         BR      7$              ;;GET THE NEXT ONE
(1)  061120  104401  001206          18$:   TYPE    ,$QUES          ;;TYPE ?<CR><LF>
(1)  061124  000720                         BR      20$             ;;SIMULATE CONTROL-U
(1)                                  .DSABL  LSB
(1)
(1)
(2)                                  ;;**************************************************************
(1)                                  ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
(1)                                  ;*CALL:
(1)                                  ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
(1)                                  ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
(1)                                  ;*                              ;;WITH PARITY BIT STRIPPED OFF
(1)                                  ;
(1)
(1)  061126  011646          $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC AND
(1)  061130  016666  000004  000002         MOV     4(SP),2(SP)     ;;THE PS
(1)  061136  005066  000004                 CLR     4(SP)           ;;GET READY FOR A CHARACTER
(2)  061142  005046                         CLR     -(SP)           ;;PUT NEW PS ON STACK
(2)  061144  012746  061152                 MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
(2)  061150  000002                         RTI                     ;;POP NEW PC AND PS
(2)  061152                          64$:
(1)  061152  005737  060352          1$:    TST     $TKCNT          ;;WAIT ON A CHARACTER
(1)  061156  001775                         BEQ     1$
```

```
(1)  061160  005337  060352                DEC     $TKCNT          ;;DECREMENT THE COUNTER
(1)  061164  117766  177166  000004        MOVB    @$TKQOUT,4(SP)  ;;GET ONE CHARACTER
(1)  061172  005237  060356                INC     $TKQOUT         ;;UPDATE THE POINTER
(1)  061176  023727  060356  060361        CMP     $TKQOUT,#$TKQEND ;;DID IT GO OFF OF THE END?
(1)  061204  001003                        BNE     2$              ;;BRANCH IF NO
(1)  061206  012737  060360  060356        MOV     #$TKQSRT,$TKQOUT ;;RESET THE POINTER
(1)  061214  000002                2$:     RTI                     ;;RETURN
(2)                                        ;;*************************************************************
(1)                                        ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
(1)                                        ;*CALL:
(1)                                        ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
(1)                                        ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
(1)                                        ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
(1)
(1)  061216  010346                $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
(1)  061220  005046                        CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
(1)  061222  012703  061452        1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
(1)  061226  022703  061461        2$:     CMP     #$TTYIN+7,R3    ;;BUFFER FULL?
(1)  061232  101456                        BLOS    4$              ;;BR IF YES
(1)  061234  104410                        RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
(1)  061236  112613                        MOVB    (SP)+,(R3)      ;;GET CHARACTER
(1)  061240  122713  000177        10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
(1)  061244  001022                        BNE     5$              ;;BR IF NO
(1)  061246  005716                        TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
(1)  061250  001007                        BNE     6$              ;;BR IF NO
(1)  061252  112737  000134  061450        MOVB    #'\,9$          ;;TYPE A BACK SLASH
(1)  061260  104401  061450                TYPE    ,9$
(1)  061264  012716  177777                MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
(1)  061270  005303                6$:     DEC     R3              ;;BACKUP BY ONE
(1)  061272  020327  061452                CMP     R3,#$TTYIN      ;;STACK EMPTY?
(1)  061276  103434                        BLO     4$              ;;BR IF YES
(1)  061300  111337  061450                MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
(1)  061304  104401  061450                TYPE    ,9$             ;;GO TYPE
(1)  061310  000746                        BR      2$              ;;GO READ ANOTHER CHAR.
(1)  061312  005716                5$:     TST     (SP)            ;;RUBOUT KEY SET?
(1)  061314  001406                        BEQ     7$              ;;BR IF NO
(1)  061316  112737  000134  061450        MOVB    #'\,9$          ;;TYPE A BACK SLASH
(1)  061324  104401  061450                TYPE    ,9$
(1)  061330  005016                        CLR     (SP)            ;;CLEAR THE RUBOUT KEY
(1)  061332  122713  000025        7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
(1)  061336  001003                        BNE     8$              ;;BR IF NO
(1)  061340  104401  061461                TYPE    ,$CNTLU         ;;TYPE A CONTROL "U"
(1)  061344  000726                        BR      1$              ;;GO START OVER
(1)  061346  122713  000022        8$:     CMPB    #22,(R3)        ;;IS CHARACTER A "↑R"?
(1)  061352  001011                        BNE     3$              ;;BRANCH IF NO
(1)  061354  105013                        CLRB    (R3)            ;;CLEAR THE CHARACTER
(1)  061356  104401  001207                TYPE    ,$CRLF          ;;TYPE A "CR" & "LF"
(1)  061362  104401  061452                TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
(1)  061366  000717                        BR      2$              ;;GO PICKUP ANOTHER CHACTER
(1)  061370  104401  001206        4$:     TYPE    ,$QUES          ;;TYPE A '?'
(1)  061374  000712                        BR      1$              ;;CLEAR THE BUFFER AND LOOP
(1)  061376  111337  061450        3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
(1)  061402  104401  061450                TYPE    ,9$
(1)  061406  122723  000015                CMPB    #15,(R3)+       ;;CHECK FOR RETURN
(1)  061412  001305                        BNE     2$              ;;LOOP IF NOT RETURN
(1)  061414  105063  177777                CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
```

