

LP11/LP05

LINE PRINTER TEST
MD-11-DZLPK-E

EP-DZLPK-E-DL-B
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IDENTIFICATION

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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

LPOS DATA PRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER

TELETYPE MODEL 33 OR EQUIVALENT CONSOLE UNIT

2.2 STORAGE

MEMORY LOCATIONS 0 - TO - 14600 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/LPOS 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 SURE SWITCH D IS DOWN BEFORE STARTING THE TEST.

4.2 STARTING ADDRESS OR ADDRESSES

THE INITIAL STARTING ADDRESS TO RUN THE ENTIRE LP11/LPOS 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(8). TO START AT ANY OTHER TEST USE THE START ADDRESS FROM THE FOLLOWING TABLE:

START ADDRESS	TEST
300	DAVFU ILLEGAL LOAD TEST
304	DAVFU NO STOP BIT TEST
310	DAVFU LINE COUNT SLEW TEST
314	DAVFU 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


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600      TEST 2  INTERFACE & DATA PATHS TEST
          (ALSO GENERAL PRINT TEST STARTING ADDRESS)

610      TEST 3  CHAR 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

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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 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.

NOTE: IN TEST 1 - SECTION 2 - PRINT SPEED TIMING
TEST SWITCH 0 IS NOT READILY ACCESSIBLE WITH
PROCESSORS HAVING A SOFTWARE SWR, SO THIS TEST SHOULD NOT BE
RUN IN THE MANUAL MODE.

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 175 WITH THE SOFTWARE SWITCH VALUES.

SWITCH	FUNCTION IN "UP" POSITION
15	LOOP ON ERROR (IN TEST 1 ONLY)
14	OPTIONAL DAVFU AVAILABLE
13	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
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 - 11

SWITCH 11 IN THE UP POSITION CAUSES THE CONTENTS OF THE SWITCH REGISTER TO BE SENT ONLY ONCE TO THE LINE PRINTER THEN HALT IN THE SCOPE DRIVER ROUTINE. TO SEND ANOTHER CHARACTER, RESET SWITCHES AND DEPRESS CONTINUE. WITH SWITCH 11 DOWN, THE SWITCH REGISTER IS SENT CONTINUOUSLY TO THE LINE PRINTER WITH A LINE FEED SENT AFTER EVERY 132 CHARACTERS. TO STOP SENDING CHARACTERS, PUT SWITCH 11 UP.

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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.

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.

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

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 5.1 TO CONTINUE AFTER AN ERROR DURING ANY OTHER TESTS.

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) .

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 THEREFORE THESE ITEMS SHOULD BE CHECKED FIRST IN CASE OF DIFFICULTY.

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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 TRACTORS AND THAT THE DRUM GATE IS CLOSED.

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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.

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 TO 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 DAVFU 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 DAVFU (IF AVAILABLE).

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DEPRESS CONTINUE 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.

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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 (DIS) 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.

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.

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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 FULL LINES OF THE DRUM PATTERN AND THEN SKIPPING FOUR (4) LINES AND PRINTING THAT DRUM LINE. 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:

```

?????-----?????
00000-----00000
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 USING THE DRUM PATTERN 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.

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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 REFERENCE LINE. 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.

7.3 SCOPE DRIVE ROUTINE

THE PURPOSE 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(B).

TO LEAVE OUT THE LINE FEED, START AT LOCATION 710(B). 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.

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MAINDEC-11-DZLPK-E-D
DZLPKE.P11

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.TITLE MAINDEC-11-DZLPK-E-D
:COPYRIGHT (C) 1975,1974 DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

:***** LP11/LPOS LINE PRINTER TEST *****

:AUTHOR: ROBERT BAKER

:LIST OF SWITCH SETTINGS USED IN THIS TEST

:SWITCH NO. DESCRIPTION

:	15	LOOP ON ERROR IN TEST 1 ONLY !!!
:	14	OPTIONAL DAVFU 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
:	0	USED TO TEST PRINT SPEED IN TEST 1 IF NO CLOCK IS AVAILABLE

000000
000001
000002
000003
000004
000005
000006
000007
000006
000007

R0=%0
R1=%1
R2=%2
R3=%3
R4=%4
R5=%5
R6=%6
R7=%7
SP=R6
PC=R7

100000
040000
020000
010000
004000
002000
001000
000400
000200
000100
000040
000020
000010
000004
000002
000001

BIT15	=100000
BIT14	=40000
BIT13	=20000
BIT12	=10000
BIT11	=4000
BIT10	=2000
BIT9	=1000
BIT8	=400
BIT7	=200
BIT6	=100
BIT5	=40
BIT4	=20
BIT3	=10
BIT2	=4
BIT1	=2
BIT0	=1

.ENABLE ABS
.ENABLE AMA

000000

.=0

000000 000002
000002 000000
000004 000006

.+2
HALT
.+2

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DZLPKE.F11

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859	000006	000000	HALT
860	000010	000012	.+2
861	000012	000000	HALT
862	000014	000016	.+2
863	000016	000000	HALT
864	000020	000022	.+2
865	000022	000000	HALT
866	000024	000026	.+2
867	000026	000000	HALT
868	000030	000032	.+2
869	000032	000000	HALT
870	000034	000036	.+2
871	000036	000000	HALT
872	000040	000042	.+2
873	000042	000000	HALT
874	000044	000046	.+2
875	000046	000000	HALT
876	000050	000052	.+2
877	000052	000000	HALT
878	000054	000056	.+2
879	000056	000000	HALT
880	000060	000062	.+2
881	000062	000000	HALT
882	000064	000066	.+2
883	000066	000000	HALT
884	000070	000072	.+2
885	000072	000000	HALT
886	000074	000076	.+2
887	000076	000000	HALT
888	000100	000102	.+2
889	000102	000000	HALT
890	000104	000106	.+2
891	000106	000000	HALT
892	000110	000112	.+2
893	000112	000000	HALT
894	000114	000116	.+2
895	000116	000000	HALT
896	000120	000122	.+2
897	000122	000000	HALT
898	000124	000126	.+2
899	000126	000000	HALT
900	000130	000132	.+2
901	000132	000000	HALT
902	000134	000136	.+2
903	000136	000000	HALT
904	000140	000142	.+2
905	000142	000000	HALT
906	000144	000146	.+2
907	000146	000000	HALT
908	000150	000152	.+2
909	000152	000000	HALT
910	000154	000156	.+2
911	000156	000000	HALT
912	000160	000162	.+2
913	000162	000000	HALT
914	000164	000166	.+2

H02

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915	000166	000000	HALT
916	000170	000172	.+N
917	000172	000000	HALT
918	000174	000176	.+N
919	000176	000000	HALT
920	000200	000202	.+N
921	000202	000000	HALT
922	000204	000206	.+N
923	000206	000000	HALT
924	000210	000212	.+N
925	000212	000000	HALT
926	000214	000216	.+N
927	000216	000000	HALT
928	000220	000222	.+N
929	000222	000000	HALT
930	000224	000226	.+N
931	000226	000000	HALT
932	000230	000232	.+N
933	000232	000000	HALT
934	000234	000236	.+N
935	000236	000000	HALT
936	000240	000242	.+N
937	000242	000000	HALT
938	000244	000246	.+N
939	000246	000000	HALT
940	000250	000252	.+N
941	000252	000000	HALT
942	000254	000256	.+N
943	000256	000000	HALT
944	000260	000262	.+N
945	000262	000000	HALT
946	000264	000266	.+N
947	000266	000000	HALT
948	000270	000272	.+N
949	000272	000000	HALT
950	000274	000276	.+N
951	000276	000000	HALT
952	000300	000302	.+N
953	000302	000000	HALT
954	000304	000306	.+N
955	000306	000000	HALT
956	000310	000312	.+N
957	000312	000000	HALT
958	000314	000316	.+N
959	000316	000000	HALT
960	000320	000322	.+N
961	000322	000000	HALT
962	000324	000326	.+N
963	000326	000000	HALT
964	000330	000332	.+N
965	000332	000000	HALT
966	000334	000336	.+N
967	000336	000000	HALT
968	000340	000342	.+N
969	000342	000000	HALT
970	000344	000346	.+N

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971	000346	000000	HALT	
972	000350	000352	.+2	
973	000352	000000	HALT	
974	000354	000356	.+2	
975	000356	000000	HALT	
976	000360	000362	.+2	
977	000362	000000	HALT	
978	000364	000366	.+2	
979	000366	000000	HALT	
980	000370	000372	.+2	
981	000372	000000	HALT	
982	000374	000376	.+2	
983	000376	000000	HALT	
984				
985		000030	.=30	
986				
987				
988	000030	010046	TYP	
989	000032	000340	340	
990				
991				
992		000042	.=42	
993				
994	000042	000000	0	
995				
996		000046	.=46	
997	000046	007670	LOGICAL	
998		000052	.=52	
999	000052	040000	BIT14	
1000				
1001				
1002		000100	.=100	
1003				
1004	000100	002624	LKSRV	
1005	000102	000340	340	;LINE CLOCK SERVICE ROUTINE
1006				
1007	000104	002634	CONVRT	
1008	000106	000340	340	
1009				
1010		000174	.=174	
1011	000174	000000	DISPREG: 0	
1012	000176	000000	SWREG: 0	
1013				
1014		000200	.=200	
1015				
1016	000200	012706	MOV	#1000,%6
1017	000204	000137	JMP	SETUP
1018				
1019				
1020		000300	.=300	
1021				
1022				
1023	000300	000137	JMP	INDAT
1024	000304	000137	JMP	NODAT
1025	000310	000137	JMP	DAVFU
1026	000314	000137	JMP	DAV2

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


