

GT40-42-44

INSTRUCTION TEST #1
MD-11-DDGTA-C

EP DDGTA-C DL A

OCT 1976

COPYRIGHT ©1976

digital

FICHE 1 OF 1

Made in U.S.A.

The microfiche card contains a grid of frames. The first two frames in the top-left corner are labeled 'UNITES' and 'UNITES'. The next two frames are labeled 'DDGTAC SEQ'. The remaining frames contain various data tables and text, including a section labeled 'PROGRAM' and another labeled 'REMARKS'. The data appears to be organized in columns and rows, with some frames containing numerical values and others containing descriptive text.

11

DO1

DDDDDDDDDDDD
DDDDDDDDDDDD
DDDDDDDDDDDD
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
DDDDDDDDDDDD
DDDDDDDDDDDD
DDDDDDDDDDDD

DDDDDDDDDDDD
DDDDDDDDDDDD
DDDDDDDDDDDD
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
D D D
DDDDDDDDDDDD
DDDDDDDDDDDD
DDDDDDDDDDDD

GGGGGGGGGGGG
GGGGGGGGGGGG
GGGGGGGGGGGG
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
G G G
GGGGGGGGGG
GGGGGGGGGG
GGGGGGGGGG

TTTTTTTTTTTT
TTTTTTTTTTTT
TTTTTTTTTTTT
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T
T T T

AAAAAAAAAA
AAAAAAAAAA
AAAAAAAAAA
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B
R B B

CCCCCCCCCC
CCCCCCCCCC
CCCCCCCCCC
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C
C C C

SSSSSSSSSSSS
SSSSSSSSSSSS
SSSSSSSSSSSS
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
S S S
SSSSSSSSSSSS
SSSSSSSSSSSS
SSSSSSSSSSSS

EEEEEEEEEEEE
EEEEEEEEEEEE
EEEEEEEEEEEE
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
E E E
EEEEEEEEEEEE
EEEEEEEEEEEE
EEEEEEEEEEEE

OOOOOOOOOO
OOOOOOOOOO
OOOOOOOOOO
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
O O O
OOOOOOOO
OOOOOOOO
OOOOOOOO

LPTSPL Version 6(100344) Running on MTA1
START User DAVIES,TOM [400,2704] Job DOGTAC Seq. 28 Date 04-Oct-76 12:53:22 Monitor IPC-D 507B [1A3] *START*
Request created: 04-Oct-76 12:21:19 /TO:ML21-4:DAVIES -- distribution to ML21-4, slot 134
DUWE 001Z0004TAP00140800WICE 05081 00001576 00P06100:118ZIMIP:264.1508MS040R0L 12:53:23
File will be RENAMED to <DS7> protection

.REM *

IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DOGTA-C
PRODUCT NAME:	GT40/GT44 INSTRUCTION TEST I
DATE CREATED:	DECEMBER 1, 1974
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	RAYMOND SHOOP

COPYRIGHT (C) 1973,1974 DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

THIS SOFTWARE IS FURNISHED TO PURCHASER UNDER A LICENSE FOR USE ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION OF DEC'S COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT AS MAY OTHERWISE BE PROVIDED IN WRITING BY DEC.

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION.

DEC ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.

1. ABSTRACT

THIS IS A TWO PART LOGIC TEST OF THE ALPHAGRAPHIC TERMINAL.
FOR THIS TEST THE TWO MAINTENANCE SWITCH WILL BE USED.
THIS TEST IS DESIGNED TO TEST ALL FUNCTIONAL REGISTERS AND INTERRUPT
VECTOR IN THE ALPHAGRAPHIC DISPLAY CONTROL.
THIS PROGRAM DOES NOT TYPE-OUT OR DISPLAY ANY MESSAGES.
THE PROGRAM WILL ONLY HALT ON AN ERROR.

2. REQUIREMENTS

2.1 EQUIPMENT

GT40 DISPLAY SYSTEM (REF. 7.) OR
GT44 DISPLAY SYSTEM

2.2 STORAGE

THIS PROGRAM USED MEMORY LOCATIONS 0-16000 <LESS THAN 4K OF MEMORY>.

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SWITCH BIT 14 = 1 LOOP ON TEST

4.2 STARTING ADDRESS OR ADDRESSES

174 SUB-TEST 1, BASIC LOGIC TEST <BR ONLY>
 (MAINT. SWITCH 1 SET, MAINT. SWITCH 2 RESET)
200 SUB-TEST 2, COMPLEX LOGIC TEST <BR, NPR AND INTERRUPT>
 (MAINT. SWITCH 1 RESET, MAINT. SWITCH 2 SET)

5. OPERATING PROCEDURE

NONE. ONCE STARTED BOTH SUB-TESTS WILL RUN IN THEIR NORMAL MANNER WITHOUT OPERATOR INTERVENTION OR SWITCH SELECTION.

6. ERRORS

THE PROGRAM WILL ONLY HALT ON AN ERROR.
THE PROGRAM DOES NOT CONTAIN FACILITIES FOR REPORTING MESSAGES OR ERROR CONDITIONS. TO PLACE THE PROGRAM INTO A SCOPE LOOP, REPLACE THE ERROR HALT WITH A NOP, SET SWITCH 14 = 1 AND DEPRESS CONT.

7. RESTRICTIONS

BECAUSE BOTH SUB-TESTS USE THE MAINTENANCE SWITCHES, ADVISE NOT RUNNING TEST IN CHAIN MODE.
IF VR14 SCOPE, LOCATION "GSYAXS" (LOC. 1012) MUST BE CHANGED TO 1377.

8. MISCELLANEOUS

8.1 EXECUTION TIME

SUB-TEST 1 TAKES APPROXIMATELY 10 SECONDS.
SUB-TEST 2 TAKES APPROXIMATELY 30 SECONDS.

8.2 DEVICE ADDRESS PROGRAM LOCATIONS

LOCATION 1000 CONTAINS THE GT40/GT44 DEVICE ADDRESS
LOCATION 1002 CONTAINS THE GT40/GT44 INTERRUPT VECTOR.
LOCATION 1004 CONTAINS THE GT40/GT44 INTERRUPT LEVEL.
LOCATION 1006 CONTAINS THE GT40/GT44 CHARACTER SIZE.
LOCATION 1010 CONTAINS THE GT40/GT44 LINE FEED SIZE.
LOCATION 1012 CONTAINS THE GT40/GT44 +Y AXIS CUTOFF LOCATION.
(LOC. 1012 = 1377 IF VR14 SCOPE)
(LOC. 1012 = 1777 IF VR17 SCOPE)

9. PROGRAM DESCRIPTION

9.1 SUBTEST 1

<MAINT. SWITCH 1 SET, MAINT. SWITCH 2 RESET>
THIS SUBTEST IS A BASIC READ/WRITE TEST OF THE DISPLAY PROGRAM COUNTER REGISTER. WITH THE MAINT. SWITCHES SET IN THIS POSITION, THE DISPLAY SHOULD NOT REQUEST AN NPR OR BR INTERRUPT.

9.2 SUBTEST 2

<MAINT. SWITCH 1 RESET, MAINT. SWITCH 2 SET>
THIS SUBTEST IS A COMPLEX TEST OF THE DISPLAY STATUS, X AXIS AND Y AXIS REGISTERS. THE PROGRAM ALSO TESTS STOP<DONE>, LIGHT-PEN, TIME-OUT AND SHIFT-OUT INTERRUPTS AND VECTORS. ALSO INCLUDED ARE TESTS FOR MODE, LINE-TYPE, BLINK, INTENSITY LEVELS, ITALICS AND COLOR CHANGE. THE 'RESUME' (DSTEP) INSTRUCTION IS USED TO SINGLE STEP THRU THE DISPLAY FILE. ALL DISPLAY INSTRUCTIONS ARE TESTED FOR PROPER OPERATION. TESTS ARE ALSO MADE FOR SETTING OF THE 'EDGE' FLAG, WHEN EXCEEDING ALL FOUR DISPLAY EDGES. TESTS ARE ALSO MADE THAT 'NULL' 'CR' 'LF' AND 'BS' CHANGE X OR Y AXIS CORRECTLY. WITH THE MAINT. SWITCHES SET IN THIS POSITION THE PROGRAM CAN SINGLE STEP THE DISPLAY CONTROLLER THRU A DISPLAY FILE (1 NPR AT A TIME) AND CHECK FOR PROPER OPERATION.

.ENABL ABS,AMA
.TITLE GT-40/GT-44 INSTRUCTION TEST I MAINDEC-11-DOGTA-C

.LIST MC,BIN,SEQ
.NLIST MC,MD,CND

165					
166					
167					
168					
169		000000		.=0	
170	000000	000000		HALT	
171	000002	000000		HALT	
172				;LOCATIONS 0-776 ARE FILLED WITH TRAP CATCHER	
173		000024		.=24	
174	000024	015556		LOMPWR	
175	000026	000340		340	
176		000030		.=30	
177	000030	015512		.WORD SCOPEA ;EMT RETURN	
178	000032	000340		340	
179		000046		.=46	
180	000046	015432		LOGICAL ;XXDP-ACT FLAG	
181					
182		000174		.=174	
183	000174	000137	001342	JMP START ;P.C. REGISTER TEST	
184	000200	000137	001544	JMP STARTB ;LOGIC TEST (BR-NPR-INTERRUPT REQUESTS)	
185					
186		001000		.=1000	
187	001000	172000	GSADD:	172000	;GS DISPLAY STARTING ADDRESS
188	001032	000320	GSVCT:	320	;GS DISPLAY STARTING VECTOR
189	001034	000320	DSPBR:	200	;GS DISPLAY INTERRUPT LEVEL
190	001036	000016	GSCHSZ:	16	;CHARACTER SIZE (14-16)
191	001010	000030	GSLFSZ:	30	;LINE FEED SIZE (30-32)
192	001012	001777	GSYAXS:	1777	;+Y AXIS CUTOFF LOCATION
193	001014	000177	GSSEMO:	177	;SHIFT-OUT END CHARACTER
194					
195	001016	000000	ICNT:	0	;PASS COUNTER
196	001020	177776	PSW:	177776	
197	001022	015656	DBUF:	BUFFER	;FIRST WORD IN THE DISPLAY BUFFER
198	001024	015660	DBUF1:	BUFFER+2	;SECOND WORD
199	001026	015662	DBUF2:	BUFFER+4	;THIRD WORD
200	001030	015664	DBUF3:	BUFFER+6	;FOURTH WORD
201	001032	015666	DBUF4:	BUFFER+10	;FIFTH WORD
202	001034	015670	DBUF5:	BUFFER+12	;SIXTH WORD
203	001036	000000	DSAVE:	0	;TEMP REG.
204	001040	017476	SIZE:	17476	;BUFFER SIZE FOR 4K (WORD LENGTH)
205	001042	000000	CNTR:	0	
206	001044	000750	LFSIZE:	750	;LINE FEED DELTA Y SIZE
207	001046	000762	CHSIZE:	762	;BACK SPACE CHARACTER DELTA X SIZE

208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300

;GS ADDRESSES AND VECTORS

001050	172000	DPC:	172000	; DISPLAY PC REGISTER
001052	172002	DSR:	172002	; DISPLAY STATUS REGISTER
001054	172004	XPOS:	172004	; X AXIS REGISTER <READ ONLY>
001056	172006	YPOS:	172006	; Y AXIS REGISTER AND GRAPHLOT REGISTER <READ ONLY>
001060	000320	DOONE:	320	; DISPLAY STOP <DONE> VECTOR
001062	000322	DOONE1:	322	;
001064	000324	LPVCT:	324	; DISPLAY LIGHT PEN VECTOR
001066	000326	LPVCT1:	326	;
001070	000330	TIMEVT:	330	; DISPLAY TIME-OUT <NXM.> ERROR VECTOR
001072	000332	TMEVT1:	332	; OR "SHIFT-OUT" VECTOR

;GS INITALIZATION ROUTINE

001074	012700	001050	SETUP:	MOV	#DPC, R0	; SET UP POINTER
001100	013701	001000		MOV	GSADD, R1	
001104	010120		SETUPA:	MOV	R1, (0)+	
001106	062701	000002		ADD	#2, R1	
001112	022700	001060		CMP	#DPC+10, R0	
001116	001372			BNE	SETUPA	
001120	012700	001060		MOV	#DOONE, R0	
001124	013701	001002		MOV	GSVCT, R1	
001130	010120		SETUPB:	MOV	R1, (0)+	
001132	062701	000002		ADD	#2, R1	
001136	022700	001074		CMP	#DOONE+14, R0	
001142	001372			BNE	SETUPB	
001144	013737	001010	001044	MOV	GSLFSZ, LFSIZE	; SET UP DELTA LF
001152	005437	001044		NEG	LFSIZE	; NEGATE IT
001158	042737	177000	001044	BIC	#177000, LFSIZE	; MASK IT
001164	013737	001006	001046	MOV	GSCHSZ, CHSIZE	; SET UP DELTA CHAR
001172	005437	001046		NEG	CHSIZE	; NEGATE IT
001176	004737	001250		JSR	PC, DDCORE	
001200	042737	177000	001046	BIC	#177000, CHSIZE	; MASK IT
001210	013777	001062	177642	MOV	DOONE1, #DOONE	
001216	005077	177640		CLR	#DOONE1	
001220	013777	001066	177634	MOV	LPVCT1, #LPVCT	
001230	005077	177632		CLR	#LPVCT1	
001234	013777	001072	177626	MOV	TMEVT1, #TIMEVT	
001242	005037	001072		CLR	TMEVT1	
001246	000207			RTS	PC	

K01

GT-40/GT-44 INSTRUCTION TEST I MAINDEC-11-DOGTA-C
 DOGTAC.P11

MACY11 27(732) 08-SEP-76 08:56 PAGE 7

```

255 ;SUBROUTINE TO DETERMINE THE SIZE OF CORE
256 ; AND SET UP LOCATION SIZE WITH THE VALUE
257
258 001250 012737 001300 000004 DOCORE: MOV #25,2#4 ;SET UP FOR NEM
259 001256 012701 017776 MOV #17776,R1 ;SET UP ADDRESS
260 001262 062701 020000 15: ADD #20000,R1 ;MOVE TO THE NEXT BANK
261 001266 005711 TST (R1) ;TIMEOUT ?
262 001270 022701 177776 CMP #177776,R1 ;END ?
263 001274 001372 BNE 15
264 001276 000401 BR 35
265 001300 022626 25: CMP (SP)+(SP)+ ;POP STACK
266 001302 012737 000006 000004 35: MOV #6,2#4 ;RESET BUSS ERROR
267 001310 162701 020000 SUB #20000,R1
268 001314 022701 017776 CMP #17776,R1 ;TEST FOR 4K MACHINE
269 001320 001003 BNE 45 ;BR IF NOT 4K
270 001322 162701 000400 SUB #400,R1 ;SAVE LOADERS
271 001326 000402 BR 55
272 001330 162701 010000 45: SUB #10000,R1 ;ADJUST FOR XXDP
273 001334 010137 001040 55: MOV R1,SIZE ;SET UP SIZE LENGTH
274 001340 000207 RTS PC ;EXIT
  
```

```

275
276 001342 012777 000340 177450 START: MOV      #340, DPCW
277 001350 012706 000500          MOV      #STKPTR, SP
278 001354 004737 001074          JSR      PC, SETUP
279 001360 005037 001016          CLR      ICNT          ;CLEAR PASS COUNT
280 001364 012701 001372          MOV      #PCTST0+2, R1
281
282          ;DOES THE DISPLAY PC LOAD PROPERLY
283          ;BASIC TEST
284
285 001370 104000          PCTST0: SCOPE
286 001372 013737 001016 177570          MOV      ICNT, #DISPLAY
287 001400 005077 177444          CLR      DPC          ;CLEAR DISPLAY P.C.
288 001404 017700 177440          MOV      DPC, R0      ;READ DPC AND SAVE IN R0
289 001410 001401          BEQ      .+4          ;DPC EQUAL TO ZERO?
290 001412 000000          HALT                ;NO, DISPLAY P.C. FAILED TO RESET
291
292
293
294 001414 104000          PCTST1: SCOPE
295 001416 012777 017776 177424          MOV      #17776, DPC  ;LOAD 17776 INTO DISPLAY P.C.
296 001424 017700 177420          MOV      DPC, R0      ;READ DPC AND SAVE IN R0.
297 001430 022700 017776          CMP      #17776, R0   ;ARE THEY EQUAL ?
298 001434 001401          BEQ      .+4          ;YES
299 001436 000000          HALT                ;NO, DISPLAY P.C. FAILED TO SET
300
301
302 001440 104000          PCTST2: SCOPE
303 001442 012777 012524 177400          MOV      #12524, DPC  ;LOAD 12524 INTO DISPLAY P.C.
304 001450 017700 177374          MOV      DPC, R0      ;READ DPC AND SAVE IN R0.
305 001454 022700 012524          CMP      #12524, R0   ;DPC EQUAL TO 12524
306 001460 001401          BEQ      .+4          ;
307 001462 000000          HALT                ;DISPLAY P.C. FAILED TO LOAD PROPERLY
308          ;12524
309
310 001464 104000          PCTST3: SCOPE
311 001466 012777 005252 177354          MOV      #5252, DPC   ;LOAD 5252 INTO DISPLAY P.C.
312 001474 017700 177350          MOV      DPC, R0      ;READ DPC AND SAVE IN R0
313 001500 022700 005252          CMP      #5252, R0    ;DPC EQUAL TO 5252?
314 001504 001401          BEQ      .+4          ;
315 001506 000000          HALT                ;DISPLAY P.C. FAILED TO LOAD PROPERLY
316          ; 5252
317
318 001510 005777 177334          PCTST4: TST      DPC
319 001514 005777 177332          TST      DSR
320 001520 005777 177330          TST      XPOS
321 001524 005777 177326          TST      YPOS
322
323 001530 005237 001016          INC      ICNT
324 001534 001315          BNE     PCTST0
325 001536 004737 015452          JSR      PC, BELL    ;RING BELL
326 001542 000712          BR      PCTST0

```

```

326 001544 012777 000340 177246 STARTB: MOV      #340, @PSW
327 001552 012706 000500          MOV      #STKPTR, SP
328 001556 004737 001074          JSR      PC, SETUP
329 001562 005037 001016          CLR      ICNT
330 001566 012701 001574          MOV      @GTO+2, R1
331
332          ;MODE REGISTER TEST
333          ;DOES THE "MODE" REGISTER LOAD PROPERLY
334
335 001572 104000          GT0:    SCOPE
336 001574 013737 001016 177570          MOV      ICNT, @DISPLAY
337 001602 012777 100000 177212          MOV      #100000, @DBUF ;LOAD MODE REGISTER=0
338 001610 013777 001022 177232          MOV      @DBUF, @PC ;LOAD DISPLAY PC
339 001616 017700 177230          MOV      @DSR, R0 ;READ DISPLAY STATUS REGISTER
340 001622 042700 103777          BIC      #103777, R0 ;MASK TO BITS 14-11
341 001626 022700 040000          CMP      #40000, R0 ;TEST R0
342 001632 001401          BEQ      .+4
343 001634 000000          HALT ;MODE BITS (14-11) FAILED TO RESET
344
345
346 001636 104000          GT1:    SCOPE
347 001640 012777 174000 177154          MOV      #174000, @DBUF ;LOAD MODE REGISTER=17
348 001646 013777 001022 177174          MOV      @DBUF, @PC ;LOAD DISPLAY PC
349 001654 017700 177172          MOV      @DSR, R0 ;READ DISPLAY STATUS REGISTER
350 001660 042700 103777          BIC      #103777, R0 ;MASK TO BITS 14-11
351 001664 022700 074000          CMP      #74000, R0 ;TEST R0
352 001670 001401          BEQ      .+4
353 001672 000000          HALT ;MODE BITS (14-11) FAILED TO SET
354
355
356 001674 104000          GT2:    SCOPE
357 001676 012777 140000 177116          MOV      #140000, @DBUF ;LOAD MODE REGISTER=10
358 001704 013777 001022 177136          MOV      @DBUF, @PC ;LOAD DISPLAY P.C.
359 001712 017700 177134          MOV      @DSR, R0 ;READ DISPLAY STATUS REGISTER
360 001716 042700 103777          BIC      #103777, R0 ;MASK TO BITS 14-11
361 001722 022700 040000          CMP      #40000, R0 ;TEST R0
362 001726 001401          BEQ      .+4
363 001730 000000          HALT ;MODE BIT 14 FAILED TO SET
364
365
366 001732 104000          GT3:    SCOPE
367 001734 012777 160000 177060          MOV      #160000, @DBUF ;LOAD MODE REGISTER=14
368 001742 013777 001022 177100          MOV      @DBUF, @PC ;LOAD DISPLAY P.C.
369 001750 017700 177076          MOV      @DSR, R0 ;READ DISPLAY STATUS REGISTER
370 001754 042700 103777          BIC      #103777, R0 ;MASK TO BITS 14-11
371 001760 022700 060000          CMP      #60000, R0 ;TEST R0
372 001764 001401          BEQ      .+4
373 001766 000000          HALT ;MODE BIT 13 FAILED TO SET
374

