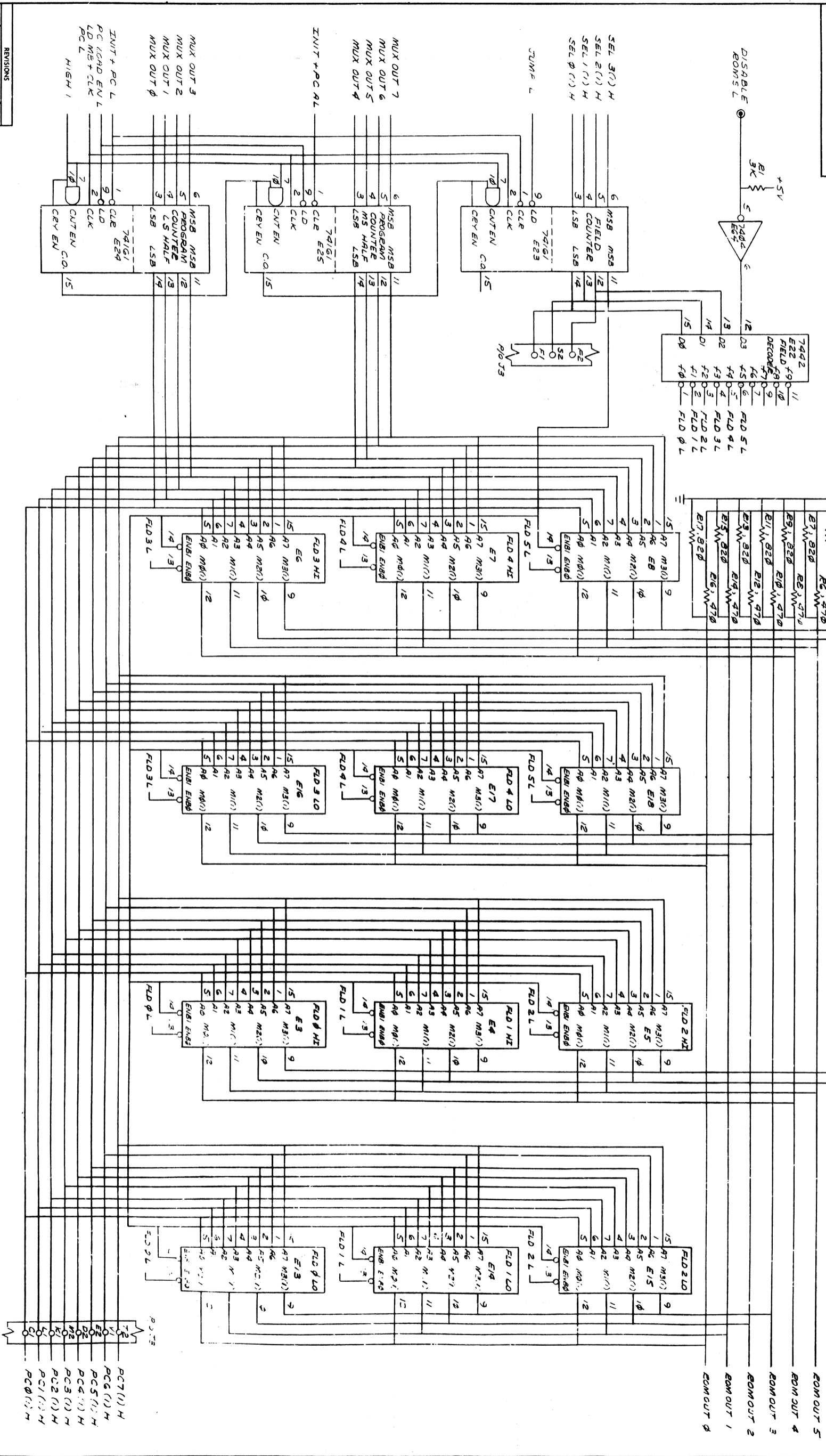


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REV.	NO.	DESCRIPTION
1	1	INITIAL DESIGN
2	1	REVISED TO ADD PC7(1) H
3	1	REVISED TO ADD PC6(1) H
4	1	REVISED TO ADD PC5(1) H
5	1	REVISED TO ADD PC4(1) H
6	1	REVISED TO ADD PC3(1) H
7	1	REVISED TO ADD PC2(1) H
8	1	REVISED TO ADD PC1(1) H
9	1	REVISED TO ADD PC0(1) H