```
(1)  061420  104401  001210                    TYPE    $LF                ;;TYPE A LINE FEED
(1)  061424  005726                            TST     (SP)+              ;;CLEAN RUBOUT KEY FROM THE STACK
(1)  061426  012603                            MOV     (SP)+,R3           ;;RESTORE R3
(1)  061430  011646                            MOV     (SP),-(SP)         ;;ADJUST THE STACK AND PUT ADDRESS OF THE
(1)  061432  016666  000004  000002            MOV     4(SP),2(SP)        ;;      FIRST ASCII CHARACTER ON IT
(1)  061440  012766  061452  000004            MOV     #$TTYIN,4(SP)
(1)  061446  000002                            RTI                        ;;RETURN
(1)  061450     000                 9$:        .BYTE   0                  ;;STORAGE FOR ASCII CHAR. TO TYPE
(1)  061451     000                            .BYTE   0                  ;;TERMINATOR
(1)  061452  000007                 $TTYIN:    .BLKB   7                  ;;RESERVE 7 BYTES FOR TTY INPUT
(1)  061461     136  006525  000012 $CNTLU:    .ASCIZ  /↑U/<15><12>       ;;CONTROL "U"
(1)  061466  043536  005015     000 $CNTLG:    .ASCIZ  /↑G/<15><12>       ;;CONTROL "G"
(1)  061473     015  051412  051127 $MSWR:     .ASCIZ  <15><12>/SWR = /
(1)  061500  036440  000040
(1)  061504  020040  042516  020127 $MNEW:     .ASCIZ  /  NEW = /
(1)  061512  020075     000
(1)          061516                            .EVEN
9529                                .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
(1)
(2)                                 ;;**************************************************************
(1)                                 ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
(1)                                 ;*CHANGE IT TO BINARY.
(1)                                 ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
(1)                                 ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
(1)                                 ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
(1)                                 ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
(1)                                 ;*CALL:
(1)                                 ;*      RDOCT                      ;;READ AN OCTAL NUMBER
(1)                                 ;*      RETURN HERE                ;;LOW ORDER BITS ARE ON TOP OF THE STACK
(1)                                 ;*                                 ;;HIGH ORDER BITS ARE IN $HIOCT
(1)
(1)  061516  011646                 $RDOCT:    MOV     (SP),-(SP)         ;;PROVIDE SPACE FOR THE
(1)  061520  016666  000004  000002            MOV     4(SP),2(SP)        ;;INPUT NUMBER
(3)  061526  010046                            MOV     R0,-(SP)           ;;PUSH R0 ON STACK
(3)  061530  010146                            MOV     R1,-(SP)           ;;PUSH R1 ON STACK
(3)  061532  010246                            MOV     R2,-(SP)           ;;PUSH R2 ON STACK
(1)  061534  104411                 1$:        RDLIN                      ;;READ AN ASCIZ LINE
(1)  061536  012600                            MOV     (SP)+,R0           ;;GET ADDRESS OF 1ST CHARACTER
(1)  061540  010037  061644                    MOV     R0,5$              ;;AND SAVE IT
(1)  061544  005001                            CLR     R1                 ;;CLEAR DATA WORD
(1)  061546  005002                            CLR     R2
(1)  061550  112046                 2$:        MOVB    (R0)+,-(SP)        ;;PICKUP THIS CHARACTER
(1)  061552  001420                            BEQ     3$                 ;;IF ZERO GET OUT
(1)  061554  122716  000060                    CMPB    #'0,(SP)           ;;MAKE SURE THIS CHARACTER
(1)  061560  003026                            BGT     4$                 ;;IS AN OCTAL DIGIT
(1)  061562  122716  000067                    CMPB    #'7,(SP)
(1)  061566  002423                            BLT     4$
(1)  061570  006301                            ASL     R1                 ;;*2
(1)  061572  006102                            ROL     R2
(1)  061574  006301                            ASL     R1                 ;;*4
(1)  061576  006102                            ROL     R2
(1)  061600  006301                            ASL     R1                 ;;*8
(1)  061602  006102                            ROL     R2
(1)  061604  042716  177770                    BIC     #↑C7,(SP)          ;;STRIP THE ASCII JUNK
(1)  061610  062601                            ADD     (SP)+,R1           ;;ADD IN THIS DIGIT
(1)  061612  000756                            BR      2$                 ;;LOOP
```

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(1)  061614  005726                  3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
(1)  061616  010166  000012                  MOV     R1,12(SP)       ;;SAVE THE RESULT
(1)  061622  010237  061654                  MOV     R2,$HIOCT
(3)  061626  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)  061630  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  061632  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  061634  000002                          RTI                     ;;RETURN
(1)  061636  005726                  4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
(1)  061640  105010                          CLRB    (R0)            ;;SET A TERMINATOR
(1)  061642  104401                          TYPE                    ;;TYPE UP THRU THE BAD CHAR.
(1)  061644  000000                  5$:     .WORD   0
(1)  061646  104401  001206                  TYPE    ,$QUES          ;;"?" "CR" & "LF"
(1)  061652  000730                          BR      1$              ;;TRY AGAIN
(1)  061654  000000                  $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
9530                                 .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
(1)
(2)                                  ;;**************************************************************
(1)                                  ;*SAVE R0-R5
(1)                                  ;*CALL:
(1)                                  ;*      SAVREG
(1)                                  ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
(1)                                  ;*
(1)                                  ;*TOP---(+16)
(1)                                  ;* +2---(+18)
(1)                                  ;* +4---R5
(1)                                  ;* +6---R4
(1)                                  ;* +8---R3
(1)                                  ;*+10---R2
(1)                                  ;*+12---R1
(1)                                  ;*+14---R0
(1)
(1)  061656                          $SAVREG:
(3)  061656  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)  061660  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(3)  061662  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(3)  061664  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(3)  061666  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
(3)  061670  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(1)  061672  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
(1)  061676  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
(1)  061702  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
(1)  061706  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
(1)  061712  000002                          RTI
(1)
(1)                                  ;*RESTORE R0-R5
(1)                                  ;*CALL:
(1)                                  ;*      RESREG
(1)  061714                          $RESREG:
(1)  061714  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
(1)  061720  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
(1)  061724  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
(1)  061730  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
(3)  061734  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
(3)  061736  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
(3)  061740  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
(3)  061742  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
```

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  (3)  061744  012601                    MOV     (SP)+,R1        ;;POP STACK INTO R1
  (3)  061746  012600                    MOV     (SP)+,R0        ;;POP STACK INTO R0
  (1)  061750  000002                    RTI
9531                             .SBTTL  TRAP DECODER
  (1)
  (2)                            ;;**********************************************************************
  (1)                            ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
  (1)                            ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
  (1)                            ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
  (1)                            ;*GO TO THAT ROUTINE.
  (1)
  (1)  061752  010046            $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
  (1)  061754  016600  000002            MOV     2(SP),R0        ;;GET TRAP ADDRESS
  (1)  061760  005740                    TST     -(R0)           ;;BACKUP BY 2
  (1)  061762  111000                    MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
  (1)  061764  006300                    ASL     R0              ;;POSITION FOR INDEXING
  (1)  061766  016000  062006            MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
  (1)  061772  000200                    RTS     R0              ;;GO TO ROUTINE
  (1)
  (1)
  (1)                            ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
  (1)
  (1)  061774  011646            $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
  (1)  061776  016666  000004  000002    MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
  (1)  062004  000002                    RTI                     ;;RESTORE THE PSW
  (1)
  (3)                            .SBTTL  TRAP TABLE
  (3)
  (3)                            ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
  (3)                            ;*BY THE "TRAP" INSTRUCTION.
  (3)
  (3)                            ;       ROUTINE
  (3)                            ;       -------
  (3)  062006  061774            $TRPAD: .WORD   $TRAP2
  (3)  062010  057460                    $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
  (3)  062012  057724                    $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
  (3)  062014  057700                    $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
  (3)  062016  057740                    $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
  (3)  062020  060126                    $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
  (1)
  (3)  062022  060714                    $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
  (1)
  (3)  062024  060624                    $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
  (3)  062026  061126                    $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
  (3)  062030  061216                    $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
  (3)  062032  061516                    $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
  (3)  062034  061656                    $SAVREG ;;CALL=SAVREG   TRAP+13(104413) SAVE R0-R5 ROUTINE
  (3)  062036  061714                    $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
9532
9533                             ;;**********************************************************************
9534
9535                             .SBTTL  TELETYPE MESSAGES
9536
9537                             ;;**********************************************************************
9538
9539  062040  005015  055012  026532  TITLE:  .ASCII  <CR><LF><LF>/ZZ-CZRJE-C/<CR><LF>
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                062046  055103  045122  026505
                062054  006503     012
 9540           062057     122  030120  027464          .ASCIZ  @RP04/5/6 DUAL CONTROLLER LOGIC TEST - PART 1@<CR><LF><LF>
                062064  027465  020066  052504
                062072  046101  041440  047117
                062100  051124  046117  042514
                062106  020122  047514  044507
                062114  020103  042524  052123
                062122  026440  050040  051101
                062130  020124  006461  005012
                062136     000
 9541           062137     015  042412  052116  ENTERA: .ASCIZ  <CR><LF>/ENTER DRIVE ADDRESS: /
                062144  051105  042040  044522
                062152  042526  040440  042104
                062160  042522  051523  020072
                062166     000
 9542           062167     111  053116  046101  ADRERR: .ASCIZ  /INVALID ADDRESS/<CR><LF>
                062174  042111  040440  042104
                062202  042522  051523  005015
                062210     000
 9543           062211     015  050012  051117  PORTAIS: .ASCIZ <CR><LF>/PORT A ADDRESS IS: /
                062216  020124  020101  042101
                062224  051104  051505  020123
                062232  051511  020072     000
 9544           062237     015  050012  051117  PORTBIS: .ASCIZ <CR><LF>/PORT B ADDRESS IS: /
                062244  020124  020102  042101
                062252  051104  051505  020123
                062260  051511  020072     000
 9545           062265     015  051412  051531  NOCLOCK: .ASCIZ <CR><LF>/SYSTEM MUST HAVE 'L' OR 'P' CLOCK/<CR><LF><LF>
                062272  042524  020115  052515
                062300  052123  044040  053101
                062306  020105  046047  020047
                062314  051117  023440  023520
                062322  041440  047514  045503
                062330  005015  000012
 9546           062334  042412  052116  051105  TESTNO: .ASCIZ  <LF>/ENTER TEST #: /
                062342  052040  051505  020124
                062350  035043  000040
 9547           062354  047111  040526  044514  BADNO:  .ASCIZ  /INVALID TEST NUMBER/<CR><LF>
                062362  020104  042524  052123
                062370  047040  046525  042502
                062376  006522  000012
 9548           062402  042440  051122  051117  TSTERR: .ASCIZ  / ERRORS/<CR><LF>
                062410  006523  000012
 9549           062414  005015  052012  042510  ADDRIS: .ASCIZ  <CR><LF><LF>/THE PRESENT ADDRESS OF THE RH11 (RPCS1) IS: /
                062422  050040  042522  042523
                062430  052116  040440  042104
                062436  042522  051523  047440
                062444  020106  044124  020105
                062452  044122  030461  024040
                062460  050122  051503  024461
                062466  044440  035123  000040
 9550           062474  042412  052116  051105  NTRH11: .ASCIZ  <LF>/ENTER NEW RH11 ADDRESS: /
                062502  047040  053505  051040
                062510  030510  020061  042101
                062516  051104  051505  035123
```

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        062524  000040
 9551
 9552                                   ;;*****************************************************************
 9553
 9554                                   .SBTTL  TEST ERROR MESSAGES
 9555
 9556                                   ;;*****************************************************************
 9557
 9558   062526  051127  047117  020107  EM1:    .ASCIZ  /WRONG DRIVE TYPE/
        062534  051104  053111  020105
        062542  054524  042520     000
 9559
 9560   062547     104  044522  042526  EM2:    .ASCIZ  /DRIVE NOT ON LINE/
        062554  047040  052117  047440
        062562  020116  044514  042516
        062570     000
 9561
 9562   062571     123  051105  040511  EM3:    .ASCIZ  /SERIAL NUMBER READ THROUGH EACH PORT NOT THE SAME/
        062576  020114  052516  041115
        062604  051105  051040  040505
        062612  020104  044124  047522
        062620  043525  020110  040505
        062626  044103  050040  051117
        062634  020124  047516  020124
        062642  044124  020105  040523
        062650  042515     000
 9563
 9564   062653     104  044522  042526  EM4:    .ASCIZ  /DRIVE NOT SEIZED BY PORT/
        062660  047040  052117  051440
        062666  044505  042532  020104
        062674  054502  050040  051117
        062702  000124
 9565
 9566   062704  051127  047117  020107  EM5:    .ASCIZ  /WRONG STATUS SEEN BY THE SEIZING PORT/
        062712  052123  052101  051525
        062720  051440  042505  020116
        062726  054502  052040  042510
        062734  051440  044505  044532
        062742  043516  050040  051117
        062750  000124
 9567
 9568   062752  042522  044507  052123  EM6:    .ASCIZ  /REGISTER CONTENTS WERE SEEN BY OPPOSITE PORT - DRIVE WAS SEIZED/
        062760  051105  041440  047117
        062766  042524  052116  020123
        062774  042527  042522  051440
        063002  042505  020116  054502
        063010  047440  050120  051517
        063016  052111  020105  047520
        063024  052122  026440  042040
        063032  044522  042526  053440
        063040  051501  051440  044505
        063046  042532  000104
 9569
 9570   063052  042522  044507  052123  EM7:    .ASCIZ  /REGISTER CONTENTS WRONG AFTER RELEASE OR TIMEOUT/
        063060  051105  041440  047117
        063066  042524  052116  020123
```

