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IDENTIFICATION

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

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1. ABSTRACT

THIS IS A TWO PART LOGIC TEST OF THE ALPHAGRAPHIC TERMINAL.
FOR THIS TEST THE TWO MAINTENANCE SWITCH WILL NOT 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 0-14000 <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

200 SUB-TEST 1, COMPLEX LOGIC TEST <BR, NPR AND INTERRUPT>
204 SUB-TEST 2, BASIC VISUAL DISPLAY PATTERNS
 <SELECTED BY SW 00-02>

- 0 = POSITIVE HORIZONTAL LINE FROM CENTER SCREEN
- 1 = NEGATIVE HORIZONTAL LINE FROM CENTER SCREEN
- 2 = POSITIVE VERTICAL LINE FROM CENTER SCREEN
- 3 = NEGATIVE VERTICAL LINE FROM CENTER SCREEN
- 4 = RECTANGLE AROUND SCREEN EDGE
- 5 = OCTAGON PATTERN IN RELATIVE POINT AND SHORT VECTOR
- 6 = CHARACTER SET
- 7 = LIGHT PEN TEST

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

BOTH SUB-TESTS DO NOT USE THE MAINTENANCE SWITCHES. IF VR14 SCOPE, LOCATION "GSYAXS" (LOC. 1012) MUST BE CHANGED TO 1377.

8. MISCELLANEOUS

8.1 EXECUTION TIME

SUB-TEST 1 TAKES APPROXIMATELY 15 SECONDS.
N/A OPERATOR INTERVENTION ONLY.

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

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.

9.2 SUBTEST 2

THIS SUBTEST CONSISTS OF SEVERAL BASIC VISUAL DISPLAY PATTERNS TO AID IN THE REPAIR AND ALIGNMENT OF THE GT-40 TERMINAL. ONCE A PATTERN HAS BEEN SELECTED BY SW 00-02, THE PROGRAM MUST BE RESTARTED TO SELECT ANOTHER PATTERN.


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210
211
212
213
214 001052 172000
215 001054 172002
216 001056 172004
217 001060 172006
218
219 001062 000320
220 001064 000322
221
222 001066 000324
223 001070 000326
224
225 001072 000330
226 001074 000332
227
228
229
230 001076 012700 001052
231 001102 013701 001000
232 001106 010120
233 001110 062701 000002
234 001114 022700 001062
235 001120 001372
236 001122 012700 001062
237 001126 013701 001002
238 001130 010120
239 001134 062701 000002
240 001140 022700 001076
241 001144 001372
242 001146 013737 001010 001046
243 001154 005437 001046
244 001160 042737 177000 001046
245 001166 013737 001006 001050
246 001174 005437 001050
247 001200 004737 001252
248 001204 042737 177000 001050
249 001212 013777 001064 177642
250 001220 005077 177640
251 001224 013777 001070 177634
252 001232 005077 177632
253 001236 013777 001074 177626
254 001244 005077 177624
255 001250 000207

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;GS ADDRESSES AND VECTORS
DPC: 172000 ;DISPLAY PC REGISTER
DSR: 172002 ;DISPLAY STATUS REGISTER
XPOS: 172004 ;X AXIS REGISTER <READ ONLY>
YPOS: 172006 ;Y AXIS REGISTER AND GRAPHLOT REGISTER <READ ONLY>
DOONE: 320 ;DISPLAY STOP <DONE> VECTOR
DOONE1: 322 ;
LPVCT: 324 ;DISPLAY LIGHT PEN VECTOR
LPVCT1: 326 ;
TIMEVT: 330 ;DISPLAY TIME-OUT <NOX.> ERROR VECTOR
THEVT1: 332 ; OR "SHIFT-OUT" VECTOR

;GS INITIALIZATION ROUTINE
SETUP: MOV #DPC,R0 ;SET UP POINTER
MOV #SADD,R1
SETUPA: MOV R1,(0)+
ADD #2,R1
CMP #DPC+10,R0
BNE SETUPA
MOV #DOONE,R0
MOV #SVCT,R1
SETUPB: MOV R1,(0)+
ADD #2,R1
CMP #DOONE+14,R0
BNE SETUPB
MOV #LFSZ,LFSIZE ;SET UP DELTA LF
NEG LFSIZE ;NEGATE IT
BIC #177000,LFSIZE ;MASK IT
MOV #CHSZ,CHSIZE ;SET UP DELTA CHAR
NEG CHSIZE ;NEGATE IT
JSR PC,DCORE ;SET UP CORE SIZE
BIC #177000,CHSIZE ;MASK IT
MOV DOONE1,DOONE ;LOAD DONE VECTOR
CLR DOONE1
MOV LPVCT1,LPVCT ;LOAD LIGHT-PEN VECTOR
CLR LPVCT1
MOV THEVT1,TIMEVT ;LOAD TIME-OUT VECTOR
CLR THEVT1
RTS PC

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256 ;SUBROUTINE TO DETERMINE THE SIZE OF CORE
257 ; AND SET UP LOCATION SIZE WITH THE VALUE
258
259 001252 012737 001302 000004 DOCORE: MOV      #25,284      ;SET UP FOR NEM
260 001260 012701 017776      MOV      #17776,R1    ;SET UP ADDRESS
261 001264 062701 020000      1S:  ADD      #20000,R1    ;MOVE TO THE NEXT BANK
262 001270 005711      TST      (R1)        ;TIMEOUT ?
263 001272 022701 177776      CMP      #177776,R1  ;END ?
264 001276 001372      BNE      1S
265 001300 000401      BR       3S
266 001302 022626      2S:  CMP      (SP)+,(SP)+ ;POP STACK
267 001304 012737 000006 000004 3S:  MOV      #6,284      ;RESET BUSS ERROR
268 001312 162701 020000      SUB      #20000,R1
269 001316 022701 017776      CMP      #17776,R1   ;TEST FOR 4K MACHINE
270 001322 001003      BNE      4S          ;BR IF NOT 4 K
271 001324 162701 000400      SUB      #400,R1     ;ADJUST FOR LOADER
272 001330 000402      BR       5S
273 001332 162701 010000      4S:  SUB      #10000,R1   ;ADJUST FOR XXDP
274 001336 010137 001042      5S:  MOV      R1,SIZE    ;LOAD SIZE
275 001342 000207      RTS      PC          ;EXIT
276

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277
278 001344 012777 000340 177446 START: MOV      @340,@PSW
279 001352 012706 000500          MOV      @STKPTR,SP
280 001356 004737 001076          JSR      PC,SETUP
281 001362 005037 001016          CLR      ICNT
282 001366 012701 001374          MOV      @GTBUSS+2,R1
;TEST FOR BUSS ERRORS ON DISPLAY ADDRESSES
GTBUSS: SCOPE
001372 104000          RESET
001374 000005          CLR      @DSR          ; ON DISPLAY STATUS
001376 005077 177452          NOP
001402 000240          CLR      @XPOS        ; ON DISPLAY X REGISTER
001404 005077 177446          NOP
001410 000240          CLR      @YPOS        ; ON DISPLAY Y REGISTERS
001412 005077 177442          RESET
001416 000005
;INCREMENT P.C. TEST
;COMPLEX - BUFFER LENGTH
GTPC:  SCOPE
001420 104000          MOV      @BUF,R2      ;SET UP POINTER
001422 013702 001022          MOV      @172000,(2)+ ;MOVE DSTOP INTO THE BUFFER
001426 012722 172000          CMP      SIZE,R2      ;FINISHED FILLING THE BUFFER?
001432 023702 001042          BNE     @1           ;NO
001436 001373
GTPCA: SCOPE
001440 104000          MOV      @BUF,@DPC    ;YES, START THE DISPLAY
001442 013777 001022 177402          MOV      @BUF,@SAVE  ;SETUP A COUNT
001450 013737 001022 001036          MOV      SIZE,R2
001456 013702 001042          DEC     R2
001462 005302          MOV      @DSR,R4
001464 017704 177364          BMI    @1           ;ERROR, STOP FLAG FAILED TO SET
310 001470 100402          HALT
311 001472 000000          BR     @GTO
312 001474 000421          ADD     @2,@SAVE
314 001476 062737 000002 001036 @1:  MOV      @DPC,R0      ;READ DISPLAY P.C.
315 001504 017700 177342          CMP     @SAVE,R0     ;DID IT INCREMENT BY 2?
316 001510 023700 001036          BEQ    @2           ;YES
317 001514 001402          HALT
318 001516 000000          BR     @GTO         ;DISPLAY PC FAILED TO INCREMENT
319 001520 000407          ;PROPERLY
320
321 001522 020037 001036          CMP     R0,@SAVE     ;FINISHED THE BUFFER ?
322 001526 001404          BEQ    @GTO         ;BR IF YES
323 001530 012777 000001 177314 @2:  MOV      @1,@DPC     ;SINGLE STEP THE DISPLAY
324 001536 000752          BR     @GTPCA       ;TRY AGAIN
325

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378								
379	001776	104000			GT5:	SCOPE		
380	002000	012777	172000	177014		MOV	#172000, 2DBUF	; COLOR ENABLE=0 COLOR=0
381	002006	013777	001022	177036		MOV	DBUF, 20PC	; LOAD DISPLAY P.C.
382	002014	017700	177034			MOV	2DSR, R0	; READ DISPLAY STATUS REGISTER
383	002020	042700	177773			BIC	#177773, R0	; MASK TO BIT 2
384	002024	022700	000004			CHP	#4, R0	; TEST R0
385	002030	001401				BEQ	.+4	
386	002032	000240				NOP		; COLOR ENABLE FAILED TO INHIBIT
387								; RESETTING OF COLOR BIT
388								
389								
390								
391	002034	104000			GT6:	SCOPE		
392	002036	012777	100004	176756		MOV	#100004, 2DBUF	; LOAD LINE TYPE ENABLE =1 AND LINE TYPE VALUE =0
393	002044	012777	172000	176752		MOV	#172000, 2DBUF1	
394	002052	013777	001022	176772		MOV	DBUF, 20PC	; LOAD DISPLAY P.C.
395	002060	017700	176770			MOV	2DSR, R0	; READ DISPLAY STATUS REGISTER
396	002064	042700	177774			BIC	#177774, R0	; MASK TO BITS 1-0
397	002070	022700	000000			CHP	#0, R0	; TEST R0
398	002074	001401				BEQ	.+4	
399	002076	000000				HALT		; LINE BITS 1-0 FAILED TO RESET
400								
401	002100	104000			GT7:	SCOPE		
402	002102	012777	100007	176712		MOV	#100007, 2DBUF	; LINE TYPE ENABLE =1 LINE TYPE =3
403	002110	012777	172000	176706		MOV	#172000, 2DBUF1	; LOAD STOP
404	002116	013777	001022	176726		MOV	DBUF, 20PC	; LOAD DISPLAY P.C.
405	002124	017700	176724			MOV	2DSR, R0	; READ DISPLAY STATUS REGISTER
406	002130	042700	177774			BIC	#177774, R0	; MASK TO BITS 1-0
407	002134	022700	000003			CHP	#3, R0	; TEST R0
408	002140	001401				BEQ	.+4	
409	002142	000000				HALT		; LINE BITS 1-0 FAILED TO SET
410								
411	002144	104000			GT8:	SCOPE		
412	002146	012777	100005	176646		MOV	#100005, 2DBUF	; LINE TYPE ENABLE =1 LINE TYPE =1
413	002154	012777	172000	176642		MOV	#172000, 2DBUF1	; LOAD STOP
414	002162	013777	001022	176662		MOV	DBUF, 20PC	; LOAD DISPLAY P.C.
415	002170	017700	176660			MOV	2DSR, R0	; READ DISPLAY STATUS REGISTER
416	002174	042700	177774			BIC	#177774, R0	; MASK TO BITS 1-0
417	002200	022700	000001			CHP	#1, R0	; TEST R0
418	002204	001401				BEQ	.+4	
419	002206	000000				HALT		; LINE BIT 0 FAILED TO SET
420								
421								
422	002210	104000			GT9:	SCOPE		
423	002212	012777	100006	176602		MOV	#100006, 2DBUF	; LINE TYPE ENABLE =1 LINE TYPE =2
424	002220	012777	172000	176576		MOV	#172000, 2DBUF1	
425	002226	013777	001022	176616		MOV	DBUF, 20PC	; LOAD DISPLAY P.C.
426	002234	017700	176614			MOV	2DSR, R0	; READ DISPLAY STATUS REGISTER
427	002240	042700	177774			BIC	#177774, R0	; MASK TO BITS 1-0
428	002244	022700	000002			CHP	#2, R0	; TEST R0
429	002250	001401				BEQ	.+4	
430	002252	000000				HALT		; LINE BIT 1 FAILED TO SET

431									
432	002254	104000				GT10:	SCOPE		
433	002256	012777	100003	176536			MOV	#100003, 2DBUF	;LINE TYPE ENABLE =0 LINE TYPE =3
434	002264	012777	172000	176532			MOV	#172000, 2DBUF1	
435	002272	013777	001022	176552			MOV	DBUF, 20PC	;LOAD DISPLAY P.C.
436	002300	017700	176550				MOV	2DSR, R0	;READ DISPLAY STATUS REGISTER
437	002304	042700	177774				BIC	#177774, R0	;MASK TO BITS 1-0
438	002310	022700	000002				CMF	#2, R0	;TEST R0
439	002314	001401					BEQ	+.4	;SHOULD NOT CHANGE LT VALUE
440	002316	000000					HALT		;LINE TYPE ENABLE FAILED TO INHIBIT
441									;CHANGING OF LINETYPE VALUE
442									
443	002320	104000				GT11:	SCOPE		
444	002322	012777	100020	176472			MOV	#100020, 2DBUF	;BLINK ENABLE =1 BLINK =0
445	002330	012777	172000	176466			MOV	#172000, 2DBUF1	
446	002336	013777	001022	176506			MOV	DBUF, 20PC	;LOAD DISPLAY P.C.
447	002344	017700	176504				MOV	2DSR, R0	;READ DISPLAY STATUS REGISTER
448	002350	042700	177767				BIC	#177767, R0	;MASK TO BIT 3
449	002354	022700	000000				CMF	#0, R0	;TEST R0
450	002360	001401					BEQ	+.4	
451	002362	000000					HALT		;BLINK BIT FAILED TO RESET
452									
453									
454	002364	104000				GT12:	SCOPE		
455	002366	012777	100030	176426			MOV	#100030, 2DBUF	;BLINK ENABLE =1 BLINK =1
456	002374	012777	172000	176422			MOV	#172000, 2DBUF1	
457	002402	013777	001022	176442			MOV	DBUF, 20PC	;LOAD DISPLAY P.C.
458	002410	017700	176440				MOV	2DSR, R0	;READ DISPLAY STATUS REGISTER
459	002414	042700	177767				BIC	#177767, R0	;MASK TO BIT 3
460	002420	022700	000010				CMF	#10, R0	;TEST R0
461	002424	001401					BEQ	+.4	
462	002426	000000					HALT		;BLINK BIT FAILED TO SET
463									
464									
465	002430	104000				GT13:	SCOPE		
466	002432	012777	100000	176362			MOV	#100000, 2DBUF	;BLINK ENABLE =0 BLINK =0
467	002440	012777	172000	176356			MOV	#172000, 2DBUF1	
468	002446	013777	001022	176376			MOV	DBUF, 20PC	;LOAD DISPLAY P.C.
469	002454	017700	176374				MOV	2DSR, R0	;READ DISPLAY STATUS REGISTER
470	002460	042700	177767				BIC	#177767, R0	;MASK TO BIT 3
471	002464	022700	000010				CMF	#10, R0	;TEST R0
472	002470	001401					BEQ	+.4	
473	002472	000000					HALT		;BLINK ENABLE FAILED TO INHIBIT
474									;CHANGING OF THE BLINK BIT
475									
476	002474	104000				GT14:	SCOPE		
477	002476	012777	100100	176316			MOV	#100100, 2DBUF	;LP ENABLE =1 LP=0
478	002504	012777	172000	176312			MOV	#172000, 2DBUF1	
479	002512	013777	001022	176332			MOV	DBUF, 20PC	;LOAD DISPLAY P.C.
480	002520	017700	176330				MOV	2DSR, R0	;READ STATUS
481	002524	032700	000200				BIT	#200, R0	
482	002530	001401					BEQ	+.4	
483	002532	000000					HALT		;LIGHT PEN FLAG SET IN ERROR

