

GT40-42-44

INSTRUCTION TEST NO. 2
MD-11-DDGTB-D

EP DDGTB-D-DL-B
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FICHE 1 OF 1

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This microfiche card contains a grid of frames. The frames on the left side of the card contain data, while the right side is mostly blank. The data in the frames is organized into columns and rows, with some frames containing headers and footers. The data appears to be a list of items or a table of values, but the text is too small to read clearly. The frames are arranged in a regular grid pattern, with approximately 10 columns and 15 rows of frames visible on the left side.

B01

ECF:DBQF005801
DDGTBC.F11

GT990100884 INSTR00228N TEST II MAINDEC0815+DDGTB-D HDR000GIB88E063) 19-DEC-760000008C PAGE 270224
SEG 0001

.REM *

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DDGTB-D
PRODUCT NAME: GT40/GT44 INSTRUCTION TEST II
DATE: JANUARY 1977
MAINTAINER: DIAGNOSTIC GROUP

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1. ABSTRACT

THIS VERSION OF THE PROGRAM SUPPORTS NON-SWITCH REGISTER CPU'S. FOR THESE CPU'S, THE SWITCH REGISTER CAN BE CHANGED BY CHANGING THE CONTENTS OF SWREG (170).

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 "GSYXS" (LOC. 1012) MUST BE CHANGED TO 1377.

8. MISCELANEOUS

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.

F01

.ENABL ABS,AMA
.TITLE GT-40/GT-44 INSTRUCTION TEST II MAINDEC-11-DDGTB-D

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

259							
260							
278							
279		000000				.=0	
280	000000	000000				HALT	
281	000002	000000				HALT	
282						;0 THRU 776 IS FILLED WITH A TRAP CATCHER	
289		000024				.=24	
290	000024	012434				LOWPWR	
291	000026	000340				340	
292		000030				.=30	
293	000030	012370				.WORD SCOPEA	;EMT RETURN
294	000032	000340				340	
295							
296		000046				.=46	
297	000046	012310				LOGICAL	
298	000050	000000				0	
299	000052	000000				0	
300		000170				.=170	
301	000170	000000	SWREG:			.WORD 0	
302							
303		000200				.=200	
304	000200	000137	001406			JMP START	
305	000204	000137	012534			JMP START1	
306							
307		001000				.=1000	
308	001000	172000	GSADD:	172000			:GS DISPLAY STARTING ADDRESS
309	001002	000320	GSVCT:	320			:GS DISPLAY STARTING VECTOR
310	001004	000200	DSPBR:	200			:GS DISPLAY INTERRUPT LEVEL
311	001006	000016	GSCHSZ:	16			:CHARACTER SIZE (14-16)
312	001010	000030	GSLFSZ:	30			:LINE FEED SIZE (30-32)
313	001012	001777	GSYAXS:	1777			:+Y AXIS CUTOFF LOCATION
314	001014	000177	GSSEND:	177			:SHIFT-OUT END CHARACTER
315							
316	001016	000000	ICNT:	0			:PASS COUNTER
317	001020	177776	PSW:	177776			
318	001022	013534	DBUF:	BUFFER			:FIRST WORD IN THE DISPLAY BUFFER
319	001024	013536	DBUF1:	BUFFER+2			:SECOND WORD
320	001026	013540	DBUF2:	BUFFER+4			:THIRD WORD
321	001030	013542	DBUF3:	BUFFER+6			:FOURTH WORD
322	001032	013544	DBUF4:	BUFFER+10			:FIFTH WORD
323	001034	013546	DBUF5:	BUFFER+12			:SIX WORD
324	001036	000000	DSAVE:	0			:TEMP REG.
325	001040	177570	SWR:	.WORD DSWR			
326	001042	017476	SIZE:	17476			:BUFFER SIZE FOR 4K <WORD LENGTH>
327	001044	000000	CNTR:	0			
328	001046	000750	LFSIZE:	750			:LINE FEED DELTA Y SIZE
329	001050	000762	CHSIZE:	762			:BACK SPACE CHARACTER DELTA X SIZE

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340                                     :GS ADDRESSES AND VECTORS
341
342 001052 172000 DPC: 172000 ;DISPLAY PC REGISTER
343 001054 172002 DSR: 172002 ;DISPLAY STATUS REGISTER
344 001056 172004 XPOS: 172004 ;X AXIS REGISTER <READ ONLY>
345 001060 172006 YPOS: 172006 ;Y AXIS REGISTER AND GRAPHLOT REGISTER <READ ONLY>
346
347 001062 000320 DDONE: 320 ;DISPLAY STOP <DONE> VECTOR
348 001064 000322 DDONE1: 322 ;
349
350 001066 000324 LPVCT: 324 ;DISPLAY LIGHT PEN VECTOR
351 001070 000326 LPVCT1: 326 ;
352
353 001072 000330 TIMEVT: 330 ;DISPLAY TIME-OUT <NXM.> ERROR VECTOR
354 001074 000332 TMEVT1: 332 ; OR "SHIFT-OUT" VECTOR
355
356                                     :GS INITIALIZATION ROUTINE
357
358 001076 012700 001052 SETUP: MOV #DPC,R0 ;SET JP POINTER
359 001102 013701 001000 MOV GSADD,R1
360 001106 010120 SETUPA: MOV R1,(0)+
361 001110 062701 000002 ADD #2,R1
362 001114 022700 001062 CMP #DPC+10,R0
363 001120 001372 BNE SETUPA
364 001122 012700 001062 MOV #DDONE,R0
365 001126 013701 001002 MOV GSVCT,R1
366 001132 010120 SETJPB: MOV R1,(0)+
367 001134 062701 000002 ADD #2,R1
368 001140 022700 001076 CMP #DDONE+14,R0
369 001144 001372 BNE SETUPB
370 001146 013737 001010 001046 MOV GSLFSZ,LFSIZE ;SET UP DELTA LF
371 001154 005437 001046 NEG LFSIZE ;NEGATE IT
372 001160 042737 177000 001046 BIC #177000,LFSIZE ;MASK IT
373 001166 013737 001005 001050 MOV GSCHSZ,CHSIZE ;SET UP DELTA CHAR
374 001174 005437 001050 NEG CHSIZE ;NEGATE IT
375 001200 004737 001320 JSR PC,DCORE ;SET UP CORE SIZE
376 001204 042737 177000 001050 BIC #177000,CHSIZE ;MASK IT
377 001212 013777 001064 177642 MOV DDONE1,@DDONE ;LOAD DONE VECTOR
378 001220 005077 177640 CLR @DDONE1
379 001224 013777 001070 177634 MOV LPVCT1,@LPVCT ;LOAD LIGHT-PEN VECTOR
380 001232 005077 177632 CLR @LPVCT1
381 001236 013777 001074 177626 MOV TMEVT1,@TIMEVT ;LOAD TIME-OUT VECTOR
382 001244 005077 177624 CLR @TIMEVT1
383 001250 013746 000004 MOV @#ERRVEC,-(SP) ;SAVE VECTOR CONTENTS
384 001254 012737 001302 000004 MOV #1$,@#ERRVEC ;SET UP FOR TRAP
385 001262 012737 177570 001040 MOV #DSWR,@#SWR ;SETUP TO TEST FOR SWITCH REGISTER
386 001270 022777 177777 177542 CMP #-1,@#SWR ;TEST FOR SWITCH REGISTER
387 001276 001005 BNE 3$ ;SWITCH REGISTER PRESENT
388 001300 000401 BR 2$ ;NO SWITCH REGISTER
389 001302 022626 1$: CMP (SP)+,(SP)+ ;POP 2 WORDS OFF STACK
390 001304 012737 000170 001040 2$: MOV #SWREG,@#SWR ;SET UP FOR SOFTWARE SWITCH REGISTER
391 001312 012637 000004 3$: MOV (SP)+,@#ERRVEC ;RESTORE VECTOR CONTENTS
392 001316 000207 RTS PC

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H01

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394          ;SUBROUTINE TO DETERMINE THE SIZE OF CORE
395          ; AND SET UP LOCATION SIZE WITH THE VALUE
396
397 001320 012737 001354 000004 DDCORE: MOV    #2$,R#4      ;SET UP FOR NEM
398 001326 012701 017776          MOV    #17776,R1     ;SET UP ADDRESS
399 001332 005000          CLR    R0
400 001334 062701 020000          1$:  ADD    #20000,R1     ;MOVE TO THE NEXT BANK
401 001340 005200          INC    R0           ;INC BANK COUNTER
402 001342 005711          TST    (1)         ;TIMEOUT ?
403 001344 022701 157776          CMP    #157776,R1  ;END ?
404 001350 001371          BNE    1$
405 001352 000404          BR    3$
406 001354 022626          2$:  CMP    (SP)+,(SP)+ ;POP THE STACK X2
407 001356 005300          DEC    R0           ;DECREMENT BANK COUNT
408 001360 162701 020000          SUB    #20000,R1
409 001364 012737 000006 000004 3$:  MOV    #6,R#4      ;RESET BUSS ERROR
410 001372 010137 001342          MOV    R1,SIZE     ;LOAD SIZE
411 001376 162737 007776 001042          SUB    #7776,SIZE  ;BYPASS LOADER
412 001404 000207          RTS    PC          ;EXIT
413

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415
416 001406 012777 000340 177404 START: MOV #340, @PSW
417 001414 012706 000500 MOV #STKPTR, SP
418 001420 004737 001076 JSR PC, SETUP
419 001424 005037 001016 CLR ICNT
420 001430 012701 001436 MOV #GTBUSS+2, R1
421
422 .TEST FOR BUSS ERRORS ON DISPLAY ADDRESSES
423
424 001434 104000 GTBUSS: SCOPE
425 001436 000005 RESET
426 001440 005077 177410 CLR @DSR : ON DISPLAY STATUS
427 001444 000240 NOP
428 001446 005077 177404 CLR @XPOS : ON DISPLAY X REGISTER
429 001452 000240 NOP
430 001454 005077 177400 CLR @YPOS : ON DISPLAY Y REGISTERS
431 001460 000005 RESET
432
433 : INCREMENT P.C. TEST
434 : COMPLEX - BUFFER LENGTH
435
436 001462 104000 GTPC: SCOPE
437 001464 013702 001022 MOV DBUF, R2 : SET UP POINTER
438 001470 012722 172000 1$: MOV #172000, (2)+ : MOVE DSTOP INTO THE BUFFER
439 001474 023702 001042 CMP SIZE, R2 : FINISHED FILLING THE BUFFER?
440 001500 001373 BNE 1$ : NO
441
442 001502 104000 SCOPE
443 001504 013777 001022 177340 MOV DBUF, @DPC : YES, START THE DISPLAY
444 001512 013737 001022 001036 MOV DBUF, DSAVE
445 001520 013702 001042 MOV SIZE, R2 : SETUP A COUNT
446 001524 005302 DEC R2
447 001526 017704 177322 GTPCA: MOV @DSR, R4
448 001532 100402 BMI 1$
449 001534 000000 HALT : ERROR, STOP FLAG FAILED TO SET
450 001536 000421 BR GTO
451
452 001540 062737 000002 001036 1$: ADD #2, DSAVE
453 001546 017700 177300 MOV @DPC, R0 : READ DISPLAY P.C.
454 001552 023700 001036 CMP DSAVE, R0 : DID IT INCREMENT BY 2?
455 001556 001402 BEQ 2$ : YES
456 001560 000000 HALT : DISPLAY PC FAILED TO INCREMENT
457 001562 000407 BR GTO : PROPERLY
458
459 001564 020037 001036 2$: CMP R0, DSAVE : FINISHED THE BUFFER ?
460 001570 001404 BEQ GTO : BR IF YES
461 001572 012777 000001 177252 MOV #1, @DPC : SINGLE STEP THE DISPLAY
462 001600 000752 BR GTPCA : TRY AGAIN
463

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465                                     ;TESTED BY "LOAD STATUS REGISTER A"
466
467 001602 104000                       GT0:  SCOPE
468 001604 012777 172040 177210        MOV    #172040, @DBUF    ;ITALICS ENABLE=1  ITALICS=0
469 001612 013777 001022 177232        MOV    DBUF, @DPC      ;LOAD DISPLAY P.C.
470 001620 017700 177230                MOV    @DSR, R0        ;READ DISPLAY STATUS REGISTER
471 001624 042700 177757                BIC    #177757, R0     ;MASK TO BIT 4
472 001630 022700 000000                CMP    #0, R0          ;TEST R0
473 001634 001401                        BEQ    .+4              ;
474 001636 000000                        HALT                    ;ITALICS BIT FAILED TO RESET
475
476 001640 104000                       GT1:  SCOPE
477 001642 012777 172060 177152        MOV    #172060, @DBUF  ;ITALICS ENABLE=1  ITALICS=1
478 001650 013777 001022 177174        MOV    DBUF, @DPC      ;LOAD DISPLAY P.C.
479 001656 017700 177172                MOV    @DSR, R0        ;READY DISPLAY STATUS REGISTER
480 001662 042700 177757                BIC    #177757, R0     ;MASK TO BIT 4
481 001666 022700 000020                CMP    #20, R0         ;TEST R0
482 001672 001401                        BEQ    .+4              ;
483 001674 000000                        HALT                    ;ITALICS BIT FAILED TO SET
484
485 001676 104000                       GT2:  SCOPE
486 001700 012777 172000 177114        MOV    #172000, @DBUF  ;ITALICS ENABLE=0  ITALICS=0
487 001706 013777 001022 177136        MOV    DBUF, @DPC      ;LOAD DISPLAY P.C.
488 001714 017700 177134                MOV    @DSR, R0        ;READ DISPLAY STATUS REGISTER
489 001720 042700 177757                BIC    #177757, R0     ;MASK TO BITS 4
490 001724 022700 000020                CMP    #20, R0         ;TEST R0
491 001730 001401                        BEQ    .+4              ;
492 001732 000000                        HALT                    ;ITALICS ENABLE FAILED TO INHIBIT
493                                     ;CLEARING OF ITALICS BIT
494
495 001734 104000                       GT3:  SCOPE
496 001736 012777 172002 177056        MOV    #172002, @DBUF  ;COLOR ENABLE=1  COLOR=0
497 001744 013777 001022 177100        MOV    DBUF, @DPC      ;LOAD DISPLAY P.C.
498 001752 004737 012422                JSR    7, DLAY1        ;EXECUTE A PROGRAM DELAY
499 001756 017700 177072                MOV    @DSR, R0        ;READ DISPLAY STATUS REGISTER
500 001762 042700 177773                BIC    #177773, R0     ;MASK TO BIT 2
501 001766 022700 000000                CMP    #0, R0          ;TEST R0
502 001772 001401                        BEQ    .+4              ;
503 001774 000240                        NOP                      ;COLOR BIT FAILED TO RESET
504
505
506 001776 104000                       GT4:  SCOPE
507 002000 012777 172003 177014        MOV    #172003, @DBUF  ;COLOR ENABLE=1  COLOR=1
508 002006 013777 001022 177036        MOV    DBUF, @DPC      ;LOAD DISPLAY P.C.
509 002014 004737 012422                JSR    7, DLAY1        ;EXECUTE A PROGRAM DELAY
510 002020 017700 177030                MOV    @DSR, R0        ;READ DISPLAY STATUS REGISTER
511 002024 042700 177773                BIC    #177773, R0     ;MASK TO BIT 2
512 002030 022700 000004                CMP    #4, R0          ;TEST R0
513 002034 001401                        BEQ    .+4              ;
514 002036 000240                        NOP                      ;COLOR BIT FAILED TO SET