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                063074  051127  047117  020107
                063102  043101  042524  020122
                063110  042522  042514  051501
                063116  020105  051117  052040
                063124  046511  047505  052125
                063132     000
9571
9572    063133     122  043505  051511  EM10:   .ASCIZ  /REGISTER CONTENTS WRONG/
                063140  042524  020122  047503
                063146  052116  047105  051524
                063154  053440  047522  043516
                063162     000
9573
9574    063163     103  047117  051124  EM11:   .ASCIZ  /CONTROL BUS PARITY ERROR READING INDICATED REGISTER/
                063170  046117  041040  051525
                063176  050040  051101  052111
                063204  020131  051105  047522
                063212  020122  042522  042101
                063220  047111  020107  047111
                063226  044504  040503  042524
                063234  020104  042522  044507
                063242  052123  051105     000
9575
9576    063247     104  044522  042526  EM12:   .ASCIZ  /DRIVE NOT SEIZED BY DRIVE CLEAR COMMAND/
                063254  047040  052117  051440
                063262  044505  042532  020104
                063270  054502  042040  044522
                063276  042526  041440  042514
                063304  051101  041440  046517
                063312  040515  042116     000
9577
9578    063317     122  040505  044504  EM13:   .ASCIZ  /READIN PRESET DOES NOT SET VOLUME VALID FOR THE PORT/
                063324  020116  051120  051505
                063332  052105  042040  042517
                063340  020123  047516  020124
                063346  042523  020124  047526
                063354  052514  042515  053040
                063362  046101  042111  043040
                063370  051117  052040  042510
                063376  050040  051117  000124
9579
9580    063404  047526  052514  042515  EM14:   .ASCIZ  /VOLUME VALID SET ON THE WRONG PORT/
                063412  053040  046101  042111
                063420  051440  052105  047440
                063426  020116  044124  020105
                063434  051127  047117  020107
                063442  047520  052122     000
9581
9582    063447     101  052124  020116  EM15:   .ASCIZ  /ATTN BIT WRONG AFTER TIMEOUT - REQUEST NOT SET/
                063454  044502  020124  051127
                063462  047117  020107  043101
                063470  042524  020122  044524
                063476  042515  052517  020124
                063504  020055  042522  052521
                063512  051505  020124  047516
                063520  020124  042523  000124
```

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9583
9584  063526  052101  047124  041040  EM16:   .ASCIZ  /ATTN BIT WRONG AFTER RELEASE - REQUEST SET/
      063534  052111  053440  047522
      063542  043516  040440  052106
      063550  051105  051040  046105
      063556  040505  042523  026440
      063564  051040  050505  042525
      063572  052123  051440  052105
      063600     000
9585
9586  063601     101  052124  020116  EM17:   .ASCIZ  /ATTN BIT WRONG AFTER RELEASE - REQUEST NOT SET/
      063606  044502  020124  051127
      063614  047117  020107  043101
      063622  042524  020122  042522
      063630  042514  051501  020105
      063636  020055  042522  052521
      063644  051505  020124  047516
      063652  020124  042523  000124
9587
9588  063660  051104  053111  020105  EM20:   .ASCIZ  /DRIVE NOT SEIZED WHEN ATTN BIT FOR PORT CLEARED/
      063666  047516  020124  042523
      063674  055111  042105  053440
      063702  042510  020116  052101
      063710  047124  041040  052111
      063716  043040  051117  050040
      063724  051117  020124  046103
      063732  040505  042522  000104
9589
9590  063740  051104  053111  020105  EM21:   .ASCIZ  /DRIVE SEIZED WHEN ZERO WRITTEN IN ATTN BIT/
      063746  042523  055111  042105
      063754  053440  042510  020116
      063762  042532  047522  053440
      063770  044522  052124  047105
      063776  044440  020116  052101
      064004  047124  041040  052111
      064012     000
9591
9592  064013     104  044522  042526  EM22:   .ASCIZ  /DRIVE NOT IN NEUTRAL AFTER TIMEOUT - REQUEST NOT SET/
      064020  047040  052117  044440
      064026  020116  042516  052125
      064034  040522  020114  043101
      064042  042524  020122  044524
      064050  042515  052517  020124
      064056  020055  042522  052521
      064064  051505  020124  047516
      064072  020124  042523  000124
9593
9594  064100  044524  042515  052517  EM23:   .ASCIZ  /TIMEOUT CLEARED THE DRIVE'S ERROR BIT/
      064106  020124  046103  040505
      064114  042522  020104  044124
      064122  020105  051104  053111
      064130  023505  020123  051105
      064136  047522  020122  044502
      064144  000124
9595
9596  064146  042522  042514  051501  EM24:   .ASCIZ  /RELEASE COMMAND RELEASED DRIVE WITH ERRORS SET/
```

