

LP14-LP11-LP05

LINE PRINTER TEST
MD-11-DZLPK-H

EP-DZLPK-H-DL
COPYRIGHT ©74-77
FICHE 1 OF 1

JAN 1978
digital
MADE IN USA

REM 1
REPT 0

IDENTIFICATION

PRODUCT CODE MAINDEC-11-DZLPK-H-D
PRODUCT NAME LP14/LP11/LP05 LINE PRINTER TEST
PRODUCT DATE 25-NOVEMBER-1977
MAINTAINER DIAGNOSTIC ENGINEERING

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT
AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL
EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION ASSUMES NO
FOR ANY ERRORS THAT MAY APPEAR IN THIS DOCUMENT.

NO RESPONSIBILITY IS ASSUMED FOR THE USE OR RELIABILITY OF
SOFTWARE ON EQUIPMENT THAT IS NOT SUPPLIED BY DIGITAL OR ITS
AFFILIATED COMPANIES.

COPYRIGHT (C) 1974, 1977 BY DIGITAL EQUIPMENT CORPORATION

THE FOLLOWING ARE TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION

DIGITAL	PDP	JNIBUS	MASSBLS
DEC	DECUS	DECTAPE	

CONTENTS

- 1.0 ABSTRACT
- 2.0 REQUIREMENTS
 - 2.1 EQUIPMENT
 - 2.2 STORAGE
 - 2.3 PRELIMINARY PROGRAMS
- 3.0 LOADING PROCEDURE
 - 3.1 METHOD
- 4.0 STARTING PROCEDURE
 - 4.1 CONTROL SWITCH SETTINGS
 - 4.2 STARTING ADDRESS OR ADDRESSES
 - 4.3 PROGRAM AND/OR OPERATOR OPERATION
- 5.0 OPERATING PROCEDURE
 - 5.1 OPERATIONAL SWITCH SETTINGS
 - 5.2 ABSENCE OF HARDWARE SWITCH REG STEP
 - 5.3 IOT CHANGES
- 6.0 ERRORS
 - 6.1 COMPUTER DETECTED ERRORS
 - 6.2 VISUALLY DETECTED ERRORS

111
112
113
114
115
116
117
118
119
120
121

- 7 0 TEST DESCRIPTIONS
- 7 1 TEST 1 CONTROL AND OPERATOR INTERACTION
 - 7 1 1 TEST 1 SECTION 1 PRINTER READY, TESTS POWER UP
 - 7 1 2 TEST 1 SECTION 2 MANUAL PRINT SPEED TEST
 - 7 1 3 TEST 1 SECTION 3 TOP OF FORM SWITCH TEST
 - 7 1 4 TEST 1 SECTION 4 DAVFU TESTS
- 7 2 PRINTING TESTS
 - 7 2 1 TEST 2 DATA TRANSFER PATHS TEST
 - 7 2 2 TEST 3 CHARACTER GENERATOR AND COMPARATOR TESTS
 - 7 2 3 TEST 4 OVER PRINT TEST
 - 7 2 4 TEST 5 SHUTTLE POSITIONING TEST
 - 7 2 5 TEST 6 PRINT CONTROL TEST
 - 7 2 6 TEST 7 MULTIPLE LINE ADVANCE TEST
 - 7 2 7 TEST 8 HIGH SPEED PRINT TEST
 - 7 2 8 TEST 9 SINGLE CHARACTER, ALL COLUMNS TEST
 - 7 2 9 TEST 10 DRUM PATTERN TEST
 - 7 2 10 TEST 11 RIGHT & LEFT HAND WEDGES
 - 7 2 11 TEST 12 HAMMER ALIGNMENT TEST
 - 7 2 12 TESTS D1&D2 DAVFU - LINE COUNT SLEWING TEST
 - 7 2 13 TEST D3 DAVFU - CHANNEL SLEWING TEST
- 7 3 SCOPE DRIVE TEST

1 0 ABSTRACT

THE LINE PRINTER DIAGNOSTIC PROGRAM IS DIVIDED INTO THREE SECTIONS. INTERNALLY DETECTED ERROR CONDITIONS ARE DISPLAYED ON THE TELEPRINTER, WHILE BRIEF DESCRIPTIONS OF EACH ERROR ARE PRESENTED IN THE LISTING. PRINT PATTERNS USED IN THESE TESTS HAVE BEEN CHOSEN FOR EASE OF VISUAL VERIFICATION.

THE FIRST SECTION IS DESIGNED TO CHECK-OUT THE PROCESSOR INTERFACE CONTROL ELECTRONICS AND THE INTER-COMMUNICATIONS DATA PATHS. IT WILL ALSO PERFORM ALL TESTS THAT REQUIRE OPERATOR INTERVENTION. THE SECOND SECTION IS A PRINTING TEST DESIGNED TO TEST THE LINE PRINTER MECHANISM ITSELF. THE LAST SECTION IS A SCOPE DRIVER ROUTINE FOR USE IN TROUBLE SHOOTING THE PRINTER INTERFACE.

2 0 REQUIREMENTS

2 1 EQUIPMENT

THIS DIAGNOSTIC SHOULD RUN ON ALL PDP-11 FAMILY COMPUTERS HAVING LINE PRINTER CONTROLS, LINE PRINTERS, AND TELETYPES COMPATIBLE WITH THE FOLLOWING:

LPC11	LINE PRINTER INTERFACE
LP05	DATAPRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER
LP11	DATAPRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER
LP14	DATAPRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER

TELETYPE MODEL 33 OR EQUIVALENT CONSOLE UNIT

2 2 STORAGE

MEMORY LOCATIONS 0 - 10 - 17200 ARE USED BY THIS DIAGNOSTIC

2 3 PRELIMINARY PROGRAMS

ALL APPLICABLE PDP-11 DIAGNOSTICS SHOULD RUN ON THE PROCESSOR AND TELETYPE

3 0 LOADING PROCEDURE

3 1 METHOD

- POWER DOWN THE LINE PRINTER
- POWER UP THE PROCESSOR ONLY
- LOAD THE BOOTSTRAP AND ABSOLUTE LOADERS
- LOAD THE LP11/LP05 DIAGNOSTIC PROGRAM TAPE

4 0 STARTING PROCEDURE

4 1 CONTROL SWITCH SETTINGS

SET CONTROL SWITCHES AS DESIRED - (SEE SECTION 5.1 FOR DESCRIPTION OF SWITCH FUNCTIONS) MAKE SUPE SWITCH 0 IS DOWN BEFORE STARTING THE TEST

4 2 STARTING ADDRESS OR ADDRESSES

THE INITIAL STARTING ADDRESS TO RUN THE ENTIRE LP14/LP11/LP05 DIAGNOSTIC IS LOCATION 200(8) TO SKIP THE OPERATOR INTERVENTION TESTS AND START WITH THE PRINTING TESTS, START AT LOCATION 600(8) TO RUN THE SPECIAL SCOPE DRIVER ROUTINE USE START ADDRESS 700(8) OR 720(3) TO START AT ANY OTHER TEST USE THE START ADDRESS FROM THE FOLLOWING TABLE

START ADDRESS	TEST
300	DAVPU ILLEGAL LOAD TEST
304	DAVPU NO STOP BIT TEST
310	DAVPU LINE COUNT SLEW TEST
314	DAVPU CHANNEL SLEW TEST
400	PRINT SPEED TEST USING MANUAL TIMING
404	PRINT SPEED TEST USING KW11-L
410	PRINT SPEED TEST USING KW11-P
414	CHECK TOP OF FORM SWITCH SETTINGS

192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221

600	TEST 2 INTERFACE & DATA PATHS TEST (ALSO GENERAL PRINT TEST STARTING ADDRESS)
610	TEST 3 CHAP COMPARATOR TEST
614	TEST 4 OVER PRINT TEST
620	TEST 5 SHUTTLE POSITIONING TEST
624	TEST 6 PRINT CONTROL TEST
630	TEST 7 MULTIPLE LINE ADVANCE TEST
634	TEST 8 HIGH SPEED PRINT TEST
640	TEST 9 SINGLE CHAR, ALL COLUMNS
644	TEST 10 DRUM PATTERN CHAR TEST
650	TEST 11 SPURIOUS HAMMER FIRING TESTS (LEFT & RIGHT WEDGES)
654	TEST 12 HAMMER ALIGNMENT
700	SCOPE DRIVER ROUTINE
720	SCOPE DRIVER WITHOUT LINE FEEDS

THE PROGRAM WILL START THROUGH THE TEST SEQUENCE BEGINNING WITH THE
SELECTED TEST UNLESS SWITCH 12 IS SET TO LOOP ON TEST (SEE SECTION
5 1)

4 3 PROGRAM AND/OR OPERATOR ACTION

DURING INITIAL START-UP OF THE LINE PRINTER DIAGNOSTIC TEST, THE
HEADER MESSAGE "LP05/LP11/LP14 LINE PRINTER TEST" WILL BE TYPED OUT ON THE
TELEPRINTER FOLLOWED BY EXECUTION OF THE PRINTER READY PORTION OF TEST
1 PRINTING OF THE MESSAGE "POWER-UP" ON THE TELEPRINTER FOLLOWING
THE TEST HEADER PRINT-OUT INDICATES START OF THIS TEST SEQUENCE THIS
TEST IS CARRIED OUT BY AN INTERACTIVE EXCHANGE BETWEEN THE OPERATOR
AND THE TEST PROGRAM THE OPERATIONAL DESCRIPTION OF THIS TEST
APPEARS AS PART OF THE TEST DESCRIPTION FOR TEST 1 (SEE SECTION
7 1 1) AFTER SUCCESSFUL COMPLETION OF THIS SECTION OF TEST 1, THE
PRINT SPEED AND TOP OF FORM SWITCH SETTINGS TESTS WILL BE PERFORMED
(SEE SECTIONS 7 1 2 AND 7 1 3 RESPECTIVELY) IF THE DAVFU IS AVAILABLE
AND SWITCH 14 IS SET, THE DAVFU TESTS WILL ALSO BE PERFORMED AFTER
COMPLETION OF ALL OF TEST 1 PRESS CONTINUE TO ENTER THE PRINTING
TESTS DIRECTLY NO OTHER OPERATOR ACTION WILL BE REQUIRED

242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264

5 0 OPERATING PROCEDURE

5 1 OPERATIONAL SWITCH SETTINGS

THE USE OF THIS PROGRAM ON PROCESSORS NOT HAVING A HARDWARE SWITCH REGISTER NECESSITATES OPERATOR INTERACTION. THE OPERATOR MUST SET UP LOCATION 174 WITH THE SOFTWARE DISPLAY VALUES AND LOCATION 176 WITH THE SOFTWARE SWITCH VALUES (SEE SECTION 5 2)

SWITCH	FUNCTION IN "UP" POSITION
15	LOOP ON ERROR (IN TEST 1 ONLY)
14	OPTIONAL DAVFU AVAILABLE
17	DOWN - 64 CHARACTER SET UP - 96 CHARACTER SET
12	LOOP ON TEST
11	SEND ONLY ONE CHARACTER TO LINE PRINTER IN SCOPE DRIVER - THEN HALT
10	UP - LP14 DOWN - LP05/LP11
9	INHIBIT EPRCP REPORTS
0	USED FOR PRINT SPEED MANUAL TIMING IF NO CLOCK AVAILABLE

1 SWITCH - 0

TO START PRINTING IN THE MANUAL PRINT SPEED TEST, PLACE SWITCH 0 IN THE UP POSITION. AT THE END OF ONE MINUTE PUT SWITCH 0 DOWN. THE APPROXIMATE PRINT SPEED WILL BE PRINTED ON BOTH THE LINE PRINTER AND THE TELEPRINTER. SWITCH 0 IS NOT USED IN ANY OTHER TESTS. MAKE SURE SWITCH 0 IS DOWN AT THE START OF THE TEST IF USING MANUAL TIMING OR UP IF USING AN INTERNAL CLOCK OPTION (KW11-L OR KW11-P)

2 SWITCH - 9

SWITCH 9 IN THE UP POSITION WILL INHIBIT EPRCP REPORTS ON THE TTY

3 SWITCH - 10

SWITCH 10 SHOULD BE SET IN THE UP FOR TESTING THE LP14

285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500

4 SWITCH - 12

SWITCH 12 IN THE UP POSITION IS USED TO AUTOMATICALLY LOOP ON THE CURRENT TEST IF IN TESTS 2 TO 12. PLACING SWITCH 12 IN THE UP POSITION WILL FORCE THE PROGRAM TO CONSTANTLY LOOP ON THE CURRENT TEST. REPLACING THE SWITCH TO THE DOWN POSITION WILL MAKE THE PROGRAM RESUME ITS NORMAL TEST SEQUENCE AT THE COMPLETION OF THE CURRENT TEST.

6 SWITCH - 13

SWITCH 13 SHOULD BE SET UP IF THE 96 CHARACTER SET IS AVAILABLE. IF THE 64 CHARACTER SET IS USED SWITCH 13 SHOULD BE DOWN.

7 SWITCH - 14

SWITCH 14 SHOULD BE SET UP IF THE OPTIONAL DAVFU IS AVAILABLE AND IT IS DESIRED TO RUN THE DAVFU DIAGNOSTIC TESTS.

8 SWITCH - 15

WITH SWITCH 15 IN THE DOWN POSITION THE PROGRAM WILL HALT AFTER AN ERROR TYPE OUT IN TEST 1. WITH SWITCH 15 IN THE UP POSITION, THE PROGRAM WILL LOOP ON THE ERROR IN TEST 1.

REFER TO SECTION 6.1 TO CONTINUE AFTER AN ERROR DURING ANY OTHER TESTS.

5.2 ABSENCE OF HARDWARE SWITCH REGISTER

WHEN THE DIAGNOSTIC IS STARTED AT ADDRESS 200(8), IT WILL DETERMINE IF THE PROCESSOR HAS A HARDWARE (H/W) SWITCH REGISTER (SWR). IF THERE IS NO H/W SWR, THE DIAGNOSTIC WILL USE THE SOFTWARE (S/W) SWR LOCATED AT ADDRESS 176(8).

THE DIAGNOSTIC WILL PROMPT THE OPERATOR WITH THE MESSAGE

SWR = XXXXXX NEW SWR =

THE FIRST TIME THE SWR VALUE IS NEEDED ANY TIME THEREAFTER, EXCEPT DURING TEST #1, SECTION 1, THE OPERATOR MAY CHANGE THE VALUE OF THE SWR BY ENTERING A CONTROL-G (G) AT THE CONSOLE.

IF THERE IS NO H/W SWITCH REGISTER AND THE DIAGNOSTIC IS TO BE STARTED AT AN ADDRESS OTHER THAN 200(8).

ENTER THE NUMBER 176(8) IN LOCATION 1004(8)

ENTER THE INITIAL VALUE OF THE SWR IN LOCATION 176(8)

350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

AFTER EXECUTION BEGINS, THE OPERATOR MAY CHANGE THE VALUE OF THE SWR BY ENTERING A CONTROL-G (G) AT THE CONSOLE
NOTE THE OPERATOR CANNOT CHANGE THE VALUE OF THE SWR DURING TEST #1, SECTION 1 WITH THIS METHOD

THE FOLLOWING COMMANDS ALLOW THE OPERATOR TO MODIFY THE S/W SWR

CONTROL-G (G) ALLOWS MODIFICATION OF THE S/W SWR
ENTERING A G WILL RESULT IN THE FOLLOWING MESSAGE OUTPUT AT THE CONSOLE

SWR = XXXXXX NEW SWR =

THE OPERATOR MAY THEN ENTER UP TO SIX (6) OCTAL DIGITS
THE DIGITS MAY BE ANY COMBINATION OF 0, 1, 2, 3, 4, 5, 6, 7, OR NO ENTRY AT ALL
ALL SWR VALUES ENTERED WILL BE TRUNCATED TO THE LOWER SIXTEEN (16) BITS
ENTERING MORE THAN SIX DIGITS OR A CHARACTER OTHER THAN A 0 GIT RESULTS IN A "?" OUTPUT ON THE CONSOLE AND A REPEAT OF THE PROMPTING MESSAGE

CARRIAGE RETURN (CR) ENTERS THE NEW SWR VALUE IF NO DIGITS HAVE BEEN ENTERED, THE SWR VALUE REMAINS UNCHANGED

CONTROL-U (U) ERASES THE SWR VALUE BEING ENTERED A CARRIAGE RETURN AND LINE FEED WILL BE OUTPUT AT THE CONSOLE THE CORRECT SWR VALUE MAY THEN BE ENTERED

ENTERING ANY CHARACTER BEFORE A CONTROL-G (G) HAS BEEN ENTERED WILL RESULT IN A "?" OUTPUT AT THE CONSOLE

NOTE IT IS POSSIBLE FOR THE DIAGNOSTIC TO OUTPUT MESSAGES AT THE CONSOLE BEFORE THE NEW SWR VALUE HAS BEEN ENTERED SHOULD THIS HAPPEN, THE OPERATOR SHOULD ENTER A CONTROL-L (U) AND THEN ENTER THE CORRECT SWR VALUE

3.3 IOT CHANGES

THE LINE PRINTER STATUS IS LOCATION 177514 AS USED BY THE PROGRAM
THE LINE PRINTER VECTOR ADDRESS IS LOCATION 1030 AS USED BY THE PROGRAM
THE LINE PRINTER PSW IS LOCATION 1032 AS USED BY THE PROGRAM
THE LINE PRINTER BUFFER IS LOCATION 177516 AS USED BY THE PROGRAM

FOR OTHER THAN THESE, PLACE THE CORRECT STATUS LOCATION IN LOCATION 1000(8) AND THE CORRECT BUFFER LOCATION IN LOCATION 1002(8), THE CORRECT VECTOR ADDRESS IN LOCATION 1030(8) AND THE CORRECT PSW IN LOCATION 1032(8)

44
44

448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500

6 0 ERRORS

6 1 COMPUTER DETECTED ERRORS

THE FOLLOWING DISCUSSION DESCRIBES (IN GENERAL) THE METHOD USED FOR INTERNAL ERROR DETECTION AND ERROR DISPLAY BY THE LINE PRINTER DIAGNOSTIC PROGRAM MONITORING OF THE CURRENT CONDITION OF THE READY LINE AFTER EACH OPERATION IS CARRIED ON CONTINUOUSLY DURING ALL TESTS WHERE APPROPRIATE AND IS DESCRIBED IN THE FOLLOWING PARAGRAPHS HOWEVER, ADDITIONAL TESTING IS PERFORMED ESPECIALLY DURING EXECUTION OF THE FIRST TEST FOR A COMPLETE DESCRIPTION OF THE TESTING PROCEDURES USED IN TEST 1 AND THE CORRESPONDING ERROR CONDITIONS, THE READER IS REFERRED TO THE DESCRIPTION OF THE TEST AND THE TEST LISTING

ERROR PRINT-OUTS ARE LIMITED TO THE ERROR NUMBER (ERROR COUNT) ADDITIONAL INFORMATION MAY BE OBTAINED FROM THE TEST DESCRIPTION OR FROM THE LISTING TO FIND THE ERROR IN THE LISTING, SEE THE SYMBOL TABLE AT THE END OF THE LISTING TO FIND THE LOCATION OF THE ERROR

ERROR TAGS WILL BE LISTED AS "ERRXX" WHERE XX = ERROR NUMBER

IN GENERAL, THE TEST PROGRAM MONITORS PROPER OPERATION OF THE LINE PRINTER AFTER EACH PRINTER OPERATION HAS BEEN COMPLETED, THROUGH THE PRINTER "READY" LINE AND THE SETTING OF THE CHARACTER FLAG OF THE PRINTER "DEMAND" RETURN LINE WITH REGARDS TO THE READY LINE, THE FOLLOWING ERROR CONDITIONS, IF DETECTED WITHIN THE LINE PRINTER ITSELF, WILL CAUSE THE READY LINE TO DROP

- 1 PAPER OUT OR TORN
- 2 DRUM GATE OPEN
- 3 RIBBON STALL CONDITION
- 4 POWER SUPPLY FAULT
- 5 HAMMER BANK FAULT
- 6 DAVFU ERROR (IF AVAILABLE)
- 7 SWITCHED OFF LINE

IT SHOULD BE NOTED THAT THE "DEMAND" RETURN FROM THE PRINTER IS CONDITIONAL UPON THE PRINTER "READY" AND THEREFOPE THESE ITEMS SHOULD BE CHECKED FIRST IN CASE OF DIFFICULTY

501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552

6 2 VISUALLY DETECTED ERRORS

SINCE THE COMPUTER CAN ONLY DETECT THE CURRENT CONDITION OF THE READY AND DEMAND RETURN LINES AND DOES NOT RECEIVE ANY ADDITIONAL DATA BACK FROM THE LINE PRINTER, IT IS NECESSARY TO EXAMINE THE PRINT PATTERNS PRODUCED BY THE VARIOUS TEST ROUTINES OR RESORT TO MANUAL SCOPING PROCEDURES, AS PROVIDED BY THE SCOPE DRIVER ROUTINE, TO DETECT AND DIAGNOSE ADDITIONAL DIFFICULTIES DETAILED DESCRIPTIONS OF EACH TEST PATTERN APPEARS IN THE DESCRIPTION OF THE CORRESPONDING TEST ROUTINES

7 0 TEST DESCRIPTIONS

7 1 TEST 1 - CONTROL TESTS AND OPERATOR INTERACTIVE TESTS

TEST 1 IS MADE UP OF FOUR SECTIONS LINKED TOGETHER AND EXECUTED IN SEQUENCE AS A SINGLE TEST THE FOLLOWING DESCRIPTIONS TREAT EACH SECTION SEPARATELY

7 1 1 TEST 1 - SECTION 1 - COMMAND DECODE, CONTROL INTERFACE

THIS PORTION OF TEST 1 IS DESIGNED AS A COMMAND DECODE AND CONTROL INTERFACE TEST AND INCLUDES CHECKOUT OF THE PRINTER INTERRUPT FACILITY UPON INITIAL ENTRY INTO THIS ROUTINE MANUAL INTERVENTION IS REQUIRED TO TEST THE VARIOUS TESTABLE ERROR (NON-READY) CONDITIONS OF THE PRINTER THE OPERATING SEQUENCE IS DESCRIBED IN DETAIL BELOW

THE PRINTER READY LINE CONTINUOUSLY MONITORS THE FOLLOWING CONDITIONS WITHIN THE PRINTER AND ITS TRUE STATE AT THE CONTROL ELECTRONICS INTERFACE IS CONDITIONAL UPON NONE OF THEM EXISTING

- 1 PAPER OUT OR TORN
- 2 DRUM GATE OPEN
- 3 RIBBON STALL CONDITION
- 4 POWER SUPPLY FAULT
- 5 HAMMER BANK FAULT
- 6 DAVFU ERROR (IF AVAILABLE)
- 7 SWITCHED OFF LINE

THE MANUAL-INTERACTIVE TEST SEQUENCE WHICH FOLLOWS IS DESIGNED TO TEST THE PROPER OPERATION OF THE READY LINE AS IT APPEARS AT THE INTERFACE ELECTRONICS WITH RESPECT TO THOSE OF THE ABOVE ITEMS WHICH ARE TESTABLE (I E - A,B,F&G) INITIAL MANUAL TEST SEQUENCE.