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K01

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516
517 002040 104000
518 002042 012777 172000 176752
519 002050 013777 001022 176774
520 002056 017700 176772
521 002062 042700 177773
522 002066 022700 000004
523 002072 001401
524 002074 000240
525
526
527
528
529 002076 104000
530 002100 012777 100004 176714
531 002106 012777 172000 176710
532 002114 013777 001022 176730
533 002122 017700 176726
534 002126 042700 177774
535 002132 022700 000000
536 002136 001401
537 002140 000000
538
539 002142 104000
540 002144 012777 100007 176650
541 002152 012777 172000 176644
542 002160 013777 001022 176664
543 002166 017700 176662
544 002172 042700 177774
545 002176 022700 000003
546 002202 001401
547 002204 000000
548
549 002206 104000
550 002210 012777 100005 176604
551 002216 012777 172000 176600
552 002224 013777 001022 176620
553 002232 017700 176616
554 002236 042700 177774
555 002242 022700 000001
556 002246 001401
557 002250 000000
558
559
560 002252 104000
561 002254 012777 100006 176540
562 002262 012777 172000 176534
563 002270 013777 001022 176554
564 002276 017700 176552
565 002302 042700 177774
566 002306 022700 000002
567 002312 001401
568 002314 000000

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GT5: SCOPE
MOV #172000, @DBUF ;COLOR ENABLE=0 COLOR=0
MOV DBUF, @DPC ;LOAD DISPLAY P.C.
MOV @DSR, RO ;READ DISPLAY STATUS REGISTER
BIC #177773, RO ;MASK TO BIT 2
CMP #4, RO ;TEST RO
BEQ .+4
NOP ;COLOR ENABLE FAILED TO INHIBIT
;RESETTING OF COLOR BIT

:TESTED BY "LOAD CHARACTER" MODE

GT6: SCOPE
MOV #100004, @DBUF ;LOAD LINE TYPE ENABLE =1 AND LINE TYPE VALUE =0
MOV #172000, @DBUF1
MOV DBUF, @DPC ;LOAD DISPLAY P.C.
MOV @DSR, RO ;READ DISPLAY STATUS REGISTER
BIC #177774, RO ;MASK TO BITS 1-0
CMP #0, RO ;TEST RO
BEQ .+4
HALT ;LINE BITS 1-0 FAILED TO RESET

GT7: SCOPE
MOV #100007, @DBUF ;LINE TYPE ENABLE =1 LINE TYPE =3
MOV #172000, @DBUF1 ;LOAD STOP
MOV DBUF, @DPC ;LOAD DISPLAY P.C.
MOV @DSR, RO ;READ DISPLAY STATUS REGISTER
BIC #177774, RO ;MASK TO BITS 1-0
CMP #3, RO ;TEST RO
BEQ .+4
HALT ;LINE BITS 1-0 FAILED TO SET

GT8: SCOPE
MOV #100005, @DBUF ;LINE TYPE ENABLE =1 LINE TYPE =1
MOV #172000, @DBUF1 ;LOAD STOP
MOV DBUF, @DPC ;LOAD DISPLAY P.C.
MOV @DSR, RO ;READ DISPLAY STATUS REGISTER
BIC #177774, RO ;MASK TO BITS 1-0
CMP #1, RO ;TEST RO
BEQ .+4
HALT ;LINE BIT 0 FAILED TO SET

GT9: SCOPE
MOV #100006, @DBUF ;LINE TYPE ENABLE =1 LINE TYPE =2
MOV #172000, @DBUF1
MOV DBUF, @DPC ;LOAD DISPLAY P.C.
MOV @DSR, RO ;READ DISPLAY STATUS REGISTER
BIC #177774, RO ;MASK TO BITS 1-0
CMP #2, RO ;TEST RO
BEQ .+4
HALT ;LINE BIT 1 FAILED TO SET

570									
571	002316	104000			GT10:	SCOPE			
572	002320	012777	100003	176474		MOV	#100003, @DBUF	;LINE TYPE ENABLE =0	LINE TYPE =3
573	002326	012777	172000	176470		MOV	#172000, @DBUF1		
574	002334	013777	001022	176510		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.	
575	002342	017700	176506			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER	
576	002346	042700	177774			BIC	#177774, RO	;MASK TO BITS 1-0	
577	002352	022700	000002			CMP	#2, RO	;TEST RO	
578	002356	001401				BEQ	.+4	;SHOULD NOT CHANGE LT VALUE	
579	002360	000000				HALT		;LINE TYPE ENABLE FAILED TO INHIBIT	
580								;CHANGING OF LINETYPE VALUE	
581									
582	002362	104000			GT11:	SCOPE			
583	002364	012777	100020	176430		MOV	#100020, @DBUF	;BLINK ENABLE =1	BLINK =0
584	002372	012777	172000	176424		MOV	#172000, @DBUF1		
585	002400	013777	001022	176444		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.	
586	002406	017700	176442			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER	
587	002412	042700	177767			BIC	#177767, RO	;MASK TO BIT 3	
588	002416	022700	000000			CMP	#0, RO	;TEST RO	
589	002422	001401				BEQ	.+4		
590	002424	000000				HALT		;BLINK BIT FAILED TO RESET	
591									
592									
593	002426	104000			GT12:	SCOPE			
594	002430	012777	100030	176364		MOV	#100030, @DBUF	;BLINK ENABLE =1	BLINK =1
595	002436	012777	172000	176360		MOV	#172000, @DBUF1		
596	002444	013777	001022	176400		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.	
597	002452	017700	176375			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER	
598	002456	042700	177767			BIC	#177767, RO	;MASK TO BIT 3	
599	002462	022700	000010			CMP	#10, RO	;TEST RO	
600	002466	001401				BEQ	.+4		
601	002470	000000				HALT		;BLINK BIT FAILED TO SET	
602									
603									
604	002472	104000			GT13:	SCOPE			
605	002474	012777	100000	176320		MOV	#100000, @DBUF	;BLINK ENABLE =0	BLINK =0
606	002502	012777	172000	176314		MOV	#172000, @DBUF1		
607	002510	013777	001022	176324		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.	
608	002516	017700	176332			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER	
609	002522	042700	177767			BIC	#177767, RO	;MASK TO BIT 3	
610	002526	022700	000010			CMP	#10, RO	;TEST RO	
611	002532	001401				BEQ	.+4		
612	002534	000000				HALT		;BLINK ENABLE FAILED TO INHIBIT	
613								;CHANGING OF THE BLINK BIT	
614									
615	002536	104000			GT14:	SCOPE			
616	002540	012777	100100	176254		MOV	#100100, @DBUF	;LP ENABLE =1	LP=0
617	002546	012777	172000	176250		MOV	#172000, @DBUF1		
618	002554	013777	001022	176270		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.	
619	002562	017700	176266			MOV	@DSR, RO	;READ STATUS	
620	002566	032700	000200			BIT	#200, RO		
621	002572	001401				BEQ	.+4		
622	002574	000000				HALT		;LIGHT PEN FLAG SET IN ERROR	

624										
625	002576	104000			GT15:	SCOPE				
626	002600	012777	100140	176214		MOV	#100140, @DBUF	;LP ENABLE =1 LP=1		
627	002606	012777	172000	176210		MOV	#172000, @DBUF1			
628	002614	013777	001022	176230		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.		
629	002622	017700	176226			MOV	@DSR, RO	;READ STATUS		
630	002626	032700	000200			BIT	#200, RO			
631	002632	001401				BEQ	.+4			
632	002634	000000				HALT		;LIGHT PEN FLAG SET IN ERROR		
633										
634	002636	104000			GT16:	SCOPE				
635	002640	012777	102000	176154		MOV	#102000, @DBUF	;INTENSITY LEVEL ENABLE =1 LEVEL =0		
636	002646	012777	172000	176150		MOV	#172000, @DBUF1			
637	002654	013777	001022	176170		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.		
638	002662	017700	176166			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER		
639	002666	042700	174377			BIC	#174377, RO	;MASK TO BITS 8-10		
640	002672	022700	000000			CMP	#0, RO	;TEST RO		
641	002676	001401				BEQ	.+4			
642	002700	000000				HALT		;INTENSITY LEVEL BITS 8-10 FAILED TO RESET		
643										
644										
645	002702	104000			GT17:	SCOPE				
646	002704	012777	103600	176110		MOV	#103600, @DBUF	;INTENSITY LEVEL ENABLE =1 LEVEL =7		
647	002712	012777	172000	176104		MOV	#172000, @DBUF1			
648	002720	013777	001022	176124		MOV	DBUF, @DPC	;LOAD DISPLAY O.C.		
649	002726	017700	176122			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER		
650	002732	042700	174377			BIC	#174377, RO	;MASK TO BITS 8-10		
651	002736	022700	003400			CMP	#3400, RO	;TEST RO		
652	002742	001401				BEQ	.+4			
653	002744	000000				HALT		;INTENSITY LEVEL BITS 8-10 FAILED TO SET		
654										
655										
656	002746	104000			GT18:	SCOPE				
657	002750	012777	103000	176044		MOV	#103000, @DBUF	;INTENSITY LEVEL ENABLE =1 LEVEL =4		
658	002756	012777	172000	176040		MOV	#172000, @DBUF1			
659	002764	013777	001022	176060		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.		
660	002772	017700	176056			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER		
661	002776	042700	174377			BIC	#174377, RO	;MASK TO BITS 8-10		
662	003002	022700	002000			CMP	#2000, RO	;TEST RO		
663	003006	001401				BEQ	.+4			
664	003010	000000				HALT		;INTENSITY LEVEL BIT 10 FAILED		
665										
666										
667	003012	104000			GT19:	SCOPE				
668	003014	012777	102400	176000		MOV	#102400, @DBUF	;INTENSITY LEVEL ENABLE =1 LEVEL =2		
669	003022	012777	172000	175774		MOV	#172000, @DBUF1			
670	003030	013777	001022	176014		MOV	DBUF, @DPC	;LOAD DISPLAY P.C.		
671	003036	017700	176012			MOV	@DSR, RO	;READ DISPLAY STATUS REGISTER		
672	003042	042700	174377			BIC	#174377, RO	;MASK TO BITS 8-10		
673	003046	022700	001000			CMP	#1000, RO	;TEST RO		
674	003052	001401				BEQ	.+4			
675	003054	000000				HALT		;INTENSITY LEVEL BIT 9 FAILED		

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677
678 003056 104000          GT20: SCOPE
679 003060 012777 102200 175734      MOV      #102200, @DBUF      ; INTENSITY LEVEL ENABLE =1  LEVEL =1
680 003066 012777 172000 175730      MOV      #172000, @DBUF1
681 003074 013777 001022 175750      MOV      DBUF, @DPC      ; LOAD DISPLAY P.C.
682 003102 017700 175746      MOV      @DSR, RO        ; READ DISPLAY STATUS REGISTER
683 003106 042700 174377      BIC      #174377, RO     ; MASK TO BITS 8-10
684 003112 022700 000400      CMP      #400, RO       ; TEST RO
685 003116 001401      BEQ      .+4
686 003120 000000      HALT
687
688
689 003122 104000          GT21: SCOPE
690 003124 012777 101600 175670      MOV      #101600, @DBUF  ; INTENSITY LEVEL ENABLE =0  LEVEL =7
691 003132 012777 172000 175664      MOV      #172000, @DBUF1
692 003140 013777 001022 175704      MOV      DBUF, @DPC      ; LOAD DISPLAY P.C.
693 003146 017700 175702      MOV      @DSR, RO        ; READ DISPLAY STATUS REGISTER
694 003152 042700 174377      BIC      #174377, RO     ; MASK TO BITS 8-10
695 003156 022700 000400      CMP      #400, RO       ; TEST RO
696 003162 001401      BEQ      .+4
697 003164 000000      HALT
698
699
700
701          ; GRAPH PLOT INCREMENT REGISTER TEST
702 003166 104000          GT22: SCOPE
703 003170 012777 174100 175624      MOV      #174100, @DBUF  ; LOAD GRAPH PLOT COUNTER
704 003176 012777 172000 175620      MOV      #172000, @DBUF1
705 003204 013777 001022 175640      MOV      DBUF, @DPC      ; START DISPLAY
706 003212 017700 175640      MOV      @XPOS, RO       ; READ INCREMENT REGISTER
707 003216 042700 001777      BIC      #1777, RO       ; MASK TO BITS 15-10
708 003222 022700 000000      CMP      #0, RO
709 003226 001401      BEQ      .+4
710 003230 000000      HALT
711
712
713 003232 104000          GT23: SCOPE
714 003234 012777 174177 175560      MOV      #174177, @DBUF  ; LOAD GRAPH PLOT COUNTER
715 003242 012777 172000 175554      MOV      #172000, @DBUF1
716 003250 013777 001022 175574      MOV      DBUF, @DPC      ; START DISPLAY
717 003256 017700 175574      MOV      @XPOS, RO       ; READ INCREMENT REGISTER
718 003262 042700 001777      BIC      #1777, RO       ; MASK TO BITS 15-10
719 003266 022700 176000      CMP      #176000, RO
720 003272 001401      BEQ      .+4
721 003274 000000      HALT
722
723
724 003276 104000          GT24: SCOPE
725 003300 012777 174152 175514      MOV      #174152, @DBUF  ; LOAD GRAPH PLOT COUNTER
726 003306 012777 017200 175510      MOV      #17200, @DBUF1
727 003314 013777 001022 175530      MOV      DBUF, @DPC      ; START DISPLAY
728 003322 017700 175530      MOV      @XPOS, RO       ; READ INCREMENT REGISTER
729 003326 042700 001777      BIC      #1777, RO       ; MASK TO BITS 15-10
730 003332 022700 124000      CMP      #124000, RO
731 003336 001401      BEQ      .+4
732 003340 000000      HALT
733
734