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                064154  020105  047503  046515
                064162  047101  020104  042522
                064170  042514  051501  042105
                064176  042040  044522  042526
                064204  053440  052111  020110
                064212  051105  047522  051522
                064220  051440  052105     000
 9597
 9598   064225     124  046511  047505  EM25:   .ASCIZ  /TIMEOUT ONE-SHOT DID NOT RETRIGGER/
                064232  052125  047440  042516
                064240  051455  047510  020124
                064246  044504  020104  047516
                064254  020124  042522  051124
                064262  043511  042507  000122
 9599
 9600   064270  051104  053111  020105  EM26:   .ASCIZ  /DRIVE NOT IN NEUTRAL AFTER RELEASE - REQUEST NOT SET/
                064276  047516  020124  047111
                064304  047040  052505  051124
                064312  046101  040440  052106
                064320  051105  051040  046105
                064326  040505  042523  026440
                064334  051040  050505  042525
                064342  052123  047040  052117
                064350  051440  052105     000
 9601
 9602   064355     122  043505  051511  EM27:   .ASCIZ  /REGISTER WRONG AFTER RELEASE WITH REQUEST SET/
                064362  042524  020122  051127
                064370  047117  020107  043101
                064376  042524  020122  042522
                064404  042514  051501  020105
                064412  044527  044124  051040
                064420  050505  042525  052123
                064426  051440  052105     000
 9603
 9604   064433     104  044522  042526  EM30:   .ASCIZ  /DRIVE SEIZED BY RELEASE COMMAND ISSUED WHEN DRIVE IN NEUTRAL/
                064440  051440  044505  042532
                064446  020104  054502  051040
                064454  046105  040505  042523
                064462  041440  046517  040515
                064470  042116  044440  051523
                064476  042525  020104  044127
                064504  047105  042040  044522
                064512  042526  044440  020116
                064520  042516  052125  040522
                064526  000114
 9605
 9606   064530  051104  053111  020105  EM31:   .ASCIZ  /DRIVE IN NEUTRAL AFTER RELEASE - REQUEST SET/
                064536  047111  047040  052505
                064544  051124  046101  040440
                064552  052106  051105  051040
                064560  046105  040505  042523
                064566  026440  051040  050505
                064574  042525  052123  051440
                064602  052105     000
 9607
 9608   064605     101  052124  020116  EM32:   .ASCIZ  /ATTN BIT WRONG AFTER RECALIBRATE COMMAND/
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                064612  044502  020124  051127
                064620  047117  020107  043101
                064626  042524  020122  042522
                064634  040503  044514  051102
                064642  052101  020105  047503
                064650  046515  047101  000104
 9609
 9610   064656  051104  053111  020105  EM33:   .ASCIZ  /DRIVE RETURNED TO NEUTRAL IF DRIVE CLEAR GIVEN WHILE DRIVE SEIZED/
        064664  042522  052524  047122
        064672  042105  052040  020117
        064700  042516  052125  040522
        064706  020114  043111  042040
        064714  044522  042526  041440
        064722  042514  051101  043440
        064730  053111  047105  053440
        064736  044510  042514  042040
        064744  044522  042526  051440
        064752  044505  042532  000104
 9611
 9612   064760  051104  053111  020105  EM34:   .ASCIZ  /DRIVE RETURNED TO NEUTRAL IF MASSBUS INIT GIVEN WHILE DRIVE SEIZED/
        064766  042522  052524  047122
        064774  042105  052040  020117
        065002  042516  052125  040522
        065010  020114  043111  046440
        065016  051501  041123  051525
        065024  044440  044516  020124
        065032  044507  042526  020116
        065040  044127  046111  020105
        065046  051104  053111  020105
        065054  042523  055111  042105
        065062     000
 9613
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 9615  065063     124  046511  047505  EM35:   .ASCIZ  /TIMEOUT ONE SHOT FIRED WITHOUT REGISTER ACCESS.
       065070  052125  047440  042516
       065076  051440  047510  020124
       065104  044506  042522  020104
       065112  044527  044124  052517
       065120  020124  042522  044507
       065126  052123  051105  040440
       065134  041503  051505  000123
 9616
 9617  065142  044524  042515  052517  EM36:   .ASCIZ  /TIMEOUT HAS NOT OCCURRED WITHIN 2 SECONDS/
       065150  020124  040510  020123
       065156  047516  020124  041517
       065164  052503  051122  042105
       065172  053440  052111  044510
       065200  020116  020062  042523
       065206  047503  042116  000123
 9618
 9619  065214  051104  053111  020105  EM37:   .ASCIZ  /DRIVE IS NON-EXISTENT ('NED' BIT SET)/
       065222  051511  047040  047117
       065230  042455  044530  052123
       065236  047105  020124  023450
       065244  042516  023504  041040
       065252  052111  051440  052105
       065260  000051
 9620
 9621  065262  052101  047124  041040  EM40:   .ASCIZ  /ATTN BIT FOR PORT NO! RESET BY MASSBUS CLEAR/
       065270  052111  043040  051117
       065276  050040  051117  020124
       065304  047516  020124  042522
       065312  042523  020124  054502
       065320  046440  051501  041123
       065326  051525  041440  042514
       065334  051101     000
 9622
 9623  065337     124  046511  047505  EM41:   .ASCIZ  /TIMEOUT CLEARED THE ATTENTION BIT/
       065344  052125  041440  042514
       065352  051101  042105  052040
       065360  042510  040440  052124
       065366  047105  044524  047117
       065374  041040  052111     000
 9624
 9625  065401     104  044522  042526  EM42:   .ASCIZ  /DRIVE NOT IN NEUTRAL OR SEIZED AFTER ATTN BIT WRITTEN/
       065406  047040  052117  044440
       065414  020116  042516  052125
       065422  040522  020114  051117
       065430  051440  044505  042532
       065436  020104  043101  042524
       065444  020122  052101  047124
       065452  041040  052111  053440
       065460  044522  052124  047105
       065466     000
 9626
 9627  065467     104  044522  042526  EM43:   .ASCIZ  /DRIVE IN NEUTRAL AFTER ATTENTION BIT WRITTEN/
       065474  044440  020116  042516
       065502  052125  040522  020114
       065510  043101  042524  020122
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                065516  052101  042524  052116
                065524  047511  020116  044502
                065532  020124  051127  052111
                065540  042524  000116
 9628
 9629   065544  051127  052111  020105  EM44:   .ASCIZ  /WRITE ATTENTION BIT DID NOT SET PORT REQUEST/
        065552  052101  042524  052116
        065560  047511  020116  044502
        065566  020124  044504  020104
        065574  047516  020124  042523
        065602  020124  047520  052122
        065610  051040  050505  042525
        065616  052123     000
 9630
 9631   065621     103  047117  051124  EM45:   .ASCIZ  @CONTROLLER SELECT SWITCH ON DRIVE NOT IN 'A/B'@
        065626  046117  042514  020122
        065634  042523  042514  052103
        065642  051440  044527  041524
        065650  020110  047117  042040
        065656  044522  042526  047040
        065664  052117  044440  020116
        065672  040447  041057  000047
 9632
 9633   065700  040503  023516  020124  EM46:   .ASCIZ  /CAN'T ACCESS DRIVE THROUGH EITHER PORT/
        065706  041501  042503  051523
        065714  042040  044522  042526
        065722  052040  051110  052517
        065730  044107  042440  052111
        065736  042510  020122  047520
        065744  052122     000
 9634
 9635   065747     101  052124  020116  EM47:   .ASCIZ  /ATTN BIT FOR SEIZING PORT NOT CLEARED BY MASSBUS INIT/
        065754  044502  020124  047506
        065762  020122  042523  055111
        065770  047111  020107  047520
        065776  052122  047040  052117
        066004  041440  042514  051101
        066012  042105  041040  020131
        066020  040515  051523  052502
        066026  020123  047111  052111
        066034     000
 9636
 9637   066035     101  052124  020116  EM50:   .ASCIZ  /ATTN BIT FOR OPPOSITE PORT CLEARED BY MASSBUS INIT/
        066042  044502  020124  047506
        066050  020122  050117  047520
        066056  044523  042524  050040
        066064  051117  020124  046103
        066072  040505  042522  020104
        066100  054502  046440  051501
        066106  041123  051525  044440
        066114  044516  000124
 9638
 9639   066120  052101  047124  041040  EM51:   .ASCIZ  /ATTN BIT CLEARED BY MASSBUS INIT, DRIVE IN NEUTRAL/
        066126  052111  041440  042514
        066134  051101  042105  041040
        066142  020131  040515  051523
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                066150  052502  020123  047111
                066156  052111  020054  051104
                066164  053111  020105  047111
                066172  047040  052505  051124
                066200  046101     000
9640
9641    066203     124  042510  040440  EM52:   .ASCIZ  /THE ATTN BIT IS SET AFTER TIMEOUT WITH NO REQUEST & 'ERR' SET/
                066210  052124  020116  044502
                066216  020124  051511  051440
                066224  052105  040440  052106
                066232  051105  052040  046511
                066240  047505  052125  053440
                066246  052111  020110  047516
                066254  051040  050505  042525
                066262  052123  023040  023440
                066270  051105  023522  051440
                066276  052105     000
9642
9643    066301     103  047101  052047  EM53:   .ASCIZ  /CAN'T READ THE ATTN BIT FROM THE 'OPPOSITE' PORT/
                066306  051040  040505  020104
                066314  044124  020105  052101
                066322  047124  041040  052111
                066330  043040  047522  020115
                066336  044124  020105  047447
                066344  050120  051517  052111
                066352  023505  050040  051117
                066360  000124
9644
9645    066362  042522  042514  051501  EM54:   .ASCIZ  /RELEASE COMMAND RECOGNIZED WHEN ISSUED BY NON-SEIZING PORT/
                066370  020105  047503  046515
                066376  047101  020104  042522
                066404  047503  047107  055111
                066412  042105  053440  042510
                066420  020116  051511  052523
                066426  042105  041040  020131
                066434  047516  026516  042523
                066442  055111  047111  020107
                066450  047520  052122     000
9646
9647    066455     124  046511  047505  EM55:   .ASCIZ  /TIMEOUT ONE-SHOT IS LESS THAN 500 MS/
                066462  052125  047440  042516
                066470  051455  047510  020124
                066476  051511  046040  051505
                066504  020123  044124  047101
                066512  032440  030060  046440
                066520  000123
9648
9649    066522  044122  030461  042040  EM56:   .ASCIZ  /RH11 DIDN'T RESPOND TO ADDRESSING/
                066530  042111  023516  020124
                066536  042522  050123  047117
                066544  020104  047524  040440
                066552  042104  042522  051523
                066560  047111  000107
9650
9651
9652
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M14