484									
485	002534	104000				GT15:	SCOPE		
486	002536	012777	100140	176256			MOV	#100140, D0BUF	;LP ENABLE =1 LP=1
487	002544	012777	172000	176252			MOV	#172000, D0BUF1	
488	002552	013777	001022	176272			MOV	D0BUF, D0PC	;LOAD DISPLAY P.C.
489	002560	017700	176270				MOV	D0SR, R0	;READ STATUS
490	002564	032700	000200				BIT	#200, R0	
491	002570	001401					BEQ	.+4	
492	002572	000000					HALT		;LIGHT PEN FLAG SET IN ERROR
493									
494	002574	104000				GT16:	SCOPE		
495	002576	012777	102000	176216			MOV	#102000, D0BUF	;INTENSITY LEVEL ENABLE =1 LEVEL =0
496	002604	012777	172000	176212			MOV	#172000, D0BUF1	
497	002612	013777	001022	176232			MOV	D0BUF, D0PC	;LOAD DISPLAY P.C.
498	002620	017700	176230				MOV	D0SR, R0	;READ DISPLAY STATUS REGISTER
499	002624	042700	174377				BIC	#174377, R0	;MASK TO BITS 8-10
500	002630	022700	000000				CMP	#0, R0	;TEST R0
501	002634	001401					BEQ	.+4	
502	002636	000000					HALT		;INTENSITY LEVEL BITS 8-10 FAILED TO RESET
503									
504									
505	002640	104000				GT17:	SCOPE		
506	002642	012777	103600	176152			MOV	#103600, D0BUF	;INTENSITY LEVEL ENABLE =1 LEVEL =7
507	002650	012777	172000	176146			MOV	#172000, D0BUF1	
508	002656	013777	001022	176166			MOV	D0BUF, D0PC	;LOAD DISPLAY O.C.
509	002664	017700	176164				MOV	D0SR, R0	;READ DISPLAY STATUS REGISTER
510	002670	042700	174377				BIC	#174377, R0	;MASK TO BITS 8-10
511	002674	022700	003400				CMP	#3400, R0	;TEST R0
512	002700	001401					BEQ	.+4	
513	002702	000000					HALT		;INTENSITY LEVEL BITS 8-10 FAILED TO SET
514									
515									
516	002704	104000				GT18:	SCOPE		
517	002706	012777	103000	176106			MOV	#103000, D0BUF	;INTENSITY LEVEL ENABLE =1 LEVEL =4
518	002714	012777	172000	176102			MOV	#172000, D0BUF1	
519	002722	013777	001022	176122			MOV	D0BUF, D0PC	;LOAD DISPLAY P.C.
520	002730	017700	176120				MOV	D0SR, R0	;READ DISPLAY STATUS REGISTER
521	002734	042700	174377				BIC	#174377, R0	;MASK TO BITS 8-10
522	002740	022700	002000				CMP	#2000, R0	;TEST R0
523	002744	001401					BEQ	.+4	
524	002746	000000					HALT		;INTENSITY LEVEL BIT 10 FAILED
525									
526									
527	002750	104000				GT19:	SCOPE		
528	002752	012777	102400	176042			MOV	#102400, D0BUF	;INTENSITY LEVEL ENABLE =1 LEVEL =2
529	002760	012777	172000	176036			MOV	#172000, D0BUF1	
530	002766	013777	001022	176056			MOV	D0BUF, D0PC	;LOAD DISPLAY P.C.
531	002774	017700	176054				MOV	D0SR, R0	;READ DISPLAY STATUS REGISTER
532	003000	042700	174377				BIC	#174377, R0	;MASK TO BITS 8-10
533	003004	022700	001000				CMP	#1000, R0	;TEST R0
534	003010	001401					BEQ	.+4	
535	003012	000000					HALT		;INTENSITY LEVEL BIT 9 FAILED

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536
537 003014 104000          GT20: SCOPE
538 003016 012777 102200 175776      MOV      #102200,2DBUF ;INTENSITY LEVEL ENABLE =1 LEVEL =1
539 003024 012777 172000 175772      MOV      #172000,2DBUF1
540 003032 013777 001022 176012      MOV      DBUF,2DPC ;LOAD DISPLAY P.C.
541 003040 017700 176010      MOV      2DSR,RO ;READ DISPLAY STATUS REGISTER
542 003044 042700 174377      BIC      #174377,RO ;MASK TO BITS 8-10
543 003050 022700 000400      CMP      #400,RO ;TEST RO
544 003054 001401      BEQ
545 003056 000000      HALT ;INTENSITY LEVEL BIT 8 FAILED
546
547
548 003060 104000          GT21: SCOPE
549 003062 012777 101600 175732      MOV      #101600,2DBUF ;INTENSITY LEVEL ENABLE =0 LEVEL =7
550 003070 012777 172000 175726      MOV      #172000,2DBUF1
551 003076 013777 001022 175746      MOV      DBUF,2DPC ;LOAD DISPLAY P.C.
552 003104 017700 175744      MOV      2DSR,RO ;READ DISPLAY STATUS REGISTER
553 003110 042700 174377      BIC      #174377,RO ;MASK TO BITS 8-10
554 003114 022700 000400      CMP      #400,RO ;TEST RO
555 003120 001401      BEQ
556 003122 000000      HALT ;INTENSITY LEVEL ENABLE FAILED TO INHIBIT
557 ;INTENSITY LEVEL CHANGE
558
559 ;GRAPHPLOT INCREMENT REGISTER TEST
560
561 003124 104000          GT22: SCOPE
562 003126 012777 174100 175666      MOV      #174100,2DBUF ;LOAD GRAPHPLOT COUNTER
563 003134 012777 172000 175662      MOV      #172000,2DBUF1
564 003142 013777 001022 175702      MOV      DBUF,2DPC ;START DISPLAY
565 003150 017700 175702      MOV      2XPOS,RO ;READ INCREMENT REGISTER
566 003154 042700 001777      BIC      #1777,RO ;MASK TO BITS 15-10
567 003160 022700 000000      CMP      #0,RO
568 003164 001401      BEQ
569 003166 000000      HALT ;GRAPHPLOT REGISTER IN ERROR
570
571 003170 104000          GT23: SCOPE
572 003172 012777 174177 175622      MOV      #174177,2DBUF ;LOAD GRAPHPLOT COUNTER
573 003200 012777 172000 175616      MOV      #172000,2DBUF1
574 003206 013777 001022 175636      MOV      DBUF,2DPC ;START DISPLAY
575 003214 017700 175636      MOV      2XPOS,RO ;READ INCREMENT REGISTER
576 003220 042700 001777      BIC      #1777,RO ;MASK TO BITS 15-10
577 003224 022700 176000      CMP      #176000,RO
578 003230 001401      BEQ
579 003232 000000      HALT ;GRAPHPLOT REGISTER IN ERROR
580
581 003234 104000          GT24: SCOPE
582 003236 012777 174152 175556      MOV      #174152,2DBUF ;LOAD GRAPHPLOT COUNTER
583 003244 012777 017200 175552      MOV      #17200,2DBUF1
584 003252 013777 001022 175572      MOV      DBUF,2DPC ;START DISPLAY
585 003260 017700 175572      MOV      2XPOS,RO ;READ INCREMENT REGISTER
586 003264 042700 001777      BIC      #1777,RO ;MASK TO BITS 15-10
587 003270 022700 124000      CMP      #124000,RO
588 003274 001401      BEQ
589 003276 000000      HALT ;GRAPHPLOT REGISTER IN ERROR

```

```

590
591 003300 104000
592 003302 012777 174125 175512
593 003310 012777 172000 175506
594 003316 013777 001022 175526
595 003324 017700 175526
596 003330 042700 001777
597 003334 022700 052000
598 003340 001401
599 003342 000000
600
601 003344 104000
602 003346 012777 174100 175446
603 003354 012777 172000 175442
604 003362 013777 001022 175462
605 003370 004737 012346
606 003374 012777 174077 175420
607 003402 013777 001022 175442
608 003410 017700 175442
609 003414 042700 001777
610 003420 022700 000000
611 003424 001401
612 003426 000000
613
614
615
616
617
618 003430 104000
619 003432 012777 122000 175362
620 003440 012777 001252 175356
621 003446 012777 172000 175352
622 003454 013777 001022 175370
623 003462 004737 012346
624 003466 017700 175364
625 003472 022700 001252
626 003476 001401
627 003500 000000
628

```

GT25: SCOPE
MOV #174125, ZD BUF ;LOAD GRAPHPLOT COUNTER
MOV #172000, ZD BUF1
MOV D BUF, ZD PC ;START DISPLAY
MOV ZD POS, R0 ;READ INCREMENT REGISTER
BIC #1777, R0 ;MASK TO BITS 15-10
CMP #52000, R0
BEQ .+4
HALT ;GRAPHPLOT REGISTER IN ERROR

GT26: SCOPE
MOV #174100, ZD BUF ;LOAD GRAPHPLOT COUNTER WITH 0
MOV #172000, ZD BUF1
MOV D BUF, ZD PC ;START DISPLAY
JSR 7, D LAY ;EXECUTE A PROGRAM DELAY
MOV #174077, ZD BUF ;LOAD GRAPHPLOT NO ENABLE
MOV D BUF, ZD PC ;START DISPLAY
MOV ZD POS, R0 ;READ INCREMENT REGISTER
BIC #1777, R0 ;MASK TO BITS 15-10
CMP #0, R0 ;ARE THEY EQUAL ?
BEQ .+4
HALT ;GRAPHPLOT REGISTER CHANGED WITHOUT
; THE ENABLE BEING SET

;TEST THAT THE X POSITION REGISTER CAN BE LOADED CORRECTLY
;USING GRAPHPLOT X

GT27: SCOPE
MOV #122000, ZD BUF ;LOW INTENSITY - SET GRAPHPLOT X MODE
MOV #1252, ZD BUF1 ;SET X POSITION
MOV #172000, ZD BUF2 ;LOAD STOP
MOV D BUF, ZD PC ;START THE DISPLAY
JSR 7, D LAY ;EXECUTE A PROGRAM DELAY
MOV ZD POS, R0 ;READ X POSITION
CMP #1252, R0
BEQ .+4
HALT ;X POSITION REGISTER FAILED TO LOAD
;PROPERLY USING GRAPHPLOT X MODE

```

629
630
631      ;TEST THAT THE X POSITION REGISTER CAN BE LOADED CORRECTLY
632      ;USING GRAPHPLOT X
633
634      003502  104000
635      003504  012777  122000  175310
636      003512  012777  000525  175304
637      003520  012777  172000  175300
638      003526  013777  001022  175316
639      003534  004737  012346
640      003540  017700  175312
641      003544  022700  000525
642      003550  001401
643      003552  000000
644
645      GT28:  SCOPE
646      MOV      @122000,@0BUF      ;LOW INTENSITY - SET GRAPH PLOT X MODE
647      MOV      @525,@0BUF1      ;SET X POSITION
648      MOV      @172000,@0BUF2    ;LOAD STATUS REGISTER A, STOP
649      MOV      @0BUF,@0PC        ;LOAD THE DISPLAY P.C.
650      JSR      7,DLAY            ;EXECUTE A PROGRAM DELAY
651      MOV      @XPOS,R0          ;READ X POSITION
652      CMP      @525,R0
653      BEQ      .+4
654      HALT
655
656      ;X POSITION REGISTER FAILED TO LOAD
657      ;PROPERLY USING GRAPH PLOT X MODE
658
659      ;TEST THAT THE Y POSITION REGISTER CAN BE LOADED CORRECTLY
660      ;USING GRAPHPLOT Y MODE
661
662      003554  104000
663      003556  012777  126000  175236
664      003564  012777  001252  175232
665      003572  012777  172000  175226
666      003600  013777  001022  175244
667      003606  004737  012346
668      003612  017700  175242
669      003616  022700  001252
670      003622  001401
671      003624  000000
672
673      GT29:  SCOPE
674      MOV      @126000,@0BUF      ;LOW INTENSITY - SET GRAPH PLOT Y
675      MOV      @1252,@0BUF1      ;SET Y POSITION
676      MOV      @172000,@0BUF2    ;LOAD STATUS REGISTER A, STOP
677      MOV      @0BUF,@0PC        ;LOAD THE DISPLAY P.C.
678      JSR      7,DLAY            ;EXECUTE A PROGRAM DELAY
679      MOV      @YPOS,R0          ;READ Y POSITION
680      CMP      @1252,R0
681      BEQ      .+4
682      HALT
683
684      ;Y POSITION REGISTER FAILED TO LOAD
685      ;PROPERLY USING GRAPH PLOT Y MODE

```



```

660
661
662
663
664 003626 104000
665 003630 012777 126000 175164
666 003636 012777 000525 175160
667 003644 012777 172000 175154
668 003652 013777 001022 175172
669 003660 004737 012346
670 003664 017700 175170
671 003670 022700 000525
672 003674 001401
673 003676 000000
674
675
676
677
678
679
680 003700 104000
681 003702 012777 122000 175112
682 003710 012777 001234 175106
683 003716 012777 126000 175102
684 003724 012777 001432 175076
685 003732 012777 172000 175072
686 003740 013777 001022 175104
687 003746 004737 012346
688 003752 017700 175100
689 003756 022700 001234
690 003762 001402
691 003764 000000
692 003766 000406
693
694 003770 017700 175064
695 003774 022700 001432
696 004000 001401
697 004002 000000
698
699

```

```

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

```

```

GT30:  SCOPE
MOV      @126000, @DBUF      :LOW INTENSITY - SET GRAPHPLOT Y MODE
MOV      @525, @DBUF1       :SET Y POSITION
MOV      @172000, @DBUF2    :LOAD STATUS REGISTER A, STOP
MOV      @DBUF, @DPC        :LOAD THE DISPLAY P.C.
JSR      7, DLAY           :EXECUTE A PROGRAM DELAY
MOV      @YPOS, 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

```

```

GT31:  SCOPE
MOV      @122000, @DBUF      :LOW INTENSITY - SET GRAPHPLOT X MODE
MOV      @1234, @DBUF1       :SET X POSITION
MOV      @126000, @DBUF2    :SET GRAPHPLOT Y MODE
MOV      @1432, @DBUF3       :SET Y POSITION
MOV      @172000, @DBUF4    :LOAD STATUS REGISTER A, STOP
MOV      @DBUF, @DPC        :LOAD THE DISPLAY P.C.
JSR      7, DLAY           :EXECUTE A PROGRAM DELAY
MOV      @XPOS, R0         :READ X POSITION
CMP      @1234, R0
BEQ      .+6
HALT