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804
805      :TEST THAT THE Y POSITION REGISTER CAN BE LOADED CORRECTLY
806      :USING GRAPHPLOT Y MODE
807
808
809      003670  104000      GT30:  SCOPE
810      003672  012777  126000  175122      MOV      #126000, @DBUF      ;LOW INTENSITY - SET GRAPHPLOT Y MODE
811      003700  012777  000525  175116      MOV      #525, @DBUF1      ;SET Y POSITION
812      003706  012777  172000  175112      MOV      #172000, @DBUF2      ;LOAD STATUS REGISTER A, STOP
813      003714  013777  001022  175130      MOV      @DBUF, @DPC      ;LOAD THE DISPLAY P.C.
814      003722  004737  012410      JSR      7, DLAY      ;EXECUTE A PROGRAM DELAY
815      003726  017700  175126      MOV      @YPOS, R0      ;READ Y POSITION
816      003732  022700  000525      CMP      #525, R0      ;
817      003736  001401      BEQ      .+4      ;
818      003740  000000      HALT      ;Y POSITION REGISTER FAILED TO LOAD
819      ;PROPERLY USING GRAPHPLOT Y MODE
820
821      :TEST THAT THE X - Y POSITION REGISTERS CAN BE LOADED CORRECTLY
822      :USING GRAPHPLOT X + Y MODE
823      :TEST FOR PROPER SELECTION OF X AND Y REGISTERS
824
825      003742  104000      GT31:  SCOPE
826      003744  012777  122000  175050      MOV      #122000, @DBUF      ;LOW INTENSITY - SET GRAPHPLOT X MODE
827      003752  012777  001234  175044      MOV      #1234, @DBUF1      ;SET X POSITION
828      003760  012777  126000  175040      MOV      #126000, @DBUF2      ;SET GRAPHPLOT Y MODE
829      003766  012777  001432  175034      MOV      #1432, @DBUF3      ;SET Y POSITION
830      003774  012777  172000  175030      MOV      #172000, @DBUF4      ;LOAD STATUS REGISTER A, STOP
831      004002  013777  001022  175042      MOV      @DBUF, @DPC      ;LOAD THE DISPLAY P.C.
832      004010  004737  012410      JSR      7, DLAY      ;EXECUTE A PROGRAM DELAY
833      004014  017700  175036      MOV      @XPOS, R0      ;READ X POSITION
834      004020  022700  001234      CMP      #1234, R0      ;
835      004024  001402      BEQ      .+6      ;
836      004026  000000      HALT      ;GRAPHPLOT X MODE FAILED TO SELECT
837      004030  000406      BR      GT32      ;X POSITION PROPERLY
838
839      004032  017700  175022      MOV      @YPOS, R0      ;READ Y POSITION
840      004036  022700  001432      CMP      #1432, R0      ;
841      004042  001401      BEQ      .+4      ;
842      004044  000000      HALT      ;Y POSITION REGISTER FAILED TO LOAD
843      ;PROPERLY USING GRAPHPLOT Y MODE

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845
846      :TEST THAT THE X-Y POSITION REGISTERS CAN BE RESET
847      :USING POINT DATA MODE.
848
849      004046 104000      GT32: SCOPE
850      004050 012777 116000 174744      MOV      #116000,2DBUF      :LOW INTENSITY - POINT MODE
851      004056 005077 174742      CLR      2DBUF1          :CLEAR X POSITION
852      004062 005077 174740      CLR      2DBUF2          :CLEAR Y POSITION
853      004066 012777 172000 174734      MOV      #172000,2DBUF3      :LOAD STATUS "A" REGISTER, STOP
854      004074 013777 001022 174750      MOV      DBUF,2DPC        :LOAD DISPLAY P.C.
855      004102 004737 012410      JSR      7,DLAY          :EXECUTE A PROGRAM DELAY
856      004106 017700 174744      MOV      2XPOS,RC        :READ X POSITION
857      004112 001402      BEQ      .+6             :WAS IT 0?
858      004114 000000      HALT
859      004116 000404      BR      GT33           :X POSITION REGISTER FAILED TO RESET
860                                :USING POINT DATA MODE
861      004120 017700 174734      MOV      2YPOS,RC        :READ Y POSITION
862      004124 001401      BEQ      .+4             :WAS IT 0?
863      004126 000000      HALT
864                                :Y POSITION REGISTER FAILED TO RESET
865                                :USING POINT DATA MODE
866
867      :TEST THAT THE X-Y POSITION REGISTERS CAN BE SET
868      :USING POINT DATA MODE.
869
870      004130 104000      GT33: SCOPE
871      004132 012777 116000 174662      MOV      #116000,2DBUF      :LOW INTENSITY - POINT MODE
872      004140 012777 001777 174656      MOV      #1777,2DBUF1      :SET X POSITION
873      004146 012777 001777 174652      MOV      #1777,2DBUF2      :SET Y POSITION
874      004154 012777 172000 174646      MOV      #172000,2DBUF3      :LOAD STATUS A REGISTER, STOP
875      004162 013777 001022 174662      MOV      DBUF,2DPC        :LOAD DISPLAY P.C.
876      004170 004737 012410      JSR      7,DLAY          :EXECUTE A PROGRAM DELAY
877      004174 017700 174656      MOV      2XPOS,RC        :READ X POSITION
878      004200 022700 001777      CMP      #1777,RC        :WAS IT SET?
879      004204 001402      BEQ      .+6             :
880      004206 000000      HALT
881      004210 000406      BR      GT34           :X POSITION REGISTER FAILED TO SET
882                                :USING POINT DATA MODE
883      004212 017700 174642      MOV      2YPOS,RC        :READ Y POSITION
884      004216 022700 001777      CMP      #1777,RC        :WAS IT SET?
885      004222 001401      BEQ      .+4             :
886      004224 000000      HALT
887                                :Y POSITION REGISTER FAILED TO SET
888                                :USING POINT DATA MODE
889
890
891
892
893
894
895
896
897

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889
890 ;TEST THAT THE X-Y POSITION REGISTERS CAN BE LOADED CORRECTLY
891 ;USING POINT DATA MODE
892
893 004226 104000 GT34: SCOPE
894 004230 012777 116000 174564 MOV #116000,@DBUF ;LOW INTENSITY - POINT MODE
895 004236 012777 001252 174560 MOV #1252,@DBUF1 ;SET X POSITION
896 004244 012777 001252 174554 MOV #1252,@DBUF2 ;SET Y POSITION
897 004252 012777 172000 174550 MOV #172000,@DBUF3 ;LOAD STATUS REGISTER A, STOP
898 004260 013777 001022 174564 MOV DBUF,@DPC
899 004266 004737 012410 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
900 004272 017700 174560 MOV @XPOS,R0 ;READ X POSITION
901 004276 022700 001252 CMP #1252,R0 ;
902 004302 001402 BEQ .+6 ;
903 004304 000000 HALT ;X POSITION REGISTER FAILED
904 004306 000406 BR GT35 ;USING POINT DATA MODE
905
906 004310 017700 174544 MOV @YPOS,R0 ;READ Y POSITION
907 004314 022700 001252 CMP #1252,R0 ;
908 004320 001401 SEQ .+4 ;
909 004322 000000 HALT ;Y POSITION REGISTER FAILED
910 ;USING POINT DATA MODE
911
912 ;TEST THAT THE X-Y POSITION REGISTERS CAN BE LOADED CORRECTLY
913 ;USING POINT DATA MODE
914
915 004324 104000 GT35: SCOPE
916 004326 012777 116000 174466 MOV #116000,@DBUF ;LOW INTENSITY - POINT MODE
917 004334 012777 000525 174462 MOV #525,@DBUF1 ;SET X POSITION
918 004342 012777 000525 174456 MOV #525,@DBUF2 ;SET Y POSITION
919 004350 012777 172000 174452 MOV #172000,@DBUF3 ;LOAD STATUS REGISTER A, STOP
920 004356 013777 001022 174466 MOV DBUF,@DPC
921 004364 004737 012410 JSR 7,DLAY ;EXECUTE A PROGRAM DELAY
922 004370 017700 174462 MOV @XPOS,R0 ;READ X POSITION
923 004374 022700 000525 CMP #525,R0 ;
924 004400 001402 BEQ .+6 ;
925 004402 000000 HALT ;X POSITION REGISTER FAILED
926 004404 000406 BR GT36 ;USING POINT DATA MODE
927
928 004406 017700 174446 MOV @YPOS,R0 ;READ Y POSITION
929 004412 022700 000525 CMP #525,R0 ;
930 004416 001401 BEQ .+4 ;
931 004420 000000 HALT ;Y POSITION REGISTER FAILED
932 ;USING POINT DATA MODE
933

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H02

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959
960      ;TEST THAT LONG VECTOR MODE INCREMENTS X AND Y AXIS PROPERLY
961      ;COJNT 1
962
963      GT37:  SCOPE
964      MOV    DBUF,RO
965      MOV    #116000,(0)+      ;LOAD "POINT MODE"
966      CLR    (0)+              ;CLEAR X AXIS
967      CLR    (0)+              ;CLEAR Y AXIS
968      MOV    #110000,(0)+      ;LOAD "LONG VECTOR MODE"
969      MOV    #1,(0)+           ;PRESET "DELTA X AXIS"
970      MOV    #1,(0)+           ;PRESET "DELTA Y AXIS"
971      MOV    #172000,(0)      ;LOAD "DISPLAY STOP"
972      MOV    DBUF,ADPC        ;LOAD THE DISPLAY P.C.
973      JSR    7,DLAY          ;EXECUTE A PROGRAM DELAY
974
975      MOV    @XPOS,RO         ;READ X AXIS
976      CMP    #1,RO           ;DID IT INCREMENT BY 1
977      BEQ    .+6             ;YES
978      HALT                    ;NO, INCREMENT X AXIS BY
979      BR     GT38            ;LONG VECTOR MODE FAILED
980
981      MOV    @YPOS,RO         ;READ Y AXIS
982      CMP    #1,RO           ;DID IT INCREMENT BY 1
983      BEQ    .+4             ;YES
984      HALT                    ;NO, INCREMENT Y AXIS BY
985      ;LONG VECTOR MODE FAILED
986
987      ;TEST THAT LONG VECTOR MODE DECREMENT X AND Y AXIS PROPERLY
988      ;COJNT 1
989
990      GT38:  SCOPE
991      MOV    DBUF,RO
992      MOV    #116000,(0)+      ;LOAD "POINT MODE"
993      CLR    (0)+              ;CLEAR X AXIS
994      CLR    (0)+              ;CLEAR Y AXIS
995      MOV    #110000,(0)+      ;LOAD "LONG VECTOR MODE"
996      MOV    #20001,(0)+       ;PRESET "DELTA X AXIS"
997      MOV    #20001,(0)+       ;PRESET "DELTA Y AXIS"
998      MOV    #172000,(0)      ;LOAD "DISPLAY STOP"
999      MOV    DBUF,ADPC        ;LOAD THE DISPLAY P.C.
1000     JSR    7,DLAY          ;EXECUTE A PROGRAM DELAY
1001
1002     MOV    @XPOS,RO         ;READ X AXIS
1003     CMP    #1777,RO        ;DID IT DECREMENT BY 1
1004     BEQ    .+6             ;YES
1005     HALT                    ;NO, DECREMENT X AXIS BY
1006     BR     GT39            ;LONG VECTOR MODE FAILED
1007
1008     MOV    @YPOS,RO         ;READ Y AXIS
1009     CMP    #1777,RO        ;DID IT DECREMENT BY 1
1010     BEQ    .+4             ;YES
1011     HALT                    ;NO, DECREMENT Y AXIS BY
1012     ;LONG VECTOR MODE FAILED

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174266

174164

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1014
1015      ;TEST THAT LONG VECTOR MODE INCREMENT X AND Y AXIS PROPERLY
1016      ;COUNT 0-1777
1017
1018      004724 104000      GT39:  SCOPE
1019      004726 012703 001777      MOV      #1777,R3      ;SET UP A COUNTER
1020      004732 012704 000001      MOV      #1,R4        ;PRESET THE COMPARED VALUE
1021
1022      004736 104000      GT39A: SCOPE
1023      004740 013700 001022      MOV      DBUF,R0      ;SET UP R0
1024      004744 012720 116000      MOV      #116000,(0)+ ;LOAD "POINT MODE"
1025      004750 005020      CLR      (0)+         ;CLEAR X AXIS
1026      004752 005020      CLR      (0)+         ;CLEAR Y AXIS
1027      004754 012720 110000      MOV      #110000,(0)+ ;LOAD "LONG VECTOR MODE"
1028      004760 010420      MOV      R4,(0)+      ;PRESET "DELTA X AXIS"
1029      004762 010420      MOV      R4,(0)+      ;PRESET "DELTA Y AXIS"
1030      004764 012720 172000      MOV      #172000,(0)+
1031      004770 013777 001022 174054      MOV      DBUF,@DPC    ;LOAD THE DISPLAY P.C.
1032      004776 004737 012410      JSR      7,DLAY      ;EXECUTE A PROGRAM DELAY
1033
1034      005002 017700 174050      MOV      @XPOS,R0     ;READ X AXIS
1035      005006 020400      CMP      R4,R0        ;ARE THEY EQUAL?
1036      005010 001402      BEQ      .+6         ;YES
1037      005012 000000      HALT
1038      005014 000411      BR      GT40         ;NO, INCREMENT X AXIS VIA
1039                                     ;LONG VECTOR MODE FAILED
1040      005016 017700 174036      MOV      @YPOS,R0     ;READ Y AXIS
1041      005022 020400      CMP      R4,R0        ;ARE THEY EQUAL?
1042      005024 001402      BEQ      .+6         ;YES
1043      005026 000000      HALT
1044      005030 000403      BR      GT40         ;NO, INCREMENT Y AXIS VIA
1045                                     ;LONG VECTOR MODE FAILED
1046      005032 005204      INC      R4           ;INCREMENT EXPECTED VALUE
1047      005034 005303      DEC      R3           ;FINISHED?
1048      005036 001340      BNE     GT39A        ;NO, TEST MORE DATA