```

375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426

001770 104000
001772 000005
001774 012777 170000 177020
002002 013777 001022 177040
002010 017700 177036
002014 042700 103777
002020 022700 070000
002024 001401
002026 000000

002030 104000
002032 012777 174000 176762
002040 013777 001022 177002
002046 017700 177000
002052 042700 103777
002056 022700 074000
002062 001401
002064 000000

002066 104000
002070 012777 100004 176724
002076 013777 001022 176744
002104 017700 176742
002110 042700 177774
002114 022700 000000
002120 001401
002122 000000

002124 104000
002126 012777 100007 176666
002134 013777 001022 176706
002142 017700 176704
002146 042700 177774
002152 022700 000003
002156 001401
002160 000000

002162 104000
002164 012777 100005 176630
002172 013777 001022 176650
002200 017700 176646
002204 042700 177774
002210 022700 000001
002214 001401
002216 000000

GT4: SCOPE
RESET
MOV #170000, 20BUF
MOV DBUF, 20PC
MOV 20SR, R0
BIC #103777, R0
CMP #70000, R0
BEQ .+4
HALT

GT5: SCOPE
MOV #174000, 20BUF
MOV DBUF, 20PC
MOV 20SR, R0
BIC #103777, R0
CMP #74000, R0
BEQ .+4
HALT

GT6: SCOPE
MOV #100004, 20BUF
MOV DBUF, 20PC
MOV 20SR, R0
BIC #177774, R0
CMP #0, R0
BEQ .+4
HALT

GT7: SCOPE
MOV #100007, 20BUF
MOV DBUF, 20PC
MOV 20SR, R0
BIC #177774, R0
CMP #3, R0
BEQ .+4
HALT

GT8: SCOPE
MOV #100005, 20BUF
MOV DBUF, 20PC
MOV 20SR, R0
BIC #177774, R0
CMP #1, R0
BEQ .+4
HALT

;LOAD MODE REGISTER=16
;LOAD DISPLAY P.C.
;READ DISPLAY STATUS REGISTER
;MASK TO BITS 14-11
;TEST R0
;MODE BIT 12 FAILED TO SET

;LOAD MODE REGISTER=17
;LOAD DISPLAY P.C.
;READ DISPLAY STATUS REGISTER
;MASK TO BITS 14-11
;TEST R0
;MODE BIT 11 FAILED TO SET

;TESTED BY "SET GRAPHIC MODE"
;LOAD LINE TYPE ENABLE =1 AND LINE TYPE VALUE =0
;LOAD DISPLAY P.C.
;READ DISPLAY STATUS REGISTER
;MASK TO BITS 1-0
;TEST R0
;LINE BITS 1-0 FAILED TO RESET

;LINE TYPE ENABLE =1 LINE TYPE =3
;LOAD DISPLAY P.C.
;READ DISPLAY STATUS REGISTER
;MASK TO BITS 1-0
;TEST R0
;LINE BITS 1-0 FAILED TO SET

;LINE TYPE ENABLE =1 LINE TYPE =1
;LOAD DISPLAY P.C.
;READ DISPLAY STATUS REGISTER
;MASK TO BITS 1-0
;TEST R0
;LINE BIT 0 FAILED TO SET

437	002220	104000			GT9:	SCOPE		
438	002222	012777	100006	176572		MOV	#100006,20BUF	;LINE TYPE ENABLE =1 LINE TYPE =2
439	002230	013777	001022	176612		MOV	DBUF,20PC	;LOAD DISPLAY P.C.
440	002236	017700	176610			MOV	20SR,RO	;READ DISPLAY STATUS REGISTER
441	002242	042700	177774			BIC	#177774,RO	;MASK TO BITS 1-0
442	002246	022700	000002			CHP	#2,RO	;TEST RO
443	002252	001401				BEQ	+.4	
444	002254	000000				HALT		;LINE BIT 1 FAILED TO SET
445								
446	002256	104000			GT10:	SCOPE		
447	002260	012777	100003	176534		MOV	#100003,20BUF	;LINE TYPE ENABLE =0 LINE TYPE =3
448	002266	013777	001022	176554		MOV	DBUF,20PC	;LOAD DISPLAY P.C.
449	002274	017700	176552			MOV	20SR,RO	;READ DISPLAY STATUS REGISTER
450	002300	042700	177774			BIC	#177774,RO	;MASK TO BITS 1-0
451	002304	022700	000002			CHP	#2,RO	;TEST RO
452	002310	001401				BEQ	+.4	;SHOULD NOT CHANGE LT VALUE
453	002312	000000				HALT		;LINE TYPE ENABLE FAILED TO INHIBIT
454								;CHANGING OF LINETYPE VALUE
455								
456	002314	104000			GT11:	SCOPE		
457	002316	012777	100020	176476		MOV	#100020,20BUF	;BLINK ENABLE =1 BLINK =0
458	002324	013777	001022	176516		MOV	DBUF,20PC	;LOAD DISPLAY P.C.
459	002332	017700	176514			MOV	20SR,RO	;READ DISPLAY STATUS REGISTER
460	002336	042700	177767			BIC	#177767,RO	;MASK TO BIT 3
461	002342	022700	000000			CHP	#0,RO	;TEST RO
462	002346	001401				BEQ	+.4	
463	002350	000000				HALT		;BLINK BIT FAILED TO RESET
464								
465	002352	104000			GT12:	SCOPE		
466	002354	012777	100030	176440		MOV	#100030,20BUF	;BLINK ENABLE =1 BLINK =1
467	002362	013777	001022	176460		MOV	DBUF,20PC	;LOAD DISPLAY P.C.
468	002370	017700	176456			MOV	20SR,RO	;READ DISPLAY STATUS REGISTER
469	002374	042700	177767			BIC	#177767,RO	;MASK TO BIT 3
470	002400	022700	000010			CHP	#10,RO	;TEST RO
471	002404	001401				BEQ	+.4	
472	002406	000000				HALT		;BLINK BIT FAILED TO SET
473								
474	002410	104000			GT13:	SCOPE		
475	002412	012777	100000	176402		MOV	#100000,20BUF	;BLINK ENABLE =0 BLINK =0
476	002420	013777	001022	176422		MOV	DBUF,20PC	;LOAD DISPLAY P.C.
477	002426	017700	176420			MOV	20SR,RO	;READ DISPLAY STATUS REGISTER
478	002432	042700	177767			BIC	#177767,RO	;MASK TO BIT 3
479	002436	022700	000010			CHP	#10,RO	;TEST RO
480	002442	001401				BEQ	+.4	
481	002444	000000				HALT		;BLINK ENABLE FAILED TO INHIBIT
482								;CHANGING OF THE BLINK BIT

477											
478	002446	104000			GT14:	SCOPE					
479	002450	012777	100100	176344		MOV	#100100,208UF	:	LP ENABLE =1 LP=0		
480	002456	013777	001022	176364		MOV	DEUF,20PC	:	LOAD DISPLAY P.C.		
481	002464	017700	176362			MOV	20SR,R0	:	READ STATUS		
482	002470	032700	000200			BIT	#200,R0	:			
483	002474	001401				BEQ	.+4	:			
484	002476	000000				HALT		:	LIGHT PEN FLAG SET IN ERROR		
485											
486	002500	104000			GT15:	SCOPE					
487	002502	012777	100140	176312		MOV	#100140,208UF	:	LP ENABLE =1 LP=1		
488	002510	013777	001022	176332		MOV	DEUF,20PC	:	LOAD DISPLAY P.C.		
489	002516	017700	176330			MOV	20SR,R0	:	READ STATUS		
490	002522	032700	000200			BIT	#200,R0	:			
491	002526	001401				BEQ	.+4	:			
492	002530	000000				HALT		:	LIGHT PEN FLAG SET IN ERROR		
493											
494	002532	104000			GT16:	SCOPE					
495	002534	012777	102000	176260		MOV	#102000,208UF	:	INTENSITY LEVEL ENABLE =1 LEVEL =0		
496	002542	013777	001022	176300		MOV	DEUF,20PC	:	LOAD DISPLAY P.C.		
497	002550	017700	176276			MOV	20SR,R0	:	READ DISPLAY STATUS REGISTER		
498	002554	042700	174377			BIC	#174377,R0	:	MASK TO BITS 8-10		
499	002560	022700	000000			CHP	R0,R0	:	TEST R0		
500	002564	001401				BEQ	.+4	:			
501	002566	000000				HALT		:	INTENSITY LEVEL BITS 8-10 FAILED TO RESET		
502											
503	002570	104000			GT17:	SCOPE					
504	002572	012777	103600	176222		MOV	#103600,208UF	:	INTENSITY LEVEL ENABLE =1 LEVEL =7		
505	002600	013777	001022	176242		MOV	DEUF,20PC	:	LOAD DISPLAY P.C.		
506	002606	017700	176240			MOV	20SR,R0	:	READ DISPLAY STATUS REGISTER		
507	002612	042700	174377			BIC	#174377,R0	:	MASK TO BITS 8-10		
508	002616	022700	003400			CHP	#3400,R0	:	TEST R0		
509	002622	001401				BEQ	.+4	:			
510	002624	000000				HALT		:	INTENSITY LEVEL BITS 8-10 FAILED TO SET		
511											
512											
513	002626	104000			GT18:	SCOPE					
514	002630	012777	103000	176164		MOV	#103000,208UF	:	INTENSITY LEVEL ENABLE =1 LEVEL =4		
515	002636	013777	001022	176204		MOV	DEUF,20PC	:	LOAD DISPLAY P.C.		
516	002644	017700	176202			MOV	20SR,R0	:	READ DISPLAY STATUS REGISTER		
517	002650	042700	174377			BIC	#174377,R0	:	MASK TO BITS 8-10		
518	002654	022700	002000			CHP	#2000,R0	:	TEST R0		
519	002660	001401				BEQ	.+4	:			
520	002662	000000				HALT		:	INTENSITY LEVEL BIT 10 FAILED		

570
571
572

002664 104000
002666 012777 102400
002674 013777 001022
002702 017700 176144
002706 042700 174377
002712 022700 001000
002716 001401
002720 000000

102400 176126
001022 176146
176144
174377
001000

GT19: SCOPE
MOV #102400,20BUF
MOV 20BUF,20PC
MOV 20SR,RO
BIC #174377,RO
CMP #1000,RO
BEQ .+4
HALT

INTENSITY LEVEL ENABLE =1 LEVEL =2
LOAD DISPLAY P.C.
READ DISPLAY STATUS REGISTER
MASK TO BITS 8-10
TEST RO
+4

; INTENSITY LEVEL BIT 9 FAILED

002722 104000
002724 012777 102200
002732 013777 001022
002740 017700 176106
002744 042700 174377
002750 022700 000400
002754 001401
002756 000000

102200 176070
001022 176110
176106
174377
000400

GT20: SCOPE
MOV #102200,20BUF
MOV 20BUF,20PC
MOV 20SR,RO
BIC #174377,RO
CMP #400,RO
BEQ .+4
HALT

INTENSITY LEVEL ENABLE =1 LEVEL =1
LOAD DISPLAY P.C.
READ DISPLAY STATUS REGISTER
MASK TO BITS 8-10
TEST RO
+4

; INTENSITY LEVEL BIT 8 FAILED

002760 104000
002762 012777 101600
002770 013777 001022
002776 017700 176050
002782 042700 174377
002786 022700 000400
002790 001401
002794 000000

101600 176032
001022 176052
176050
174377
000400

GT21: SCOPE
MOV #101600,20BUF
MOV 20BUF,20PC
MOV 20SR,RO
BIC #174377,RO
CMP #400,RO
BEQ .+4
HALT

INTENSITY LEVEL ENABLE =0 LEVEL =7
LOAD DISPLAY P.C.
READ DISPLAY STATUS REGISTER
MASK TO BITS 8-10
TEST RO
+4

; INTENSITY LEVEL ENABLE FAILED TO INHIBIT
; INTENSITY LEVEL CHANGE

;TESTED BY "LOAD STATUS REGISTER A"

003016 104000
003020 012777 170040
003026 013777 001022
003034 017700 176012
003040 042700 177757
003044 022700 000000
003050 001401
003052 000000

170040 175774
001022 176014
176012
177757
000000

GT22: SCOPE
MOV #170040,20BUF
MOV 20BUF,20PC
MOV 20SR,RO
BIC #177757,RO
CMP #0,RO
BEQ .+4
HALT

ITALICS ENABLE=1 ITALICS=0
LOAD DISPLAY P.C.
READ DISPLAY STATUS REGISTER
MASK TO BIT 4
TEST RO
+4

; ITALICS BIT FAILED TO RESET

003054 104000
003056 012777 170060
003064 013777 001022
003072 017700 175754
003076 042700 177757
003102 022700 000020
003106 001401
003110 000000

170060 175736
001022 175756
175754
177757
000020

GT23: SCOPE
MOV #170060,20BUF
MOV 20BUF,20PC
MOV 20SR,RO
BIC #177757,RO
CMP #20,RO
BEQ .+4
HALT

ITALICS ENABLE=1 ITALICS=1
LOAD DISPLAY P.C.
READY DISPLAY STATUS REGISTER
MASK TO BIT 4
TEST RO
+4

; ITALICS BIT FAILED TO SET

573									
574	003112	104000			GT24:	SCOPE			
575	003114	012777	170000	175700		MOV	#170000,20BUF	: ITALICS ENABLE=0	ITALICS=0
576	003122	013777	001022	175720		MOV	20BUF,20PC	: LOAD DISPLAY P.C.	
577	003130	017700	175716			MOV	20SR,RO	: READ DISPLAY STATUS REGISTER	
578	013134	042700	177757			BIC	#177757,RO	: MASK TO BITS 4	
579	013140	022700	000020			CMF	20,RO	: TEST RO	
580	003144	001401				BEQ	.+4		
581	003146	000000				HALT		: ITALICS ENABLE FAILED TO INHIBIT	
582								: CLEARING OF ITALICS BIT	
583									
584	003150	104000			GT25:	SCOPE			
585	003152	012777	170000	175642		MOV	#170000,20BUF	: "STOP" BIT =0	
586	003160	013777	001022	175662		MOV	20BUF,20PC	: LOAD DISPLAY P.C.	
587	003166	017700	175660			MOV	20SR,RO	: READ DISPLAY STATUS REGISTER	
588	003172	005700				TST	RO	: TEST BIT 15	
589	003174	100001				BPL	.+4		
590	003176	000000				HALT		: "STOP" BIT FAILED TO RESET	
591									
592									
593	003200	104000			GT26:	SCOPE			
594	003202	012777	172000	175612		MOV	#172000,20BUF	: "STOP" BIT =1	
595	003210	013777	001022	175632		MOV	20BUF,20PC	: LOAD DISPLAY P.C.	
596	003216	017700	175630			MOV	20SR,RO	: READ DISPLAY STATUS REGISTER	
597	003222	005700				TST	RO	: TEST BIT 15	
598	003224	100401				BMI	.+4		
599	003226	000000				HALT		: "STOP" BIT FAILED TO SET	
600									
601									
602	003230	104000			GT27:	SCOPE			
603	003232	012777	170000	175562		MOV	#170000,20BUF	: "STOP" BIT =1	
604	003240	013777	001022	175602		MOV	20BUF,20PC	: LOAD DISPLAY P.C.	
605	003246	017700	175600			MOV	20SR,RO	: READ DISPLAY STATUS REGISTER	
606	003252	005700				TST	RO	: TEST BIT 15	
607	003254	100001				BPL	.+4		
608	003256	000000				HALT		: "STOP" BIT FAILED TO RESET	

609								
610								
611	003260	104000			GT28:	SCOPE		
612	003262	012777	170002	175532		MOV	#170002,20BUF	:COLOR ENABLE=1 COLOR=0
613	003270	013777	001022	175552		MOV	20BUF,20PC	:LOAD DISPLAY P.C.
614	003276	004737	015544			JSR	7,DELAY	:EXECUTE A PROGRAM DELAY
615	003302	017700	175544			MOV	20SR,R0	:READ DISPLAY STATUS REGISTER
616	003306	042700	177773			BIC	#177773,R0	:MASK TO BIT 2
617	003312	022700	000000			CMP	#0,R0	:TEST R0
618	003316	001401				BEQ	.+4	
619	003320	000240				NOP		:COLOR BIT FAILED TO RESET
620								
621								
622	003322	104000			GT29:	SCOPE		
623	003324	012777	170003	175470		MOV	#170003,20BUF	:COLOR ENABLE=1 COLOR=1
624	003332	013777	001022	175510		MOV	20BUF,20PC	:LOAD DISPLAY P.C.
625	003340	004737	015544			JSR	7,DELAY	:EXECUTE A PROGRAM DELAY
626	003344	017700	175544			MOV	20SR,R0	:READ DISPLAY STATUS REGISTER
627	003350	042700	177773			BIC	#177773,R0	:MASK TO BIT 2
628	003354	022700	000004			CMP	#4,R0	:TEST R0
629	003360	001401				BEQ	.+4	
630	003362	000240				NOP		:COLOR BIT FAILED TO SET
631								
632								
633	003364	104000			GT30:	SCOPE		
634	003366	012777	170000	175436		MOV	#170000,20BUF	:COLOR ENABLE=0 COLOR=0
635	003374	013777	001022	175446		MOV	20BUF,20PC	:LOAD DISPLAY P.C.
636	003372	017700	175444			MOV	20R,R0	:READ DISPLAY STATUS REGISTER
637	003376	042700	177773			BIC	#177773,R0	:MASK TO BIT 2
638	003412	022700	000004			CMP	#4,R0	:TEST R0
639	003416	001401				BEQ	.+4	
640	003420	000240				NOP		:COLOR ENABLE FAILED TO INHIBIT :RESETTING OF COLOR BIT
641								
642								

```

643
644
645 ;GRAPHPLOT INCREMENT REGISTER TEST
646 003422 104000 GT31: SCOPE
647 003424 012777 174100 175370 MOV #174100,20BUF ;LOAD GRAPHPLOT COUNTER
648 003432 013777 001022 175410 MOV DBUF,20PC ;START DISPLAY
649 003440 017700 175410 MOV 2XPOS,R0 ;READ INCREMENT REGISTER
650 003444 042700 001777 BIC #1777,R0 ;MASK TO BITS 15-10
651 003450 022700 000000 CMP #0,R0
652 003454 001401 BEQ .+4
653 003456 000000 HALT ;GRAPHPLOT REGISTER IN ERROR
654
655 003460 104000 GT32: SCOPE
656 003462 012777 174177 175332 MOV #174177,20BUF ;LOAD GRAPHPLOT COUNTER
657 003470 013777 001022 175352 MOV DBUF,20PC ;START DISPLAY
658 003476 017700 175352 MOV 2XPOS,R0 ;READ INCREMENT REGISTER
659 003482 042700 001777 BIC #1777,R0 ;MASK TO BITS 15-10
660 003486 022700 176000 CMP #176000,R0
661 003512 001401 BEQ .+4
662 003514 000000 HALT ;GRAPHPLOT REGISTER IN ERROR
663
664 003516 104000 GT33: SCOPE
665 003520 012777 174152 175274 MOV #174152,20BUF ;LOAD GRAPHPLOT COUNTER
666 003526 013777 001022 175314 MOV DBUF,20PC ;START DISPLAY
667 003534 017700 175314 MOV 2XPOS,R0 ;READ INCREMENT REGISTER
668 003540 042700 001777 BIC #1777,R0 ;MASK TO BITS 15-10
669 003544 022700 124000 CMP #124000,R0
670 003550 001401 BEQ .+4
671 003552 000000 HALT ;GRAPHPLOT REGISTER IN ERROR
672
673 003554 104000 GT34: SCOPE
674 003556 012777 174125 175236 MOV #174125,20BUF ;LOAD GRAPHPLOT COUNTER
675 003564 013777 001022 175256 MOV DBUF,20PC ;START DISPLAY
676 003572 017700 175256 MOV 2XPOS,R0 ;READ INCREMENT REGISTER
677 003576 042700 001777 BIC #1777,R0 ;MASK TO BITS 15-10
678 003602 022700 052000 CMP #52000,R0
679 003606 001401 BEQ .+4
680 003610 000000 HALT ;GRAPHPLOT REGISTER IN ERROR
681
682 003612 104000 GT35: SCOPE
683 003614 012777 174100 175200 MOV #174100,20BUF ;LOAD GRAPHPLOT COUNTER WITH 0
684 003622 013777 001022 175220 MOV DBUF,20PC ;START DISPLAY
685 003630 044737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
686 003634 012777 174077 175160 MOV #174077,20BUF ;LOAD GRAPHPLOT NO ENABLE
687 003642 013777 001022 175200 MOV DBUF,20PC ;START DISPLAY
688 003650 017700 175200 MOV 2XPOS,R0 ;READ INCREMENT REGISTER
689 003654 042700 001777 BIC #1777,R0 ;MASK TO BITS 15-10
690 003660 022700 000000 CMP #0,R0 ;ARE THEY EQUAL ?
691 003664 001401 BEQ .+4
692 003666 000000 HALT ;GRAPHPLOT REGISTER CHANGED WITHOUT
693 ; THE ENABLE BEING SET