:GRAPHPLOT X MODE FAILED TO SELECT
:X POSITION PROPERLY

GT32
MOV      @YPOS, R0         :READ Y POSITION
CMP      @1432, R0
BEQ      .+4
HALT

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

```



```

743
744
745
746
747 004164 104000
748 004166 012777 116000 174626
749 004174 012777 001252 174622
750 004202 012777 001252 174616
751 004210 012777 172000 174612
752 004216 013777 001022 174626
753 004224 004737 012346
754 004230 017700 174622
755 004234 022700 001252
756 004246 001402
757 004250 000000
758 004254 000406
759
760 004246 017700 174606
761 004250 022700 001252
762 004254 001401
763 004260 000000
764
765
766
767
768
769 004262 104000
770 004264 012777 116000 174530
771 004272 012777 000525 174524
772 004300 012777 000525 174520
773 004306 012777 172000 174514
774 004314 013777 001022 174530
775 004322 004737 012346
776 004326 017700 174524
777 004332 022700 000525
778 004336 001402
779 004340 000000
780 004342 000406
781
782 004344 017700 174510
783 004350 022700 000525
784 004354 001401
785 004356 000000
786
787

```

```

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

```

```

GT34: SCOPE
MOV 0116000,20BUF :LOW INTENSITY - POINT MODE
MOV 01252,20BUF1 :SET X POSITION
MOV 01252,20BUF2 :SET Y POSITION
MOV 0172000,20BUF3 :LOAD STATUS REGISTER A, STOP
MOV 0BUF,20PC
JSR 7,DLAY :EXECUTE A PROGRAM DELAY
MOV 20POS,R0 :READ X POSITION
CMP 01252,R0
BEQ .+6
HALT :X POSITION REGISTER FAILED
BR GT35 :USING POINT DATA MODE

MOV 20YPOS,R0 :READ Y POSITION
CMP 01252,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

```

```

GT35: SCOPE
MOV 0116000,20BUF :LOW INTENSITY - POINT MODE
MOV 0525,20BUF1 :SET X POSITION
MOV 0525,20BUF2 :SET Y POSITION
MOV 0172000,20BUF3 :LOAD STATUS REGISTER A, STOP
MOV 0BUF,20PC
JSR 7,DLAY :EXECUTE A PROGRAM DELAY
MOV 20POS,R0 :READ X POSITION
CMP 0525,R0
BEQ .+6
HALT :X POSITION REGISTER FAILED
BR GT36 :USING POINT DATA MODE

MOV 20YPOS,R0 :READ Y POSITION
CMP 0525,R0
BEQ .+4
HALT :Y POSITION REGISTER FAILED
:USING POINT DATA MODE

```

```

788
789
790
791
792
793 004360 104000
793 004362 012777 116000 174432
794 004370 012777 000000 174426
795 004376 012777 001777 174422
796 004404 012777 172000 174416
797 004412 013777 001022 174432
798 004420 004737 012346
799 004424 017700 174426
800 004430 022700 000000
801 004434 001402
802 004436 000000
803 004440 000406
804
805 004442 017700 174412
806 004446 022700 001777
807 004452 001401
808 004454 000000
809
810

```

```

;TEST THAT THE X-Y POSITION REGISTERS CAN BE LOADED CORRECTLY
;USING POINT DATA MODE
GT36: SCOPE
MOV #116000,20BUF ;LOW INTENSITY - POINT MODE
MOV #0,20BUF1 ;SET X POSITION
MOV #1777,20BUF2 ;SET Y POSITION
MOV #172000,20BUF3 ;LOAD STATUS REGISTER A, STOP
MOV 20BUF,20PC
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
MOV 20XPOS,RO ;READ X POSITION
CMP #0,RO
BEQ .+6
HALT ;X POSITION REGISTER FAILED
BR GT37 ;USING POINT DATA MODE
MOV 20YPOS,RO ;READ Y POSITION
CMP #1777,RO
BEQ .+4
HALT ;Y POSITION REGISTER FAILED
;USING POINT DATA MODE

```

```

811
812      ;TEST THAT LONG VECTOR MODE INCREMENTS X AND Y AXIS PROPERLY
813      ;COUNT 1
814
815      004456  104000
816      004460  013700  001022
817      004464  012720  116000
818      004470  005020
819      004472  005020
820      004474  012720  110000
821      004500  012720  000001
822      004504  012720  000001
823      004510  012710  172000
824      004514  013777  001022  174330
825      004522  004737  012346
826
827      004526  017700  174324
828      004532  022700  000001
829      004536  001402
830      004540  000000
831      004542  000406
832
833      004544  017700  174310
834      004550  022700  000001
835      004554  001401
836      004556  000000
837
838
839      ;TEST THAT LONG VECTOR MODE DECREMENT X AND Y AXIS PROPERLY
840      ;COUNT 1
841
842      004560  104000
843      004562  013700  001022
844      004566  012720  116000
845      004572  005020
846      004574  005020
847      004576  012720  110000
848      004602  012720  020001
849      004606  012720  020001
850      004612  012710  172000
851      004616  013777  001022  174226
852      004624  004737  012346
853
854      004630  017700  174222
855      004634  022700  001777
856      004640  001402
857      004642  000000
858      004644  000406
859
860      004646  017700  174206
861      004652  022700  001777
862      004656  001401
863      004660  000000
864

```

```

GT37:  SCOPE
      MOV      DBUF,RO
      MOV      @116000,(0)+      ;LOAD "POINT MODE"
      CLR      (0)+              ;CLEAR X AXIS
      CLR      (0)+              ;CLEAR Y AXIS
      MOV      @110000,(0)+      ;LOAD "LONG VECTOR MODE"
      MOV      @1,(0)+           ;PRESET "DELTA X AXIS"
      MOV      @1,(0)+           ;PRESET "DELTA Y AXIS"
      MOV      @172000,(0)       ;LOAD "DISPLAY STOP"
      MOV      DBUF,@PC          ;LOAD THE DISPLAY P.C.
      JSR      7,DLAY           ;EXECUTE A PROGRAM DELAY

      MOV      @XPOS,RO          ;READ X AXIS
      CMP      @1,RO             ;DID IT INCREMENT BY 1
      BEQ      .+6               ;YES
      HALT                       ;NO, INCREMENT X AXIS BY
      BR      GT38              ;LONG VECTOR MODE FAILED

      MOV      @YPOS,RO          ;READ Y AXIS
      CMP      @1,RO             ;DID IT INCREMENT BY 1
      BEQ      .+4               ;YES
      HALT                       ;NO, INCREMENT Y AXIS BY

```

```

GT38:  SCOPE
      MOV      DBUF,RO
      MOV      @116000,(0)+      ;LOAD "POINT MODE"
      CLR      (0)+              ;CLEAR X AXIS
      CLR      (0)+              ;CLEAR Y AXIS
      MOV      @110000,(0)+      ;LOAD "LONG VECTOR MODE"
      MOV      @20001,(0)+       ;PRESET "DELTA X AXIS"
      MOV      @20001,(0)+       ;PRESET "DELTA Y AXIS"
      MOV      @172000,(0)       ;LOAD "DISPLAY STOP"
      MOV      DBUF,@PC          ;LOAD THE DISPLAY P.C.
      JSR      7,DLAY           ;EXECUTE A PROGRAM DELAY

      MOV      @XPOS,RO          ;READ X AXIS
      CMP      @1777,RO         ;DID IT DECREMENT BY 1
      BEQ      .+6               ;YES
      HALT                       ;NO, DECREMENT X AXIS BY
      BR      GT39              ;LONG VECTOR MODE FAILED

      MOV      @YPOS,RO          ;READ Y AXIS
      CMP      @1777,RO         ;DID IT DECREMENT BY 1
      BEQ      .+4               ;YES
      HALT                       ;NO, DECREMENT Y AXIS BY

```

```

865
866
867
868
869 004662 104000
870 004664 012703 001777
871 004670 012704 000001
872
873 004674 104000
874 004676 013700 001022
875 004702 012720 116000
876 004706 005020
877 004710 005020
878 004712 012720 110000
879 004716 010420
880 004720 010420
881 004722 012720 172000
882 004726 013777 001022 174116
883 004734 004737 012346
884
885 004740 017700 174112
886 004744 020400
887 004746 001402
888 004750 000000
889 004752 000411
890
891 004754 017700 174100
892 004760 020400
893 004762 001402
894 004764 000000
895 004766 000403
896
897 004770 005204
898 004772 005303
899 004774 001340

```

```

;TEST THAT LONG VECTOR MODE INCREMENT X AND Y AXIS PROPERLY
;COUNT 0-1777
GT39:  SCOPE
      MOV  #1777,R3      ;SET UP A COUNTER
      MOV  #1,R4        ;PRESET THE COMPARED VALUE
GT39A: SCOPE
      MOV  DBUF,RO      ;SET UP RO
      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  #172000,(0)+
      MOV  DBUF,ROPC    ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY       ;EXECUTE A PROGRAM DELAY
      MOV  #XPOS,RO     ;READ X AXIS
      CMP  R4,RO        ;ARE THEY EQUAL?
      BEQ  .+6          ;YES
      HALT              ;NO, INCREMENT X AXIS VIA
      BR   GT40         ;LONG VECTOR MODE FAILED
      MOV  #YPOS,RO     ;READ Y AXIS
      CMP  R4,RO        ;ARE THEY EQUAL?
      BEQ  .+6          ;YES
      HALT              ;NO, INCREMENT Y AXIS VIA
      BR   GT40         ;LONG VECTOR MODE FAILED
      INC  R4           ;INCREMENT EXPECTED VALUE
      DEC  R3           ;FINISHED?
      BNE  GT39A        ;NO, TEST MORE DATA

```

```

900
901      ;TEST THAT LONG VECTOR MODE DECREMENTS X AND Y AXIS PROPERLY
902      ;COUNT 1777-0
903
904      004776  104000
905      005000  012703  002000
906      005004  012704  001777
907      005010  012705  020001
908
909      005014  104000
910      005016  013700  001022
911      005022  012720  116000
912      005026  005020
913      005030  005020
914      005032  012720  110000
915      005036  010520
916      005040  010520
917      005042  012710  172000
918      005046  013777  001022  173776
919      005054  004737  012346
920
921      005060  017700  173772
922      005064  020400
923      005066  001402
924      005070  000000
925      005072  000412
926
927      005074  017700  173760
928      005100  020400
929      005102  001402
930      005104  000000
931      005106  000404
932
933      005110  005205
934      005112  005304
935      005114  005303
936      005116  001337

```

```

GT40:  SCOPE
      MOV  #2000,R3      ;SET UP A COUNTER
      MOV  #1777,R4      ;PRESET THE COMPARED VALUE
      MOV  #2000!,R5

GT40A: SCOPE
      MOV  DBUF,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  R5,(0)+      ;PRESET "DELTA X AXIS"
      MOV  R5,(0)+      ;PRESET "DELTA Y AXIS"
      MOV  #172000,(0)
      MOV  DBUF,30PC    ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY      ;EXECUTE A PROGRAM DELAY

      MOV  2XPOS,R0     ;READ X AXIS
      CMP  R4,R0        ;ARE THEY EQUAL?
      BEQ  .+6          ;YES
      HALT              ;NO, DECREMENT X AXIS VIA
      BR   GT41        ;LONG VECTOR MODE FAILED

      MOV  2YPOS,R0     ;READ Y AXIS
      CMP  R4,R0        ;ARE THEY EQUAL?
      BEQ  .+6          ;YES
      HALT              ;NO, DECREMENT Y AXIS VIA
      BR   GT41        ;LONG VECTOR MODE FAILED

      INC  R5           ;INCREMENT "DELTA X-Y"
      DEC  R4           ;DECREMENT EXPECTED VALUE
      DEC  R3           ;FINISHED?
      BNE GT40A        ;NO, TEST MORE DATA

```

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:TEST THAT X AND Y AXIS INCREMENTS PROPERLY
:USING SHORT VECTOR MODE
:COUNT 1

```

GT41:  SCOPE
        MOV    DBUF,RO          ;SET UP RO
        MOV    @116000,(0)+    ;LOAD "SET POINT MODE"
        CLR    (0)+            ;CLEAR X AXIS
        CLR    (0)+            ;CLEAR Y AXIS
        MOV    @106000,(0)+    ;LOAD "SET SHORT VECTOR MODE"
        MOV    @201,(0)+      ;PRESET "DELTA X AND DELTA Y"
        MOV    @172000,(0)
        MOV    DBUF,@PC        ;LOAD THE DISPLAY PC
        JSR    7,DLAY          ;EXECUTE A PROGRAM DELAY

        MOV    @XPOS,RO        ;READ X AXIS
        CMP    @1,RO           ;ARE THEY EQUAL?
        BEQ    .+6             ;YES
        HALT                    ;NO, INCREMENT X AXIS FAILED USING
        BR     GT42            ;SHORT VECTOR MODE

        MOV    @YPOS,RO        ;READ Y AXIS
        CMP    @1,RO           ;ARE THEY EQUAL?
        BEQ    .+4             ;YES
        HALT                    ;NO INCREMENT Y AXIS FAILED
        ;USING SHORT VECTOR MODE

```

173672

:TEST THAT X AND Y AXIS DECREMENT PROPERLY
:USING SHORT VECTOR MODE
:COUNT 1

```

GT42:  SCOPE
        MOV    DBUF,RO          ;SET UP RO
        MOV    @116000,(0)+    ;LOAD "SET POINT MODE"
        CLR    (0)+            ;CLEAR X AXIS
        CLR    (0)+            ;CLEAR Y AXIS
        MOV    @106000,(0)+    ;LOAD "SET SHORT VECTOR MODE"
        MOV    @20301,(0)+    ;PRESET "DELTA X AND DELTA Y"
        MOV    @172000,(0)
        MOV    DBUF,@PC        ;LOAD THE DISPLAY PC
        JSR    7,DLAY          ;EXECUTE A PROGRAM DELAY

        MOV    @XPOS,RO        ;READ X AXIS
        CMP    @1777,RO        ;ARE THEY EQUAL?
        BEQ    .+6             ;YES
        HALT                    ;NO, DECREMENT X AXIS FAILED USING
        BR     GT43            ;SHORT VECTOR MODE

        MOV    @YPOS,RO        ;READ Y AXIS
        CMP    @1777,RO        ;ARE THEY EQUAL?
        BEQ    .+4             ;YES
        HALT                    ;NO DECREMENT Y AXIS FAILED
        ;USING SHORT VECTOR MODE

```

173574


```

990
991
992
993
994
995 005314 104000
996 005316 012703 000077
997 005322 012702 000001
998 005326 012704 000201
999
1000 005332 104000
1001 005334 013700 001022
1002 005340 012720 116000
1003 005344 005020
1004 005346 005020
1005 005350 012720 106000
1006 005354 010420
1007 005356 012710 172000
1008 005362 013777 001022 173462
1009 005370 004737 012346
1010
1011 005374 017700 173456
1012 005400 020200
1013 005402 001402
1014 005404 000000
1015 005406 000413
1016
1017 005410 017700 173444
1018 005414 020200
1019 005416 001402
1020 005420 000000
1021 005422 000405
1022
1023 005424 062704 000201
1024 005430 005202
1025 005432 005303
1026 005434 001337

```