```

1027
1028
1029      000400      . = 400
1030
1031
1032      000400      000137      002244      JMP      SWTIME      ; 1 MINUTE PRINT SPEED CHECK
1033      000404      000137      002350      JMP      KW11L      ; START FOR USING SWITCH REG FOR TIMING
1034      000410      000137      002306      JMP      KW11P      ; START FOR KW11-L LINE CLOCK
1035      000414      000137      003034      JMP      SLEWCK      ; START FOR KW11-P LINE CLOCK
1036
1037
1038
1039      000600      . = 600
1040
1041      000600      012706      001000      MOV      #1000,%6      ; START OF PRINTING TESTS SEQUENCE
1042      000604      000137      004066      JMP      TEST2      ; TEST 2
1043      000610      000137      004312      JMP      TEST3      ; TEST 3
1044      000614      000137      004650      JMP      CHRCHK      ; TEST 4
1045      000620      000137      005114      JMP      OVRPRT      ; TEST 5
1046      000624      000137      005374      JMP      PRTCTL      ; TEST 6
1047      000630      000137      005656      JMP      MLF      ; TEST 7
1048      000634      000137      006054      JMP      HSPRT      ; TEST 8
1049      000640      000137      006360      JMP      SNGCHR      ; TEST 9
1050      000644      000137      006536      JMP      ROTATE      ; TEST 10
1051      000650      000137      007014      JMP      LFTTR      ; TEST 11
1052      000654      000137      007512      JMP      HAMALN      ; TEST 12
1053
1054
1055      000700      . = 700
1056
1057      000700      012737      014562      014606      MOV      #LSCA,LOSCOP      ; SEND LF AFTER 132 CHARS
1058      000706      000137      014456      JMP      SCOPE
1059
1060      000720      . = 720
1061
1062      000720      012737      014456      014606      MOV      #SCOPE,LOSCOP      ; NO LF'S SENT IN SCOPE ROUTINE
1063      000726      000137      014456      JMP      SCOPE      ; DO SCOPE ROUTINE
1064
1065
1066      001000      . = 1000
1067
1068      ; LINE PRINTER HARDWARE REGISTERS
1069
1070      001000      177514      LPS:      177514      ; STATUS REGISTER
1071
1072
1073
1074
1075      001002      177516      LPB:      177516      ; DATA BUFFER REGISTER
1076
1077
1078
1079
1080      001004      177570      SWR:      177570
1081      001006      177570      DISPLAY: 177570
1082      001010      177776      PSW:      177776

```


K02

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1083 001012 177566
 1084 001014 177562
 1085 001016 177564
 1086 001020 177560
 1087 001022 172542
 1088 001024 172540
 1089 001026 177546
 1090 001030 000200
 1091 001032 000202
 1092 000240
 1093 000000
 1094 000002
 1095
 1096
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 1100
 1101
 1102
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 1120 001034 000000
 1121 001036 000000
 1122 001040 000000
 1123 001042 000000
 1124 001044 000000
 1125 001046 000000
 1126 001050 000000
 1127 001052 000000
 1128 001054 000000
 1129 001056 000000
 1130 001060 000000
 1131 001062 000000
 1132
 1133
 1134
 1135 001064 004437 010030
 1136 001070 000005
 1137 001072 013746 000004
 1138 001076 013746 000006

TPB: 177566
 TKB: 177562
 TPS: 177564
 TKS: 177560
 CSBR: 172542
 PLKS: 172540
 LKS: 177546
 PTRVEC: .WORD 200
 PTRPSW: .WORD 202
 NOP =240
 N =0
 M =2

;MACRO FOR SETTING UP ERROR COUNT

.LIST ME

;MACRO FOR PRINTING TEST NUMBER AT START OF TEST

.LIST ME

;MACRO FOR WAITING FOR PRINTER TO PRINT OR SLEW

.LIST ME

;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

;ROUTINE TO TEST THE MECH. OPERATION OF THE LPOS

SETUP: JSR %4,TYPINT
 RESET
 MOV 4,-(SP) ;CLEAR WORLD
 MOV 6,-(SP) ;SAVE CURRENT VECTORS
 ;

1139	001102	012737	001116	000004		MOV	#1\$,4		;SET UP TIMEOUT VECTOR
1140	001110	005777	177670			TST	QSWR		;TRY TO ACCESS HARDWARE SWR
1141	001114	000407				BR	2\$		;IF THERE, GO TO 2\$
1142	001116				1\$:				
1143	001116	012737	000176	001004		MOV	#SWREG,SWR		;POINT TO SOFTWARE SWR
1144	001124	012737	000174	001006		MOV	#DISPREG,DISPLAY		;POINT TO SOFTWARE DISPLAY
1145	001132	022626				CMP	(SP)+,(SP)+		;RESTORE STACK
1146	001134	012637	000004		2\$:	MOV	(SP)+,4		;RESTORE TIMEOUT VECTORS
1147	001140	012637	000006			MOV	(SP)+,6		
1148	001144	104000				EMT	+0		
1149	001146	010650				MES1			;TYPE DIAGNOSTIC TITLE
1150	001150	104000				EMT	+0		
1151	001152	010701				MES2			;TYPE RESTART ADDRESS INFO
1152	001154	104000				EMT	+0		;TYPE MESSAGE
1153	001156	010726				MES3			;POWER UP
1154	001160	000000				HALT			;DEPRESS CONTINUE WHEN READY TO START TEST
1155									
1156	001162	005777	177612		STP1:	TST	QLP5		;TEST FOR ERROR
1157	001166	100006				BPL	STP2		;NO ERROR TEST FOR READY
1158	001170	012737	000000	001052	ERR0:	MOV	#0,	ERCOUNT	;SET UP ERROR COUNT 0
1159		000001				N=N+1			
1160	001176	004537	010244			JSR	%5,STAER		;REPORT ERROR BIT SET
1161	001202	000767				BR	STP1		;GO TEST FOR ERROR
1162	001204	105777	177570		STP2:	TSTB	QLP5		;TEST FOR READY
1163	001210	100406				BMI	STP3		;READY SET OK
1164	001212	012737	000001	001052	ERR1:	MOV	#1,	ERCOUNT	;SET UP ERROR COUNT 1
1165		000002				N=N+1			
1166	001220	004537	010244			JSR	%5,STAER		;REPORT READY NOT SET
1167	001224	000767				BR	STP2		;GO TEST FOR READY
1168	001226	104000			STP3:	EMT	+0		;TYPE MESSAGE
1169	001230	010757				MES4			;PRINTER OK "READY SET" TRY TORN PAPER SWITCH
1170	001232	000000				HALT			;DEPRESS CONTINUE WHEN READY
1171	001234				STP4:				
1172	001234	012777	000014	177540		MOV	#14,QLPB		;SEND A "FF" TO THE PRINTER
1173	001242	012777	000015	177532		MOV	#15,QLPB		;ATTEMPT "FF" BY SENDING A "CR"
1174	001250	005777	177524			TST	QLP5		;TEST FOR ERROR
1175	001254	100406				BMI	STP5		;BRANCH IF ERROR SET
1176	001256	012737	000002	001052	ERR2:	MOV	#2,	ERCOUNT	;SET UP ERROR COUNT 2
1177		000003				N=N+1			
1178	001264	004537	010244			JSR	%5,STAER		;REPORT ERROR NOT SET
1179	001270	000761				BR	STP4		;LOOP ON ERROR
1180	001272	104000			STP5:	EMT	+0		;TYPE MESSAGE
1181	001274	011070				MES6			;ERROR SET OK - TURN ON LINE
1182	001276	000000				HALT			;WAIT FOR OPERATOR
1183									
1184	001300	005777	177474		STP5A:	TST	QLP5		;TEST FOR ERROR
1185	001304	100006				BPL	STP5B		;NO ERROR CONTINUE
1186	001306	012737	000003	001052	ERR3:	MOV	#3,	ERCOUNT	;SET UP ERROR COUNT 3
1187		000004				N=N+1			
1188	001314	004537	010244			JSR	%5,STAER		;REPORT ERROR SET
1189	001320	000767				BR	STP5A		;LOOP ON ERROR
1190	001322	105777	177452		STP5B:	TSTB	QLP5		;TEST READY
1191	001326	100406				BMI	STP5C		;READY SET OK
1192	001330	012737	000004	001052	ERR4:	MOV	#4,	ERCOUNT	;SET UP ERROR COUNT 4
1193		000005				N=N+1			
1194	001336	004537	010244			JSR	%5,STAER		;REPORT ERROR NOT SET

M02

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1195 001342 000767          STP5C: BR      STP5B      ;LOOP ON ERROR
1196 001344 104000          EMT      +0          ;TYPE MESSAGE
1197 001346 011023          MESS      ;READY SET OK - TRY DRUM GATE SWITCH
1198 001350 000000          HALT      ;DEPRESS CONTINUE WHEN READY
1199
1200 001352 005777 177422    STP6:  TST      QLP5      ;TEST FOR ERROR
1201 001356 100406          BMI      STP7      ;BRANCH IF ERROR SET
1202 001360 012737 000005 001052 ERR5: MOV      #5,      ERCOUNT ;SET UP ERROR COUNT 5
1203 001366 000006          N=N+1
1204 001366 004537 010244    JSR      %5,STAER ;REPORT ERROR NOT SET
1205 001372 000767          BR      STP6      ;LOOP ON ERROR
1206 001374 104000          STP7: EMT      +0          ;TYPE MESSAGE
1207 001376 011070          MESS      ;ERROR SET OK - TURN ON LINE
1208 001400 000000          HALT      ;DEPRESS CONTINUE WHEN READY
1209
1210          ;TEST 1
1211          ;PERFORMS PRELIMINARY COMMAND AND REGISTER TESTING.
1212
1213          ;IS THE PRINTER FREE OF ERRORS
1214
1215 001402 000005          TEST1: RESET      ;CLEAR THE WORLD
1216 001404 005777 177370    TST      QLP5      ;IS ERROR FLAG CLEAR
1217 001410 100006          BPL      TEST1A     ;ERROR IS CLEAR OK
1218 001412 012737 000006 001052 ERR6: MOV      #6,      ERCOUNT ;SET UP ERROR COUNT 6
1219 001412 000007          N=N+1
1220 001420 004537 010244    JSR      %5,STAER ;REPORT ERROR SET
1221 001424 000766          BR      TEST1      ;LOOP ON ERROR
1222
1223          ;IS READY SET (NO ERRORS EXIST)
1224
1225 001426 000005          TEST1A: RESET      ;CLEAR THE WORLD
1226 001430 105777 177344    TSTB     QLP5      ;IS READY SET
1227 001434 100406          BMI      TEST1B     ;READY SET! PRINTER OK
1228 001436 012737 000007 001052 ERR7: MOV      #7,      ERCOUNT ;SET UP ERROR COUNT 7
1229 001436 000010          N=N+1
1230 001444 004537 010244    JSR      %5,STAER ;REPORT READY NOT SET
1231 001450 000766          BR      TEST1A     ;LOOP ON ERROR
1232
1233          ;DOES LOADING THE BUFFER RESET READY
1234
1235 001452 005037 001046    TEST1B: CLR      WORK      ;CLEAR COUNTER
1236 001456 012777 000015 177316 MOV      #15,QLPB ;LOAD CARRIAGE RETURN INTO BUFFER
1237 001464 105777 177310    TSTB     QLP5      ;IS READY CLEAR
1238 001470 100006          BPL      LP1        ;READY IO CLEAR OK!
1239 001472 012737 000010 001052 ERR10: MOV      #10,     ERCOUNT ;SET UP ERROR COUNT 10
1240 001472 000011          N=N+1
1241 001500 004537 010244    JSR      %5,STAER ;REPORT READY STILL SET
1242 001504 000762          BR      TEST1B     ;LOOP ON ERROR
1243 001506 005777 177266    LP1:  TST      QLP5      ;IS THERE AN ERROR
1244 001512 100006          BPL      LP2        ;NO ERROR CONTINUE
1245 001514 012737 000011 001052 ERR11: MOV      #11,     ERCOUNT ;SET UP ERROR COUNT 11
1246 001514 000012          N=N+1
1247 001522 004537 010244    JSR      %5,STAER ;REPORT ERROR OCCURRED
1248 001526 000751          BR      TEST1B     ;LOOP ON ERROR
1249 001530 105777 177244    LP2:  TSTB     QLP5      ;IS THE PRINTER STILL BUSY
1250 001534 100411          BMI      TEST1C     ;NO! GO TO NEXT TEST

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N02

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1251 001536 005237 001046      INC      WORK      ;YES! GO CHECK FLAGS
1252 001542 001361      BNE      LP1      ;PRINTER STILL BUSY WAIT
1253 001544 012737 000012 001052 ERR12: MOV      #12,      ERCOUNT ;SET UP ERROR COUNT 12
1254      000013      N=N+1
1255 001552 004537 010244      JSR      %5,STAER ;ERROR REPORT TIME OUT
1256 001556 000735      BR       TEST1B ;LOOP ON ERROR
1257
1258      ;CHECK INTERRUPT LEVEL OF PRINTER
1259      ;THE PRINTER SHOULD BE AT LEVEL 4
1260
1261      ;TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 7
1262
1263 001560 012777 002014 177242 TEST1C: MOV      #INT1C,APTRVEC ;SET UP INT VECTOR
1264 001566 012777 000340 177236      MOV      #340,APTRPSW ;SET PRIORITY
1265 001574 005777 177200      TST      ALPS ;TEST FOR ERROR
1266 001600 100006      BPL      LP3 ;NO ERROR CONTINUE
1267 001602 012737 000013 001052 ERR13: MOV      #13,      ERCOUNT ;SET UP ERROR COUNT 13
1268      000014      N=N+1
1269 001610 004537 010244      JSR      %5,STAER ;REPORT ERROR SET
1270 001614 000761      BR       TEST1C ;LOOP ON ERROR
1271 001616 105777 177156      LP3: TSTB     ALPS ;TST FOR READY
1272 001622 100406      BMI      LP3X ;READY SET OK
1273 001624 012737 000014 001052 ERR14: MOV      #14,      ERCOUNT ;SET UP ERROR COUNT 14
1274      000015      N=N+1
1275 001632 004537 010244      JSR      %5,STAER ;REPORT READY NOT SET
1276 001636 000750      BR       TEST1C ;LOOP ON ERROR
1277 001640
1278 001640 012737 000015 001052 LP3X: ERR15: MOV      #15,      ERCOUNT ;SET UP ERROR COUNT 15
1279      000016      N=N+1
1280 001646 012777 000340 177134      MOV      #340,APSW ;LOCKUP PROCESSOR
1281 001654 052777 000100 177116      BIS      #100,ALPS ;SET PRINTER INTO ENABLE
1282 001662 000240      NOP ;WAIT
1283 001664 042777 000100 177106      BIC      #100,ALPS ;CLEAR PRINTER INT. ENABLE
1284
1285      ;TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 6
1286
1287 001672 012737 000016 001052 ERR16: MOV      #16,      ERCOUNT ;SET UP ERROR COUNT 16
1288      000017      N=N+1
1289 001700 012777 000300 177102      MOV      #300,APSW ;SET PROCESSOR PRIORITY LEVEL 6
1290 001706 052777 000100 177064      BIS      #100,ALPS ;SET PRINTER INT ENABLE
1291 001714 000240      NOP ;WAIT
1292 001716 042777 000100 177054      BIC      #100,ALPS ;CLEAR PRINTER INT. ENABLE
1293
1294      ;TEST THAT THE PRINTER WILL NOT INT. AT
1295      ;PROCESSOR LEVEL 5
1296
1297 001724 012737 000017 001052 ERR17: MOV      #17,      ERCOUNT ;SET UP ERROR COUNT 17
1298      000020      N=N+1
1299 001732 012777 000240 177050      MOV      #240,APSW ;SET UP PROCESSOR TO LEVEL 5
1300 001740 052777 000100 177032      BIS      #100,ALPS ;SET PRINTER INT ENABLE
1301 001746 000240      NOP ;WAIT
1302 001750 042777 000100 177022      BIC      #100,ALPS ;CLEAR INT ENABLE PRINTER OK
1303
1304      ;TEST THAT THE PRINTER WILL NOT INT
1305      ;WHEN THE PROCESSOR IS AT LEVEL 4
1306

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1307 001756 012737 000020 001052 ERR20: MOV      #20,      ERCOUNT      ;SET UP ERROR COUNT 20
1308      000021      N=N+1
1309 001764 012777 000200 177016      MOV      #200, APSW      ;SET PROCESSOR TO LEVEL 4
1310 001772 052777 000100 177000      BIS      #100, ALPS      ;SET PRINTER INT. ENABLE
1311 002000 000240      NOP      ;WAIT
1312 002002 042777 000100 176770      BIC      #100, ALPS      ;CLEAR PRINTER INT ENABLE
1313 002010 000137 002026      JMP      TEST1D      ;PRINTER OK CONTINUE
1314
1315      ; INTERRUPT HANDLE FOR TEST1C
1316      ; RESTORE STACK AND REPORT ERROR
1317
1318 002014 022626      INT1C: CMP      (6)+, (6)+      ;RESTORE STACK
1319 002016 004537 010244      JSR      %5, STAER      ;REPORT ERROR
1320 002022 000137 001560      JMP      TEST1C      ;RE-ENTER TEST1C
1321
1322      ; TEST THE ABILITY OF THE PRINTER TO INTERRUPT
1323      ; AT PRIORITY LEVEL 4
1324
1325 002026 012777 002140 176774 TEST1D: MOV      #INT1D, PTRVEC      ;SET UP INTERRUPT VECTOR
1326 002034 012777 000340 176770      MOV      #340, PTRPSW      ;LOCK UP PRIORITIES
1327 002042 005777 176732      TST      ALPS      ;IS THERE A PRINTER ERROR
1328 002046 100006      BPL      LP4      ;NO! CONTINUE
1329 002050 012737 000021 001052 ERR21: MOV      #21,      ERCOUNT      ;SET UP ERROR COUNT 21
1330      000022      N=N+1
1331 002056 004537 010244      JSR      %5, STAER      ;REPORT PRINTER ERROR
1332 002062 000761      BR      TEST1D      ;LOOP ON ERROR
1333 002064 105777 176710      LP4:  TSTB     ALPS      ;IS READY SET
1334 002070 100406      BMI      LP5      ;YES - PRINTER READY
1335 002072 012737 000022 001052 ERR22: MOV      #22,      ERCOUNT      ;SET UP ERROR COUNT 22
1336      000023      N=N+1
1337 002100 004537 010244      JSR      %5, STAER      ;REPORT READY NOT SET
1338 002104 000750      BR      TEST1D      ;LOOP ON ERROR
1339 002106 012777 000140 176674 LP5:  MOV      #140, APSW      ;SET PRIORITY TO LEVEL 3
1340 002114 052777 000100 176656      BIS      #100, ALPS      ;SET PRINTER INTERRUPT ENABLE
1341 002122 000240      NOP      ;WAIT
1342 002124 012737 000023 001052 ERR23: MOV      #23,      ERCOUNT      ;SET UP ERROR COUNT 23
1343      000024      N=N+1
1344 002132 004537 010244      JSR      %5, STAER      ;REPORT ERROR
1345 002136 000733      BR      TEST1D      ;LOOP ON ERROR
1346
1347      ; INTERRUPT HANDLER FOR TEST1D
1348
1349 002140 022626      INT1D:  CMP      (6)+, (6)+      ;RESET STACK
1350 002142 042777 000100 176630      BIC      #100, ALPS      ;CLEAR INT. ENABLE FOR PRINTER
1351 002150 005077 176634      CLR      APSW      ;CLEAR PROCESSOR STATUS
1352 002154 012777 012706 176646      MOV      #12706, PTRVEC      ;RESET INSTRUCTION AT 200
1353 002162 012777 001000 176642      MOV      #1000, PTRPSW      ;RESET INSTRUCTION AT 202
1354
1355      ; 1 MINUTE PRINT SPEED CHECK
1356      ; IF A KW11-L OR KW11-P ARE NOT AVAILABLE, THE SR BIT0 IS USED
1357      ; FOR MANUAL TIMING OF THE PRINTER.
1358
1359 002170 012737 000002 000006 CLCKAV: MOV      #RTI, #6      ;SET TRAP TO RETURN
1360 002176 012737 000006 000004      MOV      #6, #4
1361 002204 000261      SEC
1362 002206 105777 176614      TSTB     ALKS      ;KW11-L AVAILABLE?

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1363 002212 103404 BCS 1S ;NO, BRANCH
1364 002214 005037 CLR 384 ;RESET TRAP VECTOR TO HALT
1365 002220 000137 002350 JMP KW11L ;USE KW11L FOR TIMING
1366 002224 000261 1S: SEC ;KW11-P AVAILABLE?
1367 002226 105777 176572 TSTB 3PLKS ;NO, USE SWITCH REG FOR TIMING
1368 002232 103404 BCS SWTIME ;RESET TRAP VECTOR TO HALT
1369 002234 005037 000004 CLR 384 ;USE KW11-P FOR TIMING
1370 002240 000137 002306 JMP KW11P ;CLEAR LINE COUNT
1371 002244 005037 001042 SWTIME: CLR LINCNT
1372 002250 004437 010030 JSR %4, TYPINT
1373 002254 005037 000004 CLR 384 ;RESET TRAP VECTOR TO HALT
1374 002260 104000 EMT +0 ;TYPE MESSAGE
1375 002262 010435 MESC ;PRINT SPEED CHECK USING MANUAL TIMING
1376 002264 012737 000002 002622 MOV #2, DIA ;SET DUMMY ADDRESS
1377 002272 032777 000001 176504 1S: BIT #BIT0, 3SWR ;START?
1378 002300 001774 1S ;WAIT FOR START
1379 002302 000137 002406 JMP STARO ;START PRINTING
1380
1381
1382 ;START FOR KW11-P.....
1383
1384 002306 005037 001042 KW11P: CLR LINCNT ;CLEAR LINE COUNT
1385 002312 004437 010030 JSR %4, TYPINT
1386 002316 012706 001000 MOV #1000, %6 ;RESET STACK
1387 002322 013777 002616 176472 MOV MINCNT, 3CSBR ;SET CLOCK COUNT