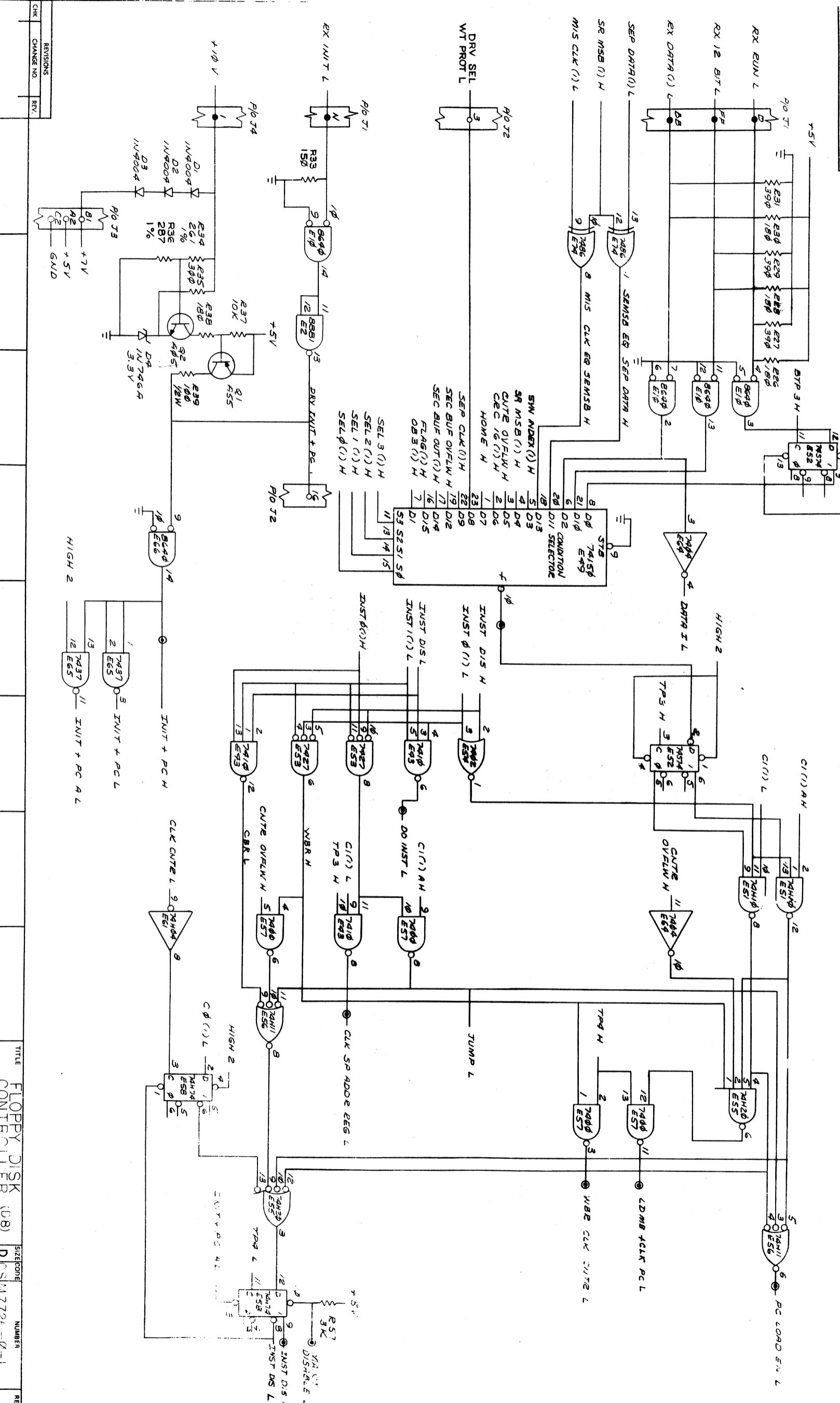
TITLE: FLOPPY DISK CONTROLLER (DB)  
 SIZE CODE: DCS M7726-V-1  
 SCALE: 1:1  
 SHEET: 3 OF 3  
 DIST: 1

CHK: CHANGE NO. REV.