```

:TEST THAT X AND Y AXIS INCREMENT PROPERLY
:USING SHORT VECTOR MODE
:COUNT 0-77
GT43:  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"
GT43A: 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  #172000,(0)
      MOV  DBUF,#DPC     ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY       ;EXECUTE A PROGRAM DELAY
      MOV  @XPOS,R0      ;READ X POSITION
      CMP  R2,R0         ;ARE THEY EQUAL
      BEQ  .+6          ;YES
      HALT              ;INCREMENT X AXIS FAILED USING
      BR   GT44         ;SHORT VECTOR MODE
      MOV  @YPOS,R0      ;READ Y POSITION
      CMP  R2,R0         ;ARE THEY EQUAL ?
      BEQ  .+6          ;YES
      HALT              ;INCREMENT Y AXIS FAILED USING
      BR   GT44         ;SHORT VECTOR MODE
      ADD  #201,R4       ;ADD DELTA X-Y
      INC  R2            ;INCREMENT EXPECTED VALUE
      DEC  R3            ;DECREMENT COUNT, FINISHED?
      BNE  GT43A        ;NO, TEST MORE DATA

```

M02

```

1027
1028
1029
1030
1031
1032 005436 104000
1033 005440 012703 000077
1034 005444 012702 001777
1035 005450 012704 020301
1036
1037 005454 104000
1038 005456 013700 001022
1039 005462 012720 116000
1040 005466 005020
1041 005470 005020
1042 005472 012720 106000
1043 005476 010420
1044 005500 012710 172000
1045 005504 013777 001022 173340
1046 005512 004737 012346
1047
1048 005516 017700 173334
1049 005522 020200
1050 005524 001402
1051 005526 000000
1052 005530 000413
1053
1054 005532 017700 173322
1055 005536 020200
1056 005540 001402
1057 005542 000000
1058 005544 000405
1059
1060 005546 062704 000201
1061 005552 005302
1062 005554 005303
1063 005556 001337
1064

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

GT44:  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"

GT44A: 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  #172000,(0)
      MOV  DBUF,DPCH     ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY        ;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   GT45          ;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   GT45          ;SHORT VECTOR MODE

      ADD  #201,R4        ;ADD "DELTA X-Y"
      DEC  R2             ;DECREMENT EXPECTED VALUE
      DEC  R3             ;DECREMENT COUNT, FINISHED?
      BNE  GT44A         ;NO, TEST MORE DATA
    
```

```

1065          ;TEST THAT X AND Y ASIS INCREMENTS PROPERLY
1066          ;USING RELATIVE POINT MODE
1067          ;COUNT 1
1068
1069          GT45: SCOPE
1070          005560 104000          MOV      DBUF,RO          ;SET UP RO
1071          005562 013700 001022  MOV      #116000,(0)+    ;LOAD "SET POINT MODE"
1072          005566 012720 116000  CLR      (0)+            ;CLEAR X AXIS
1073          005572 005020          CLR      (0)+            ;CLEAR Y AXIS
1074          005574 005020          MOV      #130000,(0)+    ;LOAD "SET RELATIVE POINT MODE"
1075          005576 012720 130000  MOV      #201,(0)+       ;PRESET "DELTA X AND DELTA Y"
1076          005602 012720 000201  MOV      #172000,(0)
1077          005606 012710 172000  MOV      DBUF,ADPC
1078          005612 013777 001022  JSR      7,DLAY          ;LOAD THE DISPLAY PC
1079          005620 004737 012346          ;EXECUTE A PROGRAM DELAY
1080          005624 017700 173226  MOV      @XPOS,RO        ;READ X AXIS
1081          005630 022700 000001  CMP      #1,RO           ;ARE THEY EQUAL?
1082          005634 001402          BEQ      .+6             ;YES
1083          005636 000000          HALT
1084          005640 000406          BR       GT46           ;NO, INCREMENT X AXIS FAILED USING
1085                                     ;RELATIVE POINT MODE
1086          005642 017700 173212  MOV      @YPOS,RO        ;READ Y AXIS
1087          005646 022700 000001  CMP      #1,RO           ;ARE THEY EQUAL?
1088          005652 001401          BEQ      .+4             ;YES
1089          005654 000000          HALT                    ;NO INCREMENT Y AXIS FAILED
1090                                     ;USING RELATIVE POINT MODE
1091
1092          ;TEST THAT X AND Y AXIS DECREMENT PROPERLY
1093          ;USING RELATIVE POINT MODE
1094          ;COUNT 1
1095
1096          GT46: SCOPE
1097          005656 104000          MOV      DBUF,RO          ;SET UP RO
1098          005660 013700 001022  MOV      #116000,(0)+    ;LOAD "SET POINT MODE"
1099          005664 012720 116000  CLR      (0)+            ;CLEAR X AXIS
1100          005670 005020          CLR      (0)+            ;CLEAR Y AXIS
1101          005672 005020          MOV      #130000,(0)+    ;LOAD "SET RELATIVE POINT MODE"
1102          005674 012720 130000  MOV      #20301,(0)+     ;PRESET "DELTA X AND DELTA Y"
1103          005700 012720 020301  MOV      #172000,(0)
1104          005704 012710 172000  MOV      DBUF,ADPC
1105          005710 013777 001022  JSR      7,DLAY          ;LOAD THE DISPLAY PC
1106          005716 004737 012346          ;EXECUTE A PROGRAM DELAY
1107          005722 017700 173130  MOV      @XPOS,RO        ;READ X AXIS
1108          005726 022700 001777  CMP      #1777,RO        ;ARE THEY EQUAL?
1109          005732 001402          BEQ      .+6             ;YES
1110          005734 000000          HALT                    ;NO, DECREMENT X AXIS FAILED USING
1111          005736 000406          BR       GT47           ;RELATIVE POINT MODE
1112
1113          005740 017700 173114  MOV      @YPOS,RO        ;READ Y AXIS
1114          005744 022700 001777  CMP      #1777,RO        ;ARE THEY EQUAL?
1115          005750 001401          BEQ      .+4             ;YES
1116          005752 000000          HALT                    ;NO DECREMENT Y AXIS FAILED
1117                                     ;USING RELATIVE POINT MODE

```

173232

173134

```

1118
1119
1120
1121
1122
1123 005754 104000
1124 005756 012703 000077
1125 005762 012702 000001
1126 005766 012704 000201
1127
1128 005772 104000
1129 005774 013700 001022
1130 006000 012720 116000
1131 006004 005020
1132 006006 005020
1133 006010 012720 130000
1134 006014 010420
1135 006016 012710 172000
1136 006022 013777 001022 173022
1137 006030 004737 012346
1138
1139 006034 017700 173016
1140 006040 020200
1141 006042 001402
1142 006044 000000
1143 006046 000413
1144
1145 006050 017700 173004
1146 006054 020200
1147 006056 001402
1148 006060 000000
1149 006062 000405
1150
1151 006064 062704 000201
1152 006070 005202
1153 006072 005303
1154 006074 001337

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

GT47:  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"

GT47A: 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  #172000,(0)
      MOV  DBUF,DPAC      ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY        ;EXECUTE A PROGRAM DELAY

      MOV  @XPOS,R0       ;READ X POSITION
      CMP  R2,R0          ;ARE THEY EQUAL
      BEQ  .+6            ;YES
      HALT                ;INCREMENT X AXIS FAILED USING
      BR   GT48           ;RELATIVE POINT MODE

      MOV  @YPOS,R0       ;READ Y POSITION
      CMP  R2,R0          ;ARE THEY EQUAL ?
      BEQ  .+6            ;YES
      HALT                ;INCREMENT Y AXIS FAILED USING
      BR   GT48           ;RELATIVE POINT MODE

      ADD  #201,R4        ;ADD DELTA X-Y
      INC  R2             ;INCREMENT EXPECTED VALUE
      DEC  R3             ;DECREMENT COUNT, FINISHED?
      BNE  GT47A         ;NO, TEST MORE DATA

```

```

1155
1156
1157
1158
1159
1160 006076 104000
1161 006100 012703 000077
1162 006104 012702 001777
1163 006110 012704 020301
1164
1165 006114 104000
1166 006116 013700 001022
1167 006122 012720 116000
1168 006126 005020
1169 006130 005020
1170 006132 012720 130000
1171 006136 010420
1172 006140 012710 172000
1173 006144 013777 001022 172700
1174 006152 004737 012346
1175
1176 006156 017700 172674
1177 006162 020200
1178 006164 001402
1179 006166 000000
1180 006170 000413
1181
1182 006172 017700 172662
1183 006176 020200
1184 006200 001402
1185 006202 000000
1186 006204 000405
1187
1188 006206 062704 000201
1189 006212 005302
1190 006214 005303
1191 006216 001337
1192

```

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

```

GT48:  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"

GT48A: 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  #172000,(0)
      MOV  DBUF,#0PC      ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY         ;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   GT49           ;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   GT49           ;RELATIVE POINT MODE

      ADD  #201,R4        ;ADD "DELTA X-Y"
      DEC  R2             ;DECREMENT EXPECTED VALUE
      DEC  R3             ;DECREMENT COUNT, FINISHED?
      BNE  GT48A         ;NO, TEST MORE DATA

```

```

1193
1194
1195
1196
1197
1198
1199 006220 104000
1200 006222 012703 000077
1201 006226 012704 000001
1202 006232 012737 174101 001036
1203
1204 006240 104000
1205 006242 013700 001022
1206 006246 012720 116000
1207 006250 005020
1208 006254 005020
1209 006256 013720 001036
1210 006262 012720 120000
1211 006266 005020
1212 006270 012710 172000
1213 006274 013777 001022 172550
1214 006302 004737 012346
1215
1216 006306 017700 172546
1217 006312 020400
1218 006314 001402
1219 006316 000000
1220 006320 000405
1221
1222 006322 005237 001036
1223 006326 005204
1224 006330 005303
1225 006332 001343

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

GT49: SCOPE
      MOV #77,R3 ;SET UP EXECUTION COUNTER
      MOV #1,R4 ;SET UP COMPARED DATA
      MOV #174101,DSAVE ;SET UP BASIC "LOAD STATUS B"

GT49A: SCOPE
      MOV DBUF,RO ;SET UP RO
      MOV #116000,(0)+ ;LOAD "POINT MODE"
      CLR (0)+ ;CLEAR X AXIS
      CLR (0)+ ;CLEAR Y AXIS
      MOV DSAVE,(0)+ ;LOAD "SET STATUS B"
      MOV #120000,(0)+ ;LOAD "SET GRAPHLOT X MODE"
      CLR (0)+ ;LOAD "X GRAPHLOT DATA"
      MOV #172000,(0)
      MOV DBUF,ROPC ;LOAD THE DISPLAY P.C.
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

      MOV JYPOS,RO ;READ Y AXIS
      CMP R4,RO ;COMPARE TO EXPECTED VALUE
      BEQ .+6 ;ARE THEY EQUAL?
      HALT ;LOAD "STATUS B" FAILED TO LOAD
      BR GT50 ;THE Y AXIS CORRECTLY

      INC DSAVE
      INC R4 ;INCREMENT THE STATUS B COUNT
      DEC R3 ;DECREMENT THE EXECUTION COUNT
      BNE GT49A ;TEST MORE DATA
    
```

```

1226
1227
1228
1229
1230
1231 006334 104000
1232 006336 012703 000077
1233 006342 012704 000001
1234 006346 012737 174101 001036
1235
1236 006354 104000
1237 006356 013700 001022
1238 006362 012720 116000
1239 006366 005020
1240 006370 005020
1241 006372 013720 001036
1242 006376 012720 124000
1243 006402 005020
1244 006404 012710 172000
1245 006410 013777 001022 172434
1246 006416 004737 012346
1247
1248 006422 017700 172430
1249 006426 042700 176000
1250 006432 020400
1251 006434 001402
1252 006436 000000
1253 006440 000405
1254
1255 006442 005237 001036
1256 006446 005204
1257 006450 005303
1258 006452 001341
1259
1260 006454 012777 174100 172340
1261 006462 012777 172000 172334
1262 006470 013777 001022 172354

;LOAD STATUS B TEST
;USE GRAPHLOT Y MODE TO TEST X AXIS IS INCREMENTED BY
;"SCALE" REGISTER

GT50: SCOPE
      MOV      #77,R3          ;SET UP EXECUTION COUNTER
      MOV      #1,R4          ;SET UP COMPARED DATA
      MOV      #174101,DSAVE ;SET UP BASIC "LOAD STATUS B"

GT50A: SCOPE
      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 GRAPHLOT Y MODE"
      CLR      (0)+          ;LOAD "Y GRAPHLOT DATA"
      MOV      #172000,(0)
      MOV      DBUF,30PC     ;LOAD THE DISPLAY P.C.
      JSR      7,DLAY        ;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?
      ;LOAD "STATUS B" FAILED TO LOAD
      ;THE X AXIS CORRECTLY

      INC      DSAVE
      INC      R4            ;INCREMENT THE STATUS B COUNT
      DEC      R3            ;DECREMENT THE EXECUTION COUNT
      BNE     GT50A        ;TEST MORE DATA

GT50B: MOV      #174100,30BUF
      MOV      #172000,30BUF1
      MOV      DBUF,30PC

```

```

1263                                     ;TEST THAT THE EDGE FLAG IS NOT SET AT 1777,0
1264
1265 006476 104000
1266 006500 013700 001022
1267 006504 012720 116000
1268 006510 012720 001777
1269 006514 012720 000000
1270 006520 012720 172000
1271 006524 013777 001022 172320
1272 006532 004737 012346
1273
1274 006536 032777 000040 172310
1275 006544 001401
1276 006546 000000
1277
1278                                     ;EDGE FLAG TEST
1279                                     ;TEST THAT EXCEEDING +X AXIS SETS EDGE FLAG
1280
1281 006550 104000
1282 006552 013700 001022
1283 006556 012720 116000
1284 006562 012720 001777
1285 006566 012720 000000
1286 006572 012720 110000
1287 006576 012720 000001
1288 006602 012720 000000
1289 006606 012720 172000
1290 006612 013777 001022 172232
1291 006620 004737 012346
1292
1293 006624 032777 000040 172222
1294 006632 001002
1295 006634 000000
1296 006636 000424
1297
1298
1299                                     ;SUB-TEST, TEST THAT THE EDGE FLAG CLEARS
1300
1301 006640 013700 001022
1302 006644 012720 116000
1303 006650 012720 001777
1304 006654 012720 000000
1305 006660 012720 172000
1306 006664 013777 001022 172160
1307 006672 004737 012346
1308
1309 006676 032777 000040 172150
1310 006704 001401
1311 006706 000000

```

```

GT51: SCOPE
      MOV DBUF,RO
      MOV #116000,(0)+ ;LOAD POINT
      MOV #1777,(0)+ ;LOAD X
      MOV #0,(0)+ ;LOAD Y
      MOV #172000,(0)+ ;LOAD STOP
      MOV DBUF,30PC ;START
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      BIT #40,3DSR
      BEQ .+4
      HALT ;ERROR, EDGE FLAG SET ON 1777,0

```