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J02

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1050
1051      ;TEST THAT LONG VECTOR MODE DECREMENTS X AND Y AXIS PROPERLY
1052      ;COUNT 1777-0
1053
1054      005040  104000      GT40:  SCOPE
1055      005042  012703  002000      MOV     #2000,R3      ;SET UP A COUNTER
1056      005046  012704  001777      MOV     #1777,R4      ;PRESET THE COMPARED VALUE
1057      005052  012705  020001      MOV     #20001,R5
1058
1059      005056  104000      GT40A: SCOPE
1060      005060  013700  001022      MOV     DBUF,R0      ;SET UP R0
1061      005064  012720  116000      MOV     #116000,(0)+ ;LOAD "POINT MODE"
1062      005070  005020      CLR     (0)+         ;CLEAR X AXIS
1063      005072  005020      CLR     (0)+         ;CLEAR Y AXIS
1064      005074  012720  110000      MOV     #110000,(0)+ ;LOAD "LONG VECTOR MODE"
1065      005100  010520      MOV     R5,(0)+      ;PRESET "DELTA X AXIS"
1066      005102  010520      MOV     R5,(0)+      ;PRESET "DELTA Y AXIS"
1067      005104  012710  172000      MOV     #172000,(0)
1068      005110  013777  001022  173734      MOV     DBUF,ADPC    ;LOAD THE DISPLAY P.C.
1069      005116  004737  012410      JSR     7,DLAY       ;EXECUTE A PROGRAM DELAY
1070
1071      005122  017700  173730      MOV     @XPOS,R0     ;READ X AXIS
1072      005126  020400      CMP     R4,R0        ;ARE THEY EQUAL?
1073      005130  001402      BEQ     .+6          ;YES
1074      005132  000000      HALT    ;NO, DECREMENT X AXIS VIA
1075      005134  000412      BR     GT41         ;LONG VECTOR MODE FAILED
1076
1077      005136  017700  173716      MOV     @YPOS,R0     ;READ Y AXIS
1078      005142  020400      CMP     R4,R0        ;ARE THEY EQUAL?
1079      005144  001402      BEQ     .+6          ;YES
1080      005146  000000      HALT    ;NO, DECREMENT Y AXIS VIA
1081      005150  000404      BR     GT41         ;LONG VECTOR MODE FAILED
1082
1083      005152  005205      INC     R5           ;INCREMENT "DELTA X-Y"
1084      005154  005304      DEC     R4           ;DECREMENT EXPECTED VALUE
1085      005156  005303      DEC     R3           ;FINISHED?
1086      005160  001337      BNE    GT40A        ;NO, TEST MORE DATA

```

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1088 ;TEST THAT X AND Y ASIS INCREMENTS PROPERLY
1089 ;USING SHORT VECTOR MODE
1090 ;COUNT 1
1091
1092 005162 104000          GT41: SCOPE
1093 005164 013700 001022  MOV      DBUF,RO          ;SET UP RO
1094 005170 012720 116000  MOV      #116000,(0)+    ;LOAD "SET POINT MODE"
1095 005174 005020          CLR      (0)+            ;CLEAR X AXIS
1096 005176 005020          CLR      (0)+            ;CLEAR Y AXIS
1097 005200 012720 106000  MOV      #106000,(0)+    ;LOAD "SET SHORT VECTOR MODE"
1098 005204 012720 000201  MOV      #201,(0)+       ;PRESET "DELTA X AND DELTA Y"
1099 005210 012710 172000  MOV      #172000,(0)
1100 005214 013777 001022  MOV      DBUF,ADPC       ;LOAD THE DISPLAY PC
1101 005222 004737 012410  JSR      7,DLAY          ;EXECUTE A PROGRAM DELAY
1102
1103 005226 017700 173624  MOV      @XPOS,RO        ;READ X AXIS
1104 005232 022700 000001  CMP      #1,RO           ;ARE THEY EQUAL?
1105 005236 001402          BEQ      .+6             ;YES
1106 005240 000000          HALT                    ;NO, INCREMENT X AXIS FAILED USING
1107 005242 000406          BR       GT42           ;SHORT VECTOR MODE
1108
1109 005244 017700 173610  MOV      @YPOS,RO        ;READ Y AXIS
1110 005250 022700 000001  CMP      #1,RO           ;ARE THEY EQUAL?
1111 005254 001401          BEQ      .+4             ;YES
1112 005256 000000          HALT                    ;NO INCREMENT Y AXIS FAILED
1113 ;USING SHORT VECTOR MODE
1114
1115 ;TEST THAT X AND Y AXIS DECREMENT PROPERLY
1116 ;USING SHORT VECTOR MODE
1117 ;COUNT 1
1118
1119 005260 104000          GT42: SCOPE
1120 005262 013700 001022  MOV      DBUF,RO          ;SET UP RO
1121 005266 012720 116000  MOV      #116000,(0)+    ;LOAD "SET POINT MODE"
1122 005272 005020          CLR      (0)+            ;CLEAR X AXIS
1123 005274 005020          CLR      (0)+            ;CLEAR Y AXIS
1124 005276 012720 106000  MOV      #106000,(0)+    ;LOAD "SET SHORT VECTOR MODE"
1125 005302 012720 020301  MOV      #20301,(0)+     ;PRESET "DELTA X AND DELTA Y"
1126 005306 012710 172000  MOV      #172000,(0)
1127 005312 013777 001022  MOV      DBUF,ADPC       ;LOAD THE DISPLAY PC
1128 005320 004737 012410  JSR      7,DLAY          ;EXECUTE A PROGRAM DELAY
1129
1130 005324 017700 173526  MOV      @XPOS,RO        ;READ X AXIS
1131 005330 022700 001777  CMP      #1777,RO        ;ARE THEY EQUAL?
1132 005334 001402          BEQ      .+6             ;YES
1133 005336 000000          HALT                    ;NO, DECREMENT X AXIS FAILED USING
1134 005340 000406          BR       GT43           ;SHORT VECTOR MODE
1135
1136 005342 017700 173512  MOV      @YPOS,RO        ;READ Y AXIS
1137 005346 022700 001777  CMP      #1777,RO        ;ARE THEY EQUAL?
1138 005352 001401          BEQ      .+4             ;YES
1139 005354 000000          HALT                    ;NO DECREMENT Y AXIS FAILED
1140 ;USING SHORT VECTOR MODE

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1142
1143
1144
1145
1146
1147 005356 104000
1148 005360 012703 000077
1149 005364 012702 000001
1150 005370 012704 000201
1151
1152 005374 104000
1153 005376 013700 001022
1154 005402 012720 116000
1155 005406 005020
1156 005410 005020
1157 005412 012720 106000
1158 005416 010420
1159 005420 012710 172000
1160 005424 013777 001022 17342C
1161 005432 004737 012410
1162
1163 005436 017700 173414
1164 005442 020200
1165 005444 001402
1166 005446 000000
1167 005450 000413
1168
1169 005452 017700 173402
1170 005456 020200
1171 005460 001402
1172 005462 000000
1173 005464 000405
1174
1175 005466 062704 000201
1176 005472 005202
1177 005474 005303
1178 005476 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

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1180
1181      ;TEST THAT X AND Y AXIS DECREMENT PROPERLY
1182      ;USING SHORT VECTOR MODE
1183      ;COUNT 77-0
1184
1185      005500  104000      GT44:  SCOPE
1186      005502  012703  000077      MOV    #77,R3      ;SET UP A COUNT LOCATION
1187      005506  012702  001777      MOV    #177,R2     ;SET UP THE COMPARED LOCATION
1188      005512  012704  020301      MOV    #20301,R4   ;PRESET THE "DELTA X-Y"
1189
1190      005516  104000      GT44A: SCOPE
1191      005520  013700  001022      MOV    DBUF,RO     ;SET UP RO
1192      005524  012720  116000      MOV    #116000,(0)+ ;LOAD "SET POINT DATA MODE"
1193      005530  005020      CLR    (0)+        ;CLEAR X AXIS
1194      005532  005120      CLR    (0)+        ;CLEAR Y AXIS
1195      005534  012720  106000      MOV    #106000,(0)+ ;LOAD "SET SHORT VECTOR MODE"
1196      005540  010420      MOV    R4,(0)+     ;PRESET "DELTA X AND DELTA Y"
1197      005542  012710  172000      MOV    #172000,(0)
1198      005546  013777  001022  173276      MOV    DBUF,ADPC   ;LOAD THE DISPLAY P.C.
1199      005554  004737  012410      JSR    7,DLAY     ;EXECUTE A PROGRAM DELAY
1200
1201      005560  017700  173272      MOV    @XPOS,RO   ;READ X POSITION
1202      005564  020200      CMP    R2,RO      ;ARE THEY EQUAL
1203      005566  001402      BEQ    .+6        ;YES
1204      005570  000000      HALT
1205      005572  000413      BR    GT45        ;DECREMENT X AXIS FAILED USING
1206                                     ;SHORT VECTOR MODE
1207
1207      005574  017700  173260      MOV    @YPOS, RO  ;READ Y POSITION
1208      005600  020200      CMP    R2,RO      ;ARE THEY EQUAL ?
1209      005602  001402      BEQ    .+6        ;YES DECREMENT
1210      005604  000000      HALT
1211      005606  000405      BR    GT45        ;DECREMENT Y AXIS FAILED USING
1212                                     ;SHORT VECTOR MODE
1213
1213      005610  062704  000201      ADD    #201,R4    ;ADD "DELTA X-Y"
1214      005614  005302      DEC    R2         ;DECREMENT EXPECTED VALUE
1215      005616  005303      DEC    R3         ;DECREMENT COUNT, FINISHED?
1216      005620  001337      BNE   GT44A      ;NO, TEST MORE DATA
1217

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1219          ;TEST THAT X AND Y AXIS INCREMENTS PROPERLY
1220          ;USING RELATIVE POINT MODE
1221          ;COUNT 1
1222
1223          GT45:  SCOPE
1224          MOV    DBUF,RO          ;SET UP PD
1225          MOV    #116000,(0)+    ;LOAD "SET POINT MODE"
1226          CLR    (0)+            ;CLEAR X AXIS
1227          CLR    (0)+            ;CLEAR Y AXIS
1228          MOV    #130000,(0)+    ;LOAD "SET RELATIVE POINT MODE"
1229          MOV    #201,(0)+       ;PRESET "DELTA X AND DELTA Y"
1230          MOV    #172000,(0)
1231          MOV    DBUF,ADPC        ;LOAD THE DISPLAY PC
1232          JSR    7,DLAY          ;EXECUTE A PROGRAM DELAY
1233
1234          MOV    @XPOS,RO         ;READ X AXIS
1235          CMP    #1,RO           ;ARE THEY EQUAL?
1236          BEQ    .+6             ;YES
1237          HALT                   ;NO, INCREMENT X AXIS FAILED USING
1238          BR     GT46            ;RELATIVE POINT MODE
1239
1240          MOV    @YPOS,RO         ;READ Y AXIS
1241          CMP    #1,RO           ;ARE THEY EQUAL?
1242          BEQ    .+4             ;YES
1243          HALT                   ;NO INCREMENT Y AXIS FAILED
1244          ;USING RELATIVE POINT MODE
1245
1246          ;TEST THAT X AND Y AXIS DECREMENT PROPERLY
1247          ;USING RELATIVE POINT MODE
1248          ;COUNT 1
1249
1250          GT46:  SCOPE
1251          MOV    DBUF,RO          ;SET UP RO
1252          MOV    #116000,(0)+    ;LOAD "SET POINT MODE"
1253          CLR    (0)+            ;CLEAR X AXIS
1254          CLR    (0)+            ;CLEAR Y AXIS
1255          MOV    #130000,(0)+    ;LOAD "SET RELATIVE POINT MODE"
1256          MOV    #20301,(0)+    ;PRESET "DELTA X AND DELTA Y"
1257          MOV    #172000,(0)
1258          MOV    DBUF,ADPC        ;LOAD THE DISPLAY PC
1259          JSR    7,DLAY          ;EXECUTE A PROGRAM DELAY
1260
1261          MOV    @XPOS,RO         ;READ X AXIS
1262          CMP    #1777,RO        ;ARE THEY EQUAL?
1263          BEQ    .+6             ;YES
1264          HALT                   ;NO, DECREMENT X AXIS FAILED USING
1265          BR     GT47            ;RELATIVE POINT MODE
1266
1267          MOV    @YPOS,RO         ;READ Y AXIS
1268          CMP    #1777,RO        ;ARE THEY EQUAL?
1269          BEQ    .+4             ;YES
1270          HALT                   ;NO DECREMENT Y AXIS FAILED
1271          ;USING RELATIVE POINT MODE

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173170

173072

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1273
1274
1275
1276
1277
1278 006016 104000
1279 006020 012703 000077
1280 006024 012702 000001
1281 006030 012704 000201
1282
1283 006034 104000
1284 006036 013700 001022
1285 006042 012720 116000
1286 006046 005020
1287 006050 005020
1288 006052 012720 130000
1289 006056 010420
1290 006060 012710 172000
1291 006064 013777 001000
1292 006072 004737 012410
1293
1294 006076 017700 172754
1295 006102 020200
1296 006104 001402
1297 006106 000000
1298 006110 000413
1299
1300 006112 017700 172742
1301 006116 020200
1302 006120 001402
1303 006122 000000
1304 006124 000405
1305
1306 006126 062704 000201
1307 006132 005202
1308 006134 005303
1309 006136 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,RO        ;SET UP RO
      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,ADFC      ;LOAD THE DISPLAY P.C.
      JSR  7,DLAY        ;EXECUTE A PROGRAM DELAY

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

      MOV  @YPOS,RO      ;READ Y POSITION
      CMP  R2,RO         ;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