- 1 AFTER "POWER ON - TURN ON LINE" HAS BEEN TYPED ON THE TELEPRINTER BRING POWER - UP ON THE LINE PRINTER AND TURN ON LINE MAKING SURE THAT THE PAPER IS IN PLACE IN THE TRACTOPS AND THAT THE DRUM GATE IS CLOSED

572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602

- 2 DEPRESS CONTINUE, "READY SET OK - TRY TORN PAPER SWITCH" WILL BE TYPED OUT IF PRINTER IS ON LINE AND NO ERRORS EXIST
- 3 PAPER - TEAR THE PAPER OFF BELOW THE PRINTER DRUM GATE AND USE THE MANUAL TOP OF FORM SWITCH TO DRIVE ALL THE PAPER OUT OF THE PRINTER AND OBSERVE THAT THE PRINTER READY LIGHT GOES OUT AND THE PAPER ERROR LIGHT GOES ON ON THE PRINTER CONTROL PANEL ATTEMPT TO PLACE THE PRINTER ON LINE THE ON-LINE AND READY LIGHTS ON THE PRINTER CONTROL PANEL SHOULD REMAIN OFF
- 4 DEPRESS CONTINUE, AN ERROR TYPE-OUT (ERROR COUNT 2) WILL OCCUR IF THE PRINTER READY LINE REMAINS HIGH AT THE INTERFACE ELECTRONICS
- 5 READY - AFTER SUCCESSFUL COMPLETION OF STEPS 3 AND 4 THE MESSAGE "ERROR SET OK - TURN ON LINE" WILL BE TYPED RESTORE PAPER TO THE TRACTORS, CLOSE THE DRUM GATE AND PLACE THE PRINTER IN THE READY-ON LINE STATE OBSERVE THAT BOTH THE ON-LINE AND READY LIGHTS COME ON ON THE PRINTER CONTROL PANEL
- 6 DEPRESS CONTINUE, AN ERROR TYPE-OUT (ERROR COUNT 4) WILL OCCUR IF THE PRINTER READY LINE DOES NOT GO HIGH AT THE INTERFACE ELECTRONICS
- 7 DRUM GATE - AFTER SUCCESSFUL COMPLETION OF STEPS 5 & 6 THE MESSAGE "READY SET OK-TRY, DRUM GATE SWITCH" WILL BE TYPED OPEN THE PRINTER DRUM GATE AND OBSERVE THAT THE ON-LINE AND READY LIGHTS GO OUT AND THE DRUM GATE ERROR LIGHT GOES ON ON THE PRINTER CONTROL PANEL
- 8 DEPRESS CONTINUE, AN ERROR TYPE-OUT (ERROR COUNT 5) WILL OCCUR IF THE PRINTER READY LINE APPEARS TO REMAIN HIGH AT THE INTERFACE ELECTRONICS
- 9 READY - AFTER SUCCESSFUL COMPLETION OF STEPS 7 & 8 THE MESSAGE "ERROR SET OK - TURN ON LINE" WILL BE TYPED
- 10 DEPRESS CONTINUE TO COMPLETE THE COMMAND AND REGISTER TESTING ALONG WITH THE INTERRUPT TESTING IF ANY ERROR CONDITIONS EXIST, ERROR TYPE-OUTS GIVING THE ERROR COUNT WILL BE PRINTED CHECK THE LISTING FOR DESCRIPTIONS OF THESE ERRORS.
- 11 SECTION 2 OF TEST 1 WILL BE ENTERED DIRECTLY UPON COMPLETION OF SECTION 1

605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655

7 1 2 TEST 1 - SECTION 2 - PRINT SPEED TIMING TEST

THIS SECTION OF TEST 1 IS DESIGNED TO TIME THE PRINTER FOR ONE FULL MINUTE DURING THIS TIME THE PRINTER WILL PRINT THE DIAGNOL OF THE DRUM PATTERN SO THAT ONLY TWO HAMMERS (MAXIMUM) WILL FIRE AT ANY GIVEN INSTANT AND MAXIMUM PRINT TIME IS USED FOR EACH LINE

IF A KW11-L OR KW11-P ARE AVAILABLE THEY WILL BE USED TO TIME THE PRINTER IF BOTH ARE AVAILABLE, THE KW11-L WILL BE USED IF NEITHER ARE AVAILABLE, MANUAL TIMING WILL BE USED WHEN MANUAL TIMING IS USED INSTRUCTIONS WILL BE TYPED ON THE TELEPRINTER TO START THE TIMING PLACE SWITCH 0 IN THE UP POSITION AT THE END OF ONE FULL MINUTE PLACE SWITCH 0 IN THE DOWN POSITION TO STOP THE TIMING IF USING AN INTERNAL CLOCK FOR TIMING, PLACE SWITCH 0 IN THE UP POSITION BEFORE STARTING THE TEST WHICH EVER METHOD OF TIMING IS USED, AT THE END OF ONE FULL MINUTE THE APPROXIMATE PRINT SPEED WILL BE TYPED ON BOTH THE TELEPRINTER AND LINE PRINTER

IF BOTH A KW11-L OR KW11-P ARE AVAILABLE OR IT IS DESIRED TO MANUALLY TIME THE PRINTER IF EITHER IS AVAILABLE USE THE FOLLOWING START ADDRESSES TO RUN THE DESIRED PRINT SPEED TIMING TEST

400 FOR MANUAL TIMING
404 FOR KW11-L
410 FOR KW11-P

NOTE IF THE LINE FREQUENCY IS 50 HZ CHANGE THE CONTENTS OF "MINCNT TC 5670(8)" REFER TO THE END OF THE PRINTING ROUTINE (SEARCH FOR "MINCNT" IN THE CROSS REFERENCE LISTING)

SECTION 3 OF TEST 1 WILL BE ENTERED DIRECTLY AFTER COMPLETION OF SECTION 2

7 1 3 TEST 1 - SECTION 3 - TOP OF FORM SWITCH TEST

THIS TEST CHECKS ALL POSITIONS OF THE TOP OF FORM SWITCH THE PROGRAM WILL GIVE THE CORRECT SETTINGS FOR THE TOP OF FORM SWITCH ON THE TELETYPE AND THEN WAIT FOR THE OPERATOR AFTER SETTING THE SWITCH, DEPRESS CONTINUE TO TEST THAT SWITCH POSITION AFTER CHECKING ALL POSITIONS THE PRINTER OUTPUT CAN BE MANUALLY VERIFIED A LINE OF ALL DASHES IS PRINTED AS A STARTING POINT FOR EACH SETTING AND THEN A LINE IS PRINTED TELLING THE PROPER SPACING (IN INCHES) FROM THE DASHED LINE TO THAT LINE

UPON COMPLETION OF THIS SECTION OF TEST 1 THE MESSAGE "TURN ON DAFU IF AVAILABLE AND RESET TOP OF FORM SWITCH TO 11 INCHES" WILL BE TYPED, THEN THE PROGRAM WILL HALT RESET THE TOP OF FORM SWITCH TO 11 INCHES AND TURN ON THE DAFU (IF AVAILABLE)

655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708

DEPRESS CONTINUE TWICE TO ENTER DIRECTLY INTO THE PRINTING TEST SEQUENCE STARTING WITH TEST 2 IF THE DAVFU IS NOT AVAILABLE (SWITCH 14 DOWN) IF THE DAVFU IS AVAILABLE (SWITCH 14 UP) SECTION 4 OF TEST 1 WILL BE ENTERED DIRECTLY AFTER DEPRESSING CONTINUE

7 1 4 TEST 1 - SECTION 4 - DAVFU ERROR TESTS

THIS SECTION OF TEST 1 CONTAINS TWO PARTS DESIGNED TO TEST THE DAVFU ERROR CONDITIONS. THE FIRST PART OF THIS TEST ATTEMPTS TO LOAD THE DAVFU WITH INCOMPLETE DATA (AN ODD NUMBER OF DATA WORDS) BETWEEN THE START LOAD AND STOP LOAD COMMANDS. THIS SHOULD CAUSE A FORMAT ERROR TO OCCUR IN THE LINE PRINTER. FAILURE TO CAUSE AN ERROR IN THE LINE PRINTER WILL CAUSE AN ERROR TYPE-OUT "ERROR COUNT 27" TO OCCUR. UPON SUCCESSFUL COMPLETION OF THIS PART OF THE TEST THE MESSAGE "ERROR SET OK - CLEAR AND TURN ON LINE" WILL BE TYPED. CLEAR THE FORMAT ERROR IN THE PRINTER AND PLACE THE PRINTER IN THE READY - ON LINE STATE. PART TWO OF THIS TEST WILL NOW BE EXECUTED TO TEST THAT CHANNEL SLEW COMMANDS REFERENCING CHANNELS WITH NO STOP BITS WILL CAUSE AN ERROR IN THE LINE PRINTER. THE DAVFU WILL BE LOADED WITH ALL ZEROS BETWEEN THE START LOAD AND STOP LOAD COMMANDS. EACH CHANNEL WILL THEN BE TESTED IN SEQUENCE STARTING WITH CHANNEL 0. IF THE ERROR DOES NOT OCCUR MESSAGE "ERROR COUNT 31" WILL BE TYPED. UPON SUCCESSFUL COMPLETION OF THE TEST ON EACH CHANNEL A MESSAGE "ERROR SET OK - CLEAR AND TRY NEXT CHANNEL" WILL BE TYPED. AFTER THIS MESSAGE, CLEAR THE PRINTER ERROR AND PRESS CONTINUE. THE DAVFU WILL THEN BE RELOADED WITH ALL ZEROS AND THE NEXT CHANNEL WILL BE TESTED. UPON SUCCESSFUL COMPLETION OF THIS TEST, THE MESSAGE "ERROR SET OK - CLEAR AND TURN ON LINE" WILL BE TYPED. CLEAR THE PRINTER ERROR AND PLACE THE PRINTER IN THE READY, ON-LINE STATE. DEPRESS CONTINUE TO ENTER THE PRINTING TEST SEQUENCE DIRECTLY STARTING WITH TEST 2.

7 2 LINE PRINTER PRINTING TESTS

TESTS 2 TO 12 PRODUCE VARIOUS PRINT PATTERNS DESIGNED FOR EASE OF VISUAL VERIFICATION. THESE TESTS CHECK ALL OF THE VARIOUS PRINTING ASPECTS OF THE PRINTER. DETAILED DESCRIPTIONS OF EACH INDIVIDUAL TEST FOLLOWS.

7 2 1 TEST 2 - DATA TRANSFER PATHS TEST

THIS TEST IS DESIGNED TO TEST THE DATA TRANSFER PATHS (WITH ALTERNATING ONES AND ZEROS), FROM THE PROCESSOR INTERFACE, THRU THE LINE PRINTER INPUT REGISTER, AND INTO THE PRINTER'S BUFFER. AN ALTERNATING STRING OF "*" AND "U" CHARACTERS ARE TRANSMITTED TO THE PRINTER ON A FULL 132 COLUMN BASIS. SINCE THESE CHARACTERS ARE COMPLIMENTARY BITWISE, THEY PROVIDE BOTH A ONES AND ZEROES CHECK OF ALL TRANSMISSION LINES. END OF LINE IS SENSED WITHIN THE PROCESSOR AND A LINE FEED CHARACTER IS TRANSMITTED TO PRINT EACH LINE. PRINTING OF THE TEST LINE IS REPEATED 32 TIMES, ALTERNATING THE COLUMN POSITIONS OF THE "*" AND "U" CHARACTERS TO PRODUCE A CHECKER-BOARD PATTERN.

703
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762

7 2 2 TEST 3 - CHARACTER GENERATOR AND COMPARATOR TEST

TEST 3 IS DESIGNED PRIMARILY TO TEST THE LINE PRINTER CHARACTER GENERATOR AND COMPARATOR LOGIC AND ITS ABILITY TO DETECT AND ACT UPON BOTH PRINTABLE AND ILLEGAL (NON-PRINTING) CHARACTERS. A SERIES OF ALL 64 OR 96 PRINTABLE CHARACTERS ARE TRANSMITTED IN SEQUENCE TO THE LINE PRINTER AND PRINTED ON A SINGLE LINE BEGINNING WITH THE SPACE CHARACTER. THIS IS FOLLOWED BY AN ALTERNATE LINE OF ALL 64 OR 32 ILLEGAL CHARACTERS, EACH OF WHICH SHOULD BE CONVERTED TO A SPACE CHARACTER PRODUCING NO VISIBLE PRINTING. THIS SEQUENCE OF ALTERNATING ALL PRINTABLE CHARACTERS FOLLOWED BY ALL ILLEGAL CHARACTERS IS REPEATED 10 TIMES ALONG WITH AN EXTRA LINE OF ILLEGAL CHARACTERS INSERTED AT THE BEGINNING OF THE TEST TO PRODUCE 21 LINES OF PRINT (11 OF WHICH WILL BE BLANK)

7 2 3 TEST 4 - OVER PRINT TEST

THIS TEST CHECKS THE CARRIAGE RETURN (015) CONTROL FOR OVERPRINTING A LINE. THE TEST PRODUCES 24 LINES OF ALTERNATING E'S AND SPACES, OVERPRINTED WITH E'S AND SPACES IN THE SAME LOCATIONS. THE STARTING CHARACTER FOR EACH LINE IS ALSO ALTERNATED PRODUCING A CHECKERBOARD PATTERN. OVERPRINTED E'S SHOULD BE ALIGNED WITH THE FIRST E'S PRINTED.

7 2 4 TEST 5 - SHUTTLE POSITIONING TEST

THIS TEST CHECKS THE HAMMER SHUTTLE FOR CORRECT OPERATION. FULL LINES OF E'S ARE PRINTED BY PRINTING A PAIR OF E'S AT A TIME THEN OVERPRINTING THOSE E'S PRINTED WITH SPACES AND ADDING ANOTHER PAIR OF E'S TO THE LINE UNTIL THE LINE IS COMPLETED. THEN A FULL LINE OF M'S ARE PRINTED FOR COMPARISON. A TOTAL OF 16 LINES ARE PRINTED DURING THIS TEST. THERE IS NO SHUTTLE IN THE LP14 LINE PRINTER. EACH COLUMN HAS A HAMMER. THE PRINTER LOGIC SELECTS WHICH HAMMER IS TO FIRE.

7 2 5 TEST 6 - PRINT CONTROL TEST

THIS TEST CHECKS THE PRINT CONTROL LOGIC BY SENDING MORE THAN 132 CHARACTERS BEFORE SENDING A PRINT COMMAND. THE PRINTER SHOULD SAVE THE FIRST 132 CHARACTERS RECEIVED AND PRINT THEM CORRECTLY WHEN THE PRINT COMMAND IS RECEIVED. ALL CHARACTERS AFTER THE FIRST 132 SHOULD BE LOST. THE PROGRAM SENDS A FULL LINE OF 132 ZEROS THEN THE FULL CHARACTER SET BEFORE SENDING A LINE FEED TO PRINT THE LINE. THE PRINTED LINE SHOULD CONTAIN ONLY ZEROS. THIS IS REPEATED USING ONES, TWOS, THREES, FOURS, AND FIVES. THEN A LINE OF SPACES ARE SENT AND THE FULL CHARACTER SET BEFORE THE LINE FEED. A BLANK LINE SHOULD BE PRINTED. AFTER THE BLANK LINE, THE NUMBERS 6 TO 9 ARE SENT AS BEFORE. A TOTAL OF 11 LINES WILL BE PRINTED WITH THE MIDDLE LINE BLANK.

764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817

7 2 6 TEST 7 - MULTIPLE LINE ADVANCE TEST

THIS TEST CHECKS THE MULTIPLE LINE ADVANCE OF THE LINE PRINTER. A LINE OF NUMBERS IS PRINTED THEN THE PAPER IS ADVANCED THAT NUMBER OF LINES. THUS THE NUMBER PRINTED WILL INDICATE THE NUMBER OF BLANK LINES FOLLOWING THAT LINE. THE NUMBER IS VARIED BETWEEN 2 AND 9, AND A LINE OF ALL ZEROS WILL END THE TEST.

7 2 7 TEST 8 - HIGH SPEED PRINT TEST

THIS TEST PRINTS AT A SPEED GREATER THAN 300 LINES PER MINUTE (APPROXIMATELY 500 LINES PER MINUTE) BY PRINTING A FULL LINE OF THE DRUM PATTERN AND THEN SKIPPING FOUR (4) LINES AND PRINTING THAT DRUM LINE, ETC. THIS WILL TEST THE HAMMER SUPPLY FOR MAXIMUM CURRENT SURGE AND WILL TEST FOR WORST CASE NOISE SINCE ALL HAMMERS WILL FIRE AT ONCE ON EACH LINE.

7 2 8 TEST 9 - SINGLE CHAR, ALL COLUMNS TEST

THIS TEST IS DESIGNED AS AN ENDURANCE TEST OF THE LINE PRINTER AS WELL AS A CHARACTER CHECK OF THE DRUM. 132 COLUMNS OF EACH OF THE 64 OR 96 CHARACTERS ARE TRANSMITTED TO THE LINE PRINTER AND PRINTED IN ROTATION. A SAMPLE OF THE PRINT OUT FOLLOWS.

```
?????--- -----?????  
@@@@@-----@@@@@  
AAAAA-----AAAAA  
BBBBB--- -----BBBBB  
-----  
-----  
ZZZZZ-----ZZZZZ
```

7 2 9 TEST 10 - DRUM PATTERN TEST

THIS TEST IS DESIGNED TO PRODUCE AN IMAGE OF THE ENTIRE DRUM PATTERN. THIS IS A WORST CASE NOISE AND ENDURANCE TEST, AND A CHECK OF THE DRUM PATTERN.

7 2 10 TEST 11 - SPURIOUS HAMMER FIRING TEST

THIS TEST IS DESIGNED TO DETECT SPURIOUS HAMMER FIRINGS AND DEFECTIVE HAMMER DRIVERS DURING OPERATION OF THE LINE PRINTER. THE PATTERNS WHICH ARE PRODUCED ARE RIGHT AND LEFT HAND WEDGES, EACH COMPOSED OF 132 LINES OF PRINT AS FOLLOWS.

LEFT HAND WEDGE - WILL END EACH LINE WITH A "?" CHARACTER

RIGHT HAND WEDGE - WILL START EACH LINE WITH A "?" CHARACTER

ANY PRINT OUTSIDE OF THE WEDGE WILL BE CAUSED BY A HAMMER MISFIRE OR HAMMER BOUNCE.

0000
0001
0002
0003
0004
0005
0006
0007
0008
0009
0010
0011
0012
0013
0014
0015
0016
0017
0018
0019
0020
0021
0022
0023
0024
0025
0026
0027
0028
0029
0030
0031
0032
0033
0034
0035
0036
0037
0038
0039
0040
0041
0042
0043
0044
0045
0046
0047
0048
0049
0050
0051
0052
0053
0054
0055
0056
0057
0058
0059
0060
0061
0062
0063
0064
0065
0066
0067
0068
0069
0070
0071
0072
0073
0074
0075
0076
0077
0078
0079
0080
0081
0082
0083
0084
0085
0086
0087
0088
0089
0090
0091
0092
0093
0094
0095
0096
0097
0098
0099
0100

7 2 11 TEST 12 - HAMMER ALIGNMENT TEST

THIS ROUTINE IS DESIGNED TO BE USED AS A DRIVER FOR MANUAL HAMMER ALIGNMENT AND INTENSITY ADJUSTMENTS ON THE LINE PRINTER THIS TEST PRINTS A FULL 132 COLUMN LINE OF "E" CHARACTERS FOR 63 LINES

7 2 12 TESTS D1 & D2 - DAVFU LINE COUNT SLEWING TESTS

THIS TEST IS DESIGNED TO TEST THE LINE COUNT METHOD OF PAPER CONTROL USING THE DAVFU BEFORE STARTING THIS TEST, A MESSAGE WILL BE TYPED INSTRUCTING THE OPERATOR THAT THE DAVFU TESTS ARE BEING RUN THE DAVFU MEMORY WILL BE LOADED WITH DUMMY DATA, THEN EACH OF THE LINE COUNT SLEWING COMMANDS WILL BE TESTED IN TURN STARTING WITH A SLEW OF ZERO (0) LINES IF THE SLEW OF ZERO LINES OPERATES CORRECTLY, THE MESSAGE "THIS LINE SHOULD BE PRINTED ALL ON ONE LINE --- IF SLEWED 0 LINES" WILL BE PRINTED ALL ON ONE LINE THEN EACH OF THE REMAINING COMMANDS WILL BE TESTED AFTER EACH SLEW, A LINE WILL BE PRINTED INDICATING THE CORRECT NUMBER OF BLANK LINES BETWEEN THE LAST PRINTED LINE AND THAT LINE AFTER COMPLETION OF TEST D1 THE SEQUENCE IS REPEATED (TEST D2), CHANGING THE TWO (2) UNUSED BITS IN THE PAPER INSTRUCTION TO INSURE THEY HAVE NO EFFECT ON THE DAVFU UPON COMPLETION OF TEST D2, TEST D3 IS ENTERED DIRECTLY

7 2 13 TEST D3 - DAVFU CHANNEL SLEW COMMAND TEST

THIS TEST IS DESIGNED TO TEST THE CHANNEL SLEW COMMANDS ON THE DAVFU THE DAVFU IS FIRST LOADED, THEN EACH OF THE CHANNELS IS TESTED IN TURN STARTING WITH CHANNEL 0 THE DATA PATTERNS (STOP BITS) LOADED INTO THE DAVFU ARE CHOSEN SUCH THAT NO TWO ADJACENT CHANNELS HAVE THE SAME PATTERN CHANNELS 1 AND 7 WILL CAUSE ONE BLANK LINE BETWEEN EACH PRINTED LINE CHANNELS 2 AND 8 WILL CAUSE TWO BLANK LINES BETWEEN EACH PRINTED LINE CHANNELS 3 AND 9 WILL CAUSE THREE BLANK LINES BETWEEN EACH PRINTED LINE CHANNELS 4 AND 10 WILL CAUSE SIX BLANK LINES BETWEEN EACH LINE CHANNELS 5 AND 11 WILL CAUSE 24 LINES BETWEEN EACH PRINTED LINE CHANNELS 6 AND 12 WILL CAUSE 143 BLANK LINES BETWEEN THE HEADER AND THE PRINTED REFERENCeline BEFORE TESTING EACH CHANNEL, A HEADER MESSAGE IS PRINTED TELLING WHICH CHANNEL IS BEING TESTED AFTER TESTING EACH SLEW COMMAND, A LINE IS PRINTED GIVING THE CORRECT NUMBER OF BLANK LINES FROM THE LAST PRINTED LINE TO THAT LINE UPON COMPLETION OF THIS TEST THE DIAGNOSTIC WILL RESTART THE PRINTING TESTS WITH TEST 2

8880
8881
8882
8883
8884
8885
8886
8887
8888
8889

7 3 SCOPE DRIVE ROUTINE

THE PRUPOSE OF THIS TEST SEQUENCE IS TO PROVIDE THE OPERATOR WITH A SHORT BUT COMPREHENSIVE SCOPE DRIVER ROUTINE FOR USE IN TROUBLE SHOOTING THE PRINTER INTERFACE CONTROL MODULE WITH THE SCOPE. DEPENDING ON THE SETTING OF SWITCH 11 THIS TEST WILL EITHER CONTINUALLY SEND WHATEVER CHARACTER IS SET IN THE SWITCH REGISTER TO THE LINE PRINTER, OR ONLY SEND IT ONCE AND HALT (SEE DESCRIPTION OF SWITCH 11 OPERATION IN SECTION 5 1)

TO INSERT A LINE FEED CHARACTER AFTER EVERY 132 CHARACTERS, WHEN SENDING CHARACTERS CONTINUOUSLY, START AT LOCATION 700(8)

TO LEAVE OUT THE LINE FEED, START AT LOCATION 710(8) THIS ROUTINE SHOULD BE USEFUL WHEN TROUBLE SHOOTING THE DAVFU

WHEN SWITCH 11 IS UP, TO SEND ONLY ONE CHARACTER THEN HALT, DEPRESS CONTINUE TO SEND THE NEXT CHARACTER AFTER SETTING THE SWITCH REGISTER AS DESIRED TO RESUME SENDING CONTINUOUS CHARACTERS, PLACE SWITCH 11 DOWN. SET THE SWITCHES, AND DEPRESS CONTINUE TO STOP SENDING CONTINUOUSLY PLACE SWITCH 11 UP

ENDP

TITLE MAINDEC-11-DZLPK-H-D
NLIST MC
COPYRIGHT (C) 1977,1974 DIGITAL EQUIPMENT CORP , MAYNARD, MASS.
***** LP14/LP11/LP05 LINE PRINTER TEST *****

LIST OF SWITCH SETTINGS USED IN THIS TEST

SWITCH NO	DESCRIPTION
15	LOOP ON ERROR IN TEST 1 ONLY
14	OPTIONAL DAUFU AVAILABLE
13	"DOWN" 64 CHAR /"UP"-96 CHAR OPTION
12	LOOP ON TEST
11	SEND ONLY ONE CHAR TO LINE PRINTER IN SCOPE TEST - THEN HALT
10	DOWN - LP05/LP11, UP - LP14
9	"UP" - INHIBIT ERROR REPORTS
0	USED TO TEST PRINT SPEED IN TEST 1 IF NO CLOCK IS AVAILABLE

000000	R0=%0
000001	P1=%1
000002	P2=%2
000003	P3=%3
000004	P4=%4
000005	P5=%5
000006	P6=%6
000007	P7=%7
000006	SP=R6
000007	PC=R7
100000	BIT15 =100000
040000	BIT14 =40000
020000	BIT13 =20000
010000	BIT12 =10000
004000	BIT11 =4000
002000	BIT10 =2000
001000	BIT9 =1000
000400	BIT8 =400
000200	BIT7 =200
000100	BIT6 =100
000040	BIT5 =40
000020	BIT4 =20
000010	BIT3 =10
000004	BIT2 =4
000002	BIT1 =2
000001	BIT0 =1
	ENABLE ABS
	ENABLE AMA
000000	-0