1388 002330 013737 001024 002622 MOV PLKS, DIA ;STORE PLKS ADDRESS
1389 002336 012777 000105 176460 MOV #105, 3PLKS ;START CLOCK
1390 002344 000137 002406 JMP STARO ;START PRINTING
1391
1392 ;START FOR KW11-L.....
1393
1394 002350 005037 001042 KW11L: CLR LINCNT ;CLEAR LINE COUNT
1395 002354 004437 010030 JSR %4, TYPINT
1396 002360 012706 001000 MOV #1000, %6 ;RESET STACK
1397 002364 013737 002616 002620 MOV MINCNT, CNTR ;SET CLOCK COUNT
1398 002372 013737 001026 002622 MOV LKS, DIA ;STORE LKS ADDRESS
1399 002400 012777 000100 176420 MOV #100, 3LKS ;ENABLE CLOCK INTERRUPT
1400
1401 ;PRINTING ROUTINE.....
1402
1403 002406 032777 020000 176370 STARO: BIT #BIT13, 3SWR ;CHECK CHAR SET
1404 002414 001007 STAROA ;BRANCH IF 96
1405 002416 012737 000140 001060 MOV #140, LEGCHR ;LEGAL CHECK
1406 002424 012737 000100 001062 MOV #100, NUMCHR ;#CHARS
1407 002432 000406 STAROB ;CONTINUE
1408 002434 012737 000200 001060 STAROA: MOV #200, LEGCHR ;LEGAL CHECK
1409 002442 012737 000140 001062 MOV #140, NUMCHR ;#CHARS
1410
1411 002450 012737 000204 001036 STAROB: MOV #132, CHRCNT ;SET CHAR COUNT
1412 002456 012737 003014 001054 STARA: MOV #PATTB, STCHR ;INITIALIZE TABLE POINTER
1413 002464 012737 000021 001044 MOV #17, CYCNT ;SET GROUP COUNT
1414 002472 017737 176356 001040 MOV 3STRCHR, CHRCNT ;GET CHAR FROM TABLE
1415 002500 063737 001042 001040 ADD LINCNT, CHRCNT ;ADD LINE COUNT
1416 002506 023737 001060 001040 1S: CMP LEGCHR, CHRCNT ;LEGAL CHAR?
1417 002514 003004 BGT STAR1 ;YES, BRANCH
1418 002516 163737 001062 001040 SUB NUMCHR, CHRCNT ;NO, MAKE LEGAL

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1419	002524	000770			BR	1\$	:RECHECK CHAR
1420	002526	013777	001040	176246	STAR1: MOV	CHRGEN,ALPB	:LOAD BUFFER
1421	002534	005337	001036		DEC	CHRCNT	:DECREMENT CHAR COUNT
1422	002540	001410			BEQ	STARED	:BRANCH IF DONE LINE
1423	002542	005337	001044		DEC	CYCCNT	:DECREMENT CYCCLE COUNT
1424	002546	001367			BNE	STAR1	:CONTINUE IF NOT DONE GROUP
1425	002550	062737	000002	001054	ADD	#2,STRCHR	:ADD 2 TO TABLE POINTER
1426	002556	000137	002464		JMP	STARA	:CONTINUE
1427	002562	005237	001042		STAR1: INC	LINCNT	:INCREMENT LINE COUNT
1428	002566	012777	000012	176206	MOV	#12,ALPB	:SEND LF
1429	002574	105777	176200		TSTB	ALPB	:TEST READY
1430	002600	100375			BPL	-4	:WAIT FOR READY
1431	002602	032777	000001	176174	BIT	#BIT0,ASWR	:STOP PRINT?
1432	002610	001411			BEQ	CONVRT	:YES, BRANCH
1433	002612	000137	002406		JMP	STAR0	:CONTINUE

MINCNT: 7020
CNTR: 0
DIA: 2

:NOTE -- PLACE 5670 (8) IN MINCNT FOR 50 HZ. LINE FREQUENCY !!!

:LINE CLOCK SERVICE ROUTINE FOR KW11-L

002624	005337	002620	LKSRV: DEC	CNTR	:DECREMENT COUNTER
002630	001401		BEQ	CONVRT	:EXIT IF 1 MINUTE
002632	000002		RTI		:RETURN

:ROUTINE TO PRINT NUMBER OF LINES PRINTED IN 1 MINUTE

002634	042777	000100	177760	CONVRT: BIC	#100,DIA	:DISABLE CLOCK INTERRUPT IF CLOCK AVAILABLE
002642	005037	010160		CLR	TYPDAT	:CLEAR DIGIT COUNT
002646	012703	011450		MOV	#MES12,%3	:SET MESSAGE POINTER
002652	022737	000144	001042	1\$: CMP	#100.,LINCNT	:GREATER THAN 100?
002660	003006			BGT	2\$	:NO, PRINT HUNDRED'S DIGIT
002662	162737	000144	001042	SUB	#100.,LINCNT	:YES, SUBTRACT 100
002670	005237	010160		INC	TYPDAT	:INCREMENT HUNDRED'S DIGIT
002674	000766			BR	1\$	:CONTINUE CONVERSION
002676	062737	000060	010160	2\$: ADD	#60,TYPDAT	:MAKE ASCII
002704	113723	010160		MOVB	TYPDAT,(%3)+	:STORE DIGIT
002710	005037	010160		CLR	TYPDAT	:CLEAR DIGIT COUNTER
002714	022737	000012	001042	3\$: CMP	#10.,LINCNT	:GREATER THEN 10?
002722	003006			BGT	4\$	:NO, PRINT DIGIT
002724	162737	000012	001042	SUB	#10.,LINCNT	:YES, SUBTRACT 10
002732	005237	010160		INC	TYPDAT	:INCREMENT TEN'S DIGIT
002736	000766			BR	3\$	:CONTINUE CONVERSION
002740	062737	000060	010160	4\$: ADD	#60,TYPDAT	:MAKE ASCII
002746	113723	010160		MOVB	TYPDAT,(%3)+	:STORE DIGIT
002752	013737	001042	010160	MOV	LINCNT,TYPDAT	:GET ONE'S DIGIT
002760	062737	000060	010160	ADD	#60,TYPDAT	:MAKE ASCII
002766	113723	010160		MOVB	TYPDAT,(%3)+	:STORE DIGIT
002772	104000			EMT	+0	:TYPE MESSAGE
002774	011412			MES11		:TYPE PRINT SPEED
002776	012737	011410	010026	MOV	#MES11A,PRMSG	:SET PRINTER MESSAGE ADDRESS

E03

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1475 003004 004437 010010 JSR %4,RINT ;PRINT PRINTER SPEED ON LINE PRINTER
1476 003010 000137 003034 JMP SLEWCK ;NEXT TEST

1477
1478
1479
1480 003014 000040 PATTB: 40
1481 003016 000117 117
1482 003020 000076 76
1483 003022 000055 55
1484 003024 000134 134
1485 003026 000113 113
1486 003030 000072 72
1487 003032 000051 51

;CHECK TOP OF FORM SWITCH
1488 003034 004437 010030 SLEWCK: JSR %4,TYPINT
1489 003040 004537 007704 JSR %5,PRINT ;INITIALIZE PRINTER
1490 003044 000406 BR SLW ;BRANCH IF OK
1491 003046 012737 000024 001052 ERR24: MOV #24, ERCOUNT ;SET UP ERROR COUNT 24
1492 000025 N=N+1
1493 003054 004537 010244 JSR %5,STAER ;REPORT PRINTER NOT READY
1494 003060 000000 HALT ;HALT ON ERROR
1495 003062 012737 003276 001042 SLW: MOV #FFTAB,LINCNT ;LINE COUNT FOR SWITCH SETTING
1496 003070 012704 003354 MOV #FFSET,%4 ;INIT SWITCH SETTING TABLE POINTER
1497 003074 012703 011164 SLWD: MOV #MES8,%3 ;INIT MESSAGE POINTER
1498 003100 012702 011277 MOV #MES10,%2 ;PUT SWITCH SETTINGS INTO MESSAGES
1499 003104 111413 SLW1: MOVB (%4),(%3)
1500 003106 111412 MOVB (%4),(%2)
1501 003110 122423 CMPB (%4)+,(%3)+ ;INCREMENT POINTERS
1502 003112 105722 TSTB (%2)+
1503 003114 105714 TSTB (%4) ;DONE MOVING SWITCH SETTINGS TO MSG'S?
1504 003116 001372 BNE SLW1 ;BRANCH IF NOT DONE
1505 003120 005204 INC %4 ;TABLE POINTER SET FOR NEXT SWITCH SETTING
1506 003122 104000 EMT +0 ;TYPE MESSAGE
1507 003124 011130 MES7 ;SET TOP OF FORM SWITCH TO ---
1508 003126 000000 HALT ;WAIT FOR OPERATOR TO SET SWITCH
1509 003130 005777 175706 SLW11: TST @LINCNT ;CHECK LINE COUNT
1510 003134 001003 BNE SLW1A ;BRANCH IF NOT ZERO
1511 003136 012737 011477 010026 SLW1A: MOV #MES13,PRMSG ;CHANGE PRINTER MESSAGE
1512 003144 005777 175630 TST @LPS ;TEST FOR ERRORS
1513 003150 100006 BPL SLW2 ;BRANCH IF NO ERROR
1514 003152 012737 000025 001052 ERR25: MOV #25, ERCOUNT ;SET UP ERROR COUNT 25
1515 000026 N=N+1
1516 003160 004537 010244 JSR %5,STAER ;REPORT ERROR SET
1517 003164 000000 HALT ;HALT ON ERROR
1518 003166 012777 000014 175606 SLW2: MOV #14,@LPB ;SEND FF
1519 003174 105777 175600 TSTB @LPS ;TEST READY
1520 003200 100375 BPL -4 ;WAIT FOR READY
1521 003202 004437 010010 JSR %4,RINT ;PRINT MESSAGE ON LINE PRINTER
1522 003206 062737 000002 001042 ADD #2,LINCNT ;NEXT LINE COUNT
1523 003214 022737 003352 001042 CMP #FTABE,LINCNT ;DONE TEST?
1524 003222 001410 BEQ DAVAV ;YES, EXIT
1525 003224 005777 175612 TST @LINCNT ;DONE CHECK OF THIS SWITCH SETTING?
1526 003230 001721 BEQ SLWD ;YES, NEXT SWITCH SETTING
1527 003232 012737 011202 010026 MOV #MES9,PRMSG ;NO, CHECK THIS SETTING

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1531 003240 000137 003130 JMP SLW11 ;CONTINUE
1532 003244 013737 012412 011164 DAVAV: MOV TNO13,MES8 ;SET MESSAGE
1533 003252 104000 EMT +0 ;TYPE MESSAGE
1534 003254 011126 MES7A ;RESET TOP OF FORM SWITCH
1535 003256 000000 HALT ;WAIT FOR OPERATOR
1536 003260 032777 040000 175516 BIT #BIT14,DSWR ;DAVFU AVAILABLE?
1537 003266 001060 BNE INDAT ;YES DO DAVFU TESTS
1538 003270 000000 HALT ;DONE OPERATOR TESTS - HALT
1539 003272 000137 004066 JMP TEST2 ;DEPRESS CONTINUE TO START PRINTING TESTS
1540 ;LOOP COUNTS FOR SLEW CHECKS
1541 FFTAB: 0
1542 003276 000000 18.
1543 003300 000022 00.
1544 003302 000000 21.
1545 003304 000025 21.
1546 003306 000000 24.
1547 003310 000030 24.
1548 003312 000000 33.
1549 003314 000041 33.
1550 003316 000000 36.
1551 003320 000044 36.
1552 003322 000000 42.
1553 003324 000052 42.
1554 003326 000000 48.
1555 003330 000060 48.
1556 003332 000000 51.
1557 003334 000063 51.
1558 003336 000000 66.
1559 003340 000102 66.
1560 003342 000000 72.
1561 003344 000110 72.
1562 003346 000000 84.
1563 003350 000124 84.
1564 003352 000000 FTAB: 0
1565 ;SWITCH SETTINGS FOR MESSAGES
1566 FFSET: .ASCIZ /3 /
1567 .ASCIZ /3.5 /
1568 .ASCIZ /4 /
1569 .ASCIZ /5.5 /
1570 .ASCIZ /6 /
1571 .ASCIZ /7 /
1572 .ASCIZ /8 /
1573 .ASCIZ /8.5 /
1574 .ASCIZ /11 /
1575 .ASCIZ /12 /
1576 .ASCIZ /14 /
1577 .EVEN
1578 ;CHECK THAT VFU WILL NOT ACCEPT INCOMPLETE DATA
1579
1580
1581
1582
1583 003430 004437 010030 INDAT: JSR %4,TYPINT
1584 003434 012737 003564 001040 MOV #INDATT,CHRGEN ;SET TABLE POINTER
1585 003442 005777 175332 INDO: TST @LPS ;TEST FOR ERROR
1586 003446 100010 BPL INDATO ;BRANCH IF NO ERROR

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1587 003450 012737 000026 001052 ERR26: MOV #26, ERCOUNT ;SET UP ERROR COUNT 26
1588 000027 N=N+1
1589 003456 004537 010244 JSR %5, STAER ;REPORT ERROR SET
1590 003462 000000 HALT ;HALT ON ERROR
1591 003464 000137 003430 JMP INDAT ;RESTART TEST
1592 003470 017777 175344 175304 INDATO: MOV @CHRGEN, @LPB ;LOAD BUFFER
1593 003476 062737 000002 001040 ADD #2, CHRGEN ;NEXT DATA
1594 003504 005777 175330 TST @CHRGEN ;TEST CHAR
1595 003510 001405 BEQ IND1 ;CONTINUE IF DONE
1596 003512 105777 175262 TSTB @LPS ;TEST READY
1597 003516 100375 BPL -4 ;WAIT FOR READY
1598 003520 000137 003442 JMP IND0
1599 003524 005777 175250 IND1: TST @LPS ;TEST FOR ERROR SET.
1600 003530 100410 BMI INDAT1 ;BRANCH IF ERROR SET
1601 003532 012737 000027 001052 ERR27: MOV #27, ERCOUNT ;SET UP ERROR COUNT 27
1602 000030 N=N+1
1603 003540 004537 010244 JSR %5, STAER ;REPORT ERROR NOT SET
1604 003544 000000 HALT ;HALT ON ERROR
1605 003546 000137 003430 JMP INDAT ;RESTART TEST
1606 003552 104000 INDAT1: EMT +0 ;TYPE MESSAGE
1607 003554 010315 MESA ;ERROR SET OK - CLEAR & TURN ON LINE
1608 003556 000000 HALT ;WAIT FOR OPERATOR
1609 ;DEPRESS CONTINUE WHEN READY FOR NEXT TEST
1610 003560 000137 003600 JMP NODAT ;NEXT TEST
1611
1612 003564 000356 INDATT: 356 ;DATA TABLE FOR ABOVE TEST
1613 003566 000001 1
1614 003570 000002 2
1615 003572 000003 3
1616 003574 000357 357
1617 003576 000000 0
1618
1619 ;CHECK THAT CHANNELS WITH NO STOP BITS CAUSE ERRORS IF CHANNEL SELECTED
1620
1621 003600 004437 010030 NODAT: JSR %4, TYPINT
1622 003604 012737 000200 001054 MOV #200, STRCHR ;SET PAPER INSTRUCTION
1623 003612 012737 004006 001040 NODOA: MOV #NODAT3, CHRGEN ;SET TABLE POINTER FOR LOAD
1624 003620 005777 175154 NODO: TST @LPS ;TEST FOR ERROR
1625 003624 100007 BPL NODATO ;BRANCH IF NO ERROR
1626 003626 012737 000030 001052 ERR30: MOV #30, ERCOUNT ;SET UP ERROR COUNT 30
1627 000031 N=N+1
1628 003634 004537 010244 JSR %5, STAER ;REPORT ERROR SET
1629 003640 000000 HALT ;HALT ON ERROR
1630 003642 000756 BR NODAT ;RESTART TEST
1631 003644 017777 175170 175130 NODATO: MOV @CHRGEN, @LPB ;LOAD BUFFER
1632 003652 062737 000002 001040 ADD #2, CHRGEN ;NEXT DATA
1633 003660 022737 004066 001040 CMP #NODAT4+2, CHRGEN ;DONE LOAD?
1634 003666 001405 BEQ NODATA ;BRANCH IF DONE
1635 003670 105777 175104 TSTB @LPS ;TEST READY
1636 003674 100375 BPL -4 ;WAIT FOR READY
1637 003676 000137 003620 JMP NODO
1638 003702 013777 001054 175072 NODATA: MOV STRCHR, @LPB ;SEND DATA
1639 003710 005037 001036 CLR CHRCNT ;DELAY
1640 003714 005237 001036 1$: INC CHRCNT
1641 003720 001375 BNE 1$
1642 003722 005777 175052 TST @LPS ;TEST FOR ERROR SET

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1643 003726 100410      BMI      NODAT1      ;BRANCH IF ERROR SET
1644 003730 012737 000031 001052 ERR31: MOV      #31,      ERCOUNT      ;SET UP ERROR COUNT 31
1645      000032      N=N+1
1646 003736 004537 010244      JSR      %5,STAER      ;REPORT ERROR NOT SET
1647 003742 000000      HALT      ;HALT ON ERROR
1648 003744 000137 003612      JMP      NODDA      ;RETEST
1649 003750 005237 001054      NODAT1: INC      STRCHR      ;NEXT PAPER INSTRUCTION
1650 003754 022737 000214 001054      CMP      #214,STRCHR      ;DONE TEST?
1651 003762 001404      BEQ      NODAT2      ;CONTINUE IF NOT DONE
1652 003764 104000      EMT      +0      ;TYPE MESSAGE
1653 003766 010362      MESB      ;ERROR SET OK - CLEAR & TRY NEXT CHANNEL
1654 003770 000000      HALT      ;WAIT FOR OPERATOR
1655 003772 000707      BR      NODDA      ;RELOAD & TEST NEXT CHANNEL
1656 003774 104000      NODAT2: EMT      +0      ;TYPE MESSAGE
1657 003776 010315      MESA      ;ERROR SET OK - TURN ON LINE
1658 004000 000000      HALT
1659 004002 000137 004066      JMP      TEST2      ;JUMP
1660
1661      NODAT3: 356      ;START LOAD
1662 004006 000356
1663 004010 000000
1664 004012 000000
1665 004014 000000
1666 004016 000000
1667 004020 000000
1668 004022 000000
1669 004024 000000
1670 004026 000000
1671 004030 000000
1672 004032 000000
1673 004034 000000
1674 004036 000000
1675 004040 000000
1676 004042 000000
1677 004044 000000
1678 004046 000000
1679 004050 000000
1680 004052 000000
1681 004054 000000
1682 004056 000000
1683 004060 000000
1684 004062 000000
1685 004064 000357      NODAT4: 357      ;STOP LOAD
1686
1687      ;TEST 2
1688      ;TESTS INTERFACE AND PRINTER DATA PATHS
1689      ;WITH ALTERNATING ONES AND ZEROS
1690
1691 004066 004437 010030      TEST2: JSR      %4,TYPINT
1692 004072 004537 007704      JSR      %5,PRINT      ;INITIALIZE PRINTER
1693 004076 000406      BR      TST2AX      ;BRANCH IF OK
1694 004100 012737 000032 001052 ERR32: MOV      #32,      ERCOUNT      ;SET UP ERROR COUNT 32
1695      000033      N=N+1
1696 004106 004537 010244      JSR      %5,STAER      ;REPORT PRINTER NOT READY
1697 004112 000000      HALT      ;HALT ON ERROR
1698 004114      TST2AX:

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1699 004114 013737 012370 011724      MOV      TN02,MES15      ;SET TEST NUMBER FOR MESSAGE
1700 004122 004437 007760      JSR      %4,PRNNT      ;PRINT TEST NUMBER
1701      000003      M=M+1
1702 004126 012737 177740 001044      MOV      #-32.,CYCNT      ;SET UP LINE COUNT FOR 32 LINES
1703 004134 012737 177574 001036      MOV      #-132.,CHRCNT      ;SET CHAR COUNT TO 132
1704 004142 013737 004216 001054      MOV      SCHRSW,STRCHR      ;SET CHAR. SWITCH TO U
1705 004150 005777 174624      T3A:      TST      @LPS      ;TEST FOR ERROR
1706 004154 100006      BPL      LP2B      ;NO ERROR CONTINUE
1707 004156 012737 000033 001052  ERR33:  MOV      #33,      ERCOUNT      ;SET UP ERROR COUNT 33
1708      000034      N=N+1
1709 004164 004537 010244      JSR      %5,STAER      ;REPORT ERROR SET
1710 004170 000000      HALT      ;HALT ON ERROR
1711 004172 000177 174656      LP2B:      JMP      @STRCHR      ;LOAD CHAR
1712 004176 013737 004220 001054  T2A:      MOV      RCHRSW,STRCHR      ;RESET CHAR. SWITCH
1713 004204 012737 000125 001050      MOV      #125,SAVE      ;STORE CHAR
1714 004212 000137 004236      JMP      TSA      ;LOAD CHAR
1715
1716 004216 004176      SCHRSW: T2A
1717 004220 004222      RCHRSW: T1A
1718
1719 004222 013737 004216 001054  T1A:      MOV      SCHRSW,STRCHR      ;SET CHAR. SWITCH TO U
1720 004230 012737 000052 001050      MOV      #52,SAVE      ;STORE CHAR
1721 004236 013777 001050 174536  TSA:      MOV      SAVE,@LPB      ;LOAD BUFFER
1722 004244 005237 001036      INC      CHRCNT      ;INC CHARACTER COUNT
1723 004250 001337      BNE      T3A      ;CONTINUE
1724 004252 012777 000012 174522      MOV      #12,@LPB      ;SEND LF
1725 004260 105777 174514      TSTB      @LPS      ;TEST READY
1726 004264 100375      BPL      .-4      ;WAIT FOR READY
1727 004266 012737 177574 001036      MOV      #-132.,CHRCNT      ;RESET CHAR COUNT
1728 004274 005237 001044      INC      CYCNT      ;INC CYCLE COUNT
1729 004300 001356      BNE      TSA      ;CONTINUE IF NOT DONE
1730 004302 032777 010000 174474      BIT      #BIT12,@SWR      ;LOOP ON TEST?
1731 004310 001266      BNE      TEST2      ;LOOP
1732
1733      ;TEST 3
1734      ;TEST CHARACTER COMPARATOR WITH ALTERNATE LINES OF
1735      ;ALL CHARACTERS AND ILLEGAL CHARACTERS
1736
1737 004312 004437 010030      TEST3:  JSR      %4,TYPINT
1738 004316 013737 012372 011724      MOV      TN03,MES15      ;SET TEST NUMBER FOR MESSAGE
1739 004324 004437 007760      JSR      %4,PRNNT      ;PRINT TEST NUMBER
1740      000004      M=M+1
1741 004330 012737 177765 001044      MOV      #-13,CYCNT      ;SET 21 LINES
1742 004336 000137 004470      JMP      LP2H      ;SEND ILLEGAL CHARS FIRST TO GIVE BLANK LINE
1743 004342 012737 177574 001036  T2B0:      MOV      #-132.,CHRCNT      ;SET CHAR COUNT FOR 132
1744 004350 012737 000040 001040  T2B0A:  MOV      #40,CHGEN      ;SET FIRST CHAR.
1745 004356 005777 174416      T2B1:      TST      @LPS      ;DOES THE PRINTER HAVE AN ERROR
1746 004362 100006      BPL      LP2E      ;BRANCH IF NO ERROR
1747 004364 012737 000034 001052  ERR34:  MOV      #34,      ERCOUNT      ;SET UP ERROR COUNT 34
1748      000035      N=N+1
1749 004372 004537 010244      JSR      %5,STAER      ;REPORT ERROR
1750 004376 000000      HALT      ;HALT ON ERROR
1751 004400 013777 001040 174374  LP2E:      MOV      CHGEN,@LPB      ;PRINT CHARACTER
1752 004406 005237 001036      INC      CHRCNT      ;INC. CHAR. COUNT
1753 004412 001420      BEQ      T2B2      ;BRANCH IF LINE IS FINISHED
1754 004414 005237 001040      INC      CHGEN      ;NEXT CHAR

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1755	004420	032777	020000	174356	BIT	#BIT13, QSWR	:CHECK CHAR SET
1756	004426	001405			BEQ	T2B2B	:BRANCH IF 64 CHARS
1757	004430	022737	000200	001040	CMP	#200, CHGEN	:LEGAL CHAR?
1758	004436	001744			BEQ	T2B0A	:MAKE SPACE IF ILLEGAL