```

```

1311
1312           ;TEST THAT X AND Y AXIS DECREMENT PROPERLY
1313           ;USING RELATIVE POINT MODE
1314           ;COUNT 77-0
1315
1316 006140 104000          GT48:  SCOPE
1317 006142 012703 000077  MOV     #77,R3           ;SET UP A COUNT LOCATION
1318 006146 012702 001777  MOV     #1777,R2        ;SET UP THE COMPARED LOCATION
1319 006152 012704 020301  MOV     #20301,R4      ;PRESET THE "DELTA X-Y"
1320
1321 006156 104000          GT48A: SCOPE
1322 006160 013700 001022  MOV     DBUF,R0        ;SET UP R0
1323 006164 012720 116000  MOV     #116000,(0)+  ;LOAD "SET POINT DATA MODE"
1324 006170 005020          CLR     (0)+          ;CLEAR X AXIS
1325 006172 005020          CLR     (0)+          ;CLEAR Y AXIS
1326 006174 012720 130000  MOV     #130000,(0)+  ;LOAD "SET RELATIVE POINT MODE"
1327 006200 010420          MOV     R4,(0)+      ;PRESET "DELTA X AND DELTA Y"
1328 006202 012710 172000  MOV     #172000,(0)
1329 006206 013777 001022  MOV     DBUF,DPIC     ;LOAD THE DISPLAY P.C.
1330 006214 004737 012410  JSR     7,DLAY        ;EXECUTE A PROGRAM DELAY
1331
1332 006220 017700 172632  MOV     @XPOS,R0      ;READ X POSITION
1333 006224 020200          CMP     R2,R0         ;ARE THEY EQUAL
1334 006226 001402          BEQ     .+6          ;YES
1335 006230 000000          HALT
1336 006232 000413          BR      GT49        ;DECREMENT X AXIS FAILED USING
                            ;RELATIVE POINT MODE
1337
1338 006234 017700 172620  MOV     @YPOS, R0     ;READ Y POSITION
1339 006240 020200          CMP     R2,R0         ;ARE THEY EQUAL ?
1340 006242 001402          BEQ     .+6          ;YES DECREMENT
1341 006244 000000          HALT
1342 006246 00040E          BR      GT49        ;DECREMENT Y AXIS FAILED USING
                            ;RELATIVE POINT MODE
1343
1344 006250 062704 000201  ADD     #201,R4       ;ADD "DELTA X-Y"
1345 006254 005302          DEC     R2            ;DECREMENT EXPECTED VALUE
1346 006256 005303          DEC     R3            ;DECREMENT COUNT, FINISHED?
1347 006260 001337          BNE    GT48A         ;NO, TEST MORE DATA
1348

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1350
1351
1352           ;LOAD STATUS B TEST
1353           ;USE GRAPHPLOT X MODE TO TEST Y AXIS IS INCREMENTED BY
1354           ;"SCALE" REGISTER
1355
1356 006262 104000          GT49:  SCOPE
1357 006264 012703 000077  MOV      #77,R3           ;SET UP EXECUTION COUNTER
1358 006270 012704 000001  MOV      #1,R4            ;SET UP COMPARED DATA
1359 006274 012737 174101 001036  MOV      #174101,DSAVE    ;SET UP BASIC "LOAD STATUS B"
1360
1361 006302 104000          GT49A: SCOPE
1362 006304 013700 001022  MOV      DBUF,R0          ;SET UP R0
1363 006310 012720 116000  MOV      #116000,(0)+    ;LOAD "POINT MODE"
1364 006314 005020          CLR      (0)+            ;CLEAR X AXIS
1365 006316 005020          CLR      (0)+            ;CLEAR Y AXIS
1366 006320 013720 001036  MOV      DSAVE,(0)+      ;LOAD "SET STATUS B"
1367 006324 012720 120000  MOV      #120000,(0)+    ;LOAD "SET GRAPHPLOT X MODE"
1368 006330 005020          CLR      (0)+            ;LOAD "X GRAPHPLOT DATA"
1369 006332 012710 172000  MOV      #172000,(0)
1370 006336 013777 001022 172506  MOV      DBUF,ADPC       ;LOAD THE DISPLAY P.C.
1371 006344 004737 012410  JSR      7,DLAY          ;EXECUTE A PROGRAM DELAY
1372
1373 006350 017700 172504  MOV      @YPOS,R0        ;READ Y AXIS
1374 006354 020400          CMP      R4,R0           ;COMPARE TO EXPECTED VALUE
1375 006356 001402          BEQ     .+6             ;ARE THEY EQUAL?
1376 006360 000000          HALT
1377 006362 000405          BR      GT50            ;LOAD "STATUS B" FAILED TO LOAD
1378                                     ;THE Y AXIS CORRECTLY
1379 006364 005237 001036  INC      DSAVE
1380 006370 005204          INC      R4
1381 006372 005303          DEC      R3
1382 006374 001343          BNE     GT49A          ;INCREMENT THE STATUS B COUNT
                                     ;DECREMENT THE EXECUTION COUNT
                                     ;TEST MORE DATA

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1384
1385
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1390 006376 104000
1391 006400 012703 000077
1392 006404 012704 000001
1393 006410 012737 174101 001036
1394 006416 104000
1395 006420 013700 001022
1396 006424 012720 116000
1397 006430 005020
1398 006432 005020
1399 006434 013720 001036
1400 006440 012720 124000
1401 006444 005020
1402 006446 012710 172000
1403 006452 013777 001022 172372
1404 006460 004737 012410
1405
1406 006464 017700 172366
1407 006470 042700 175000
1408 006474 020400
1409 006476 001402
1410 006500 000000
1411 006502 000405
1412
1413 006504 005237 001036
1414 006510 005204
1415 006512 005303
1416 006514 001341
1417
1418 006516 012777 174100 172276
1419 006524 012777 172000 172272
1420 006532 013777 001022 172312

: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,@DPC ;LOAD THE DISPLAY P.C.
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

MOV @XPOS,R0 ;READ X AXIS
BIC #176000,R0 ;MASK TO BITS 0-9
CMP R4,R0 ;COMPARE TO EXPECTED VALUE
BEQ .+6 ;ARE THEY EQUAL?
HALT ;LOAD "STATUS B" FAILED TO LOAD
BR GT50B ;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,@DBUF
MOV #172000,@DBUF1
MOV DBUF,@DPC

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1422          ;TEST THAT THE EDGE FLAG IS NOT SET AT 1777.0
1423
1424 006540 104000          GT51: SCOPE
1425 006542 013700 001022   MOV     DBUF,RO
1426 006546 012720 116000   MOV     #116000,(0)+ ;LOAD POINT
1427 006552 012720 001777   MOV     #1777,(0)+  ;LOAD X
1428 006556 012720 000000   MOV     #0,(0)+    ;LOAD Y
1429 006562 012720 172000   MOV     #172000,(0)+ ;LOAD STOP
1430 006566 013777 001022 172256   MOV     DBUF,ADPC   ;START
1431 006574 004737 012410   JSR     7,DLAY      ;EXECUTE A PROGRAM DELAY
1432
1433 006600 032777 000040 172246   BIT     #40,ADSR
1434 006606 001401          BEQ     .+4
1435 006610 000000          HALT          ;ERROR, EDGE FLAG SET ON 1777.0
1436
1437          ;EDGE FLAG TEST
1438          ;TEST THAT EXCEEDING +X AXIS SETS EDGE FLAG
1439
1440 006612 104000          GT52: SCOPE
1441 006614 013700 001022   MOV     DBUF,RO
1442 006620 012720 116000   MOV     #116000,(0)+ ;LOAD POINT
1443 006624 012720 001777   MOV     #1777,(0)+  ;LOAD MAX X
1444 006630 012720 000000   MOV     #0,(0)+    ;LOAD Y
1445 006634 012720 110000   MOV     #110000,(0)+ ;LOAD LONG VECTOR
1446 006640 012720 000001   MOV     #1,(0)+    ;LOAD DELTA X
1447 006644 012720 000000   MOV     #0,(0)+    ;LOAD DELTA Y
1448 006650 012720 172000   MOV     #172000,(0)+ ;LOAD STOP
1449 006654 013777 001022 17217C   MOV     DBUF,ADPC   ;START DISPLAY
1450 006662 004737 012410   JSR     7,DLAY      ;EXECUTE A PROGRAM DELAY
1451
1452 006666 032777 000040 17216C   BIT     #40,ADSR    ;TEST BIT 5
1453 006674 001002          BNE     .+6
1454 00667E 000000          HALT          ;EDGE FLAG FAILED TO SET
1455 006700 000424          BR      GT53
1456
1457          ;SUB-TEST, TEST THAT THE EDGE FLAG CLEARS
1458
1459
1460 006702 013700 001022          MOV     DBUF,RO
1461 006706 012720 116000          MOV     #116000,(0)+ ;LOAD POINT
1462 006712 012720 001777          MOV     #1777,(0)+  ;LOAD X
1463 006716 012720 000000          MOV     #0,(0)+    ;LOAD Y
1464 006722 012720 172000          MOV     #172000,(0)+ ;LOAD STOP
1465 006726 013777 001022 172116   MOV     DBUF,ADPC   ;START DISPLAY
1466 006734 004737 012410          JSR     7,DLAY      ;EXECUTE A PROGRAM DELAY
1467
1468 006740 032777 000040 172106   BIT     #40,ADSR
1469 006746 001401          BEQ     .+4
1470 006750 000000          HALT          ;ERROR, EDGE FLAG FAILED TO CLEAR

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1498
1499
1500
1501
1502
1503
1504
1505
1506

006752 104000
006754 013700 001022
006760 012720 116000
006764 012720 000000
006770 012720 000000
006774 012720 110000
007000 012720 020001
007004 012720 000000
007010 012720 172000
007014 013777 001022 172030
007022 004737 012410

007026 032777 000040 172020
007034 001002
007036 000000
007040 000424

007042 013700 001022
007046 012720 116000
007052 012720 000000
007056 012720 000000
007062 012720 172000
007066 013777 001022 171756
007074 004737 012410

007100 032777 000040 171746
007106 001401
007110 000000

:EDGE FLAG TEST
:TEST THAT EXCEEDING -X AXIS SETS EDGE FLAG

GT53: SCOPE
MOV DBUF,RO
MOV #116000,(0)+ :LOAD POINT
MOV #0,(0)+ :LOAD MAX X
MOV #0,(0)+ :LOAD Y
MOV #110000,(0)+ :LOAD LONG VECTOR
MOV #20001,(0)+ :LOAD DELTA X
MOV #0,(0)+ :LOAD DELTA Y
MOV #172000,(0)+ :LOAD STOP
MOV DBUF,@DPC :START DISPLAY
JSR 7,DLAY :EXECUTE A PROGRAM DELAY

BIT #40,@DSR ;TEST BIT 5
BNE .+6
HALT ;EDGE FLAG FAILED TO SET
BR GT54

:SUB-TEST, TEST THAT THE EDGE FLAG CLEARS

MOV DBUF,RO
MOV #116000,(0)+ :LOAD POINT
MOV #0,(0)+ :LOAD X
MOV #0,(0)+ :LOAD Y
MOV #172000,(0)+ :LOAD STOP
MOV DBUF,@DPC :START DISPLAY
JSR 7,DLAY :EXECUTE A PROGRAM DELAY

BIT #40,@DSR
BEQ .+4
HALT ;ERROR, DEGE FLAG FAILED TO CLEAR

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007112 104300
007114 013700 001022
007120 012720 116000
007124 012720 000000
007130 013720 001012
007134 012720 113000
007140 012720 000000
007144 012720 000001
007150 012720 172000
007154 013777 001022 171670
007162 004737 012410

007166 032777 000040 171660
007174 001002
007176 000000
007200 000424

007232 013700 001022
007206 012720 116000
007212 012720 000000
007216 012720 000000
007222 012720 172000
007226 013777 001022 171616
007234 004737 012410

007240 032777 000040 171608
007246 001401
007250 000000

007252 104000
007254 013700 001022
007260 012720 116000
007264 012720 000000
007270 012720 000000
007274 012720 113000
007300 012720 000000
007304 012720 020001
007310 012720 172000
007314 013777 001022 171530
007322 004737 012410

007326 032777 000040 171520
007334 001001
007336 000000

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

GT54: SCOPE
MOV DBUF,RO
MOV #15000,(0)+ ;LOAD POINT
MOV #0,(0)+ ;LOAD X
MOV GSYAXS,(0)+ ;LOAD MAX Y
MOV #110000,(0)+ ;LOAD LONG VECTOR
MOV #0,(0)+ ;LOAD DELTA X
MOV #1,(0)+ ;LOAD DELTA Y
MOV #172000,(0)+ ;LOAD STOP
MOV DBUF,ADPC ;START DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

BIT #40,ADSR ;TEST BIT 5
BNE .+6
HALT ;EDGE FLAG FAILED TO SET
BR GT55

:SUB-TEST, TEST THAT THE EDGE FLAG CLEARS

MOV DBUF,RO
MOV #116000,(0)+ ;LOAD POINT
MOV #0,(0)+ ;LOAD X
MOV #0,(0)+ ;LOAD Y
MOV #172000,(0)+ ;LOAD STOP
MOV DBUF,ADPC ;START DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

BIT #40,ADSR
BEQ .+4
HALT ;ERROR, EDGE FLAG FAILED TO CLEAR

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

GT55: SCOPE
MOV DBUF,RO
MOV #116000,(0)+ ;LOAD POINT
MOV #0,(0)+ ;LOAD X
MOV #0,(0)+ ;LOAD Y
MOV #110000,(0)+ ;LOAD LONG VECTOR
MOV #0,(0)+ ;LOAD DELTA X
MOV #20001,(0)+ ;LOAD DELTA Y
MOV #172000,(0)+ ;LOAD STOP
MOV DBUF,ADPC ;START DISPLAY
JSR 7,DLAY ;EXECUTE A PROGRAM DELAY

BIT #40,ADSR ;TEST BIT 5
BNE .+4
HALT ;EDGE FLAG FAILED TO SET

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1562          ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1563          ; CODE 00
1564
1565 007340 104000          GT56: SCOPE
1566 007342 012777 100000 171452      MOV      #100000, @DBUF      ;LOAD "CHARACTER MODE"
1567 007350 012777 000000 171446      MOV      #0, @DBUF1        ;LOAD "NULL" CHARACTER
1568 007356 012777 172000 171442      MOV      #172000, @DBUF2
1569 007364 013777 001022 171450      MOV      @DBUF, @DPC      ;START DISPLAY
1570 007372 004737 012410          JSR      7, DLAY          ;EXECUTE A PROGRAM DELAY
1571 007376 017700 171456      MOV      @YPOS, R0        ;READ CHARACTER REG.
1572 007402 042700 001777          BIC      #1777, R0        ;MASK TO BITS 10-15
1573 007406 022700 000000          CMP      #0, R0
1574 007412 001401          BEQ      .+4
1575 007414 000000          HALT                    ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1576
1577          ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1578          ; CODE 77
1579
1580 007416 104000          GT57: SCOPE
1581 007420 012777 100000 171374      MOV      #100000, @DBUF      ;LOAD "CHARACTER MODE"