000000
000001
000002
000003
000004
000005
000006
000007
000006
000007
000006
000007
100000
040000
020000
010000
004000
002000
001000
000400
000200
000100
000040
000020
000010
000004
000002
000001
000000

93		000030		=30	
94	000030	011524		TYP	
95	000032	000340		340	
95		000042		=42	
95	000042	000000		0	
95		000046		=46	
95	000046	011316		LOGICAL	
95		000052		=52	
95	000052	040000		BIT14	
96		000060		=60	
96	000060	012002		TK INT	
96	000062	000300		300	KEYBOARD INTERRUPT ROUTINE
96		000100		=100	
97	000100	003254		LKSRV	
97	000102	000340		340	LINE CLOCK SERVICE ROUTINE
97		000104		CONVRT	
97	000106	000340		340	
97		000174		=174	
97	000174	000000		DISPREG	0
97	000176	000000		SWREG	0
98		000200		=200	
98	000200	012706	001000	MOV	#1000, %6
98	000204	000137	001102	JMP	SETUP
98		000300		=300	
98	000300	000137	004074	JMP	INDAT
98	000304	000137	004260	JMP	NO DAT
98	000310	000137	014616	JMP	DAV FU
98	000314	000137	015350	JMP	DAV 2
98		000400		=400	
98	000400	000137	002514	JMP	SW TIME
98	000404	000137	002650	JMP	KW11L
98	000410	000137	002572	JMP	KW11P
98	000414	000137	003464	JMP	SLEW CK

KEYBOARD INTERRUPT ROUTINE

LINE CLOCK SERVICE ROUTINE

START FOR DAVFU TESTS
 ILLEGAL LOAD TEST
 NO STOP BIT - CHANNEL SLEW TEST
 LINE COUNT SLEW TEST
 CHANNEL SLEW TEST

1 MINUTE PRINT SPEED CHECK
 START FOR USING SWITCH PEG FOR TIMING
 START FOR KW11-L LINE CLOCK
 START FOR KW11-P LINE CLOCK
 CHECK TOP OF FORM SWITCH

1002						
1003						
1004						
1005		000600			=600	
1006						
1007	000600	012706	001000	MOV	#1000,%6	, START OF PRINTING TESTS SEQUENCE
1008	000604	000137	004562	JMP	TEST2	, TEST 2
1009	000610	000137	005022	JMP	TEST3	, TEST 3
1010	000614	000137	005374	JMP	CHRCHK	, TEST 4
1011	000620	000137	005654	JMP	OVRPRT	, TEST 5
1012	000624	000137	006150	JMP	PRTCTL	, TEST 6
1013	000630	000137	006446	JMP	MLF	, TEST 7
1014	000634	000137	006660	JMP	HSPRT	, TEST 8
1015	000640	000137	007460	JMP	SNGCHR	, TEST 9
1016	000644	000137	007652	JMP	ROTATE	, TEST 10
1017	000650	000137	010412	JMP	LFTTR	, TEST 11
1018	000654	000137	011124	JMP	HAMALN	, TEST 12
1019						
1020						
1021		000700			=700	
1022						
1023	000700	012737	017020 017044	MOV	#LSCA,LOSCOP	, SEND LF AFTER 132 CHARS
1024	000706	000137	016700	JMP	SCOPE	
1025						
1026		000720			=720	
1027						
1028	000720	012737	016700 017044	MOV	#SCOPE,LOSCOP	NO LF'S SENT IN SCOPE ROUTINE
1029	000726	000137	016700	JMP	SCOPE	, DO SCOPE ROUTINE
1030						
1031						
1032		001000			=1000	
1033						
1034						
1035						LINE PRINTER HARDWARE REGISTERS
1036	001000	177514		LPS	177514	, STATUS REGISTER
1037						, BIT 15=ERROR
1038						, BIT 7=READY
1039						BIT 6- INTERRUPT ENABLE
1040						
1041	001000	177516		LPB	177516	DATA BUFFER REGISTER
1042						BITS 0-6=7 BIT ASCII CHARACTER B_FFEP
1043						, BITS 7-15=NCT USED
1044						
1045						
1046	001004	177570		SWR	177570	
1047	001006	177570		C_SPLAY	177570	
1048	001010	177776		PSW	177776	
1049	001012	177566		TPB	177566	
1050	001014	177562		TKB	177562	
1051	001016	177564		TPS	177564	
1052	001020	177560		TKS	177560	
1053	001022	172542		CSBR	172542	
1054	001024	172540		PLKS	172540	
1055	001026	177546		LKS	177546	
1056	001030	000200		PTRVEC	WORD 200	
1057	001032	000202		PTRPSW	WORD 202	


```

1058      000240      NOP      =240
1059      000000      N        =0
1060      000002      M        =2
1061
1062      .MACRO FOR SETTING UP ERROR COUNT
1063
1064      LIST ME
1065
1066      MACR  SERROR X
1067      MOV   #X,   ERCOUNT      .SET UP ERROR COUNT X
1068      N=N+1
1069      ENDM  SERROR
1070
1071
1072      .MACRO FOR PRINTING TEST NUMBER AT START OF TEST
1073
1074      LIST ME
1075
1076      MACR  SPRINT Y
1077      MOV   TNG'Y',MES15      .SET TEST NUMBER FOR MESSAGE
1078      JSR   %4,PRNT          .PRINT TEST NUMBER
1079      M=M+1
1080      ENDM  SPRINT
1081
1082
1083      .MACRO FOR WAITING FOR PRINTER TO PRINT OP SLEW
1084
1085      LIST ME
1086
1087      MACR  SWAIT
1088      TSTB  @LPS          .TEST READY
1089      BPL   -4            WAIT FOR READY
1090      ENDM  SWAIT
1091
1092
1093
1094      .MACRO FOR ENABLING KEYBOARD INTERRUPT IF THERE IS NO
1095      .H/W SWITCH REGISTER AND THERE IS A S/W SWITCH REGISTER
1096
1097
1098      LIST ME
1099
1100
1101      MACR  SENABLE
1102      CMP   #176,SWR      .S/W SWP ?
1103      BNE   15           .NO- CONTINUE
1104      JSR   PC,ENABL     .ENABLE KEYBOARD INTERRUPT
1105
1106      ENDM  SENABLE
1107
1108
1109
1110      .MACRO USED TO LOAD THE PSW WITH THE
1111      .CORRECT PROCESSOR PRIORITY LEVEL
1112
1113
    
```

19

LIST ME

1114						
1115						
1116						
1117						
1118						
1119						
1120						
1121						
1122						
1123						
1124						
1125						
1126						
1127						
1128						
1129						
1130	001034	000000				
1131	001036	000000				
1132	001040	000000				
1133	001042	000000				
1134	001044	000000				
1135	001046	000000				
1136	001050	000000				
1137	001052	000000				
1138	001054	000000				
1139	001056	000000				
1140	001060	000000				
1141	001062	000000				
1142	001064	000000				
1143	001066	000000				
1144	001070	000000				
1145	001072	000000				
1146	001074	000000				
1147	001076	000000				
1148	001100	000000				
1149						
1150						
1151						
1152						
1153	001102	004437	011472			
1154	001106	000005				
1155	001110	013746	000004			
1156	001114	013746	000006			
1157	001120	012737	001134	000004		
1158	001126	005777	177652			
1159	001132	000407				
1160	001134					
1161	001134	012737	000176	001004		
1162	001142	012737	000174	001006		
1163	001150	022626				
1164	001152	012637	000006			
1165	001156	012637	000004			
1166						
1167	001162	104000				
1168	001164	012761				
1169	001166	104000				

```

MACR  S$ETPSW
MOV   PC, -(SP)      , MOVE PRESENT LOCATION TO STACK
ADD   #6, (SP)       , SET UP FOR NEXT INSTRUCTION
PTI
ENDM  S$ETPSW
        , LOAD PSW
    
```

, MEMORY LOCATIONS USED AS PROGRAM FLAGS AND COUNTERS

```

SEGCNT  0
CHRCNT  0
CHRGEN  0
LINCNT  0
CYCCNT  0
WORK    0
SAVE    0
ERCOUNT 0
STRCHR  0
STRCNT  0
LEGCHR  0
NUMCHR  0
OFFSET  0
DIGITS  0
SIGNAL  0
SET      0
CHAR     0
OCT      0
TEMP     0
    
```

, ROUTINE TO TEST THE MECH OPERATION OF THE LPO5

```

SETUP   JSR     %4, TYPINT
        RESET
        MOV     4, -(SP)      , CLEAR WORLD
        MOV     6, -(SP)      , SAVE CURRENT VECTORS
        MOV     #15, 4
        TST    @SWP          , SET UP TIMEOUT VECTOR
        BR     25           , TRY TO ACCESS HARDWARE SWP
        , IF THERE, GO TO 25
        15
        MOV     #SWREG, SWP   , POINT TO SOFTWARE SWP
        MOV     #DISPREG, DISPLAY , POINT TO SOFTWARE DISPLAY
        CMP     (SP)+, (SP)+  , RESTORE STACK
        MOV     (SP)+, 6     , RESTORE TIMEOUT VECTORS
        MOV     (SP)+, 4
        EMT     +0
        MES1
        EMT     +0
        , TYPE DIAGNOSTIC TITLE
    
```

```

1170 001170 013024          MES2          ,TYPE RESTART ADDRESS INFO
1171
1172
1173
1174          ;LOWER PROCESSOR PRIORITY
1175
1176
1177 001172 005046          35      CLR      -(SP)          ,NEW PSW
1178 001174 012746 001202      MOV      #45, -(SP)      ,NEW PC
1179 001200 000002          RTI          ,LOAD NEW PSW
1180 001202          45
1181
1182
1183
1184
1185
1186
1187          ; GET INITIAL SWR VALUE
1188          ; IF THERE IS NO H/W SWR
1189
1190
1191 001202 022737 000176 001004      CMP      #176, SWR          ,S/W SWR ?
1192 001210 001044          BNE      SKIP          ,NO- CONTINUE
1193 001212 005037 001070      CLR      SIGNAL          , INITIALIZE INTERRUPT ROUTINE
1194 001216 005037 001066      CLR      DIGITS
1195 001222 005037 001072      CLP      SET
1196 001226 005037 001074      CLR      CHAR
1197 001232 013746 000034      MOV      34, -(SP)          ,SAVE VECTOR
1198 001236 013746 000036      MOV      36, -(SP)          ,SAVE VECTOR
1199 001242 012737 012002 000034      MOV      #TKINT, 34          ,SET UP NEW VECTOR
1200 001250 012737 000300 000036      MOV      #300, 36          ,SET UP NEW VECTOR
1201 001256 005237 001072          INC      SET
1202 001262 104400          TRAP     +0          ,SET HEADER FLAG
1203 001264 005037 001072      CLR      SET
1204 001270 012637 000036      MOV      (SP)+, 36          ,ENTER INTERRUPT ROUTINE
1205 001274 012637 000034      MOV      (SP)+, 34          ,CLEAR HEADER FLAG
1206 001300 012777 000100 177512      MOV      #100, @TKS          ,RESTORE VECTOR
1207 001306 000001          WT      WAIT          ,RESTORE VECTOR
1208 001310 000240          NOP
1209 001312 022737 000001 001070      CMP      #1, SIGNAL          ,ENABLE KEYBOARD INTERRUPT
1210 001320 001772          BEQ     WT
1211 001322 000240          SKIP    NOP          ,SWR VALUE ENTERED ?
1212          ,NO WAIT
1213
1214
1215 001324 000005          RESET
1216
1217
1218
1219 001326 104000          EMT     +0          ,TYPE MESSAGE
1220 001330 013051          MESS3
1221 001332 000000          HALT          ,POWER UP
1222          ,DEPRESS CONTINUE WHEN READY TO START TEST
1223
1224
1225
  
```

1229	001334	005777	177440		STP1	TST	@LPS		, TEST FOR ERROR
1230	001340	100006				BPL	STP2		, NO ERROR TEST FOR READY
1231	001342	012737	000000	001052	ERRO	MOV	#0,	ERCOUNT	, SET UP ERROR COUNT 0
1232		000001				N=N+1			
1233	001350	004537	011722			JSR	%5, STAER		, REPORT ERROR BIT SET
1234	001354	000767				BR	STP1		, GO TEST FOR ERROR
1235	001356	105777	177416		STP2	TSTB	@LPS		, TEST FOR READY
1236	001362	100406				BMI	STP3		, READY SET OK
1237	001364	012737	000001	001052	ERR1	MOV	#1,	ERCOUNT	, SET UP ERROR COUNT 1
1238		000002				N=N+1			
1239	001372	004537	011722			JSR	%5, STAER		, REPORT READY NOT SET
1240	001376	000767				BR	STP2		, GO TEST FOR READY
1241	001400	104000			STP3	EMT	+0		, TYPE MESSAGE
1242	001402	013103				MES4			, PRINTER OK "READY SET" TRY TORN PAPER SWITCH
1243	001404	000000				HALT			, DEPRESS CONTINUE WHEN READY
1244	001406				STP4				
1245	001406	012777	000014	177306		MOV	#14, @LPE		, SEND A "FF" TO THE PRINTER
1246	001414	012737	000100	001100		MOV	#100, TEMP		, DELAY COUNT
1247	001422	005337	001100		15	DEC	TEMP		, DECREMENT COUNTER
1248	001426	001375				BNE	15		, CONTINUE WAIT LOOP
1249	001430	012777	000015	177344		MOV	#15, @LPE		, ATTEMPT "FF" BY SENDING A "CR"
1250	001436	012737	000100	001100		MOV	#100, TEMP		, DELAY COUNT
1251	001444	005337	001100		25	DEC	TEMP		, DECREMENT COUNTER
1252	001450	001375				BNE	25		, CONTINUE WAIT LOOP
1253	001452	005777	177322			TST	@LPS		, TEST FOR ERROR
1254	001456	100406				BMI	STP5		, BRANCH IF ERROR SET
1255	001460	012737	000002	001052	EPP2	MOV	#2,	ERCOUNT	, SET UP ERROR COUNT 2
1256		000003				N=N+1			
1257	001466	004537	011722			JSR	%5, STAER		, REPORT ERROR NOT SET
1258	001472	000745				BR	STP4		, LOOP ON ERROR
1259	001474	104000			STP5	EMT	+0		, TYPE MESSAGE
1260	001476	013214				MES6			, ERROR SET OK - TURN ON LINE
1261	001500	000000				HALT			, WAIT FOR OPERATOR
1262	001502	005777	177272		STP5A	TST	@LPS		, TEST FOR ERROR
1263	001506	100006				BPL	STP5B		, NO ERROR CONTINUE
1264	001510	012737	000003	001052	ERR3	MOV	#3,	ERCOUNT	, SET UP ERROR COUNT 3
1265		000004				N=N+1			
1266	001516	004537	011722			JSR	%5, STAER		, REPORT ERROR SET
1267	001522	000767				BR	STP5A		, LOOP ON ERROR
1268	001524	105777	177250		STP5B	TSTB	@LPS		, TEST READY
1269	001530	100406				BMI	STP5C		, READY SET OK
1270	001532	012737	000004	001052	ERR4	MOV	#4,	ERCOUNT	, SET UP ERROR COUNT 4
1271		000005				N=N+1			
1272	001540	004537	011722			JSR	%5, STAER		, REPORT ERROR NOT SET
1273	001544	000767				BR	STP5B		, LOOP ON ERROR
1274	001546	104000			STP5C	EMT	+0		, TYPE MESSAGE
1275	001550	013147				MES5			, READY SET OK - TRY DRUM GATE SWITCH
1276	001552	000000				HALT			, DEPRESS CONTINUE WHEN READY
1277	001554	005777	177220		STP6	TST	@LPS		, TEST FOR ERROR
1278	001560	100406				BMI	STP7		, BRANCH IF ERROR SET
1279	001562	012737	000005	001052	ERR5	MOV	#5,	ERCOUNT	, SET UP ERROR COUNT 5
1280		000006				N=N+1			
1281	001570	004537	011722			JSR	%5, STAER		, REPORT ERROR NOT SET

```

1282 001574 000767
1283 001576 104000
1284 001600 013214
1285 001602 000000
1286
1287
1288
1289
1290
1291
1292 001604 000005
1293 001606 005777 177166
1294 001612 100006
1295 001614 012737 000006 001052 ERR6
1296 000007
1297 001622 004537 011722
1298 001626 000766
1299
1300
1301
1302 001630 000005
1303 001632 105777 177142
1304 001636 100406
1305 001640 012737 000007 001052 ERR7
1306 000010
1307 001646 004537 011722
1308 001652 000766
1309
1310
1311
1312 001654 005037 001046
1313 001660 012777 000012 177114
1314 001666 105777 177106
1315 001672 100006
1316 001674 012737 000010 001052 ERR10
1317 000011
1318 001702 004537 011722
1319 001706 000762
1320 001710 005777 177064 LP1
1321 001714 100006
1322 001716 012737 000011 001052 ERR11
1323 000012
1324 001724 004537 011722
1325 001730 000751
1326 001732 105777 177042 LP2
1327 001736 100411
1328 001740 005237 001046
1329 001744 001361
1330 001746 012737 000712 001052 ERR12
1331 000013
1332 001754 004537 011722
1333 001760 000735
1334
1335
1336
1337
    
```

STP7 BR STP6
 EMT +0
 MES6
 HALT

, LOOP ON ERROR
 , TYPE MESSAGE
 , ERROR SET OK - TURN ON LINE
 , DEPRESS CONTINUE WHEN READY

, TEST 1
 , PERFORMS PRELIMINARY COMMAND AND REGISTER TESTING
 , IS THE PRINTER FREE OF ERRORS

TEST1 PESET
 TST @LPS
 BPL TEST1A
 MOV #6, ERCOUNT
 N=N+1
 JSR %5, STAER
 BR TEST1

, CLEAR THE WORLD
 , IS ERROR FLAG CLEAR
 , ERROR IS CLEAR OK
 , SET UP ERROR COUNT 6
 , REPORT ERROR SET
 , LOOP ON ERROR

, IS READY SET (NO ERRORS EXIST)

TEST1A PESET
 TSTB @LPS
 BMI TEST1B
 MOV #7, ERCOUNT
 N=N+1
 JSR %5, STAER
 BR TEST1A

, CLEAR THE WORLD
 , IS READY SET
 , READY SET! PRINTER OK
 , SET UP ERROR COUNT 7
 , REPORT READY NOT SET
 , LOOP ON ERROR

, DOES LOADING THE BUFFER RESET READY

TEST1B CLR WORK
 MOV #12, @LPB
 TSTB @LPS
 BPL LP1
 MOV #10, ERCOUNT
 N=N+1
 JSR %5, STAER
 BR TEST1B

, CLEAR COUNTER
 , LOAD LINE FEED INTO BUFFER
 , IS READY CLEAR
 , READY TO CLEAR OK!
 , SET UP ERROR COUNT 10
 , REPORT READY STILL SET
 , LOOP ON ERROR

LP1 TST @LFS
 BPL LP2
 MOV #11, ERCOUNT
 N=N+1
 JSR %5, STAER
 BR TEST1B

, IS THERE AN ERROR
 , NO ERROR CONTINUE
 , SET UP ERROR COUNT 11
 , REPORT ERROR OCCURRED
 , LOOP ON ERROR

LP2 TSTB @LPS
 BMI TEST1C
 INC WORK
 BNE LP1
 MOV #12, ERCOUNT
 N=N+1
 JSR %5, STAER
 BR TEST1B

, IS THE PRINTER STILL BUSY
 , NO! GO TO NEXT TEST
 , YES! GO CHECK FLAGS
 , PRINTER STILL BUSY WAIT
 , SET UP ERROR COUNT 12
 , ERROR REPORT TIME OUT
 , LOOP ON ERROR

CHECK INTERRUPT LEVEL OF PRINTER
 THE PRINTER SHOULD BE AT LEVEL 4

```

1338
1339
1340 001762 012777 002246 177040 TEST1C MOV #INT1C,@PTRVEC ,SET UP INT VECTOR
1341 001770 012777 000340 177034 MOV #340,@PTRPSW ,SET PRIORITY
1342 001776 005777 176776 TST @LPS ,TEST FOR ERROR
1343 002002 100006 BPL LP3 ,NO ERROR CONTINUE
1344 002004 012737 000013 001052 ERR13 MOV #13, ERCOUNT ,SET UP ERROR COUNT 13
1345 000014 N=N+1
1346 002012 004537 011722 JSR %5,STAER ,REPORT ERROR SET
1347 002016 000761 BP TEST1C ,LOOP ON ERROR
1348 002020 105777 176754 LP3 TSTB @LPS ,TST FOR READY
1349 002024 100406 BMI LP3X ,READY SET OK
1350 002026 012737 000014 001052 ERR14 MOV #14, ERCOUNT ,SET UP ERROR COUNT 14
1351 000015 N=N+1
1352 002034 004537 011722 JSR %5,STAER ,REPORT READY NOT SET
1353 002040 000750 BR TEST1C ,LOOP ON ERROR
1354 002042 LP3X
1355 002042 012737 000015 001052 ERR15 MOV #15, ERCOUNT ,SET UP ERROR COUNT 15
1356 000016 N=N+1
1357 002050 012746 000340 MOV #340,-(SP) ,LOCKUP PROCESSOR, NEW PRIORITY
1358 002054 010746 MOV PC,-(SP) ,MOVE PRESENT LOCATION TO STACK
1359 002056 062716 000006 ADD #6,(SP) ,SET UP FOR NEXT INSTRUCTION
1360 002062 000002 RTI ,LOAD PSW
1361 002064 052777 000100 176706 BIS #100,@LPS ,SET PRINTER INTO ENABLE
1362 002072 000240 NOP ,WAIT
1363 002074 042777 000100 176676 BIC #100,@LPS ,CLEAR PRINTER INT ENABLE
1364
1365
1366 TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 6
1367 002102 012737 000016 001052 ERR16 MOV #16, ERCOUNT ,SET UP ERROR COUNT 16
1368 000017 N=N+1
1369 002110 012746 000300 MOV #300,-(SP) ,SET PROCESSOR PRIORITY LEVEL 6
1370 002114 010746 MOV PC,-(SP) ,MOVE PRESENT LOCATION TO STACK
1371 002116 062716 000006 ADD #6,(SP) ,SET UP FOR NEXT INSTRUCTION
1372 002122 000002 RTI ,LOAD PSW
1373 002124 052777 000100 176646 BIS #100,@LPS ,SET PRINTER INT ENABLE
1374 002132 000240 NOP ,WAIT
1375 002134 042777 000100 176636 BIC #100,@LPS ,CLEAR PRINTER INT ENABLE
1376
1377
1378 TEST THAT THE PRINTER WILL NOT INT AT
1379 ,PROCESSOR LEVEL 5
1380 002142 012737 000017 001052 ERR17 MOV #17, ERCOUNT ,SET UP ERROR COUNT 17
1381 000020 N=N+1
1382 002150 012746 000240 MOV #240,-(SP) ,SET UP PROCESSOR TO LEVEL 5
1383 002154 010746 MOV PC,-(SP) ,MOVE PRESENT LOCATION TO STACK
1384 002156 062716 000006 ADD #6,(SP) ,SET UP FOR NEXT INSTRUCTION
1385 002162 000002 RTI ,LOAD PSW
1386 002164 052777 000100 176606 BIS #100,@LPS ,SET PRINTER INT ENABLE
1387 002172 000240 NOP ,WAIT
1388 002174 042777 000100 176576 BIC #100,@LPS ,CLEAR INT ENABLE PRINTER OF
1389
1390 TEST THAT THE PRINTER WILL NOT INTERRUPT
1391 ,WHEN THE PROCESSOR IS AT LEVEL 4
1392
1393 002202 012737 000020 001052 ERR20 MOV #20, ERCOUNT ,SET UP ERROR COUNT 20
    
```

```

1394          000021
1395 002210 012746 000200          N=N+1
1396 002214 010746          MOV      #200,-(SP)      ,SET PROCESSOR TO LEVEL 4
1397 002216 062716 000006          MOV      PC,-(SP)      ,MOVE PRESENT LOCATION TO STACK
1398 002222 000002          ADD      #6,(SP)      ,SET UP FOR NEXT INSTRUCTION
1399 002224 052777 000100 176546          RTI          ,LOAD PSW
1400 002232 000240          BIS      #100,@LPS      ,SET PRINTER INT ENABLE
1401 002234 042777 000100 176536          NOP          ,WAIT
1402 002242 000137 002260          BIC      #100,@LPS      ,CLEAR PRINTER INT ENABLE
1403          JMP      TEST1D      ,PRINTER OK CONTINUE
1404
1405          , INTERRUPT HANDLE FOR TEST1C
1406          , RESTORE STACK AND REPORT ERROR
1407 002246 022626          INT1C  CMP      (6)+,(6)+      ,RESTORE STACK
1408 002250 004537 011722          JSR      %5,STAER      ,REPORT ERROR
1409 002254 000137 001762          JMP      TEST1C      ,RE-ENTER TEST1C
1410
1411          , TEST THE ABILITY OF THE PRINTER TO INTERRUPT
1412          , AT PRIORITY LEVEL 4
1413
1414 002260 012777 002400 176542 TEST1D MOV      #INT1D,@PTRVEC      ,SET UP INTERRUPT VECTOR
1415 002266 012777 000340 176536          MOV      #340,@PTRPSW      ,LOCK UP PRIORITIES
1416 002274 005777 176500          TST      @LPS          ,IS THERE A PRINTER ERROR
1417 002300 100006          BPL      LP4          ,NO! CONTINUE
1418 002302 012737 000021 001052 ERR21 MOV      #21, ERRCOUNT      ,SET UP ERROR COUNT 21
1419          000022          N=N+1
1420 002310 004537 011722          JSR      %5,STAER      ,REPORT PRINTER ERROR
1421 002314 000761          BR      TEST1D      ,LOOP ON ERROR
1422 002316 105777 176456          _P4  TSTB      @LPS      ,IS READY SET
1423 002322 100406          BMI      LP5          ,YES - PRINTER READY
1424 002324 012737 000022 001052 EPR22 MOV      #22, ERRCOUNT      ,SET UP ERROR COUNT 22
1425          000023          N=N+1
1426 002332 004537 011722          JSR      %5,STAER      ,REPORT READY NOT SET
1427 002336 000750          BR      TEST1D      ,LOOP ON ERROR
1428 002340 012746 000140          LP5  MOV      #140,-(SP)      ,SET PRIORITY TO LEVEL 3
1429 002344 010746          MOV      PC,-(SP)      ,MOVE PRESENT LOCATION TO STACK
1430 002346 062716 000006          ADD      #6,(SP)      ,SET UP FOR NEXT INSTRUCTION
1431 002352 000002          RTI          ,LOAD PSW
1432 002354 052777 000100 176416          BIS      #100,@LPS      ,SET PRINTER INTERRUPT ENABLE
1433 002362 000240          NOP          ,WAIT
1434 002364 012737 000023 001052 EPR23 MOV      #23, ERRCOUNT      ,SET UP ERROR COUNT 23
1435          000024          N=N+1
1436 002372 004537 011722          JSR      %5,STAER      ,REPORT ERROR
1437 002376 000730          BR      TEST1D      ,LOOP ON ERROR
1438
1439          INTERRUPT HANDLER FOR TEST1D
1440
1441 002400 022626          INT1D  CMP      (6)+,(6)+      ,RESET STACK
1442 002402 042777 000100 176370          BIC      #100,@LPS      ,CLEAR INT. ENABLE FOR PRINTER
1443 002410 012746 000000          MOV      #0,-(SP)      ,CLEAR PROCESSOR STATUS
1444 002414 010746          MOV      PC,-(SP)      ,MOVE PRESENT LOCATION TO STACK
1445 002416 062716 000006          ADD      #6,(SP)      ,SET UP FOR NEXT INSTRUCTION
1446 002422 000002          RTI          ,LOAD PSW
1447 002424 012777 012706 176376          MOV      #12706,@PTRVEC      ,RESET INSTRUCTION AT 200
1448 002432 012777 001000 176372          MOV      #1000,@PTRPSW      ,RESET INSTRUCTION AT 202
1449
  