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 9653
 9654
 9655  066564  042524  052123  021440  DH1:    .ASCIZ  /TEST #  ERR PC  PORT #  REG ADR CONTENTS/
       066572  020040  051105  020122
       066600  041520  020040  047520
       066606  052122  021440  020040
       066614  042522  020107  042101
       066622  020122  047503  052116
       066630  047105  051524     000
 9656  066635     124  051505  020124  DH3:    .ASCIZ  /TEST #  ERR PC  REG ADR PORT A  PORT B/
       066642  020043  042440  051122
       066650  050040  020103  051040
       066656  043505  040440  051104
       066664  050040  051117  020124
       066672  020101  050040  051117
       066700  020124  000102
 9657  066704  020040  020040  020040  DH4:    .ASCII  /               SEIZE   ERROR/<CR><LF>
       066712  020040  020040  020040
       066720  020040  020040  042523
       066726  055111  020105  020040
       066734  051105  047522  006522
       066742     012
 9658  066743     124  051505  020124          .ASCIZ  /TEST #  ERR PC  PORT #  PORT #  REG ADR GOOD    BAD/
       066750  020043  042440  051122
       066756  050040  020103  050040
       066764  051117  020124  020043
       066772  050040  051117  020124
       067000  020043  051040  043505
       067006  040440  051104  043440
       067014  047517  020104  020040
       067022  041040  042101     000
 9659  067027     124  051505  020124  DH5:    .ASCIZ  /TEST #  ERR PC  PORT #  REG ADR GOOD    BAD/
       067034  020043  042440  051122
       067042  050040  020103  050040
       067050  051117  020124  020043
       067056  051040  043505  040440
       067064  051104  043440  047517
       067072  020104  020040  041040
       067100  042101     000
 9660  067103     040  020040  020040  DH7:    .ASCII  /               RELSNG  ERROR/<CR><LF>
       067110  020040  020040  020040
       067116  020040  020040  051040
       067124  046105  047123  020107
       067132  042440  051122  051117
       067140  005015
 9661  067142  042524  052123  021440          .ASCIZ  /TEST #  ERR PC  PORT #  PORT #  REG ADR GOOD    BAD/
       067150  020040  051105  020122
       067156  041520  020040  047520
       067164  052122  021440  020040
       067172  047520  052122  021440
       067200  020040  042522  020107
       067206  042101  020122  047507
       067214  042117  020040  020040
       067222  040502  000104
 9662  067226  042524  052123  021440  DH11:   .ASCIZ  /TEST #  ERR PC  PORT #  REG ADR CONTENTS/
       067234  020040  051105  020122
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                067242  041520  020040  047520
                067250  052122  021440  020040
                067256  042522  020107  042101
                067264  020122  047503  052116
                067272  047105  051524     000
9663            067277     040  020040  020040  DH13:   .ASCII  /              SEIZE   ERROR/<CR><LF>
                067304  020040  020040  020040
                067312  020040  020040  051440
                067320  044505  042532  020040
                067326  042440  051122  051117
                067334  005015
9664            067336  042524  052123  021440          .ASCIZ  /TEST #  ERR PC  PORT #  PORT #  REG ADR CONTENTS/
                067344  020040  051105  020122
                067352  041520  020040  047520
                067360  052122  021440  020040
                067366  047520  052122  021440
                067374  020040  042522  020107
                067402  042101  020122  047503
                067410  052116  047105  051524
                067416     000
9665            067417     040  020040  020040  DH22:   .ASCII  /              RELSNG  SEIZE/<CR><LF>
                067424  020040  020040  020040
                067432  020040  020040  051040
                067440  046105  047123  020107
                067446  051440  044505  042532
                067454  005015
9666            067456  042524  052123  021440          .ASCIZ  /TEST #  ERR PC  PORT #  PORT #/
                067464  020040  051105  020122
                067472  041520  020040  047520
                067500  052122  021440  020040
                067506  047520  052122  021440
                067514     000
9667            067515     040  020040  020040  DH23:   .ASCII  /              SEIZE/<CR><LF>
                067522  020040  020040  020040
                067530  020040  020040  051440
                067536  044505  042532  005015
9668            067544  042524  052123  021440          .ASCIZ  /TEST #  ERR PC  PORT #  REG ADR CONTENTS/
                067552  020040  051105  020122
                067560  041520  020040  047520
                067566  052122  021440  020040
                067574  042522  020107  042101
                067602  020122  047503  052116
                067610  047105  051524     000
9669            067615     040  020040  020040  DH26:   .ASCII  /              RELSNG/<CR><LF>
                067622  020040  020040  020040
                067630  020040  020040  051040
                067636  046105  047123  0065C7
                067644     012
9670            067645     124  051505  020124          .ASCIZ  /TEST #  ERR PC  PORT #/
                067652  020043  042440  051122
                067660  050040  020103  050040
                067666  051117  020124  000043
9671            067674  020040  020040  020040  DH31:   .ASCII  /              RELSNG  RQSTNG/<CR><LF>
                067702  020040  020040  020040
                067710  020040  020040  042522
                067716  051514  043516  020040
```