REV. NUMBER: 1



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REV.	NO.	DESCRIPTION
1	1	INITIAL

TITLE	FLOPPY DISK CONTROLLER (U8)
SCALE	1:1
SHEET	8 OF 9
DIST	
NUMBER	17726-0-1
REV.	J



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4 3 1  
 REV. 2-0-10XR  
 PART NO. SPK 2  
 1

FIRST USED ON OPTION MODEL RXØ1		QTY.	DESCRIPTION	PART NO.	ITEM NO.
------------------------------------	--	------	-------------	----------	----------

DRN	DATE	DATE	DATE
CHK'D	DATE	DATE	DATE
ENG	DATE	DATE	DATE
PRO. ENG.	DATE	DATE	DATE
PROD.	DATE	DATE	DATE

**digital** EQUIPMENT CORPORATION  
 MAYNARD, MASSACHUSETTS

TITLE  
 FLOPPY CONTROLLER  
 FIRMWARE

SIZE CODE	NUMBER	REV.
K SP	RXØ1-Ø-2	

REVISIONS		
REV.	CHANGE NO.	CHK

DEC FORM NO. DRB 109 4 3 2 1 15

```

1
2      /RX01 FLOPPY CONTROLLER FIRMWARE
3
4
5      /THIS SYMBOL TABLE REPLACES THE NORMAL PAL SYMBOL TABLE AND DEFINES
6      /THE INSTRUCTIONS POSSIBLE BY THE RX01 CONTROLLER
7
8
9
10
11     /DO INSTRUCTIONS
12
13
14     0002    SET=2
15     0000    CLR=0
16     0002    ONE=2
17     0000    ZERO=0
18
19     0000    IOB0=0      /INTERFACE-DISK BUSS OUTPUT BUFFER
20     0004    IOB1=4
21     0012    IOB2=10
22     0014    IOB3=14
23     0020    IOB4=20
24     0024    IOB5=24
25     0030    IOB6=30
26
27     0000    INTERF=CLR IOB0  /IOB0 SELECTS EITHER INTERFACE OR DISK BUSS, CLR= INTERFACE
28     0002    DISK=SET IOB0   /SET=DISK
29
30     /INTERFACE BUFFER DEFINITIONS
31     0004    ERR=IOB1        /SET TO INDICATE THAT AN RX01 ERROR HAS OCCURED
32     0010    XREQ=IOB2       /SET TO REQUEST AN RX01 WORD TRANSFER
33     0014    IOOUT=IOB3      /DIRECTION FOR DATA LINE, SET=TO INTERFACE
34     0020    DONE=IOB4       /SET TO INDICATE RX01 READINESS TO ACCEPT A COMMAND
35     0024    SHIFT=IOB5      /SHIFT FOR DATA LINE
36     0030    SECDAT=IOB6     /SELECTS SOURCE FOR DATA OUT OF CONTROLLER ON DATA LINE
37     /SET=SECTOR BUFFER CLR=SHIFT REGISTER MOST SIG BIT
38
39     /DISK BUFFER DEFINITIONS
40     0004    WGate=IOB1      /WRITE CURRENT ENABLE WHEN SET
41     0012    STPHD=IOB2     /HEAD STEP, TWO PULSES REQUIRED FOR EACH TRACK
42     0014    HDOUT=IOB3     /DIRECTION OF HEAD MOTION
43     0020    EGATE=IOB4     /ERASE CURRENT ENABLE
44     0024    LQWCP=IOB5     /SPECIFIES WRITE CURRENT LEVEL
45
46     0034    UNIT=34        /SELECTS ONE OF TWO DRIVES, UNIT (ZERO)(ONE)
47
48     0040    UNHD=40        /DEACTIVATES HEAD LOAD SOLENOID OF SELECTED DRIVE
49     0042    LHD=42        /ACTIVATES HEAD LOAD SOLENOID OF SELECTED DRIVE
50
51     0044    BAP=44        /SECTOR BUFFER ADDRESS REGISTER CONTROL
52     0001    LONG=1        /FORMAT: CLR BAR (SHORT)(LONG)
53     0000    SHORT=0       /SHORT PRESETS FOR COUNT OF 1024
54     0002    INCR=2        /LONG PRESETS FOR COUNT OF 4096
55     /FORMAT: INCP BAR INCREMENT THE BUFFER ADDRESS REG.

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56
57     0050    WRTBUF=50      /SECTOR BUFFER WRITE CLOCK
58     0003    START=3       /FORMAT: (STPAT)(FIN) WRTBUF
59     0000    FIN=0        /A 750NS MINIMUM PULSE IS REQUIRED
60
61
62     0054    CRC=54        /CRC REGISTER CONTROL
63     /FORMAT: CRC (ONE)(ZERO) SPECIFIES DATA TO
64     /BE JAMMED INTO CRC GENERATOR/CHECKER