1582 007426 012777 000077 171370      MOV      #77, @DBUF1        ;LOAD CHARACTER
1583 007434 012777 172000 171364      MOV      #172000, @DBUF2
1584 007442 013777 001022 171402      MOV      @DBUF, @DPC      ;START DISPLAY
1585 007450 004737 012410          JSR      7, DLAY          ;EXECUTE A PROGRAM DELAY
1586 007454 017700 171400      MOV      @YPOS, R0        ;READ CHARACTER REG.
1587 007460 042700 001777          BIC      #1777, R0        ;MASK TO BITS 10-15
1588 007464 022700 176000          CMP      #176000, R0
1589 007470 001401          BEQ      .+4
1590 007472 000000          HALT                    ;ERROR, CHARACTER REGISTER LOADED IN ERROR
1591
1592          ;TEST THAT THE CHARACTER REGISTER IS LOADED PROPERLY
1593          ; CODE 25
1594
1595 007474 104000          GT58: SCOPE
1596 007476 012777 100000 171316      MOV      #100000, @DBUF      ;LOAD "CHARACTER MODE"
1597 007504 012777 000025 171312      MOV      #25, @DBUF1        ;LOAD CHARACTER
1598 007512 012777 172000 171306      MOV      #172000, @DBUF2
1599 007520 013777 001022 171324      MOV      @DBUF, @DPC      ;START DISPLAY
1600 007526 004737 012410          JSR      7, DLAY          ;EXECUTE A PROGRAM DELAY
1601 007532 017700 171322      MOV      @YPOS, R0        ;READ CHARACTER REG.
1602 007536 042700 001777          BIC      #1777, R0        ;MASK TO BITS 10-15
1603 007542 022700 052000          CMP      #52000, R0
1604 007546 001401          BEQ      .+4
1605 007550 000000          HALT                    ;ERROR, CHARACTER REGISTER LOADED IN ERROR

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1656
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1661 007766 104000
1662 007770 012777 116000 171024
1663 007776 012777 001000 171020
1664 010004 012777 001000 171014
1665 010012 012777 100000 171010
1666 010020 012777 000015 171004
1667 010026 012777 172000 171000
1668 010034 013777 001022 171010
1669 010042 004737 012410
1670
1671 010046 017700 171006
1672 010052 042700 001777
1673 010056 022700 032000
1674 010062 001402
1675 010064 000000
1676 010066 000417
1677
1678 010070 017700 170762
1679 010074 022700 000000
1680 010100 001402
1681 010102 000000
1682 010104 000410
1683
1684 010106 017700 170746
1685 010112 042700 176000
1686 010116 022700 001000
1687 010122 001401
1688 010124 000000
1689

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

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

MOV @YPOS,R0 ;READ Y AXIS
BIC #1777,R0 ;MASK TO BITS 10-15
CMP #32000,R0
BEQ .+6
HALT ;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

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1691
1692
1693 ;TEST THAT CHARACTER MODE DOES NOT HANG THE DISPLAY PROCESSOR
1694 ;TEST THAT "LF" DOES NOT CHANGE X BUT DOES CHANGE Y AXIS
1695
1696 010126 104000          GT62:  SCOPE
1697 010130 012777 116000 170664      MOV      #116000, @DBUF      ;POINT MODE
1698 010136 012777 001000 170660      MOV      #1000, @DBUF1
1699 010144 012777 001000 170654      MOV      #1000, @DBUF2      ;1000,1000
1700 010152 012777 100000 170650      MOV      #100000, @DBUF3    ;LOAD "CHARACTER MODE"
1701 010160 012777 000012 170644      MOV      #12, @DBUF4
1702 010166 012777 172000 170640      MOV      #172000, @DBUF5
1703 010174 013777 001022 170650      MOV      @DBUF, @DPC        ;LOAD THE DISPLAY P.C.
1704 010202 004737 012410          JSR      7, DLAY            ;EXECUTE A PROGRAM DELAY
1705
1706 010206 017700 170646      MOV      @YPOS, R0          ;READ CHARACTER REG.
1707 010212 042700 001777      BIC      #1777, R0          ;MASK TO BITS 10-15
1708 010216 022700 024000      CMP      #24000, R0
1709 010222 001402          BEQ      .+6
1710 010224 000000          HALT
1711 010226 000477          BR      GT63              ;CHARACTER REGISTER IN ERROR
1712
1713 010230 017700 170622      MOV      @XPOS, R0          ;READ X AXIS
1714 010234 022700 001000      CMP      #1000, R0          ;ARE THEY EQUAL ?
1715 010240 001402          BEQ      .+6              ;YES
1716 010242 000000          HALT                      ;"LF" CHARACTER CHANGED X AXIS
1717 010244 000470          BR      GT63
1718
1719 010246 017700 170606      MOV      @YPOS, R0          ;READ Y AXIS
1720 010252 042700 176000      BIC      #176000, R0        ;MASK TO BITS 10-15
1721 010256 023700 001046      CMP      LFSIZE, R0        ;ARE THEY EQUAL ?
1722 010262 001401          BEQ      .+4              ;YES
1723 010264 000000          HALT                      ;"LF" CHARACTER FAILED TO CHANGED Y AXIS CORRECTLY
1724

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1803
1804
1805      ;TEST THAT "SHIFT-OUT" GENERATES A STATUS BIT
1806      ;SHIFT-OUT <LOW BYTE>, FOLLOWED BY CODE 77 <HIGH BYTE>
1807 010602 104000      GT64: SCOPE
1808 010604 012777 116000 170210      MOV      #116000, @DBUF      ;POINT MODE
1809 010612 012777 001000 170204      MOV      #1000, @DBUF1
1810 010620 012777 001000 170200      MOV      #1000, @DBUF2      ;1000,1000
1811 010626 012777 100000 170174      MOV      #100000, @DBUF3      ;LOAD "CHARACTER MODE"
1812 010634 012777 037416 170170      MOV      #37416, @DBUF4      ;"SHIFT-OUT" IN LOW BYTE #77 IN HIGH BYTE
1813 010642 012777 172000 170164      MOV      #172000, @DBUF5      ;LOAD STOP
1814 010650 013777 001022 170174      MOV      @DBUF, @DPC      ;START DISPALY
1815 010656 004737 012410      JSR      7, DLAY      ;EXECUTE A PROGRAM DELAY
1816
1817 010662 017700 170172      MOV      @YPOS, R0      ;READ CHARACTER REG
1818 010666 042700 001777      BIC      #1777, R0      ;MASK TO BITS 10-15
1819 010672 022700 176000      CMP      #176000, R0
1820 010676 001402      BEQ      .+6
1821 010700 000000      HALT
1822 010702 000426      BR      GT65      ; CHARACTER REGISTER IN ERROR
1823                                     ; AFTER A SHIFT-OUT COMMAND
1824 010704 017700 170144      MOV      @DSR, R0      ;READ STATUS REGISTER
1825 010710 032700 000100      BIT      #100, R0
1826 010714 001002      BNE      .+6
1827 010716 000000      HALT      ;SHIFT OUT STATUS BIT FAILED TO SET
1828 010720 000417      BR      GT65
1829
1830 010722 017700 170130      MOV      @XPOS, R0      ;READ X POS
1831 010726 022700 001000      CMP      #1000, R0
1832 010732 001402      BEQ      .+6
1833 010734 000000      HALT      ;SHIFT-OUT CHARACTER CHANGED X AXIS
1834 010736 000410      BR      GT65
1835
1836 010740 017700 170114      MOV      @YPOS, R0      ;READ Y POS
1837 010744 042700 176000      BIC      #176000, R0      ;MASK
1838 010750 022700 001000      CMP      #1000, R0
1839 010754 001401      BEQ      .+4
1840 010756 000000      HALT      ;SHIFT-OUT CHARACTER CHANGED Y AXIS

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1842
1843 ;TEST THAT "SHIFT-OUT" DOES NOT GENERATE A STATUS BIT
1844 ;("SHIFT-OUT" FOLLOWED BY CODE 0 THRU 37 EXCEPT #17)
1845
1846 010760 104000 GT65: SCOPE
1847 010762 000005 RESET
1848 010764 005003 CLR R3
1849 010766 012777 100000 170026 MOV #100000, @DBUF ;SET 'CHAR' MODE
1850 010774 012777 000016 170022 MOV #16, @DBUF1 ;LOAD "SHIFT-OUT" INTO THE LOW BYTE
1851 011002 012777 172000 170016 MOV #172000, @DBUF2
1852 011010 110337 013537 GT65A: MOVB R3, BUFFER+3 ;LOAD HIGH BYTE
1853 011014 000240 NOP
1854 011016 013777 001022 170026 MOV DBUF, @DPC ;START THE DISPLAY
1855 011024 004737 012410 JSR 7, DLAY ;EXECUTE A PROGRAM DELAY
1856
1857 011030 032777 000100 170016 BIT #100, @DSR ;TEST FOR SHIFT BIT
1858 011036 001402 BEQ .+6
1859 011040 000000 HALT ;SHIFT STATUS BIT SET IN ERROR
1860 011042 000407 BR GT66 ; CHARACTER IS IN R3
1861
1862 011044 005203 GT65B: INC R3
1863 011046 022703 000017 CMP #17, R3 ;TEST FOR "SHIFT-IN"
1864 011052 001774 BEQ GT65B
1865 011054 022703 000040 CMP #40, R3 ;TEST FOR #40
1866 011060 001353 BNE GT65A ;IS IT #40
1867 ;YES, NEXT TEST
1868
1869 ;TEST THAT "SHIFT-OUT" FOLLOWED BY CODE 40 GENERATE A
1870 ;SHIFT STATUS BIT
1871
1872 011062 104000 GT66: SCOPE
1873 011064 000005 RESET
1874 011066 012777 100000 167726 MOV #100000, @DBUF ;LOAD SET CHAR MODE
1875 011074 012777 000016 167722 MOV #16, @DBUF1 ;LOAD "SHIFT-OUT" INTO THE LOW BYTE
1876 011102 012777 172000 167716 MOV #172000, @DBUF2
1877 011110 112737 000040 013537 GT66A: MOVB #40, BUFFER+3 ;LOAD HIGH BYTE
1878 011116 000240 NOP
1879 011120 013777 001022 167724 MOV DBUF, @DPC ;START THE DISPLAY
1880 011126 004737 012410 JSR 7, DLAY ;EXECUTE A PROGRAM DELAY
1881
1882 011132 032777 000100 167714 BIT #100, @DSR ;TEST 'SHIFT' STATUS BIT
1883 011140 001002 BNE .+6
1884 011142 000000 HALT ;"SHIFT-OUT" STATUS BIT FAILED TO SET
1885 011144 000407 BR GT67 ;ON CHARACTER IN R3
1886

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1888
1889 011146 000005          RESET
1890 011150 032777 000100 167676      BIT      #100, @DSR      ;TEST SHIFT-OUT BIT
1891 011156 001402          BEQ      GT67          ;BR IF CLEARED
1892 011160 000000          HALT
1893 011162 000400          BR       GT67          ;SHIFT OUT STATUS BIT FAILED TO CLEAR
1894
1895          ;TEST THAT 'SHIFT-OUT' IN THE HIGH BYTE FOLLOWED BY A CHARACTER
1896          ; IN THE NEXT LOW BYTE GENERATES A STATUS BIT
1897
1898 011164 104000          GT67:  SCOPE
1899 011166 012777 100000 167626      MOV      #100000, @DBUF ;LOAD SET 'CHAR' MODE
1900 011174 005077 167624          CLR      @DBUF1
1901 011200 012777 007000 167616      MOV      #7000, @DBUF1 ;LOAD 'SHIFT-OUT' INTO THE HIGH BYTE
1902 011206 012777 000040 167612      MOV      #40, @DBUF2   ;LOAD A SHIFT-OUT CHARACTER IN THE NEXT
1903          ;WORD <LOW BYTE>
1904 011214 012777 172000 167606      MOV      #172000, @DBUF3
1905 011222 000005          RESET
1906 011224 000240          NOP
1907 011226 013777 001022 167616      MOV      @DBUF, @DPC   ;START THE DISPLAY
1908 011234 004737 012410          JSR      7, DLAY       ;EXECUTE A PROGRAM DELAY
1909
1910 011240 032777 000100 167606      BIT      #100, @DSR    ;TEST THE STATUS REGISTER
1911 011246 001002          BNE     .+6
1912 011250 000000          HALT
1913 011252 000410          BR       GT68          ;SHIFT-OUT IN THE HIGH BYTE FAILED TO
1914          ;SET A STATUS BIT
1915 011254 017700 167600          MOV      @YPOS, R0     ;READ Y POS
1916 011260 042700 001777          BIC     #1777, R0     ;MASK TO BITS 15-10
1917 011264 022700 100000          CMP     #100000, R0   ;TEST FOR CHAR #40
1918 011270 001401          BEQ     .+4
1919 011272 000000          HALT
1920          ;CHARACTER REGISTER IN ERROR AFTER A
1921          ;"SHIFT-OUT" <HIGH BYTE> FOLLOWED BY
1922          ; #40 <LOW BYTE NEXT WORD>

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1924 ;STOP INTERRUPT TEST
1925 ;TEST FOR NO INTERRUPT
1926
1927 011274 104000 GT68: SCOPE
1928 011276 000005 RESET
1929 011300 012777 011362 167554 MOV #GT68A,@DDONE ;LOAD RETURN FROM DONE INTERRUPT
1930 011306 012777 011362 167556 MOV #GT68A,@TIMEVT ;LOAD RETURN FROM TIME-OUT INTERRUPT
1931 011314 012777 011362 167544 MOV #GT68A,@LPVCT ;LOAD RETURN FROM LIGHT-PEN INTERRUPT
1932 011322 012777 164000 167472 MOV #164000,@DBUF ;LOAD "DISPLAY NOP"
1933 011330 012777 173000 167466 MOV #173000,@DBUF1 ;LOAD "STATUS A"--"STOP"--"STOP INT. ENABLE"
1934 011336 005077 167456 CLR @PSW ;LOWER MACHINE PRIORITY
1935 011342 013777 001022 167502 MOV DBUF,@DPC ;LOAD DISPLAY P.C.
1936 011350 000240 NOP
1937 011352 000240 NOP
1938 011354 000240 NOP
1939 011356 000240 NOP
1940 011360 000401 BR .+4
1941
1942 011362 000000 GT68A: HALT ;GT-40 INTERRUPTED IN ERROR
1943
1944 ;STOP INTERRUPT TEST
1945 ;TEST FOR INTERRUPT
1946
1947 011364 104000 GT69: SCOPE
1948 011366 000005 RESET
1949 011370 012777 011452 167464 MOV #GT69A,@DDONE ;LOAD RETURN ADDRESS FROM INTERRUPT
1950 011376 012777 011464 167462 MOV #GT69B,@LPVCT ;LOAD LP VECTOR
1951 011404 012777 011472 167460 MOV #GT69C,@TIMEVT ;LOAD TO VECTOR
1952 011412 012777 164000 167402 MOV #164000,@DBUF ;LOAD "DISPLAY NOP"
1953 011420 012777 173400 167376 MOV #173400,@DBUF1 ;LOAD "STATUS A"--"STOP"--"STOP INT. ENABLE-IN"
1954 011426 005077 167366 CLR @PSW
1955 011432 013777 001022 167412 MOV DBUF,@DPC
1956 011440 012700 000010 MOV #10,@R0 ;SET UP FOR DELAY
1957 011444 005300 1$: DEC R0 ;WAIT FOR INTERRUPT
1958 011446 100376 BPL 1$
1959 011450 000000 HALT ;GT-40 FAILED TO GENERATE A STOP INTERRUPT