```
                067724  050522  052123  043516
                067732  005015
9672            067734  042524  052123  021440          .ASCIZ  /TEST #  ERR PC  PORT #  PORT #/
                067742  020040  051105  020122
                067750  041520  020040  047520
                067756  052122  021440  020040
                067764  047520  052122  021440
                067772     000
9673            067773     124  051505  020124  DH36:   .ASCIZ  /TEST #  ERR PC  PORT #/
                070000  020043  042440  051122
                070006  050040  020103  050040
                070014  051117  020124  000043
9674            070022  042524  052123  021440  DH42:   .ASCIZ  /TEST #  ERR PC/
                070030  020040  051105  020122
                070036  041520     000
9675            070041     040  020040  020040  DH44:   .ASCII  /               RELSNG  ERROR/<CR><LF>
                070046  020040  020040  020040
                070054  020040  020040  051040
                070062  046105  047123  020107
                070070  042440  051122  051117
                070076  005015
9676            070100  042524  052123  021440          .ASCIZ  /TEST #  ERR PC  PORT #  PORT #/
                070106  020040  051105  020122
                070114  041520  020040  047520
                070122  052122  021440  020040
                070130  047520  052122  021440
                070136     000
9677            070137     040  020040  020040  DH46:   .ASCII  /               PORT A  PORT B/<CR><LF>
                070144  020040  020040  020040
                070152  020040  020040  050040
                070160  051117  020124  020101
                070166  050040  051117  020124
                070174  006502     012
9678            070177     124  051505  020124          .ASCIZ  /TEST #  ERR PC  RPDS1   RPDS1/
                070204  020043  042440  051122
                070212  050040  020103  051040
                070220  042120  030523  020040
                070226  051040  042120  030523
                070234     000
9679            070235     124  051505  020124  DH55:   .ASCIZ  /TEST #  ERR PC  PORT #  TIMEOUT VALUE (IN MS)/
                070242  020043  042440  051122
                070250  050040  020103  050040
                070256  051117  020124  020043
                070264  052040  046511  047505
                070272  052125  053040  046101
                070300  042525  024040  047111
                070306  046440  024523     000
9680            070313     044  050122  042101  DH56:   .ASCIZ  /$RPADR/
                070320  000122
9681
9682                                            DH55:   .EVEN
9683
9684            070322  001242  001116  001234  DT1:    .WORD   TSTNUM,$ERRPC,PTNBR,$BDADR,$BDDAT,0
                070330  001122  001126  000000
9685            070336  001242  001116  001122  DT3:    .WORD   TSTNUM,$ERRPC,$BDADR,$GDDAT,$BDDAT,0
                070344  001124  001126  000000
```

```
9686  070352  001242  001116  001234  DT5:    .WORD   TSTNUM,$ERRPC,PTNBR,$BDADR,$GDDAT,$BDDAT,0
      070360  001122  001124  001126
      070366  000000
9687  070370  001242  001116  001240  DT6:    .WORD   TSTNUM,$ERRPC,OPPRT,$BDADR,$BDDAT,0
      070376  001122  001126  000000
9688  070404  001242  001116  001236  DT7:    .WORD   TSTNUM,$ERRPC,SEIZPT,PTNBR,$BDADR,$GDDAT,$BDDAT,0
      070412  001234  001122  001124
      070420  001126  000000
9689  070424  001242  001116  001236  DT13:   .WORD   TSTNUM,$ERRPC,SEIZPT,PTNBR,$BDADR,$BDDAT,0
      070432  001234  001122  001126
      070440  000000
9690  070442  001242  001116  001236  DT22:   .WORD   TSTNUM,$ERRPC,SEIZPT,PTNBR,0
      070450  001234  000000
9691  070454  001242  001116  001236  DT23:   .WORD   TSTNUM,$ERRPC,SEIZPT,$BDADR,$BDDAT,0
      070462  001122  001126  000000
9692  070470  001242  001116  001236  DT31:   .WORD   TSTNUM,$ERRPC,SEIZPT,OPPRT,0
      070476  001240  000000
9693  070502  001242  001116  001236  DT36:   .WORD   TSTNUM,$ERRPC,SEIZPT,0
      070510  000000
9694  070512  001242  001116  001234  DT37:   .WORD   TSTNUM,$ERRPC,PTNBR,0
      070520  000000
9695  070522  001242  001116  000000  DT42:   .WORD   TSTNUM,$ERRPC,0
9696  070530  001242  001116  001170  DT46:   .WORD   TSTNUM,$ERRPC,$TMP2,$TMP3,0
      070536  001172  000000
9697  070542  001242  001116  001240  DT54:   .WORD   TSTNUM,$ERRPC,OPPRT,SEIZPT,0
      070550  001236  000000
9698  070554  001242  001116  001236  DT55:   .WORD   TSTNUM,$ERRPC,SEIZPT,TIME,0
      070562  001252  000000
9699  070566  001300  000000          DT56:   .WORD   $RPADR,0
9700
9701  070572      000     000     000 DF1:    .BYTE   0,0,0,0,0
      070575      000     000
9702  070577      000     000     000 DF5:    .BYTE   0,0,0,0,0,0
      070602      000     000     000
9703  070605      000     000     000 DF7:    .BYTE   0,0,0,0,0,0,0
      070610      000     000     000
      070613      000
9704  070614      000     000     000 DF31:   .BYTE   0,0,0,0
      070617      000
9705  070620      000     000     000 DF36:   .BYTE   0,0,0
9706  070623      000     000         DF42:   .BYTE   0,0
9707  070625      000     000     000 DF55:   .BYTE   0,0,0,1
      070630      001
9708  070631      000                 DF56:   .BYTE   0
9709
9710                                        .EVEN
9711
9712
9713                                ;;*****************************************************************
9714
9715                                .SBTTL  CONSTANTS, TABLES, ETC
9716
9717                                ;;*****************************************************************
9718
9719                                ;TABLE OF TEST STARTING ADDRESSES
9720
```