65     0057    PRECRC=57     /PRESETS CRC REG TO ALL ONES
66     0055    DATCRC=55     /SHIFTS SEPERATED DATA INTO CRC CIRCUIT
67
68     /GENERAL PURPOSE FLAG CONTROL
69     0002    FLAG=60       /FORMAT: FLAG (ON)(OFF)(TOG)
70     0002    ON=2        /SET FLAG
71     0001    OFF=1       /CLR FLAG
72     0003    TOG=3       /TOGGLE FLAG
73
74     0064    LSP=64        /LOAD OPEN SCRATCHPAD REG WITH CONTENTS OF SHIFT REG
75
76     0070    LCT=70       /LOAD COUNTER WITH CONTENTS OF NEXT ROM LOCATION
77     0071    ESP=71       /LOAD COUNTER WITH CONTENTS OF OPEN SCRATCHPAD
78     0073    ICT=73       /INCREMENT COUNTER
79
80     /SHIFT REGISTER CONTROL
81     0074    RCTATE=74    /FORMAT: ROTATE(ONE)(ZERO)
82     /SHIFTS SHIFT REG TOWARDS MOST SIGNIFICANT BIT
83     /WHILE INSERTING A ONE OR ZERO INTO THE LEAST
84     /SIGNIFICANT BIT
85     0075    LSR=75       /LOAD SHIFT REGISTER WITH CONTENTS OF COUNTER
86     0077    DATSR=77     /SHIFT REG TOWARDS MSB WHILE INSERTING SEPERATED
87     /DATA INTO LSR

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87
88
89      /BRANCH INSTRUCTIONS AND CONDITIONS
90
91
92      0100      BR=100      /FORMAT: BR COND (T)(F)(ONE)(ZERO)
93                                     /IF CONDITION IS MET, A BRANCH IS MADE WITHIN
94                                     /THE CURRENT FIFD USING THE CONTENTS OF THE
95                                     /NEXT ROM LOCATION AS THE BRANCH ADDRESS
96                                     /IF THE CONDITION IS NOT MET, THE NEXT ROM LOCATION
97                                     /IS IGNORED AND THE FOLLOWING INSTRUCTION IS EXECUTED
98      2300      WBR=300      /FORMAT: WBR COND (T)(ONE)
99                                     /THE COUNTER IS INCREMENTED WITH EVERY EXECUTION OF
100                                    /THIS INSTRUCTION, THE WBR IS REPEATEDLY
101                                    /EXECUTED UNTILL EITHER THE COUNTER OVERFLOWS OR
102                                    /THE CONDITION IS MET. IF THE CONDITION IS MET
103                                    /THE BRANCH IS MADE. IF THE COUNTER OVERFLOWS
104                                    /THE BRANCH ADDRESS IS IGNORED AND THE NEXT INSTRUCTION
105                                    /IS EXECUTED
106      0200      F=ZERO
107      0202      T=ONE
108      0201      IND=1
109                                     /REQUIRES THE CONDITION TO BE FALSE
110                                     /REQUIRES THE CONDITION TO BE TRUE
111                                     /IF APPENDED TO THE JUMP, BR OR WBR INSTRUCTION,
112                                     /CAUSES THE BRANCH ADDRESS TO BE TAKEN FROM THE
113                                     /OPEN SCRATCHPAD RATHER THAN FROM THE NEXT ROM LOCATION
114
115      0000      RUN=0
116                                     /WHEN ASSERTED INDICATES THAT THE INTERFACE HAS
117                                     /SERVICED A TRANSFER REQUEST, OR THAT A COMMAND
118                                     /IS PENDING
119      0004      IOB30T=4
120                                     /INTERF/DISK OUTPUT BUFFER BIT 3
121      0010      DATAIN=10