```

1450
 1451
 1452
 1453
 1454
 1455
 1456
 1457
 1458
 1459
 1460
 1461
 1462
 1463
 1464
 1465
 1466
 1467
 1468
 1469
 1470
 1471
 1472
 1473
 1474
 1475
 1476
 1477
 1478
 1479
 1480
 1481
 1482
 1483
 1484
 1485
 1486
 1487
 1488
 1489
 1490
 1491
 1492
 1493
 1494
 1495
 1496
 1497
 1498
 1499
 1500
 1501
 1502
 1503
 1504
 1505

.1 MINUTE PRINT SPEED CHECK
 .IF A KW11-L OR KW11-P ARE NOT AVAILABLE, THE SR BIT0 IS USED
 .FOR MANUAL TIMING OF THE PRINTER

```

1461 002440 012737 000002 000006 CLCKAV MOV #RT1,@#6 .SET TRAP TO RETURN
1462 002446 012737 000006 000004 MOV #6,@#4
1463 002454 000261 SEC
1464 002456 105777 176344 TSTB @LKS .KW11-L AVAILABLE?
1465 002462 103404 BCS 15 .NO. BRANCH
1466 002464 005037 000004 CLR @#4 .RESET TRAP VECTOR TO HALT
1467 002470 000137 002650 JMP KW11L .USE KW11L FOR TIMING
1468 002474 000261 15 SEC
1469 002476 105777 176322 TSTB @PLKS .KW11-P AVAILABLE?
1470 002502 103404 BCS SWTIME .NO. USE SWITCH REG FOR TIMING
1471 002504 005037 000004 CLR @#4 .RESET TRAP VECTOR TO HALT
1472 002510 000137 002572 JMP KW11P .USE KW11-P FOR TIMING
1473 002514 SWTIME
1474 002514 022737 000176 001004 CMP #176,SWR .S/W SWR ?
1475 002522 001002 BNE 15 .NO- CONTINUE
1476 002524 004737 011762 JSR PC,ENABL .ENABLE KEYBOARD INTERRUPT
1477 002530 15
1478 002530 005037 001042 CLR LINCNT .CLEAR LINE COUNT
1479 002534 004437 011472 JSR %4,TYPINT
1480 002540 005037 000004 CLR @#4 .RESET TRAP VECTOR TO HALT
1481 002544 104000 EMT +0 .TYPE MESSAGE
1482 002546 012542 MESC .PRINT SPEED CHECK USING MANUAL TIMING
1483 002550 012737 000002 003252 MOV #2,DIA .SET DUMMY ADDRESS
1484 002556 032777 000001 176220 25 BIT #BIT0,@SWR START?
1485 002564 001774 BEQ 25 .WAIT FOR START
1486 002566 000137 002722 IMP STARG .START PRINTING
1487
1488
1489
1490 .START FOR KW11-P
1491 002572 KW11P
1492 002572 022737 000176 001004 CMP #176,SWR .S/W SWR ?
1493 002600 001002 BNE 15 .NO- CONTINUE
1494 002602 004737 011762 JSR PC,ENABL .ENABLE KEYBOARD INTERRUPT
1495 002606 15
1496 002606 005037 001042 CLR LINCNT .CLEAR LINE COUNT
1497 002612 004437 011472 JSR %4,TYPINT
1498 002616 012706 001000 MOV #1000,%6 .RESET STACK
1499 002622 013777 003246 176172 MOV MINCNT,@CSBR .SET CLOCK COUNT
1500 002630 013737 001024 003252 MOV PLKS,DIA .STORE PLKS ADDRESS
1501 002636 012777 000105 176160 MOV #105,@PLKS .START CLOCK
1502 002644 000137 002722 JMP STARG .START PRINTING
1503
1504 .START FOR KW11-L
1505
  
```


1506	002650									
1507	002650	022737	000176	001004						
1508	002656	001002								
1509	002660	004737	011762							
1510	002664									
1511	002664	005037	001042							
1512	002670	004437	011472							
1513	002674	012706	001000							
1514	002700	013737	003246	003250						
1515	002706	013737	001026	003252						
1516	002714	012777	000100	176104						
1517										
1518										
1519										
1520	002722	032777	020000	176054	STARO	BIT	#BIT13, @SWR			
1521	002730	001007				BNE	STAROA			
1522	002732	012737	000140	001060		MOV	#140, LEGCHR			
1523	002740	012737	000100	001062		MOV	#100, NUMCHR			
1524	002746	000406				BR	STAROC			
1525	002750	012737	000200	001060	STAROA	MOV	#200, LEGCHR			
1526	002756	012737	000140	001062		MOV	#140, NUMCHR			
1527	002764	013737	001060	001054	STAROC	MOV	LEGCHR, STRCHR			
1528	002772	032777	002000	176004	STAROB	BIT	#BIT10, @SWR			
1529	003000	001063				BNE	TIMTST			
1530	003002	012737	000204	001036		MOV	#132, CHRCNT			
1531	003010	012737	003444	001054		MOV	#PATTB, STRCHR			
1532	003016	012737	000021	001044	STARA	MOV	#17, CYCCNT			
1533	003024	017737	176024	001040		MOV	@STRCHR, CHRCNT			
1534	003032	063737	001042	001040		ADD	LINCNT, CHRCNT			
1535	003040	023737	001060	001040	15	CMP	LEGCHR, CHRCNT			
1536	003046	003004				BGT	STAR1			
1537	003050	163737	001062	001040		SUB	NUMCHR, CHRCNT			
1538	003056	000770				BP	15			
1539	003060	013777	001040	175714	STAR1	MOV	CHRCNT, @LPB			
1540	003066	005337	001036			DEC	CHRCNT			
1541	003072	001410				BEQ	STAR1			
1542	003074	005337	001044			DEC	CYCCNT			
1543	003100	001367				BNE	STAR1			
1544	003102	062737	000002	001054		ADD	#2, STRCHR			
1545	003110	000137	003016			JMP	STARA			
1546	003114	005237	001042		STAR1	INC	LINCNT			
1547	003120	012777	000012	175654		MOV	#12, @LPB			
1548	003126	105777	175646			TSTB	@LPS			
1549	003132	100375				BPL	-4			
1550	003134	032777	000001	175642		BIT	#BIT0, @SWP			
1551	003142	001450				BEQ	CONVRT			
1552	003144	000137	002772			JMP	STAROB			
1553										
1554										
1555										
1556	003150	012737	000204	001036	TIMTST	MOV	#132, CHRCNT			
1557	003156	005337	001054			DEC	STRCHR			
1558	003162	023727	001054	000240		CMP	STRCHR, #40			
1559	003170	100303				BPL	35			
1560	003172	063737	001062	001054		ADD	NUMCHR, STRCHR			
1561	003200	013737	001054	001040	35	MOV	STRCHR, CHRCNT			

```

1562 003206 023727 001040 000040 TMTST2 CMP      CHRGEN, #40      .LEGAL CHARACTER ?
1563 003214 100003                BPL      15          .YES-CONTINUE
1564 003216 063737 001062 001040      ADD     NUMCHR, CHRGEN .NO-MAKE LEGAL
1565 003224 013777 001040 175550 15      MOV     CHRGEN, @LPB   .SEND CHARACTER
1566 003232 005337 001036                DEC     CHR CNT       .DECREMENT CHARACTER COUNT
1567 003236 001726                BEQ     STARED        .LINE FINISHED
1568 003240 005337 001040                DEC     CHRGEN        .GET NEXT CHARACTER
1569 003244 000760                TMTST1 BP      TMTST2 .CONTINUE
1570
1571
1572 003246 007020                MINCNT 7020
1573 003250 000000                CNTR   0
1574 003252 000002                DIA    2
1575
1576
1577
1578
1579
1580
1581 003254 005337 003250      LFSV   DEC      CNTP      .DECREMENT COUNTER
1582 003260 001401                BEQ     CONVRT        .EXIT IF 1 MINUTE
1583 003262 000002                RTI
1584
1585
1586
1587
1588
1589
1590
1591 003264 042777 000100 177760 CONVRT  BIC      #100, @DIA  .DISABLE CLOCK INTERPT F CLOCK AVAILABLE
1592 003272 005037 011636      CLP    TYPDAT      .CLEAR DIGIT COUNT
1593 003276 012703 013575      MOV    #MES12, %3  .SET MESSAGE POINTER
1594 003302 022737 000144 001042 15      CMP    #100, LINCNT .GREATER THAN 100?
1595 003310 003006                BGT    25          .NO, PRINT HUNDRED'S DIGIT
1596 003312 162737 000144 001042      SUB    #100, LINCNT .YES, SUBTRACT 100
1597 003320 005237 011636      INC    TYPDAT      .INCREMENT HUNDRED'S DIGIT
1598 003324 000766                BR     15          .CONTINUE CONVERSION
1599 003326 062737 000060 011636 25      ADD    #60, TYPDAT  .MAKE ASCII
1600 003334 113723 011636      MOVB  TYPDAT, (%3)+ .STORE DIGIT
1601 003340 005037 011636      CLR    TYPDAT      .CLEAR DIGIT COUNTER
1602 003344 022737 000012 001042 35      CMP    #10, LINCNT .GREATER THEN 10?
1603 003352 003006                BGT    45          .NO, PRINT DIGIT
1604 003354 162737 000012 001042      SUB    #10, LINCNT .YES, SUBTRACT 10
1605 003362 005237 011636      INC    TYPDAT      .INCREMENT TEN'S DIGIT
1606 003366 000766                BR     35          .CONTINUE CONVERSION
1607 003370 062737 000060 011636 45      ADD    #60, TYPDAT  .MAKE ASCII
1608 003376 113723 011636      MOVB  TYPDAT, (%3)+ .STORE DIGIT
1609 003402 013737 001042 011636      MOV    LINCNT, TYPDAT .GET ONE'S DIGIT
1610 003410 062737 000060 011636      ADD    #60, TYPDAT  .MAKE ASCII
1611 003416 113723 011636      MOVB  TYPDAT, (%3)+ .STORE DIGIT
1612 003422 104000                ENT    +0          .TYPE MESSAGE
1613 003424 013536                MES11
1614 003426 012737 013534 011470      MOV    #MES11A, PPTMSG .SET PRINTER MESSAGE ADDRESS
1615 003434 004437 011452                JSR    %4, RINT     .PRINT PRINTER SPEED ON LINE PRINTER
1616 003440 000137 003464                JMP    SLEWCK      .NEXT TEST
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
  
```

.NOTE -- PLACE 5670 (8) IN MINCNT FOR 50 HZ LINE FREQUENCY !!!
 .LINE CLOCK SERVICE ROUTINE FOR KW11-L

ROUTINE TO PRINT NUMBER OF LINES PRINTED IN 1 MINUTE

FHTTB 40

1613	003446	000117				117		
1619	003450	000076				76		
1620	003452	000055				55		
1621	003454	000134				134		
1622	003456	000113				113		
1623	003460	000072				72		
1624	003462	000051				51		
1625								
1626								
1627								
1628	003464							
1629	003464	022737	000176	001004	SLEWCK-			
1630	003472	001002						
1631	003474	004737	011762					
1632	003500							
1633	003500	004437	011472					
1634	003504	004537	011332					
1635	003510	000406						
1636	003512	012737	000024	001052	ERR24			
1637		000025						
1638	003520	004537	011722					
1639	003524	000000						
1640	003526	012737	000742	001042	SLW			
1641	003534	012704	004020					
1642	003540	012703	010310		SLW0			
1643	003544	012702	010407					
1644	003550	111413			SLW1			
1645	003552	111412						
1646	003554	122423						
1647	003556	105722						
1648	003560	105714						
1649	003562	001372						
1650	003564	005204						
1651	003566	104000						
1652	003570	013254						
1653	003572	000000						
1654	003574	005777	175242		SLW11			
1655	003600	001003						
1656	003602	012737	013624	011470				
1657	003610	005777	175164		SLW1A			
1658	003614	100006						
1659	003616	012737	000025	001052	EPP25			
1660		000026						
1661	003624	004537	011722					
1662	003630	000000						
1663	003632	012777	000014	175142	SLW2			
1664	003640	105777	175134					
1665	003644	100375						
1666	003646	004437	011452					
1667	003652	062737	000002	001042				
1668	003660	022737	004016	001042				
1669	003666	001410						
1670	003670	005777	175146					
1671	003674	001721						
1672	003676	012737	013326	011470				
1673	003704	000137	003574					

CHECK TOP OF FORM SWITCH

SLEWCK-

S/W SWR ?
 NO- CONTINUE
 ENABLE KEYBOARD INTERRUPT

INITIALIZE PRINTER
 BRANCH IF OK
 SET UP ERROR COUNT 24

REPORT PRINTER NOT READY
 HALT ON ERROR
 LINE COUNT FOR SWITCH SETTING
 INIT SWITCH SETTING TABLE POINTER
 INIT MESSAGE POINTER
 PUT SWITCH SETTINGS INTO MESSAGES
 INCREMENT POINTERS

DONE MOVING SWITCH SETTINGS TO MSG'S?
 BRANCH IF NOT DONE
 TABLE POINTER SET FOR NEXT SWITCH SETTING
 TYPE MESSAGE

SET TOP OF FORM SWITCH TO ---
 WAIT FOR OPERATOR TO SET SWITCH
 CHECK LINE COUNT
 BRANCH IF NOT ZERO
 CHANGE PRINTER MESSAGE
 TEST FOR ERRORS
 BRANCH IF NO ERROR
 SET UP ERROR COUNT 25

REPORT ERROR SET
 HALT ON ERROR
 SEND FF
 TEST READY
 WAIT FOR READY
 PRINT MESSAGE ON LINE PRINTER
 NEXT LINE COUNT
 DONE TEST?
 YES, EXIT
 DONE CHECK OF THIS SWITCH SETTING?
 YES, NEXT SWITCH SETTING
 NO, CHECK THIS SETTING
 CONTINUE

```

1674 003710 013737 014604 013310 DAVAV MOV TN013,MES8
1675 003716 104000 EMT +0
1676 003720 013252 MES7A
1677 003722 000000 HALT
1678 003724 032777 040000 175052 BIT #BIT14,2SWR
1679 003732 001060 BNE INDAT
1680 003734 000000 HALT
1681 003736 000137 004562 JMP TEST2
1682
1683 003742 000000 FFTAB 0
1684 003744 000022 15
1685 003746 000000 0
1686 003750 000025 21
1687 003752 000000 0
1688 003754 000030 24
1689 003756 000000 0
1690 003760 000041 33
1691 003762 000000 0
1692 003764 000044 36
1693 003766 000000 0
1694 003770 000052 42
1695 003772 000000 0
1696 003774 000060 48
1697 003776 000000 0
1698 004000 000063 51
1699 004002 000000 0
1700 004004 000102 66
1701 004006 000000 0
1702 004010 000110 72
1703 004012 000000 0
1704 004014 000124 84
1705 004016 000000 FTABE 0
1706
1707
1708 004020 020063 000040 FFSET ASCIZ /3 /
1709 004024 027063 000065 ASCIZ /3 5/
1710 004030 020064 000040 ASCIZ /4 /
1711 004034 027065 000065 ASCIZ /5 5/
1712 004040 020066 000040 ASCIZ /6 /
1713 004044 020067 000040 ASCIZ /7 /
1714 004050 020070 000040 ASCIZ /8 /
1715 004054 027070 000065 ASCIZ /8 5/
1716 004060 030461 000040 ASCIZ /11 /
1717 004064 031061 000040 ASCIZ /12 /
1718 004070 032061 000040 ASCIZ /14 /
1719
1720
1721
1722
1723
1724
1725
1726 004074 022737 000176 001004 INDAT CMP #176,SWR
1727 004102 001002 BNE 15
1728 004104 004737 011762 JSP PC,ENABL
1729 004110 15
    
```

.SET MESSAGE
 .TYPE MESSAGE
 .RESET TOP OF FORM SWITCH
 .WAIT FOR OPERATOR
 .DAVFU AVAILABLE?
 .YES. DO DAVFU TESTS
 .DONE OPERATOR TESTS - HALT
 .DEPRESS CONTINUE TO START PRINTING TESTS

 .LOOP COUNTS FOR SLEW CHECKS

SWITCH SETTINGS FOR MESSAGES

EVEN
 CHECK THAT VFI WILL NOT ACCEPT INCOMPLETE DATA

.S/W SWR ?
 .NO- CONTINUE
 .ENABLE KEYBOARD INTERRUPT

1730	004110	004437	011472			JSR	%4, TYPINT	
1731	004114	012737	004244	001040		MOV	#INDATT, CHRGEN	. SET TABLE POINTER
1732	004122	005777	174652		INDO	TST	@LPS	. TEST FOR ERROR
1733	004126	100010				BPL	INDATO	. BRANCH IF NO ERROR
1734	004130	012737	000026	001052	ERP26	MOV	#26, ERCOUNT	. SET UP ERROR COUNT 26
1735		000027				N=N+1		
1736	004136	004537	011722			JSR	%5, STAER	. REPORT ERROR SET
1737	004142	000000				HALT		. HALT ON ERROR
1738	004144	000137	004074			JMP	NDAT	. RESTART TEST
1739	004150	017777	174664	174624	INDATO	MOV	@CHRGEN, @LPB	. LOAD BUFFER
1740	004156	062737	000002	001040		ADD	#2, CHRGEN	. NEXT DATA
1741	004164	005777	174650			TST	@CHRGEN	. TEST CHAR
1742	004170	001405				BEQ	IND1	. CONTINUE IF DONE
1743	004172	105777	174602			TSTB	@LPS	. TEST READY
1744	004176	100375				BPL	-4	. WAIT FOR READY
1745	004200	000137	004122			JMP	INDO	
1746	004204	005777	174570		IND1	TST	@LPS	. TEST FOR ERROR SET
1747	004210	100410				BMI	INDAT1	. BRANCH IF ERROR SET
1748	004212	012737	000027	001052	ERP27	MOV	#27, ERCOUNT	. SET UP ERROR COUNT 27
1749		000030				N=N+1		
1750	004220	004537	011722			JSR	%5, STAEP	. REPORT ERROR NOT SET
1751	004224	000000				HALT		. HALT ON ERROR
1752	004226	000137	004074			JMP	NDAT	. RESTART TEST
1753	004232	104000			NDAT1	EMT	+0	. TYPE MESSAGE
1754	004234	012422				MESA		. ERROR SET OK - CLEAR & TURN ON LINE
1755	004236	000000				HALT		. WAIT FOR OPERATOR
1756								. DEPRESS CONTINUE WHEN READY FOR NEXT TEST
1757	004240	000137	004260			JMP	NODAT	. NEXT TEST
1758								
1759	004244	000356			NDATT	356		. DATA TABLE FOR ABOVE TEST
1760	004246	000001				1		
1761	004250	000002				2		
1762	004252	000003				3		
1763	004254	000357				357		
1764	004256	000000				0		
1765								
1766								. CHECK THAT CHANNELS WITH NO STOP BITS CAUSE ERRORS IF CHANNEL SELECTED
1767								
1768	004260				NODAT.			
1769	004260	022737	000176	001004		CMP	#176, SWP	. S/W SWP ?
1770	004266	001002				BNE	1\$. NO- CONTINUE
1771	004270	004737	011762			JSR	PC, ENABL	. ENABLE KEYBOARD INTERPUPT
1772	004274				1\$			
1773	004274	004437	011472			JSR	%4, TYPINT	
1774	004300	012737	000200	001054		MOV	#200, STRCHR	. SET PAPER INSTRUCTION
1775	004306	012737	004502	001040	NODOR	MOV	#NODAT3, CHRGEN	. SET TABLE POINTER FOR LOAD
1776	004314	005777	174460		NODO	TST	@LPS	. TEST FOR ERROR
1777	004320	100007				BPL	NODATO	. BRANCH IF NO ERROR
1778	004322	012737	000030	001052	ERP30	MOV	#30, ERCOUNT	. SET UP ERPOP COUNT 30
1779		000031				N=N+1		
1780	004330	004537	011722			JSR	%5, STAER	. REPORT ERROR SET
1781	004334	000000				HALT		. HALT ON ERROR
1782	004336	000750				BR	NODAT	. RESTART TEST
1783	004340	017777	174474	174434	NODATO	MOV	@CHRGEN, @LPB	. LOAD BUFFER
1784	004346	062737	000002	001040		ADD	#2, CHRGEN	. NEXT DATA
1785	004354	022737	004562	001040		CMP	#NODAT4+2, CHRGEN	. DONE LOAD