```

GT52: SCOPE
      MOV DBUF,RO
      MOV #116000,(0)+ ;LOAD POINT
      MOV #1777,(0)+ ;LOAD MAX X
      MOV #0,(0)+ ;LOAD Y
      MOV #110000,(0)+ ;LOAD LONG VECTOR
      MOV #1,(0)+ ;LOAD DELTA X
      MOV #0,(0)+ ;LOAD DELTA Y
      MOV #172000,(0)+ ;LOAD STOP
      MOV DBUF,30PC ;START DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      BIT #40,3DSR ;TEST BIT 5
      BNE .+6
      HALT ;EDGE FLAG FAILED TO SET
      BR GT53

```

```

GT53: SCOPE
      MOV DBUF,RO
      MOV #116000,(0)+ ;LOAD POINT
      MOV #1777,(0)+ ;LOAD X
      MOV #0,(0)+ ;LOAD Y
      MOV #172000,(0)+ ;LOAD STOP
      MOV DBUF,30PC ;START DISPLAY
      JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
      BIT #40,3DSR
      BEQ .+4
      HALT ;ERROR, EDGE FLAG FAILED TO CLEAR

```


1312					
1313					
1314					
1315					;EDGE FLAG TEST
1316					;TEST THAT EXCEEDING -X AXIS SETS EDGE FLAG
1317	006710	104000			GT53: SCOPE
1318	006712	013700	001022		MOV DBUF,RO
1319	006716	012720	116000		MOV #116000,(0)+ ;LOAD POINT
1320	006722	012720	000000		MOV #0,(0)+ ;LOAD MAX X
1321	006726	012720	000000		MOV #0,(0)+ ;LOAD Y
1322	006732	012720	110000		MOV #110000,(0)+ ;LOAD LONG VECTOR
1323	006736	012720	020001		MOV #20001,(0)+ ;LOAD DELTA X
1324	006742	012720	000000		MOV #0,(0)+ ;LOAD DELTA Y
1325	006746	012720	172000		MOV #172000,(0)+ ;LOAD STOP
1326	006752	013777	001022	172072	MOV DBUF,30PC ;START DISPLAY
1327	006760	004737	012346		JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1328					
1329	006764	032777	000040	172062	BIT #40,30SR ;TEST BIT 5
1330	006772	001002			BNE .+6
1331	006774	000000			HALT ;EDGE FLAG FAILED TO SET
1332	006776	000424			BR GT54
1333					
1334					;SUB-TEST, TEST THAT THE EDGE FLAG CLEARS
1335					
1336	007000	013700	001022		MOV DBUF,RO
1337	007004	012720	116000		MOV #116000,(0)+ ;LOAD POINT
1338	007010	012720	000000		MOV #0,(0)+ ;LOAD X
1339	007014	012720	000000		MOV #0,(0)+ ;LOAD Y
1340	007020	012720	172000		MOV #172000,(0)+ ;LOAD STOP
1341	007024	013777	001022	172020	MOV DBUF,30PC ;START DISPLAY
1342	007032	004737	012346		JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1343					
1344	007036	032777	000040	172010	BIT #40,30SR
1345	007044	001401			BEG .+4
1346	007046	000000			HALT ;ERROR, DEGE FLAG FAILED TO CLEAR


```

1400          ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1401          ; CODE 00
1402
1403          GT56:  SCOPE
1404          007276 104000          MOV      #100000,20BUF      ;LOAD "CHARACTER MODE"
1405          007300 012777 100000 171514      MOV      #0,20BUF1        ;LOAD "NULL" CHARACTER
1406          007306 012777 000000 171510      MOV      #172000,20BUF2
1407          007314 012777 172000 171504      MOV      0BUF,20PC
1408          007322 013777 001022 171522      JSR      7,DLAY           ;START DISPLAY
1409          007330 004737 012346             JSR      7,DLAY           ;EXECUTE A PROGRAM DELAY
1410          007334 017700 171520             MOV      2YPOS,RO        ;READ CHARACTER REG.
1411          007340 042700 001777             BIC      #1777,RO        ;MASK TO BITS 10-15
1412          007344 022700 000000             CMP      #0,RO
1413          007350 001401             BEQ      .+4
1414          007352 000000             HALT
1415          ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1416
1417          ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1418          ; CODE 77
1419
1420          GT57:  SCOPE
1421          007354 104000          MOV      #100000,20BUF      ;LOAD "CHARACTER MODE"
1422          007356 012777 100000 171436      MOV      #77,20BUF1       ;LOAD CHARACTER
1423          007364 012777 000077 171432      MOV      #172000,20BUF2
1424          007372 012777 172000 171426      MOV      0BUF,20PC
1425          007400 013777 001022 171444      JSR      7,DLAY           ;START DISPLAY
1426          007406 004737 012346             JSR      7,DLAY           ;EXECUTE A PROGRAM DELAY
1427          007412 017700 171442             MOV      2YPOS,RO        ;READ CHARACTER REG.
1428          007416 042700 001777             BIC      #1777,RO        ;MASK TO BITS 10-15
1429          007422 022700 176000             CMP      #176000,RO
1430          007426 001401             BEQ      .+4
1431          007430 000000             HALT
1432          ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1433
1434          ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1435          ; CODE 25
1436
1437          GT58:  SCOPE
1438          007432 104000          MOV      #100000,20BUF      ;LOAD "CHARACTER MODE"
1439          007434 012777 100000 171360      MOV      #25,20BUF1       ;LOAD CHARACTER
1440          007442 012777 000025 171354      MOV      #172000,20BUF2
1441          007450 012777 172000 171350      MOV      0BUF,20PC
1442          007456 013777 001022 171366      JSR      7,DLAY           ;START DISPLAY
1443          007464 004737 012346             JSR      7,DLAY           ;EXECUTE A PROGRAM DELAY
1444          007470 017700 171364             MOV      2YPOS,RO        ;READ CHARACTER REG.
1445          007474 042700 001777             BIC      #1777,RO        ;MASK TO BITS 10-15
1446          007500 022700 052000             CMP      #52000,RO
1447          007504 001401             BEQ      .+4
1448          007506 000000             HALT
1449          ;ERROR, CHARACTER REGISTER LOADED IN ERROR

```

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1444
1445
1446
1447
1448 007510 104000
1449 007512 012777 100000 171302
1450 007520 012777 000052 171276
1451 007526 012777 172000 171272
1452 007534 013777 001022 171310
1453 007542 004737 012346
1454 007546 017700 171306
1455 007552 042700 001777
1456 007556 022700 124000
1457 007562 001401
1458 007564 000000
1459
1460
1461
1462
1463 007566 104000
1464 007570 012777 116000 171224
1465 007576 012777 001000 171220
1466 007604 012777 001000 171214
1467 007612 012777 100000 171210
1468 007620 005077 171206
1469 007624 012777 172000 171202
1470 007632 013777 001022 171212
1471 007640 004737 012346
1472
1473 007644 017700 171210
1474 007650 042700 001777
1475 007654 022700 000000
1476 007660 001402
1477 007662 000000
1478 007664 000417
1479
1480 007666 017700 171164
1481 007672 022700 001000
1482 007676 001402
1483 007700 000000
1484 007702 000410
1485
1486 007704 017700 171150
1487 007710 042700 176000
1488 007714 022700 001000
1489 007720 001401
1490 007722 000000
1491

```

```

;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
; CODE 52
GT59: SCOPE
      MOV      #100000,30BUF ;LOAD "CHARACTER MODE"
      MOV      #52,30BUF1 ;LOAD CHARACTER
      MOV      #172000,30BUF2
      MOV      DBUF,30PC ;START DISPLAY
      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV      @YPOS,RO ;READ CHARACTER REG.
      BIC      #1777,RO ;MASK TO BITS 10-15
      CMP      #124000,RO
      BEQ      .+4
      HALT ;ERROR, CHARACTER REGISTER LOADED IN ERROR

;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
;TEST THAT "NULL" DOES NOT CHANGE X OR Y AXIS
GT60: SCOPE
      MOV      #116000,30BUF ;POINT MODE
      MOV      #1000,30BUF1
      MOV      #1000,30BUF2 ;1000,1000
      MOV      #100000,30BUF3 ;LOAD "CHARACTER MODE"
      CLR      30BUF4 ;NULL CHARACTER
      MOV      #172000,30BUF5
      MOV      DBUF,30PC ;LOAD THE DISPLAY P.C.
      JSR      7,DLAY ;EXECUTE A PROGRAM DELAY
      MOV      @YPOS,RO ;READ CHARACTER REGISTER
      BIC      #1777,RO ;MASK TO BITS 10-15
      CMP      #0,RO
      BEQ      .+6
      HALT ;CHARACTER REGISTER IN ERROR
      BR      GT61
      MOV      @XPOS,RO ;READ X AXIS
      CMP      #1000,RO ;ARE THEY EQUAL ?
      BEQ      .+6 ;YES
      HALT ;"NULL" CHARACTER CHANGED X AXIS
      BR      GT61
      MOV      @YPOS,RO ;READ Y AXIS
      BIC      #176000,RO ;MASK TO BITS 0-9
      CMP      #1000,RO ;ARE THEY EQUAL ?
      BEQ      .+4 ;YES
      HALT ;"NULL" CHARACTER CHANGED Y AXIS

```

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

1492
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1500
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1524
1525

007724 104000
007726 012777 116000 171066
007734 012777 001000 171062
007742 012777 001000 171056
007750 012777 100000 171052
007756 012777 000015 171046
007764 012777 172000 171042
007772 013777 001022 171052
010000 004737 012346

010004 017700 171050
010010 042700 001777
010014 022700 032000

010020 001402
010022 000000
010024 000417

010026 017700 171024
010032 022700 000000

010036 021402
010040 000000
010042 000410

010044 017700 171010
010050 042700 176000
010054 022700 001000
010060 001401
010062 000000

GT61: SCOPE
MOV @116000, @DBUF ;POINT MODE
MOV @1000, @DBUF1 ;1000,1000
MOV @1000, @DBUF2 ;LOAD "CHARACTER MODE"
MOV @100000, @DBUF3 ;LOAD "CR"
MOV @15, @DBUF4 ;LOAD STOP
MOV @172000, @DBUF5 ;LOAD THE DISPLAY P.C.
DBUF @DBUF @DPC ;EXECUTE A PROGRAM DELAY
JSR 7, DLAY

MOV @YPOS, R0 ;READ Y AXIS
BIC @1777, R0 ;MASK TO BITS 10-15
CMP @32000, R0
BEQ .+6 ;CHARACTER REGISTER FAILED TO LOAD CORRECTLY
BR GT62

MOV @XPOS, R0 ;READ X AXIS
CMP @0, R0 ;ARE THEY EQUAL ?
BEQ .+6 ;YES
HALT ;"CR" CHARACTER FAILED TO CHANGED X AXIS CORRECTLY
BR GT62

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

```

1526
1527
1528
1529
1530
1531 010064 104000
1532 010066 012777 116000 170726
1533 010074 012777 001000 170722
1534 010102 012777 001000 170716
1535 010110 012777 100000 170712
1536 010116 012777 000012 170706
1537 010124 012777 172000 170702
1538 010132 013777 001022 170712
1539 010140 004737 012346
1540
1541 010144 017700 170710
1542 010150 042700 001777
1543 010154 022700 024000
1544 010160 001402
1545 010162 000000
1546 010164 000477
1547
1548 010166 017700 170664
1549 010172 022700 001000
1550 010176 001402
1551 010200 000000
1552 010202 000470
1553
1554 010204 017700 170650
1555 010210 042700 176000
1556 010214 023700 001046
1557 010220 001401
1558 010222 000000
1559

```

```

;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
;TEST THAT "LF" DOES NOT CHANGE X BUT DOES CHANGE Y AXIS
GT62: SCOPE
MOV @116000, @DBUF ;POINT MODE
MOV @1000, @DBUF1
MOV @1000, @DBUF2 ;1000,1000
MOV @100000, @DBUF3 ;LOAD "CHARACTER MODE"
MOV @12, @DBUF4
MOV @172000, @DBUF5
MOV @DBUF, @DPC ;LOAD THE DISPLAY P.C.
JSR 7, DLAY ;EXECUTE A PROGRAM DELAY
MOV @YPOS, R0 ;READ CHARACTER REG.
BIC @1777, R0 ;MASK TO BITS 10-15
CMP @24000, R0
BEQ .+6
HALT ;CHARACTER REGISTER IN ERROR
BR GT63
MOV @XPOS, R0 ;READ X AXIS
CMP @1000, R0 ;ARE THEY EQUAL ?
BEQ .+6 ;YES
HALT ;"LF" CHARACTER CHANGED X AXIS
BR GT63
MOV @YPOS, 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

```

```

1560
1561
1562
1563
1564
1565 010224 104000
1566 010226 012777 116000 170566
1567 010234 012777 000000 170562
1568 010242 012777 001000 170556
1569 010250 012777 100000 170552
1570 010256 012777 000101 170546
1571 010264 012777 172000 170542
1572 010272 013777 001022 170552
1573 010300 004737 012546
1574
1575 010304 017700 170550
1576 010310 042700 001777
1577 010314 022700 002000
1578 010320 001402
1579 010322 000000
1580 010324 000417
1581
1582 010326 017700 170524
1583 010332 023700 001006
1584 010336 001402
1585 010340 000000
1586 010342 000410
1587
1588 010344 017700 170510
1589 010350 042700 176000
1590 010354 022700 001000
1591 010360 001401
1592 010362 000000
1593

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

GT62A: SCOPE
MOV #116000,2DBUF ;POINT MODE
MOV #0,2DBUF1
MOV #1000,2DBUF2 ;0,1000
MOV #100000,2DBUF3 ;LOAD "CHARACTER MODE"
MOV #101,2DBUF4 ;LOAD AN "A"
MOV #172000,2DBUF5
MOV DBUF,2DPC ;LOAD THE DISPLAY P.C.
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

MOV 2YPOS,R0 ;READ CHARACTER REG
BIC #1777,R0 ;MASK TO BITS 10-15
CMP #2000,R0
BEQ .+6
HALT ;CHARACTER REGISTER IN ERROR
BR GT63

MOV 2XPOS,R0 ;READ X AXIS
CMP GSCHSZ,R0 ;ARE THEY EQUAL ?
BEQ .+6 ;YES
HALT ;"A" CHARACTER FAILED TO CHANGED X AXIS CORRECTLY
BR GT63

MOV 2YPOS,RC ;READ Y AXIS
BIC #176000,R0 ;MASK TO BITS 0-9
CMP #1000,R0 ;ARE THEY EQUAL ?
BEQ .+4 ;YES
HALT ;"A" CHARACTER CHANGED Y AXIS

```

```

1594
1595
1596
1597
1598
1599 010364 104000
1600 010366 012777 116000 170426
1601 010374 012777 001000 170422
1602 010402 012777 001000 170416
1603 010410 012777 100000 170412
1604 010416 012777 000010 170406
1605 010424 012777 172000 170402
1606 010432 013777 001022 170412
1607 010440 004737 012346
1608
1609 010444 017700 170410
1610 010450 042700 001777
1611 010454 022700 020000
1612 010460 001402
1613 010462 000000
1614 010464 000425
1615
1616 010466 017700 170364
1617 010472 023700 001050
1618 010476 001402
1619 010500 000000
1620 010502 000416
1621
1622 010504 017700 170350
1623 010510 042700 176000
1624 010514 022700 001000
1625 010520 001401
1626 010522 000000
1627
1628
1629
1630 010524 017700 170324
1631 010530 032700 000100
1632 010534 001401
1633 010536 000000
1634