122                                     /BIDIRECTIONAL DATA LINE BETWEEN INTERFACE AND CONTROLLER
123      0014      INDx=14
124                                     /DRIVE INDEX LATCH
125      0020      SR7=20
126                                     /SHIFT REGISTER MOST SIGNIFICANT BIT
127      0024      COFL=24
128                                     /OVERFLOW (ALL ONES) OF THE COUNTER
129      0030      CRC16=30
130                                     /BIT 16 OF CRC GENERATOR/CHECKER
131      0034      HOME=34
132                                     /TRACK ZERO OF SELECTED DRIVE ANDED WITH HEAD
133                                     /DIRECTION BEING OUT
134      0040      WRTE=40
135                                     /WRITE ENABLED STATUS OF THE SELECTED DRIVE
136      0244      SEPCLK=44
137                                     /SEPERATED CLOCK FROM DISK DATA
138      0250      XIIIBIT=50
139                                     /ASSERTED IF INTERFACE TRANSFERS ARE TO BE AS
140                                     /12 BIT WORDS RATHER THAN 8 BIT BYTES
141      0054      DEQSR7=54
142                                     /SEPERATED DATA EQUAL TO SHIFT REG BIT 7
143      0060      BAROFL=60
144                                     /OVERFLOW CONDITION (ALL ONES) OF THE SECTOR BUFFER
145                                     /ADDRESS REGISTER
146      0064      MCEQSR=64
147                                     /MISSING CLOCK EQUAL TO SHIFT REG BIT 7
148      0070      RDATA0=70
149                                     /OUTPUT OF SECTOR BUFFER
150      0074      FLAG0=74
151                                     /STATE OF GENERAL PURPOSE FLAG

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133
134      /SCRATCHPAD REGISTER SELECTION
135
136      0200      OPEN=200      /FORMAT: OPEN X WHERE X IS ONE OF THE SCRATCHPAD REG
137                                     /THIS INSTRUCTION MAKES THE NAMED SCRATCHPAD
138                                     /ACCESSABLE VIA THE LSP AND ESP COMMANDS
139
140      0000      R0=0
141      0004      R1=4
142      0010      R2=10
143      0014      R3=14
144      0020      R4=20
145      0024      R5=24
146      0030      R6=30
147      0034      R7=34
148      0040      R8=40
149      0044      R9=44
150      0050      R10=50
151      0054      R11=54
152      0060      R12=60
153      0064      R13=64
154      0070      R14=70
155      0074      R15=74
156
157      /DEFINITION OF SCRATCHPADS BY PNEUMONICS
158      0000      CURTK0=R0
159      0004      CURTK1=R1
160      0010      ERREG=R2
161      0014      STAT=R3
162      0020      TARTRK=R4
163      0024      TARSEC=R5
164      0030      TEMPA=R6
165      0034      TEMPB=R7
166      0040      TEMPC=R8
167      0044      TEMPD=R9
168      0050      TEMPE=R10
169      0054      TEMPF=R11
170      0060      TEMPG=R12
171      0064      RTNB=R13
172      0070      RTNA=R14
173      0074      RTN=R15
174

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81

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175          /JUMP INSTRUCTION AND JUMP FIELD DEFINITIONS
176
177          0202      JUMP=222          /FORMAT: JUMP FX (IND)
178                                     /CAUSES A BRANCH TO ONE OF SIX ROM FIELDS (0-5)