```
 9721  070632  003120                TSTADR: .WORD   TST1            ;STARTING ADDRESS OF TEST 1
 9724  070634  004520                        .WORD   TST2            ;STARTING ADDRESS OF TEST 2
  (1)  070636  006120                        .WORD   TST3            ;STARTING ADDRESS OF TEST 3
  (1)  070640  007520                        .WORD   TST4            ;STARTING ADDRESS OF TEST 4
  (1)  070642  010656                        .WORD   TST5            ;STARTING ADDRESS OF TEST 5
  (1)  070644  012014                        .WORD   TST6            ;STARTING ADDRESS OF TEST 6
  (1)  070646  013004                        .WORD   TST7            ;STARTING ADDRESS OF TEST 7
  (1)  070650  013774                        .WORD   TST10           ;STARTING ADDRESS OF TEST 10
  (1)  070652  014416                        .WORD   TST11           ;STARTING ADDRESS OF TEST 11
  (1)  070654  015040                        .WORD   TST12           ;STARTING ADDRESS OF TEST 12
  (1)  070656  016416                        .WORD   TST13           ;STARTING ADDRESS OF TEST 13
  (1)  070660  017774                        .WORD   TST14           ;STARTING ADDRESS OF TEST 14
  (1)  070662  021276                        .WORD   TST15           ;STARTING ADDRESS OF TEST 15
  (1)  070664  022600                        .WORD   TST16           ;STARTING ADDRESS OF TEST 16
  (1)  070666  024040                        .WORD   TST17           ;STARTING ADDRESS OF TEST 17
  (1)  070670  024726                        .WORD   TST20           ;STARTING ADDRESS OF TEST 20
  (1)  070672  025614                        .WORD   TST21           ;STARTING ADDRESS OF TEST 21
  (1)  070674  026774                        .WORD   TST22           ;STARTING ADDRESS OF TEST 22
  (1)  070676  030154                        .WORD   TST23           ;STARTING ADDRESS OF TEST 23
  (1)  070700  031164                        .WORD   TST24           ;STARTING ADDRESS OF TEST 24
 9727  070702  032174                        .WORD   TST25           ;STARTING ADDRESS OF TEST 25
  (1)  070704  033402                        .WORD   TST26           ;STARTING ADDRESS OF TEST 26
  (1)  070706  034610                        .WORD   TST27           ;STARTING ADDRESS OF TEST 27
  (1)  070710  036604                        .WORD   TST30           ;STARTING ADDRESS OF TEST 30
  (1)  070712  037300                        .WORD   TST31           ;STARTING ADDRESS OF TEST 31
  (1)  070714  040540                        .WORD   TST32           ;STARTING ADDRESS OF TEST 32
  (1)  070716  042000                        .WORD   TST33           ;STARTING ADDRESS OF TEST 33
  (1)  070720  043070                        .WORD   TST34           ;STARTING ADDRESS OF TEST 34
  (1)  070722  044160                        .WORD   TST35           ;STARTING ADDRESS OF TEST 35
  (1)  070724  044774                        .WORD   TST36           ;STARTING ADDRESS OF TEST 36
 9730  070726  045610                        .WORD   TST37           ;STARTING ADDRESS OF TEST 37
  (1)  070730  046572                        .WORD   TST40           ;STARTING ADDRESS OF TEST 40
  (1)  070732  047554                        .WORD   TST41           ;STARTING ADDRESS OF TEST 41
  (1)  070734  051162                        .WORD   TST42           ;STARTING ADDRESS OF TEST 42
  (1)  070736  052570                        .WORD   TST43           ;STARTING ADDRESS OF TEST 43
  (1)  070740  053452                        .WORD   TST44           ;STARTING ADDRESS OF TEST 44
  (1)  070742  054340                        .WORD   TST45           ;STARTING ADDRESS OF TEST 45
  (1)  070744  055306                        .WORD   TST46           ;STARTING ADDRESS OF TEST 46
 9731
 9732                                ;ATTENTION BIT TABLE
 9733
 9734  070746     001                ATABIT: .BYTE   1               ;ATTENTION BIT FOR DRIVE 0
 9735  070747     002                        .BYTE   2               ;ATTENTION BIT FOR DRIVE 1
 9736  070750     004                        .BYTE   4               ;ATTENTION BIT FOR DRIVE 2
 9737  070751     010                        .BYTE   10              ;ATTENTION BIT FOR DRIVE 3
 9738  070752     020                        .BYTE   20              ;ATTENTION BIT FOR DRIVE 4
 9739  070753     040                        .BYTE   40              ;ATTENTION BIT FOR DRIVE 5
 9740  070754     100                        .BYTE   100             ;ATTENTION BIT FOR DRIVE 6
 9741  070755     200                        .BYTE   200             ;ATTENTION BIT FOR DRIVE 7
 9742
 9743  070756  000046                MAXTN:  .WORD   $TN-1           ;MAXIMUM TEST NUMBER
 9744
 9745          000001                        .END
```

```
ABS    = 000200
ACL    = 000040
ACU    = 100000
ADDRIS   062414
ADRERR   062167
AOE    = 001000
ASR1     001232
ATA    = 100000
ATABIT   070746
ATO    = 000001
AT1    = 000002
AT2    = 000004
AT3    = 000010
AT4    = 000020
AT5    = 000040
AT6    = 000100
AT7    = 000200
A16    = 000400
A17    = 001000
BADNO    062354
BAI    = 000010
BIT0   = 000001
BIT00  = 000001
BIT01  = 000002
BIT02  = 000004
BIT03  = 000010
BIT04  = 000020
BIT05  = 000040
BIT06  = 000100
BIT07  = 000200
BIT08  = 000400
BIT09  = 001000
BIT1   = 000002
BIT10  = 002000
BIT11  = 004000
BIT12  = 010000
BIT13  = 020000
BIT14  = 040000
BIT15  = 100000
BIT2   = 000004
BIT3   = 000010
BIT4   = 000020
BIT5   = 000040
BIT6   = 000100
BIT7   = 000200
BIT8   = 000400
BIT9   = 001000
BPTVEC= 000014
CHANGE   003004
CHGADR   001276
CKCLK    056474
CKCLK1   056544
CKCLK2   056606
CKCLK3   056616
CKERR    001244
CKSWR  = 104407
CLOCK    056626
CLR    = 000040
CR     = 000015
CRLF   = 000200
CSF    = 000002
CSU    = 000010
DCK    = 100000
DCL    = 000100
DCU    = 000001
DDISP  = 177570
DE1    = 000040
DFF20  = 000002
DF1      070572
DF31     070614
DF36     070620
DF42     070623
DF5      070577
DF55     070625
DF56     070631
DF7      070605
DH1      066564
DH11     067226
DH13     067277
DH22     067417
DH23     067515
DH26     067615
DH3      066635
DH31     067674
DH36     067773
DH4      066704
DH42     070022
DH44     070041
DH46     070137
DH5      067027
DH55     070235
DH56     070313
DH7      067103
DIGB   = 000004
DISPLA   001142
DISPRE   000174
DLT    = 100000
DL64   = 000020
DMD    = 000001
DPR    = 000400
DRQ    = 004000
DRY    = 000200
DSWR   = 177570
DTE    = 010000
DTSY   = 000200
DTO0   = 000001
DTO1   = 000002
DTO2   = 000004
DTO3   = 000C10
DTO4   = 000020
DTO5   = 000040
DTO6   = 000100
DTO7   = 000200
DTO8   = 000400
DT1      070322
DT13     070424
DT22     070442
DT23     070454
DT3      070336
DT31     070470
DT36     070502
DT37     070512
DT42     070522
DT46     070530
DT5      070352
DT54     070542
DT55     070554
DT56     070566
DT6      070370
DT7      070404
DVA    = 004000
ECH    = 000100
ECI    = 004000
EMTVEC= 000030
EM1      062526
EM10     063133
EM11     063163
EM12     063247
EM13     063317
EM14     063404
EM15     063447
EM16     063526
EM17     063601
EM2      062547
EM20     063660
EM21     063740
EM22     064013
EM23     064100
EM24     064146
EM25     064225
EM26     064270
EM27     064355
EM3      062571
EM30     064433
EM31     064530
EM32     064605
EM33     064656
EM34     064760
EM35     065063
EM36     065142
EM37     065214
EM4      062653
EM40     065262
EM41     065337
EM42     065401
EM43     065467
EM44     065544
EM45     065621
EM46     065700
EM47     065747
EM5      062704
EM50     066035
EM51     066120
EM52     066203
EM53     066301
EM54     066362
EM55     066455
EM56     066522
EM6      062752
EM7      063052
ENTERA   062137
ERR    = 040000
ERRVEC= 000004
EXEC     002622
EXT1   = 000001
EXT10  = 000010
EXT2   = 000002
EXT20  = 000020
EXT4   = 000004
EXT40  = 000040
FEN    = 000200
FER    = 000020
FMT22  = 010000
F1     = 000002
F2     = 000004
F3     = 000010
F4     = 000020
F5     = 000040
GO     = 000001
GRV    = 000010
GTSWR  = 104406
HCE    = 000200
HCI    = 002000
HCRC   = 000400
HT     = 000011
IAE    = 002000
IE     = 000100
ILF    = 000001
ILR    = 000002
IOTVEC= 000020
IR     = 000100
IXE    = 004000
KYBCTL   001274
LF     = 000012
LST    = 002000
MAXTN    070756
MCLK   = 000002
MCPE   = 020000
MHS    = 001000
MINX   = 000004
MOH    = 020000
MOL    = 010000
MPE    = 000400
MRD    = 000020
MSE    = 000020
MSTCK  = 000010
MWR    = 000040
MXF    = 001000
NBA    = 100000
NED    = 010000
NEM    = 004000
NHS    = 002000
NOATA  = 000001
NOCLOC   062265
NOSEIZ   001246
NTRH11   062474
OCYL   = 100000
OFREV  = 000200
OF100  = 000004
OF200  = 000010
OF25   = 000001
OF400  = 000020
OF50   = 000002
OF800  = 000040
OPE    = 020000
OPI    = 020000
OPPRT    001240
OR     = 000200
PAR    = 000010
PAT    = 000020
PGE    = 002000
PGM    = 001000
PIP    = 020000
PIRQ   = 177772
PIRQVE= 000240
PLU    = 020000
PORTA    001224
PORTAI   062211
PORTB    001226
PORTBI   062237
PORTC    001230
PRE    = 000020
PRO    = 000000
PR1    = 000040
PR2    = 000100
```