1759	004440	000746			BR	T2B1	:CONTINUE IF LEGAL CHAR
1760	004442	022737	000140	001040	T2B2B: CMP	#140, CHGEN	:LEGAL CHAR?
1761	004450	001737			BEQ	T2B0A	:MAKE SPACE IF ILLEGAL
1762	004452	000741			BR	T2B1	:CONTINUE IF LEGAL CHAR
1763	004454	012777	000012	174320	T2B2: MOV	#12, QLPB	:ISSUE LINE FEED
1764	004462	105777	174312		TSTB	QLP5	:TEST READY
1765	004466	100375			BPL	-4	:WAIT FOR READY
1766	004470	005037	001040		LP2H: CLR	CHGEN	:FIRST ILLEGAL CHAR
1767	004474	005777	174300		T2B3: TST	QLP5	:TEST FOR ERROR
1768	004500	100006			BPL	LDCH	:BRANCH IF NO ERROR
1769	004502	012737	000035	001052	ERR35: MOV	#35, ERCOUNT	:SET UP ERROR COUNT 35
1770		000036			N=N+1		
1771	004510	004537	010244		JSR	%5, STAER	:REPORT ERROR SET
1772	004514	000000			HALT		:HALT ON ERROR
1773	004516	013777	001040	174256	LDCH: MOV	CHGEN, QLPB	:TRANSMIT CHARACTER
1774	004524	005237	001040		T2B4: INC	CHGEN	:NEXT CHAR
1775	004530	022737	000012	001040	CMP	#12, CHGEN	:TEST FOR LINE FEED
1776	004536	001772			BEQ	T2B4	:SKIP IF LF
1777	004540	022737	000014	001040	CMP	#14, CHGEN	:TEST FOR FORM FEED
1778	004546	001766			BEQ	T2B4	:SKIP IF FF
1779	004550	022737	000015	001040	CMP	#15, CHGEN	:TEST FOR CARRIAGE RETURN
1780	004556	001762			BEQ	T2B4	:SKIP IF CR
1781	004560	023727	001040	000040	CMP	CHGEN, #40	:CHECK IF LEGAL CHAR
1782	004566	002753			BLT	LDCH	:CONTINUE IF STILL ILLEGAL CHAR
1783	004570	032777	020000	174206	BIT	#BIT13, QSWR	:CHECK CHAR SET
1784	004576	001007			BNE	T2B5	:BRANCH IF 96 CHAR SET
1785	004600	052737	000100	001040	BIS	#100, CHGEN	:SET BIT 7 IF NOT SET
1786	004606	032737	000200	001040	BIT	#200, CHGEN	:DONE ILLEGAL CHARS?
1787	004614	001740			BEQ	LDCH	:BRANCH IF NOT DONE
1788	004616	012777	000012	174156	T2B5: MOV	#12, QLPB	:ISSUE LINE FEED
1789	004624	105777	174150		TSTB	QLP5	:TEST READY
1790	004630	100375			BPL	-4	:WAIT FOR READY
1791	004632	005237	001044		INC	CYCCNT	:INCREMENT LINE COUNT
1792	004636	001241			BNE	T2B0	:CONTINUE IF NOT DONE
1793	004640	032777	010000	174136	BIT	#BIT12, QSWR	:CHECK TO LOOP ON TEST
1794	004646	001221			BNE	TEST3	:LOOP
1795							
1796							
1797							
1798							
1799							
1800	004650	004437	010030		CHRCHK: JSR	%4, TYPINT	
1801	004654	013737	012374	011724	MOV	TN04, MES15	:SET TEST NUMBER FOR MESSAGE
1802	004662	004437	007760		JSR	%4, PRNNT	:PRINT TEST NUMBER
1803		000005			M=M+1		
1804	004666	012737	177750	001042	MOV	#-24, LINCNT	:SET UP LINE COUNT FOR 24 LINES
1805	004674	012737	177776	001044	MOV	#-2, CYCCNT	:SET UP CYCLE COUNT
1806	004702	013737	005044	001054	MOV	CHRE, STRCHR	:SET CHAR TAG TO SPACE
1807	004710	012737	177574	001036	CR: MOV	#-132, CHRCNT	:SET CHAR COUNT
1808	004716	005777	174056		CRO: TST	QLP5	:TEST FOR ERROR
1809	004722	100006			BPL	CR1	:CONTINUE IF NO ERROR
1810	004724	012737	000036	001052	ERR36: MOV	#36, ERCOUNT	:SET UP ERROR COUNT 36

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1811      000037      N=N+1
1812 004732 004537 010244 JSR      %5,STAER      ;REPORT ERROR SET
1813 004736 000000      HALT      ;HALT ON ERROR
1814 004740 000177 174110 CR1: JMP      @STRCHR      ;OPPOSITE CHAR
1815 004744 013737 005044 001054 CR2: MOV      CHRE,STRCHR      ;SET CHAR SWITCH TO SPACE
1816 004752 012737 000105 001050 MOV      #105,SAVE      ;SEND E
1817 004760 013777 001050 174014 CR3: MOV      SAVE,@LPB      ;LOAD BUFFER
1818 004766 005237 001036      INC      CHRCNT      ;INCREMENT CHAR COUNT
1819 004772 001351      BNE      CRO      ;BRANCH IF NOT DONE
1820 004774 005237 001044      INC      CYCcnt      ;INCREMENT CYCLE COUNT
1821 005000 001422      BEQ      CR5      ;BRANCH IF FINISHED OVERPRINTS
1822 005002 012777 000015 173772 MOV      #15,@LPB      ;SEND CR
1823 005010 105777 173764      TSTB      @LPS      ;TEST READY
1824 005014 100375      BPL      -4      ;WAIT FOR READY
1825 005016 000137 004710      JMP      CR      ;OVERPRINT LINE
1826 005022 013737 005042 001054 CR7: MOV      CHRS,STRCHR      ;RESET CHAR SWITCH
1827 005030 012737 000040 001050 MOV      #40,SAVE      ;SEND SPACE
1828 005036 000137 004760      JMP      CR3      ;CONTINUE
1829
1830 005042 004744      CHRS: CR2
1831 005044 005022      CHRE: CR7
1832 005046 012777 000012 173726 CR5: MOV      #12,@LPB      ;SEND LF
1833 005054 105777 173720      TSTB      @LPS      ;TEST READY
1834 005060 100375      BPL      -4      ;WAIT FOR READY
1835 005062 012737 177776 001044 MOV      #-2,CYCcnt      ;RESET CYCLE COUNT
1836 005070 012737 177574 001036 MOV      #-132.,CHRCNT      ;RESET CHAR COUNT
1837 005076 005237 001042      INC      LINCNT      ;INCREMENT LINE COUNT
1838 005102 001326      BNE      CR3      ;BRANCH IF NOT DONE
1839 005104 032777 010000 173672 BIT      #BIT12,@SWR      ;LOOP ON TEST?
1840 005112 001256      BNE      CHRCHK      ;YES, LOOP
1841
1842
1843
1844      ;TEST 5
1845      ;SHUTTLE POSITIONING TEST
1846      ;SENDS PAIRS OF E'S, THEN OVER PRINTS THEM WITH SPACES AND ADDS ANOTHER
1847      ;PAIR OF E'S TO THE LINE --- THIS IS REPEATED UNTIL A FULL LINE OF E'S
1848      ;HAVE BEEN PRINTED, THEN A FULL LINE OF M'S ARE PRINTED.
1849
1850 005114 004437 010030 OVRPRT: JSR      %4,TYPINT
1851 005120 013737 012376 011724 MOV      TN05,MES15      ;SET TEST NUMBER FOR MESSAGE
1852 005126 004437 007760      JSR      %4,PRNNT      ;PRINT TEST NUMBER
1853      000006      M=M+1
1854 005132 012737 177760 001042 MOV      #-16.,LINCNT      ;SET LINE COUNT FOR 16 LINES
1855 005140 012737 177574 001036 OVR: MOV      #-132.,CHRCNT      ;SET CHAR COUNT
1856 005146 012737 177776 001044 OVRD: MOV      #-2,CYCcnt      ;SET CYCLE COUNT FOR A PAIR OF E'S
1857 005154 013737 001036 001056 MOV      CHRCNT,STRCNT      ;NO. CHARS LEFT TO PRINT
1858 005162 062737 000205 001056 ADD      #133.,STRCNT      ;NO. SPACES +1
1859 005170 012737 000040 001040 MOV      #40,CHRGEN      ;SEND SPACE
1860 005176 000406      BR      OVR2      ;BRANCH
1861 005200 012737 000105 001040 OVR4: MOV      #105,CHRGEN      ;SEND E
1862 005206 013777 001040 173566 OVR1: MOV      CHRGEN,@LPB      ;LOAD BUFFER
1863 005214 005777 173560 OVR2: TST      @LPS      ;TEST FOR ERROR
1864 005220 100006      BPL      OVR3      ;BRANCH IF NO ERROR
1865 005222 012737 000037 001052 ERR37: MOV      #37, ERcount      ;SET UP ERROR COUNT 37
1866      000040      N=N+1

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1867 005230 004537 010244 JSR %5,STAER ;REPORT ERROR SET
1868 005234 000000 HALT
1869 005236 005337 001056 OVR3: DEC STRCNT ;DECREMENT SPACE COUNTER
1870 005242 003361 BGT OVR1 ;BRANCH IF NOT DONE SPACES
1871 005244 001755 BEQ OVR4 ;BRANCH IF NOT FIRST E
1872 005246 005237 001036 INC CHRCNT ;INCREMENT CHAR COUNT
1873 005252 001437 BEQ OVR8 ;BRANCH IF DONE LINE
1874 005254 005237 001044 OVR5: INC CYCNT ;INCREMENT CYCLE COUNT
1875 005260 001352 BNE OVR1 ;CONTINUE SENDING E'S IF NOT DONE
1876 005262 012777 000015 173512 MOV #15,ALPB ;SEND CR
1877 005270 OVR6:
1878 005270 105777 173504 TSTB ALPS ;TEST READY
1879 005274 100375 BPL -4 ;WAIT FOR READY
1880 005276 005737 001036 TST CHRCNT ;LINE DONE?
1881 005302 001321 BNE OVR0 ;NO, CONTINUE OVER PRINT
1882 005304 005237 001042 INC LINCNT ;YES, INCREMENT LINE COUNT
1883 005310 001425 BEQ OVREXT ;EXIT IF DONE TEST
1884 005312 032737 000001 001042 BIT #1,LINCNT ;WHICH LINE NEXT?
1885 005320 001707 BEQ OVR ;BRANCH TO SEND E'S
1886 005322 012737 000115 001040 MOV #115,CHRCNT ;SET UP TO SEND M'S
1887 005330 012737 177573 001036 MOV #-133,CHRCNT ;SET CHAR COUNT
1888 005336 005037 001056 CLR STRCNT ;CLEAR SPACE COUNT
1889 005342 005037 001044 CLR CYCNT ;CLEAR CYCLE COUNT
1890 005346 000137 005214 JMP OVR2 ;PRINT LINE OF M'S
1891 005352 012777 000012 173422 OVR8: MOV #12,ALPB ;SEND LF
1892 005360 000137 005270 JMP OVR6 ;CONTINUE
1893 005364 032777 010000 173412 OVREXT: BIT #BIT12,ASWR ;LOOP ON TEST?
1894 005372 001250 BNE OVRPRT ;LOOP
1895
1896 ;TEST 6
1897 ;PRINT CONTROL TEST
1898 ;SENDS FULL LINE OF SAME CHARACTER THEN FULL CHAR SET
1899 ;SHOULD ONLY PRINT THE FIRST 132 CHARACTERS RECEIVED
1900
1901 005374 004437 010030 PRTCTL: JSR %4,TYPINT
1902 005400 013737 012400 011724 MOV TN06,MES15 ;SET TEST NUMBER FOR MESSAGE
1903 005406 004437 007760 JSR %4,PRNNT ;PRINT TEST NUMBER
1904 000007 M=M+1
1905 005412 012737 000060 001054 MOV #60,STRCHR ;FIRST START CHAR
1906 005420 032777 020000 173356 PRT0: BIT #BIT13,ASWR ;TEST FOR CHAR SET
1907 005426 001404 BEQ PRT1 ;BRANCH IF 64 CHARS
1908 005430 012737 177641 001034 MOV #-95,SEGCNT ;SET OVERFLOW COUNT
1909 005436 000403 BR PRT2 ;BRANCH
1910 005440 012737 177701 001034 PRT1: MOV #-63,SEGCNT ;SET OVERFLOW COUNT
1911 005446 012737 177574 001036 PRT2: MOV #-132,CHRCNT ;SET CHAR COUNT
1912 005454 013737 001054 001040 MOV STRCHR,CHRCNT ;GET START CHAR
1913 005462 005777 173312 PRT3: TST ALPS ;TEST FOR ERROR
1914 005466 100006 BPL PRT4 ;BRANCH IF NO ERROR
1915 005470 012737 000040 001052 ERR40: MOV #40, ERRCOUNT ;SET UP ERROR COUNT 40
1916 000041 N=N+1
1917 005476 004537 010244 JSR %5,STAER ;REPORT ERROR SET
1918 005502 000000 HALT ;HALT ON ERROR
1919 005504 013777 001040 173270 PRT4: MOV CHRCNT,ALPB ;LOAD BUFFER
1920 005512 005237 001036 INC CHRCNT ;INCREMENT CHAR COUNT
1921 005516 002761 BLT PRT3 ;BRANCH IF NOT 132 CHARS
1922 005520 001433 BEQ PRTA ;START OVERFLOW

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M03

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1923 005522 005237 001040

INC

CHRG

;NEXT CHAR

N03

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1924	005526	005237	001034		INC	SEGCNT	: INCREMENT OVERFLOW COUNT
1925	005532	001353			BNE	PRT3	: CONTINUE IF NOT DONE
1926	005534	012777	000012	173240	MOV	#12, @LPB	: SEND LF
1927	005542	105777	173232		TSTB	@LPS	: TEST READY
1928	005546	100375			BPL	-4	: WAIT FOR READY
1929	005550	022737	000040	001054	CMP	#40, STRCHR	: LAST START CHAR SPACE?
1930	005556	001421			BEQ	PRT6	: YES BRANCH
1931	005560	022737	000065	001054	CMP	#65, STRCHR	: LAST START CHAR 5?
1932	005566	001422			BEQ	PRT7	: YES BRANCH
1933	005570	022737	000071	001054	CMP	#71, STRCHR	: DONE?
1934	005576	001423			BEQ	PRT8	: YES
1935	005600	005237	001054		INC	STRCHR	: NO, GET NEXT START CHAR
1936	005604	000137	005420		JMP	PRT0	: CONTINUE
1937	005610	012737	000041	001040	PRTA: MOV	#41, CHGEN	: GET FIRST CHAR IN SET
1938	005616	000137	005462		JMP	PRT3	: START OVERFLOW
1939	005622	012737	000066	001054	PRT6: MOV	#66, STRCHR	: SET START CHAR TO 6
1940	005630	000137	005420		JMP	PRT0	: CONTINUE
1941	005634	012737	000040	001054	PRT7: MOV	#40, STRCHR	: SET START CHAR TO SPACE
1942	005642	000137	005420		JMP	PRT0	: CONTINUE
1943	005646	032777	010000	173130	PRT8: BIT	#BIT12, @SWR	: CHECK LOOP ON TEST
1944	005654	001247			BNE	PRTCTL	: LOOP
1945							
1946							
1947							
1948							
1949							
1950							
1951	005656	004437	010030		MLF: JSR	%4, TYPINT	
1952	005662	013737	012402	011724	MOV	TN07, MES15	: SET TEST NUMBER FOR MESSAGE
1953	005670	004437	007760		JSR	%4, PRNNT	: PRINT TEST NUMBER
1954		000010			M=M+1		
1955	005674	012737	006026	001054	MOV	#TABSTR, STRCHR	: FIRST CHAR
1956	005702	012737	177574	001036	MLFA: MOV	#-132, CHCNT	: SET CHAR COUNT
1957	005710	117737	173140	001040	MOVB	@STRCHR, CHGEN	: GET CHAR
1958	005716	001452			BEQ	MLF4	: BRANCH IF DONE
1959	005720	005777	173054		MLFO: TST	@LPS	: TEST FOR ERROR
1960	005724	100006			BPL	MLF1	: CONTINUE IF NO ERROR
1961	005726	012737	000041	001052	ERR41: MOV	#41, ERCOUNT	: SET UP ERROR COUNT 41
1962		000042			N=N+1		
1963	005734	004537	010244		JSR	%5, STAER	: REPORT ERROR
1964	005740	000000			HALT		: HALT ON ERROR
1965	005742	013777	001040	173032	MLF1: MOV	CHGEN, @LPB	: LOAD BUFFER
1966	005750	005237	001036		INC	CHCNT	: INCREMENT CHAR COUNT
1967	005754	001361			BNE	MLFO	: CONTINUE
1968	005756	117737	173072	001042	MOVB	@STRCHR, LINCNT	: GET ASCII LINE COUNT
1969	005764	042737	177770	001042	BIC	#177770, LINCNT	: MAKE OCTAL
1970	005772	005237	001042		INC	LINCNT	: ADD 1
1971	005776	012777	000012	172776	MLF2: MOV	#12, @LPB	: SEND LF
1972	006004	105777	172770		TSTB	@LPS	: TEST READY
1973	006010	100375			BPL	-4	: WAIT FOR READY
1974	006012	005337	001042		DEC	LINCNT	: DECREMENT LINE COUNT
1975	006016	001367			BNE	MLF2	: CONTINUE
1976	006020	005237	001054		INC	STRCHR	: NEXT CHAR

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


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1977 006024 000726 BR MLFA ;CONTINUE
1978
1979 006026 033462 033062 033463 TABSTR: .ASCIZ /272637463540/
1980 006034 033064 032463 030064
1981 006042 000
1982
1983 006044 .EVEN
1984
1985 006044 032777 010000 172732 MLF4: BIT #BIT12,ASWR ;CHECK LOOP ON TEST
1986 006052 001301 BNE MLF ;LOOP
1987 .EVEN
1988
1989 ;TEST 8
1990 ;HIGH SPEED PRINT TEST
1991
1992 006054 004437 010030 HSFRT: JSR %4,TYPINT
1993 006060 013737 012404 011724 MOV TN010,MES15 ;SET TEST NUMBER FOR MESSAGE
1994 006066 004437 007760 JSR %4,PRINT ;PRINT TEST NUMBER
1995 000011 M=M+1
1996 006072 032777 020000 172704 BIT #BIT13,ASWR ;CHECK CHAR SET
1997 006100 001007 BNE HS00A ;BRANCH IF 96 CHAR SET
1998 006102 012737 000140 001060 MOV #140,LEGCHR ;LEGAL CHK
1999 006110 012737 000100 001062 MOV #100,NUMCHR ;#CHARS
2000 006116 000406 BR HS00 ;CONTINUE
2001 006120 012737 000200 001060 HS00A: MOV #200,LEGCHR ;LEGAL CHECK
2002 006126 012737 000140 001062 MOV #140,NUMCHR ;#CHARS
2003 006134 012737 000040 001054 HS00: MOV #40,STRCHR ;SET UP FIRST LINE
2004 006142 012737 000177 001042 MOV #127,LINCNT ;SET LINE COUNT FOR 2 PAGES
2005 006150 012737 177574 001036 HS0: MOV #-132,CHRCNT ;SET CHAR COUNT
2006 006156 012737 177757 001044 MOV #-17,CYCCNT ;SET GROUP COUNT
2007 006164 013737 001054 001040 MOV STRCHR,CHRCNT ;STORE START CHAR
2008 006172 005777 172604 HS1: TST 0LPB ;TEST FOR ERROR
2009 006176 100006 BPL HS2 ;BRANCH IF NO ERROR
2010 006200 012737 000042 001052 ERR42: MOV #42, ERRCOUNT ;SET UP ERROR COUNT 42
2011 000043 N=N+1
2012 006206 004537 010244 JSR %5,STAER ;REPORT ERROR SET
2013 006212 000000 HALT ;HALT ON ERROR
2014 006214 013777 001040 172560 HS2: MOV CHRCNT,0LPB ;LOAD BUFFER
2015 006222 005237 001036 INC CHRCNT ;INCREMENT CHAR COUNT
2016 006226 001424 BEQ HS4 ;BRANCH IF DONE LINE
2017 006230 005237 001040 INC CHRCNT ;NEXT CHAR
2018 006234 005237 001044 INC CYCCNT ;INCREMENT GROUP COUNT
2019 006240 001410 BEQ HS3 ;BRANCH IF DONE GROUP
2020 006242 023737 001060 001040 CMP LEGCHR,CHRCNT ;LEGAL CHAR?
2021 006250 001350 BNE HS1 ;BRANCH AND CONTINUE IF LEGAL CHAR
2022 006252 163737 001062 001040 SUB NUMCHR,CHRCNT ;MAKE LEGAL
2023 006260 000744 BR HS1 ;CONTINUE
2024 006262 013737 001054 001040 HS3: MOV STRCHR,CHRCNT ;GET FIRST CHAR IN GROUP
2025 006270 012737 177757 001044 MOV #-17,CYCCNT ;RESET CYCLE COUNT
2026 006276 000735 BR HS1 ;CONTINUE
2027 006300 012777 000012 172474 HS4: MOV #12,0LPB ;SEND LF
2028 006306 105777 172466 TSTB 0LPB ;TEST READY
2029 006312 100375 BPL -4 ;WAIT FOR READY
2030 006314 005337 001042 DEC LINCNT ;DECREMENT LINE COUNT
2031 006320 002413 BLT HS6 ;EXIT TEST IF DONE
2032 006322 162737 000004 001054 SUB #4,STRCHR ;SKIP 4 LINES ON DRUM, FIND START CHAR

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C04

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2033 006330 022737 000040 001054      CMP      #40,STCHR      :START CHAR A LEGAL CHAR?
2034 006336 003704      BLE      HSO        :CONTINUE IF LEGAL START CHAR
2035 006340 062737 000100 001054      ADD      #100,STCHR    :MAKE LEGAL AND CONTINUE
2036 006346 000700      BR       HSO        :CONTINUE
2037 006350 032777 010000 172426 HS6:   BIT      #BIT12,BSWR    :LOOP ON TEST?
2038 006356 001236      BNE      HSPRT      :LOOP
2039
2040      :TEST 9
2041      :WORST CASE NOISE TEST
2042      :SINGLE CHAR. ACROSS ALL COLS.
2043
2044 006360 004437 010030      SNGCHR: JSR      %4,TYPINT
2045 006364 013737 012406 011724      MOV      TN011,MES15      :SET TEST NUMBER FOR MESSAGE
2046 006372 004437 007760      JSR      %4,PRNT      :PRINT TEST NUMBER
2047      M=M+1
2048 006376 032777 020000 172400      BIT      #BIT13,BSWR    :TEST CHAR SET
2049 006404 001404      BEQ      S2        :BRANCH IF 64
2050 006406 012737 177640 001042      MOV      #-96.,LINCNT  :96 CHAR.
2051 006414 000403      BR       .+10      :BRANCH
2052 006416 012737 177700 001042 S2:   MOV      #-64.,LINCNT  :64 CHAR.
2053 006424 012737 000040 001040      MOV      #40,CHGEN     :SET UP SPACE
2054 006432 012737 177574 001036 S2A:  MOV      #-132.,CHRCNT :SET CHAR COUNT FOR 132
2055 006440 005777 172334 S1:   TST      QLP5        :TEST FOR ERRORS
2056 006444 100006      BPL      XS1X        :BRANCH IF NO ERRORS
2057 006446 012737 000043 001052 ERR43: MOV      #43,   ERCOUNT :SET UP ERROR COUNT 43
2058      N=N+1
2059 006454 004537 010244      JSR      %5,STAER      :REPORT ERROR
2060 006460 000000      HALT                     :HALT ON ERROR
2061 006462 013777 001040 172312 XS1X:  MOV      CHGEN,QLPB    :LOAD PRINTER BUFFER
2062 006470 005237 001036      INC      CHRCNT      :INCREMENT CHAR COUNT
2063 006474 001361      BNE      S1        :CONTINUE IF NOT DONE LINE
2064 006476 012777 000012 172276 S4X2:  MOV      #12,QLPB    :ISSUE LINE FEED
2065 006504 105777 172270      TSTB     QLP5        :TEST READY
2066 006510 100375      BPL      .-4        :WAIT FOR READY
2067 006512 005237 001040      INC      CHGEN     :+1 CHAR.
2068 006516 005237 001042      INC      LINCNT     :+1 LINE COUNT
2069 006522 002743      BLT      S2A        :CONTINUE IF NOT DONE