```

694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729

;NOP TEST <INCREMENT PC TEST>
;SIMPLE - 4 INCREMENTS

GT36: SCOPE

003670	104000		
003672	012777	164000	175122
003700	012777	164000	175116
003706	012777	164000	175112
003714	012777	164000	175106
003722	012777	164000	175102
003730	013777	001022	175112
003736	017700	175106	
003742	023700	001024	
003746	001402		
003750	000000		
003752	000435		
003754	012777	000001	175066
003762	017700	175062	
003766	023700	001026	
003772	001402		
003774	000700		
003776	000123		
004000	012777	000001	175042
004006	017700	175036	
004012	023700	001030	
004016	001402		
004020	000000		
004022	000411		
004024	012777	000001	175016
004032	017700	175012	
004036	023700	001032	
004042	001401		
004044	000000		

```

MOV #164000,2DBUF ;MOVE DNOP INTO BUFFER
MOV #164000,2DBUF1 ;MOVE DNOP INTO BUFFER
MOV #164000,2DBUF2 ;MOVE DNOP INTO BUFFER
MOV #164000,2DBUF3 ;MOVE DNOP INTO BUFFER
MOV #164000,2DBUF4 ;MOVE DNOP INTO BUFFER
MOV DBUF,20PC ;START THE DISPLAY
MOV 20PC,RO ;READ THE DISPLAY P.C.
CMP DBUF1,RO ;DID IT INCREMENT BY 2?
BEQ .+6 ;DISPLAY P.C. FAILED TO INCREMENT
BR GT37
MOV #1,20PC ;SINGLE STEP THE DISPLAY
MOV 20PC,RO ;READ THE DISPLAY P.C.
CMP DBUF2,RO ;DID IT INCREMENT BY 2?
BEQ .+6 ;DISPLAY P.C. FAILED TO INCREMENT
BR GT37
MOV #1,20PC ;SINGLE STEP THE DISPLAY
MOV 20PC,RO ;READ THE DISPLAY P.C.
CMP DBUF3,RO ;DID IT INCREMENT BY 2?
BEQ .+6 ;DISPLAY P.C. FAILED TO INCREMENT
BR GT37
MOV #1,20PC ;SINGLE STEP THE DISPLAY
MOV 20PC,RO ;READ THE DISPLAY P.C.
CMP DBUF4,RO ;DID IT INCREMENT BY 2?
BEQ .+4 ;DISPLAY P.C. FAILED TO INCREMENT
HALT

```

```

730
731      ;DNOP TEST (INCREMENT P.C. TEST)
732      ;COMPLEX - BUFFER LENGTH
733
734      004046 104000
735      004050 013702 001022
736      004054 012722 164000
737      004060 023702 001040
738      004064 001373
739
740      004066 104000
741      004070 013777 001022 174752
742      004076 013737 001022 001036
743      004104 013702 001040
744      004110 024242
745      004112 062737 000002 001036 GT37A:
746      004120 017700 174724
747      004124 023700 001036
748      004130 001402
749      004132 000000
750      004134 000407
751
752      004136 020237 001036 IS:
753      004142 001404
754      004144 012777 000001 174676
755      004152 000757
756

```

GT37: SCOPE

```

MOV DBUF,R2
IS: MOV #164000,(2)+
    CMP SIZE,R2
    BNE IS

```

```

;SET UP POINTER
;MOVE DNOP INTO THE BUFFER
;FINISHED FILLING THE BUFFER?
;NO

```

SCOPE

```

MOV DBUF,20PC
MOV D_BUF,DSAVE
MOV SIZE,R2
CMP -(R2),-(R2)

```

;YES, START THE DISPLAY

```

;SETUP A COUNT
;DEC BY 2

```

GT37A:

```

ADD #2,DSAVE
MOV 20PC,RO
CMP DSAVE,RO
BEQ IS
HALT
BR GT40

```

```

;READ DISPLAY P.C.
;DID IT INCREMENT BY 2?
;YES
;DISPLAY PC FAILED TO INCREMENT
;PROPERLY

```

IS:

```

CMP R2,DSAVE
BEQ GT40
MOV #1,20PC
BR GT37A

```

```

;FINISHED THE BUFFER
;YES
;SINGLE STEP THE DISPLAY
;TRY AGAIN

```



```

803
804
805
806 004404 104000
807 [ 4436 012777 122000 174406
808 [ 4414 012777 001252 174402
809 004422 012777 172000 174376
810 004430 013777 001022 174412
811 [ 4436 012777 000001 174404
812 004444 004737 015532
813 004450 017700 174400
814 004454 022700 001252
815 004450 001401
816 004462 000000

```

:TEST THAT THE X POSITION REGISTER CAN BE LOADED CORRECTLY
:USING GRAPH PLOT X

```

GT44: SCOPE
      MOV      @122000, @0BUF      ;LOW INTENSITY - SET GRAPH PLOT X MODE
      MOV      @1252, @0BUF1      ;SET X POSITION
      MOV      @172000, @0BUF2     ;LOAD STATUS REGISTER A, STOP
      MOV      @0BUF, @0PC        ;LOAD DISPLAY P.C.
      MOV      @1, @0PC           ;SINGLE STEP THE DISPLAY
      JSR      7, @LAY            ;EXECUTE A PROGRAM DELAY
      MOV      @XPOS, R0          ;READ X POSITION
      CMP      @1252, R0
      BEQ     .+4
      HALT

```

:X POSITION REGISTER FAILED TO LOAD
:PROPERLY USING GRAPH PLOT X MODE

```

817
818
819
820
821
822 004464 104000
823 004466 012777 122000 174326
824 004474 012777 000525 174322
825 004502 012777 172000 174316
826 004510 013777 001022 174332
827 004516 012777 000001 174324
828 004524 004737 015532
829 004530 017700 174320
830 004534 022700 000525
831 004540 001401
832 004542 000000

```

:TEST THAT THE X POSIT.ON REGISTER CAN BE LOADED CORRECTLY
:USING GRAPH PLOT X

```

GT45: SCOPE
      MOV      @122000, @0BUF      ;LOW INTENSITY - SET GRAPH PLOT X MODE
      MOV      @1252, @0BUF1      ;SET X POSITION
      MOV      @172000, @0BUF2     ;LOAD STATUS REGISTER A, STOP
      MOV      @0BUF, @0PC        ;LOAD THE DISPLAY P.C.
      MOV      @1, @0PC           ;SINGLE STEP THE DISPLAY
      JSR      7, @LAY            ;EXECUTE A PROGRAM DELAY
      MOV      @XPOS, R0          ;READ X POSITION
      CMP      @525, R0
      BEQ     .+4
      HALT

```

:X POSITION REGISTER FAILED TO LAD
:PROPERLY USING GRAPH PLOT X MODE

```

833
834
835
836
837
838 004544 104000
839 004546 012777 126000 174246
840 004554 012777 001252 174242
841 004562 012777 172000 174236
842 004570 013777 001022 174252
843 004576 012777 000001 174244
844 004604 004737 015532
845 004610 017700 174242
846 004614 022700 001252
847 004620 001401
848 004622 000000

```

:TEST THAT THE Y POSITION REGISTER CAN BE LOADED CORRECTLY
:USING GRAPH PLOT Y MODE

```

GT46: SCOPE
      MOV      @126000, @0BUF      ;LOW INTENSITY - SET GRAPH PLOT Y
      MOV      @1252, @0BUF1      ;SET Y POSITION
      MOV      @172000, @0BUF2     ;LOAD STATUS REGISTER A, STOP
      MOV      @0BUF, @0PC        ;LOAD THE DISPLAY P.C.
      MOV      @1, @0PC           ;SINGLE STEP THE DISPLAY
      JSR      7, @LAY            ;EXECUTE A PROGRAM DELAY
      MOV      @YPOS, R0          ;READ Y POSITION
      CMP      @1252, R0
      BEQ     .+4
      HALT

```

:Y POSITION REGISTER FAILED TO LOAD
:PROPERLY USING GRAPH PLOT Y MODE

849
850


```

851
852
853
854
855 004624 104000
856 004626 012777 126000 174166
857 004634 012777 000525 174162
858 004642 012777 172000 174156
859 004650 013777 001022 174172
860 004656 012777 000001 174164
861 004664 004737 015532
862 004670 017700 174162
863 004674 022700 000525
864 004700 001401
865 004702 000000
866
867
868
869
870
871
872 004704 104000
873 004706 012777 122000 174106
874 004714 012777 001234 174102
875 004722 012777 126000 174076
876 004730 012777 001432 174072
877 004736 012777 172000 174066
878 004744 013777 001022 174076
879 004752 012777 000001 174070
880 004760 004737 015532
881 004764 017700 174064
882 004770 022700 001234
883 004774 001402
884 004776 000000
885 005000 000416
886
887 005002 012777 000001 174040
888 005010 012777 000001 174032
889 005016 004737 015532
890 005022 017700 174030
891 005026 022700 001432
892 005032 001401
893 005034 000000
894
895
    
```

```

:TEST THAT THE Y POSITION REGISTER CAN BE LOADED CORRECTLY
:USING GRAPHPLOT Y MODE
    
```

```

GT47:  SCOPE
        MOV      #126000,208UF      :LOW INTENSITY - SET GRAPHPLOT Y MODE
        MOV      #525,208UF1       :SET Y POSITION
        MOV      #172000,208UF2    :LOAD STATUS REGISTER A, STOP
        MOV      208UF,20PC        :LOAD THE DISPLAY P.C.
        MOV      #1,20PC           :SINGLE STEP THE DISPLAY
        JSR      7,DLAY            :EXECUTE A PROGRAM DELAY
        MOV      2YPOS,R0          :READ Y POSITION
        CMP      #525,R0
        BEQ     .+4
        HALT
    
```

```

:Y POSITION REGISTER FAILED TO LOAD
:PROPERLY USING GRAPHPLOT Y MODE
    
```

```

:TEST THAT THE X - Y POSITION REGISTERS CAN BE LOADED CORRECTLY
:USING GRAPHPLOT X + Y MODE
:TEST FOR PROPER SELECTION OF X AND Y REGISTERS
    
```

```

GT48:  SCOPE
        MOV      #122000,208UF     :LOW INTENSITY - SET GRAPHPLOT X MODE
        MOV      #1234,208UF1      :SET X POSITION
        MOV      #126000,208UF2    :SET GRAPHPLOT Y MODE
        MOV      #1432,208UF3      :SET Y POSITION
        MOV      #172000,208UF4    :LOAD STATUS REGISTER A, STOP
        MOV      208UF,20PC        :LOAD THE DISPLAY P.C.
        MOV      #1,20PC           :SINGLE STEP THE DISPLAY
        JSR      7,DLAY            :EXECUTE A PROGRAM DELAY
        MOV      2XPOS,R0          :READ X POSITION
        CMP      #1234,R0
        BEQ     .+6
        HALT
        BR      GT49
    
```

```

:GRAPHPLOT X MODE FAILED TO SELECT
:X POSITION PROPERLY
    
```

```

        MOV      #1,20PC           :SINGLE STEP THE DISPLAY
        MOV      #1,20PC           :SINGLE STEP THE DISPLAY
        JSR      7,DLAY            :EXECUTE A PROGRAM DELAY
        MOV      2YPOS,R0          :READ Y POSITION
        CMP      #1432,R0
        BEQ     .+4
        HALT
    
```

```

:Y POSITION REGISTER FAILED TO LOAD
:PROPERLY USING GRAPHPLOT Y MODE
    
```



```

945
946
947
948
949
950 005256 104000
951 005260 012777 116000 173534
952 005266 012777 001252 173530
953 005274 012777 001252 173524
954 005302 012777 172000 173520
955 005310 013777 001022 173532
956 005316 012777 000001 173524
957 005324 004737 015532
958 005330 017700 173520
959 005334 022700 001252
960 005340 001402
961 005342 000000
962 005344 000413
963 005346 012777 000001 173474
964 005354 004737 015532
965 005360 017700 173472
966 005364 022700 001252
967 005370 001401
968 005372 000000
969
970
971
972
973
974 005374 104000
975 005376 012777 116000 173416
976 005404 012777 000525 173412
977 005412 012777 000525 173406
978 005420 012777 172000 173402
979 005426 013777 001022 173414
980 005434 012777 000001 173406
981 005442 004737 015532
982 005446 017700 173402
983 005452 022700 000525
984 005456 001402
985 005460 000000
986 005462 000413
987
988 005464 012777 000001 173356
989 005472 004737 015532
990 005476 017700 173354
991 005502 022700 000525
992 005506 001401
993 005510 000000
994
995

```

:TEST THAT THE X-Y POSITION REGISTERS CAN BE LOADED CORRECTLY
:USING POINT DATA MODE

GT51: SCOPE
MOV #116000,20BUF ;LOW INTENSITY - POINT MODE
MOV #1252,20BUF1 ;SET X POSITION
MOV #1252,20BUF2 ;SET Y POSITION
MOV #172000,20BUF3 ;LOAD STATUS REGISTER A, STOP
MOV 20BUF,20PC
MOV #1,20PC ;SINGLE STEP THE DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 20XPOS,R0 ;READ X POSITION
CMP #1252,R0
BEQ .+6
HALT ;X POSITION REGISTER FAILED
BR GT52 ;USING POINT DATA MODE

MOV #1,20PC ;SINGLE STEP THE DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 20YPOS,R0 ;READ Y POSITION
CMP #1252,R0
BEQ .+4
HALT ;Y POSITION REGISTER FAILED
;USING POINT DATA MODE

:TEST THAT THE X-Y POSITION REGISTERS CAN BE LOADED CORRECTLY
:USING POINT DATA MODE

GT52: SCOPE
MOV #116000,20BUF ;LOW INTENSITY - POINT MODE
MOV #525,20BUF1 ;SET X POSITION
MOV #525,20BUF2 ;SET Y POSITION
MOV #172000,20BUF3 ;LOAD STATUS REGISTER A, STOP
MOV 20BUF,20PC
MOV #1,20PC ;SINGLE STEP THE DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 20XPOS,R0 ;READ X POSITION
CMP #525,R0
BEQ .+6
HALT ;X POSITION REGISTER FAILED
BR GT53 ;USING POINT DATA MODE

MOV #1,20PC ;SINGLE STEP THE DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 20YPOS,R0 ;READ Y POSITION
CMP #525,R0
BEQ .+4
HALT ;Y POSITION REGISTER FAILED
;USING POINT DATA MODE

```

996
997
998
999
1000 005512 104000
1001 005514 012777 116000 173300
1002 005522 012777 000000 173274
1003 005530 012777 001777 173270
1004 005536 012777 172000 173264
1005 005544 013777 001022 173276
1006 005552 012777 000001 173270
1007 005560 004737 015532
1008 005564 017700 173264
1009 005570 022700 000000
1010 005574 001402
1011 005576 000000
1012 005600 000413
1013
1014 005602 012777 000001 173240
1015 005610 004737 015532
1016 005614 017700 173236
1017 005620 022700 001777
1018 005624 001401
1019 005626 000000
1020
1021

```

:TEST THAT THE X-Y POSITION REGISTERS CAN BE LOADED CORRECTLY
:USING POINT DATA MODE

```

GT53: SCOPE
MOV 0116000,20BUF1 ;LOW INTENSITY - POINT MODE
MOV 00,20BUF1 ;SET X POSITION
MOV 01777,20BUF2 ;SET Y POSITION
MOV 0172000,20BUF3 ;LOAD STATUS REGISTER A, STOP
MOV 0BUF,20PC
MOV 01,20PC ;SINGLE STEP THE DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 2XPOS,RO ;READ X POSITION
CMP 00,RO
BEQ .+6
HALT
BR GT54 ;X POSITION REGISTER FAILED
;USING POINT DATA MODE

MOV 01,20PC ;SINGLE STEP THE DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 2YPOS,RO ;READ Y POSITION
CMP 01777,RO
BEQ .+4
HALT ;Y POSITION REGISTER FAILED
;USING POINT DATA MODE

```


E03

GT-40/GT-44 INSTRUCTION TEST I MAINDEC-11-00GTA-C
 00GTAC.P11

MACY11 27(732) 08-SEP-76 08:56 PAGE 27

```

1098
1099
1100      ;TEST THAT LONG VECTOR MODE INCREMENT X AND Y AXIS PROPERLY
1101      ;COUNT 0-1777
1102      006214 104000
1103      006216 012703 001777
1104      006222 012704 000001
1105
1106      006226 104000
1107      006230 013700 001022
1108      006234 012720 116000
1109      006240 005020
1110      006242 005020
1111      006244 012720 110000
1112      006250 010420
1113      006252 010420
1114      0  254 013777 001022 172566
1115      0  2  012777 000001 172560
1116      0  270 004737 015532
1117      0  274 012777 000001 172546
1118      0  2  004737 015532
1119      0  256 012777 000001 172534
1120      006314 004737 015532
1121      006320 012777 000001 172522
1122      006326 004737 015532
1123      0  332 012777 000001 172510
1124      006340 004737 015532
1125
1126      006344 017700 172504
1127      0  250 020400
1128      0  352 001402
1129      006354 000000
1130      006356 000411
1131
1132      006360 017700 172472
1133      006364 020400
1134      006366 001402
1135      0  370 000000
1136      006372 000403
1137
1138      006374 005204
1139      006376 005303
1140      006400 001313
  
```

```

GT56:  SCOPE
        MOV      #1777,R3      ;SET UP A COUNTER
        MOV      #1,R4        ;PRESET THE COMPARED VALUE

GT56A:  SCOPE
        MOV      @BUF,R0      ;SET UP R0
        MOV      #116000,(0)+ ;LOAD "POINT MODE"
        CLR      (0)+         ;CLEAR X AXIS
        CLR      (0)+         ;CLEAR Y AXIS
        MOV      #110000,(0)+ ;LOAD "LONG VECTOR MODE"
        MOV      R4,(0)+      ;PRESET "DELTA X AXIS"
        MOV      R4,(0)+      ;PRESET "DELTA Y AXIS"
        MOV      @BUF,@PC     ;LOAD THE DISPLAY P.C.
        MOV      #1,@PC       ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY      ;EXECUTE A PROGRAM DELAY
        MOV      #1,@PC       ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY      ;EXECUTE A PROGRAM DELAY
        MOV      #1,@PC       ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY      ;EXECUTE A PROGRAM DELAY
        MOV      #1,@PC       ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY      ;EXECUTE A PROGRAM DELAY
        MOV      #1,@PC       ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY      ;EXECUTE A PROGRAM DELAY
        JSR      7,DELAY      ;EXECUTE A PROGRAM DELAY

        MOV      @XPOS,R0     ;READ X AXIS
        CMP      R4,R0        ;ARE THEY EQUAL?
        BEQ      .+6          ;YES
        HALT                ;NO, INCREMENT X AXIS VIA
        BR      GT57          ;LONG VECTOR MODE FAILED

        MOV      @YPOS,R0     ;READ Y AXIS
        CMP      R4,R0        ;ARE THEY EQUAL?
        BEQ      .+6          ;YES
        HALT                ;NO, INCREMENT Y AXIS VIA
        BR      GT57          ;LONG VECTOR MODE FAILED

        INC      R4           ;INCREMENT EXPECTED VALUE
        DEC      R3           ;FINISHED?
        BNE      GT56A        ;NO, TEST MORE DATA
  