```

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

```

GT63: SCOPE
MOV #116000, @DBUF ;POINT MODE
MOV #1000, @DBUF1 ;1000,1000
MOV #1000, @DBUF2 ;LOAD "CHARACTER MODE"
MOV #100000, @DBUF3
MOV #10, @DBUF4
MOV #172000, @DBUF5
MOV @DBUF, @DPC ;LOAD THE DISPLAY P.C.
JSR 7, DLAY ;EXECUTE A PROGRAM DELAY
MOV @YPOS, R0 ;READ CHARACTER REG
BIC #1777, R0 ;MASK TO BITS 10-15
CMP #20000, R0
BEQ .+6
HALT ;CHARACTER REGISTER IN ERROR
BR GT64
MOV @XPOS, R0 ;READ X AXIS
CMP @CHSIZE, R0 ;ARE THEY EQUAL ?
BEQ .+6 ;YES
HALT ;"BS" CHARACTER FAILED TO CHANGED X AXIS CORRECTLY
BR GT64
MOV @YPOS, R0 ;READ Y AXIS
BIC #176000, R0 ;MASK TO BITS 0-9
CMP #1000, R0 ;ARE THEY EQUAL ?
BEQ .+4 ;YES
HALT ;"BS" CHARACTER CHANGED Y AXIS

```

;TEST THAT "SHIFT-OUT" STATUS BIT IS NOT SET

```

GT63A: MOV @DSR, R0 ;READ STATUS
BIT #100, R0
BEQ .+4
HALT ;SHIFT OUT STATUS BIT IS SET

```



```

1635
1636
1637
1638
1639 010540 104000
1640 010542 012777 116000 170252
1641 010550 012777 001000 170246
1642 010556 012777 001000 170242
1643 010564 012777 100000 170236
1644 010572 012777 037416 170232
1645 010600 012777 172000 170226
1646 010606 013777 001022 170236
1647 010614 004737 012346
1648
1649 010620 017700 170234
1650 010624 042700 001777
1651 010630 022700 176000
1652 010634 001402
1653 010636 000000
1654 010640 000426
1655
1656 010642 017700 170206
1657 010646 032700 000100
1658 010652 001002
1659 010654 000000
1660 010656 000417
1661
1662 010660 017700 170172
1663 010664 022700 001000
1664 010670 001402
1665 010672 000000
1666 010674 000410
1667
1668 010676 017700 170156
1669 010702 042700 176000
1670 010706 022700 001000
1671 010712 001401
1672 010714 000000

;TEST THAT "SHIFT-OUT" GENERATES A STATUS BIT
;SHIFT-OUT <LOW BYTE>, FOLLOWED BY CODE 77 <HIGH BYTE>

GT64: SCOPE
MOV #116000,30BUF ;POINT MODE
MOV #1000,30BUF1
MOV #1000,30BUF2 ;1000,1000
MOV #100000,30BUF3 ;LOAD "CHARACTER MODE"
MOV #37416,30BUF4 ;"SHIFT-OUT" IN LOW BYTE #77 IN HIGH BYTE
MOV #172000,30BUFS ;LOAD STOP
MOV 30BUF,30PC ;START DISPALY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

MOV 30YPOS,RO ;READ CHARACTER REG
BIC #1777,RO ;MASK TO BITS 10-15
CMP #176000,RO
BEQ .+6
HALT ;CHARACTER REGISTER IN ERROR
BR GT65 ; AFTER A SHIFT-OUT COMMAND

MOV 30SR,RO ;READ STATUS REGISTER
BIT #100,RO
BNE .+6
HALT ;SHIFT OUT STATUS BIT FAILED TO SET
BR GT65

MOV 30XPOS,RO ;READ X POS
CMP #1000,RO
BEQ .+6
HALT ;SHIFT-OUT CHARACTER CHANGED X AXIS
BR GT65

MOV 30YPOS,RO ;READ Y POS
BIC #176000,RO ;MASK
CMP #1000,RO
BEQ .+4
HALT ;SHIFT-OUT CHARACTER CHANGED Y AXIS

```

```

1673
1674
1675 ;TEST THAT "SHIFT-OUT" DOES NOT GENERATE A STATUS BIT
1676 ;("SHIFT-OUT" FOLLOWED BY CODE 0 THRU 37 EXCEPT #17)
1677 010716 104000 GT65: SCOPE
1678 010720 000005 RESET
1679 010722 005003 CLR R3
1680 010724 012777 100000 170070 MOV #100000,30BUF ;SET 'CHAR' MODE
1681 010732 012777 000016 170064 MOV #16,30BUF1 ;LOAD "SHIFT-OUT" INTO THE LOW BYTE
1682 010740 012777 172000 170060 MOV #172000,30BUF2
1683 010746 110337 013475 GT65A: MOV#B R3,BUFFER+3 ;LOAD HIGH BYTE
1684 010752 000240 NOP
1685 010754 013777 001022 170070 MCV DBUF,30PC ;START THE DISPLAY
1686 010762 004737 012346 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1687
1688 010766 032777 000100 170060 BIT #100,30SR ;TEST FOR SHIFT BIT
1689 010774 001402 BEQ .+6
1690 010776 000000 HALT ;SHIFT STATUS BIT SET IN ERROR
1691 011000 000407 BR GT66 ; CHARACTER IS IN R3
1692
1693 011002 005203 GT65B: INC R3
1694 011004 022703 000017 CMP #17,R3 ;TEST FOR "SHIFT-IN"
1695 011010 001774 BEQ GT65B
1696 011012 022703 000040 CMP #40,R3 ;TEST FOR #40
1697 011016 001353 BNE GT65A ;IS IT #40
1698 ;YES, NEXT TEST
1699
1700 ;TEST THAT "SHIFT-OUT" FOLLOWED BY CODE 40 GENERATE A
1701 ;SHIFT STATUS BIT
1702
1703 011020 104000 GT66: SCOPE
1704 011022 000005 RESET
1705 011024 012777 100000 167770 MOV #100000,30BUF ;LOAD SET CHAR MODE
1706 011032 012777 000016 167764 MOV #16,30BUF1 ;LOAD "SHIFT-OUT" INTO THE LOW BYTE
1707 011040 012777 172000 167760 MOV #172000,30BUF2
1708 011046 112737 000040 013475 GT66A: MOV#B #40,BUFFER+3 ;LOAD HIGH BYTE
1709 011054 000240 NOP
1710 011056 013777 001022 167766 MOV DBUF,30PC ;START THE DISPLAY
1711 011064 004737 012346 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
1712
1713 011070 032777 000100 167756 BIT #100,30SR ;TEST 'SHIFT' STATUS BIT
1714 011076 001002 BNE .+6
1715 011100 000000 HALT ;"SHIFT-OUT" STATUS BIT FAILED TO SET
1716 011102 000407 BR GT67 ;ON CHARACTER IN R3
1717

```

```

1718
1719 011104 000005          RESET
1720 011106 032777 000100 167740  BIT      @100, @DSR      ;TEST SHIFT-OUT BIT
1721 011114 001402          BEQ      GT67          ;BR IF CLEARED
1722 011116 000000          HALT
1723 011120 000400          BR       GT67          ;SHIFT OUT STATUS BIT FAILED TO CLEAR
1724
1725
1726          ;TEST THAT 'SHIFT-OUT' IN THE HIGH BYTE FOLLOWED BY A CHARACTER
1727          ; IN THE NEXT LOW BYTE GENERATES A STATUS BIT
1728 011122 104000          GT67:  SCOPE
1729 011124 012777 100000 167670  MOV      @100000, @DBUF ;LOAD SET 'CHAR' MODE
1730 011132 005077 167666          CLR      @DBUF1
1731 011136 012777 007000 167660  MOV      @7000, @DBUF1 ;LOAD 'SHIFT-OUT' INTO THE HIGH BYTE
1732 011144 012777 000040 167654  MOV      @40, @DBUF2   ;LOAD A SHIFT-OUT CHARACTER IN THE NEXT
1733          ;WORD (LOW BYTE)
1734 011152 012777 172000 167650  MOV      @172000, @DBUF3
1735 011160 000005          RESET
1736 011162 000240          NOP
1737 011164 013777 001022 167660  MOV      @DBUF, @DPC   ;START THE DISPLAY
1738 011172 004737 012346          JSR      7, DLAY      ;EXECUTE A PROGRAM DELAY
1739
1740 011176 032777 000100 167650  BIT      @100, @DSR   ;TEST THE STATUS REGISTER
1741 011204 001002          BNE
1742 011206 000000          HALT
1743 011210 000410          BR       GT68
1744          ;SHIFT-OUT IN THE HIGH BYTE FAILED TO
1745          ;SET A STATUS BIT
1746 011212 017700 167642          MOV      @YPOS, R0    ;READ Y POS
1747 011216 042700 001777          BIC      @1777, R0    ;MASK TO BITS 15-10
1748 011222 022700 100000          CMP      @100000, R0 ;TEST FOR CHAR @40
1749 011226 001401          BEQ      .+4
1750 011230 000000          HALT
1751          ;CHARACTER REGISTER IN ERROR AFTER A
1752          ;"SHIFT-OUT" (HIGH BYTE) FOLLOWED BY
1753          ; @40 (LOW BYTE NEXT WORD)