2070 006524 001764      BEQ      S4X2      :SEND BLANK LINE AT END OF TEST
2071 006526 032777 010000 172250 LPS7:  BIT      #BIT12,BSWR    :CHECK TO LOOP ON TEST
2072 006534 001311      BNE      SNGCHR      :LOOP ON TEST
2073
2074
2075      :TEST 10
2076      :DRUM PATTERN CHARACTER TEST
2077
2078
2079 006536 004437 010030      ROTATE: JSR      %4,TYPINT
2080 006542 013737 012410 011724      MOV      TN012,MES15      :SET TEST NUMBER FOR MESSAGE
2081 006550 004437 007760      JSR      %4,PRNT      :PRINT TEST NUMBER
2082      M=M+1
2083 006554 032777 020000 172222      BIT      #BIT13,BSWR    :TEST CHAR SET
2084 006562 001012      BNE      ROT0        :SKIP IF 96 CHAR
2085 006564 012737 000137 001042      MOV      #137,LINCNT   :LAST CHAR
2086 006572 012737 000140 001060      MOV      #140,LEGCHR   :LEGAL CHK
2087 006600 012737 000100 001062      MOV      #100,NUMCHR   :#CHARS
2088 006606 000411      BR       ROT1        :CONTINUE

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004

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2089 006610 012737 000177 001042 ROT0: MOV #177,LINCNT :LAST CHAR
2090 006616 012737 000200 001060 MOV #200,LEGCHR :LEGAL CHK
2091 006624 012737 000140 001062 MOV #140,NUMCHR :#CHARS
2092 006632 005037 001044 ROT1: CLR CYCCNT :CLEAR CYCLE COUNT
2093 006636 005237 001044 ROT2: INC CYCCNT :INC CYCLE COUNT
2094 006642 005037 001040 CLR CHRCNT :CLEAR POINTER
2095 006646 005237 001040 ROT3: INC CHRCNT :INC POINTER
2096 006652 013737 001040 001054 MOV CHRCNT,STCHR :STORE POINTER
2097 006660 063737 001042 001054 ADD LINCNT,STCHR :FIND CHAR
2098 006666 023737 001054 001060 CMP STCHR,LEGCHR :LEGAL?
2099 006674 002403 BLT ROT4 :BRANCH IF LEGAL
100 006676 163737 001062 001054 SUB NUMCHR,STCHR :MAKE LEGAL
101 006704 005777 172070 ROT4: TST ALPS :TEST FOR ERRORS
102 006710 100006 BPL ROT5 :BRANCH IF NO ERRORS
103 006712 012737 000044 001052 ERR44: MOV #44, ERCOUNT :SET UP ERROR COUNT 44
104 000045 N=N+1
105 006720 004537 010244 JSR %5,STAER :REPORT ERROR
106 006724 000000 HALT :HALT ON ERROR
107 006726 013777 001054 172046 ROT5: MOV STCHR,ALPB :LOAD BUFFER
108 006734 023727 001040 000021 CMP CHRCNT,#17. :DONE GROUP?
109 006742 001341 BNE ROT3 :NO GET NEXT CHAR
110 006744 023727 001044 000010 CMP CYCCNT,#8. :DONE LINE?
111 006752 001331 BNE ROT2 :NO NEXT GROUP
112 006754 012777 000012 172020 MOV #12,ALPB :YES SEND LF
113 006762 105777 172012 TSTB ALPS :TEST READY
114 006766 100375 BPL -4 :WAIT FOR READY
115 006770 005337 001042 DEC LINCNT :DECREMENT LINE COUNT
116 006774 023727 001042 000037 CMP LINCNT,#37 :DONE?
117 007002 003313 BGT ROT1 :NO NEXT LINE
118 007004 032777 010000 171772 BIT #BIT12,ASWR :LOOP ON TEST?
119 007012 001251 BNE ROTATE :LOOP
120
121 ;TEST 11 ----- SPURIOUS HAMMER FIRING TEST
122 ;LEFT AND RIGHT TRIANGLES
123
124 ; STARTING WITH A LEFT TRIANGLE
125
126 007014 004437 010030 LFTTR: JSR %4,TYPINT
127 007020 013737 012412 011724 MOV TN013,MES15 :SET TEST NUMBER FOR MESSAGE
128 007026 004437 007760 JSR %4,PRINT :PRINT TEST NUMBER
129 000014 M=M+1
130 007032 012737 000204 001042 LFT: MOV #132,LINCNT :SET LINE COUNT
131 007040 013737 001042 001036 LFT0: MOV LINCNT,CHRCNT :STORE CHAR COUNT
132 007046 012737 177757 001044 MOV #-17,CYCCNT :SET GROUP COUNT
133 007054 013737 001036 001040 MOV CHRCNT,CHRCNT :FIND FIRST CHAR ON LINE...
134 007062 022737 000022 001040 LFT1: CMP #18.,CHRCNT :MORE THAN 17 CHARS?
135 007070 003004 BGT LFT2 :BRANCH IF LESS THAN 17
136 007072 162737 000021 001040 SUB #17.,CHRCNT :SUBTRACT 17, IF > 17
137 007100 000770 BR LFT1 :CONTINUE
138 007102 005437 001040 LFT2: NEG CHRCNT :NEGATE CHRCNT
139 007106 062737 000100 001040 ADD #100,CHRCNT :START CHAR IN CHRCNT
140 007114 013737 001040 001054 MOV CHRCNT,STCHR :STORE STARTING CHAR
141 007122 005777 171652 LFT3: TST ALPS :TEST FOR ERROR
142 007126 100006 BPL LFT4 :CONTINUE IF NO ERROR
143 007130 012737 000045 001052 ERR45: MOV #45, ERCOUNT :SET UP ERROR COUNT 45
144 000046 N=N+1

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E04

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2145	007136	004537	010244		JSR	%5,STAER	:REPORT ERROR SET
2146	007142	000000			HALT		:HALT ON ERROR
2147	007144	013777	001040	171630	LFT4:	MOV	:LOAD BUFFER
2148	007152	005337	001036		DEC	CHRCNT	:DECREMENT CHAR COUNT
2149	007156	001415			BEQ	LFT6	:BRANCH IF DONE LINE
2150	007160	005237	001044		INC	CYCCNT	:INCREMENT GROUP COUNT
2151	007164	001403			BEQ	LFT5	:BRANCH IF DONE GROUP
2152	007166	005237	001040		INC	CHRCNT	:NEXT CHAR IN GROUP
2153	007172	000753			BR	LFT3	:CONTINUE
2154	007174	013737	001054	001040	LFT5:	MOV	:GET START CHAR AGAIN
2155	007202	012737	177757	001044	MOV	%-17.,CYCCNT	:RESET GROUP COUNT
2156	007210	000744			BR	LFT3	:CONTINUE
2157	007212	012777	000012	171562	LFT6:	MOV	:SEND LF
2158	007220	105777	171554		TSTB	%12,%LPB	:TEST READY
2159	007224	100375			BPL	%-4	:WAIT FOR READY
2160	007226	005337	001042		DEC	LINCNT	:DECREMENT LINE COUNT
2161	007232	003302			BGT	LFT0	:BRANCH IF NOT DONE
2162	007234	001766			BEQ	LFT6	:SEND BLANK LINE AT END OF TEST
2163	007236	032777	010000	171540	BIT	%BIT12,%SWR	:LOOP ON TEST?
2164	007244	001263			BNE	LFTTR	:LOOP
2165							
2166							
2167							
2168							
2169	007246	012737	000001	001042	RTTR:	MOV	:INITIALIZE LINE
2170	007254	012737	000077	001040	RT1:	MOV	:FIRST CHAR IS A ?
2171	007262	013737	001042	001044	MOV	%77,CHRCNT	:SAVE NO. CHARS ON LINE
2172	007270	012737	177757	001056	MOV	LINCNT,CYCCNT	:SET GROUP COUNT
2173	007276	012737	000204	001036	MOV	%-17.,STRCNT	:NO. CHARS PER LINE
2174	007304	163737	001042	001036	MOV	%132.,CHRCNT	:SUBTRACT NO. OF CHARS ON LINE
2175	007312	001425			SUB	LINCNT,CHRCNT	:BRANCH IF NO SPACES ON THIS LINE
2176	007314	005777	171460		BEQ	RT3	:TEST FOR ERROR
2177	007320	100006			TST	%LPB	:CONTINUE IF NO ERROR
2178	007322	012737	000046	001052	BPL	RT2A	:SET UP ERROR COUNT 46
2179		000047			MOV	%46, ERCOUNT	
2180	007330	004537	010244		N=N+1		
2181	007334	000000			JSR	%5,STAER	:REPORT ERROR SET
2182	007336	012777	000040	171436	HALT		:HALT ON ERROR
2183	007344	005237	001056		MOV	%40,%LPB	:LOAD BUFFER
2184	007350	001003			INC	STRCNT	:INCREMENT GROUP COUNT
2185	007352	012737	177757	001056	BNE	RT2AA	:BRANCH IF NOT DONE GROUP
2186	007360	005337	001036		MOV	%-17.,STRCNT	:RESET GROUP COUNT
2187	007364	001353			DEC	CHRCNT	:DECREMENT SPACE COUNT
2188	007366	005777	171406		BNE	RT2	:BRANCH IF NOT DONE SPACES
2189	007372	100006			TST	%LPB	:TEST FOR ERROR
2190	007374	012737	000047	001052	BPL	RT3A	:CONTINUE IF NO ERROR
2191		000050			MOV	%47, ERCOUNT	:SET UP ERROR COUNT 47
2192	007402	004537	010244		N=N+1		
2193	007406	000000			JSR	%5,STAER	:REPORT ERROR SET
2194	007410	013777	001040	171364	HALT		:HALT ON ERROR
2195	007416	005237	001040		MOV	CHRCNT,%LPB	:LOAD BUFFER
2196	007422	005237	001056		INC	CHRCNT	:NEXT CHAR
2197	007426	001006			INC	STRCNT	:INCREMENT GROUP COUNT
2198	007430	012737	177757	001056	BNE	RT3B	:BRANCH IF NOT DONE GROUP
2199	007436	162737	000021	001040	MOV	%-17.,STRCNT	:RESET GROUP COUNT
2200	007444	005337	001044		SUB	%17.,CHRCNT	:GET FIRST GROUP CHAR
					DEC	CYCCNT	:DECREMENT CHAR COUNT

:TEST 11 ----- CONTINUED
:RIGHT TRIANGLE

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2201 007450 001346      BNE      RT3          ;CONTINUE
2202 007452 012777 000012 171322      MOV      #12,ALPB      ;SEND LF
2203 007460 105777      TSTB     ALPS          ;TEST READY
2204 007464 100375      BPL      -4          ;WAIT FOR READY
2205 007466 005237 001042      INC      LINCNT      ;INCREMENT LINE COUNT
2206 007472 022737 000205 001042      CMP      #133.,LINCNT ;DONE?
2207 007500 003265      BGT      RT1          ;BRANCH IF NOT DONE
2208 007502 032777 010000 171274      BIT      #BIT12,ASWR ;LOOP ON TEST?
2209 007510 001256      BNE      RTTR         ;LOOP
2210
2211      ;TEST 12
2212      ;HAMMER ALIGNMENT
2213
2214 007512 004437 010030      HAMALN: JSR      %4,TYPINT
2215 007516 013737 012414 011724      MOV      TNO14,MES15      ;SET TEST NUMBER FOR MESSAGE
2216 007524 004437 007760      JSR      %4,PRNT        ;PRINT TEST NUMBER
2217      M=M+1
2218 007530 012737 177701 001042      MOV      #-63.,LINCNT ;SET UP FOR 63 LINES
2219 007536 012737 177574 001036      HAM1X: MOV      #-132.,CHRCNT ;SET CHAR COUNT
2220 007544 005777 171230      HAM2:  TST      ALPS          ;CHECK FOR ERROR
2221 007550 100006      BPL      XHAM1        ;BRANCH IF NO ERROR
2222 007552 012737 000050 001052      ERR50: MOV      #50, ERRCOUNT ;SET UP ERROR COUNT 50
2223      N=N+1
2224 007560 004537 010244      JSR      %5,STAER        ;REPORT ERROR OCCURRED
2225 007564 000000      HALT          ;HALT ON ERROR
2226      XHAM1:
2227 007566 105777 171206      TSTB     ALPS          ;TEST READY
2228 007572 100375      BPL      -4          ;WAIT FOR READY
2229 007574 100375      BPL      -4          ;WAIT FOR READY
2230 007576 012777 000105 171176      XHAM1X: MOV      #105,ALPB ;TRANSMIT E TO PRINTER
2231 007604 005237 001036      INC      CHRCNT        ;+1 CHAR COUNT
2232 007610 001355      BNE      HAM2          ;TRANSMIT ANOTHER CHAR.
2233 007612 012777 000012 171162      MOV      #12,ALPB      ;TRANSMIT LINE FEED
2234 007620 105777 171154      TSTB     ALPS          ;TEST READY
2235 007624 100375      BPL      -4          ;WAIT FOR READY
2236 007626 005237 001042      INC      LINCNT        ;+1 TO COUNT
2237 007632 001341      BNE      HAM1X        ;GO DO NEXT LINE
2238 007634 032777 010000 171142      BIT      #BIT12,ASWR ;CHECK TO LOOP ON TEST
2239 007642 001323      BNE      HAMALN       ;LOOP ON TEST
2240
2241 007644 032777 040000 171132      ;BIT14,ASWR ;DAVFU AVAILABLE?
2242 007652 001402      EMB          ;NO, RECYCLE PRINTING TESTS
2243 007654 000137 012424      JMP      DAVFU         ;YES, DO DAVFU PRINTING TESTS
2244
2245 007660 013700 000042      HAMX:  MOV      #42,RO
2246 007664 001405      BEQ      DOAGN        ;DOAGN
2247 007666 000005      RESET
2248
2249      LOGICAL: JSR      PC,(RO)
2250      NOP
2251      NOP
2252      NOP
2253
2254 007700 000137 004066      DOAGN: JMP      TEST2      ;RESTART
2255
2256      ;MISC. ROUTINES

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G04

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;ROUTINE TO INITIALIZE PRINTER
;ENTER FROM JSR %S, PRINT

PRINT: TST      3LPS          ;TEST FOR ERROR
        BMI     PRINO        ;BRANCH IF ERROR
        TSTB    3LPS          ;TEST FOR READY
        BMI     RDYOK         ;READY SET OK
PRINO:  ADD     #2,%S          ;SET UP FOR ERROR REPORT
        RTS     %S            ;REPORT READY NOT SET
RDYOK:  MOV     #14,3LPB       ;ISSUE FORM FEED
        TSTB    3LPS          ;TEST FOR READY NOT SET
        BPL     NTRDY         ;READY NOT SET OK
        ADD     #2,%S          ;SET UP FOR REPORT
        RTS     %S            ;EXIT AND REPORT

NTRDY:  TSTB    3LPS          ;TEST READY
        BPL     -4            ;WAIT FOR READY
        RTS     %S            ;READY SET EXIT

;ROUTINE TO OUTPUT ASCII MESSAGES ON THE LINE PRINTER

PRNT:  MOV     #MES14,PRMSG    ;PRINT TEST NUMBER
        TST     3LPS          ;TEST FOR ERROR
        BPL     RINT          ;BRANCH IF OK
ERR51: MOV     #51, ERRCOUNT    ;SET UP ERROR COUNT 51
        N=N+1
        JSR     %S,STAER       ;REPORT ERROR SET
        HALT                    ;HALT ON ERROR
RINT:  MOV     LPS,TPS          ;SET VECTORS -
        MOV     LPB,TPB        ;TO PRINT ON LINE PRINTER
        EMT     +0             ;PRINT
        PRMSG: MES14           ;MESSAGE
        TYPINT: MOV     #177564,TPS ;RESET VECTORS
        MOV     #177566,TPB      ;FOR TTY
        RTS     %4             ;RETURN

;SUBROUTINE TO OUTPUT ASCII MESSAGES ON TELETYPE PRINTER

TYP:   MOV     3%6,%0          ;GET ADDR. THAT CONTAINS MESS.
        ADD     #2,3%6          ;SET UP EXIT
        MOV     3%0,%0          ;ADDRESS OF MESSAGE IN RO
TYPA:  MOVB    (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

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2313 010112 000761          BR      TYPD      ;NEXT CHAR IN MESSAGE
2314 010114 113777 010160 170670 TYPD:  MOVB   TYPDAT,ATPB ;OUTPUT CHARACTER TO PRINTER
2315 010122 105777 170670 TYPD:  TSTB   ATPB
2316 010126 100375          BPL      -4
2317 010130 000207          RTS      %7
2318 010132 112737 000012 010160 TYPF:  MOVB   #12,TYPDAT ;CHAR. TYPED EXIT
2319 010140 004737 010114          JSR      %7,TYPD ;OUTPUT LF
2320 010144 112737 000015 010160 TYPG:  MOVB   #15,TYPDAT ;GO TYPE CHAR.
2321 010152 004737 010114          JSR      %7,TYPD ;OUTPUT CR
2322 010156 000737          BR      TYPD      ;GO TYPE CHAR.
2323 010160 000000          TYPD:  J
2324
2325
2326
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2333
2334 010162 013537 010242          CONV:  MOV     @5+,ACNVX ;ADDRSS OF NO. TO BE CONVERTED
2335 010166 012501          MOV     (5)+,%1 ;ADDRESS OF MESSAGE
2336 010170 012502          MOV     (5)+,%2 ;NUMBER OF ASCII CHARACTERS
2337 010172 060201          ADD     %2,%1 ;FIRST CHAR ADDRESS
2338 010174 013703 010242          ACVN:  MOV     ACNVX,%3 ;STORE NUMBER
2339 010200 042703 177770          BIC     #177770,%3 ;ISOLATE LEAST SIGNIFICANT BIT
2340 010204 062703 000060          ADD     #60,%3 ;SET UP ASCII CHARACTER
2341 010210 110341          MOVB    %3,-(1) ;STORE CHARACTER
2342 010212 000241          CLC          ;GET NEXT SIGNIFICANT BIT ...
2343 010214 006037 010242          ROR     ACNVX
2344 010220 000241          CLC
2345 010222 006037 010242          ROR     ACNVX
2346 010226 000241          CLC
2347 010230 006037 010242          ROR     ACNVX
2348 010234 005302          DEC     %2 ;-1 FROM ASCII CHAR. CNT
2349 010236 001356          BNE     ACVN ;CONVERT NEXT CHARACTER
2350 010240 000205          RTS      %5 ;EXIT! CONVERSION DONE
2351
2352 010242 000000          ACNVX:  0 ;WORK REGISTER
2353
2354
2355
2356
2357 010244 004537 010162          STAER: JSR     %5,CONV ;CONVERT OCTAL TO ASCII
2358 010250 001052          ERCOUNT
2359 010252 010274          HED1
2360 010254 000003          3
2361 010256 104000          EMT      +0 ;TYPE ERROR MESSAGE
2362 010260 010274          HED1
2363 010262 005777 170516          TST     @SWR ;TEST FOR HALT ON ERROR
2364 010266 100401          BMI     .+4 ;BRANCH IF NO HALT WANTED
2365 010270 000000          HALT
2366 010272 000205          RTS      %5 ;RETURN
2367
010274 020040 020040 051105 HED1:  .ASCIZ  /  ERROR COUNT%

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010315	105	051122	051117	MESA:	.ASCIZ	/ERROR SET OK - CLEAR & TURN ON LINE%/
010362	051105	047522	020122	MESB:	.ASCIZ	/ERROR SET OK - CLEAR AND TRY NEXT CHANNEL%/
010435	120	044522	052116	MESC:	.ASCIZ	/PRINT SPEED CHECK USING MANUAL TIMING%/
010503	120	052125	051440		.ASCIZ	/PUT SWITCH 0 UP TO START TIMING%/
010543	120	052125	051440		.ASCIZ	/PUT SWITCH 0 DOWN AT END OF 1 MINUTE%/
010611	123	040524	052122	MESDD:	.ASCIZ	/STARTING DAVFU PRINTING TESTS%/
010650	046045	030120	020065	MES1:	.ASCIZ	/LPOS LINE PRINTER TEST%/
010701	122	051505	040524	MES2:	.ASCIZ	/RESTART ADDRESS 600%/
010726	047520	042527	020122	MES3:	.ASCIZ	/POWER ON - TURN ON LINE%/
010757	117	020116	044514	MES4:	.ASCIZ	/ON LINE OK - TRY TORN PAPER SWITCH%/
011023	122	040505	054504	MES5:	.ASCIZ	/READY SET OK - TRY DRUM GATE SWITCH%/
011070	051105	047522	020122	MES6:	.ASCIZ	/ERROR SET OK - TURN ON LINE%/
	011126				.EVEN	
011126	042522			MES7A:	.ASCIZ	/RE/
011130	042523	020124	047524	MES7:	.ASCIZ	/SET TOP OF FORM SWITCH TO /
011164	020040	020040	044440	MES8:	.ASCIZ	/ INCHES%/
	011202				.EVEN	
011202	026455	026455	026455	MES9:	.ASCIZ	/----- THIS LINE SHOULD BE /
011277	040	020040	020040	MES10:	.ASCIZ	/ INCHES FROM THE LAST LINE -----
011410	005012			MES11A:	.ASCIZ	<12><12>
011412	051120	047111	020124	MES11:	.ASCIZ	/PRINT SPEED IS APPROXIMATELY /
011450	020040	020040	046040	MES12:	.ASCIZ	/ LINES PER MINUTE%/
011477	055	026455	026455	MES13:	.ASCIZ	/-----/
011561	055	026455	026455		.ASCIZ	/-----/
011643	055	026455	026455		.ASCIZ	/-----#/
	011706				.EVEN	
011706	005012	042524	052123	MES14:	.ASCIZ	<12><12>/TEST NUMBER /
011724	020040	005012	000012	MES15:	.ASCIZ	/ /<12><12><12>
					.EVEN	
011732	044124	051511	046040	MES16:	.ASCIZ	/THIS LINE SHOULD BE PRINTED#/
011767	040	020040	020040	MES17:	.ASCIZ	/ ALL ON ONE LINE --- IF SLEWED 0 LINES%/
					.EVEN	
012072	026455	026455	026455	MES18:	.ASCIZ	/----- THERE SHOULD BE /
012164	020040	020040	020040	MES19:	.ASCIZ	/ BLANK LINES BEFORE THIS LINE -----
					.EVEN	
012300	052040	051505	044524	MES20:	.ASCIZ	/ TESTING CHANNEL SLEWING USING CHANNEL NO. /
012354	020040	000		MES20A:	.ASCIZ	/ /
	012360				.EVEN	
012360	030504			TNDV1:	.ASCIZ	/D1/ ;TEST NUMBERS FOR DAVFU TESTS
012362	031104			TNDV2:	.ASCIZ	/D2/
012364	031504			TNDV3:	.ASCIZ	/D3/
012366	020061			TN01:	.ASCIZ	/1 /
012370	020062			TN02:	.ASCIZ	/2 /
012372	020063			TN03:	.ASCIZ	/3 /
012374	020064			TN04:	.ASCIZ	/4 /
012376	020065			TN05:	.ASCIZ	/5 /
012400	020066			TN06:	.ASCIZ	/6 /
012402	020067			TN07:	.ASCIZ	/7 /
012404	020070			TN010:	.ASCIZ	/8 /
012406	020071			TN011:	.ASCIZ	/9 /
012410	030061			TN012:	.ASCIZ	/10/
012412	030461			TN013:	.ASCIZ	/11/
012414	031061			TN014:	.ASCIZ	/12/
012416	031461			TN015:	.ASCIZ	/13/
012420	032061			TN016:	.ASCIZ	/14/
012422	032461			TN017:	.ASCIZ	/15/

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