179                                     /SPECIFIED BY X. THE BRANCH ADDRESS IS TAKEN FROM
180                                     /THE ROM LOCATION FOLLOWING THE JUMP INSTRUCTION.
181                                     /IF IND IS APPENDED, THE BRANCH ADDRESS
182                                     /IS TAKEN FROM THE OPEN SCRATCH PAD
183
184          0000      F0=0
185          0204      F1=4
186          0010      F2=10
187          0014      F3=14
188          0020      F4=20
189          0024      F5=24

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```

190
191
192
193
194
195
196
197
198          /TABLE OF DEFINITIVE ERROR CODES
199
200          0210      KXDEV0=10          /DRIVE 0 FAILED TO SEE HOME ON INITIALIZE
201          0220      KXDEV1=20          /DRIVE 1 FAILED TO SEE HOME ON INITIALIZE. DOES NOT CAUSE ERROR
202          0230      KARONG=30          /FOUND HOME WHEN STEPPING IN 10 TRACKS FOR INIT
203          0240      KERTRK=40          /TRIED TO ACCESS A TRACK GREATER THAN 76
204          0250      KHOMERR=50          /HOME WAS FOUND BEFORE DESIRED TRACK WAS REACHED
205          0260      KSELFERR=60          /SELF DIAGNOSTIC ERR
206          0270      KXDR=70           /DESIRED SECTOR COULD NOT BE FOUND AFTER LOOKING
207                                     /AT 52 HEADERS
208          0100      KAPROT=100          /WRITE FUNCTION ATTEMPTED ON A WRITE PROTECTED DISK
209          0110      KTIMEERR=110          /MORE THAN 40 MICROSECONDS AND NO SEPCLOCK SEEN
210          0120      KXPREAM=120          /A PREAMBLE COULD NOT BE FOUND
211          0130      KXIDAM=130          /PREAMBLE FOUND BUT NO ID MARK FOUND WITHIN ALLOWABLE TIME
212          0140      KHCRCER=140          /CRC ERROR ON WHAT APPEARED TO BE A HEADER. ERROR IS NOT ASSERTED
213          0150      KTKSEER=150          /THE TRACK ADDRESS OF A GOOD HEADER DOES NOT COMPARE
214                                     /WITH THE DESIRED TRACK
215          0160      KXSTRYS=160          /TOO MANY TRIES FOR AN IDAM
216          0170      KXODAM=170          /DATA AM NOT FOUND IN ALLOTTED TIME
217          0200      KDCRCER=200          /CRC ERROR ON READING THE SECTOR FROM THE DISK
218          0210      KPARER=210          /PARITY ERROR ON SOME WORD FROM THE INTERFACE
219

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```

220 /([ROUTINE: INITIALIZE] IF A HOST PROCESSOR INITIALIZE OR AN
221 /RX01 POWER LOW IS DETECTED, THE PC IS CLEARED AND THE RX01 TIMING
222 /STOPS. UPON THE NEGATION OF INITIALIZE, TIMING RESUMES AND A SELF TEST OF
223 /INTERNAL DATA PATHS IS MADE. IF AN ERROR OCCURS HERE, ERROR AND
224 /DONE ARE SET, BUT ERREG IS NOT ALTERED. THEN IF NO ERROR HAS OCCURRED AN ATTEMPT
225 /IS MADE TO RECALIBRATE DRIVE 1 THEN DRIVE 0. IF DRIVE 0 FAILS TO RECALIBRATE,
226 /THE ERROR CODE IS LOADED INTO ERREG AND ERROR IS SET. IF DRIVE
227 /RECALIBRATES AND IS READY (DISK LOADED) SECTOR ONE OF TRACK ONE
228 /IS READ INTO THE SECTOR BUFFER, IT IS POSSIBLE FOR A READ ERROR
229 /TO OCCUR WHILE READING THIS SECTOR.
230
231
232 0000 *2200
233          DECIMAL
234
235 0004 0210          OPEN ERREG          /CLEAR ERROR REGISTER
236 0001 0064          LSP
237