```

```

1141
1142
1143
1144
1145 006402 104000
1146 00404 012703 002000
1147 00410 012704 001777
1148 006414 012705 020001
1149
1150 006420 104000
1151 00000 013700 001022
1152 00000 012720 116000
1153 00000 005020
1154 00000 000000
1155 00000 012720 110000
1156 00000 010520
1157 00000 010520
1158 00000 013777 001022 172374
1159 00000 012777 000001 172366
1160 00000 004737 015532
1161 00000 012777 000001 172354
1162 00000 004737 015532
1163 00000 012777 000001 172342
1164 00000 004737 015532
1165 00000 012777 000001 172330
1166 00000 004737 015532
1167 00000 012777 000001 172316
1168 006532 004737 015532
1169
1170 006536 017700 172312
1171 006542 020400
1172 00544 001402
1173 00546 000000
1174 006550 000412
1175
1176 006552 017700 172300
1177 006560 000400
1178 006560 001402
1179 006562 000000
1180 006564 000404
1181
1182 006566 005205
1183 006570 005304
1184 006572 005303
1185 006574 001312

:TEST THAT LONG VECTOR MODE DECREASEMENTS X AND Y AXIS PROPERLY
:COUNT 1777-0
GT57: SCOPE
MOV R3,R3
MOV R4,R4
MOV R5,R5
:SET UP A COUNTER
:PRESET THE COMPARED VALUE

GT57A: SCOPE
MOV R0,R0
MOV R1,R1
CLR R2
CLR R3
MOV R4,R4
MOV R5,R5
MOV R6,R6
MOV R7,R7
MOV R8,R8
MOV R9,R9
MOV R10,R10
MOV R11,R11
MOV R12,R12
MOV R13,R13
MOV R14,R14
MOV R15,R15
MOV R16,R16
MOV R17,R17
MOV R18,R18
MOV R19,R19
MOV R20,R20
MOV R21,R21
MOV R22,R22
MOV R23,R23
MOV R24,R24
MOV R25,R25
MOV R26,R26
MOV R27,R27
MOV R28,R28
MOV R29,R29
MOV R30,R30
MOV R31,R31
MOV R32,R32
MOV R33,R33
MOV R34,R34
MOV R35,R35
MOV R36,R36
MOV R37,R37
MOV R38,R38
MOV R39,R39
MOV R40,R40
MOV R41,R41
MOV R42,R42
MOV R43,R43
MOV R44,R44
MOV R45,R45
MOV R46,R46
MOV R47,R47
MOV R48,R48
MOV R49,R49
MOV R50,R50
MOV R51,R51
MOV R52,R52
MOV R53,R53
MOV R54,R54
MOV R55,R55
MOV R56,R56
MOV R57,R57
MOV R58,R58
MOV R59,R59
MOV R60,R60
MOV R61,R61
MOV R62,R62
MOV R63,R63
MOV R64,R64
MOV R65,R65
MOV R66,R66
MOV R67,R67
MOV R68,R68
MOV R69,R69
MOV R70,R70
MOV R71,R71
MOV R72,R72
MOV R73,R73
MOV R74,R74
MOV R75,R75
MOV R76,R76
MOV R77,R77
MOV R78,R78
MOV R79,R79
MOV R80,R80
MOV R81,R81
MOV R82,R82
MOV R83,R83
MOV R84,R84
MOV R85,R85
MOV R86,R86
MOV R87,R87
MOV R88,R88
MOV R89,R89
MOV R90,R90
MOV R91,R91
MOV R92,R92
MOV R93,R93
MOV R94,R94
MOV R95,R95
MOV R96,R96
MOV R97,R97
MOV R98,R98
MOV R99,R99
:SET UP R0
:LOAD "POINT MODE"
:CLEAR X AXIS
:CLEAR Y AXIS
:LONG VECTOR MODE
:SET "DELTA X AXIS"
:SET "DELTA Y AXIS"
:LOAD THE DISPLAY P.C.
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:READ X AXIS
:ARE THEY EQUAL?
:YES
:NO, DECREMENT X AXIS VIA
:LONG VECTOR MODE FAILED

GT58
MOV R0,R0
MOV R1,R1
MOV R2,R2
MOV R3,R3
MOV R4,R4
MOV R5,R5
MOV R6,R6
MOV R7,R7
MOV R8,R8
MOV R9,R9
MOV R10,R10
MOV R11,R11
MOV R12,R12
MOV R13,R13
MOV R14,R14
MOV R15,R15
MOV R16,R16
MOV R17,R17
MOV R18,R18
MOV R19,R19
MOV R20,R20
MOV R21,R21
MOV R22,R22
MOV R23,R23
MOV R24,R24
MOV R25,R25
MOV R26,R26
MOV R27,R27
MOV R28,R28
MOV R29,R29
MOV R30,R30
MOV R31,R31
MOV R32,R32
MOV R33,R33
MOV R34,R34
MOV R35,R35
MOV R36,R36
MOV R37,R37
MOV R38,R38
MOV R39,R39
MOV R40,R40
MOV R41,R41
MOV R42,R42
MOV R43,R43
MOV R44,R44
MOV R45,R45
MOV R46,R46
MOV R47,R47
MOV R48,R48
MOV R49,R49
MOV R50,R50
MOV R51,R51
MOV R52,R52
MOV R53,R53
MOV R54,R54
MOV R55,R55
MOV R56,R56
MOV R57,R57
MOV R58,R58
MOV R59,R59
MOV R60,R60
MOV R61,R61
MOV R62,R62
MOV R63,R63
MOV R64,R64
MOV R65,R65
MOV R66,R66
MOV R67,R67
MOV R68,R68
MOV R69,R69
MOV R70,R70
MOV R71,R71
MOV R72,R72
MOV R73,R73
MOV R74,R74
MOV R75,R75
MOV R76,R76
MOV R77,R77
MOV R78,R78
MOV R79,R79
MOV R80,R80
MOV R81,R81
MOV R82,R82
MOV R83,R83
MOV R84,R84
MOV R85,R85
MOV R86,R86
MOV R87,R87
MOV R88,R88
MOV R89,R89
MOV R90,R90
MOV R91,R91
MOV R92,R92
MOV R93,R93
MOV R94,R94
MOV R95,R95
MOV R96,R96
MOV R97,R97
MOV R98,R98
MOV R99,R99
:READ Y AXIS
:ARE THEY EQUAL?
:YES
:NO, DECREMENT Y AXIS VIA
:LONG VECTOR MODE FAILED

GT58
INC R5
DEC R4
DEC R3
BNE GT57A
:INCREMENT "DELTA X-Y"
:DECREMENT EXPECTED VALUE
:FINISHED?
:NO, TEST MORE DATA

```



```

1218
1219
1220
1221
1222
1223 006734 104000
1224 076736 001022
1225 01674 012720 116000
1226
1227
1228
1229 012720
1230 013777 172060
1231 012777 172052
1232 044737 013332
1233 012777 000001 172040
1234 007010 044737 015532
1235 007014 012777 000001 172026
1236 007013 044737 000001
1237 007013 012777 000001 172014
1238 007014 004737 015532
1239
1240 007040 017700 172010
1241 007044 022700 001777
1242 007050 011402
1243 007052 000000
1244 007054 000406
1245
1246 007056 017700 171774
1247 007062 012700 001777
1248 007066 011401
1249 007070 000000
1250

```

```

:TEST THAT X AND Y AXIS DECREMENT PROPERLY
:USING SHORT VECTOR MODE
:COUNT I

```

GT59: SCOPE

```

MOV DBUF,RO
MOV #116000,(0)+
CLR (0)+
CLR (0)+
MOV #106000,(0)+
MOV #20301,(0)+
MOV DBUF,ROPC
MOV #1,ROPC
JSR 7,DELAY
MOV #1,ROPC
JSR 7,DELAY
MOV #1,ROPC
JSR 7,DELAY
MOV #1,ROPC
JSR 7,DELAY

```

```

:SET UP RO
:LOAD "SET POINT MODE"
:CLEAR X AXIS
:CLEAR Y AXIS
:LOAD "SET SHORT VECTOR MODE"
:SET DELTA X AND DELTA Y
:INITIALIZE DISPLAY
:EXECUTE THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY

```

```

MOV @XPOS,RO
CMP #1777,RO
BEQ .+6
HALT
BR GT60

```

```

:READ X AXIS
:ARE THEY EQUAL?
:YES
:NO, DECREMENT X AXIS FAILED USING
:SHORT VECTOR MODE

```

```

MOV @YPOS,RO
CMP #1777,RO
BEQ .+4
HALT

```

```

:READ Y AXIS
:ARE THEY EQUAL?
:YES
:NO DECREMENT Y AXIS FAILED
:USING SHORT VECTOR MODE

```

```

1251
1252
1253
1254
1255
1256 007072 104000
1257 007074 012703 000077
1258 007100 012702 000001
1259 007104 012704 000001
1260
1261 007110 104000
1262 007112 013700 001022
1263 007116 012720 116000
1264 007122 012720
1265 007124 012720
1266 007126 012720 106000
1267 007132 010420
1268 007134 013777 001022 171706
1269 007142 012777 000001 171700
1270 007150 004737 015532
1271 007154 012777 000001 171666
1272 007162 004737 015532
1273 007166 012777 000001 171654
1274 007174 004737 015532
1275 007200 012777 000001 171642
1276 007206 004737 015532
1277
1278 007212 017700 171636
1279 007216 020200
1280 007220 001402
1281 007222 000000
1282 007224 000413
1283
1284 007226 017700 171624
1285 007232 020200
1286 007234 001402
1287 007236 000000
1288 007240 000405
1289
1290 007242 062704 000201
1291 007246 005202
1292 007250 005303
1293 007252 001317

```

```

:TEST THAT X AND Y AXIS INCREMENT PROPERLY
:USING SHORT VECTOR MODE
:COUNT 0-77

```

```

GT60: SCOPE
MOV #77,R3 :SET UP A COUNT LOCATION
MOV #1,R2 :SET UP THE COMPARED LOCATION
MOV #201,R4 :SET UP "DELTA X-Y"

GT60A: SCOPE
MOV DBUF,R0 :SET UP R0
MOV #116000,(0)+ :LOAD "SET POINT DATA MODE"
CLR (0)+ :CLEAR X AXIS
CLR (0)+ :CLEAR Y AXIS
MOV #106000,(0)+ :LOAD "SET SHORT VECTOR MODE"
MOV R4,(0)+ :PRESET "DELTA X AND DELTA Y"
MOV DBUF,20PC :LOAD THE DISPLAY P.C.
MOV #1,20PC :SINGLE STEP THE DISPLAY
JSR 7,DELAY :EXECUTE A PROGRAM DELAY
MOV #1,20PC :SINGLE STEP THE DISPLAY
JSR 7,DELAY :EXECUTE A PROGRAM DELAY
MOV #1,20PC :SINGLE STEP THE DISPLAY
JSR 7,DELAY :EXECUTE A PROGRAM DELAY
MOV #1,20PC :SINGLE STEP THE DISPLAY
JSR 7,DELAY :EXECUTE A PROGRAM DELAY

MOV 2XPOS,R0 :READ X POSITION
CMP R2,R0 :ARE THEY EQUAL
BEQ .+6 :YES
HALT :INCREMENT X AXIS FAILED USING
BR GT61 :SHORT VECTOR MODE

MOV 2YPOS,R0 :READ Y POSITION
CMP R2,R0 :ARE THEY EQUAL ?
BEQ .+6 :YES
HALT :INCREMENT Y AXIS FAILED USING
BR GT61 :SHORT VECTOR MODE

ADD #201,R4 :ADD DELTA X-Y
INC R2 :INCREMENT EXPECTED VALUE
DEC R3 :DECREMENT COUNT, FINISHED?
BNE GT60A :NO, TEST MORE DATA

```

```

1294
1295
1296
1297
1298
1299 007254 104000
1300 007256 012703 000077
1301 007262 012702 001777
1302 007266 012704 020301
1303
1304 007272 104000
1305 007274 013700 001022
1306 007300 012720 116000
1307 007304 012720
1308 007306 012720
1309 007310 012720 106000
1310 007314 010420
1311 007316 013777 001022 171524
1312 007324 012777 000001 171516
1313 007332 004737 015532
1314 007336 012777 000001 171504
1315 007344 004737 015532
1316 007350 012777 000001 171472
1317 007356 004737 015532
1318 007362 012777 000001 171460
1319 007370 004737 015532
1320
1321 007374 017700 171454
1322 007400 020200
1323 007402 001402
1324 007404 000000
1325 007406 000413
1326
1327 007410 017700 171442
1328 007414 020200
1329 007416 001402
1330 007420 000000
1331 007422 000405
1332
1333 007424 062704 000201
1334 007430 005302
1335 007432 005303
1336 007434 001317
1337

```

:TEST THAT X AND Y AXIS DECREMENT PROPERLY
:USING SHORT VECTOR MODE
:COUNT 77-0

```

GT61: SCOPE
      MOV      #77,R3          ;SET UP A COUNT LOCATION
      MOV      #1777,R2       ;SET UP THE COMPARED LOCATION
      MOV      #20301,R4      ;PRESET THE "DELTA X-Y"

GT61A: SCOPE
      MOV      DBUF,R0        ;SET UP R0
      MOV      #116000,(0)+   ;LOAD "SET POINT DATA MODE"
      CLR      (0)+          ;CLEAR X AXIS
      CLR      (0)+          ;CLEAR Y AXIS
      MOV      #106000,(0)+   ;LOAD "SET SHORT VECTOR MODE"
      MOV      R4,(0)+       ;PRESET "DELTA X AND DELTA Y"
      MOV      DBUF,PC       ;LOAD THE DISPLAY P.C.
      MOV      #1,PC        ;SINGLE STEP THE DISPLAY
      JSR      7,DELAY       ;EXECUTE A PROGRAM DELAY
      MOV      #1,PC        ;SINGLE STEP THE DISPLAY
      JSR      7,DELAY       ;EXECUTE A PROGRAM DELAY
      MOV      #1,PC        ;SINGLE STEP THE DISPLAY
      JSR      7,DELAY       ;EXECUTE A PROGRAM DELAY
      MOV      #1,PC        ;SINGLE STEP THE DISPLAY
      JSR      7,DELAY       ;EXECUTE A PROGRAM DELAY
      JSR      7,DELAY       ;EXECUTE A PROGRAM DELAY

      MOV      #XPOS,R0      ;READ X POSITION
      CMP      R2,R0        ;ARE THEY EQUAL
      BEQ      .+6          ;YES
      HALT                    ;DECREMENT X AXIS FAILED USING
      BR      GT62          ;SHORT VECTOR MODE

      MOV      #YPOS,R0      ;READ Y POSITION
      CMP      R2,R0        ;ARE THEY EQUAL ?
      BEQ      .+6          ;YES DECREMENT
      HALT                    ;DECREMENT Y AXIS FAILED USING
      BR      GT62          ;SHORT VECTOR MODE

      ADD      #201,R4       ;ADD "DELTA X-Y"
      DEC      R2           ;DECREMENT EXPECTED VALUE
      DEC      R3           ;DECREMENT COUNT, FINISHED?
      BNE     GT61A        ;NO, TEST MORE DATA

```


1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402

007574 104000
007576 013700 001022
007602 012720 116000
007606 005020
007610 005020
007612 012720 130000
007616 012720 020301
007617 013777 001022 171220
007630 012777 000001 171212
007636 004737 015532
007642 012777 000001 171200
007650 004737 015532
007654 012777 000001 171166
007662 004737 015532
007666 012777 000001 171154
007674 004737 015532
007700 017700 171150
007704 022700 001777
007710 001402
007712 000000
007714 000406
007716 017700 171134
007722 022700 001777
007726 001401
007730 000000

:TEST THAT X AND Y AXIS DECREMENT PROPERLY
:USING RELATIVE POINT MODE
:COUNT 1

GT63:

SCOPE

MOV DBUF,RO
MOV #116000,(0)+
CLR (0)+
CLR (0)+
MOV #130000,(0)+
MOV #20301,(0)+
MOV DBUF,20PC
MOV #1,20PC
JSR 7,0LAY
MOV #1,20PC
JSR 7,0LAY
MOV #1,20PC
JSR 7,0LAY
MOV #1,20PC
JSR 7,0LAY
MOV #1,20PC
JSR 7,0LAY

:SET UP RO
:LOAD "SET POINT MODE"
:CLEAR X AXIS
:CLEAR Y AXIS
:LOAD "SET RELATIVE POINT MODE"
:PRESET "DELTA X AND DELTA Y"
:LOAD THE DISPLAY PC
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY
:SINGLE STEP THE DISPLAY
:EXECUTE A PROGRAM DELAY

MOV 2XPOS,RO
CMP #1777,RO
BEQ .+6
HALT
BR GT64

:READ X AXIS
:ARE THEY EQUAL?
:YES
:NO, DECREMENT X AXIS FAILED USING
:RELATIVE POINT MODE

MOV 2YPOS,RO
CMP #1777,RO
BEQ .+4
HALT

:READ Y AXIS
:ARE THEY EQUAL?
:YES
:NO DECREMENT Y AXIS FAILED
:USING RELATIVE POINT MODE

```

1403
1404           ;TEST THAT X AND Y AXIS INCREMENT PROPERLY
1405           ;USING RELATIVE POINT MODE
1406           ;COUNT 0-77
1407
1408 007732 104000          GT64:  SCOPE
1409 007734 012703 000077      MOV      #77,R3           ;SET UP A COUNT LOCATION
1410 007740 012702 000001      MOV      #1,R2            ;SET UP THE COMPARED LOCATION
1411 007744 012704 000201      MOV      #201,R4         ;SET UP "DELTA X-Y"
1412
1413 007750 104000          GT64A: SCOPE
1414 007752 013700 001022      MOV      DBUF,R0         ;SET UP R0
1415 007756 012720 116000      MOV      #116000,(0)+   ;LOAD "SET POINT DATA MODE"
1416 007762 005020          CLR      (0)+           ;CLEAR X AXIS
1417 007764 005020          CLR      (0)+           ;CLEAR Y AXIS
1418 007766 012720 130000      MOV      #130000,(0)+   ;LOAD "SET RELATIVE POINT MODE"
1419 007772 010420          MOV      R4,(0)+       ;PRESET "DELTA X AND DELTA Y"
1420 007774 013777 001022 171046  MOV      DBUF,20PC      ;LOAD THE DISPLAY P.C.
1421 010002 012777 000001 171040  MOV      #1,20PC       ;SINGLE STEP THE DISPLAY
1422 010010 004737 015532          JSR      7,DLAY         ;EXECUTE A PROGRAM DELAY
1423 010014 012777 000001 171026  MOV      #1,20PC       ;SINGLE STEP THE DISPLAY
1424 010022 004737 015532          JSR      7,DLAY         ;EXECUTE A PROGRAM DELAY
1425 010026 012777 000001 171014  MOV      #1,20PC       ;SINGLE STEP THE DISPLAY
1426 010034 004737 015532          JSR      7,DLAY         ;EXECUTE A PROGRAM DELAY
1427 010040 012777 000001 171002  MOV      #1,20PC       ;SINGLE STEP THE DISPLAY
1428 010046 004737 015532          JSR      7,DLAY         ;EXECUTE A PROGRAM DELAY
1429
1430 010052 017700 170776      MOV      2XPOS,R0       ;READ X POSITION
1431 010056 020200          CMP      R2,R0         ;ARE THEY EQUAL
1432 010060 001402          BEQ     .+6            ;YES
1433 010062 000000          HALT                    ;INCREMENT X AXIS FAILED USING
1434 010064 000413          BR      GT65           ;RELATIVE POINT MODE
1435
1436 010066 017700 170764      MOV      2YPOS,R0       ;READ Y POSITION
1437 010072 020200          CMP      R2,R0         ;ARE THEY EQUAL ?
1438 010074 001402          BEQ     .+6            ;YES
1439 010076 000000          HALT                    ;INCREMENT Y AXIS FAILED USING
1440 010100 000405          BR      GT65           ;RELATIVE POINT MODE
1441
1442 010102 062704 000201      ADD      #201,R4        ;ADD DELTA X-Y
1443 010106 005202          INC      R2            ;INCREMENT EXPECTED VALUE
1444 010110 005303          DEC      R3            ;DECREMENT COUNT, FINISHED?
1445 010112 001317          BNE     GT64A         ;NO, TEST MORE DATA