```

```

1753 ;STOP INTERRUPT TEST
1754 ;TEST FOR NO INTERRUPT
1755
1756 011232 104000 GT68: SCOPE
1757 011234 000005 RESET
1758 011236 012777 011320 167616 MOV @GT68A,@DDONE ;LOAD RETURN FROM DONE INTERRUPT
1759 011244 012777 011320 167620 MOV @GT68A,@TIMEVT ;LOAD RETURN FROM TIME-OUT INTERRUPT
1760 011252 012777 011320 167606 MOV @GT68A,@LPVCT ;LOAD RETURN FROM LIGHT-PEN INTERRUPT
1761 011260 012777 164000 167534 MOV @164000,@DBUF ;LOAD "DISPLAY NOP"
1762 011266 012777 173000 167530 MOV @173000,@DBUF1 ;LOAD "STATUS A"-"STOP"-"STOP INT. ENABLE"
1763 011274 005077 167520 ;PSW ;LOWER MACHINE PRIORITY
1764 011300 013777 001022 167544 MOV DBUF,@DPC ;LOAD DISPLAY P.C.
1765 011306 000240 NOP
1766 011310 000240 NOP
1767 011312 000240 NOP
1768 011314 000240 NOP
1769 011316 000401 BR .+4
1770
1771 011320 000000 GT68A: HALT ;GT-40 INTERRUPTED IN ERROR
1772
1773 ;STOP INTERRUPT TEST
1774 ;TEST FOR INTERRUPT
1775
1776 011322 104000 GT69: SCOPE
1777 011324 000005 RESET
1778 011326 012777 011410 167526 MOV @GT69A,@DDONE ;LOAD RETURN ADDRESS FROM INTERRUPT
1779 011334 012777 011422 167524 MOV @GT69B,@LPVCT ;LOAD LP VECTOR
1780 011342 012777 011430 167522 MOV @GT69C,@TIMEVT ;LOAD TO VECTOR
1781 011350 012777 164000 167444 MOV @164000,@DBUF ;LOAD "DISPLAY NOP"
1782 011356 012777 173400 167440 MOV @173400,@DBUF1 ;LOAD "STATUS A"-"STOP"-"STOP INT. ENABLE-INT"
1783 011364 005077 167430 CLR @PSW
1784 011370 013777 001022 167454 MOV DBUF,@DPC
1785 011376 000240 NOP
1786 011400 000240 NOP
1787 011402 000240 NOP
1788 011404 000240 NOP
1789 011406 000000 HALT ;GT-40 FAILED TO GENERATE A STOP INTERRUPT
1790 011410 013777 001064 167444 GT69A: MOV DDONE1,@DDONE
1791 011416 022626 CMP (SP)+,(SP)+
1792 011420 000405 BR GT70
1793
1794 011422 022626 GT69B: CMP (SP)+,(SP)+
1795 011424 000000 HALT ;GT-40 STOP (DONE) INTERRUPTED TO THE
1796 ; LIGHT-PEN VECTOR
1797 011426 000402 BR GT70
1798
1799 011430 022626 GT69C: CMP (SP)+,(SP)+
1800 011432 000000 HALT ;GT-40 STOP (DONE) INTERRUPTED TO THE
1801 ; TIME-OUT VECTOR

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011434 104000
011436 000005
011440 012777
011446 012777
011454 012777
011462 012777
011470 012777
011476 012777
011504 005077
011510 013777
011516 000240
011520 000240
011522 000240
011524 000240
011526 000000
011530 000240
011532 013777
011540 022626
011542 000405
011544 022626
011546 000000
011550 000402
011552 022626
011554 000000

011544 167414
011552 167412
011530 167410
100000 167332
020016 167326
173000 167322
167310
001022 167334
001074 167332

;SHIFT OUT INTERRUPT TEST
;TEST FOR INTERRUPT

GT70: SCOPE
RESET
MOV
MOV
MOV
MOV
MOV
CLR
MOV
NOP
NOP
NOP
NOP
HALT
GT70A: NOP
MOV
CMP
BR
GT70B: CMP
HALT
BR
GT70C: CMP
HALT

@GT70B,@D00NE
@GT70C,@LPVCT
@GT70A,@TIMEVT
@100000,@DBUF
@20016,@DBUF1
@173000,@DBUF2
@PSH
@DBUF,@DPC
@TIMEVT1,@TIMEVT
(SP)+,(SP)+
GT71
(SP)+,(SP)+
(SP)+,(SP)+

;LOAD DONE VECTOR
;LOAD LIGHT-PEN VECTOR
;LOAD RETURN ADDRESS
;LOAD "CHARACTER MODE"
;LOAD "SHIFT-OUT"
;START DISPLAY
;GT-40 FAILED TO INTERRUPT ON SHIFT-OUT
;GT-40 SHIFT-OUT INTERRUPTED TO THE
; DONE VECTOR
;GT-40 SHIFT-OUT INTERRUPTED TO THE
; LIGHT PEN VECTOR

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1835
1836
1837           ;TIME-OUT INTERRUPT TEST
1838
1839 011556 104000          GT71:  SCOPE
1840 011560 000005          RESET
1841 011562 013777 001064 167272      MOV     DOONE1,DOONE
1842 011570 013777 001070 167270      MOV     LPVCT1,ALPVCT
1843 011576 012777 011624 167266      MOV     @GT71A,@TIMEVT ;LOAD RETURN ADDRESS
1844 011604 005077 167210      CLR     @PSW
1845 011610 012777 177776 167234      MOV     @177776,@DPC ;LOAD DISPLAY P.C.
1846 011616 004737 012346      JSR     7,DLAY ;EXECUTE A PROGRAM DELAY
1847 011622 000000          HALT ;GT-40 FAILED TO INTERRUPT ON TIME-OUT
1848
1849 011624 000240          GT71A: NOP
1850 011626 013777 001074 167236      MOV     TIMEVT1,@TIMEVT
1851 011634 022626          CMP     (SP)+,(SP)+
1852
1853           ;NO LIGHT PEN INTERUPT TEST
1854
1855 011636 104000          GT72:  SCOPE
1856 011640 000005          RESET
1857 011642 012777 011704 167216      MOV     @GT72A,ALPVCT ;LOAD RETURN ADDRESS
1858 011650 012777 100140 167144      MOV     @100140,@DBUF ;LOAD DISPLAY BUFFER
1859 011656 012777 173000 167140      MOV     @173000,@DBUF1
1860 011664 005077 167130      CLR     @PSW
1861 011670 013777 001022 167154      MOV     DBUF,@DPC
1862 011676 004737 012346      JSR     7,DLAY ;EXECUTE A PROGRAM DELAY
1863 011702 000401          BR     .+4
1864 011704 000000          GT72A: HALT
1865 011706 013777 001070 167152      MOV     LPVCT1,ALPVCT

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1866                                     ;PRE BR LEVEL SETUP
1867
1868 011714 042737 177437 001004      BIC      #177437,DSPBR      ;MASK TO BITS
1869 011722 001001                    BNE      .+4
1870 011724 000000                    HALT                      ;BR LEVEL WAS 0
1871 011726 022737 000340 001004      CMP      #340,DSPBR
1872 011734 001001                    BNE      .+4
1873 011736 000000                    HALT                      ;BR LEVEL WAS 7
1874
1875 011740 013737 001004 011764      MOV      DSPBR,BRLEV1
1876 011746 162737 000040 011764      SUB      #40,BRLEV1
1877 011754 013737 001004 011766      MOV      DSPBR,BRLEV2
1878 011762 000402                    BR       GT73
1879
1880 011764 000140                    BRLEV1: 140
1881 011766 000200                    BRLEV2: 200
1882
1883                                     ;BR LEVEL TEST (BR-1)
1884                                     ;TEST FOR INTERRUPT
1885
1886 011770 104000                    GT73:  SCOPE
1887 011772 000005                    RESET
1888 011774 012777 012036 167060      MOV      #GT73A,DOONE     ;LOAD RETURN ADDRESS
1889 012002 012777 173400 167012      MOV      #173400,DBUF    ;LOAD "STATUS A"-NO INTERRUPT ENABLE
1890 012010 013777 011764 167002      MOV      BRLEV1,PSW
1891 012016 013777 001022 167026      MOV      DBUF,PC        ;LOAD THE DISPLAY P.C.
1892 012024 000240                    NOP
1893 012026 000240                    NOP
1894 012030 000240                    NOP
1895 012032 000240                    NOP
1896 012034 000100                    HALT
1897
1898 012036 022626                    GT73A: CMP      (SP)+,(SP)+
1899
1900                                     ;BR LEVEL TEST (BR)
1901                                     ;TEST THAT THE GT-40 DOES NOT INTERRUPT AT THE LEVEL INDICATED
1902
1903 012040 104000                    GT74:  SCOPE
1904 012042 000005                    RESET
1905 012044 012777 012106 167010      MOV      #GT74A,DOONE     ;LOAD RETURN ADDRESS
1906 012052 012777 173400 166742      MOV      #173400,DBUF    ;LOAD "STATUS A- STOP- STOP INT ENABLE
1907 012060 013777 011766 166732      MOV      BRLEV2,PSW     ;LOWER MACHINE PRIORITY TO INDICATED LEVEL
1908 012066 013777 001022 166756      MOV      DBUF,PC
1909 012074 000240                    NOP
1910 012076 000240                    NOP
1911 012100 000240                    NOP
1912 012102 000240                    NOP
1913 012104 000401                    BR       .+4
1914 012106 000000                    GT74A: HALT
1915 012110 013777 001064 166744      MOV      DOONE1,DOONE    ;NEXT TEST
1916 012116 000005                    RESET                      ;GT-40 INTERRUPTED ON THE WRONG BR LEVEL
1917 012120 000005                    RESET                      ;LOAD INTERRUPT VECTOR

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1918
1919
1920 ;RESET TEST
1921 ;DOES RESET CLEAR ALL DISPLAY PC AND STATUS BITS
1922
1923 012122 104000
1924 012124 012777 117637 166670 GT75: SCOPE
1925 012132 005077 166666 MOV #117637,20BUF ;POINT INTENSITY=7,BLINK=1,LINETYPE=3
1926 012136 005077 166664 CLR 20BUF1 ; X = 0
1927 012142 012777 172077 166660 CLR 20BUF2 ; Y = 0
1928 012150 013777 001022 166674 MOV #172077,20BUF3 ;ITALIC=1,SYNC=1,COLOR=1
1929 012156 004737 012346 MOV 20BUF,20PC ;LOAD DISPLAY P.C.
1930 012162 000005 JSR PC,DLAY ;DELAY
1931 012164 005777 166662 RESET ;GENERATE "INIT"
1932 012170 001402 TST 20PC
1933 012172 000000 BEQ .+6 ;RESET FAILED TO CLEAR DISPLAY PC
1934 012174 000406 BR END
1935
1936 012176 017700 166652 MOV 20SR,R0 ;READ DISPLAY STATUS
1937 012202 042700 074000 BIC #74000,R0 ;MASK TO BIT 11-14
1938 012206 001401 BEQ .+4 ;IS THE STATUS CLEARED ?
1939 012210 000000 HALT ;"INIT" FAILED TO RESET DISPLAY STATUS REGISTER
1940
1941 012212 104000
1942 012214 005237 001016 END: SCOPE
1943 012220 022737 000010 001016 INC ICNT ;UPDATE COUNT
1944 012226 001402 CMP #10,ICNT ;FINISHED ?
1945 012230 000137 001420 BEQ HERE ;BR IF YES
1946 012234 000005 JMP GTPC ;NO RE-DO
1947 012236 013700 000042 HERE: MOV #42,R0
1948 012242 001410 BEQ HERE1 ;BRANCH IF OFF LINE
1949 012244 000005 RESET
1950 012246 004710 LOGICAL: JSR PC,(0)
1951 012250 000240 NOP
1952 012252 000240 NOP
1953 012254 000240 NOP
1954 012256 000240 NOP
1955 012258 000240 NOP
1956 012260 000240 NOP
1957 012262 000240 NOP
1958 012264 012777 000002 166562 HERE1: MOV #2,20SR ;RING THE BELL
1959 012272 012737 000207 177566 MOV #207,TPDBR ;RINT THE BELL
1960 012300 105737 177564 1S: TSTB TPCSR ;WAIT
1961 012304 100375 BPL 1S
1962 012306 012737 000207 177566 2S: MOV #207,TPDBR ;RINT BELL
1963 012314 105737 177564 TSTB TPCSR
1964 012320 100375 BPL 2S
012322 000137 001344 JMP START

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1965 ;SCOPE ROUTINE
1966
1967 012326 032737 040000 177570 SCOPEA: BIT #40000,2#DISPLAY ;TEST "SCOPE" SWITCH
1968 012334 001001 BNE SCOPEB
1969 012336 011601 MOV (SP),R1
1970 012340 012706 000500 SCOPEB: MOV #STKPTR,SP
1971 012344 000111 JMP (1)
1972
1973 012346 012700 000200 DLAY: MOV #200,R0
1974 012352 005300 DLAYA: DEC R0
1975 012354 001376 BNE DLAYA
1976 012356 000207 RTS 7
1977
1978 012360 012700 001000 DLAY1: MOV #1000,R0
1979 012364 005300 DLAY1A: DEC R0
1980 012366 001376 BNE DLAY1A
1981 012370 000207 RTS 7
1982
1983 012372 010046 LOWPWR: MOV R0,-(SP)
1984 012374 010146 MOV R1,-(SP)
1985 012376 010246 MOV R2,-(SP)
1986 012400 010346 MOV R3,-(SP)
1987 012402 010446 MOV R4,-(SP)
1988 012404 010546 MOV R5,-(SP)
1989 012406 010637 012470 MOV SP,LOWSV
1990 012412 012737 012422 000024 MOV #HIGPWR,2#24
1991 012420 000000 HALT
1992 012422 013706 012470 HIGPWR: MOV LOWSV,SP
1993 012426 012605 HIGPWR: MOV (SP)+,R5
1994 012430 012604 HIGPWR: MOV (SP)+,R4
1995 012432 012603 HIGPWR: MOV (SP)+,R3
1996 012434 012602 HIGPWR: MOV (SP)+,R2
1997 012436 012601 HIGPWR: MOV (SP)+,R1
1998 012440 012600 HIGPWR: MOV (SP)+,R0
1999 012442 012737 012372 000024 MOV #LOWPWR,2#24
2000 012450 012706 000500 MOV #STKPTR,SP
2001 012454 000240 NOP
2002 012456 000240 NOP
2003 012460 000000 HALT
2004 012462 000240 NOP
2005 012464 000240 NOP
2006 012466 000111 JMP (R1)
2007
2008 012470 000000 LOWSV: 0
2009

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2053			
2054			
2055	012664	117004	FRAME0: POINT!INT4!LINE0
2056	012666	041600	INTX+1600
2057	012670	000600	600
2058	012672	041000	INTX+1000
2059	012674	000600	600
2060	012676	112400	LONGV!INT2
2061	012700	040600	INTX+600
2062	012702	000000	0
2063	012704	173400	DSTOP
2064	012706	160000	DJMP
2065	012710	012664	FRAME0
2066			
2067	012712	117004	FRAME1: POINT!INT4!LINE0
2068	012714	040200	INTX+200
2069	012716	000600	600
2070	012720	041000	INTX+1000
2071	012722	000600	600
2072	012724	112400	LONGV!INT2
2073	012726	060600	INTX!MINUSX+600
2074	012730	000000	0
2075	012732	173400	DSTOP
2076	012734	160000	DJMP
2077	012736	012712	FRAME1
2078			
2079	012740	117004	FRAME2: POINT!INT4!LINE0
2080	012742	041000	INTX+1000
2081	012744	001200	1200
2082	012746	041000	INTX+1000
2083	012750	000600	600
2084	012752	112400	LONGV!INT2
2085	012754	040000	INTX
2086	012756	000400	400
2087	012760	173400	DSTOP
2088	012762	160000	DJMP
2089	012764	012740	FRAME2
2090			
2091	012766	117004	FRAME3: POINT!INT4!LINE0
2092	012770	041000	INTX+1000
2093	012772	000200	200
2094	012774	041000	INTX+1000
2095	012776	000600	600
2096	013000	112400	LONGV!INT2
2097	013002	040000	INTX
2098	013004	020400	MINUSX+400
2099	013006	173400	DSTOP
2100	013010	160000	DJMP
2101	013012	012766	FRAME3
2102			

2103			
2104	013014	117004	FRAME4: POINT!INT4!LINE0
2105	013016	000000	0
2106	013020	000000	0
2107	013022	110000	LONGV
2108	013024	041777	INTX!MAXX
2109	013026	000000	0
2110	013030	040000	INTX
2111	013032	001377	MAXY
2112	013034	061777	INTX!MINUSX!MAXX
2113	013036	000000	0
2114	013040	040000	INTX
2115	013042	021377	MINUSX!MAXY
2116	013044	173400	DSTOP
2117	013046	160000	DJMP
2118	013050	013014	FRAME4
2119			
2120	013052	117004	FRAME5: POINT!INT4!LINE0
2121	013054	000740	740
2122	013056	000540	540
2123	013060	104000	SHORTV
2124	013062	057600	INTX+17600
2125	013064	057677	INTX+17677
2126	013066	040077	INTX+77
2127	013070	077677	INTX!MINUSX+17677
2128	013072	077600	INTX!MINUSX+17600
2129	013074	077777	INTX!MINUSX+17777
2130	013076	040177	INTX+177
2131	013100	057777	INTX+17777
2132	013102	114000	POINT
2133	013104	000760	760
2134	013106	000620	620
2135	013110	130000	RELATV
2136	013112	047600	INTX+7600
2137	013114	047637	INTX+7637
2138	013116	040037	INTX+37
2139	013120	067637	INTX!MINUSX+7637
2140	013122	067600	INTX!MINUSX+7600
2141	013124	067737	INTX!MINUSX+7737
2142	013126	040137	INTX+137
2143	013130	047737	INTX+7737
2144	013132	173400	DSTOP
2145	013134	160000	DJMP
2146	013136	013052	FRAME5
2147			

2148					
2149	013140	117004			FRAME6: POINT!INT4!LINE0
2150	013142	000200			200
2151	013144	000600			600
2152	013146	100000			CHAR
2153					
2154	013150	040500	041502	042504	.ASCII '0ABCDEF...GHIJKLMNOPQRSTUVWXYZ'
2155	013156	043506	044510	045512	
2156	013164	046514	047516	050520	
2157	013172	051522	052524	053526	
2158	013200	054530	132		
2159	013203	040	021041	022043	.ASCIZ @ !"#%&'()*+,-./0123456789:;<=>?@
2160	013210	023045	024047	025051	
2161	013216	026053	027055	030057	
2162	013224	031061	032063	033065	