```
:TESTS D1 AND D2
:CHECK DAVFU LINE COUNT SLEWING
```

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0368      ;DAVFU PRINTING TESTS IF DAVFU IS AVAILABLE -- SET SWITCH 14
0369
0370
0371      ;TESTS D1 AND D2
0372      ;CHECK DAVFU LINE COUNT SLEWING
0373
0374      012424 004437 010030      DAVFU: JSR      %4,TYPINT      ;INITIALIZE
0375      012430 013737 014454 012166      MOV      SPSP,MES19+2
0376      012436 104000      EMT      +0      ;TYPE MESSAGE
0377      012440 010611      MESDD      ;STARTING DAVFU TESTS
0378      012442 012737 000220 013136      MOV      #220,DAVI1      ;SET DAVFU INSTRUCTIONS
0379      012450 012737 000221 013140      MOV      #221,DAVI2
0380      012456 013737 012360 011724      MOV      TNDV1,MES15      ;SET TEST NUMBER FOR MESSAGE
0381      012464 004437 007760      JSR      %4,PRNNT      ;PRINT TEST NUMBER
0382      012470 012737 013070 001040      DAV0: MOV      #DAVTAB,CHRGEN      ;SET TABLE POINTER
0383      012476 005777 166276      DAV00: TST      @LPS      ;TEST FOR ERROR
0384      012502 100010      BPL      DAV1      ;BRANCH IF NO ERROR
0385      012504 012737 000052 001052      ERR52: MOV      #52,      ERCOUNT      ;SET UP ERROR COUNT 52
0386      000053      N=N+1
0387      012512 004537 010244      JSR      %5,STAER      ;REPORT ERROR SET
0388      012516 000000      HALT      ;HALT ON ERROR
0389      012520 000137 012470      JMP      DAV0      ;RESTART TEST
0390      012524 017777 166310 166250      DAV1: MOV      @CHRGEN,@LPB      ;LOAD DAVFU
0391      012532 062737 000002 001040      ADD      #2,CHRGEN      ;INCREMENT TABLE POINTER
0392      012540 005777 166274      TST      @CHRGEN      ;TEST IF DONE LOAD
0393      012544 001405      BEQ      D5      ;CONTINUE IF DONE
0394      012546 105777 166226      TSTB     @LPS      ;TEST READY
0395      012552 100375      BPL      -4      ;WAIT FOR READY
0396      012554 000137 012476      JMP      DAV00
0397      012560 012737 000002 001044      D5:  MOV      #2,CYCONT      ;SET CYCLE COUNT
0398      012566 012737 011732 010026      D0:  MOV      #MES16,PRMSG      ;SET MESSAGE ADDRESS
0399      012574 004437 010010      JSR      %4,RINT      ;PRINT MESSAGE
0400      012600 005777 166174      TST      @LPS      ;TEST FOR ERROR
0401      012604 100006      BPL      D1      ;CONTINUE IF NO ERROR
0402      012606 012737 000053 001052      ERR53: MOV      #53,      ERCOUNT      ;SET UP ERROR COUNT 53
0403      000054      N=N+1
0404      012614 004537 010244      JSR      %5,STAER      ;REPORT ERROR SET
0405      012620 000000      HALT      ;HALT ON ERROR
0406      012622 013777 013136 166152      D1:  MOV      DAVI1,@LPB      ;SEND DAVFU INSTRUCTION, SKIP 0 LINES
0407      012630 105777 166144      TSTB     @LPS      ;TEST READY
0408      012634 100375      BPL      -4      ;WAIT FOR READY
0409      012636 012737 011767 010026      MOV      #MES17,PRMSG      ;SET PRINTER MESSAGE ADDRESS
0410      012644 004437 010010      JSR      %4,RINT      ;PRINT MESSAGE
0411      012650 012737 012072 010026      MOV      #MES18,PRMSG      ;SET MESSAGE ADDRESS
0412      012656 013737 013140 001040      MOV      DAVI2,CHRGEN      ;FIRST DAVFU INSTRUCTION
0413      012664 012737 012366 001054      MOV      #TN01,STRCHR      ;SET TABLE POINTER
0414      012672 012737 000017 001036      MOV      #15.,CHRCNT      ;SET TABLE COUNT
0415      012700 005777 166074      D2:  TST      @LPS      ;TEST FOR ERROR
0416      012704 100006      BPL      D3      ;CONTINUE IF NO ERRORS
0417      012706 012737 000054 001052      ERR54: MOV      #54,      ERCOUNT      ;SET UP ERROR COUNT 54
0418      000055      N=N+1
0419      012714 004437 010244      JSR      %4,STAER      ;REPORT ERROR SET
0420      012720 000000      HALT      ;HALT ON ERROR

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2421	012722	013777	001040	166052	D3:	MOV	CHRGEN,ALPB	;SEND DAVFU INSTR.
2422	012730	105777	166044			TSTB	ALPS	;TEST READY
2423	012734	100375				BPL	-4	;WAIT FOR READY
2424	012736	017737	166112	012164		MOV	@STRCHR,MES19	;SET PRINTER MESSAGE
2425	012744	004437	010010			JSR	%4,RINT	;PRINT MESSAGE
2426	012750	005337	001036			DEC	CHRCNT	;DEC TABLE COUNT
2427	012754	001407				BEQ	D4	;EXIT TEST IF DONE
2428	012756	005237	001040			INC	CHRGEN	;NEXT DAVFU INSTR.
2429	012762	062737	000002	001054		ADD	#2,STRCHR	;INC TABLE POINTER
2430	012770	000137	012700			JMP	D2	;CONTINUE
2431	012774	005337	001044		D4:	DEC	CYCCNT	;DEC CYCLE COUNT
2432	013000	001415				BEQ	DEXD	;EXIT IF DONE
2433	013002	062737	000140	013136		ADD	#140,DAVI1	;CHANGE DAVFU INSTR.
2434	013010	062737	000140	013140		ADD	#140,DAVI2	;CHANGE DAVFU INSTR.
2435	013016	013737	012362	011724		MOV	TNDAY2,MES15	;SET TEST NUMBER FOR MESSAGE
2436	013024	004437	007760			JSR	%4,PRNNT	;PRINT TEST NUMBER
2437	013030	000137	012566			JMP	D0	;RETEST LINE COUNT SLEWING
2438	013034	012737	000220	013136	DEXD:	MOV	#220,DAVI1	;RESET DAVFU INSTR.
2439	013042	012737	000221	013140		MOV	#221,DAVI2	;RESET DAVFU INSTR.
2440	013050	032777	010000	165726		BIT	#BIT12,@SWR	;LOOP ON TEST?
2441	013056	001002				BNE	1\$	;LOOP
2442	013060	000137	013142			JMP	DAV2	;NEXT TEST
2443	013064	000137	012424		1\$:	JMP	DAVFU	;LOOP
2444								
2445								
2446	013070	000356			DAVTAB:	356		;DAVFU LOAD TABLE
2447	013072	000001				1		
2448	013074	000002				2		
2449	013076	000003				3		
2450	013100	000004				4		
2451	013102	000005				5		
2452	013104	000006				6		
2453	013106	000007				7		
2454	013110	000010				10		
2455	013112	000011				11		
2456	013114	000012				12		
2457	013116	000013				13		
2458	013120	000014				14		
2459	013122	000015				15		
2460	013124	000016				16		
2461	013126	000017				17		
2462	013130	000020				20		
2463	013132	000357				357		
2464	013134	000000				0		
2465								
2466								
2467	013136	000220			DAVI1:	220		
2468	013140	000221			DAVI2:	221		
2469								
2470								
2471								
2472								
2473	013142	004437	010030		DAV2:	JSR	%4,TYPINT	;INITIALIZE
2474	013146	013737	014454	012166		MOV	SPSP,MES19+2	
2475	013154	013737	012364	011724		MOV	TNDAY3,MES15	;SAT TEST NUMBER FOR MESSAGE
2476	013162	004437	007760			JSR	%4,PRNNT	;PRINT TEST NUMBER D3


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2477 013166 012737 014436 013720 MOV #MTAB,MTABP ;SET MESSAGE TABLE POINTER
2478 013174 012737 014404 013714 MOV #ITAB,ITABP ;SET INSTRUCTION TABLE POINTER
2479 013202 017737 000506 001054 MOV @ITABP,STRCHR ;SAT FIRST INSTRUCTION
2480 013210 012737 012366 013722 MOV #TNO1,HTABP ;SET HEADER MESSAGE TABLE POINTER
2481 013216 012737 014366 013716 MOV #ICTAB,ICTABP ;SET INSTR COUNT TABLE POINTER
2482 013224 017737 000466 001056 MOV @ICTABP,STRCNT ;GET FIRST INSTR COUNT
2483 013232 012737 013724 013712 LOAD: MOV #DTAB,DTABP ;SET DATA TABLE POINTER
2484 013240 017737 000446 001040 MOV @DTABP,CHRGEN ;SET FIRST DATA PAIR
2485 013246 005777 165526 TST @LPS ;TEST FOR ERROR
2486 013252 100007 BPL DL1 ;BRANCH IF NO ERROR
2487 013254 012737 000055 001052 ERR55: MOV #55, ERCOUNT ;SET UP ERROR COUNT 55
2488 000056 N=N+1
2489 013262 004537 010244 JSR %5,STAER ;REPORT ERROR SET
2490 013266 000000 HALT ;HALT ON ERROR
2491 013270 000760 BR ;RESTART LOAD
2492 013272 012737 000002 001036 DL1: MOV #2,CHRCNT ;SET PAIR COUNT
2493 013300 013777 001040 165474 DL2: MOV CHRGEN,@LPB ;LOAD DAVFU
2494 013306 105777 165466 TSTB @LPS ;TEST READY
2495 013312 100375 BPL -4 ;WAIT FOR READY
2496 013314 005777 165460 TST @LPS ;TEST FOR ERROR
2497 013320 100010 BPL DL6 ;BRANCH IF NO ERROR
2498 013322 012737 000056 001052 ERR56: MOV #56, ERCOUNT ;SET UP ERROR COUNT 56
2499 000057 N=N+1
2500 013330 004537 010244 JSR %5,STAER ;REPORT ERROR SET
2501 013334 000000 HALT ;HALT ON ERROR
2502 013336 000137 013232 JMP ;RESTART LOAD
2503 013342 022737 000356 001040 DL6: CMP #356,CHRGEN ;LOAD COMMAND?
2504 013350 001407 BEQ DL6A ;YES, SEND ONLY ONCE
2505 013352 022737 000357 001040 CMP #357,CHRGEN ;LOAD COMMAND?
2506 013360 001403 BEQ DL6A ;YES, SEND ONLY ONCE
2507 013362 005337 001036 DEC CHRCNT ;DEC PAIR COUNT
2508 013366 001344 BNE DL2 ;FINISH PAIR IF NOT DONE
2509 013370 062737 000002 013712 DL6A: ADD #2,DTABP ;INC DATA TABLE POINTER
2510 013376 017737 000310 001040 MOV @DTABP,CHRGEN ;SET NEXT DATA PAIR
2511 013404 022737 077777 001040 CMP #77777,CHRGEN ;DONE LOAD?
2512 013412 001327 BNE DL1
2513
2514 ;START OF CHANNEL SLEW TESTS
2515
2516 013414 DL8:
2517 013414 013777 001054 165360 MOV STRCHR,@LPB ;SEND DAVFU INSTRUCTION
2518 013422 105777 165352 TSTB @LPS ;TEST READY
2519 013426 100375 BPL -4 ;WAIT FOR READY
2520 013430 105777 165344 TSTB @LPS ;TEST READY
2521 013434 100375 BPL -4 ;WAIT FOR READY
2522
2523 013436 DL8A:
2524 013436 017737 000260 012354 MOV @HTABP,MES20A ;SET HEADER MSSG ADDRESS
2525 013444 012737 012300 010026 MOV #MES20,PRTMSG ;SET HEADER MSG ADDRESS
2526 013452 004437 010010 JSR %4,RINT ;PRINT HEADER MESSAGE
2527 013456 013777 001054 165316 DL9: MOV STRCHR,@LPB ;SEND DAVFU INSTRUCTION
2528 013464 105777 165310 TSTB @LPS ;TEST READY
2529 013470 100375 BPL -4 ;WAIT FOR READY
2530 013472 005777 165302 TST @LPS ;TEST FOR ERROR
2531 013476 100010 BPL DL10 ;BRANCH IF OK
2532 013500 012737 000057 001052 ERR57: MOV #57, ERCOUNT ;SET UP ERROR COUNT 57
2533 000060 N=N+1