```

```

1446
1447
1448
1449
1450
1451 010114 104000
1452 010116 012703 000077
1453 010122 012702 001777
1454 010126 012704 020301
1455
1456 010132 104000
1457 010134 013700 001022
1458 010140 012720 116000
1459 010144 005020
1460 010146 005020
1461 010150 012720 130000
1462 010154 010470
1463 010156 013777 001022 170664
1464 010164 012777 000001 170656
1465 010172 004737 015532
1466 010176 012777 000001 170644
1467 010204 004737 015532
1468 010210 012777 000001 170632
1469 010216 004737 015532
1470 010222 012777 000001 170620
1471 010230 004737 015532
1472
1473 010234 017700 170614
1474 010240 020200
1475 010242 001402
1476 010244 000000
1477 010246 000413
1478
1479 010250 017700 170602
1480 010254 020200
1481 010256 001402
1482 010260 000000
1483 010262 000405
1484
1485 010264 062704 000201
1486 010270 005302
1487 010272 005303
1488 010274 001317
1489

;TEST THAT X AND Y AXIS DECREMENT PROPERLY
;USING RELATIVE POINT MODE
;COUNT 77-0

GT65: SCOPE
      MOV #77,R3 ;SET UP A COUNT LOCATION
      MOV #1777,R2 ;SET UP THE COMPARED LOCATION
      MOV #20301,R4 ;PRESET THE "DELTA X-Y"

GT65A: SCOPE
      MOV DBUF,R0 ;SET UP R0
      MOV #116000,(0)+ ;LOAD "SET POINT DATA MODE"
      CLR (0)+ ;CLEAR X AXIS
      CLR (0)+ ;CLEAR Y AXIS
      MOV #130000,(0)+ ;LOAD "SET RELATIVE POINT MODE"
      MOV R4,(0)+ ;PRESET "DELTA X AND DELTA Y"
      MOV DBUF,20PC ;LOAD THE DISPLAY P.C.
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,0LAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,0LAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,0LAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,0LAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,0LAY ;EXECUTE A PROGRAM DELAY

      MOV @XPOS,R0 ;READ X POSITION
      CMP R2,R0 ;ARE THEY EQUAL
      BEQ .+6 ;YES
      HALT ;DECREMENT X AXIS FAILED USING
      BR GT66 ;RELATIVE POINT MODE

      MOV @YPOS,R0 ;READ Y POSITION
      CMP R2,R0 ;ARE THEY EQUAL ?
      BEQ .+6 ;YES DECREMENT
      HALT ;DECREMENT Y AXIS FAILED USING
      BR GT66 ;RELATIVE POINT MODE

      ADD #201,R4 ;ADD "DELTA X-Y"
      DEC R2 ;DECREMENT EXPECTED VALUE
      DEC R3 ;DECREMENT COUNT, FINISHED?
      BNE GT65A ;NO, TEST MORE DATA

```



```

1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529

```

010276	104000			GT66:	SCOPE		
010300	012703	000077			MOV	#77,R3	:SET UP EXECUTION COUNTER
010304	012704	000001			MOV	#1,R4	:SET UP COMPARED DATA
010310	012737	174101	001036		MOV	#174101,DSAVE	:SET UP BASIC "LOAD STATUS B"
010316	104000			GT66A:	SCOPE		
010320	013700	001022			MOV	DBUF,R0	:SET UP R0
010324	012720	116000			MOV	#116000,(0)+	:LOAD "POINT MODE"
010330	005020				CLR	(0)+	:CLEAR X AXIS
010334	005020				CLR	(0)+	:CLEAR Y AXIS
010338	013720	001036			MOV	DSAVE,(0)+	:LOAD "SET STATUS B"
010340	012720	120000			MOV	#120000,(0)+	:LOAD "SET GRAPH PLOT X MODE"
010344	005020				CLR	(0)+	:LOAD "X GRAPH PLOT DATA"
010346	013777	001022	170474		MOV	DBUF,JOPC	:LOAD THE DISPLAY P.C.
010354	012777	000001	170466		MOV	#1,JOPC	:SINGLE STEP THE DISPLAY
010362	004737	015532			JSR	7,DLAY	:EXECUTE A PROGRAM DELAY
010366	012777	000001	170454		MOV	#1,JOPC	:SINGLE STEP THE DISPLAY
010374	004737	015532			JSR	7,DLAY	:EXECUTE A PROGRAM DELAY
010400	012777	000001	170442		MOV	#1,JOPC	:SINGLE STEP THE DISPLAY
010406	004737	015532			JSR	7,DLAY	:EXECUTE A PROGRAM DELAY
010412	012777	000001	170430		MOV	#1,JOPC	:SINGLE STEP THE DISPLAY
010420	004737	015532			JSR	7,DLAY	:EXECUTE A PROGRAM DELAY
010424	012777	000001	170416		MOV	#1,JOPC	:SINGLE STEP THE DISPLAY
010432	004737	015532			JSR	7,DLAY	:EXECUTE A PROGRAM DELAY
010436	017700	170414			MOV	ZYPOS,R0	:READ Y AXIS
010442	020400				CMR	R4,R0	:COMPARE TO EXPECTED VALUE
010444	001402				BEQ	.+6	:ARE THEY EQUAL?
010446	000000				HALT		:LOAD "STATUS B" FAILED TO LOAD
010450	000405				BR	GT67	:THE Y AXIS CORRECTLY
010452	005237	001036			INC	DSAVE	
010456	005204				INC	R4	:INCREMENT THE STATUS B COUNT
010460	005303				DEC	R3	:DECREMENT THE EXECUTION COUNT
010462	001316				BNE	GT66A	:TEST MORE DATA

```

1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574

:LOAD STATUS B TEST
:USE GRAPH PLOT Y MODE TO TEST X AXIS IS INCREMENTED BY
:"SCALE" REGISTER

GT67:  SCOPE
010464  104000
010466  012703  000077
010472  012704  000001
010476  012737  174101  001036

GT67A: SCOPE
010504  104000
010506  013700  001022
010512  012720  116000
010516  005020
010520  005020
010524  013720  001036
010528  012720  124000
010532  005020
010534  013777  001022  170306
010548  012777  000001  170300
010550  004737  015532
010554  012777  000001  170266
010562  004737  015532
010566  012777  000001  170254
010574  004737  015532
010600  012777  000001  170242
010606  004737  015532
010612  012777  000001  170230
010620  004737  015532

010624  017700  170224
010630  042700  176000
010634  020400
010636  001402
010640  000000
010642  000413

010644  005237  001036
010650  005204
010652  005303
010654  001314

010656  012777  174100  170136
010664  013777  001022  170156

GT67:  MOV      #77,R3          ;SET UP EXECUTION COUNTER
        MOV      #1,R4          ;SET UP COMPARED DATA
        MOV      #174101,DSAVE ;SET UP BASIC "LOAD STATUS B"

GT67A: MOV      DBUF,R0          ;SET UP R0
        MOV      #116000,(0)+   ;LOAD "POINT MODE"
        CLR      (0)+          ;CLEAR X AXIS
        CLR      (0)+          ;CLEAR Y AXIS
        MOV      DSAVE,(0)+     ;LOAD "SET STATUS B"
        MOV      #124000,(0)+   ;LOAD "SET GRAPH PLOT Y MODE"
        CLR      (0)+          ;LOAD "Y GRAPH PLOT DATA"
        MOV      DBUF,PC        ;LOAD THE DISPLAY P.C.
        JSR      #1,PC          ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY        ;EXECUTE A PROGRAM DELAY
        JSR      #1,PC          ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY        ;EXECUTE A PROGRAM DELAY
        JSR      #1,PC          ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY        ;EXECUTE A PROGRAM DELAY
        JSR      #1,PC          ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY        ;EXECUTE A PROGRAM DELAY
        JSR      #1,PC          ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY        ;EXECUTE A PROGRAM DELAY
        JSR      #1,PC          ;SINGLE STEP THE DISPLAY
        JSR      7,DELAY        ;EXECUTE A PROGRAM DELAY

        MOV      2XPOS,R0       ;READ X AXIS
        BIC      #176000,R0     ;MASK TO BITS 0-9
        CMP      R4,R0          ;COMPARE TO EXPECTED VALUE
        BEQ      .+6           ;ARE THEY EQUAL?
        HALT                    ;LOAD "STATUS B" FAILED TO LOAD
        BR      GT70           ;THE X AXIS CORRECTLY

        INC      DSAVE
        INC      R4              ;INCREMENT THE STATUS B COUNT
        DEC      R3              ;DECREMENT THE EXECUTION COUNT
        BNE     GT67A          ;TEST MORE DATA

GT67B: MOV      #174100,20BUF
        MOV      DBUF,PC
    
```

```

1575                                     ;EDGE FLAG TEST
1576                                     ;TEST THAT EXCEEDING +X AXIS SETS EDGE FLAG
1577
1578 010672 104000 GT70: SCOPE
1579 010674 013700      MOV      DBUF,RO
1580 010700 012720      MOV      #16000,(0)+ ;LOAD POINT
1581 010704 012720      MOV      #1777,(0)+ ;LOC MAX X
1582 010710 012720      MOV      #0,(0)+ ;LOAD Y
1583 010714 012720      MOV      #10000,(0)+ ;LOAD LONG VECTOR
1584 010720 012720      MOV      #1,(0)+ ;LOAD DELTA X
1585 010724 012720      MOV      #0,(0)+ ;LOAD DELTA Y
1586 010730 012720      MOV      #172000,(0)+ ;LOAD STOP
1587 010734 013777      MOV      DEUF,30PC ;START DISPLAY
1588 010742 012777      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1589 010750 004737      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1590 010754 012777      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1591 010762 004737      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1592
1593 010766 032777 000040 170056      BIT      #40,30SR ;TEST BIT 5
1594 010774 001402      BEQ      .+6
1595 010776 000000      HALT
1596 011000 000454      BR      GT71 ;EDGE FLAG SET IN ERROR
1597
1598 011002 012777 000001 170040      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1599 011010 004737 015532      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1600 011014 012777 000001 170026      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1601 011022 004737 015532      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1602 011026 012777 000001 170014      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1603 011034 004737 015532      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1604 011040 012777 000001 170002      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1605 011046 004737 015532      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1606
1607 011052 032777 000040 167772      BIT      #40,30SR ;TEST BIT 5
1608 011060 001002      BNE      .+6
1609 011062 000000      HALT
1610 011064 000422      BR      GT71 ;EDGE FLAG FAILED TO SET
1611
1612 011066 013777 001022 167754      MOV      DBUF,30PC ;START DISPLAY AGAIN
1613 011074 012777 000001 167746      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1614 011102 004737 015532      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1615 011106 012777 000001 167734      MOV      #1,30PC ;SINGLE STEP THE DISPLAY
1616 011114 004737 015532      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1617 011120 032777 000040 167724      BIT      #40,30SR ;TEST BIT 5
1618 011126 001401      BEQ      .+4
1619 011130 000000      HALT ;EDGE FLAG FAILED TO CLEAR

```

```

1620
1621
1622
1623
1624
1625 011132 104000
1626 011134 013700 001022
1627 011140 012720 116000
1628 011144 012720 000000
1629 011150 012720 000000
1630 011154 012720 110000
1631 011160 012720 020001
1632 011164 012720 000000
1633 011170 012720 172000
1634 011174 013777 001022 167646
1635 011202 012777 000001 167640
1636 011210 004737 015532
1637 011214 012777 000001 167626
1638 011222 004737 015532
1639
1640 011226 032777 000040 167616
1641 011234 001402
1642 011236 000000
1643 011240 000454
1644
1645 011242 012777 000001 167600
1646 011250 004737 015532
1647 011254 012777 000001 167566
1648 011262 004737 015532
1649 011266 012777 000001 167554
1650 011274 004737 015532
1651 011300 012777 000001 167542
1652 011306 004737 015532
1653
1654 011312 032777 000040 167532
1655 011320 001002
1656 011322 000000
1657 011324 000520
1658
1659 011326 013777 001022 167514
1660 011334 012777 000001 167506
1661 011342 004737 015532
1662 011346 012777 000001 167474
1663 011354 004737 015532
1664 011360 032777 000040 167464
1665 011366 001401
1666 011370 000000

```

```

:EDGE FLAG TEST
:TEST THAT EXCEEDING -X AXIS SETS EDGE FLAG
GT71: SCOPE
      MOV DBUF,RO
      MOV #116000,(0)+ ;LOAD POINT
      MOV #0,(0)+ ;LOAD MAX X
      MOV #0,(0)+ ;LOAD Y
      MOV #110000,(0)+ ;LOAD LONG VECTOR
      MOV #20001,(0)+ ;LOAD DELTA X
      MOV #0,(0)+ ;LOAD DELTA Y
      MOV #172000,(0)+ ;LOAD STOP
      MOV DBUF,20PC ;START DISPLAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      BIT #40,20SR ;TEST BIT 5
      BEQ .+6
      HALT ;EDGE FLAG SET IN ERROR
      BR GT72
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      BIT #40,20SR ;TEST BIT 5
      BNE .+6
      HALT ;EDGE FLAG FAILED TO SET
      BR GT73
      MOV DBUF,20PC ;START DISPLAY AGAIN
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DELAY ;EXECUTE A PROGRAM DELAY
      BIT #40,20SR ;TEST BIT 5
      BEQ .+4
      HALT ;EDGE FLAG FAILED TO CLEAR

```

```

1667
1668
1669
1670
1671
1672 011372 104000
1673 011374 013700 001022
1674 011400 012720 116000
1675 011404 012720 000000
1676 011410 013720 001012
1677 011414 012720 110000
1678 011420 012720 001000
1679 011424 012720 000001
1680 011430 012720 172000
1681 011434 013777 001002 167406
1682 011442 012777 000001 167400
1683 011450 004737 015532
1684 011454 012777 000001 167366
1685 011462 004737 015532
1686
1687 011466 032777 000040 167356
1688 011474 001402
1689 011476 000000
1690 011500 000032
1691
1692 011502 012777 000001 167340
1693 011510 004737 015532
1694 011514 012777 000001 167326
1695 011522 004737 015532
1696 011530 012777 000001 167314
1697 011534 004737 015532
1698 011540 012777 000001 167302
1699 011546 004737 015532
1700
1701 011552 032777 000040 167272
1702 011560 001002
1703 011562 000000
1704 011564 000400
1705

```

```

:EDGE FLAG TEST
:TEST THAT EXCEEDING +Y AXIS SETS EDGE FLAG

GT72: SCOPE
MOV DBUF, RD
MOV #116000, (0)+ ;LOAD POINT
MOV #0, (0)+ ;LOAD X
MOV #65455, (0)+ ;LOAD MAX Y
MOV #110000, (0)+ ;LOAD LONG VECTOR
MOV #0, (0)+ ;LOAD DELTA X
MOV #1, (0)+ ;LOAD DELTA Y
MOV #172000, (0)+ ;LOAD STOP
MOV DBUF, #0PC ;START DISPLAY
MOV #1, #0PC ;SINGLE STEP THE DISPLAY
JSR 7, #0PC ;EXECUTE A PROGRAM DELAY
MOV #1, #0PC ;SINGLE STEP THE DISPLAY
JSR 7, #0PC ;EXECUTE A PROGRAM DELAY

BIT #40, #0SR ;TEST BIT 5
EIO .+6
HALT ;EDGE FLAG SET IN ERROR
BR GT73

MOV #1, #0PC ;SINGLE STEP THE DISPLAY
JSR 7, #0PC ;EXECUTE A PROGRAM DELAY
MOV #1, #0PC ;SINGLE STEP THE DISPLAY
JSR 7, #0PC ;EXECUTE A PROGRAM DELAY
MOV #1, #0PC ;SINGLE STEP THE DISPLAY
JSR 7, #0PC ;EXECUTE A PROGRAM DELAY
MOV #1, #0PC ;SINGLE STEP THE DISPLAY
JSR 7, #0PC ;EXECUTE A PROGRAM DELAY

BIT #40, #0SR ;TEST BIT 5
BNE .+6
HALT ;EDGE FLAG FAILED TO SET
BR GT73

```

```

1706
1707
1708           ;EDGE FLAG TEST
1709           ;TEST THAT EXCEEDING -Y AXIS SETS EDGE FLAG
1710
1711 011566 104000
1712 011570 013700 001022
1713 011574 012720 116000
1714 011600 012720 000000
1715 011604 012720 000000
1716 011610 012720 110000
1717 011614 012720 000000
1718 011670 012720 020001
1719 011674 012720 172000
1720 011630 013777 001022 167212
1721 011636 012777 001001 167204
1722 011644 004737 011032
1723 011650 012777 001001 167172
1724 011656 004737 015532
1725
1726 011652 032777 000040 167162
1727 011670 001402
1728 011672 000000
1729 011674 000454
1730
1731 011676 012777 000001 167144
1732 011704 004737 015532
1733 011710 012777 000001 167132
1734 011716 004737 015532
1735 011722 012777 000001 167120
1736 011730 004737 015532
1737 011734 012777 000001 167106
1738 011742 004737 015532
1739
1740 011746 032777 000040 167076
1741 011754 001002
1742 011756 011000
1743 011760 001422
1744
1745 011762 013777 001022 167060
1746 011770 012777 000001 167052
1747 011776 004737 015532
1748 012002 012777 000001 167040
1749 012010 004737 015532
1750 012014 032777 000040 167030
1751 012022 001401
1752 012024 000000

```

```

GT73: SCOPE
      MOV DBUF,RO
      MOV #116000,(0)+ ;LOAD POINT
      MOV #0,(0)+ ;LOAD X
      MOV #0,(0)+ ;LOAD Y
      MOV #110000,(0)+ ;LOAD LONG VECTOR
      MOV #0,(0)+ ;LOAD DELTA X
      MOV #20001,(0)+ ;LOAD DELTA Y
      MOV #172000,(0)+ ;LOAD STOP
      MOV DBUF,20PC ;START DISPLAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      BIT #40,20SR ;TEST BIT 5
      BEQ .+6
      HALT ;EDGE FLAG SET IN ERROR
      BR GT74
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      BIT #40,20SR ;TEST BIT 5
      BNE .+6
      HALT ;EDGE FLAG FAILED TO SET
      BR GT74
      MOV DBUF,20PC ;START DISPLAY AGAIN
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      BIT #40,20SR ;TEST BIT 5
      BEQ .+4
      HALT ;EDGE FLAG FAILED TO CLEAR

```

```

1753 ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1754 ; CODE 00
1755
1756 012026 104000 GT74: SCOPE
1757 012030 012777 100000 166764 MOV #100000,20BUF ;LOAD "CHARACTER MODE"
1758 012036 012777 000000 166760 MOV #0,20BUF1 ;LOAD "NULL" CHARACTER
1759 012044 013777 001022 166776 MOV 20BUF,20PC ;START DISPLAY
1760 012052 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1761 012056 012777 000001 166764 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1762 012064 017700 166766 MOV 20YPOS,RO ;READ CHARACTER REG.
1763 012070 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
1764 012074 022700 000000 CMP #0,RO
1765 012100 001401 BEQ .+4
1766 012102 000000 HALT ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1767
1768 ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1769 ; CODE 77
1770
1771 012104 104000 GT75: SCOPE
1772 012106 012777 100000 166706 MOV #100000,20BUF ;LOAD "CHARACTER MODE"
1773 012114 012777 000077 166702 MOV #77,20BUF1 ;LOAD CHARACTER
1774 012122 013777 001022 166720 MOV 20BUF,20PC ;START DISPLAY
1775 012130 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1776 012134 012777 000001 166706 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1777 012142 017700 166710 MOV 20YPOS,RO ;READ CHARACTER REG.
1778 012146 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
1779 012152 022700 176000 CMP #176000,RO
1780 012156 001401 BEQ .+4
1781 012160 000000 HALT ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1782
1783 ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1784 ; CODE 25
1785
1786 012162 104000 GT76: SCOPE
1787 012164 012777 100000 166630 MOV #100000,20BUF ;LOAD "CHARACTER MODE"
1788 012172 012777 000025 166624 MOV #25,20BUF1 ;LOAD CHARACTER
1789 012180 013777 001022 166642 MOV 20BUF,20PC ;START DISPLAY
1790 012186 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1791 012212 012777 000001 166630 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1792 012220 017700 166632 MOV 20YPOS,RO ;READ CHARACTER REG.
1793 012224 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
1794 012230 022700 052000 CMP #52000,RO
1795 012234 001401 BEQ .+4
1796 012236 000000 HALT ;ERROR, CHARACTER REGISTER LOADED IN ERROR