```
PR3     = 000140
PR4     = 000200
PR5     = 000240
PR6     = 000300
PR7     = 000340
PS      = 177776
PSEL    = 002000
PSU     = 000001
PSW     = 177776
PTNBR     001234
PWRVEC= 000024
RAW     = 000020
RDCHR   = 104410
RDLIN   = 104411
RDOCT   = 104412
RDY     = 000200
RELERR    001250
RELOK   = 000001
RESREG= 104414
RESVEC= 000010
RMR     = 000004
RPAS    = 000016
RPBA    = 000004
RPCA    = 000034
RPCC    = 000036
RPCS1   = 000000
RPCS2   = 000010
RPDA    = 000006
RPDB    = 000022
RPDS1   = 000012
RPDT    = 000026
RPEC1   = 000044
RPEC2   = 000046
RPER1   = 000014
RPER2   = 000040
RPER3   = 000042
RPLA    = 000020
RPMR    = 000024
RPOF    = 000032
RPSN    = 000030
RPWC    = 000002
R6      =%000006
R7      =%000007
SAVREG=  104413
SC      = 100000
SC1     = 000100
SC10    = 001000
SC2     = 000200
SC20    = 002000
SC4     = 000400
SEIZPT    001236
SKI     = 040000
STACK   = 001100
START     002064
START1    002072
START2    002100
STKLMT=  177774
SWR       001140
SWREG     000176
SW0     = 000001
SW00    = 000001
SW01    = 000002
SW02    = 000004
SW03    = 000010
SW04    = 000020
SW05    = 000040
SW06    = 000100
SW07    = 000200
SW08    = 000400
SW09    = 001000
SW1     = 000002
SW10    = 002000
SW11    = 004000
SW12    = 010000
SW13    = 020000
SW14    = 040000
SW15    = 100000
SW2     = 000004
SW3     = 000010
SW4     = 000020
SW5     = 000040
SW6     = 000100
SW7     = 000200
SW8     = 000400
SW9     = 001000
TAP     = 040000
TBITVE=  000014
TDF     = 000040
TESTNO    062334
TEST1     003172
TEST10    014046
TEST11    014470
TEST12    015112
TEST13    016470
TEST14    020046
TEST15    021350
TEST16    022652
TEST17    024112
TEST2     004572
TEST20    025000
TEST21    025666
TEST22    027046
TEST23    030226
TEST24    031236
TEST25    032246
TEST26    033454
TEST27    034662
TEST3     006172
TEST30    036656
TEST31    037352
TEST32    040612
TEST33    042052
TEST34    043142
TEST35    044232
TEST36    045046
TEST37    045662
TEST4     007572
TEST40    046644
TEST41    047626
TEST42    051234
TEST43    052642
TEST44    053524
TEST45    054412
TEST46    055360
TEST5     010730
TEST6     012066
TEST7     013056
TIME      001252
TIMEA     001256
TIMEAM    001262
TIMEAP    001260
TIMEB     001264
TIMEBM    001270
TIMEBP    001266
TIMES     001272
TITLE     062040
TKVEC   = 000060
TOLER     056660
TPVEC   = 000064
TRAPVE=  000034
TRE     = 040000
TRK1    = 004000
TRK10   = 040000
TRK2    = 010000
TRK20   = 100000
TRK4    = 020000
TRTVEC=  000014
TSTADR    070632
TSTERR    062402
TSTNUM    001242
TST1      003120
TST1AA    003114
TST10     013774
TST11     014416
TST12     015040
TST13     016416
TST14     017774
TST15     021276
TST16     022600
TST17     024040
TST2      004520
TST20     024726
TST21     025614
TST22     026774
TST23     030154
TST24     031164
TST25     032174
TST26     033402
TST27     034610
TST3      006120
TST30     036604
TST31     037300
TST32     040540
TST33     042000
TST34     043070
TST35     044160
TST36     044774
TST37     045610
TST4      007520
TST40     046572
TST41     047554
TST41B    050630
TST42     051162
TST42B    052236
TST43     052570
TST44     053452
TST45     054340
TST46     055306
TST5      010656
TST6      012014
TST7      013004
TUF     = 000100
TYPDS   = 104405
TYPE    = 104401
TYPOC   = 104402
TYPON   = 104404
TYPOS   = 104403
UNS     = 040000
UPE     = 020000
US1     = 000001
US2     = 000002
US4     = 000004
UWR     = 000010
VUF     = 000002
VU30    = 010000
VV      = 000100
VVSET   = 000001
WA0     = 000002
WATCH     001254
WCE     = 040000
WCF     = 000040
WCU     = 000001
WLE     = 004000
WRL     = 004000
WRU     = 000400
WSU     = 000004
$AUTOB    001134
$BDADR    001122
$BDDAT    001126
$BELL     001202
$CHARC    057674
$CKSWR    060624
$CMTAG    001100
$CM1    = 000001
$CM2    = 000002
$CM3    = 000001
$CM4    = 000005
$CNTLG    061466
$CNTLU    061461
$CRLF     001207
$DBLK     060342
$DOAGN    056464
$DTBL     060332
$ENDAD    056454
$ENDCT    056320
$ENULL    056470
$EOP      056254
$EOPCT    056312
$ERFLG    001103
$ERMAX    001115
$ERROR    057152
$ERRPC    001116
$ERRTB    001304
$ERRTY    057304
$ERTTL    001112
$ESCAP    001200
$FILLC    001156
$FILLS    001155
$GDADR    001120
$GDDAT    001124
$GET42    056444
$GTSWR    060714
$HD     = 000000
$HIOCT    061654
$ICNT     001104
$INTAG    001135
$ITEMB    001114
$LF       001210
$LKCSB    001214
$LKCSR    001212
$LKS      001220
$LLVEC    001222
$LPADR    001106
$LPERR    001110
$LPVEC    001216
```

```
CZRJECO, DL CTRLR LGC   MACY11 30A(1052)  28-DEC-77  10:17  PAGE 69-2
CZRJEC.P11    21-DEC-77 14:19          SYMBOL TABLE                    SEQ 0188

$MNEW   061504          $RDSZ = 000007  $SWR   = 166000  $TMP1   001166  $TTYIN  061452
$MSWR   061473          $REGAD  001160  $SWRMK= 000000  $TMP2   001170  $TYPDS  060126
$MXCNT  057150          $REGO   001162  $TIMES  001176  $TMP3   001172  $TYPE   057460
$NULL   001154          $RESRE  061714  $TKB    001146  $TMP4   001174  $TYPEC  057630
$NWTST= 000001          $RPADR  001300  $TKCNT  060352  $TN    = 000047  $TYPEX  057676
$OCNT   060122          $RPVEC  001302  $TKINT  060362  $TPB     001152  $TYPOC  057724
$OMODE  060124          $RTNAD  056466  $TKQEN= 060361  $TPFLG   001157  $TYPON  057740
$OVER   057134          $SAVRE  061656  $TKQIN  060354  $TPS     001150  $TYPOS  057700
$PASS   001100          $SCOPE  056720  $TKQOU  060356  $TRAP    061752  $XTSTR  056732
$QUES   001206          $SETUP= 000127  $TKQSR  060360  $TRAP2   061774  $$GET4= 000000
$RDCHR  061126          $STUP = 177777  $TKS    001144  $TRP   = 000015  $OFILL  060123
$RDLIN  061216          $SVLAD  057106  $TKSRV  060432  $TRPAD   062006  .     = 070760
$RDOCT  061516          $SVPC = 000200  $TMPO   001164  $TSTNM   001102

. ABS.  070760     000

 ERRORS DETECTED:  0

 CZRJEC,CZRJEC.SEQ=CZRJEC.SML,CZRJEC.P11
 RUN-TIME:  30  42  .6 SECONDS
 RUN-TIME RATIO: 740/73=10.0
 CORE USED:  40K  (79 PAGES)
```

H15