1960 011452 013777 001064 167402 GT69A: MOV DDONE1,@DDONE
1961 011460 022626 CMP (SP)+,(SP)+
1962 011462 000405 BR GT70
1963
1964 011464 022626 GT69B: CMP (SP)+,(SP)+
1965 011466 000000 HALT ;GT-40 STOP (DONE) INTERRUPTED TO THE
1966 ; LIGHT-PEN VECTOR
1967 011470 000402 BR GT70
1968
1969 011472 022626 GT69C: CMP (SP)+,(SP)+
1970 011474 000000 HALT ;GT-40 STOP (DONE) INTERRUPTED TO THE
1971 ; TIME-OUT VECTOR

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1973
1974
1975
1976
1977 011476 104000
1978 011500 000005
1979 011502 012777 011606 167352
1980 011510 012777 011614 167350
1981 011516 012777 011572 167346
1982 011524 012777 100000 167270
1983 011532 012777 020016 167264
1984 011540 012777 173000 167260
1985 011546 005077 167246
1986 011552 013777 001022 167272
1987 011560 012700 000010
1988 011564 005300
1989 011566 100376
1990 011570 000000
1991 011572 000240
1992 011574 013777 001074 167270
1993 011602 022626
1994 011604 000405
1995
1996 011606 022626
1997 011610 000000
1998
1999 011612 000402
2000
2001 011614 022626
2002 011616 000000
2003
2004

;SHIFT OUT INTERRUPT TEST
;TEST FOR INTERRUPT

GT70:  SCOPE
      RESET
      MOV #GT70B,@DDONE ;LOAD DONE VECTOR
      MOV #GT70C,@LPVCT ;LOAD LIGHT-PEN VECTOR
      MOV #GT70A,@TIMEVT ;LOAD RETURN ADDRESS
      MOV #100000,@DBUF ;LOAD "CHARACTER MODE"
      MOV #20016,@DBUF1 ;LOAD "SHIFT-OUT"
      MOV #173000,@DBUF2
      CLR @PSW
      MOV DBUF,@DPC ;START DISPLAY
      MOV #10,@R0 ;SET UP FOR DELAY
1$:   DEC R0 ;WAIT FOR INTERRUPT
      BPL 1$
      HALT ;GT-40 FAILED TO INTERRUPT ON SHIFT-OUT
GT70A: NOP
      MOV TMEVT1,@TIMEVT
      CMP (SP)+,(SP)+
      BR GT71
GT70B: CMP (SP)+,(SP)+
      HALT ;GT-40 SHIFT-OUT INTERRUPTED TO THE
          ; DONE VECTOR
      BR GT71
GT70C: CMP (SP)+,(SP)+
      HALT ;GT-40 SHIFT-OUT INTERRUPTED TO THE
          ; LIGHT PEN VECTOR

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2006
2007
2008           ;TIME-OUT INTERRUPT TEST
2009
2010 011620 104000          GT71:  SCOPE
2011 011622 000005          RESET
2012 011624 013777 001064 167230      MOV      DDONE1, @DDONE
2013 011632 013777 001070 167226      MOV      LPVCT1, @LPVCT
2014 011640 012777 011666 167224      MOV      @GT71A, @TIMEVT ;LOAD RETURN ADDRESS
2015 011646 005077 167146          CLR      @PSW
2016 011652 012777 177776 167172      MOV      #177776, @DPC ;LOAD DISPLAY P.C.
2017 011660 004737 012410          JSR      7, DLAY ;EXECUTE A PROGRAM DELAY
2018 011664 000000          HALT ;GT-40 FAILED TO INTERRUPT ON TIME-OUT
2019
2020 011666 000240          GT71A: NOP
2021 011670 013777 001074 167174      MOV      TMEVT1, @TIMEVT
2022 011676 022626          CMP      (SP)+, (SP)+
2023
2024           ;NO LIGHT PEN INTERRUPT TEST
2025
2026 011700 104000          GT72:  SCOPE
2027 011702 000005          RESET
2028 011704 012777 011746 167154      MOV      @GT72A, @LPVCT ;LOAD RETURN ADDRESS
2029 011712 012777 100140 167102      MOV      #100140, @DBUF ;LOAD DISPLAY BUFFER
2030 011720 012777 173000 167076      MOV      #173000, @DBUF1
2031 011726 005077 167066          CLR      @PSW
2032 011732 013777 001022 167112      MOV      @DBUF, @DPC
2033 011740 004737 012410          JSR      7, DLAY ;EXECUTE A PROGRAM DELAY
2034 011744 000401          BR      .+4
2035 011746 000000          GT72A: HALT ;GT-40 INTERRUPTED ON FALSE LIGHT PEN FLAG
2036 011750 013777 001070 167110      MOV      LPVCT1, @LPVCT

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2038 ;PRE BR LEVEL SETUP
2039
2040 011756 042737 177437 001004 BIC #177437,DSPBR ;MASK TO BITS
2041 011764 001001 BNE .+4
2042 011766 000000 HALT ;BR LEVEL WAS 0
2043 011770 022737 000340 001004 CMP #340,DSPBR
2044 011776 001001 BNE .+4
2045 012000 000000 HALT ;BR LEVEL WAS 7
2046
2047 012002 013737 001004 012026 MOV DSPBR, BRLEV1
2048 012010 162737 000040 012026 SUB #40, BRLEV1
2049 012016 013737 001004 012030 MOV DSPBR, BRLEV2
2050 012024 000402 BR GT73
2051
2052 012026 000140 BRLEV1: :40
2053 012030 000200 BRLEV2: 200
2054
2055 ;BR LEVEL TEST (BR-1)
2056 ;TEST FOR INTERRUPT
2057
2058 012032 104000 GT73: SCOPE
2059 012034 000005 RESET
2060 012036 012777 012100 167016 MOV #GT73A, @DDONE ;LOAD RETURN ADDRESS
2061 012044 012777 173400 166750 MOV #173400, @DBUF ;LOAD "STATUS A"-NO INTERRUPT ENABLE
2062 012052 013777 012026 166740 MOV BRLEV1, @PSW
2063 012060 013777 001022 166764 MOV @BUF, @DPC ;LOAD THE DISPLAY P.C.
2064 012066 012700 000010 MOV #10, @R0 ;SET UP FOR DELAY
2065 012072 005300 1$: DEC @R0 ;WAIT FOR INTERRUPT
2066 012074 100376 BPL 1$
2067 012076 000000 HALT ;NO STOP INTERRUPT ON BR LEVEL INDICATED -1
2068 ;CHECK TO SEE IF PROPER BR LEVEL
2069 012100 022626 GT73A: CMP (SP)+, (SP)+
2070
2071 ;BR LEVEL TEST (BR)
2072 ;TEST THAT THE GT-40 DOES NOT INTERRUPT AT THE LEVEL INDICATED
2073
2074 012102 104000 GT74: SCOPE
2075 012104 000005 RESET
2076 012106 012777 012150 166746 MOV #GT74A, @DDONE ;LOAD RETURN ADDRESS
2077 012114 012777 173400 166700 MOV #173400, @DBUF ;LOAD "STATUS A- STOP- STOP INT ENABLE
2078 012122 013777 012030 166670 MOV BRLEV2, @PSW ;LOWER MACHINE PRIORITY TO INDICATED LEVEL
2079 012130 013777 001022 166714 MOV @BUF, @DPC
2080 012136 000240 NOP
2081 012140 000240 NOP
2082 012142 000240 NOP
2083 012144 000240 NOP
2084 012146 000401 BR .+4 ;NEXT TEST
2085 012150 000000 GT74A: HALT ;GT-40 INTERRUPTED ON THE WRONG BR LEVEL
2086 012152 013777 001064 166702 MOV @DONE1, @DDONE ;LOAD INTERRUPT VECTOR
2087 012160 000005 RESET
2088 012162 000005 RESET

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2090
2091
2092          :RESET TEST
2093          :DSES RESET CLEAR ALL DISPLAY PC AND STATUS BITS
2094
2095          GT75:  SCOPE
2096          012164 104000          MOV      #117637, @DBUF      ;POINT INTENSITY=7,BLINK=1,LINETYPE=3
2097          012166 012777 117637 166626          CLR      @DBUF1          ; X = 0
2098          012174 005077 166624          CLR      @DBUF2          ; Y = 0
2099          012200 005077 166622          MOV      #172077, @DBUF3  ; ITALIC=1, SYNC=1, COLOR=1
2100          012204 012777 172077 166616          MOV      @DBUF, @DPC     ; LOAD DISPLAY P.C.
2101          012212 013777 001022 166632          JSR      PC, DLAY       ; DELAY
2102          012220 004737 012410          RESET
2103          012224 000005          TST      @DPC           ; GENERATE "INIT"
2104          012226 005777 166620          BEQ      .+6
2105          012232 001402          HALT
2106          012234 000000          BR       END            ; RESET FAILED TO CLEAR DISPLAY PC
2107          012236 000406
2108          012240 017700 166610          MOV      @DSR, R0       ; READ DISPLAY STATUS
2109          012244 042700 074000          BIC      #74000, R0    ; MASK TO BIT 11-14
2110          012250 001401          BEQ      .+4            ; IS THE STATUS CLEARED ?
2111          012252 000000          HALT                    ; "INIT" FAILED TO RESET DISPLAY STATUS REGISTER
2112
2113          012254 104000          ENC:    SCOPE
2114          012256 005237 001016          INC      ICNT           ; UPDATE COUNT
2115          012262 022737 000010 001016          CMP      #10, ICNT     ; FINISHED ?
2116          012270 001402          BEQ      HERE          ; BR IF YES
2117          012272 000137 001462          JMP      $TPC          ; NO RE-DO
2118          012276 000005          HERE:  RESET
2119          012300 013700 000042          MOV      @#42, R0
2120          012304 001410          BEQ      HERE1         ; BRANCH IF OFF LINE
2121          012306 000005          RESET
2122          012310 004710          LOGICAL: JSR      PC, (0)
2123          012312 000240          NOP
2124          012314 000240          NOP
2125          012316 000240          NOP
2126          012320 000240          NOP
2127          012322 000240          NOP
2128          012324 000240          NOP
2129          012326 012777 000002 166520          HERE1: MOV      #2, @DSR      ; RING THE BELL
2130          012334 012737 000207 177566          MOV      #207, TPDBR   ; RING THE BELL
2131          012342 105737 177564          1$:    TSTB      TPCSR   ; WAIT
2132          012346 100375          BPL      1$
2133          012350 012737 000207 177566          MOV      #207, TPDBR   ; RING BELL
2134          012356 105737 177564          2$:    TSTB      TPCSR
2135          012362 100375          BPL      2$
2136          012364 000137 001406          JMP      START

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2138                                     :SCOPE ROUTINE
2139
2140 012370 032777 040000 166442 SCOPEA: BIT      #40000,DSWR      :TEST "SCOPE" SWITCH
2141 012376 001001                                     BNE      SCOPEB
2142 012400 011601                                     MOV      (SP),R1
2143 012402 012706 000500 SCOPEB: MOV      #STKPTR,SP
2144 012406 000111                                     JMP      (1)
2145
2146 012410 012700 001000 DLAY:  MOV      #1000,R0
2147 012414 005300 DLAYA: DEC      R0
2148 012416 001376                                     BNE      DLAYA
2149 012420 000207                                     RTS
2150
2151 012422 012700 001000 DLAY1: MOV      #1000,R0
2152 012426 005300 DLAY1A: DEC      R0
2153 012430 001376                                     BNE      DLAY1A
2154 012432 000207                                     RTS
2155
2156 012434 010046 LOWPWR: MOV      R0,-(SP)
2157 012436 010146                                     MOV      R1,-(SP)
2158 012440 010246                                     MOV      R2,-(SP)
2159 012442 010346                                     MOV      R3,-(SP)
2160 012444 010446                                     MOV      R4,-(SP)
2161 012446 010546                                     MOV      R5,-(SP)
2162 012450 010637 012532 MOV      SP,LOWSV
2163 012454 012737 012464 000024 MOV      #HIGPWR,D#24
2164 012462 000000                                     HALT
2165 012464 013706 012532 HIGPWR: MOV      LOWSV,SP
2166 012470 012605                                     MOV      (SP)+,R5
2167 012472 012604                                     MOV      (SP)+,R4
2168 012474 012603                                     MOV      (SP)+,R3
2169 012476 012602                                     MOV      (SP)+,R2
2170 012500 012601                                     MOV      (SP)+,R1
2171 012502 012600                                     MOV      (SP)+,R0
2172 012504 012737 012434 000024 MOV      #LOWPWR,D#24
2173 012512 012706 000500 MOV      #STKPTR,SP
2174 012516 000240 NOP
2175 012520 000240 NOP
2176 012522 000000 HALT
2177 012524 000240 NOP
2178 012526 000240 NOP
2179 012530 000111 JMP      (R1)
2180
2181 012532 000000 LOWSV: 0
2182

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K04

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2184
2185 012534 012777 000340 166256 START1: MOV #340, @PSW
2186 012542 012706 000500 MOV #STKPTR, SP
2187 012546 004737 001076 JSR PC, SETUP
2188 012552 012701 012534 MOV #START1, R1
2189 012556 012777 012612 166276 MOV #SPACEA, @DDONE ;SET UP DONE VECTOR
2190 012564 013777 001004 166272 MOV DSPBR, @DDONE1
2191 012572 012777 012666 166266 MOV #SPACEB, @LPVCT ;SET UP LIGHT-PEN VECTOR
2192 012600 013777 001004 166262 MOV DSPBR, @LPVCT1
2193 012606 000240 NOP
2194 012610 000240 NOP
2195 012612 012706 000500 SPCEA: MOV #STKPTR, SP
2196 012616 012737 173400 013476 MOV #DSTOP, FRM7A
2197 012624 017700 166210 MOV @SWR, R0
2198 012630 006100 ROL R0
2199 012632 042700 177761 BIC #177761, R0
2200 012636 016002 012706 MOV DSPTCH(0), R2
2201 012642 010277 166204 MOV R2, @DPC ;START THE DISPLAY
2202
2203 012646 000240 NOP
2204 012650 000240 NOP
2205 012652 005077 166142 SPCEC: CLR @PSW
2206 012656 000001 WAIT
2207 012660 000240 NOP
2208 012662 000240 NOP
2209 012664 000752 BR SPCEA
2210
2211 012666 012737 164000 013476 SPACEB: MOV #DNOP, FRM7A
2212 012674 012777 000001 166150 MOV #1, @DPC ;SINGLE STEP THE DISPLAY
2213 012702 022626 CMP (SP)+, (SP)+
2214 012704 000762 BR SPCEC
2215
2216
2217 012706 012726 DSPTCH: FRAME0
2218 012710 012754 FRAME1
2219 012712 013002 FRAME2
2220 012714 013030 FRAME3
2221 012716 013056 FRAME4
2222 012720 013114 FRAME5