```

```

1797
1798 ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1799 ; CODE 52
1800
1801 012240 104000 GT77: SCOPE
1802 012242 012777 100000 166552 MOV #100000,20BUF ;LOAD "CHARACTER MODE"
1803 012250 012777 000052 166546 MOV #52,20BUF1 ;LOAD CHARACTER
1804 012256 013777 001022 166564 MOV 20BUF,20PC ;START DISPLAY
1805 012274 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1806 012270 012777 000001 166552 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1807 012276 017700 166554 MOV 20YPOS,RO ;READ CHARACTER REG.
1808 012302 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
1809 012306 022700 124000 CMP #124000,RO
1810 012312 001401 BEQ .+4
1811 012314 000000 HALT ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1812
1813 ;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
1814 ;TEST THAT "NULL" DOES NOT CHANGE X OR Y AXIS
1815
1816 012316 104000 GT78: SCOPE
1817 012320 012777 116000 166474 MOV #116000,20BUF ;POINT MODE
1818 012326 012777 001000 166470 MOV #1000,20F1 ;
1819 012334 012777 001000 166464 MOV #1000,20F2 ;1000,1000
1820 012342 012777 100000 166460 MOV #100000,20BUF3 ;LOAD "CHARACTER MODE"
1821 012350 013777 166456 CLR 20BUF4 ;NULL CHARACTER
1822 012354 013777 001022 166466 MOV 20BUF,20PC ;LOAD THE DISPLAY P.C.
1823 012362 013777 000001 166460 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1824 012370 011737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1825 012374 012777 000001 166446 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1826 012402 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1827 012406 012777 000001 166434 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1828 012414 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1829 012420 012777 000001 166422 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1830 012426 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1831
1832 012432 017700 166420 MOV 20YPOS,RO ;READ CHARACTER REGISTER
1833 012436 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
1834 012442 022700 000000 CMP #0,RO
1835 012446 001402 BEQ .+6
1836 012450 000000 HALT ;CHARACTER REGISTER IN ERROR
1837 012452 000417 BR GT79
1838
1839 012454 017700 166374 MOV 20XPOS,RO ;READ X AXIS
1840 012460 022700 001000 CMP #1000,RO ;ARE THEY EQUAL ?
1841 012464 001402 BEQ .+6 ;YES
1842 012466 000000 HALT ;"NULL" CHARACTER CHANGED X AXIS
1843 012470 000410 BR GT79
1844
1845 012472 017700 166360 MOV 20YPOS,RO ;READ Y AXIS
1846 012476 042700 176000 BIC #176000,RO ;MASK TO BITS 0-9
1847 012502 022700 001000 CMP #1000,RO ;ARE THEY EQUAL ?
1848 012506 001401 BEQ .+4 ;YES
1849 012510 000000 HALT ;"NULL" CHARACTER CHANGED Y AXIS
1850

```



```

1851
1852
1853
1854
1855
1856 012512 104000
1857 012514 012777 116000 166300
1858 012516 012777 001000 166274
1859 012518 012777 001000 166270
1860 012536 012777 101000 166254
1861 012544 012777 001015 166230
1862 012552 013777 001012 166270
1863 012560 012777 001011 166202
1864 012566 004737 011032
1865 012572 012777 001011 166250
1866 012580 004737 011032
1867 012584 012777 001011 166236
1868 012612 004737 011032
1869 012616 012777 001011 166224
1870 012624 004737 015532
1871
1872 012630 017700 166222
1873 012634 042700 001777
1874 012640 022700 032000
1875 012644 001402
1876 012646 001000
1877 012650 004117
1878
1879 012652 017700 166176
1880 012656 022700 006000
1881 012662 001402
1882 012664 000000
1883 012666 000410
1884
1885 012670 017700 166162
1886 012674 042700 176000
1887 012700 022700 001000
1888 012704 001401
1889 012706 000000
1890

```

```

;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
;TEST THAT "CR" DOES CHANGE X AND DOES NOT CHANGE Y AXIS

```

```

GT79: SCOPE
      MOV      #116000, R0BUF ;POINT MODE
      MOV      #1070, R1      ;1000,1000
      MOV      #1070, R2      ;LOAD "CHARACTER MODE"
      MOV      #1000, R3      ;LOAD "CR"
      MOV      #15, R4        ;LOAD THE DISPLAY P.C.
      MOV      06, R5         ;SINGLE STEP THE DISPLAY
      MOV      #1, R6         ;EXECUTE A PROGRAM DELAY
      JSR      7, DELAY
      MOV      #1, R7         ;SINGLE STEP THE DISPLAY
      JSR      7, DELAY
      MOV      #1, R8         ;EXECUTE A PROGRAM DELAY
      JSR      7, DELAY
      MOV      #1, R9         ;SINGLE STEP THE DISPLAY
      JSR      7, DELAY
      JSR      7, DELAY
      MOV      @YPOS, R0      ;READ Y AXIS
      BIC      #1777, R0     ;MASK TO BITS 10-15
      CMP      #32000, R0
      BEQ      .+6
      HALT
      BR      GT80
      ;CHARACTER REGISTER FAILED TO LOAD CORRECTLY

      MOV      @XPOS, R0     ;READ X AXIS
      CMP      #0, R0
      BEQ      .+6
      HALT
      BR      GT80
      ;ARE THEY EQUAL ?
      ;YES
      ;"CR" CHARACTER FAILED TO CHANGED X AXIS CORRECTLY

      MOV      @YPOS, R0     ;READ Y AXIS
      BIC      #176000, R0   ;MASK TO BITS 0-9
      CMP      #1000, R0
      BEQ      .+4
      HALT
      ;ARE THEY EQUAL ?
      ;YES
      ;"CR" CHARACTER CHANGED Y AXIS

```

1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930

;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
;TEST THAT "LF" DOES NOT CHANGE X BUT DOES CHANGE Y AXIS

```

GT80:  SCOPE
        MOV      @116000, @0BUF ;POINT MODE
        MOV      @1000, @F1 ;:1000,1000
        MOV      @1000, @F2 ;:LOW "CHARACTER MODE"
        MOV      @1000, @0BUF3
        MOV      @12, @F4
        MOV      @0BUF, @0PC ;LOAD THE DISPLAY P.C.
        MOV      @1, @0PC ;SINGLE STEP THE DISPLAY
        JSR      7, @LAY ;EXECUTE A PROGRAM DELAY
        MOV      @1, @0PC ;SINGLE STEP THE DISPLAY
        JSR      7, @LAY ;EXECUTE A PROGRAM DELAY
        MOV      @1, @0PC ;SINGLE STEP THE DISPLAY
        JSR      7, @LAY ;EXECUTE A PROGRAM DELAY
        MOV      @1, @0PC ;SINGLE STEP THE DISPLAY
        JSR      7, @LAY ;EXECUTE A PROGRAM DELAY
        MOV      @2YPOS, @R0 ;READ CHARACTER REG.
        BIC      @1777, @R0 ;MASK TO BITS 10-15
        CMP      @24000, @R0
        BEQ     .+6 ;CHARACTER REGISTER IN ERROR
        BR      GT80A
        MOV      @XPOS, @R0 ;READ X AXIS
        CMP      @1000, @R0 ;ARE THEY EQUAL ?
        BEQ     .+6 ;YES
        HALT    ;"LF" CHARACTER CHANGED X AXIS
        BR      GT80A
        MOV      @2YPOS, @R0 ;READ Y AXIS
        BIC      @176000, @R0 ;MASK TO BITS 10-15
        CMP      @LFSIZE, @R0 ;ARE THEY EQUAL ?
        BEQ     .+4 ;YES
        HALT    ;"LF" CHARACTER FAILED TO CHANGED Y AXIS CORRECTLY

```

```

1931
1932
1933          ;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
1934          ;TEST THAT "A" DOES CHANGE X BUT NOT Y AXIS
1935
1936 013106 104000          GTBOA: SCOPE
1937 013110 012777 116000 165704      MOV      #116000,20BUF ;POINT MODE
1938 013116 012777 000000 165700      MOV      #0,20BUF1
1939 013124 012777 001000 165674      MOV      #1000,20BUF2 ;0,1000
1940 013132 012777 100000 165670      MOV      #100000,20BUF3 ;LOAD "CHARACTER MODE"
1941 013140 012777 000101 165664      MOV      #101,20BUF4 ;LOAD AN "A"
1942 013146 013777 001022 165674      MOV      20BUF,20PC ;LOAD THE DISPLAY P.C.
1943 013154 012777 000001 165666      MOV      #1,20PC ;SINGLE STEP THE DISPLAY
1944 013162 004737 010032 165654      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1945 013166 012777 000001 165654      MOV      #1,20PC ;SINGLE STEP THE DISPLAY
1946 013174 004737 010032 165642      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1947 013180 012777 000001 165642      MOV      #1,20PC ;SINGLE STEP THE DISPLAY
1948 013186 004737 010032 165630      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1949 013192 012777 000001 165630      MOV      #1,20PC ;SINGLE STEP THE DISPLAY
1950 013220 004737 015532 165630      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
1951
1952 013224 017700 165626      MOV      20YPOS,RO ;READ CHARACTER REG
1953 013230 042700 001777      BIC      #1777,RO ;MASK TO BITS 10-15
1954 013234 022700 002000      CMP      #2000,RO
1955 013240 001402      BEQ      .+6
1956 013242 000000      HALT
1957 013244 000417      BR      GTB1 ;CHARACTER REGISTER IN ERROR
1958
1959 013246 017700 165602      MOV      20XPOS,RO ;READ X AXIS
1960 013252 023700 001006      CMP      #2370,RO ;ARE THEY EQUAL ?
1961 013256 001402      BEQ      .+6 ;YES
1962 013260 000000      HALT ;"A" CHARACTER FAILED TO CHANGED X AXIS CORRECTLY
1963 013262 000410      BR      GTB1
1964
1965 013264 017700 165566      MOV      20YPOS,RO ;READ Y AXIS
1966 013270 042700 176000      BIC      #176000,RO ;MASK TO BITS 0-9
1967 013274 022700 001000      CMP      #1000,RO ;ARE THEY EQUAL ?
1968 013300 001401      BEQ      .+4 ;YES
1969 013302 000000      HALT ;"A" CHARACTER CHANGED Y AXIS
1970

```

```

1971
1972
1973 ;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
1974 ;TEST THAT "BS" DOES CHANGE X BUT NOT Y AXIS
1975
1976 013304 104000 GTB1: SCOPE
1977 013306 012777 116000 165506 MOV #116000,20BUF ;POINT MODE
1978 013314 012777 001000 165502 MOV #1000,20BUF1
1979 013322 012777 001000 165476 MOV #1000,20BUF2 ;1000,1000
1980 013330 012777 100000 165472 MOV #100000,20BUF3 ;LOAD "CHARACTER MODE"
1981 013336 012777 000010 165466 MOV #10,20BUF4
1982 013344 013777 001022 165476 MOV 20BUF,20PC ;LOAD THE DISPLAY P.C.
1983 013352 012777 000001 165470 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1984 012360 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1985 013364 012777 000001 165456 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1986 013372 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1987 013376 012777 000001 165444 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1988 013404 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1989 013410 012777 000001 165432 MOV #1,20PC ;SINGLE STEP THE DISPLAY
1990 013416 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1991
1992 013422 017700 165430 MOV 20YPOS,RO ;READ CHARACTER REG
1993 013426 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
1994 013432 022700 020000 CMP #20000,RO
1995 013436 001402 BEQ .+6
1996 013440 000000 HALT ;CHARACTER REGISTER IN ERROR
1997 013442 000426 BR GTB2
1998
1999 013444 017700 165404 MOV 20XPOS,RO ;READ X AXIS
2000 013450 023700 001046 CMP CHSIZE,RO ;ARE THEY EQUAL ?
2001 013454 001402 BEQ .+6 ;YES
2002 013456 000000 HALT ;"BS" CHARACTER FAILED TO CHANGED X AXIS CORRECTLY
2003 013460 000417 BR GTB2
2004
2005 013462 017700 165370 MOV 20YPOS,RO ;READ Y AXIS
2006 013466 042700 176000 BIC #176000,RO ;MASK TO BITS 0-9
2007 013472 022700 001000 CMP #1000,RO ;ARE THEY EQUAL ?
2008 013476 001402 BEQ .+6 ;YES
2009 013500 000000 HALT ;"BS" CHARACTER CHANGED Y AXIS
2010 013502 000406 BR GTB2
2011
2012 ;TEST THAT "SHIFT-OUT" STATUS BIT IS NOT SET
2013
2014 013504 017700 165342 MOV 20DSR,RO ;READ STATUS
2015 013510 032700 000100 BIT #100,RO
2016 013514 001401 BEQ .+4
2017 013516 000000 HALT ;SHIFT OUT STATUS BIT IS SET
2018

```

```

2019
2020 ;TEST THAT "SHIFT-OUT" GENERATES A STATUS BIT
2021 ;SHIFT-OUT <LOW BYTE>, FOLLOWED BY CODE 77 <HIGH BYTE>
2022
2023 013520 104000 GT82: SCOPE
2024 013522 012777 116000 165272 MOV #116000,20BUF ;POINT MODE
2025 013530 012777 001000 165266 MOV #1000,20BF ;
2026 013536 012777 001000 165262 MOV #1000,20BF2 ;:1000,1000
2027 013544 012777 100000 165256 MOV #100000,20BUF3 ;LOAD "CHARACTER MODE"
2028 013552 012777 037416 165252 MOV #37416,20BUF4 ;"SHIFT-OUT" IN LOW BYTE #77 IN HIGH BYTE
2029 013560 013777 001022 165262 MOV 08UF,20PC ;START DISPALY
2030 013566 012777 000001 165254 MOV #1,20PC ;SINGLE STEP THE DISPLAY
2031 013574 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
2032 013600 012777 000001 165242 MOV #1,20PC ;SINGLE STEP THE DISPLAY
2033 013606 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
2034 013612 012777 000001 165230 MOV #1,20PC ;SINGLE STEP THE DISPLAY
2035 013620 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
2036 013624 012777 000001 165216 MOV #1,20PC ;SINGLE STEP THE DISPLAY
2037 013632 004737 015532 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
2038
2039 013636 017700 165214 MOV #2YPOS,RO ;READ CHARACTER REG
2040 013642 042700 001777 BIC #1777,RO ;MASK TO BITS 10-15
2041 013646 022700 176000 CMP #176000,RO
2042 013652 001402 BEQ .+6
2043 013654 000000 HALT
2044 013656 000426 BR GT83 ;CHARACTER REGISTER IN ERROR
; AFTER A SHIFT-OUT COMMAND
2045
2046 013660 017700 165166 MOV #2OSR,RO ;READ STATUS REGISTER
2047 013664 032700 000100 BIT #100,RO
2048 013670 001002 BNE .+6
2049 013672 000000 HALT
2050 013674 000417 BR GT83 ;SHIFT OUT STATUS BIT FAILED TO SET
2051
2052 013676 017700 165152 MOV #2XPOS,RO ;READ X POS
2053 013702 022700 001000 CMP #1000,RO
2054 013706 001402 BEQ .+6
2055 013710 000000 HALT
2056 013712 000410 BR GT83 ;SHIFT-OUT CHARACTER CHANGED X AXIS
2057
2058 013714 017700 165136 MOV #2YPOS,RO ;READ Y POS
2059 013720 042700 176000 BIC #176000,RO ;MASK
2060 013724 022700 001000 CMP #1000,RO
2061 013730 001401 BEQ .+4
2062 013732 000000 HALT ;SHIFT-OUT CHARACTER CHANGED Y AXIS

```

2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107

```

013734 104000
013736 000005
013740 005003
013742 012777 100000 165052
013750 012737 000016 001036
013756 110337 001037
013762 013777 001036 165034
013770 013777 001022 165052
013776 012777 001001 165044
014004 004737 001032

014010 032777 000100 165034
014016 001402
014020 000000
014022 000407

014024 005203
014026 022703 000017
014032 001774
014034 022703 000040
014040 001340

014042 104000
014044 000005
014046 012777 100000 164746
014054 012777 000016 164742
014062 112737 000040 015661
014070 013777 001022 164752
014076 004737 015532
014102 012777 000001 164740
014110 004737 015532

014114 032777 000100 164730
014122 001002
014124 000000
014126 000441
    
```

```

;TEST THAT "SHIFT-OUT" DOES NOT GENERATE A STATUS BIT
;("SHIFT-OUT" FOLLOWED BY CODE 0 THRU 37 EXCEPT #17)

GT83:  SCOPE
      RESET
      CLR      R3
GT83A:  MOV      #100000, D0BUF ;SET 'CHAR' MODE
      MOV      #16, DSAVE ;LOAD "SHIFT-OUT" INTO THE LOW BYTE
      MOVVB    R3, DSAVE+1 ;LOAD HIGH BYTE WITH A CHARACTER
      MOV      DSAVE, D0BUF1 ;LOAD DISPLAY BUFFER
      MOV      D0BUF, D0PC ;START THE DISPLAY
      MOV      #1, D0PC ;SINGLE STEP THE DISPLAY
      JSR      7, DLAY ;EXECUTE A PROGRAM DELAY

      BIT      #100, D0SR ;TEST FOR SHIFT BIT
      BEQ     .+6
      HALT    ;SHIFT STATUS BIT SET IN ERROR
      BR      GT84 ; CHARACTER IS IN R3

GT83B:  INC      R3
      CMP     #17, R3 ;TEST FOR "SHIFT-IN"
      BEQ     GT83B
      CMP     #40, R3 ;TEST FOR #40
      BNE    GT83A ;IS IT #40
      ;YES, NEXT TEST

;TEST THAT "SHIFT-OUT" FOLLOWED BY CODE 40 GENERATE A
;SHIFT STATUS BIT

GT84:  SCOPE
      RESET
      MOV      #100000, D0BUF ;LOAD SET CHAR MODE
      MOV      #16, D0BUF1 ;LOAD "SHIFT-OUT" INTO THE LOW BYTE
GT84A:  MOVVB    #40, BUFFER+3 ;LOAD HIGH BYTE
      MOV      D0BUF, D0PC ;START THE DISPLAY
      JSR      PC, DLAY ;DELAY
      MOV      #1, D0PC ;SINGLE STEP THE DISPLAY
      JSR      7, DLAY ;EXECUTE A PROGRAM DELAY

      BIT      #100, D0SR ;TEST 'SHIFT' STATUS BIT
      BNE     .+6
      HALT    ;"SHIFT-OUT" STATUS BIT FAILED TO SET
      BR      GT85 ;ON CHARACTER IN R3
    
```



```

2161 ;STOP INTERRUPT TEST
2162 ;TEST FOR NO INTERRUPT
2163
2164 014376 104000 GT86: SCOPE
2165 014370 000005 RESET
2166 014372 012777 014442 164500 MOV @GT86A, @DOONE ;LOAD RETURN FROM DONE INTERRUPT
2167 014360 012777 014442 164502 MOV @GT86A, @TIMEVT ;LOAD RETURN FROM TIME-OUT INTERRUPT
2168 014366 012777 014442 164470 MOV @GT86A, @LPVCT ;LOAD RETURN FROM LIGHT-PEN INTERRUPT
2169 014374 012777 164000 164420 MOV @164000, @DBUF ;LOAD "DISPLAY NOP"
2170 014402 012777 173700 164414 MOV @173000, @DBUF1 ;LOAD "STATUS A"-"STOP"-"STOP INT. ENABLE"
2171 014410 005077 164404 CLR @PSW ;LOWER MACHINE PRIORITY
2172 014414 013777 001022 164426 MOV @DBUF, @DPC ;LOAD DISPLAY P.C.
2173 014422 012777 000001 164420 MOV @1, @DPC ;SINGLE STEP THE DISPLAY
2174 014430 001240 NOP
2175 014432 001240 NOP
2176 014434 001240 NOP
2177 014436 001240 NOP
2178 014440 000401 BR .+4
2179
2180 014442 000000 GT86A: HALT ;GT-40 INTERRUPTED IN ERROR
2181
2182 ;STOP INTERRUPT TEST
2183 ;TEST FOR INTERRUPT
2184
2185 014444 104000 GT87: SCOPE
2186 014446 000005 RESET
2187 014450 012777 014540 164402 MOV @GT87A, @DOONE ;LOAD RETURN ADDRESS FROM INTERRUPT
2188 014456 012777 014552 164404 MOV @GT87B, @TIMEVT
2189 014464 012777 014560 164372 MOV @GT87C, @LPVCT
2190 014472 012777 164000 164322 MOV @164000, @DBUF ;LOAD "DISPLAY NOP"
2191 014500 012777 173400 164316 MOV @173400, @DBUF1 ;LOAD "STATUS A"-"STOP"-"STOP INT. ENABLE-INT"
2192 014506 005077 164306 CLR @PSW
2193 014512 013777 001022 164330 MOV @DBUF, @DPC
2194 014520 012777 000001 164322 MOV @1, @DPC ;SINGLE STEP THE DISPLAY
2195 014526 001240 NOP
2196 014530 001240 NOP
2197 014532 001240 NOP
2198 014534 001240 NOP
2199 014536 000000 HALT ;GT-40 FAILED TO GENERATE AN INTERRUPT
2200 014540 013777 001062 164312 GT87A: MOV @DOONE1, @DOONE
2201 014546 022626 CMP (SP)+, (SP)+
2202 014550 000405 BR GT88
2203
2204 014552 022626 GT87B: CMP (SP)+, (SP)+
2205 014554 000000 HALT ;GT-40 STOP (DONE) INTERRUPTED TO
2206 ; THE GT-40 TIME OUT VECTOR
2207 014556 000402 BR GT88
2208
2209 014560 022626 GT87C: CMP (SP)+, (SP)+
2210 014562 000000 HALT ;GT-40 STOP (DONE) INTERRUPTED
2211 ; TO THE GT-40 LIGHT-PEN VECTOR