1786	004362	001405				BEQ	NODATA		
1787	004364	105777	174410			TSTB	@LPS		, BRANCH IF DONE
1788	004370	100375				BPL	-4		, TEST READY
1789	004372	000137	004314			JMP	NODD		, WAIT FOR READY
1790	004376	013777	001054	174376	NODATA	MOV	STRCHR, @LPB		, SEND DATA
1791	004404	005037	001036			CLR	CHRCNT		, DELAY
1792	004410	005237	001036		15	INC	CHRCNT		
1793	004414	001375				BNE	15		
1794	004416	005777	174356			TST	@LPS		, TEST FOR ERROR SET
1795	004422	100410				BMI	NODAT1		, BRANCH IF ERROR SET
1796	004424	012737	000031	001052	ERR31	MOV	#31, ERCOUNT		, SET UP ERROR COUNT 31
1797		000032				N=N+1			
1798	004432	004537	011722			JSR	%5, STAEP		, REPORT ERROR NOT SET
1799	004436	000000				HALT			, HALT ON ERROR
1800	004440	000137	004306			JMP	NODDA		, RETEST
1801	004444	005237	001054		NODAT1	INC	STRCHR		, NEXT PAPER INSTRUCTION
1802	004450	022737	000214	001054		CMP	#214, STRCHR		, DONE TEST?
1803	004456	001404				BEQ	NODAT2		, CONTINUE IF NOT DONE
1804	004460	10+000				EMT	+0		, TYPE MESSAGE
1805	004462	012467				MESB			, ERROR SET OK - CLEAR & TRY NEXT CHANNEL
1806	004464	000000				HALT			, WAIT FOR OPERATOR
1807	004466	000707				BR	NODDA		, RELOAD & TEST NEXT CHANNEL
1808	004470	104000			NODAT2	EMT	+0		, TYPE MESSAGE
1809	004472	012422				MESA			, ERROR SET OK - TURN ON LINE
1810	004474	000000				HALT			
1811	004476	000137	004562			JMP	TEST2		JUMP
1812									
1813									
1814	004502	000356			NODAT3	356			, START LOAD
1815	004504	000000				0			
1816	004506	000000				0			
1817	004510	000000				0			
1818	004512	000000				0			
1819	004514	000000				0			
1820	004516	000000				0			
1821	004520	000000				0			
1822	004522	000000				0			
1823	004524	000000				0			
1824	004526	000000				0			
1825	004530	000000				0			
1826	004532	000000				0			
1827	004534	000000				0			
1828	004536	000000				0			
1829	004540	000000				0			
1830	004542	000000				0			
1831	004544	000000				0			
1832	004546	000000				0			
1833	004550	000000				0			
1834	004552	000000				0			
1835	004554	000000				0			
1836	004556	000000				0			
1837	004560	000357			NODAT4	357			, STOP LOAD
1838									
1839									
1840									
1841									

TEST 2
 TESTS INTERFACE AND PRINTER DATA PATHS
 WITH ALTERNATING ONES AND ZEROS

```

1242
1243 004562          TEST2
1244 004562 022737 000176 001004      CMP      #176, SWR          ; S/W SWR ?
1245 004570 001002          BNE      15           ; NO- CONTINUE
1246 004572 004737 011762          JSR      PC, ENABL    ; ENABLE KEYBOARD INTERRUPT
1247 004576          15
1248 004576 004437 011472          JSR      %4, TYPINT
1249 004602 004537 011332          JSR      %5, PRINT    ; INITIALIZE PRINTER
1250 004606 000406          BR       TST2AX      ; BRANCH IF OK
1251 004610 012737 000032 001052  ERR32  MOV      #32,   ERCOUNT ; SET UP ERROR COUNT 32
1252          000033          N=N+1
1253 004616 004537 011722          JSR      %5, STAER   ; REPORT PRINTER NOT READY
1254 004622 000000          HALT          ; HALT ON ERROR
1255 004624          TST2AX
1256 004624 013737 014562 014050      MOV      TNO2, MES15 ; SET TEST NUMBER FOR MESSAGE
1257 004632 004437 011406          JSR      %4, PRNNT   ; PRINT TEST NUMBER
1258          000003          M=M+1
1259 004636 012737 177740 001044      MOV      #-32, CYCCNT ; SET UP LINE COUNT FOR 32 LINES
1260 004644 012737 177574 001036      MOV      #-132, CHRCNT ; SET CHAR COUNT TO 132
1261 004652 013737 004726 001054      MOV      SCHRSW, STRCHR ; SET CHAR SWITCH TO U
1262 004660 005777 174114          T3A      TST      @LPS ; TEST FOR ERROR
1263 004664 100006          BPL      LP2B        ; NO ERROR CONTINUE
1264 004666 012737 000033 001052  ERR33  MOV      #33,   ERCOUNT ; SET UP ERROR COUNT 33
1265          000034          N=N+1
1266 004674 004537 011722          JSR      %5, STAER   ; REPORT ERROR SET
1267 004700 000000          HALT          ; HALT ON ERROR
1268 004702 000177 174146          LP2B     JMP      @STRCHR    ; LOAD CHAR
1269 004706 013737 004730 001054  T2A     MOV      RCHRSW, STRCHR ; RESET CHAR SWITCH
1270 004714 012737 000125 001050      MOV      #125, SAVE  ; STORE CHAR
1271 004722 000137 004746          JMP      T5A        ; LOAD CHAR
1272
1273 004726 004706          SCHRSW  T2A
1274 004730 004732          RCHRSW  T1A
1275
1276 004732 013737 004726 001054  T1A     MOV      SCHRSW, STRCHR ; SET CHAR SWITCH TO U
1277 004740 012737 000052 001050      MOV      #52, SAVE   ; STORE CHAR
1278 004746 013777 001050 174026  T5A     MOV      SAVE, @LPB  ; LOAD BUFFER
1279 004754 005237 001036          INC     CHRCNT      ; INC CHARACTER COUNT
1280 004760 001337          BNE     T3A        ; CONTINUE
1281 004762 012777 000012 174012      MOV      #12, @LPB  ; SEND LF
1282 004770 105777 174004          TSTB   @LPS        ; TEST READY
1283 004774 100375          BPL     -4         ; WAIT FOR READY
1284 004776 012737 177574 001036      MOV      #-132, CHRCNT ; RESET CHAR COUNT
1285 005004 005237 001044          INC     CYCCNT     ; INC CYCLE COUNT
1286 005010 001356          BNE     T5A        ; CONTINUE IF NOT DONE
1287 005012 032777 010000 173764      BIT     #BIT12, @SWR ; LOOP ON TEST?
1288 005020 001260          BNE     TEST2     ; LOOP
1289
1290          ; TEST 3
1291          ; TEST CHARACTER COMPARATOR WITH ALTERNATE LINES OF
1292          ; ALL CHARACTERS AND ILLEGAL CHARACTERS
1293
1294 005022          TEST3
1295 005022 022737 000176 001004      CMP      #176, SWR   ; S/W SWR ?
1296 005030 001002          BNE      15         ; NO- CONTINUE
1297 005032 004737 011762          JSR      PC, ENABL   ; ENABLE KEYBOARD INTEPRUPT
    
```

1898	005036					15				
1899	005036	004437	011472				JSR	%4, TYPINT		
1900	005042	013737	014564	014050			MOV	TN03, MES15	. SET TEST NUMBER FOR MESSAGE	
1901	005050	004437	011406				JSR	%4, PRNNT	. PRINT TEST NUMBER	
1902		000004					M=M+1			
1903	005054	012737	177765	001044			MOV	#-13, CYCCNT	. SET 21 LINES	
1904	005062	000137	005214				JMP	LP2H	. SEND ILLEGAL CHARS FIRST TO GIVE BLANK LINE	
1905	005066	012737	177574	001036	T280		MOV	#-132, CHR CNT	. SET CHAR COUNT FOR 132	
1906	005074	012737	000040	001040	T280A		MOV	#40, CHRGEN	. SET FIRST CHAR	
1907	005102	005777	173672		T281		TST	@LPS	. DOES THE PRINTER HAVE AN ERROR	
1908	005106	100006					BPL	LP2E	. BRANCH IF NO ERROR	
1909	005110	012737	000034	001052	ERR34		MOV	#34, ERCOUNT	. SET UP EPPOR COUNT 34	
1910		000035					N=N+1			
1911	005116	004537	011722				JSR	%5, STAER	. REPORT ERROR	
1912	005122	000000					HALT		. HALT ON ERROR	
1913	005124	013777	001040	173650	LP2E		MOV	CHRGEN, @LPB	. PRINT CHARACTER	
1914	005132	005237	001036				INC	CHR CNT	. INC CHAR COUNT	
1915	005136	001420					BEQ	T282	. BRANCH IF LINE IS FINISHED	
1916	005140	005237	001040				INC	CHRGEN	. NEXT CHAR	
1917	005144	032777	020000	173632			BIT	#BIT13, @SWR	. CHECK CHAR SET	
1918	005152	001405					BEQ	T282B	. BRANCH IF 64 CHARS	
1919	005154	022737	000200	001040			CMP	#200, CHRGEN	. LEGAL CHAR?	
1920	005162	001744					BEQ	T280A	. MAKE SPACE IF ILLEGAL	
1921	005164	000746					BR	T291	. CONTINUE IF LEGAL CHAR	
1922	005166	022737	000140	001040	T282B		CMP	#140, CHRGEN	. LEGAL CHAR?	
1923	005174	001737					BEQ	T280A	. MAKE SPACE IF ILLEGAL	
1924	005176	000741					BR	T281	. CONTINUE IF LEGAL CHAR	
1925	005200	012777	000012	173574	T282		MOV	#12, @LPB	. ISSUE LINE FEED	
1926	005206	105777	173566				TSTB	@LPS	. TEST READY	
1927	005212	100375					BPL	-4	. WAIT FOR READY	
1928	005214	005037	001040		LP2H		CLR	CHRGEN	. FIRST ILLEGAL CHAR	
1929	005220	005777	173554		T283		TST	@LPS	. TEST FOR ERROR	
1930	005224	100006					BPL	LDCH	. BRANCH IF NO ERROR	
1931	005226	012737	000035	001052	ERR35		MOV	#35, ERCOUNT	. SET UP ERROR COUNT 35	
1932		000036					N=N+1			
1933	005234	004537	011722				JSR	%5, STAER	. REPORT ERROR SET	
1934	005240	000000					HALT		. HALT ON ERROR	
1935	005242	013777	001040	173532	LDCH		MOV	CHRGEN, @LPB	. TRANSMIT CHARACTER	
1936	005250	005237	001040		T284		INC	CHRGEN	. NEXT CHAR	
1937	005254	022737	000012	001040			CMP	#12, CHRGEN	. TEST FOR LINE FEED	
1938	005262	001772					BEQ	T284	. SKIP IF LF	
1939	005264	022737	000014	001040			CMP	#14, CHRGEN	. TEST FOR FORM FEED	
1940	005272	001766					BEQ	T284	. SKIP IF FF	
1941	005274	022737	000015	001040			CMP	#15, CHRGEN	. TEST FOR CARRIAGE RETURN	
1942	005302	001762					BEQ	T284	. SKIP IF CR	
1943	005304	023727	001040	000040			CMP	CHRGEN, #40	. CHECK IF LEGAL CHAR	

1944	005312	002753		
1945	005314	032777	020000	173462
1946	005322	001007		
1947	005324	052737	000100	001040
1948	005332	032737	000200	001040
1949	005340	001740		

BLT	LDCH
BIT	#81713, @SWR
BNE	T285
BIS	#100, CHGEN
BIT	#200, CHGEN
BEG	LDCH

CONTINUE IF STILL ILLEGAL CHAR
.CHECK CHAR SET
.BRANCH IF 96 CHAR SET
SET BIT 7 IF NOT SET
.DONE ILLEGAL CHARS
.BRANCH IF NOT DONE

1950	005342	012777	000C12	173432	T2B5	MOV	#12,@LPB	.ISSUE LINE FEED
1951	005350	105777	173424			TSTB	@LPS	.TEST READY
1952	005354	100375				BPL	-4	.WAIT FOR READY
1953	005356	005237	001044			INC	CYCCNT	.INCREMENT LINE COUNT
1954	005362	001241				BNE	T2B0	.CONTINUE IF NOT DONE
1955	005364	032777	010000	173412		BIT	#BIT12,@SWR	.CHECK TO LOOP ON TEST
1956	005372	001213				BNE	TEST3	.LOOP
1957								
1958								
1959								
1960								
1961								

.TEST 4
.OVER PRINT TEST
.OVER PRINT FULL LINES OF ALTERNATING E'S AND SPACES

1962	005374				CHRCHK		
1963	005374	022737	000176	001004		CMP	#176, SWR
1964	005402	001002				BNE	15
1965	005404	004737	011762			JSP	PC, ENABL
1966	005410				15		

SW SWR ?
NO- CONTINUE
ENABLE KEYBOARD INTERRUPT

1207 005410 004437 011472

JSR 24.TYPINT

1963 005414 013737 014566 014050
1963 005422 004437 011406
1963 000005

MOV TNO4,MES15
JSR %4,PRNT
M=M+1

.SET TEST NUMBER FOR MESSAGE
.PRINT TEST NUMBER

1971	005426	012737	177750	001042	MOV	#-24 ,LINCNT	SET UP LINE COUNT FOR 24 LINES
1972	005434	012737	177776	001044	MOV	#-2, CYC CNT	SET UP CYCLE COUNT
1973	005442	012737	005604	001054	MOV	CHRE, STRCHR	SET CHAR TAG TO SPACE

1974	005450	012737	177574	001036	CR	MOV	#-132 ,CHRCNT	, SET CHAR COUNT
1975	005456	005777	173316		CR0	TST	@LPS	, TEST FOR ERROR
1976	005462	100006				BPL	CR1	, CONTINUE IF NO ERROR
1977	005464	012737	000036	001052	ERR36	MOV	#36, ERCCUNT	, SET UP ERROR COUNT 36
1978		000037				N=N+1		
1979	005472	004537	011722			JSR	%5, STAER	, REPORT ERROR SET
1950	005476	000000				HALT		, HALT ON ERROR
1981	005500	000177	173350		CR1	JMP	@STRCHR	, OPPOSITE CHAR
1982	005504	013737	005604	001054	CR2	MOV	CHRE, STRCHR	, SET CHAR SWITCH TO SPACE
1983	005512	012737	000105	001050		MOV	#105, SAVE	, SEND E
1984	005520	013777	001050	173254	CR3	MOV	SAVE, @LPB	, LOAD BUFFER
1985	005526	005237	001036			INC	CHRCNT	, INCREMENT CHAR COUNT
1986	005532	001351				BNE	CR0	, BRANCH IF NOT DONE
1987	005534	005237	001044			INC	CYCCNT	, INCREMENT CYCLE COUNT

001422

BEQ CRS

.BRANCH IF FINISHED OVERPP NTS

1989	005542	012777	000015	173232
1990	005550	105777	173224	
1991	005554	100375		

MOV #15, @LPB
TSTB @LPS
BPL -4

.SEND CR
.TEST READY
.WAIT FOR READY

1932	005556	000137	005450		JMP	CR	.OVERPRINT LINE
1933	005562	013737	005602	001054	MOV	CHRS, STRCHR	.RESET CHAR SWITCH
1934	005570	012737	000040	001050	MOV	#40, SAVE	.SEND SPACE

1995	005576	000137	005520			JMP	CR3	. CONTINUE
1996								
1997	005602	005504				CHRS	CR2	
1998	005604	005562				CHRE	CR7	
1999	005606	012777	000012	1.3166		CR5	MOV	#12, @LPB
2000	005614	105777	173160				TSTB	@LPS
2001	005620	100375					BPL	-4
2002	005622	012737	177776	001044			MOV	#-2, CYCNT
2003	005630	012737	177574	001036			MOV	#-132, CHRCNT
2004	005636	005237	001042				INC	LINCNT
2005	005642	001326					BNE	CR3
2006	005644	032777	010000	173132			BIT	#BIT12, @SWR
2007	005652	001250					BNE	CHRCHK

2008
2009
2010
2011
2012
2013

. TEST 5
 . SHUTTLE POS T ON NG TEST
 . SENDS PAIRS OF E S THEN OVER PRINTS THEM WITH SPACES AND ADDS ANOTHER

2014
2015
2016
2017 005654
2018 005654 022737 000176 001004
2019 005662 001002
2020 005664 004737 011762
2021 005670
2022 005670 004437 011472
2023 005674 013737 014570 014050
2024 005702 004437 011406
2025 000006
2026 005706 012737 177760 001042
2027 005714 012737 177574 001036 OVR
2028 005722 012737 177776 001044 OVR0
2029 005730 013737 001036 001056
2030 005736 062737 000205 001056
2031 005744 012737 000040 001040
2032 005752 000406
2033 005754 012737 000105 001040 OVR4

.PAIR OF E'S TO THE LINE --- THIS IS REPEATED UNTIL A FULL LINE OF E'S
.HAVE BEEN PRINTED, THEN A FULL LINE OF M'S ARE PRINTED

OVRPRT
CMP #176, SWR
BNE 15
JSR PC, ENABL
JSR %4, TYPINT
MOV TN05, MES15
JSR %4, PRNNT
M=M+1
MOV #-16, LINCNT
MOV #-132, CHRCNT
MOV #-2, CYCCNT
ADD #133, STRCNT
MOV #40, CHRGEN
BR OVR2
MOV #105, CHRGEN

.S/W SWR ?
.NO- CONTINUE
.ENABLE KEYBOARD INTERRUPT
.SET TEST NUMBER FOR MESSAGE
.PRINT TEST NUMBER
.SET LINE COUNT FOR 16 LINES
.SET CHAR COUNT
.SET CYCLE COUNT FOR A PAIR OF E'S
.NO CHARS LEFT TO PRINT
.NO SPACES +1
.SEND SPACE
.BRANCH
.SEND E

2034	005762	013777	001040	173012	OVR1	MOV	CHRGEN, @LPB	, LOAD BUFFER
2035	005770	005777	173004		OVR2	TST	@LPS	, TEST FOR ERROR
2036	005774	100006				BPL	OVR3	, BRANCH IF NO ERROR
2037	005776	012737	000037	001052	ERR37	MOV	#37, ERCOUNT	, SET UP ERROR COUNT 37
2038		000040				N=N+1		
2039	006004	004537	011722			JSR	%5, STAER	, REPORT ERROR SET
2040	006010	000000				HALT		
2041	006012	005337	001056		OVR3	DEC	STRCNT	, DECREMENT SPACE COUNTER

CC-2 005016 003361

BGT OVR1

.BRANCH IF NOT DONE SPACES

2042 006020 001755
2044 006022 005237 001036
2045 006026 001437
2046 006030 005237 001044

OVR5

BEG OVR4
INC CHRCNT
BEG OVR8
INC CYCCNT

. BRANCH IF NOT FIRST E
. INCREMENT CHAR COUNT
. BRANCH IF DONE LINE
. INCREMENT CYCLE COUNT

2047	006034	001352				BNE	OVR1	.CONTINUE SENDING E'S IF NOT DONE
2048	006036	012777	000015	172736		MOV	#15, 2LPA	SEND CR
2049	006044				OVR6			
2050	006044	105777	172730			TSTB	2LPS	.TEST READY
2051	006050	100375				BPL	-4	.WAIT FOR READY
2052	006052	005737	001036			TST	CHRCNT	.LINE DONE?
2053	006056	001321				BNE	OVR0	.NO. CONTINUE OVER PRINT
2054	006060	005237	001042			INC	LINCNT	.YES. INCREMENT LINE COUNT
2055	006064	001425				BEQ	OVR6EXT	.EXIT IF DONE TEST
2056	006066	032737	000001	001042		BIT	#1, LINCNT	.WHICH LINE NEXT?
2057	006074	001707				BEQ	OVR	.BRANCH TO SEND E'S
2058	006076	012737	000115	001040		MOV	#115, CHRCNT	.SET UP TO SEND M'S
2059	006104	012737	177573	001036		MOV	#-133, CHRCNT	.SET CHAR COUNT
2060	006112	005037	001056			CLP	STRCNT	.CLEAR SPACE COUNT
2061	006116	005037	001044			CLP	CYCLNT	.CLEAR CYCLE COUNT

0000	006122	000137	005770			JMP	OVR2	.PRINT LINE OF M'S
0000	006126	012777	000012	172646	OVR8.	MOV	#12, 0LPB	.SEND LF

000134 000137 006044

JMP OVR6

.CONTINUE

2065	006140	032777	010000	172636	OVREXT	BIT	#BIT12, @SWR	.LOOP ON TEST
2066	006146	001242			BNE	OURPRT		.LOOP
2067								
2068								
2070								
2071								
2072								
2073	006150				PPTCTL			
2074	006150	022737	000176	001004	CMP	#176, SWR		.S/W SWR
2075	006156	001002			BNE	15		.NO- CONTINUE
2076	006160	004737	011762		JMP	PC, ENABL		.ENABLE KEYBOARD INTERRUPT
2077	006164							
2078	006164	004437	011772		JCF	14 TYP NT		

2079	006170	013737	014572	014050		MOV	TN06, MES15		. SET TEST NUMBER FOR MESSAGE
2080	006176	004437	011406			JSR	%4, PRNNT		. PRINT TEST NUMBER
2081		000007				M=M+1			
2082	006202	012737	000060	001054		MOV	#60, STRCHR		. FIRST START CHAR
2083	006210	032777	020000	172566	PRT0	BIT	#BIT13, @SWR		. TEST FOR CHAR SET
2084	006216	001404				BEQ	PRT1		. BRANCH IF 64 CHARS
2085	006220	012737	177641	001034		MOV	#-95, SEGCNT		. SET OVERFLOW COUNT
2086	006226	000403				BR	PRT2		. BRANCH
2087	006230	012737	177701	001034	PRT1	MOV	#-63, SEGCNT		. SET OVERFLOW COUNT
2088	006236	012737	177574	001036	PRT2	MOV	#-132, CHRCNT		. SET CHAR COUNT
2089	006244	013737	001054	001040		MOV	STRCHR, CHRCNT		. GET START CHAR
2090	006252	005777	172522		PRT3	TST	@LPS		. TEST FOR ERROR
2091	006256	100006				BPL	PRT4		. BRANCH IF NO ERROR
2092	006260	012737	000040	001052	ERR40	MOV	#40, ERCOUNT		. SET UP ERROR COUNT 40
2093		000041				N=N+1			
2094	006266	004537	011722			JSR	%5, STREP		. REPORT ERROR SET
2095	006272	000000				HALT			. HALT ON ERROR
2096	006274	013777	001040	172530	PRT4	MOV	CHRCNT, @LPS		. LOAD BUFFER
2097	006302	005237	001036			INC	CHRCNT		. INCREMENT CHAR COUNT
2098	006306	002761				BLT	PRT3		. BRANCH IF NOT 132 CHARS
2099	006310	001433				BEQ	PRT4		. START OVERFLOW
2100	006312	005237	001040			INC	CHRCNT		. NEXT CHAR

Line	Address	OpCode	Operand 1	Operand 2	Operand 3	Instruction	Comments
2101	006316	005237	001034			INC	SEGCNT
2102	006322	001353				BNE	PRT3
2103	006324	012777	000012	172450		MOV	#12, @LPB
2104	006332	105777	172442			TSTB	@LPS
2105	006336	100375				BPL	-4
2106	006340	022737	000040	001054		CMP	#40, STRCHR
2107	006346	001421				BEQ	PRT6
2108	006350	022737	000065	001054		CMP	#65, STRCHR
2109	006356	001422				BEQ	PRT7
2110	006360	022737	000071	001054		CMP	#71, STRCHR
2111	006366	001423				BEQ	PRT8
2112	006370	005237	001054			INC	STRCHR
2113	006374	000137	006210			JMP	PRT0
2114	006400	012737	000041	001040	PRTA	MOV	#41, CHRGEN
2115	006406	000137	006252			JMP	PRT3
2116	006412	012737	000066	001054	PRT6	MOV	#66, STRCHR
2117	006420	000137	006210			JMP	PRT0
2118	006424	012737	000040	001054	PRT7	MOV	#40, STRCHR
2119	006432	000137	006210			JMP	PRT0
2120	006436	032777	010000	172340	PRT8	BIT	#BIT12, @SWR
2121	006444	001241				BNE	PFTCTL
2122							
2123							
2124							
2125							
2126							
2127							
2128	006446					MLF	
2129	006446	022737	000176	001004		CMP	#176, SWR
2130	006454	001002				BNE	15
2131	006456	004737	011762			SEP	PC ENABL
2132	006462						15
2133	006462	004437	011472			JSR	%4, T P NT
2134	006466	013737	014574	014050		MOV	TN07, MES15
2135	006474	004437	011406			JSR	%4, PRNNT
2136		000010					M=M+1
2137	006500	012737	006632	001054		MOV	#TABSTR, STRCHR
2138	006506	012737	177574	001036	MLFA	MOV	#-132, CHRCNT
2139	006514	117737	172334	001040		MOVB	@STRCHR, CHRGEN
2140	006522	001452				BEQ	MLF4
2141	006524	005777	172250		MLF0	TST	@LPS
2142	006530	100006				BPL	MLF1
2143	006532	012737	000041	001052	EPR41	MOV	#41, EPCOUNT
2144		000042					N=N+1
2145	006540	004537	011722			JSR	%5, STAEF
2146	006544	000000				HALT	
2147	006546	013777	001040	172226	MLF1	MOV	CHRGEN, @LPB
2148	006554	005237	001036			INC	CHRCNT
2149	006560	001361				BNE	MLF0
2150	006562	117737	172266	001042		MOVB	@STRCHR, LINCNT
2151	006570	042737	177770	001042		BIC	#177770, LINCNT
2152	006576	005237	001042			INC	LINCNT
2153	006602	012777	000012	172172	MLF2	MOV	#12, @LPB
2154	006610	105777	172164			TSTB	@LPS
2155	006614	100375				BPL	-4
2156	006616	005377	001042			DEF	LINCNT