2163	013232	034067	035071	036053	
2164	013240	037075	000077		
2165					.EVEN
2166	013244	114000			POINT
2167	013246	000200			200
2168	013250	000540			540
2169	013252	100000			CHAR
2170					
2171	013254	140	141	142	.BYTE 140,141,142,143,144,145,146,147
2172	013257	143	144	145	
2173	013262	146	147		
2174	013264	150	151	152	.BYTE 150,151,152,153,154,155,156,157
2175	013267	153	154	155	
2176	013272	156	157		
2177	013274	160	161	162	.BYTE 160,161,162,163,164,165,166,167
2178	013277	163	164	165	
2179	013302	166	167		
2180	013304	170	171	172	.BYTE 170,171,172,173,174,175,176,177
2181	013307	173	174	175	
2182	013312	176	177		
2183					
2184	013314	016	000	001	.BYTE 16,0,1,2,3,4,5,6,7,10,11,12,13,14,15,16
2185	013317	002	003	004	
2186	013322	005	006	007	
2187	013325	010	011	012	
2188	013330	013	014	015	
2189	013333	016			
2190	013334	020	021	022	.BYTE 20,21,22,23,24,25,26,27,30,31,32,33,34,35,36,37,17,0
2191	013337	023	024	025	
2192	013342	026	027	030	
2193	013345	031	032	033	
2194	013350	034	035	036	
2195	013353	037	017	000	
2196					.EVEN
2197	013356	173400			DSTOP
2198	013360	160000			DJMP
2199	013362	013140			FRAME6
2200					

2201
 2202 013364 117004
 2203 013366 000400
 2204 013370 000700
 2205 013372 170200
 2206 013374 110140
 2207 013376 041000
 2208 013400 000000
 2209 013402 114000
 2210 013404 000400
 2211 013406 000600
 2212 013410 170300
 2213 013412 110140
 2214 013414 041000
 2215 013416 000000
 2216 013420 114000
 2217 013422 000400
 2218 013424 000500
 2219 013426 110100
 2220 013430 041000
 2221 013432 000000
 2222 013434 173400
 2223 013436 114000
 2224 013440 000700
 2225 013442 001000
 2226 013444 100000
 2227 013446 044514
 2228 013454 042520
 2229 013462 000124
 2230
 2231 013464 173400
 2232 013466 160000
 2233 013470 013364
 2234
 2235 013472 000000
 2236
 2237 000001

FRAME7: POINT!INT4!LINE0
 400
 700
 STATSA!LPLITE
 LONGV!LPON
 INTX+1000
 0
 POINT
 400
 600
 STATSA!LPDARK
 LONGV!LPON
 INTX+1000
 0
 POINT
 400
 500
 LONGV!LPOFF
 INTX+1000
 0
 FRM7A: DSTOP
 POINT
 700
 1000
 CHAR
 .ASCIZ /LIGHT-PEN HIT/
 .EVEN
 DSTOP
 DJMP
 FRAME7
 BUFFER: 0
 .END

044107 026524
 020116 044510

BLKOFF=	000020	164#																		
BLKON =	000030	164#																		
BRLEV1	011764	1875#	1876#	1880#	1890															
BRLEV2	011766	1877#	1881#	1907																
BUFFER	013472	198	199	200	201	202	203	1683#	1708#	2235#										
CHAR =	100000	164#	2152	2169	2226															
CHSIZE	001050	209#	245#	246#	248#	1617														
CNTR	001044	207#																		
DBUF	001022	198#	299	305	306	329#	330	338#	339	347#	348	357#	358	369#						
		370	380#	381	392#	394	402#	404	412#	414	423#	425	433#	435						
		444#	446	455#	457	466#	468	477#	479	486#	488	495#	497	506#						
		508	517#	519	528#	530	538#	540	549#	551	562#	564	572#	574						
		582#	584	592#	594	602#	604	606#	607	619#	622	634#	637	649#						
		652	665#	668	681#	686	705#	709	725#	729	748#	752	770#	774						
		793#	797	816	824	843	851	874	882	910	918	942	949	969						
		976	1001	1008	1038	1045	1070	1077	1097	1104	1129	1136	1166	1173						
		1205	1213	1237	1245	1260#	1262	1266	1271	1282	1290	1301	1306	1318						
		1326	1336	1341	1351	1359	1369	1374	1385	1393	1404#	1407	1419#	1422						
		1434#	1437	1449#	1452	1464#	1470	1498#	1504	1532#	1538	1566#	1572	1600#						
		1606	1640#	1646	1680#	1685	1705#	1710	1729#	1737	1761#	1764	1781#	1784						
		1811#	1815	1858#	1861	1889#	1891	1906#	1908	1924#	1928	1981#	1984	2038#						
DBUF1	001024	199#	393#	403#	413#	424#	434#	445#	456#	467#	478#	487#	496#	507#						
		518#	529#	539#	550#	563#	573#	583#	593#	603#	620#	635#	650#	666#						
		682#	706#	726#	749#	771#	794#	821#	845#	870#	895#	920#	945#	970#						
DBUF2	001026	1533#	1567#	1601#	1641#	1681#	1706#	1730#	1731#	1762#	1782#	1812#	1859#	1925#						
		200#	621#	636#	651#	667#	683#	707#	727#	750#	772#	795#	816#	841#						
		1436#	1451#	1466#	1500#	1534#	1568#	1602#	1642#	1682#	1707#	1732#	1813#	1926#						
DBUF3	001030	201#	694#	708#	728#	751#	773#	796#	820#	844#	868#	892#	916#	940#						
		1734#	1927#																	
DBUF4	001032	202#	685#	1468#	1502#	1536#	1570#	1604#	1644#											
DBUF5	001034	203#	1469#	1503#	1537#	1571#	1605#	1645#												
DOONE	001062	219#	236	240	249#	1758#	1778#	1790#	1808#	1841#	1888#	1905#	1915#	2015#						
DOONE1	001064	220#	249	250#	1790	1841	1915	2016#												
DISPLA=	177570	169#	1967																	
DJMP =	160000	164#	2064	2076	2088	2100	2117	2145	2198	2232										
DLAY	012346	605	623	638	653	669	687	710	730	753	775	798	825	852						
		883	919	950	977	1009	1046	1078	1105	1137	1174	1214	1246	1272						
		1291	1307	1327	1342	1360	1375	1394	1408	1423	1438	1453	1471	1505						
		1539	1573	1607	1647	1686	1711	1738	1846	1862	1929	1973#								
DLAYA	012352	1974#	1975																	
DLAY1	012360	359	371	1978#																
DLAY1A	012364	1979#	1980																	
DNOP =	164000	164#	2037																	
DOCORE	001252	247	259#																	
DPC	001052	214#	230	234	305#	315	323#	330#	339#	348#	358#	370#	381#	394#						
		404#	414#	425#	435#	446#	457#	468#	479#	488#	497#	508#	519#	530#						
		540#	551#	564#	574#	584#	594#	604#	607#	622#	637#	652#	668#	686#						
		709#	729#	752#	774#	797#	824#	851#	882#	918#	949#	976#	1008#	1045#						
		1077#	1104#	1136#	1173#	1213#	1245#	1262#	1271#	1290#	1306#	1326#	1341#	1359#						
		1374#	1393#	1407#	1422#	1437#	1452#	1470#	1504#	1538#	1572#	1606#	1646#	1685#						
		1710#	1737#	1764#	1784#	1815#	1845#	1861#	1891#	1908#	1928#	1931	2027#	2038#						
DSAVE	001036	204#	306#	314#	316	321	1202#	1209	1222#	1234#	1241	1255#								
DSPBR	001004	190#	1868#	1871	1875	1877	2016	2018												
DSP7CH	012644	202#	2043#																	
DSR	001054	215#	288#	309	331	340	349	361	373	382	395	405	415	426						
		436	447	458	469	480	489	498	509	520	531	541	552	1274						

GT37	004456	803	815#			
GT38	004560	831	842#			
GT39	004662	858	869#			
GT39A	004676	874#	899			
GT4	001734	368#				
GT40	004776	889	895	904#		
GT40A	005016	910#	936			
GT41	005120	925	931	941#		
GT42	005216	956	968#			
GT43	005314	983	995#			
GT43A	005334	1001#	1026			
GT44	005436	1015	1021	1032#		
GT44A	005456	1038#	1063			
GT45	005560	1052	1058	1069#		
GT46	005656	1084	1096#			
GT47	005754	1111	1123#			
GT47A	005774	1129#	1154			
GT48	006076	1143	1149	1160#		
GT48A	006116	1166#	1191			
GT49	006220	1180	1186	1199#		
GT49A	006242	1205#	1225			
GT5	001776	379#				
GT50	006334	1220	1231#			
GT50A	006356	1237#	1258			
GT50B	006454	1253	1260#			
GT51	006476	1265#				
GT52	006550	1281#				
GT53	006710	1296	1317#			
GT54	007050	1332	1350#			
GT55	007210	1365	1384#			
GT56	007276	1403#				
GT57	007354	1418#				
GT58	007432	1433#				
GT59	007510	1448#				
GT6	002034	391#				
GT60	007566	1463#				
GT61	007724	1478	1484	1497#		
GT62	010064	1512	1518	1531#		
GT62A	010224	1565#				
GT63	010364	1546	1552	1580	1586	1599#
GT63A	010524	1630#				
GT64	010540	1614	1620	1639#		
GT65	010716	1654	1660	1666	1677#	
GT65A	010746	1683#	1697			
GT65B	011002	1693#	1695			
GT66	011020	1691	1703#			
GT66A	011046	1708#				
GT67	011122	1716	1721	1723	1728#	
GT68	011232	1743	1756#			
GT68A	011320	1758	1759	1760	1771#	
GT69	011322	1776#				
GT69A	011410	1778	1790#			
GT69B	011422	1779	1794#			
GT69C	011430	1780	1799#			
GT7	002100	401#				
GT70	011434	1792	1797	1806#		

GT-40/GT-44 INSTRUCTION TEST II MAINDEC-11-DDGTB-C
DDGTBC.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

GT70A	011530	1810	1821#															
GT70B	011544	1808	1826#															
GT70C	011552	1809	1831#															
GT71	011556	1824	1829	1839#														
GT71A	011624	1843	1849#															
GT72	011636	1855#																
GT72A	011704	1857	1864#															
GT73	011770	1878	1886#															
GT73A	012036	1888	1898#															
GT74	012040	1903#																
GT74A	012106	1905	1914#															
GT75	012122	1923#																
GT8	002144	411#																
GT9	002210	422#																
HERE	012234	1944	1946#															
HERE1	012264	1948	1957#															
HIGPMR	012422	1990	1992#															
ICNT	001016	196#	281#	1942#	1943													
INCR =	000100	164#																
INTX =	040000	164#	2056	2058	2061	2068	2070	2073	2080	2082	2085	2092	2094	2097				
		2108	2110	2112	2114	2124	2125	2126	2127	2128	2129	2130	2131	2136				
		2137	2138	2139	2140	2141	2142	2143	2207	2214	2220							
INTO =	002000	164#																
INT1 =	002200	164#																
INT2 =	002400	164#	2060	2072	2084	2096												
INT3 =	002600	164#																
INT4 =	003000	164#	2055	2067	2079	2091	2104	2120	2149	2202								
INT5 =	003200	164#																
INT6 =	003400	164#																
INT7 =	003600	164#																
ITAL0 =	000040	164#																
ITAL1 =	000060	164#																
LFSIZE	001046	208#	242#	243#	244#	1556												
LINED =	000004	164#	2055	2067	2079	2091	2104	2120	2149	2202								
LINE1 =	000005	164#																
LINE2 =	000006	164#																
LINE3 =	000007	164#																
LOGICA	012246	181	1950#															
LONGV =	110000	164#	2060	2072	2084	2096	2107	2206	2213	2219								
LOMPMR	012372	175	1983#	1999														
LOMSV	012470	1989#	1992	2008#														
LPDARK =	000300	164#	2212															
LPLITE =	000200	164#	2205															
LPOFF =	000100	164#	2219															
LPON =	000140	164#	2206	2213														
LPVCT	001066	222#	251#	1760#	1779#	1809#	1842#	1857#	1865#	2017#								
LPVCT1	001070	223#	251	252#	1842	1865	2018#											
MAXSX =	017600	164#																
MAXSY =	000077	164#																
MAXX =	001777	164#	2108	2112														
MAXY =	001377	164#	2111	2115														
MINSUY =	000100	164#																
MINUSX =	020000	164#	2073	2098	2112	2115	2127	2128	2129	2139	2140	2141						
MINUSY =	020000	164#																
PC =	000007	169#	247#	255#	275#	280#	1929#	1950#	2013#									
POINT =	114000	164#	2055	2067	2079	2091	2104	2120	2132	2149	2166	2202	2209	2216				

ADD	233	239	261	314	1023	1060	1151	1188											
BEQ	317	322	334	343	352	364	376	385	398	408	418	429	439	450	461				
	472	483	491	501	512	523	534	544	555	568	578	588	598	611	626				
	641	656	672	690	696	712	717	733	739	756	762	778	784	801	807				
	829	835	856	862	887	893	923	929	954	960	981	987	1013	1019	1050				
	1056	1082	1088	1109	1115	1141	1147	1178	1184	1218	1251	1275	1310	1345	1378				
	1412	1427	1442	1457	1476	1482	1489	1510	1516	1523	1544	1550	1557	1578	1584				
	1591	1612	1618	1625	1632	1652	1664	1671	1689	1695	1721	1748	1932	1938	1944				
	1948																		
BIC	244	248	332	341	350	362	374	383	396	406	416	427	437	448	459				
	470	499	510	521	532	542	553	566	576	586	596	609	1249	1410	1425				
	1440	1455	1474	1487	1508	1521	1542	1555	1576	1589	1610	1623	1650	1669	1746				
	1868	1937	2025																
BIT	481	490	1274	1293	1309	1329	1344	1362	1377	1396	1631	1657	1688	1713	1720				
	1740	1967																	
BMI	310																		
BNE	235	241	264	270	302	899	936	1026	1063	1154	1191	1225	1258	1294	1330				
	1363	1397	1658	1697	1714	1741	1869	1872	1968	1975	1980								
BPL	1960	1963																	
BR	265	272	312	319	324	692	714	735	758	780	803	831	858	889	895				
	925	931	956	983	1015	1021	1052	1058	1084	1111	1143	1149	1180	1186	1220				
	1253	1296	1332	1365	1478	1484	1512	1518	1546	1552	1580	1586	1614	1620	1654				
	1660	1666	1691	1716	1723	1743	1769	1792	1797	1824	1829	1863	1878	1913	1934				
	2036	2040																	
CLR	250	252	254	281	288	290	292	706	707	818	819	845	846	876	877				
	912	913	944	945	971	972	1003	1004	1040	1041	1072	1073	1099	1100	1131				
	1132	1168	1169	1207	1208	1211	1239	1240	1243	1468	1679	1730	1763	1783	1814				
	1844	1860	1925	1926	2031														
CMP	234	240	263	266	269	301	316	321	333	342	351	363	375	384	397				
	407	417	428	438	449	460	471	500	511	523	533	543	554	567	577				
	587	597	610	625	640	655	671	689	695	732	738	755	761	777	783				
	800	806	828	834	855	861	886	892	922	928	953	959	980	986	1012				
	1018	1049	1055	1081	1087	1108	1114	1140	1146	1177	1183	1217	1250	1411	1426				
	1441	1456	1475	1481	1488	1509	1515	1522	1543	1549	1556	1577	1583	1590	1611				
	1617	1624	1651	1663	1670	1694	1696	1747	1791	1794	1799	1823	1826	1831	1851				
	1871	1898	1943	2039															
DEC	308	898	934	935	1025	1061	1062	1153	1189	1190	1224	1257	1974	1979					
EMT	169																		
HALT	171	172	174	311	318	335	344	353	399	409	419	430	440	451	462				
	473	483	492	502	513	524	535	545	556	569	579	589	599	612	627				
	642	657	673	691	697	713	718	734	740	757	763	779	785	802	808				
	830	836	857	863	888	894	924	930	955	961	982	988	1014	1020	1051				
	1057	1083	1089	1110	1116	1142	1148	1179	1155	1219	1252	1276	1295	1311	1331				
	1346	1364	1379	1398	1413	1428	1443	1458	1477	1483	1490	1511	1517	1524	1545				
	1551	1558	1579	1585	1592	1613	1619	1626	1633	1653	1659	1665	1672	1690	1715				
	1722	1742	1749	1771	1789	1795	1800	1820	1827	1832	1847	1864	1870	1873	1896				
	1914	1933	1939	1991	2003														
INC	897	933	1024	1152	1222	1223	1255	1256	1693	1942									
JMP	184	185	1945	1964	1971	2006													
JSR	247	280	359	371	605	623	638	653	669	687	710	730	753	775	798				
	825	852	883	919	950	977	1009	1046	1078	1105	1137	1174	1214	1246	1272				
	1291	1307	1327	1342	1360	1375	1394	1408	1423	1438	1453	1471	1505	1539	1573				
	1607	1647	1686	1711	1738	1846	1862	1929	1950	2013									
MOV	230	231	232	236	237	238	242	245	249	251	253	259	260	267	274				
	278	279	282	299	300	305	306	307	309	315	323	329	330	331	338				
	339	340	347	348	349	357	358	361	369	370	373	380	381	382	392				

.LIST	1	164	166	169	174
.MACR	210	211	212		
.MACRO	164				
.NLIST	1	164	167	169	174
.REM	1				
.REPT	174				
.TITLE	165				
.WORD	178				

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

#DDGTBC, DDGTBC. SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DDGTBC.P11
RUN-TIME: 6 13 3 SECONDS
RUN-TIME RATIO: 63/25=2.5
CORE USED: BK (16 PAGES)