```



```

2212
2213           ;SHIFT OUT INTERRUPT TEST
2214           ;TEST FOR INTERRUPT
2215
2216 014564 104000          GT88:  SCOPE
2217 014566 000005          RESET
2218 014570 012777 014674 164262      MOV  @GT88B,@D0ONE      ;LOAD DONE VECTOR
2219 014576 012777 014702 164260      MOV  @GT88C,@LPVCT     ;LOAD LIGHT-PEN VECTOR
2220 014604 012777 014660 164256      MOV  @GT88A,@TIMEVT   ;LOAD RETURN ADDRESS
2221 014612 012777 100000 164202      MOV  @100000,@0BUF    ;LOAD "CHARACTER MODE"
2222 014620 012777 020016 164176      MOV  @20016,@0BUF1   ;LOAD "SHIFT-OUT"
2223 014626 005077 164166          CLR  @PSW
2224 014632 013777 001022 164210      MOV  @0BUF,@0PC      ;START DISPLAY
2225 014640 012777 000001 164202      MOV  @1,@0PC        ;SINGLE STEP THE DISPLAY
2226 014646 01 240          NOP
2227 014650 01 240          NOP
2228 014652 01 240          NOP
2229 014654 01 240          NOP
2230 014656 000000          HALT
2231 014660 000240          GT88A: NOP
2232 014662 013777 001072 164200      MOV  @TIMEVT1,@TIMEVT
2233 014670 022626          CMP  (SP)+,(SP)+
2234 014672 000405          BR   GT89
2235
2236 014674 022626          GT88B: CMP  (SP)+,(SP)+
2237 014676 000000          HALT
2238 014700 000402          BR   GT89
2239
2240 014702 022626          GT88C: CMP  (SP)+,(SP)+
2241 014704 000000          HALT
2242
           ;GT-40 FAILED TO INTERRUPT ON SHIFT-OUT
           ;GT-40 SHIFT-OUT INTERRUPTED
           ; TO STOP VECTOR
           ;GT-40 SHIFT-OUT INTERRUPTED TO
           ; THE LIGHT-PEN VECTOR

```

2263
2264
2265
2266
2267
2268
2269
2270
2271
2272

014706 104000
014710 000005
014712 013777 001062 164140
014720 013777 001066 164136
014726 012777 014754 164134
014734 005077 164060
014740 012777 177776 164102
014746 004737 015532
014752 000000

014754 000240
014756 013777 001072 164104
014764 022626

014766 104000
014770 000005
014772 012777 015026 164064
015000 012777 100140 164014
015006 005077 164006
015012 013777 001022 164030
015020 004737 015532
015024 000401
015026 000000
015030 013777 001066 164026

;TIME-OUT INTERRUPT TEST

GT89: SCOPE
RESET
MOV DOONE1, DOONE
MOV LPVCT1, 2LPVCT
MOV @GT89A, @TIMEVT ;LOAD RETURN ADDRESS
CLR @PSW
MOV @177776, @DPC ;LOAD DISPLAY P.C.
JSR 7, DLAY ;EXECUTE A PROGRAM DELAY
HALT ;GT-40 FAILED TO INTERRUPT ON TIME-OUT

GT89A: NOP
MOV TIMEVT1, @TIMEVT
CMP (SP)+, (SP)+

;LIGHT PEN INTERRUPT TEST

GT90: SCOPE
RESET
MOV @GT90A, 2LPVCT ;LOAD RETURN ADDRESS
MOV @100140, @DBUF ;LOAD DISPLAY BUFFER
CLR @PSW
MOV @DBUF, @DPC ;LOAD DISPLAY P.C.
JSR 7, DLAY ;EXECUTE A PROGRAM DELAY
BR .+4
GT90A: HALT
MOV LPVCT1, 2LPVCT ;GT-40 INTERRUPTED ON FALSE LIGHT PEN FLAG

```

2273                                     ;PRE BR LEVEL SETUP
2274
2275 015036 042737 177437 001004      BIC      #177437,DSPBR      ;MASK TO BITS
2276 015044 001001                    BNE     .+4
2277 015046 000000                    HALT     ;BR LEVEL WAS 0
2278 015050 022737 000340 001004      CMP     #340,DSPBR
2279 015056 001001                    BNE     .+4
2280 015058 000000                    HALT     ;BR LEVEL WAS 7
2281
2282 015062 013737 001004 015106      MOV     DSPBR,BRLEV1
2283 015070 162737 000040 015106      SUB     #40,BRLEV1
2284 015076 013737 001004 015110      MOV     DSPBR,BRLEV2
2285 015104 000402                    BR      GT91
2286
2287                                     BRLEV1: 140
2288                                     BRLEV2: 200
2289
2290                                     ;BR LEVEL TEST (BR-1)
2291                                     ;TEST FOR INTERRUPT
2292
2293                                     GT91:  SCOPE
2294                                     RESET
2295 015112 104700                    MOV     #GT91A,DOONE      ;LOAD RETURN ADDRESS
2296 015114 000000                    MOV     #173400,DOBUF    ;LOAD "STATUS A"-NO INTERRUPT ENABLE
2297 015116 012777 015160 163734      MOV     BRLEV1,PSW
2298 015124 012777 173400 163670      MOV     DOBUF,DOPC
2299 015132 013777 015106 163500      NOP
2300 015140 013777 001022 163702      NOP
2301 015146 000240                    NOP
2302 015150 000240                    NOP
2303 015152 000240                    NOP
2304 015154 000240                    HALT
2305 015156 000000                    ;NO STOP INTERRUPT ON BR LEVEL INDICATED -1
2306                                     ;CHECK TO SEE IF PROPER BR LEVEL
2307
2308                                     GT91A:  CMP      (SP)+,(SP)+
2309
2310                                     ;BR LEVEL TEST (BR)
2311                                     ;TEST THAT THE GT-40 DOES NOT INTERRUPT AT THE LEVEL INDICATED
2312
2313                                     GT92:  SCOPE
2314                                     RESET
2315 015162 104700                    MOV     #GT92A,DOONE      ;LOAD RETURN ADDRESS
2316 015164 000000                    MOV     #173400,DOBUF    ;LOAD "STATUS A"- STOP- STOP INT ENABLE
2317 015166 012777 015230 163664      MOV     BRLEV2,PSW
2318 015174 012777 173400 163620      MOV     DOBUF,DOPC
2319 015202 013777 015110 163610      NOP
2320 015210 013777 001022 163632      NOP
2321 015216 000240                    NOP
2322 015220 000240                    NOP
2323 015222 000240                    NOP
2324 015224 000240                    BR      .+4
2325 015226 000401                    ;NEXT TEST
2326
2327                                     GT92A:  HALT
2328                                     ;GT-40 INTERRUPTED ON THE WRONG BR LEVEL
2329
2330 015230 000000
2331
2332 015232 013777 001062 163620      MOV     DOONE1,DOONE     ;LOAD INVERRUPT VECTOR
2333 015240 000005                    RESET
2334
2335
2336

```

2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351
2352
2353
2354
2355
2356
2357
2358
2359
2360
2361
2362
2363
2364
2365
2366
2367
2368
2369
2370
2371
2372
2373
2374
2375
2376
2377
2378
2379

```

:RESET TEST
:DOES RESET CLEAR ALL DISPLAY PC AND STATUS BITS

GT93:  SCOPE
      MOV #117637,20BUF ;POINT INTENSITY=7,BLINK=1,LINETYPE=3
      CLR 20BUF1 ;CLEAR X
      CLR 20BUF2 ;CLEAR Y
      MOV #172077,20BUF3 ;ITALIC=1,SYNC=1,COLOR=1
      MOV 0BUF,20PC ;LOAD DISPLAY P.C.
      JSR PC,DLAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR PC,DLAY ;SINGLE STEP THE DISPLAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR PC,DLAY ;SINGLE STEP THE DISPLAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      JSR PC,DLAY ;SINGLE STEP THE DISPLAY
      MOV #1,20PC ;SINGLE STEP THE DISPLAY
      RESET ;GENERATE "INIT"
      TST 20PC
      BEQ .+6
      HALT ;RESET FAILED TO CLEAR DISPLAY PC
      BR END

      MOV 20SR,R0 ;READ DISPLAY STATUS
      BIC #74000,R0 ;MASK TO BIT 11-14
      BEQ .+4 ;IS THE STATUS CLEARED ?
      HALT ;"INIT" FAILED TO RESET DISPLAY STATUS REGISTER

END:  SCOPE
      INC ICNT ;UPDATE COUNTER
      CMP #4,ICNT ;FINISHED ?
      BEQ HERE ;BR IF YES
      JMP GTO ;NO RESTART

HERE:  RESET
      MOV 2042,R0 ;BRANCH IF OFF LINE
      BEQ HERE1
      RESET

LOGICAL: JSR PC,(0)

      NOP
      NOP
      NOP
HERE1:  JSR PC,BELL
      JMP STARTB

BELL:  MOV #2,20SR ;RING THE BELL
      MOV #207,20TPDBR ;RINT THE BELL

1$:  TSTB TPCSR
      BPL 1$

2$:  MOV #207,TPDBR
      TSTB TPCSR
      BPL 2$
      RTS PC

```

```

;SCOPE ROUTINE
2380
2381
2382 015512 032737 040000 177570 SCOPEA: BIT #40000,2#DISPLAY ;TEST "SCOPE" SWITCH
2383 015520 001001 BNE SCOPEB
2384 015521 011501 MOV (SP),R1
2385 015522 012706 000500 SCOPEB: MOV #STKPTR,SP
2386 015530 000111 JMP (1)
2387
2388 015532 012700 000200 DLAY: MOV #200,R0
2389 015536 005300 DLAYA: DEC R0
2390 015538 001376 E IE DLAYA
2391 015542 000207 RTS 7
2392
2393 015544 012700 001000 DLAY1: MOV #1000,R0
2394 015545 005300 DLAY1A: DEC R0
2395 015546 001376 E IE DLAY1A
2396 015547 000207 RTS 7
2397
2398 015548 010046 LOWPWR: MOV R0, -(SP)
2399 015549 010146 MOV R1, -(SP)
2400 015550 010246 MOV R2, -(SP)
2401 015551 010346 MOV R3, -(SP)
2402 015552 010446 MOV R4, -(SP)
2403 015553 010546 MOV R5, -(SP)
2404 015554 010637 015654 MOV SP, LOWSV
2405 015555 012737 015606 000024 MOV #HIGPWR,2#24
2406 015556 000000 HALT
2407 015557 013706 015654 HIGPWR: MOV LOWSV,SP
2408 015558 012605 MOV (SP)+,R5
2409 015559 012604 MOV (SP)+,R4
2410 015560 012603 MOV (SP)+,R3
2411 015561 012602 MOV (SP)+,R2
2412 015562 012601 MOV (SP)+,R1
2413 015563 012600 MOV (SP)+,R0
2414 015564 012737 015556 000024 MOV #LOWPWR,2#24
2415 015565 012706 000500 MOV #STKPTR,SP
2416 015566 000240 NOP
2417 015567 000240 NOP
2418 015568 000000 HALT
2419 015569 000240 NOP
2420 015570 000240 NOP
2421 015571 000111 JMP (R1)
2422
2423 015654 000000 LOWSV: 0
2424
2425 015656 000000 BUFFER: 0
2426
2427 000001 .END

```


GT32	003460	655#			
GT33	003516	664#			
GT34	003554	673#			
GT35	003612	682#			
GT36	003670	699#			
GT37	004046	710	716	722	734#
GT37A	004112	745#	755		
GT4	001770	377#			
GT40	004154	750	753	760#	
GT41	004222	771#			
GT42	004270	782#			
GT43	004336	793#			
GT44	004404	806#			
GT45	004464	822#			
GT46	004544	838#			
GT47	004624	855#			
GT48	004704	872#			
GT49	005036	885	900#		
GT5	002030	388#			
GT50	005140	911	923#		
GT51	005256	935	949#		
GT52	005374	961	974#		
GT53	005512	986	1000#		
GT54	005630	1012	1026#		
GT55	006022	1053	1064#		
GT56	006214	1091	1102#		
GT56A	006230	1107#	1140		
GT57	006402	1130	1136	1145#	
GT57A	006422	1151#	1185		
GT58	006576	1174	1180	1190#	
GT59	006734	1211	1223#		
GT6	002066	400#			
GT60	007072	1244	1256#		
GT60A	007112	1262#	1293		
GT61	007254	1282	1288	1299#	
GT61A	007274	1305#	1336		
GT62	007436	1325	1331	1342#	
GT63	007574	1363	1375#		
GT64	007732	1396	1408#		
GT64A	007752	1414#	1445		
GT65	010114	1434	1440	1451#	
GT65A	010134	1457#	1488		
GT66	010276	1477	1483	1496#	
GT66A	010320	1502#	1529		
GT67	010464	1525	1535#		
GT67A	010506	1541#	1570		
GT67B	010656	1573#			
GT7	002124	409#			
GT70	010672	1565	1578#		
GT71	011132	1596	1610	1625#	
GT72	011372	1643	1672#		
GT73	011566	1657	1690	1704	1711#
GT74	012026	1729	1743	1756#	
GT75	012104	1771#			
GT76	012162	1786#			
GT77	012240	1801#			

GT78	012316	1816#																		
GT79	012512	1837	1843	1856#																
GT8	002162	418#																		
GT80	012710	1877	1883	1896#																
GT80A	013106	1917	1923	1936#																
GT81	013704	1957	1963	1976#																
GT82	013730	1997	2003	2010	2023#															
GT83	013734	2044	2050	2056	2067#															
GT83A	013742	2070#	2087																	
GT83B	014024	2083#	2085																	
GT84	014042	2091	2093#																	
GT84A	014052	2097#																		
GT85	014232	2106	2113	2124	2128	2130	2136#													
GT86	014346	2151	2164#																	
GT87	014442	2166	2167	2168	2180#															
GT87	014444	2185#																		
GT87A	014540	2187	2200#																	
GT87B	014552	2188	2204#																	
GT87C	014560	2189	2209#																	
GT89	014564	2202	2207	2216#																
GT89A	014660	2220	2231#																	
GT89B	014674	2218	2236#																	
GT89C	014702	2219	2240#																	
GT89	014706	2234	2238	2247#																
GT89A	014754	2251	2257#																	
GT9	002220	428#																		
GT90	014766	2263#																		
GT90A	015026	2265	2271#																	
GT91	015112	2285	2293#																	
GT91A	015160	2295	2305#																	
GT92	015162	2310#																		
GT92A	015230	2312	2322#																	
GT93	015242	2332#																		
HERE	015420	2360	2362#																	
HERE1	015442	2364	2370#																	
HIGPWR	015606	2405	2407#																	
ICNT	001016	195#	279#	286	322*	329*	336	2358*	2359											
LFSIZE	001044	206#	241#	242*	243*	1927														
LOGICA	015432	180	2366#																	
LOWPWR	015556	174	2398#	2414																
LOMSV	015654	2404#	2407	2423#																
LPVCT	001064	221#	250#	2168#	2189*	2219*	2250*	2265*	2272*											
LPVCT1	001066	222#	250	251#	2250	2272														
PC	=%000007	168#	246#	254#	274#	278*	324*	328*	2099*	2117*	2119*	2338*	2340*	2342*						
		2344#	2366#	2370#	2379#															
PCTST0	001370	280	285#	323	325															
PCTST1	001414	293#																		
PCTST2	001440	301#																		
PCTST3	001464	309#																		
PCTST4	001510	317#																		
PSW	001020	196#	276*	326*	2171*	2192*	2223*	2252*	2267*	2297*	2314*									
RO	=%000000	168#	229*	233	235*	239	288*	295*	296	303*	304	311*	312	339*						
		340#	341	349*	350*	351	359*	360*	361	369*	370*	371	381*	382*						
		383	391*	392*	393	403*	404*	405	412*	413*	414	421*	422*	423						
		431*	432*	433	441*	442*	443	451*	452*	453	461*	462*	463	471*						
		472*	473	481*	482	489*	490	497*	498*	499	506*	507*	508	516*						

N05

GT-40/GT-44 INSTRUCTION TEST I MAINDEC-11-DOGTA-C
 DOGTAC.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

MACY11 27(732) 08-SEP-76 08:56 PAGE 63

		517*	518	525*	526*	527	534*	535*	536	544*	545*	546	555*	557*
		558	566*	567*	568	577*	578*	579	587*	588	596*	597	605*	606
		615*	616*	617	626*	627*	628	636*	637*	638	649*	650*	651	658*
		659*	660	667*	668*	669	676*	677*	678	688*	689*	690	706*	707
		712*	713	718*	719	724*	725	746*	747	765*	766	776*	777	787*
		788	798*	799	813*	814	829*	830	845*	846	852*	863	881*	882
		890*	891	903*	915*	931*	932	939*	940	957*	958	965*	966	982*
		983	990*	991	1008*	1009	105*	1017	1027*	1049*	1050	1055*	1056	1065*
		1087*	1088	1093*	1094	1107*	115*	1127	1132*	1133	1151*	1170*	1171	1176*
		1177	1191*	1207*	1208	1213*	1214	1224*	1240*	1241	1246*	1247	1262*	1278*
		1779	1204*	125	1305*	1321*	1322	1327*	1328	1343*	1359*	1360	1365*	1366
		176*	1392*	1393	1398*	1399	1414*	1430*	1431	1436*	1437	1457*	1473*	1474
		1479*	1480	1502*	1521*	1522	1541*	1560*	1561*	1562	1579*	1626*	1673*	1712*
		1762*	1763*	1764	1777*	1778*	1779	1792*	1793*	1794	1807*	1808*	1809	1832*
		1833*	1834	1839*	1840	1845*	1846*	1847	1872*	1873*	1874	1879*	1879	185*
		1876*	1837	1912*	1913*	1914	1919*	1920	1925*	1926*	1927	1972*	1953*	1954
		1959*	1960	1965*	1966*	1967	1992*	1993*	1994	1999*	2000	2005*	2006*	2007
		2014*	2015	2039*	2040*	2041	2046*	2047	2052*	2053	2058*	2059*	2060	2153*
		2154*	2155	2352*	2353*	2363*	2388*	2389*	2393*	2394*	2398	2413*		
R1	=%000001	168#	230*	231	232*	236*	237	238*	259*	260*	261	262	267*	268
R2	=%000002	270*	272*	273	274*	330*	2384*	2399	2412*	2421				
		168#	735*	737	743*	744	752	1258*	1279	1285	1291*	1301*	1322	1328
R3	=%000003	1324*	1410*	1431	1437	1443*	1453*	1474	1490	1485*	2400	2411*		
		168#	1103*	1139*	1146*	1184*	1257*	1292*	1300*	1335*	1409*	1444*	1452*	1487*
R4	=%000004	1497*	1528*	1536*	1569*	2069*	2072	2083*	2084	2086	2401	2410*		
		168#	1104*	1112	1113	1127	1133	1138*	1147*	1171	1177	1183*	1259*	1267
		1290*	1302*	1310	1333*	1411*	1419	1442*	1454*	1462	1485*	1498*	1522	1527*
		1537*	1562	1568*	2402	2409*								
R5	=%000005	168#	1148*	1156	1157	1162*	2403	2408*						
SCOPE	= 10400C	168#	285	293	301	309	335	346	356	366	377	388	400	409
		418	428	438	448	458	468	478	486	494	503	513	522	531
		541	553	563	574	584	593	602	611	622	633	646	655	664
		673	682	699	734	740	760	771	782	793	806	822	838	855
		872	900	923	949	974	1000	1026	1064	1102	1106	1145	1150	1190
		1223	1256	1261	1299	1304	1342	1375	1408	1413	1451	1456	1496	1501
		1535	1540	1578	1625	1672	1711	1756	1771	1786	1801	1816	1856	1896
		1936	1976	2023	2067	2093	2136	2164	2185	2216	2247	2263	2293	2310
		2332	2357											
SCOPEA	015512	177	2382*											
SCOPEB	015524	2383	2385*											
SETUP	001074	229#	278	328										
SETUPA	001104	231#	234											
SETUPB	001130	237#	240											
SIZE	001040	204#	273*	737	743									
SP	=%000006	168#	265	277*	327*	2201	2204	2209	2233	2236	2240	2259	2305	2384
		2385*	2398*	2399*	2400*	2401*	2402*	2403*	2404	2407*	2408	2409	2410	2411
		2412	2413	2415*										
START	001342	183	276*											
STARTB	001544	184	326*	2371										
STKPTR=	000500	168#	277	327	2385	2415								
TIMEVT	001070	224#	252*	2167*	2188*	2220*	2232*	2251*	2258*					
TIMEVT1	001072	225#	252	253*	2232	2258								
TPCSR =	177564	168#	2374	2377										
TPDBR =	177566	168#	2373*	2376*										
XPOS	001054	215#	319	649	658	667	676	688	813	829	881	908	931	957
		982	1008	1049	1087	1126	1170	1207	1240	1278	1321	1359	1392	1430