TEST 7
 MULTIPLE LINE ADVANCE TEST
 TESTS MULTIPLE LINE ADVANCES AND TIMINGS
 PRINTS THE NUMBER OF LINES SKIPPED ON THE LINE PR NTEP

INCREMENT OVERFLOW COUNT
 CONTINUE IF NOT DONE
 SEND LF
 TEST READY
 WAIT FOR READY
 LAST START CHAR SPACE?
 YES, BRANCH
 LAST START CHAR 5?
 YES, BRANCH
 DONE?
 YES
 NO, GET NEXT START CHAR
 CONTINUE
 GET FIRST CHAR IN SET
 START OVERFLOW
 SET START CHAR TO 6
 CONTINUE
 SET START CHAR TO SPACE
 CONTINUE
 CHECK LOOP ON TEST
 LOOP

S/W SWR ?
 NO- CONTINUE
 ENABLE KEYBOARD INTERRUPT
 SET TEST NUMBER FOR MESSAGE
 PP NT TEST NUMBER
 FIRST CHAR
 SET CHAR COLNT
 GET CHAR
 BRANCH IF DONE
 TEST FOR ERPOP
 CONTINUE IF NO ERPOP
 SET UP ERPOP COUNT 41
 REPORT ERROR
 HALT ON ERPOP
 LOAD BUFFER
 INCREMENT CHAR COUNT
 CONTINUE
 GET ASCII LINE COUNT
 MAKE OCTAL
 ADD 1
 SEND LF
 TEST READY
 WAIT FOR READY
 DECREMENT LINE COUNT

2157 006622 001367
2158 006624 005237 001054

BNE MLF2
INC STRCHR

.CONTINUE
.NEXT CHAR

2159	006630	000726			BR	MLFA		, CONTINUE
2160								
2161	006632	032462	033062	033463	TABSTR	ASCIZ	/272637463540/	
2162	006640	033064	032463	030064				
2163	006646	000						
2164								
2165		006650				EVEN		
2166								
2167	006650	032777	010000	172126	MLF4	BIT	#BIT12, @SWR	, CHECK LOOP ON TEST
2168	006656	001273				BNE	MLF	, LOOP
2169						EVEN		
2170								
2171								
2172								
2173								
2174	006660							
2175	006660	022737	000176	001004				
2176	006666	001002			CMP	#176, SWR		, S/W SWR ?
2177	006670	004737	011762		BNE	15		, NO- CONTINUE
2178	006674				JSR	PC, ENABL		, ENABLE KEYBOARD INTERRUPT
2179	006674	004437	011472					
2180	006700	013737	014576	014050	15			
2181	006706	004437	011406		JSR	%4, TYPINT		
2182		000011			MOV	TN010, MES15		, SET TEST NUMBER FOR MESSAGE
2183	006712	032777	002000	172064	JSR	%4, PRNNT		, PRINT TEST NUMBER
2184	006720	001135			M=M+1			
2185	006722	032777	020000	172054	BIT	#BIT10, @SWR		, CHECK FOR NEW DRUM / OLD DRUM
2186	006730	001007			BNE	NHSPRT		, BRANCH IF NEW DRUM
2187	006732	012737	000140	001060	BIT	#BIT13, @SWR		, CHECK CHAR SET
2188	006740	012737	000100	001062	BNE	HS00A		, BRANCH IF 96 CHAR SET
2189	006746	000406			MOV	#140, LEGCHR		, LEGAL CHK
2190	006750	012737	000200	001060	MOV	#100, NUMCHR		, #CHARS
2191	006756	012737	000140	001062	BR	HS00		, CONTINUE
2192	006764	012737	000040	001054	MOV	#200, LEGCHR		, LEGAL CHECK
2193	006772	012737	000177	001042	MOV	#140, NUMCHR		, #CHARS
2194	007000	012737	177574	001036	MOV	#40, STRCHR		, SET UP FIRST LINE
2195	007006	012737	177757	001044	MOV	#127, LINCNT		, SET LINE COUNT FOR 2 PAGES
2196	007014	013737	001054	001040	MOV	#-132, CHRCNT		, SET CHAR COUNT
2197	007022	005777	171752		MOV	#-17, CYCCNT		, SET GROUP COUNT
2198	007026	100006			STRCHR, CHRCNT			, STORE START CHAR
2199	007030	012737	000042	001052	TST	@LPS		, TEST FOR ERROR
2200		000043			BPL	HS2		, BRANCH IF NO ERROR
2201	007036	004537	011722		MOV	#42, EPCOUNT		, SET UP ERROR COUNT 42
2202	007042	000000			N=N+1			
2203	007044	013777	001040	171730	JSR	%5, STAER		, REPORT ERROR SET
2204	007052	005237	001036		HALT			, HALT ON ERROR
2205	007056	001424			MOV	CHRCNT, @LPB		, LOAD BUFFER
2206	007060	005237	001040		INC	CHRCNT		, INCREMENT CHAR COUNT
2207	007064	005237	001044		BEQ	HS4		, BRANCH IF DONE LINE
2208	007070	001410			INC	CHRCNT		, NEXT CHAR
2209	007072	023737	001060	001040	INC	CYCCNT		, INCREMENT GROUP COUNT
2210	007100	001350			BEQ	HS3		, BRANCH IF DONE GROUP
2211	007102	163737	001062	001040	CMP	LEGCHR, CHRCNT		, LEGAL CHAR?
2212	007110	006744			BNE	HS1		, BRANCH AND CONTINUE IF LEGAL CHAR
2213	007112	013737	001054	001040	SUB	NUMCHR, CHRCNT		, MAKE LEGAL
2214	007120	012737	177757	001044	BR	HS1		, CONTINUE
					MOV	STRCHR, CHRCNT		, GET FIRST CHAR IN GROUP
					MOV	#-17, CYCCNT		, RESET CYCLE COUNT

2215	007126	000735				BR	HS1		. CONTINUE
2216	007130	012777	000012	171644	HS4	MOV	#12, @LPB		. SEND LF
2217	007136	105777	171636			TSTB	@LPS		. TEST READY
2218	007142	100375				BPL	-4		. WAIT FOR READY
2219	007144	005337	001042			DEC	LINCNT		. DECREMENT LINE COUNT
2220	007150	002413				BLT	HS6		. EXIT TEST IF DONE
2221	007152	162737	000004	001054		SUB	#4, STRCHR		. SKIP 4 LINES ON DRUM, FIND START CHAR
2222	007160	022737	000040	001054		CMP	#40, STRCHR		. START CHAR A LEGAL CHAR?
2223	007166	003704				BLE	HS0		. CONTINUE IF LEGAL START CHAR
2224	007170	063737	001062	001054		ADD	NUMCHR, STRCHR		. MAKE LEGAL AND CONTINUE
2225	007176	000700				BR	HS0		. CONTINUE
2226	007200	032777	010000	171576	HS6	BIT	#BIT12, @SWR		. LOOP ON TEST?
2227	007206	001224				BNE	HSPRT		. LOOP
2228									
2229									
2230	007210	000137	007460			JMP	SNGCHR		. JUMP TO TEST 9 AFTER COMPLETION
2231									
2232									
2233									
2234									. NEW DRUM (LP14) HIGH SPEED PRINT TEST
2235	007214	032777	020000	171562	NHSPRT	BIT	#BIT13, @SWR		. CHECK CHARACTER SET
2236	007222	001007				BNE	NHS00A		. BRANCH IF 96 CHARACTER SET
2237									
2238	007224	012737	000140	001060		MOV	#140, LEGCHR		. LEGAL CHARACTER CHECK
2239	007232	012737	000100	001062		MOV	#100, NUMCHR		. # CHARACTERS = 64
2240	007240	000406				BR	NHS00		. CONTINUE
2241	007242	012737	000200	001060	NHS00A	MOV	#200, LEGCHR		. LEGAL CHARACTER CHECK
2242	007250	012737	000140	001062		MOV	#140, NUMCHR		. # CHARACTERS = 96
2243	007256	012737	000003	001064	NHS00	MOV	#3, OFFSET		. COLUMN/CHARACTER OFFSET
2244	007264	012737	000040	001054		MOV	#40, STRCHR		. SET UP FIRST CHARACTER OF FIRST LINE
2245	007272	012737	000177	001042		MOV	#127, LINCNT		. SET LINE COUNT FOR 2 PAGES
2246	007300	012737	177574	001036	NHS0	MOV	#-132, CHRCNT		. SET CHARACTER COUNT = # COLUMNS
2247	007306	013737	001054	001040		MOV	STRCHR, CHRCNT		. STORE STARTING CHARACTER
2248	007314	005777	171460		NHS1	TST	@LPS		. TEST FOR ERROR
2249	007320	100006				BPL	NHS2		. BRANCH IF NO ERROR
2250	007322	012737	000043	001052	ERR43	MOV	#43, ERCOUNT		. SET UP ERROR COUNT 43
2251		000044							
2252	007330	004537	011722			N=N+1			
2253	007334	000000				JSR	%5, STAER		. REPORT ERROR SET
2254	007336	013777	001040	171436	NHS2	HALT			. HALT ON ERROR
2255	007344	005237	001036			MOV	CHRCNT, @LPB		. LOAD PRINTER BUFFER
2256	007350	001413				INC	CHRCNT		. INCREMENT CHARACTER COUNT
2257	007352	063737	001064	001040		BEQ	NHS4		. BRANCH IF LINE DONE
2258	007360	023737	001060	001040		ADD	OFFSET, CHRCNT		. NEXT CHARACTER
2259	007366	003352				CMP	LEGCHR, CHRCNT		. LEGAL CHARACTER
2260	007370	163737	001062	001040		BGT	NHS1		. BRANCH + CONTINUE IF LEGAL CHARACTER
2261	007376	000746				SUB	NUMCHR, CHRCNT		. MAKE LEGAL
2262	007400	012777	000012	171374	NHS4	BR	NHS1		. CONTINUE
2263	007406	105777	171366			MOV	#12, @LPB		. SEND LINE FEED
2264	007412	100375				TSTB	@LPS		. TEST READY
2265	007414	005337	001042			BPL	-4		. WAIT FOR READY
2266	007420	002413				DEC	LINCNT		. DECREMENT LINE COUNT
2267	007422	162737	000004	001054		BLT	NHS6		. EXIT IF TEST IS DONE
2268	007430	022737	000040	001054		SUB	#4, STRCHR		. SKIP 4 LINES DOWN DRUM, FIND STARTING CHARACTER
2269	007436	003720				CMP	#40, STRCHR		. START CHARACTER A LEGAL CHARACTER
2270	007440	063737	001062	001054		BLE	NHS0		. CONTINUE IF LEGAL START CHARACTER
						ADD	NUMCHR, STRCHR		. MAKE LEGAL + CONTINUE

2271	007446	000714					BR	NHSO		, CONTINUE
2272	007450	032777	010000	171326	NHS6		BIT	#BIT12, @SWR		, LOOP ON TEST
2273	007456	001256					BNE	NHSPRT		, LOOP
2274										
2275										
2276										, TEST 9
2277										, WORST CASE NOISE TEST
2278										, SINGLE CHAR ACROSS ALL COLS
2279	007460									
2280	007460	022737	000176	001004			CMP	#176, SWR		, S/W SWR ?
2281	007466	001002					BNE	15		, NO- CONTINUE
2282	007470	004737	011762				JSR	PC, ENABL		, ENABLE KEYBOARD INTERRUPT
2283	007474									
2284	007474	004437	011472							
2285	007500	013737	014600	014050			JSR	%4, TYPINT		
2286	007506	004437	011406				MOV	TN011, MES15		, SET TEST NUMBER FOR MESSAGE
2287		000012					JSR	%4, PRNNT		, PRINT TEST NUMBER
2288	007512	032777	020000	171204			M=M+1			
2289	007520	001404					BIT	#BIT13, @SWR		, TEST CHAR SET
2290	007522	012737	177640	001042			BEQ	S2		, BRANCH IF 64
2291	007530	000403					MOV	#-96, LINCNT		, 96 CHAR
2292	007532	012737	177700	001042	S2		BR	+10		, BRANCH
2293	007540	012737	000040	001040			MOV	#-64, LINCNT		, 64 CHAR
2294	007546	012737	177574	001036	S2A		MOV	#40, CHRCNT		, SET UP SPACE
2295	007554	005777	171220		S1		MOV	#-132, CHRCNT		, SET CHAR COUNT FOR 132
2296	007560	100006					TST	@LPS		, TEST FOR ERRORS
2297	007562	012737	000044	001052	ERR44		BPL	XS1X		, BRANCH IF NO ERRORS
2298		000045					MOV	#44, ERCOUNT		, SET UP ERROR COUNT 44
2299	007570	004537	011722				N=N+1			
2300	007574	000000					JSR	%5, STAER		, REPORT ERROR
2301	007576	013777	001040	171176	XS1X		HALT			, HALT ON ERROR
2302	007604	005237	001036				MOV	CHRCNT, @LPS		, LOAD PRINTER BUFFER
2303	007610	001361					INC	CHRCNT		, INCREMENT CHAR COUNT
2304	007612	012777	000012	171162	S4X2		BNE	S1		, CONTINUE IF NOT DONE L NE
2305	007620	105777	171154				MOV	#12, @LPS		, ISSUE LINE FEED
2306	007624	100375					TSTB	@LPS		, TEST READY
2307	007626	005237	001040				BPL	-4		, WAIT FOR READY
2308	007632	005237	001042				INC	CHRCNT		, +1 CHAR.
2309	007636	002743					INC	LINCNT		, +1 LINE COUNT
2310	007640	001764					BLT	S2A		, CONTINUE IF NOT DONE
2311	007642	032777	010000	171134	LPS7		BEQ	S4X2		, SEND BLANK LINE AT END OF TEST
2312	007650	001303					BIT	#BIT12 @SWR		, CHECK TO LOOP ON TEST
2313							BNE	SNGCHR		, LOOP ON TEST
2314										
2315										
2316										
2317										, TEST 10
2318										, DRUM PATTERN CHARACTER TEST
2319	007652									
2320	007652	022737	000176	001004			ROTATE			
2321	007660	001002					CMP	#176, SWR		, S/W SWR ?
2322	007662	004737	011762				BNE	15		, NO- CONTINUE
2323	007666						JSR	PC, ENABL		, ENABLE KEYBOARD INTERRUPT
2324	007666	004437	011472							
2325	007672	013737	014600	014050			JSR	%4, TYPINT		
2326	007700	004437	011406				MOV	TN012, MES15		, SET TEST NUMBER FOR MESSAGE
							JSR	%4, PRNNT		, PRINT TEST NUMBER

2327		000013				M=M+1		
2328								
2329	007704	032777	002000	171072		BIT	#BIT10, @SWR	, CHECK FOR NEW D- JM/OLD DRUM
2330	007712	001122				BNE	NROTAT	, BRANCH IF NEW DRUM
2331	007714	032777	020000	171062		BIT	#BIT13, @SWR	, TEST CHAR SET
2332	007722	001012				BNE	ROTO	, SKIP IF 96 CHAR
2333	007724	012737	000137	001042		MOV	#137, LINCNT	, LAST CHAR
2334	007732	012737	000140	001060		MOV	#140, LEGCHR	, LEGAL CHK
2335	007740	012737	000100	001062		MOV	#100, NUMCHR	, #CHARS
2336	007746	000411				BR	ROT1	, CONTINUE
2337	007750	012737	000177	001042	ROTO	MOV	#177, LINCNT	, LAST CHAR
2338	007756	012737	000200	001060		MOV	#200, LEGCHR	, LEGAL CHK
2339	007764	012737	000140	001062		MOV	#140, NUMCHR	, #CHARS
2340	007772	005037	001044		ROT1	CLR	CYCCNT	, CLEAR CYCLE COUNT
2341	007776	005237	001044		ROT2	INC	CYCCNT	, INC CYCLE COUNT
2342	010002	005037	001040			CLR	CHRGEN	, CLEAR POINTER
2343	010006	005237	001040		ROT3	INC	CHRGEN	, INC POINTER
2344	010012	013737	001040	001054		MOV	CHRGEN, STRCHR	, STORE POINTER
2345	010020	063737	001042	001054		ADD	LINCNT, STRCHR	, FIND CHAR
2346	010026	023737	001054	001060		CMP	STRCHR, LEGCHR	, LEGAL?
2347	010034	002403				BLT	ROT4	, BRANCH IF LEGAL
2348	010036	163737	001062	001054		SUB	NUMCHR, STRCHR	, MAKE LEGAL
2349	010044	005777	170730		ROT4	TST	@LPS	, TEST FOR ERRORS
2350	010050	100006				BPL	ROT5	, BRANCH IF NO ERRORS
2351	010052	012737	000045	001052	ERP45	MOV	#45, ERCOUNT	, SET UP ERROR COUNT 45
2352		000046					N=N+1	
2353	010060	004537	011722			JSR	%5, STAER	, REPORT ERROR
2354	010064	000000				HALT		, HALT ON ERROR
2355	010066	013777	001054	170706	ROT5	MOV	STRCHR, @LPB	, LOAD BUFFER
2356	010074	023727	001040	000021		CMP	CHRGEN, #17	, DONE GROUP?
2357	010102	001341				BNE	ROT3	, NO GET NEXT CHAR
2358	010104	023727	001044	000010		CMP	CYCCNT, #8	, DONE LINE?
2359	010112	001331				BNE	ROT2	, NO, NEXT GROUP
2360	010114	012777	000012	170660		MOV	#12, @LPB	, YES, SEND LF
2361	010122	105777	170652			TSTB	@LPS	, TEST READY
2362	010126	100375				BPL	-4	, WAIT FOR READY
2363	010130	005337	001042			DEC	LINCNT	, DECREMENT LINE COUNT
2364	010134	023727	001042	000037		CMP	LINCNT, #37	, DONE?
2365	010142	003313				BGT	ROT1	, NO, NEXT LINE
2366	010144	032777	010000	170632		BIT	#BIT12, @SWR	, LOOP ON TEST?
2367	010152	001237				BNE	POTATE	, LOOP
2368								
2369	010154	000137	010412			JMP	LFTTR	, JUMP TO TEST 11 AFTER COMPLETION
2370								
2371								
2372								
2373								

NEW DRUM (LP14) PATTERN CHARACTER TEST

2374	010160	032777	020000	170616	NROTAT	BIT	#BIT13, @SWR	, TEST CHARACTER SET
2375	010166	001012				BNE	NROTO	, SKIP IF 96 CHARACTERS
2376	010170	012737	000137	001042		MOV	#137, LINCNT	, LAST CHARACTER
2377	010176	012737	000140	001060		MOV	#140, LEGCHR	, LEGAL CHECK
2378	010204	012737	000100	001062		MOV	#100, NUMCHR	, # OF CHARACTERS
2379	010212	000411				BR	NROT1	, CONTINUE
2380	010214	012737	000177	001042	NROTO	MOV	#177, LINCNT	, LAST CHARACTER
2381	010222	012737	000200	001060		MOV	#200, LEGCHR	, LEGAL CHECK
2382	010230	012737	000140	001062		MOV	#140, NUMCHR	, # OF CHARACTERS

SE.

2323	010236	012737	000040	001040	NROT1	MOV	#40, CHRGEN	.GET POINTER
2384	010244	005237	001040		NROT6	INC	CHRGEN	.SET POINTER
2385	010250	013737	001040	001054		MOV	CHRGEN, STRCHR	.STORE POINTER
2386	010256	005037	001036			CLP	CHRCNT	.# CHARACTERS PRINTED
2387	010262	005237	001036		NROT2	INC	CHRCNT	.INCREMENT CHARACTERS PRINTED
2388	010266	063737	001064	001054		ADD	OFFSET, STRCHR	.INCREMENT POINTER
2389	010274	023737	001054	001060		CMP	STRCHR, LEGCHR	.LEGAL CHARACTER?
2390	010302	002403				BLT	NROT4	.BRANCH IF LEGAL
2391	010304	163737	001062	001054		SUB	NUMCHR, STRCHR	.MAKE LEGAL
2392	010312	005777	170462		NROT4	TST	@LPS	.TEST FOR ERRORS
2393	010316	100006				BPL	NROT5	.BRANCH IF NO ERRORS
2394	010320	012737	000046	001052	ERR46	MOV	#46, ERCOUNT	.SET UP ERROR COUNT 46
2395		000047				N=N+1		
2396	010326	004537	011722			JSR	%5, STAEF	.REPORT ERROR
2397	010332	000000				HALT		
2398	010334	013777	001054	170440	NROT5	MOV	STPCHR, @LPB	.LOAD BUFFER
2399	010342	023727	001036	000204		CMP	CHRCNT, #132	.LINE FINISHED?
2400	010350	001344				BNE	.POT2	.NO GET NEXT CHARACTER
2401	010352	012777	000012	170422		MOV	# @LPB	.YES, SEND LINE FEED
2402	010360	105777	170414			TST	@LPS	.TEST READY
2403	010364	100375				BPL		.WAIT FOR READY
2404	010366	005337	001042			DEC	LINCNT	.DECREMENT LINE COUNT
2405	010372	023727	001042	000037		CMP	LINCNT, #37	.PATTERN FINISHED
2406	010400	003321				BGT	NROT6	.NO, DO NEXT LINE
2407	010402	032777	010000	170374		BIT	#BIT12, @SWP	.LOOP ON TEST
2408	010410	001263				BNE	NROTAT	.LOOP
2409								
2410								
2411								
2412								
2413								
2414								
2415	010412							
2416	010412	022737	000176	001004		CMP	#176 SWP	.SW SWP ?
2417	010420	001002				BNE	15	.NO- CONTINUE
2418	010422	004737	011762			JSP	PC, ENABL	.ENABLE KEYBOARD INTERRUPT
2419	010426							
2420	010426	004437	011472			JSR	24, TYPINT	
2421	010432	013737	014604	014050		MOV	TNO13, MES15	.SET TEST NUMBER FOR MESSAGE
2422	010440	004437	011406			ISR	24, PPNT	.PRINT TEST NUMBER
2423		000014				M=M+1		
2424	010444	012737	000204	001042	LFT	MOV	#132, LINCNT	.SET LINE COUNT
2425	010452	013737	001042	001036	LFT0	MOV	LINCNT, CHRCNT	.STORE CHAR COUNT
2426	010460	012737	177757	001044		MOV	#-17, CYCNT	.SET GROUP COUNT
2427	010466	013737	001036	001040		MOV	CHRCNT, CHRGEN	.FIND FIRST CHAR ON LINE
2428	010474	022737	000022	001040	LFT1	CMP	#19, CHRGEN	.MORE THAN 17 CHARS?
2429	010502	003004				BGT	LFT2	.BRANCH IF LESS THAN 17
2430	010504	162737	000021	001040		SUB	#17, CHRGEN	.SUBTRACT 17, IF < 17
2431	010512	000770				BR	LFT1	.CONTINUE
2432	010514	005437	001040		LFT2	NEG	CHRGEN	.NEGATE CHRGEN
2433	010520	062737	000100	001040		ADD	#100, CHRGEN	.START CHAR IN CHRGEN
2434	010526	013737	001040	001054		MOV	CHRGEN, STPCHR	.STORE STARTING CHAR
2435	010534	005777	170240		LFT3	TST	@LPS	.TEST FOR ERROR
2436	010540	100006				BPL	LFT4	.CONTINUE IF NO ERROR
2437	010542	012737	000047	001052	ERR47	MOV	#47, ERCOUNT	.SET UP ERROR COUNT 47
2438		000050				N=N+1		