238 0002 0222          JUMP F4
239 0003 2352          TEST          /GO DO THE INITIALIZE DIAGNOSTIC ROUTINE
240
241 0004 0070          TSTRTN, LCT          /RETURN FROM SUCCESSFUL DIAGNOSTIC ROUTINE
242          OCTAL
243 0005 0004          4
244          DECIMAL
245 0006 0075          LSR          /SET THE INIT DONE BIT OF STAT
246 0007 0214          OPEN STAT
247 0010 0064          LSP
248
249 0011 0070          LCT          /SET UP SOME 3CPATCHPAD REGISTERS
250 0012 0377          -1
251 0013 0075          LSR
252 0014 0244          OPEN TEMPD          /UNIT 0 TO SOFT UNIT BIT
253 0015 0064          LSP
254 0016 0200          OPEN CURTK0          /NEG ZERO TO BOTH CURRENT TRACK ADDRESSES
255 0017 0064          LSP
256 0020 0204          OPEN CURTK1
257 0021 0064          LSP
258
259 0022 0074          ROTATE ZERO          /NEG ONE TO TARGET SECTOR
260 0023 0224          OPEN TARSEC
261 0024 0064          LSP
262 0025 0220          OPEN TARTRK          /NEG ONE TO TARGET TRACK FOR INITIALIZE BOOTSTRAP
263 0026 0064          LSP
264
265 0027 0002          DISK          /SELECT DISK PUSS
266
267 0030 0070          LCT          /CALL SUBROUTINE TO LOAD HEAD AND WAIT 25 MS.
268 0031 0034          RECAL1          /TO ALLOW POWER UP DRIVE SETTLE TIME
269 0032 0222          JUMP F4
270 0033 2145          DLY25
271
272 0034 2036          RECAL1, UNIT ONE          /SELECT UNIT ONE FOR RECALIBRATE
273
274 0035 0014          RECAL0, CLR HDOUT          /STEP HEAD IN 17 TRACKS TO ASSURE IT IS NOT BEHIND TRACK 0

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275 0036 0070          LCT
276 0037 0305          -10-1
277 0040 0075          LSR
278 0041 0070          LCT
279 0042 0045          IN10
280 0043 0222          JUMP F4
281 0044 2100          STEPHD
282
283 0045 0226          IN10, JUMP F5          /ERROR. HOME WAS SEEN WHILE STEPPING IN.
284 0046 2621          WRONG
285
286 0047 0016          SET HDOUT          /STEP OUT AS MANY AS 80 TRACKS IN SEARCH OF HOME
287 0050 0070          LCT
288 0051 0257          -80-1
289 0052 0075          LSR
290 0053 0070          LCT
291 0054 0060          RCALOK
292 0055 0040          UNHD
293 0056 0222          JUMP F4
294 0057 2100          STEPHD
295
296 0060 0202          RCALOK, JUMP F0          /HOME WAS FOUND OK
297 0061 0075          WHCHDR
298
299 0062 0174          BR FLAG0 F          /IF FLAG=0 RECALIBRATE WAS ON DRIVE 1
300 0063 0070          XDRV1
301
302 0064 0070          XDRV0, LCT          /RECALABRATE FAILURE WAS ON DRV 0
303 0065 0010          KXNDV0
304 0066 0226          JUMP F5
305 0067 2610          GOERDN
306
307 0070 0070          XDRV1, LCT          /RECAL FAILURE WAS ON DRV 1, LOG ERROR
308 0071 0020          KXNDV1          /AND CONTINUE RECALIBRATION
309 0072 0075          LSR
310 0073 0210          OPEN ERREG
311 0074 0064          LSP
312
313 0075 0176          WHCHDR, BR FLAG0 T          /IF FLAG=1 BOTH DRIVES HAVE BEEN RECALIBRATED
314 0076 0372          PUNRCL
315
316 0077 0062          FLAG ON          /SET FLAG TO INDICATE DRV 0 IS BEING RECALIBRATED
317
318 0100 0034          UNIT ZERO
319
320 0101 0222          JUMP F0          /GO BACK AND RECALIBRATE DRVD
321 0102 0035          RECAL0