2223 012722 013202 FRAME6
2224 012724 013426 FRAME7
2225
2226

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2228			
2229			
2230	012726	117004	FRAMED: POINT!INT4!LINE0
2231	012730	041600	INTX+1600
2232	012732	000600	600
2233	012734	041000	INTX+1000
2234	012736	000600	600
2235	012740	112400	LONGV!INT2
2236	012742	040600	INTX+600
2237	012744	000000	0
2238	012746	173400	DSTOP
2239	012750	160000	DJMP
2240	012752	012726	FRAMED
2241			
2242	012754	117004	FRAME1: POINT!INT4!LINE0
2243	012756	040200	INTX+200
2244	012760	000600	600
2245	012762	041000	INTX+1000
2246	012764	000600	600
2247	012766	112400	LONGV!INT2
2248	012770	060600	INTX!MINUSX+600
2249	012772	000000	0
2250	012774	173400	DSTOP
2251	012776	160000	DJMP
2252	013000	012754	FRAME1
2253			
2254	013002	117004	FRAME2: POINT!INT4!LINE0
2255	013004	041000	INTX+1000
2256	013006	001200	1200
2257	013010	041000	INTX+1000
2258	013012	000600	600
2259	013014	112400	LONGV!INT2
2260	013016	040000	INTX
2261	013020	000400	400
2262	013022	173400	DSTOP
2263	013024	160000	DJMP
2264	013026	013002	FRAME2
2265			
2266	013030	117004	FRAME3: POINT!INT4!LINE0
2267	013032	041000	INTX+1000
2268	013034	000200	200
2269	013036	041000	INTX+1000
2270	013040	000600	600
2271	013042	112400	LONGV!INT2
2272	013044	040000	INTX
2273	013046	020400	MINUSX+400
2274	013050	173400	DSTOP
2275	013052	160000	DJMP
2276	013054	013030	FRAME3
2277			

2279			
2280	013056	117004	FRAME4: POINT!INT4!LINE0
2281	013060	000000	0
2282	013062	000000	0
2283	013064	110000	LONGV
2284	013066	041777	INTX!MAXX
2285	013070	000000	0
2286	013072	040000	INTX
2287	013074	001377	MAXY
2288	013076	061777	INTX!MINUSX!MAXX
2289	013100	000000	0
2290	013102	040000	INTX
2291	013104	021377	MINUSX!MAXY
2292	013106	173400	DSTOP
2293	013110	160000	DJMP
2294	013112	013056	FRAME4
2295			
2296	013114	117004	FRAME5: POINT!INT4!LINE0
2297	013116	000740	740
2298	013120	000540	540
2299	013122	104000	SHORTV
2300	013124	057600	INTX+17600
2301	013126	057677	INTX+17677
2302	013130	040077	INTX+77
2303	013132	077677	INTX!MINUSX+17677
2304	013134	077600	INTX!MINUSX+17600
2305	013136	077777	INTX!MINUSX+17777
2306	013140	040177	INTX+177
2307	013142	057777	INTX+17777
2308	013144	114000	POINT
2309	013146	000760	760
2310	013150	000620	620
2311	013152	130000	RELATV
2312	013154	047600	INTX+7600
2313	013156	047637	INTX+7637
2314	013160	040037	INTX+37
2315	013162	067637	INTX!MINUSX+7637
2316	013164	067600	INTX!MINUSX+7600
2317	013166	067737	INTX!MINUSX+7737
2318	013170	040137	INTX+137
2319	013172	047737	INTX+7737
2320	013174	173400	DSTOP
2321	013176	160000	DJMP
2322	013200	013114	FRAME5
2323			

2325					
2326	013202	117004			FRAME6: POINT!INT4!LINED
2327	013204	000200			200
2328	013206	000600			600
2329	013210	100000			CHAR
2330					
(1)	013212	040500	041502	042504	.ASCII 'ABCDEFGHIJKLMNOPQRSTUVWXYZ'
(1)	013220	043506	044510	045512	
(1)	013226	046514	047516	050520	
(1)	013234	051522	052524	053526	
(1)	013242	054530	132		
(1)	013245	040	021041	022043	.ASCIZ @!"#\$%&'()*+,-./0123456789:;<=>?@
(1)	013252	023045	024047	025051	
(1)	013260	026053	027055	030057	
(1)	013266	031061	032063	033065	
(1)	013274	034067	035071	036053	
(1)	013302	037075	000077		
(1)					.EVEN
2331	013306	114000			POINT
2332	013310	000200			200
2333	013312	000540			540
2334	013314	100000			CHAR
2335					
(1)	013316	140	141	142	.BYTE 140,141,142,143,144,145,146,147
(1)	013321	143	144	145	
(1)	013324	146	147		
(1)	013326	150	151	152	.BYTE 150,151,152,153,154,155,156,157
(1)	013331	153	154	155	
(1)	013334	156	157		
(1)	013336	160	161	162	.BYTE 160,161,162,163,164,165,166,167
(1)	013341	163	164	165	
(1)	013344	166	167		
(1)	013346	170	171	172	.BYTE 170,171,172,173,174,175,176,177
(1)	013351	173	174	175	
(1)	013354	176	177		
2336					
(1)	013356	016	000	001	.BYTE 16,0,1,2,3,4,5,6,7,10,11,12,13,14,15,16
(1)	013361	002	003	004	
(1)	013364	005	006	007	
(1)	013367	010	011	012	
(1)	013372	013	014	015	
(1)	013375	016			
(1)	013376	020	021	022	.BYTE 20,21,22,23,24,25,26,27,30,31,32,33,34,35,36,37,17,0
(1)	013401	023	024	025	
(1)	013404	026	027	030	
(1)	013407	C31	032	033	
(1)	013412	034	035	036	
(1)	013415	037	017	000	
(1)					.EVEN
2337	013420	173400			DSTOP
2338	013422	160000			DJMP
2339	013424	013202			FRAME6
2340					

2342									
2343	013426	117004							
2344	013430	000400							
2345	013432	000700							
2345	013434	170200							
2347	013436	110140							
2348	013440	041000							
2349	013442	000000							
2350	013444	114000							
2351	013446	000400							
2352	013450	000600							
2353	013452	170300							
2354	013454	110140							
2355	013456	041000							
2356	013460	000000							
2357	013462	114000							
2358	013464	000400							
2359	013466	000500							
2360	013470	110100							
2361	013472	041000							
2362	013474	000000							
2363	013476	173400							
2364	013500	114000							
2365	013502	000700							
2366	013504	001000							
2367	013506	100000							
2368	013510	044514	044107	026524					
	013516	042520	020116	044510					
	013524	000124							
2369									
2370	013526	173400							
2371	013530	160000							
2372	013532	013426							
2373									
2374	013534	000000							
2375									
2376		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

	575	586	597	608	619	629	638	649	660	671	682	693	1433
	1452	1468	1489	1504	1523	1538	1557	1797	1824	1857	1882	1890	1910
DSTOP = 173400	2108	2129*											
DSWR = 177570	207#	2196	2238	2250	2262	2274	2292	2320	2337	2363	2370		
END 012254	274#	325	385										
ERRVEC= 000004	2106	2113#											
FRAME0 012726	272#	383	384*	391*									
FRAME1 012754	2217	2230#	2240										
FRAME2 013002	2218	2242#	2252										
FRAME3 013030	2219	2254#	2264										
FRAME4 013056	2220	2266#	2276										
FRAME5 013114	2221	2280#	2294										
FRAME6 013202	2222	2296#	2322										
FRAME7 013426	2223	2326#	2339										
FRM7A 013476	2224	2343#	2372										
GRAPHX= 120000	2196*	2211*	2363#										
GRAPHY= 124000	181#												
GREEN = 000002	182#												
GSADD 001000	215#												
GSCHSZ 001006	309#	359											
GSLFSZ 001010	311#	373	1749										
GSEND 001014	312#	370											
GSVCT 001002	314#												
GSYAXS 001012	309#	365											
GTBUSS 001434	313#	1515											
GTPC 001462	420	424#											
GTPCA 001526	436#	2117											
GTC 001602	447#	462											
GT1 001640	450	457	460	467#									
GT10 002316	476#												
GT11 002362	571#												
GT12 002426	582#												
GT13 002472	593#												
GT14 002536	604#												
GT15 002576	615#												
GT16 002636	625#												
GT17 002702	634#												
GT18 002746	645#												
GT19 003012	656#												
GT2 001676	667#												
GT20 003056	485#												
GT21 003122	678#												
GT22 003166	689#												
GT23 003232	702#												
GT24 003276	712#												
GT25 003342	722#												
GT26 003406	733#												
GT27 003472	743#												
GT28 003544	750#												
GT29 003616	776#												
GT3 001734	791#												
GT30 003670	495#												
GT31 003742	809#												
	824#												

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GT32	004046	836	849#			
GT33	004130	859	869#			
GT34	004226	880	893#			
GT35	004324	904	915#			
GT36	004422	926	939#			
GT37	004520	950	963#			
GT38	004622	979	990#			
GT39	004724	1006	1018#			
GT39A	004740	1023#	1048			
GT4	001776	506#				
GT40	005040	1038	1044	1054#		
GT40A	005060	1060#	1086			
GT41	005162	1075	1081	1092#		
GT42	005260	1107	1119#			
GT43	005356	1134	1147#			
GT43A	005376	1153#	1178			
GT44	005500	1167	1173	1185#		
GT44A	005520	1191#	1216			
GT45	005622	1205	1211	1223#		
GT46	005720	1238	1250#			
GT47	006016	1265	1278#			
GT47A	006036	1284#	1309			
GT48	006140	1298	1304	1316#		
GT48A	006160	1322#	1347			
GT49	006262	1336	1342	1356#		
GT49A	006304	1362#	1382			
GT5	002040	517#				
GT50	006376	1377	1389#			
GT50A	006420	1395#	1416			
GT50B	006516	1411	1418#			
GT51	006540	1424#				
GT52	006612	1440#				
GT53	006752	1455	1477#			
GT54	007112	1492	1511#			
GT55	007252	1526	1545#			
GT56	007340	1565#				
GT57	007416	1580#				
GT58	007474	1595#				
GT59	007552	1611#				
GT6	002076	529#				
GT60	007630	1626#				
GT61	007766	1641	1647	1661#		
GT62	010126	1676	1682	1696#		
GT62A	010266	1731#				
GT63	010426	1711	1717	1746	1752	1766#
GT63A	010566	1797#				
GT64	010602	1781	1787	1807#		
GT65	010760	1822	1828	1834	1946#	
GT65A	011010	1852#	1866			
GT65B	011044	1862#	1864			
GT66	011062	1860	1872#			
GT66A	011110	1877#				
GT67	011164	1885	1891	1893	1898#	
GT68	011274	1913	1927#			

ACC	361	367	400	452	1175	1213	1306	1344								
ADG	455	460	473	482	491	502	513	523	536	546	556	567	578	589	600	
	611	621	631	641	652	663	674	685	696	709	719	729	740	753	768	
	784	799	816	834	840	857	862	878	884	902	908	924	930	948	954	
	977	983	1004	1010	1036	1042	1073	1079	1105	1111	1132	1138	1165	1171	1203	
	1209	1236	1242	1263	1269	1296	1302	1334	1340	1375	1409	1434	1469	1505	1539	
	1574	1589	1604	1620	1639	1645	1652	1674	1680	1687	1709	1715	1722	1744	1750	
	1757	1779	1785	1792	1799	1820	1832	1839	1858	1864	1891	1918	2104	2110	2116	
	2120															
BIC	372	376	471	480	489	500	511	521	534	544	554	565	576	587	598	
	609	639	650	661	672	683	694	707	717	727	738	751	1407	1572	1587	
	1602	1618	1637	1650	1672	1685	1707	1720	1742	1755	1777	1790	1818	1837	1916	
	2040	2109	2199													
BIT	620	630	1433	1452	1468	1489	1504	1523	1538	1557	1798	1825	1857	1892	1990	
	1910	2140														
BMT	448															
BNE	363	369	387	404	440	1048	1086	1178	1216	1309	1347	1382	1416	1453	1490	
	1524	1558	1826	1866	1883	1911	2041	2044	2141	2148	2153					
BP	1958	1989	2066	2132	2135											
BPL	388	405	450	457	462	836	859	880	904	926	950	979	1006	1038	1044	
	1075	1081	1107	1134	1167	1173	1205	1211	1238	1265	1299	1304	1336	1342	1377	
	1411	1455	1492	1526	1641	1647	1676	1682	1711	1717	1746	1752	1781	1787	1822	
	1828	1834	1860	1885	1893	1913	1940	1962	1967	1994	1999	2034	2050	2084	2106	
	2209	2214														
CLR	378	380	382	399	419	426	428	430	851	852	966	967	993	994	1025	
	1026	1062	1063	1095	1096	1122	1123	1155	1156	1193	1194	1226	1227	1253	1254	
	1286	1287	1324	1325	1364	1365	1368	1397	1398	1401	1631	1848	1900	1934	1954	
	1985	2015	2031	2097	2098	2205										
CMR	362	368	386	389	403	406	439	454	459	472	481	490	501	512	522	
	535	545	555	566	577	588	599	610	640	651	662	673	684	695	708	
	718	728	739	752	767	783	798	815	833	839	877	883	901	907	923	
	929	947	953	976	982	1003	1009	1035	1041	1072	1078	1104	1110	1131	1137	
	1164	1170	1202	1208	1235	1241	1262	1268	1295	1301	1333	1339	1374	1408	1573	
	1588	1603	1619	1638	1644	1651	1673	1679	1686	1708	1714	1721	1743	1749	1756	
	1778	1784	1791	1819	1831	1838	1863	1865	1917	1961	1964	1969	1993	1996	2001	
	2022	2043	2069	2115	2213											
DEC	407	446	1047	1084	1085	1177	1214	1215	1308	1345	1346	1391	1415	1957	1989	
	2065	2147	2152													
EMT	271															
HALT	280	281	287	449	456	474	483	492	537	547	557	568	579	590	601	
	612	622	632	642	653	664	675	686	697	710	720	730	741	754	769	
	785	800	817	835	841	858	863	879	885	903	909	925	931	949	955	
	978	984	1005	1011	1037	1043	1074	1080	1106	1112	1133	1139	1166	1172	1204	
	1210	1227	1243	1264	1270	1297	1303	1335	1341	1376	1410	1435	1454	1470	1491	
	1506	1525	1540	1559	1575	1590	1605	1621	1640	1646	1653	1675	1681	1688	1710	
	1716	1723	1745	1751	1758	1780	1786	1793	1800	1821	1827	1833	1840	1859	1884	
	1892	1912	1919	1942	1959	1965	1970	1990	1997	2002	2018	2035	2042	2045	2067	
	2085	2105	2111	2164	2176											
JYC	401	1046	1083	1176	1307	1379	1380	1413	1414	1862	2114					
JMP	304	305	2117	2136	2144	2179										
JSR	375	418	498	509	747	765	781	796	813	831	855	875	899	921	945	
	973	1000	1032	1069	1101	1128	1161	1199	1232	1259	1292	1330	1371	1404	1431	
	1450	1466	1487	1502	1521	1536	1555	1570	1585	1600	1615	1634	1669	1704	1739	
	1774	1815	1855	1880	1908	2017	2033	2101	2122	2197						

.BYTE	2335	2336				
.ENABL	257					
.END	2376					
.EVEN	2330	2336	2369			
.LIST	3	256	259	277	288	
.MACR	331	334	337			
.MACRO	235	242	249			
.NLIST	1	2	174	260	262	283
.REM	4					
.REPT	294					
.TITLE	258					
.WORD	293	301	325			

ERRORS DETECTED: 0

*DSKZ:DDGTBD,DDGTBD/CRF=DDGTBD
RUN-TIME: 7 15 3 SECONDS
CORE USED: 7K

M05