YPOS	001056	1473	1560	1839	1879	1919	1959	1999	2052	990	1016	1055	1093	1132
		216	320	845	862	890	915	939	965	1479	1521	1762	1777	1792
		1176	1213	1246	1264	1327	1365	1398	1436	1965	1992	2005	2039	2058
		1807	1832	1845	1872	1885	1912	1925	1952					
		2153												
.	= 015660	169	173	176	179	182	186	289	297	305	313	342	352	362
		372	384	394	406	415	424	434	444	454	464	474	483	491
		500	509	519	528	537	547	559	569	580	589	598	607	618
		629	639	652	661	670	679	691	708	714	720	726	767	778
		789	800	815	831	847	864	883	892	909	916	933	941	959
		967	982	992	1010	1018	1051	1057	1089	1095	1128	1134	1172	1178
		1209	1215	1242	1248	1280	1286	1323	1329	1361	1367	1394	1400	1432
		1438	1475	1481	1523	1563	1594	1608	1618	1641	1655	1665	1688	1702
		1727	1741	1751	1765	1780	1795	1810	1835	1841	1848	1875	1881	1898
		1915	1921	1928	1955	1961	1968	1995	2001	2008	2016	2042	2048	2054
		2061	2079	2104	2122	2149	2156	2178	2270	2276	2279	2320	2348	2354

DELAY	2098	685	812	879	844	861	830	879	907	914	877	977	876	844	991
	989	1007	1015	1037	1039	1041	1043	1045	1047	1075	1077	1079	1071	1073	1075
	1116	1118	1120	1172	1124	1160	1162	1164	1166	1168	1193	1191	1203	1205	1207
	1234	1236	1279	1270	1272	1274	1276	1313	1315	1317	1319	1351	1353	1355	1357
	1334	1376	1379	1390	1472	1424	1476	1478	1475	1477	1463	1471	1511	1513	1515
	1517	1519	1520	1552	1574	1576	1578	1573	1591	1573	1601	1603	1675	1614	1616
	1636	1638	1646	1648	1650	1652	1661	1663	1683	1675	1673	1675	1637	1699	1722
	1724	1732	1734	1736	1738	1747	1749	1760	1775	1770	1873	1874	1876	1878	1870
	1864	1856	1878	1870	1904	1906	1908	1910	1944	1946	1973	1970	1974	1978	1970
	1920	2031	2033	2035	2037	2076	2101	2144	2146	2254	2269	2269	2269	2269	2269
DELAY1	2108	614	625	723	754	764	775	786	797	811	827	843	860	879	887
RESUME	2038	711	717	829	837	855	853	870	908	1006	1014	1036	1038	1040	1042
	1074	1046	1074	1076	1078	1075	1072	1074	1115	1117	1119	1121	1123	1159	1161
	1163	1165	1167	1198	1230	1202	1204	1231	1233	1275	1237	1259	1271	1273	1275
	1312	1314	1316	1318	1350	1352	1354	1356	1353	1355	1367	1389	1421	1423	1425
	1427	1464	1466	1468	1470	1510	1512	1514	1516	1518	1549	1551	1553	1555	1557
	1509	1590	1598	1600	1602	1604	1613	1615	1635	1637	1645	1647	1649	1651	1660
	1662	1682	1684	1682	1694	1696	1698	1721	1723	1731	1733	1735	1737	1746	1748
	1761	1776	1791	1806	1823	1825	1827	1829	1863	1865	1867	1869	1903	1905	1907
	1909	1943	1945	1947	1949	1983	1985	1987	1989	2030	2032	2034	2036	2075	2100
	2118	2143	2145	2173	2194	2225	2339	2341	2343	2345					

ADD	232	238	260	745	1290	1333	1443	1485									
BEG	299	297	305	313	342	332	352	372	384	394	406	415	424	434	444		
	454	464	474	493	491	503	509	529	528	537	547	559	569	580	618		
	639	639	652	661	670	679	691	709	714	720	726	748	753	767	778		
	789	800	815	831	847	854	893	892	909	916	933	941	959	967	984		
	1010	1010	1018	1011	1057	1059	1055	1128	1134	1172	1178	1209	1215	1242	1248		
	1280	1286	1323	1313	1361	1367	1394	1400	1432	1438	1475	1481	1523	1563	1594		
	1618	1641	1655	1651	1727	1751	1765	1770	1795	1810	1835	1841	1848	1875	1881		
	1915	1915	1931	1931	1935	1941	1939	1945	2001	2008	2016	2042	2054	2061	2079		
BIC	243	247	250	251	260	264	268	292	384	404	413	422	432	442	452	462	
	472	498	507	517	536	370	382	392	567	578	616	627	637	650	659		
	658	677	693	701	736	1778	1793	1808	1833	1846	1873	1886	1913	1926	1953		
BIT	1966	1933	2003	2007	2039	2154	2275	2353	1687	1701	1726	1740	1750	2015	2047		
BTI	442	490	1543	1547	1617	1640	1654	1664									
BMI	2078	2103	2110	2121	2127	2148	2382										
BVE	598																
BVE	234	240	243	249	323	738	1140	1185	1293	1336	1445	1488	1529	1570	1608		
	1655	1702	1741	2318	2367	2104	2122	2149	2276	2279	2383	2390	2395				
BPL	539	607	2375	2378													
BR	264	271	325	710	716	722	750	755	885	911	935	961	996	1012	1053		
	1091	1130	1176	1174	1170	1211	1244	1282	1273	1325	1331	1363	1376	1434	1440		
	1477	1483	1515	1545	1516	1610	1643	1657	1690	1704	1729	1743	1837	1843	1877		
	1883	1917	1923	1927	1963	1997	2003	2010	2044	2050	2056	2081	2106	2113	2124		
CLR	2130	2151	2178	2232	2207	2234	2238	2270	2285	2320	2350						
	249	251	253	279	287	329	902	903	1029	1030	1067	1068	1109	1110	1153		
	1154	1193	1194	1276	1227	1264	1265	1307	1308	1345	1346	1378	1379	1416	1417		
	1459	1460	1504	1565	1508	1543	1544	1547	1821	2069	2171	2192	2223	2252	2267		
	2334	2335															
CMP	233	239	262	265	268	296	304	312	341	351	361	371	383	393	405		
	414	423	433	443	453	463	473	499	508	518	527	536	545	558	568		
	579	617	628	638	651	660	669	678	690	707	713	719	725	737	744		
	747	752	766	777	788	799	814	830	846	863	882	891	922	940	958		
	966	983	991	1079	1017	1050	1056	1078	1094	1127	1133	1171	1177	1208	1214		
	1241	1247	1279	1275	1372	1373	1370	1376	1393	1399	1431	1437	1474	1480	1522		
	1562	1764	1779	1794	1819	1834	1840	1847	1874	1890	1887	1914	1920	1927	1954		
	1960	1967	1994	2000	2007	2041	2053	2060	2084	2086	2155	2201	2204	2209	2233		
	2236	2240	2279	2278	2315	2379											
DEC	1139	1183	1184	1292	1344	1335	1444	1486	1487	1528	1569	2389	2394				
EHT	168																
HALT	170	171	173	290	298	306	314	343	353	363	373	385	395	407	416		
	425	435	445	455	465	475	484	492	501	510	520	529	538	548	560		
	570	581	590	599	603	653	657	671	680	692	709	715	721	727	749		
	768	779	790	801	816	832	837	853	864	893	910	917	924	942	960		
	968	985	993	1011	1019	1052	1053	1070	1096	1129	1135	1173	1179	1210	1216		
	1243	1249	1281	1287	1324	1330	1336	1353	1395	1401	1433	1439	1476	1482	1524		
	1564	1595	1609	1619	1642	1653	1655	1659	1703	1728	1742	1752	1766	1781	1796		
	1811	1836	1842	1849	1876	1883	1893	1916	1922	1929	1956	1962	1969	1996	2002		
	2009	2017	2043	2049	2076	2082	2080	2105	2112	2123	2129	2150	2157	2180	2199		
	2205	2210	2230	2237	2251	2255	2271	2277	2290	2303	2322	2349	2355	2406	2418		
	322	1138	1182	1291	1443	1526	1527	1567	1568	2083	2358						
INC	183	184	2361	2371	2306	2421											
JMP	246	278	324	328	614	625											
JSR	930	938	956	964	981	989	685	812	828	844	861	880	889	907	914		
	1077	1079	1081	1083	1085	1116	1007	1015	1037	1039	1041	1043	1045	1047	1075		
	1199	1201	1203	1205	1232	1234	1118	1120	1122	1124	1160	1162	1164	1166	1168		
							1236	1238	1270	1272	1274	1276	1313	1315	1317		

MOV

1319	1351	1353	1355	1357	1384	1386	1388	1390	1422	1424	1426	1428	1465	1467
1469	1471	1511	1513	1515	1517	1519	1550	1555	1556	1558	1559	1589	1591	1599
1601	1603	1605	1614	1615	1617	1618	1650	1655	1657	1661	1667	1668	1683	1685
1693	1695	1697	1699	1723	1724	1725	1738	1743	1747	1749	1760	1760	1775	1790
1805	1824	1826	1828	1830	1834	1835	1866	1870	1884	1886	1908	1910	1944	1946
1948	1950	1954	1956	1959	1960	1961	2003	2008	2037	2076	2098	2101	2117	2119
2148	2150	2154	2156	2159	2160	2161	2203	2208	2270	2276	2298	2301	2317	2319
2239	2230	2231	2235	2236	2237	2238	2271	2274	2310	2352	2358	2359	2366	2373
2276	2277	2280	2281	2282	2283	2284	2319	2322	2361	2362	2368	2369	2370	2381
2339	2338	2339	2340	2341	2342	2343	2376	2379	2419	2420	2421	2429	2430	2431
2389	2388	2391	2392	2393	2394	2395	2430	2433	2461	2462	2471	2479	2480	2481
2439	2430	2431	2432	2433	2434	2435	2466	2469	2496	2497	2516	2533	2534	2525
2479	2480	2481	2482	2483	2484	2485	2516	2519	2556	2557	2566	2573	2574	2577
2539	2538	2539	2540	2541	2542	2543	2576	2579	2612	2613	2615	2623	2624	2626
2579	2580	2581	2582	2583	2584	2585	2619	2622	2654	2655	2667	2674	2675	2676
2639	2638	2639	2640	2641	2642	2643	2676	2679	2704	2705	2706	2711	2712	2717
2679	2678	2679	2680	2681	2682	2683	2709	2712	2747	2748	2755	2762	2764	2765
2739	2738	2739	2740	2741	2742	2743	2776	2779	2814	2815	2829	2836	2837	2838
2779	2778	2779	2780	2781	2782	2783	2817	2820	2856	2857	2874	2881	2882	2883
2839	2838	2839	2840	2841	2842	2843	2878	2881	2916	2917	2939	2946	2947	2948
2879	2878	2879	2880	2881	2882	2883	2921	2924	2960	2961	2987	2994	2995	2996
2939	2938	2939	2940	2941	2942	2943	2976	2979	3014	3015	3039	3046	3047	3048
2979	2978	2979	2980	2981	2982	2983	3021	3024	3060	3061	3087	3094	3095	3096
3039	3038	3039	3040	3041	3042	3043	3076	3079	3114	3115	3139	3146	3147	3148
3079	3078	3079	3080	3081	3082	3083	3121	3124	3160	3161	3187	3194	3195	3196
3139	3138	3139	3140	3141	3142	3143	3176	3179	3214	3215	3239	3246	3247	3248
3179	3178	3179	3180	3181	3182	3183	3219	3222	3256	3257	3287	3294	3295	3296
3239	3238	3239	3240	3241	3242	3243	3281	3284	3314	3315	3339	3346	3347	3348
3279	3278	3279	3280	3281	3282	3283	3319	3322	3356	3357	3387	3394	3395	3396
3339	3338	3339	3340	3341	3342	3343	3381	3384	3414	3415	3439	3446	3447	3448
3379	3378	3379	3380	3381	3382	3383	3419	3422	3456	3457	3487	3494	3495	3496
3439	3438	3439	3440	3441	3442	3443	3481	3484	3514	3515	3539	3546	3547	3548
3479	3478	3479	3480	3481	3482	3483	3519	3522	3556	3557	3587	3594	3595	3596
3539	3538	3539	3540	3541	3542	3543	3581	3584	3614	3615	3639	3646	3647	3648
3579	3578	3579	3580	3581	3582	3583	3619	3622	3656	3657	3687	3694	3695	3696
3639	3638	3639	3640	3641	3642	3643	3681	3684	3714	3715	3739	3746	3747	3748
3679	3678	3679	3680	3681	3682	3683	3719	3722	3756	3757	3787	3794	3795	3796
3739	3738	3739	3740	3741	3742	3743	3781	3784	3814	3815	3839	3846	3847	3848
3779	3778	3779	3780	3781	3782	3783	3819	3822	3856	3857	3887	3894	3895	3896
3839	3838	3839	3840	3841	3842	3843	3881	3884	3914	3915	3939	3946	3947	3948
3879	3878	3879	3880	3881	3882	3883	3919	3922	3956	3957	3987	3994	3995	3996
3939	3938	3939	3940	3941	3942	3943	3981	3984	4014	4015	4039	4046	4047	4048
3979	3978	3979	3980	3981	3982	3983	4019	4022	4056	4057	4087	4094	4095	4096
4039	4038	4039	4040	4041	4042	4043	4081	4084	4114	4115	4139	4146	4147	4148
4079	4078	4079	4080	4081	4082	4083	4119	4122	4156	4157	4187	4194	4195	4196
4139	4138	4139	4140	4141	4142	4143	4181	4184	4214	4215	4239	4246	4247	4248
4179	4178	4179	4180	4181	4182	4183	4219	4222	4256	4257	4287	4294	4295	4296
4239	4238	4239	4240	4241	4242	4243	4281	4284	4314	4315	4339	4346	4347	4348
4279	4278	4279	4280	4281	4282	4283	4319	4322	4356	4357	4387	4394	4395	4396
4339	4338	4339	4340	4341	4342	4343	4381	4384	4414	4415	4439	4446	4447	4448
4379	4378	4379	4380	4381	4382	4383	4419	4422	4456	4457	4487	4494	4495	4496
4439	4438	4439	4440	4441	4442	4443	4481	4484	4514	4515	4539	4546	4547	4548
4479	4478	4479	4480	4481	4482	4483	4519	4522	4556	4557	4587	4594	4595	4596
4539	4538	4539	4540	4541	4542	4543	4581	4584	4614	4615	4639	4646	4647	4648
4579	4578	4579	4580	4581	4582	4583	4619	4622	4656	4657	4687	4694	4695	4696
4639	4638	4639	4640	4641	4642	4643	4681	4684	4714	4715	4739	4746	4747	4748
4679	4678	4679	4680	4681	4682	4683	4719	4722	4756	4757	4787	4794	4795	4796
4739	4738	4739	4740	4741	4742	4743	4781	4784	4814	4815	4839	4846	4847	4848
4779	4778	4779	4780	4781	4782	4783	4819	4822	4856	4857	4887	4894	4895	4896
4839	4838	4839	4840	4841	4842	4843	4881	4884	4914	4915	4939	4946	4947	4948
4879	4878	4879	4880	4881	4882	4883	4919	4922	4956	4957	4987	4994	4995	4996
4939	4938	4939	4940	4941	4942	4943	4981	4984	5014	5015	5039	5046	5047	5048
4979	4978	4979	4980	4981	4982	4983	5019	5022	5056	5057	5087	5094	5095	5096
5039	5038	5039	5040	5041	5042	5043	5081	5084	5114	5115	5139	5146	5147	5148
5079	5078	5079	5080	5081	5082	5083	5119	5122	5156	5157	5187	5194	5195	5196
5139	5138	5139	5140	5141	5142	5143	5181	5184	5214	5215	5239	5246	5247	5248
5179	5178	5179	5180	5181	5182	5183	5219	5222	5256	5257	5287	5294	5295	5296
5239	5238	5239	5240	5241	5242	5243	5281	5284	5314	5315	5339	5346	5347	5348
5279	5278	5279	5280	5281	5282	5283	5319	5322	5356	5357	5387	5394	5395	5396
5339	5338	5339	5340	5341	5342	5343	5381	5384	5414	5415	5439	5446	5447	5448
5379	5378	5379	5380	5381	5382	5383	5419	5422	5456	5457	5487	5494	5495	5496
5439	5438	5439	5440	5441	5442	5443	5481	5484	5514	5515	5539	5546	5547	5548
5479	5478	5479	5480	5481	5482	5483	5519	5522	5556	5557	5587	5594	5595	5596
5539	5538	5539	5540	5541	5542	5543	5581	5584	5614	5615	5639	5646	5647	5648
5579	5578	5579	5580	5581	5582	5583	5619	5622	5656	5657	5687	5694	5695	5696
5639	5638	5639	5640	5641	5642	5643	5681	5684	5714	5715	5739	5746	5747	5748
5679	5678	5679	5680	5681	5682	5683	5719	5722	5756	5757	5787	5794	5795	5796
5739	5738	5739	5740	5741	5742	5743	5781	5784	5814	5815	5839	5846	5847	5848
5779	5778	5779	5780	5781	5782	5783	5819	5822	5856	5857	5887	5894	5895	5896
5839	5838	5839	5840	5841	5842	5843	5881	5884	5914	5915	5939	5946	5947	5948
5879	5878	5879	5880	5881	5882	5883	5919	5922	5956	5957	5987	5994	5995	5996
5939	5938	5939	5940	5941	5942	5943	5981	5984	6014	6015	6039	6046	6047	6048
5979	5978	5979	5980	5981	5982	5983	6019	6022	6056	6057	6087	6094	6095	6096
6039	6038	6039	6040	6041	6042	6043	6081	6084	6114	6115	6139	6146	6147	6148
6079	6078	6079	6080	6081	6082	6083	6119	6122	6156	6157	6187	6194	6195	6196
6139	6138	6139	6140	6141	6142	6143	6181	6184	6214	6215	6239	6246	6247	6248
6179	6178	6179	6180	6181	6182	6183	6219	6222	6256	6257	6287	6294	6295	62

NEG	242	245													
NOP	619	630	640	2174	2175	2176	2177	2195	2196	2197	2198	2226	2227	2228	2229
	2231	2257	2299	2300	2301	2302	2316	2317	2318	2319	2367	2368	2369	2416	2417
	2419	2420													
RESET	378	2068	2094	2109	2126	2141	2165	2186	2217	2248	2264	2294	2311	2325	2346
	2362	2365													
RTS	254	274	2379	2391	2396										
SUB	267	270	272	2283											
TST	261	317	318	319	320	588	597	606	2347						
TSTB	2374	2377													
.ENABL	163														
.END	2427														
.LIST	1	165	168	173											
.MACR	208	209	210												
.NLIST	1	166	168	173											
.REM	1														
.REPT	173														
.TITLE	164														
.WORD	177														

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

#DOGTA,DOGTA.SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DOGTA.P11
RUN-TIME: 8 17 4 SECONDS
RUN-TIME RATIO: 64/30=2.0
CORE USED: BK (16 PAGES)

G06

Special printing @ Standard, 24 1/2" x 36" 1/2" thick paper, 2 disk copies, 67 pages