TEST 11 ---- SPURIOUS HAMMER FIRING TEST
 LEFT AND RIGHT TRIANGLES

STARTING WITH A LEFT TRIANGLE

2439	010550	004537	011722			JSR	%5, STAER	. REPORT ERROR SET
2440	010554	000000				HALT		. HALT ON ERROR
2441	010556	013777	001040	170216	LFT4	MOV	CHRGEM, @LPB	. LOAD BUFFER
2442	010564	005337	001036			DEC	CHRCNT	. DECREMENT CHAR COUNT
2443	010570	001415				BEQ	LFT6	. BRANCH IF DONE LINE
2444	010572	005237	001044			INC	CYCCNT	. INCREMENT GROUP COUNT
2445	010576	001403				BEQ	LFT5	. BRANCH IF DONE GROUP
2446	010600	005237	001040			INC	CHRGEM	. NEXT CHAR IN GROUP
2447	010604	000753				BR	LFT3	. CONTINUE
2448	010606	013737	001054	001040	LFT5	MOV	STRCHR, CHRGEM	. GET START CHAR AGAIN
2449	010614	012737	177757	001044		MOV	#-17, CYCCNT	. RESET GROUP COUNT
2450	010622	000744				BR	LFT3	. CONTINUE
2451	010624	012777	000012	170150	LFT6	MOV	#12, @LPB	. SEND LF
2452	010632	105777	170142			TSTB	@LPS	. TEST READY
2453	010636	100375				BPL	-4	. WAIT FOR READY
2454	010640	005337	001042			DEC	LINCNT	. DECREMENT LINE COUNT
2455	010644	003302				BGT	LFT0	. BRANCH IF NOT DONE
2456	010646	001766				BEQ	LFT6	. SEND BLANK LINE AT END OF TEST
2457	010650	032777	010000	170126		BIT	#BIT12, @SWP	. LOOP ON TEST?
2458	010656	001255				BNE	LFTTR	. LOOP
2459								
2460								
2461								
2462								
2463	010660	012737	000001	001042	PTTR	MOV	#1, LINCNT	. INITIALIZE LINE
2464	010666	012737	000077	001040	RT1	MOV	#77, CHRGEM	. FIRST CHAR IS A ?
2465	010674	013737	001042	001044		MOV	LINCNT, CYCCNT	. SAVE NO CHARS ON LINE
2466	010702	012737	177757	001056		MOV	#-17, STRCNT	. SET GROUP COUNT
2467	010710	012737	000204	001036		MOV	#132, CHRCNT	. NO CHARS PER LINE
2468	010716	163737	001042	001036		SUB	LINCNT, CHRCNT	. SUBTRACT NO. OF CHARS ON LINE
2469	010724	001425				BEQ	RT3	. BRANCH IF NO SPACES ON THIS LINE
2470	010726	005777	170046		RT2	TST	@LPS	. TEST FOR ERROR
2471	010732	100006				BPL	PT2A	. CONTINUE IF NO ERROR
2472	010734	012737	000050	001052	ERR50	MOV	#50, ERCOUNT	. SET UP ERROR COUNT 50
2473		000051						
2474	010742	004537	011722					
2475	010746	000000				JSR	%5, STAER	. REPORT ERROR SET
2476	010750	012777	000040	170024	RT2A	HALT		. HALT ON ERROR
2477	010756	005237	001056			MOV	#40, @LPB	. LOAD BUFFER
2478	010762	001003				INC	STPCNT	. INCREMENT GROUP COUNT
2479	010764	012737	177757	001056		BNE	RT2AA	. BRANCH IF NOT DONE GROUP
2480	010772	005337	001036		RT2AA	MOV	#-17, STPCNT	. RESET GROUP COUNT
2481	010776	001353				DEC	CHRCNT	. DECREMENT SPACE COUNT
2482	011000	005777	167774		RT3	BNE	RT2	. BRANCH IF NOT DONE SPACES
2483	011004	100006				TST	@LPS	. TEST FOR ERROR
2484	011006	012737	000051	001052	ERR51	BPL	RT3A	. CONTINUE IF NO ERROR
2485		000052				MOV	#51, ERCOUNT	. SET UP ERROR COUNT 51
2486	011014	004537	011722					
2487	011020	000000				JSR	%5, STAER	. REPORT ERROR SET
2488	011022	013777	001040	167752	RT3A	HALT		. HALT ON ERROR
2489	011030	005237	001040			MOV	CHRGEM, @LPB	. LOAD BUFFER
2490	011034	005237	001056			INC	CHRGEM	. NEXT CHAR
2491	011040	001006				INC	STPCNT	. INCREMENT GROUP COUNT
2492	011042	012737	177757	001056		BNE	RT3B	. BRANCH IF NOT DONE GROUP
2493	011050	162737	000021	001040		MOV	#-17, STPCNT	. RESET GROUP COUNT
2494	011056	005337	001044		RT3B	SUB	#17, CHRGEM	. GET FIRST GROUP CHAR
						DEC	CYCCNT	. DECREMENT CHAR COUNT

2495	011062	001346			BNE	RT3		.CONTINUE
2496	011064	012777	000012	167710	MOV	#12, @LPB		.SEND LF
2497	011072	105777	167702		TSTB	@LPS		.TEST READY
2498	011076	100375			BPL	-4		.WAIT FOR READY
2499	011100	005237	001042		INC	LINCNT		.INCREMENT LINE COUNT
2500	011104	022737	000205	001042	CMP	#133, LINCNT		.DONE?
2501	011112	003265			BGT	RT1		.BRANCH IF NOT DONE
2502	011114	032777	010000	167662	BIT	#BIT12, @SWR		.LOOP ON TEST?
2503	011122	001256			BNE	RTTR		.LOOP
2504								
2505								
2506								
2507								
2508	011124							
2509	011124	022737	000176	001004	CMP	#176, SWP		.S/W SWR ?
2510	011132	001002			BNE	15		.NO- CONTINUE
2511	011134	004737	011762		JSR	PC, ENABL		.ENABLE KEYBOARD INTERRUPT
2512	011140							
2513	011140	004437	011472		JSR	%4, TYPINT		
2514	011144	013737	014606	014050	MOV	TNO14, MES15		.SET TEST NUMBER FOR MESSAGE
2515	011152	004437	011406		JSR	%4, PRNNT		.PRINT TEST NUMBER
2516		000015				M=M+1		
2517	011156	012737	177701	001042	MOV	#-63, LINCNT		.SET UP FOR 63 LINES
2518	011164	012737	177574	001036	MOV	#-132, CHRCNT		.SET CHAR COUNT
2519	011172	005777	167602		TST	@LPS		.CHECK FOR ERROR
2520	011176	100006			BPL	XHAM1		.BRANCH IF NO ERROR
2521	011200	012737	000052	001052	MOV	#52, ERCOUNT		.SET UP ERROR COUNT 52
2522		000053				N=N+1		
2523	011206	004537	011722		JSR	%5, STAEF		.REPORT ERROR OCCURRED
2524	011212	000000			HALT			.HALT ON ERROR
2525	011214							
2526	011214	105777	167560					
2527	011220	100375			TSTB	@LPS		.TEST READY
2528	011222	100375			BPL	-4		.WAIT FOR READY
2529	011224	012777	000105	167550	BPL	-4		.WAIT FOR READY
2530	011232	005237	001036		MOV	#105, @LPB		.TRANSMIT E TO PRINTER
2531	011236	001355			INC	CHRCNT		.+1 CHAR COUNT
2532	011240	012777	000012	167534	BNE	HAM2		.TRANSMIT ANOTHER CHAR
2533	011246	105777	167526		MOV	#12, @LPB		.TRANSMIT LINE FEED
2534	011252	100375			TSTB	@LPS		.TEST READY
2535	011254	005237	001042		BPL	-4		.WAIT FOR READY
2536	011260	001341			INC	LINCNT		.+1 TO COUNT
2537	011262	032777	010000	167514	BNE	HAM1X		.GO DO NEXT LINE
2538	011270	001315			BIT	#BIT12, @SWR		.CHECK TO LOOP ON TEST
2539					BNE	HAMALN		.LOOP ON TEST
2540	011272	032777	040000	167524				
2541	011300	001402			BIT	#BIT14, @SWP		.DAVBU AVAILABLE?
2542	011302	000137	014616		BEQ	HAMX		.NO, RECYCLE PRINTING TESTS
2543	011306				JMP	DAVBU		.YES, DO DAVBU PRINTING TESTS
2544	011306	013700	000042					
2545	011312	001405			MOV	@#42, RC		
2546	011314	000005			BEQ	DOAGN		
2547	011316				RESET			
2548	011316	004710						
2549	011320	000240			JSR	PC (RC)		
2550	011322	000240			NOP			
					NOP			

```

2551 011324 000240          NOP
2552 011326          DOAGN
2553 011326 000137 004562      JMP      TEST2      ,RESTART
2554
2555          ,MISC ROUTINES
2556
2557
2558
2559
2560
2561          ,ROUTINE TO INITIALIZE PRINTER
2562          ,ENTER FROM ISR %5, PRTINT
2563
2564 011332 005777 167442      PRTINT  TST      @LPS          ,TEST FOR ERROR
2565 011336 100403          BMI      PRTINO          ,BRANCH IF ERROR
2566 011340 105777 167434      TSTB   @LPS          ,TEST FOR READY
2567 011344 100403          BMI      RDYOK          ,READY SET OK
2568 011346 062705 000002      PRTINO  ADD      #2,%5          ,SET UP FOR ERROR REPORT
2569 011352 000205          RTS      %5          ,REPORT READY NOT SET
2570 011354 012777 000014 167420  RDYOK  MOV      #14,@LPB          ,ISSUE FORM FEED
2571 011362 105777 167412      TSTB   @LPS          ,TEST FOR READY NOT SET
2572 011366 100003          BPL     NTRDY          ,READY NOT SET OK
2573 011370 062705 000002      ADD     #2,%5          ,SET UP FOR REPORT
2574 011374 000205          RTS     %5          ,EXIT AND REPORT
2575 011376          NTRDY
2576 011376 105777 167376      TSTB   @LPS          ,TEST READY
2577 011402 100375          BPL     -4          ,WAIT FOR READY
2578 011404 000205          PTS     %5          ,READY SET EXIT
2579
2580
2581
2582          ,ROUTINE TO OUTPUT ASC I MESSAGES ON THE LINE PRINTER
2583
2584 011406 012737 014032 011470  PRNNT  MOV      #MES14,PPTMSG          ,PRINT TEST NUMBER
2585 011414 012740 000340          MOV     #340,-(SP)          ,LOCK OUT KEYBOARD INTERRUPTS
2586 011420 010746          MOV     PC,-(SP)          ,MOVE PRESENT LOCATION TO STACK
2587 011422 062716 000006          ADD     #6,(SP)          ,SET UP FOR NEXT INSTRUCTION
2588 011426 000002          RTI          ,LOAD PSW
2589 011430 005777 167344      TST     @LPS          ,TEST FOR ERROR
2590 011434 100006          BPL     RINT          ,BRANCH IF OK
2591 011436 012737 000053 001052  EPP53  MOV     #53      ERPCOUNT          ,SET UP ERPCOUNT 53
2592 000054          N=N+1
2593 011444 004537 011722      JSR     %5,STAER          ,REPORT ERROR SET
2594 011450 000000          HALT          ,HALT ON ERRCP
2595 011452 013737 001000 001016  RINT  MOV     LPS,TPS          ,SET VECTORS -
2596 011460 013737 001002 001012  MOV     LPB,TPB          ,TO PRINT ON LINE PRINTER
2597 011466 104000          EMT     +0          ,PRINT
2598 011470 014032          PRTMSG MES14          ,MESSAGE
2599 011472 012737 177564 001016  TYPINT MOV     #177564,TPS          ,RESET VECTORS
2600 011500 012737 177566 001012  MOV     #177566,TPB          ,FOR TTY
2601 011506 012746 000000          MOV     #0,-(SP)          ,ALLOW KEYBOARD INTERRUPTS
2602 011512 010746          MOV     PC,-(SP)          ,MOVE PRESENT LOCATION TO STACK
2603 011514 062716 000006          ADD     #6,(SP)          ,SET UP FOR NEXT INSTRUCTION
2604 011520 000002          RTI          ,LOAD PSW
2605 011522 000204          PTS     %4          ,PETJPN
2606
    
```

```

2607
2608
2609 011524 011600
2610 011526 062716 000002
2611 011532 011000
2612 011534 112037 011636
2613 011540 001001
2614 011542 000002
2615 011544 122737 000045 011636
2616 011552 001416
2617 011554 122737 000043 011636
2618 011562 001417
2619 011564 004737 011572
2620 011570 000761
2621 011572 113777 011636 167212
2622 011600 105777 167212
2623 011604 100375
2624 011606 000207
2625 011610 112737 000012 011636
2626 011616 004737 011572
2627 011622 112737 000015 011636
2628 011630 004737 011572
2629 011634 000737
2630 011636 000000
2631
2632
2633
2634
2635
2636
2637
2638
2639
2640
2641 011640 013537 011720
2642 011644 011501
2643 011646 012502
2644 011650 060201
2645 011652 013703 011720
2646 011656 042703 177770
2647 011662 062703 000060
2648 011666 110341
2649 011670 000241
2650 011672 006037 011720
2651 011676 000241
2652 011700 006037 011720
2653 011704 000241
2654 011706 006037 011720
2655 011712 005302
2656 011714 001356
2657 011716 000205
2658
2659 011720 000000
2660
2661
2662
    
```

```

SUBROUTINE TO OUTPUT ASCII MESSAGES ON TELETYPE PRINTER
TYP      MOV      @%6,%0      .GET ADDR THAT CONTAINS MESS
          ADD      #2,@%6      .SET UP EXIT
          MOV      @%0,%0      .ADDRESS OF MESSAGE IN RO
TYFA     MOVVB    (0)+,TYPDAT .GET CHARACTER
          BNE     TYPC        .BRANCH IF NOT DONE
          RTI     .EXIT
TYPC     CMPB     #45,TYPDAT   .CHECK FOR "%"
          BEQ     TYPF        .BRANCH IF "%"
          CMPB    #43,TYPDAT   .CHECK FOR "#"
          BEQ     TYPG        .BRANCH IF "#"
          JSR     %7,TYPD      .TYPE CHARACTER IN TYPDAT
          BR     TYPA        .NEXT CHAR IN MESSAGE
TYPD     MOVVB    TYPDAT,@TPB .OUTPUT CHARACTER TO PRINTER
          TSTB    @TPS
          BPL     -4
          RTS     %7
TYPF     MOVVB    #12,TYPDAT   .CHAR TYPED EXIT
          JSR     %7,TYPD      .OUTPUT LF
TYPG     MOVVB    #15,TYPDAT   .GO TYPE CHAR
          JSR     %7,TYPD      .OUTPUT CR
          BR     TYPA        .GO TYPE CHAR
TYPDAT   0
    
```

ROUTINE TO CONVERT OCTAL TO ASCII

```

ENTER ROUTINE AS FOLLOWS
JSR      %5,CONV
.XXXXXX=ADDRESS OF NUMBER TO BE CONVERTED
XXXXXX=ADDRESS OF ASCII MESSAGE
XXXXXX=NUMBER OF OCTAL NO 'S TO BE CONVERTED
    
```

```

CONV     MOV      @(%5)+,ACNVX .ADDRESS OF NO TO BE CONVERTED
          MOV      (%5)+,%1    .ADDRESS OF MESSAGE
          MOV      (%5)+,%2    .NUMBER OF ASCII CHARACTERS
          ADD      %2,%1      .FIRST CHAR ADDRESS
ACVN     MOV      ACNVX,%3      .STORE NUMBER
          BIC     #177770,%3   .ISOLATE LEAST SIGNIFICANT BIT
          ADD     #60,%3      .SET UP ASCII CHARACTER
          MOVVB   %3,%1        .STORE CHARACTER
          CLC     .GET NEXT SIGNIFICANT BIT
          ROR     ACNVX
          CLC     .
          ROR     ACNVX
          CLC     .
          ROR     ACNVX
          DEC     %2          .-1 FROM ASCII CHAR CNT
          BNE     ACVN        .CONVERT NEXT CHARACTER
          RTS     %5          .EXIT: CONVERSION DONE
ALNVX    0
WORK REGISTER
    
```

ROUTINE TO REPORT ERROR COUNT

```

2663 011722 032777 001000 167054 STAER BIT #BIT9, @SWR .INHIBIT ERROR REPORTS ?
2664 011730 001007 BNE STAER1 .YES
2665 011732 004537 011640 JSR %5, CONV .CONVERT OCTAL TO ASCII
2666 011736 001052 ERCOUNT
2667 011740 012401 HED1
2668 011742 000003 3
2669 011744 104000 EMT +0 .TYPE ERROR MESSAGE
2670 011746 012400 HED0
2671 011750 005777 167030 STAER1 TST @SWR .TEST FOR HALT ON ERROR
2672 011754 100401 BMI +4 .BRANCH IF NO HALT WANTED
2673 011756 000000 HALT .HALT ON ERROR
2674 011760 000205 RTS %5 .RETURN

ROUTINE TO ENABLE THE KEYBOARD INTERRUPT
AND LOWER THE PROCESSOR PRIORITY SO INTERRUPTS
CAN BE SERVICED

2681
2682 011762 005046 ENABL CLR (SP) .NEW PSW
2683 011764 012746 011772 MOV #15, -(SP) .NEW PC
2684 011770 000002 RTI .LOAD NEW PSW
2685 011772 052777 000100 167722 15 BIS #100, @TFS .ENABLE KEYBOARD INTERRUPT
2686 012000 000207 ENABL PTS PC .RETURN TO MAINLINE PROGRAM
2687
2688
2689
2690
2691
2692
2693
2694
2695
2696 012002 010046 TR NT MOV #0, -(SP) .SAVE REGISTER
2697 012004 010146 MOV #1, -(SP)
2698 012006 010246 MOV #2, -(SP)
2699 012010 010346 MOV #3, -(SP)
2700 012012 010446 MOV #4, -(SP)
2701 012014 010546 MOV #5, -(SP)
2702 012016 005737 001072 TST SET .INITIAL SWP ENTRY ?
2703 012022 001130 BNE TYP SWR .YES-PRINT HEADER
2704 012024 005737 001070 TST SIGNAL .PREVIOUS CONTROL-G NPJT ?
2705 012030 001477 BEQ CNTRLG .YES-CONTINUE
2706 012032 017737 166756 001074 MOV @TK8, CHAR .GET INPUT CHARACTER
2707 012040 042737 177600 001074 BIC #177600, CHAR .STRIP OFF PARITY BIT
2708 012046 022737 000015 001074 CMP #15, CHAR .CARRIAGE RETURN ?
2709 012054 001456 BEQ DGT5 .YES-CONTINUE
2710 012056 022737 000025 001074 CMP #25, CHAR .CONTROL-U INPUT ?
2711 012064 001530 BEQ TK4 .YES-CONTINUE
2712 012066 023727 001074 000060 CMP CHAR, #60 .LEGAL CHECK LESS THAN 60 ?
2713 012074 100001 BPL TK1 .NO-CONTINUE
2714 012076 000466 BR WT3 .YES-PRINT "?"
2715 012100 022737 000067 001074 T#1 CMP #67, CHAR .LEGAL CHECK GREATER THAN 67 ?
2716 012106 100001 BPL TK2 .NO-CONTINUE
2717 012110 000461 BR WT3 .YES PRINT "?"
2718 012112 005237 001066 T#2 INC DIGITS .NEXT DIGIT OF SWP NEXT
  
```


2719	012116	022737	000006	001066		CMP	#6, DIGITS	. MORE THAN SIX DIGITS ?
2720	012124	100453				BMI	WT3	. YES-PRINT "?"
2721	012126	105777	166664		WT2	TSTB	@TPS	. TTY PRINTER READY ?
2722	012132	100375				BPL	WT2	. NO-WAIT
2723	012134	013777	001074	166650		MOV	CHAR, @TPB	. PRINT CHARACTER
2724	012142	162737	000060	001074		SUB	#60, CHAR	. CONVERT TO OCTAL
2725	012150	022737	000001	001066		CMP	#1, DIGITS	. FIRST DIGIT ?
2726	012156	001411				BEQ	TK5	. YES-CONTINUE
2727	012160	000241				CLC		. ROTATE LEFT THREE
2728	012162	006137	001076			ROL	OCT	. TIMES
2729	012166	000241				CLC		. THIS WILL SHIFT
2730	012170	006137	001076			ROL	OCT	. SWR VALUE ONE
2731	012174	000241				CLC		. PLACE LEFT
2732	012176	006137	001076			ROL	OCT	. OCTAL
2733	012202	063737	001074	001076	TK5	ADD	CHAR, OCT	. NEW VALUE OF SWR
2734	012210	000464				BR	TK6	. RETURN FROM INTERRUPT
2735	012212	005737	001066		DGTS	TST	DIGITS	. SWR VALUE CHANGED ?
2736	012216	001451				BEQ	TK3	. NO-RETURN, NO CHANGE TO SWR
2737	012220	013777	001076	166556		MOV	OCT, @SWR	. YES-ENTER NEW SWR VALUE
2738	012226	000445				BR	TK3	. RETURN FROM INTERRUPT
2739	012230	017737	166560	001074	CNTPLG	MOV	@TKB, CHAR	. GET CHARACTER
2740	012236	042737	177600	001074		BIC	#177600, CHAR	. STRIP OFF PARITY BIT
2741	012244	022737	000007	001074		CMP	#7, CHAR	. CONTROL-G INPUT ?
2742	012252	001414				BEQ	T, PSW	. YES-PRINT HEADER
2743	012254	105777	166576		WT3	TSTB	@TPS	. TTY PRINTER READY ?
2744	012260	100375				BPL	WT3	. NO-WAIT
2745	012262	013777	001074	166522		MOV	CHAR, @TPB	. PRINT CHARACTER
2746	012270	104000				EMT	+0	. PRINT "?"
2747	012272	014506				MES22		
2748	012274	005737	001074			TST	SIGNAL	. BAD VALUE ?
2749	012300	001001				BNE	T, PSW	. YES-PRINT HEADER
2750	012302	000427				BR	TK6	. RETURN FROM INTERRUPT
2751	012304	012737	000001	001070	T, PSW	MOV	#1, SIGNAL	. SET FLAG CONTROL-G ENTERED
2752	012312	104000				EMT	+0	. PRINT HEADER
2753	012314	014512				MES23		
2754	012316	004537	011640			JSF	15, CON	. CONVERT SWR VALUE TO ASCII
2755	012322	000176				176		
2756	012324	014542				MES25		
2757	012326	000006				6		
2758	012330	104000				EMT	+0	. PRINT SWR VALUE
2759	012332	014542				MES25		
2760	012334	104000				EMT	+0	. PRINT HEADER
2761	012336	014523				MES24		
2762	012340	000404				BR	TK7	. RETURN FROM INTERRUPT
2763	012342	005037	001070		TK3	CLR	SIGNAL	. CLEAR CONTROL-G FLAG
2764	012346	104000			TK4	EMT	+0	. PRINT LINE FEED AND CARRIAGE RETURN
2765	012350	014504				MES21		
2766	012352	005037	001066		TK	CLR	DIGITS	. CLEAR DIGIT COUNT
2767	012356	005037	001076			CLR	OCT	. CLEAR SWR INPUT
2768	012362	012605			TK6	MOV	(SP)+, 25	. RESTORE REGISTERS
2769	012364	012604				MOV	(SP)+, 24	
2770	012366	012603				MOV	(SP)+, 23	
2771	012370	012602				MOV	(SP)+, 22	
2772	012372	012601				MOV	(SP)+, 21	
2773	012374	012600				MOV	(SP)+, 20	
2774	012376	000002				RT		. RETURN FROM INTERRUPT