```


M04

MAINDEC-11-DZLPK-E-D
DZLPKE.P11

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```

2533 013506 004537 010244 JSR %5,STAER ;REPORT ERROR SET
2534 013512 000000 HALT ;HALT ON ERROR
2535 013514 000137 013232 JMP LOAD ;RELOAD DAVFU
2536 013520 017737 000174 012164 DL10: MOV @MTABP,MES19 ;SET MESSAGE
2537 013526 027727 000164 000001 CMP @ICTABP,#1 ;CHECK IF MAX LINE SLEW
2538 013534 001004 BNE DL10A ;NOT, CONTINUE
2539 013536 013737 014452 012166 MOV FS,MES19+2 ;SET MESSAGE
2540 013544 000403 BR DL10B ;CONTINUE
2541 013546 013737 014454 012166 DL10A: MOV SPSP,MES19+2 ;SET MESSAGE
2542 013554 012737 012072 010026 DL10B: MOV #MES18,PRMSG ;SET MSG ADDRESS
2543 013562 004437 010010 JSR %4,RINT ;PRINT MESSAGE
2544 013566 005337 001056 DEC STRCNT ;DEC INSTR COUNT
2545 013572 001331 BNE DL9 ;FINISH TESTING THIS CHANNEL
2546 013574 062737 000002 013720 ADD #2,MTABP ;INC MSG TABLE POINTER
2547 013602 062737 000002 013722 ADD #2,HTABP ;INC HEADER MSG TABLE POINTER
2548 013610 062737 000002 013716 ADD #2,ICTABP ;INC INSTR COUNT TABLE POINTER
2549 013616 005777 000074 TST @ICTABP ;CHECK INSTR COUNT
2550 013622 001006 BNE DL12
2551 013624 012737 014366 013716 MOV #ICTAB,ICTABP ;RESET TABLE POINTER
2552 013632 012737 014436 013720 MOV #MTAB,MTABP ;RESET MSG TABLE POINTER
2553 013640 017737 000052 001056 DL12: MOV @ICTABP,STRCNT ;GET INSTR COUNT
2554 013646 062737 000002 013714 ADD #2,ITABP ;INC INSTR TABLE POINTER
2555 013654 017737 000034 001054 MOV @ITABP,STRCHR ;GET INSTRUCTION
2556 013662 001254 BNE DL8 ;CONTINUE IF NOT DONE TEST
2557 013664 013737 014454 012166 MOV SPSP,MES19+2 ;RESET MESSAGE
2558 013672 032777 010000 165104 BIT #BIT12,@SWR ;LOOP ON TEST?
2559 013700 001402 BEQ DLEX
2560 013702 000137 013142 JMP DAV2 ;LOOP ON TEST
2561 013706 000137 004066 DLEX: JMP TEST2 ;RECYCLE PRINTING TESTS
2562
2563 013712 000000 DTABP: 0 ;DATA TABLE POINTER
2564 013714 000000 ITABP: 0 ;INSTRUCTION TABLE POINTER
2565 013716 000000 ICTABP: 0 ;INSTR COUNT TABLE POINTER
2566 013720 000000 MTABP: 0 ;MESSAGE TABLE POINTER
2567 013722 000000 HTABP: 0 ;HEADER MESSAGE TABLE POINTER
2568
2569 ;DATA TABLE FOR DAVFU LOAD
2570
2571 013724 000356 DTAB: 356 ;START LOAD
2572 013726 000077 77 ;HEADER MESSAGES
2573 013730 000000 0
2574 013732 000001 0
2575 013734 000002 0
2576 013736 000005 0
2577 013740 000000 0
2578 013742 000003 0
2579 013744 000010 0
2580 013746 000005 0
2581 013750 000002 0
2582 013752 000001 0
2583 013754 000000 0
2584 013756 000007 0
2585 013760 000000 0
2586 013762 000011 0
2587 013764 000002 0
2588 013766 000005 0

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N04

MAINDEC-11-DZLPK-E-D MACY11 27(732) 27-SEP-76 10:57 PAGE 89
DZLPKE.F11

2589	013770	000000
2590	013772	000003
2591	013774	000000
2592	013776	000005
2593	014000	000012
2594	014002	000001
2595	014004	000000
2596	014006	000007
2597	014010	000020
2598	014012	000001
2599	014014	000002
2600	014016	000015
2601	014020	000000
2602	014022	000003
2603	014024	000000
2604	014026	000005
2605	014030	000002
2606	014032	000001
2607	014034	000010
2608	014036	000007
2609	014040	000000
2610	014042	000001
2611	014044	000002
2612	014046	000005
2613	014050	000000
2614	014052	000013
2615	014054	000000
2616	014056	000005
2617	014060	000002
2618	014062	000001
2619	014064	000000
2620	014066	000007
2621	014070	000010
2622	014072	000021
2623	014074	000002
2624	014076	000005
2625	014100	000000
2626	014102	000003
2627	014104	000000
2628	014106	000015
2629	014110	000002
2630	014112	000001
2631	014114	000000
2632	014116	000007
2633	014120	000000
2634	014122	000001
2635	014124	000012
2636	014126	000005
2637	014130	000000
2638	014132	000003
2639	014134	000000
2640	014136	000005
2641	014140	000002
2642	014142	000011
2643	014144	000000
2644	014146	000007

000000 000003 000000 000005 000012 000001 000000 000007 000020 000001 000002 000015 000000 000003 000000 000005 000002 000001 000010 000007 000000 000001 000002 000005 000000 000013 000000 000005 000002 000001 000000 000007 000010 000021 000002 000005 000000 000003 000000 000015 000002 000001 000000 000007 000000 000001 000005 000000 000012 000005 000000 000003 000000 000005 000002 000011 000000 000007

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2701	014330	000002
2702	014333	000001
2703	014333	000000
2704	014333	000007
2705	014333	000010
2706	014334	000001
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2756	014335	000000