```

61

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322
323 /[SUBROUTINE: FINDTRACK]
324 /THIS SUBROUTINE IS USED TO LOCATE A SPECIFIED SECTOR, IT PICKS
325 /UP THE TRACK AND SECTOR ADDRESS FROM THE INTERFACE, CHECKS THAT
326 /THE TRACK ADDRESS IS LEGAL (NOT GREATER THAN 114 OCTAL.), MOVES THE
327 /HEAD OF THE SELECTED DRIVE TO THE SPECIFIED TRACK, VERIFIES
328 /TRACK POSITION, AND LOCATES THE CORRECT SECTOR, EXIT FROM
329 /THIS SUBROUTINE OCCURS AT WRITE TURN ON TIME OF THE SELECTED,
330 /SECTOR, ENTRANCE IS MADE WITH THE RETURN ADDRESS IN THE COUNTER
331
332
333
334
335 0103 0075 FINDTR, LSR /SAVE THE RETURN ADDRESS
336 0104 0274 OPEN RTN
337 0105 0064 LSP
338
339 0106 0270 LCT /CLEAR THE ERROR REGISTER
340 0107 0000
341 0110 0075 LSR
342 0111 0210 OPEN ERREG
343 0112 0064 LSP
344
345 0113 0244 OPEN TEMPD /SOFT UNIT BIT TO SR
346 0114 0071 ESP
347 0115 0075 LSR
348
349 0116 0122 BR SR7 ONE /IF SR=1 DRIVE 0 IS CURRENTLY SELECTED
350 0117 0127 UZERO
351
352 0120 0174 UONE, BR FLAG0 ZERO /IF FLAG=0 DRIVE 1 IS DESIRED AND ALREADY SELECTED
353 0121 0141 USAME
354
355 0122 0034 UNIT ZERO /DRIVE 0 IS DESIRED AND DRIVE1 WAS SELECTED, SELECT 0
356
357 0123 0070 LCT /SET UP SOFT UNIT SELECT AS DRIVE 0
358 OCTAL
359 0124 0200 ZPO
360 DECIMAL
361
362 0125 0202 JUMP F0 /GO STORE SOFT UNIT BIT
363 0126 0134 UDIF
364
365 0127 0176 UZERO, BR FLAG0 ONE /IF FLAG=1 DRIVE 0 IS DESIRED AND ALREADY SELECTED
366 0130 0141 USAME
367
368
369 0131 0036 UNIT ONE /DRIVE 1 IS DESIRED BUT DRIVE0 IS SELECTED, SELECT DRIVE 1
370 0132 0070 LCT /SET UP SOFT UNIT SELECT BIT AS DRIVE 1
371 0133 0000
372
373 0134 0075 UDIF, LSR /STORE SOFT UNIT SELECT BIT
374 0135 0064 LSP
375
376 0136 0074 ROTATE ZERO /CLR SOFT HD LOAD BIT BECAUSE UNITS CHANGED

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/HX01 FLOPPY CONTROLLER FIRMWARE PAL10 V102A 9-FEB-74 9117 PAGE 7-1

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377 0137 0250 OPEN TEMPE
378 0140 0064 LSP
379
380 0141 0070 USAME, LCT /CALL GETWORD SUBROUTINE FOR THE SECTOR ADDRESS
381 0142 0145 PUTSEC
382 0143 0222 JUMP F4
383 0144 0000 GETWRD
384
385
386 0145 0070 PUTSEC, LCT /MAKE FIRST BIT OF COMPLEMENTED SECTOR ADDRESS A 1 REGARDLESS OF DATA
387 0146 0370 -7-1
388 0147 0070 ROTATE ONE
389 0150 0120 BR COFL T
390 0151 0160 .+7
391 0152 0073 ICT
392 0153 0122 BR SR7 T
393 0154 0147 .-5
394 0155 0074 ROTATE ZERO
395 0156 0202 JUMP F0
396 0157 0150 .-7
397
398 0160 0224 OPEN TARSEC /PUT THE TARGET SECTOR AWAY
399 0161 0064 LSP
400
401 0162 0070 LCT /CALL GETWRD SUBROUTINE FOR TRACK ADDRESS
402 0163 0160 PUTTRK
403 0164 0222 JUMP F4
404 0165 0000 GETWRD
405
406
407 0166 0220 PUTTRK, OPEN TARTRK /STASH THE TRACK ADDRESS
408 0167 0064 LSP
409
410 0170 0254 OPEN TEMPF /START SETUP FOR COMPARING THE
411 0171 0064 LSP /TARGET TRACK AND TRACK 76
412 0172 0260 OPEN TEMPG /F= TARGET TRACK
413 0173 0070 LCT /G= 77
414 0174 0262 -77-1
415 0175 0075 LSR
416 0176 0064 LSP
417
418 0177 0070 LCT /CALL SUBR MAGCOM TO SEE IF TARGET TRACK
419 0200 0200 ILTRK /IS GREATER THAN 114 OCTAL, 76 DECIMAL.
420 0201 0075 LSR
421 0202 0270 OPEN RTNA
422 0203 0064 LSP
423 0204 0226 JUMP F5
424 0205 0400 MAGCOM
425
426
427 0206 0202 ILTRK, JUMP F0 /TARGET TRACK IS 77, ILLEGAL ADDRESS
428 0207 0242 ERTRK /GO, REPORT THE ERROR
429 0210 0202 JUMP F0 /TARGET TRACK IS GREATER THAN 77
430 0211 0242 ERTRK /GO, REPORT THE ERROR
431

```