012400	045			MES0	ASCII	/%/	
012401	040	020040	042440	MES1	ASCII	/ ERROR COUNT%/	
012422	051105	047522	020122	MESA	ASCII	/ERROR SET OK - CLEAR & TURN ON LINE%/	
012467	105	051122	051117	MESB	ASCII	/ERROR SET OK - CLEAR AND TRY NEXT CHANNEL%/	
012542	050045	044522	052116	MESC	ASCII	/%PRINT SPEED CHECK USING MANUAL TIMING%/	
012611	045	052520	020124		ASCII	/%PUT SWITCH 0 UP TO START TIMING%/	
012652	050045	052125	051440		ASCII	/%PUT SWITCH 0 DOWN AT END OF 1 MINUTE%/	
012721	045	052123	051101	MESDD	ASCII	/%STARTING DAUFU PRINTING TESTS%/	
012761	045	050114	032460	MES1	ASCII	/%LP05-LP11-LP14 LINE PRINTER TEST%/	
013024	042522	052123	051101	MES2	ASCII	/RESTART ADDRESS 600%/	
013051	045	047520	042527	MES3	ASCII	/%POWER ON - TURN ON LINE%/	
013103	117	020116	044514	MES4	ASCII	/ON LINE OK - TRY TORN PAPER SWITCH%/	
013147	122	040505	054504	MES5	ASCII	/READY SET OK - TRY DRUM GATE SWITCH%/	
013214	051105	047522	020122	MES6	ASCII	/ERROR SET OK - TURN ON LINE%/	
	013252			EVEN			
013252	042522			MES7A	ASCII	/RE/	
013254	042523	020124	047524	MES7	ASCII	/SET TOP OF FORM SWITCH TO /	
013310	020040	020040	044440	MES8	ASCII	/ INCHES%/	
	013326			EVEN			
013326	026455	026455	026455	MES9	ASCII	/----- THIS LINE SHOULD BE /	
013423	040	020040	020040	MES10	ASCII	/ INCHES FROM THE LAST LINE -----	
013534	005012			MES11A	ASCII	/ 12 << 12 >	
013536	050045	044522	052116	MES11	ASCII	/%PRINT SPEED IS APPROXIMATELY	
013575	040	020040	020040	MES12	ASCII	/ LINES PER MINUTE%/	
013624	026455	026455	026455	MES13	ASCII	/-----	
013706	026455	026455	026455		ASCII	/-----	
013770	026455	026455	026455		ASCII	/-----	
				EVEN			
014032	005012	042524	052123	MES14	ASCII	/ 12 12 <TEST NUMBER	
014050	020040	005012	000012	MES15	ASCII	/ 12 << 12 > 12 >	
				EVEN			
014056	044124	051511	046040	MES16	ASCII	/THIS LINE SHOULD BE PRINTED#.	
014113	040	020040	020040	MES17	ASCII	/ ALL ON ONE LINE --- F SLEWED 0 LINES%/	
				EVEN			
014216	026455	026455	026455	MES18	ASCII	/-----	
014310	020040	020040	020040	MES19	ASCII	/ BLANK LINES BEFORE THIS LINE -----	
				EVEN			
014424	052040	051505	044524	MES20	ASCII	/ TESTING CHANNEL SLEWING USING CHANNEL NO	
014500	020040	000		MES20A	ASCII		
	014504			EVEN			
014504	000045			MES21	ASCII		
014506	037440	000045		MES22	ASCII		
014512	051445	051127	036440	MES23	ASCII	/SWR =	
014523	040	020040	042516	MES24	ASCII	/ NEW SWR =	
014542	020040	020040	020040	MES25	ASCII		
	014552			EVEN			
014552	030504			TNDAV1	ASCII	/01 TEST NUMBERS FOR DAUFU TESTS	
014554	031104			TNDAV2	ASCII	/02	
014556	031504			TNDAV3	ASCII	/03	
014560	020061			TND1	ASCII	/1	
014562	020062			TND2	ASCII	/2	
014564	020063			TND3	ASCII	/3	
014566	020064			TND4	ASCII	/4	

.DAVFU PRINTING TESTS IF DAVFU IS AVAILABLE -- SET SWITCH 14

.TESTS D1 AND D2
.CHECK DAVFU LINE COUNT SLEWING

2783										
2784	014616					DAVFU				
2785	014616	022737	000176	001004		CMP	#176, SWR		.S/W SWR ?	
2786	014624	001002				BNE	15		.NO- CONTINUE	
2787	014626	004737	011762			ISR	PC ENABL		.ENABLE KEYBOARD INTERRUPT	
2788	014632					15				
2789	014632	004437	011472			JSP	%4, TYPINT		.INITIALIZE	
2790	014636	013737	016676	014012		MOV	SPSP, MES19+2			
2791	014644	104000				EMT	+0		.TYPE MESSAGE	
2792	014646	012721				MES00			.STARTING DAVFU TESTS	
2793	014650	012737	000220	015244		MOV	#220, DAV11		.SET DAVFU INSTRUCTIONS	
2794	014656	012737	000221	015346		MOV	#221, DAV12			
2795	014664	013737	014552	014050		MOV	TNDV1, MES15		SET TEST NUMBER FOR MESSAGE	
2796	014672	004437	011406			JSR	%4, PRNNT		PRINT TEST NUMBER	
2797	014676	012737	015276	001040	DAV0	MOV	#DAVTAB, CHPGEN		.SET TABLE POINTER	
2798	014704	005777	164070		DAV00	TST	@LPS		.TEST FOR ERROR	
2799	014710	100010				BPL	DAV1		.BRANCH IF NO ERROR	
2800	014712	012737	000054	001052	ERR54	MOV	#54, EPCOUNT		.SET UP ERROR COUNT 54	
2801		000055				N=N+1				
2802	014720	004537	011722			JSR	%5, STAEF		.REPORT ERROR SET	
2803	014724	000000				HALT			HALT ON ERROR	
2804	014726	000137	014676			JMP	DAV0		.RESTART TEST	
2805	014732	017777	164102	16404	DAV1	MOV	@CHRGEN @LPB		LOAD DAVFU	
2806	014740	062737	000002	001040		ADD	#2, CHPGEN		.INCREMENT TABLE POINTER	
2807	014746	005777	164066			TST	@CHRGEN		.TEST IF DONE LOAD	
2808	014752	001405				BEQ	D5		.CONTINUE IF DONE	
2809	014754	105777	164020			TSTB	@LPS		.TEST READY	
2810	014760	100375				BPL	4		WAIT FOR READY	
2811	014762	000137	014704			JMP	DAV00			
2812	014766	012737	000002	001044	D5	MOV	#2, CYLCNT		.SET CYCLE COUNT	
2813	014774	012737	014056	011470	D0	MOV	#MES16, PRMSG		.SET MESSAGE ADDRESS	
2814	015002	004437	011452			JSP	%4, RINT		.PRINT MESSAGE	
2815	015006	005777	163766			TST	@LPS		.TEST FOR ERROR	
2816	015012	100006				BPL	D1		.CONTINUE IF NO ERROR	
2817	015014	012737	000055	001052	ERR55	MOV	#55, EPCOUNT		.SET UP ERROR COUNT 55	
2818		000056				N=N+1				
2819	015022	004537	011722			ISR	%5, STAEF		REPORT ERROR SET	

2820	015026	000000				HALT			, HALT ON ERROR
2821	015030	013777	015344	163744	01	MOV	DAV11, @LPB		, SEND DAVFU INSTRUCTION, SKIP 0 LINES
2822	015036	105777	163736			TSTB	@LPS		, TEST READY
2823	015042	100375				BPL	-4		, WAIT FOR READY
2824	015044	012737	014113	011470		MOV	#MES17, PRTMSG		, SET PRINTER MESSAGE ADDRESS
2825	015052	004437	011452			JSR	%4, RINT		, PRINT MESSAGE
2826	015056	012737	014216	011470		MOV	#MES18, PRTMSG		, SET MESSAGE ADDRESS
2827	015064	013737	015346	001040		MOV	DAV12, CHRCNT		, FIRST DAVFU INSTRUCTION
2828	015072	012737	014560	001054		MOV	#TNO1, STRCHR		, SET TABLE POINTER
2829	015100	012737	000017	001036		MOV	#15, CHRCNT		, SET TABLE COUNT
2830	015106	005777	163666		D2	TST	@LPS		, TEST FOR ERROR
2831	015112	100006				BPL	D3		, CONTINUE IF NO ERRORS
2832	015114	012737	000056	001052	ERR56	MOV	#56, ERCOUNT		, SET UP ERROR COUNT 56
2833		000057				N=N+1			
2834	015122	004437	011722			JSR	%4, STAER		, REPORT ERROR SET
2835	015126	000000				HALT			, HALT ON ERROR
2836	015130	013777	001040	163644	D3	MOV	CHRCNT, @LPB		, SEND DAVFU INSTR
2837	015136	105777	163636			TSTB	@LPS		, TEST READY
2838	015142	100375				BPL	-4		, WAIT FOR READY
2839	015144	017737	163704	014310		MOV	@STRCHR, MES19		, SET PRINTER MESSAGE
2840	015152	004437	011452			JSR	%4, RINT		, PRINT MESSAGE
2841	015156	005337	001036			DEC	CHRCNT		, DEC TABLE COUNT
2842	015162	001407				BEQ	D4		, EXIT TEST IF DONE
2843	015164	005237	001040			INC	CHRCNT		, NEXT DAVFU INSTR
2844	015170	062737	000002	001054		ADD	#2, STRCHR		, INC TABLE POINTER
2845	015176	000137	015106			JMP	D2		, CONTINUE
2846	015202	005337	001044		D4	DEC	CYCCNT		, DEC CYCLE COUNT
2847	015206	001415				BEQ	DEXO		, EXIT IF DONE
2848	015210	062737	000140	015344		ADD	#140, DAV11		, CHANGE DAVFU INSTR
2849	015216	062737	000140	015346		ADD	#140, DAV12		, CHANGE DAVFU INSTR
2850	015224	013737	014554	014050		MOV	TNDV2, MES15		, SET TEST NUMBER FOR MESSAGE
2851	015232	004437	011406			JSR	%4, PRNT		, PRINT TEST NUMBER
2852	015236	000137	014774			JMP	D0		, RETEST LINE COUNT SLEWING
2853	015242	012737	000220	015344	DEXO	MOV	#220, DAV11		, RESET DAVFU INSTR
2854	015250	012737	000221	015346		MOV	#221, DAV12		, RESET DAVFU INSTR
2855	015256	032777	010000	163520		BIT	#BIT12, @SWP		, LOOP ON TEST?
2856	015264	001002				BNE	15		, LOOP
2857	015266	000137	015350			JMP	DAV2		, NEXT TEST
2858	015272	000137	014616		15	JMP	DAV11		, LOOP
2859									
2860									
2861	015276	000356			DAV11	356			, DAVFU LOAD TABLE
2862	015300	000001				1			
2863	015302	000002				2			
2864	015304	000003				3			
2865	015306	000004				4			
2866	015310	000005				5			
2867	015312	000006				6			
2868	015314	000007				7			
2869	015316	000010				10			
2870	015320	000011				11			
2871	015322	000012				12			
2872	015324	000013				13			
2873	015326	000014				14			
2874	015330	000015				15			
2875	015332	000016				16			

2988
 2989
 2990
 2991 016146 000356
 2992 016150 000077
 2993 016152 000000
 2994 016154 000001
 2995 016156 000002
 2996 016160 000005
 2997 016162 000000
 2998 016164 000003
 2999 016166 000010
 3000 016170 000005
 3001 016172 000002
 3002 016174 000001
 3003 016176 000000
 3004 016200 000007
 3005 016202 000000
 3006 016204 000011
 3007 016206 000002
 3008 016210 000005
 3009 016212 000000
 3010 016214 000003
 3011 016216 000000
 3012 016220 000005
 3013 016222 000012
 3014 016224 000001
 3015 016226 000000
 3016 016230 000007
 3017 016232 000020
 3018 016234 000001
 3019 016236 000002
 3020 016240 000015
 3021 016242 000000
 3022 016244 000003
 3023 016246 000000
 3024 016250 000005
 3025 016252 000002
 3026 016254 000001
 3027 016256 000010
 3028 016260 000007
 3029 016262 000000
 3030 016264 000001
 3031 016266 000002
 3032 016270 000005
 3033 016272 000000
 3034 016274 000013
 3035 016276 000000
 3036 016300 000005
 3037 016302 000002
 3038 016304 000001
 3039 016306 000000
 3040 016310 000007
 3041 016312 000010
 3042 016314 000021
 3043 016316 000002

. DATA TABLE FOR DAVFU LOAD

DTAB	356	. START LOAD
	77	. HEADER MESSAGES
	0	
	1	
	2	
	5	
	0	
	3	
	4	
	10	
	5	
	2	
	1	
	0	
	7	
	0	
	11	
	0	
	5	
	0	
	5	
	0	
	12	
	1	
	7	
	1	
	20	
	1	
	15	
	0	
	4	
	0	
	5	
	0	
	11	
	1	
	10	
	0	
	7	
	0	
	1	
	2	
	5	
	0	
	10	
	1	
	10	
	11	

3044	016320	000005
3045	016322	000000
3046	016324	000003
3047	016326	000000
3048	016330	000015
3049	016332	000002
3050	016334	000001
3051	016336	000000
3052	016340	000007
3053	016342	000000
3054	016344	000001
3055	016346	000012
3056	016350	000005
3057	016352	000000
3058	016354	000003
3059	016356	000000
3060	016360	000005
3061	016362	000002
3062	016364	000011
3063	016366	000000
3064	016370	000007
3065	016372	000000
3066	016374	000001
3067	016376	000022
3068	016400	000005
3069	016402	000010
3070	016404	000003
3071	016406	000000
3072	016410	000005
3073	016412	000002
3074	016414	000001
3075	016416	000000
3076	016420	000017
3077	016422	000000
3078	016424	000001
3079	016426	000002
3080	016430	000005
3081	016432	000000
3082	016434	000003
3083	016436	000010
3084	016440	000005
3085	016442	000002
3086	016444	000001
3087	016446	000000
3088	016450	000007
3089	016452	000000
3090	016454	000011
3091	016456	000002
3092	016460	000025
3093	016462	000000
3094	016464	000003
3095	016466	000000
3096	016470	000005
3097	016472	000012
3098	016474	000001
3099	016476	000000

016320-016476

3100	016500	000007	7
3101	016502	000000	0
3102	016504	000001	1
3103	016506	000002	2
3104	016510	000015	15
3105	016512	000000	0
3106	016514	000003	3
3107	016516	000000	0
3108	016520	000005	5
3109	016522	000002	2
3110	016524	000001	1
3111	016526	000010	10
3112	016530	000007	7
3113	016532	000000	0
3114	016534	000001	1
3115	016536	000002	2
3116	016540	000005	5
3117	016542	000020	20
3118	016544	000013	13
3119	016546	000000	0
3120	016550	000005	5
3121	016552	000002	2
3122	016554	000001	1
3123	016556	000000	0
3124	016560	000007	7
3125	016562	000010	10
3126	016564	000001	1
3127	016566	000002	2
3128	016570	000005	5
3129	016572	000000	0
3130	016574	000003	3
3131	016576	000000	0
3132	016600	000001	1
3133	016602	000000	0
3134	016604	000357	357
3135	016606	077777	77777

STOP LOAD
STOP

INSTRUCTION COUNT TABLE - FOR DAVFU CHANNEL SLEW INSTRUCTIONS

ICTAB	105
	56
	42
	23
	5
	1
	0

END OF TABLE

INSTRUCTION TABLE - DAVFU CHANNEL SLEW INSTRUCTIONS

3149	016626	000200	ITAB	200	CHANNEL 1
3150	016630	000201		201	CHANNEL 2
3151	016632	000202		202	CHANNEL 3
3152	016634	000203		203	CHANNEL 4
3153	016636	000204		204	CHANNEL 5
3154	016640	000205		205	CHANNEL 6
3155	016642	000206		206	CHANNEL 7

0150	016644	000207	207	. CHANNEL 8
0151	016646	000210	210	. CHANNEL 9
0152	016650	000211	211	. CHANNEL 10
0153	016652	000212	212	. CHANNEL 11
0154	016654	000213	213	. CHANNEL 12
0155	016656	000000	0	. END OF TABLE

01655 016660 030440
01656 016662 031040
01657 016664 031440
01658 016666 033040
01659 016670 032062
01670 016672 032061
01671 016674 020063
01672 016676 020040

MESSAGE TABLE FOR BLANK LINE COUNTS IN MESSAGE

MTAB ASCII / 1/
ASCII / 2/
ASCII / 3/
ASCII / 6/
ASCII /24/
ASCII /14/
FS ASCII /3 /
SPSP ASCII / /

SCOPE LOOP ROUTINE

SET CHARACTER IN SWITCH REGISTER -0

3178	016700				SCOPE			
3179	016700	022737	000176	001004		CMP	#176, SWR	
3180	016706	001002				BNE	15	.S/W SWR ?
3181	016710	004737	011762			JSP	PC, ENABL	:NO- CONTINUE
3182	016714				15			.ENABLE KEYBOARD INTERRUPT

0111	006714	004437	011472		JSR	%4, TYP INT	
0114	006720	017737	162060	001050	MOV	@SWR, SAVE	.FETCH SWITCHES

016726	012737	177574	001036	MOV	#-132	.CHRCNT	.SET CHAR COUNT
016734	042737	177400	001050	B.C	#177400	.SAVE	.MASK CHARACTER
016742	105777	162032		TSTB	@LPS		.TEST READY
016746	100775			BPL	-4		.WAIT FOR READY
016750	005777	162024		TST	@LPS		.TEST FOR ERROR

LDLPY

100006	100006			BPL	LPSCOPE	.BRANCH IF NO EPROR
012737	012737	000062	001052	MOV	#62, ERCOUNT	.SET UP ERROR COUNT 62
000063	000063			N=N+1		
004537	004537	011722		JSE	%5, STAER	.REPORT ERROR SET
000000	000000			HALT		.HALT ON ERROR
001050	001050	162002	LPSCOPE	MOV	SAVE @LPB	.LOAD PRINTER BUFFER

3198	017000	032777	004000	161776		BIT	#BIT11,@SWF	.SEND ONLY ONE CHAR?
3199	017006	001402				REQ	LSCO	.NO. BRANCH
3200	017010	000000				HALT		.HALT - WAIT FOR OPERATOR
3201	017012	000732				BR	SCOPE	.NEXT CHAR
3202	017014	000177	000024		LSCO	JMP	@LOSCOP	.SEND LF?
3203	017020	005237	001036		LSCA	INC	CHRCNT	.INCREMENT CHAR COUNT
3204	017024	001346				BNE	LDLPX	.CONTINUE IF NOT DONE LINE
3205	017026	012777	000012	161746		MOV	#12,@LPB	.SEND LF
3206	017034	105777	161740			TSTB	@LPS	.TEST READY
3207	017040	100375				BPL	-4	.WAIT FOR READY
3208	017042	000716				BF	SCOPE	.CONTINUE
3209								
3210								
3211	017044	017020			LOSCOF	LSCA		
3212								
3213								
3214								
3215								
3216								
3217								
3218								
3219								
3220								
3221								
3222								
3223								
3224								
3225								
3226								
3227								
3228								
3229								
3230								
3231								
3232								
3233								
3234								
3235								
3236								
3237								
3238								
3239								
3240								
3241								
3242								
3243								
3244								
3245								
3246								
3247								
3248								
3249								
3250								
3251								
3252								
3253								
3254								
3255								
3256								
3257								
3258								
3259								
3260								
3261								
3262								
3263								
3264								
3265								
3266								
3267								
3268								
3269								
3270								
3271								
3272								
3273								
3274								
3275								
3276								
3277								
3278								
3279								
3280								
3281								
3282								
3283								
3284								
3285								
3286								
3287								
3288								
3289								
3290								
3291								
3292								
3293								
3294								
3295								
3296								
3297								
3298								
3299								
3300								
3301								
3302								
3303								
3304								
3305								
3306								
3307								
3308								
3309								
3310								
3311								
3312								
3313								
3314								
3315								
3316								
3317								
3318								
3319								
3320								
3321								
3322								
3323								
3324								
3325								
3326								
3327								
3328								
3329								
3330								
3331								
3332								
3333								
3334								
3335								
3336								
3337								
3338								
3339								
3340								
3341								
3342								
3343								
3344								
3345								
3346								
3347								
3348								
3349								
3350								
3351								
3352								
3353								
3354								
3355								
3356								
3357								
3358								
3359								
3360								
3361								
3362								
3363								
3364								
3365								
3366								
3367								
3368								
3369								
3370								
3371								
3372								
3373								
3374								
3375								
3376								
3377								
3378								
3379								
3380								
3381								
3382								
3383								
3384								
3385								
3386								
3387								
3388								
3389								
3390								
3391								
3392								
3393								
3394								
3395								
3396								
3397								
3398								
3399								
3400								
3401								
3402								
3403								
3404								
3405								
3406								
3407								
3408								
3409								
3410								
3411								
3412								
3413								
3414								
3415								
3416								
3417								
3418								
3419								
3420								
3421								
3422								
3423								
3424								
3425								
3426								
3427								
3428								
3429								
3430								
3431								
3432								
3433								
3434								
3435								
3436								
3437								
3438								
3439								
3440								
3441								
3442								
3443								
3444								
3445								
3446								
3447								
3448								
3449								
3450								
3451								
3452								
3453								
3454								
3455								
3456								
3457								
3458								
3459								
3460								
3461								

EPP27	004212	1748#							
EPP3	001510	1263#							
ERP30	004322	1778#							
ERP31	004424	1796#							
ERR32	004610	1851#							
ERR33	004666	1864#							
ERP34	005110	1909#							
ERP35	005226	1931#							
EPP36	005464	1977#							
EPP37	005776	2037#							
EPP4	001532	1269#							
FPP40	006260	2092#							
EPP41	006532	2143#							
EPP42	007030	2199#							
EPP43	007322	2250#							
ERR44	007562	2297#							
EPP45	010052	2351#							
EPP46	010320	2394#							
ERR47	010542	2437#							
ERR5	001562	1279#							
ERR50	010734	2472#							
ERR51	011006	2484#							
ERR52	011200	2521#							
ERR53	011436	2591#							
ERR54	014712	2800#							
ERR55	015014	2817#							
ERR56	015114	2832#							
ERP57	015476	2907#							
ERR6	001614	1295#							
ERR60	015544	2918#							
ERR61	015722	2951#							
ERR62	016756	3192#							
ERR7	001640	1305#							
FFSET	004020	1641	1708#						
FFTAB	003742	1640	1683#						
FS	016674	2959	3171#						
FTABE	004016	1668	1705#						
HAMALN	011124	1018	2508#	2538					
HAMY	011306	2541	2543#						
HAMIX	011164	2518#	2536						
HAM2	011172	2519#	2531						
HED0	012400	2670	2777#						
HED1	012401	2667	2777#						
HSPRT	006660	1014	2174#	2227					
HS0	007000	2194#	2223	2225					
HS00	006764	2189	2192#						
HS00A	006750	2186	2190#						
HS1	007022	2197#	2210	2212	2215				
HS2	007044	2198	2203#						
HS3	007112	2208	2213#						
HS4	007130	2205	2216#						
HS6	007200	2220	2226#						
HTABP	016144	2900#	2943	2967#	2987#				
ICTAB	016610	2901	2971	3139#					
ICTABP	016140	2901#	2902	2957	2968#	2969	2971#	2973	2985#
INDAT	004074	959	1679	1725#	1738	1752			

CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0097

SECT	11018	1473	1491	1506	1628	1725	1768	1843	1894	1962	2017	2073	2128	2174	2279
	2319	2415	2508	2784	2888	3178									
SECT	10668	1229	1235	1253	1263	1269	1279	1295	1305	1316	1322	1330	1344	1350	1354
	1367	1380	1393	1418	1424	1434	1636	1659	1734	1748	1778	1796	1851	1864	1909
	1931	1977	2037	2092	2143	2199	2250	2297	2351	2394	2437	2472	2484	2521	2591
	2800	2817	2832	2907	2918	2951	3192								
SECT	10768	1855	1900	1968	2023	2079	2134	2180	2285	2325	2421	2514			
SECT	11178	1358	1370	1383	1396	1429	1444	2586	2802						
	10878	1548	1664	1743	1787	1882	1926	1951	1990	2000	2049	2104	2154	2217	2263
	2305	2361	2402	2452	2497	2525	2533	2575	2809	2822	2837	2914	2938	2947	3187
	3206														

11746 000

SECT 0

DELPH H-D DELPH LIST OF SECT TO DELPH P11
RUN-TIME 3 2 9 SECONDS
RUN-TIME PART 101 11-9 2
CORE USED 24 11 PAGES