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:STOP LOAD
:STOP !!!!!
```

:INSTRUCTION COUNT TABLE - FOR DAVFU CHANNEL SLEW INSTRUCTIONS

ICTAB: 105

המחלקה
המרכזית

:END OF TABLE

:INSTRUCTION TABLE - DAVFU CHANNEL SLEW INSTRUCTIONS

ITAB: 200

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: CHANNEL 1
: CHANNEL 2
: CHANNEL 3
: CHANNEL 4
: CHANNEL 5
: CHANNEL 6
: CHANNEL 7
: CHANNEL 8
: CHANNEL 9
: CHANNEL 10
: CHANNEL 11
: CHANNEL 12
: END OF TABLE

```

:MESSAGE TABLE FOR BLANK LINE COUNTS IN MESSAGE

```
MTAB:      .ASCII // /  
           .ASCII // /  
           .ASCII // /  
           .ASCII // /  
           .ASCII // /  
           .ASCII // /  
TSP:       .ASCII // /  
SPP:       .ASCII // /
```

```
:SCOPE LOOP ROUTINE
```

```
:SET CHARACTER IN SWITCH REGISTER -0.
```


D05

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```

2757 014456 004437 010030 SCOPE: JSR %4,TYPINT
2758 014462 017737 164316 001050 MOV @SWR,SAVE ;FETCH SWITCHES
2759 014470 012737 177574 001036 MOV #-132,CHRCNT ;SET CHAR COUNT
2760 014476 042737 177400 001050 BIC #177400,SAVE ;MASK CHARACTER
2761 014504 105777 164270 LDLPX: TSTB @LPS ;TEST READY
2762 014510 100375 BPL -4 ;WAIT FOR READY
2763 014512 005777 164262 TST @LPS ;TEST FOR ERROR
2764 014516 100006 BPL LPSCOPE ;BRANCH IF NO ERROR
2765 014520 012737 000060 001052 ERR60: MOV #60, ERRCOUNT ;SET UP ERROR COUNT 60
2766 014526 004537 010244 JSR %5,STAER ;REPORT ERROR SET
2767 014532 000000 HALT ;HALT ON ERROR
2768 014534 013777 001050 164240 LPSCOPE: MOV SAVE,@LPB ;LOAD PRINTER BUFFER
2769 014542 032777 004000 164234 BIT #BIT11,@SWR ;SEND ONLY ONE CHAR?
2770 014550 001402 BEQ LSCO ;NO, BRANCH
2771 014552 000000 HALT ;HALT - WAIT FOR OPERATOR
2772 014554 000740 BR SCOPE ;NEXT CHAR
2773 014556 000177 000024 LSCO: JMP @LOSCOP ;SEND LF?
2774 014562 005237 001036 LSCA: INC CHRCNT ;INCREMENT CHAR COUNT
2775 014566 001346 BNE LDLPX ;CONTINUE IF NOT DONE LINE
2776 014570 012777 000012 164204 MOV #12,@LPB ;SEND LF
2777 014576 105777 164176 TSTB @LPS ;TEST READY
2778 014602 100375 BPL -4 ;WAIT FOR READY
2779 014604 000724 BR SCOPE ;CONTINUE
2780 014606 014562 LOSCOP: LSCA
2781 000001 .END

```


[illegible]

[illegible][illegible]

FRR4	001330	1192#							
FRR40	005470	1615#							
FRR41	005726	1961#							
FRR42	006200	2010#							
FRR43	006446	2057#							
FRR44	006712	2103#							
FRR45	007130	2142#							
FRR46	007322	2178#							
FRR47	007374	2190#							
FRR5	001360	1202#							
FRR50	007552	2222#							
FRR51	007774	2288#							
FRR52	012504	2385#							
FRR53	012606	2402#							
FRR54	012706	2417#							
FRR55	013254	2487#							
FRR56	013322	2498#							
FRR57	013500	2531#							
FRR6	001412	1218#							
FRR60	014520	2767#							
FRR7	001436	1228#							
FFSET	003354	1499#	1566#						
FFTAB	003276	1498#	1541#						
FS	014452	2539#	2751#						
FTABE	003352	1526#	1563#						
HAMALN	007512	1052#	2214#	2239					
HAMX	007660	2242#	2244#						
HAM1X	007536	2215#	2237#						
HAM2	007544	2220#	2232#						
HED1	010274	2358#	2361#	2367#					
HSPRT	006054	1048#	1992#	2038					
H50	006150	2005#	2034#	2036					
H500	006134	2000#	2003#						
H500A	006120	1997#	2001#						
H51	006172	2008#	2021#	2023	2026				
H52	006214	2009#	2014#						
H53	006262	2019#	2024#						
H54	006300	2016#	2027#						
H56	006350	2031#	2037#						
HTABP	013722	2480*	2523#	2547*	2567#				
ICTAB	014366	2481#	2551#	2719#					
ICTABP	013716	2481*	2482#	2537#	2548*	2549	2551*	2553	2565#
INDAT	003430	1023#	1537#	1583#	1591	1605			
INDATT	003564	1584#	1612#						
INDATO	003470	1586#	1592#						
INDAT1	003552	1600#	1606#						
INDO	003442	1585#	1598#						
IND1	003524	1595#	1599#						
INT1C	002014	1263#	1318#						
INT1D	002140	1325#	1349#						
ITAB	014404	2478#	2729#						
ITABP	013714	2478*	2479#	2554*	2555	2564#			
KW11L	002350	1033#	1365#	1394#					
KW11P	002306	1034#	1370#	1384#					
LDCH	004516	1768#	1773#	1782	1787				
LDPFX	014504	2762#	2778#						

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DZLPKE.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

LEGCHR	001060	1130#	1405*	1408*	1416	1998*	2001*	2020	2086*	2090*	2098						
LFT	007032	2130#															
LFTTR	007014	1051	2126#	2164													
LFTO	007040	2131#	2161														
LFT1	007062	2134#	2137														
LFT2	007102	2135#	2138#														
LFT3	007122	2141#	2153	2156													
LFT4	007144	2142#	2147#														
LFT5	007174	2151#	2154#														
LFT6	007212	2149#	2157#	2162													
LINCNT	001042	1123#	1271*	1384*	1394*	1415	1427*	1454	1456*	1462	1464*	1469	1498*	1512			
		1525*	1526	1528	1804*	1837*	1854*	1882*	1884	1968*	1969*	1970*	1974*	2004*			
		2030*	2050*	2052*	2068*	2085*	2089*	2097	2115*	2116	2130*	2131	2160*	2169*			
		2171	2174	2205*	2206	2218*	2236*										
LKS	001026	1089#	1362	1398	1399*												
LKSRV	002624	1004	1444#														
LOAD	013232	2483#	2491	2502	2535												
LOGICA	007670	997	2248#														
LOSCOP	014606	1057*	1062*	2776	2785#												
LPS	001002	1075#	1172*	1173*	1236*	1420*	1428*	1521*	1592*	1631*	1638*	1721*	1724*	1751*			
		1763*	1773*	1788*	1817*	1822*	1832*	1862*	1876*	1891*	1919*	1926*	1965*	1971*			
		2008	2014*	2027*	2061*	2064*	2107*	2112*	2147*	2157*	2182*	2194*	2202*	2230*			
		2233*	2271*	2293	2390*	2406*	2421*	2493*	2517*	2526*	2771*	2779*					
		1070#	1156	1162	1174	1184	1190	1200	1216	1226	1237	1243	1249	1265			
		1271	1281*	1283*	1290*	1292*	1300*	1302*	1310*	1312*	1327	1333	1340*	1350*			
		1429	1515	1522	1585	1596	1599	1624	1635	1642	1705	1725	1745	1764			
		1767	1789	1808	1823	1833	1863	1878	1913	1927	1959	1972	2028	2055			
		2065	2101	2113	2141	2158	2176	2188	2203	2220	2227	2234	2265	2267			
		2272	2277	2286	2292	2383	2394	2400	2407	2415	2422	2485	2494	2496			
		22518	2520	2527	2529	2763	2765	2780									
		2766	2771#														
LPSCOP	014534	2071#															
LPS7	006526	1238	1243#	1252													
LP1	001506	1244	1249#														
LP2	001530	1706	1														

MES15	011724	1699*	1738*	1801*	1851*	1902*	1952*	1993*	2045*	2080*	2127*	2215*	2367*	2380*
MES16	011732	2435*	2475*											
MES17	011767	2367*	2398											
MES18	012072	2367*	2409											
MES19	012164	2367*	2411	2542										
MES20	010701	2367*	2375*	2424*	2474*	2536*	2539*	2541*	2557*					
MES20A	012300	1151	2367*											
MES21	012354	2367*	2524											
MES22	010726	2367*	2523*											
MES23	010757	1153	2367*											
MES24	011023	1169	2367*											
MES25	011070	1197	2367*											
MES26	011130	1181	1207	2367*										
MES27A	011126	1510	2367*											
MES28	011164	1534	2367*											
MES29	011202	1500	1532*	2367*										
MINCNT	002616	1530	2367*											
MLF	005656	1387	1397	1435*										
MLFA	005702	1047	1951*	1986										
MLFD	005720	1956*	1977											
MLF1	005742	1959*	1967											
MLF2	005776	1960	1965*											
MLF4	006044	1971*	1975*											
MTAB	014436	1958	1985*											
MTABP	013720	2477*	2552*	2745*										
N	= 000061	2477*	2536*	2546*	2552*	2566*								
		1093*	1158	1159*	1164	1165*	1176	1177*	1186	1187*	1192	1193*	1202	1203*
		1218	1219*	1228	1229*	1239	1240*	1245	1246*	1253	1254*	1267	1268*	1273
		1274*	1277	1279*	1287	1288*	1297	1298*	1307	1308*	1329	1330*	1335	1336*
		1342	1343*	1494	1495*	1517	1518*	1587	1588*	1601	1602*	1626	1627*	1644
		1645*	1694	1695*	1707	1708*	1747	1748*	1769	1770*	1810	1811*	1865	1866*
		1915	1916*	1961	1962*	2010	2011*	2057	2058*	2103	2104*	2143	2144*	2178
		2179*	2190	2191*	2222	2223*	2288	2289*	2385	2386*	2402	2403*	2417	2418*
		2487	2488*	2498	2499*	2531	2532*	2767	2768*					
NODAT	003600	1024	1610	1621*	1630									
NODATA	003702	1634	1638*											
NODAT0	003644	1625	1631*											
NODAT1	003750	1643	1649*											
NODAT2	003774	1651	1655*											
NODAT3	004006	1623	1662*											
NODAT4	004064	1633	1685*											
NOD0	003620	1624*	1637				</							

OVR8	005352	1873	1891#														
PATTB	003014	1412	1480#														
PC	=%000007	831#	2249*														
PLKS	001024	1088#	1367	1388	1389*												
PRNNT	007760	1700	1739	1802	1852	1903	1953	1994	2046	2081	2128	2216	2285#	2381			
		2436	2476														
PRTA	005610	1922	1937#														
PRTCTL	005374	1046	1901#	1944													
PRTINT	007704	1492	1692	2265#													
PRTINO	007720	2266	2269#														
PRTMSG	010026	1474*	1514*	1530*	2285*	2295#	2398*	2409*	2411*	2524*	2542*						
PRTD	005420	1906#	1936	1940	1942												
PRT1	005440	1907	1910#														
PRT2	005446	1909	1911#														
PRT3	005462	1913#	1921	1925	1938												
PRT4	005504	1914	1919#														
PRT6	005622	1930	1939#														
PRT7	005634	1932	1941#														
PRT8	005646	1934	1943#														
PSW	001010	1082#	1280*	1289*	1299*	1309*	1339*	1351*									
PTRPSW	001032	1091#	1264*	1326*	1353*												
PTRVEC	001030	1090#	1263*	1325*	1352*												
RCHRSW	004220	1712	1717#														
RDYOK	007726	2268	2271#														
RINT	010010	1475	1524	2287	2292#	2399	2410	2425	2525	2543							
ROTATE	006536	1050	2079#	2119													
ROTD	006610	2084	2089#														
ROT1	006632	2088	2092#	2117													
ROT2	006636	2093#	2111														
ROT3	006646	2095#	2109														
ROT4	006704	2099	2101#														
ROT5	006726	2102	2107#														
RTTR	007246	2169#	2209														
RT1	007254	2170#	2207														
RT2	007314	2176#	2187														
RT2A	007336	2177	2182#														
RT2AA	007360	2184	2186#														
RT3	007366	2175	2188#	2201													
RT3A	007410	2189	2194#														
RT3B	007444	2197	2200#														
RO	=%000000	822#	2245*	2249													
R1	=%000001	823#															
R2	=%000002	824#															
R3	=%000003	825#															
R4	=%000004	826#															
R5	=%000005	827#															
R6	=%000006	828#	830														
R7	=%000007	829#	831														
SAVE	001050	1126#	1713*	1720*	1721	1816*	1817	1827*	2759*	2761*	2771						
SCHRSW	004216	1704	1716#	1719													
SCOPE	014456	1058	1062	1063	2758#	2775	2782										
SEGCNT	001034	1120#	1908*	1910*	1924*												
SETUP	001064	1017	1135#														
GLEWCK	003034	1035	1476	1491#													
SLW	003062	1493	1498#														
SLWO	003074	1500#	1529														

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DZLPKE.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value
SLW1	003104	1502#	1507																
SLW1A	003144	1513	1515#																
SLW11	003130	1512#	1531																
SLW2	003166	1516	1521#																
SNGCHR	006360	1049	2044#	2072															
SP	=%000006	830#	1137*	1138*	1145	1146	1147												
SPSP	014454	2375	2474	2541	2557	2752#													
STAER	010244	1160	1166	1178	1188	1194	1204	1220	1230	1241	1247	1255	1269	1275					
		1319	1331	1337	1344	1496	1519	1589	1603	1628	1646	1696	1709	1749					
		1771	1812	1867	1917	1963	2012	2059	2105	2145	2180	2192	2224	2290					
		2356#	2387	2404	2419	2489	2500	2533	2769										
STARA	002464	1413#	1426																
STARED	002562	1422	1427#																
STARO	002406	1379	1390	1403#	1433														
STAROA	002434	1404	1408#																
STAROB	002450	1407	1410#																
STAR1	002526	1417	1420#	1424															
STP1	001162	1156#	1161																
STP2	001204	1157	1162#	1167															
STP3	001226	1163	1168#																
STP4	001234	1171#	1179																
STP5	001272	1175	1180#																
STP5A	001300	1184#	1189																
STP5B	001322	1185	1190#	1195															
STP5C	001344	1191	1196#																
STP6	001352	1200#	1205																
STP7	001374	1201	1206#																
STRCHR	001054	1128#	1412*	1414	1425*	1622*	1638	1649*	1650	1704*	1711	1712*	1719*	1806*					
		1814	1815*	1826*	1905														

[illegible]

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DZLPKE.P11 CROSS REFERENCE TABLE -- MACRO NAMES

COMMAND	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
COMMAN	1														
ENDCOM	1														
ESCAPE	1														
GETPRI	1														
GETSWR	1														
MULT	1														
NEWTST	1														
POP	1														
PUSH	1														
REPORT	1														
SETPRI	1														
SETUP	1														
SKIP	1														
SLASH	1														
STARS	1														
SWRSU	1														
TYPBIN	1														
TYPDEC	1														
TYPNAM	1														
TYPNUM	1														
TYPPCS	1														
TYPCT	1														
TYPTXT	1														
SERROR	1100	1158	1164	1176	1186	1192	1202	1218	1228	1239	1245	1253	1267	1273	1277
	1287	1297	1307	1329	1335	1342	1494	1517	1587	1601	1626	1644	1694	1707	1747
	1769	1810	1865	1915	1961	2010	2057	2103	2143	2178	2190	2222	2288	2385	2402
	2417	2487	2498	2531	2767										
SPRINT	1106	1698	1738	1801	1851	1902	1952	1993	2045	2080	2127	2215			
SWAIT	1112	1429	1522	1596	1635	1725	1764	1789	1823	1833	1877	1927	1972	2028	2065
	2113	2158	2203	2226	2234	2276	2394	2407	2422	2494	2518	2527	2762	2780	
SSESCA	1														
SSNEWT	1														
SSSKIP	1														
.EQUAT	1														
.HEADE	1														
.KT11	1														
.SETUP	1														
.SWRHI	1														
.SACT1	1														
.SAPT8	1														
.SAPTH	1														
.SAPTY	1														
.SASTA	1														
.SCATC	1														
.SCMTA	1														
.SDB2D	1														
.SDB20	1														
.SDIV	1														

N05

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DZLPKE.P11 CROSS REFERENCE TABLE -- MACRO NAMES

.SREAD	18
.SR2AZ	18
.SSAVE	18
.SSB2D	18
.SSB2O	18
.SSCOP	18
.SSIZE	18
.SSUPR	18
.STRAP	18
.STYPB	18
.STYPD	18
.STYPT	18
.STYPO	18
.S4DCA	18
.117D	18

[illegible]

	1985	1985	1987	1990	1993	1997	1998	1999	2000	2001	2002	2003	2004	2059
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
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	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264	2264	2264	2264	2264	2264	2264
	2203	2209	2226	2238	2259	2263	2264	2264						

D06

MAINDEC-11-DZLPK-E-D MACY11 27(732) 27-SEP-76 10:57 PAGE 107
DZLPKE.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*DZLPKE,DZLPKE,SEQ/SOL/CRF/PAGNUM=SYSMAC.SML(400,1066),DZLPKE(400,4571)
RUN-TIME: 27 37 4 SECONDS
RUN-TIME RATIO: 186/69=2.6
CORE USED: 33K (65 PAGES)

E06

Spooler runtime 11 Seconds, 48 KCS, 270 disk reads, 4 disk writes, 68 pages

~~/NOVICE-S-04V86TES, TUNIF100;27941.JAN2198,PUE.S.4347 Date: 01-Dec-76 17:37:43 Monitor IPC-D 602 (680) #END#~~

[illegible]