

LP11/LP05

LINE PRINTER TEST
MD-11-DZLPK-D

EP-DZLPK-D-DL-A
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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

LPDS DATA PRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER

TELETYPE MODEL 33 OR EQUIVALENT CONSOLE UNIT

2.2 STORAGE

MEMORY LOCATIONS 0 - 10 - 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/LP05 DIAGNOSTIC PROGRAM TAPE

4.0 STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

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

4.2 STARTING ADDRESS OR ADDRESSES

THE INITIAL STARTING ADDRESS TO RUN THE ENTIRE LP11/LP05 DIAGNOSTIC IS LOCATION 200(8). TO SKIP THE OPERATOR INTERVENTION TESTS AND START WITH THE PRINTING TESTS, START AT LOCATION 600(8). TO RUN THE SPECIAL SCOPE DRIVER ROUTINE USE START ADDRESS 700(8) OR 720(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 ROM PATTERN CHAR TEST
650	TEST 11 SPURIOUS HAMMER FIRING TESTS (LEFT & RIGHT WEDGES)
654	TEST 12 HAMMER ALIGNMENT
700	SCOPE DRIVER ROUTINE
720	SCOPE DRIVER WITHOUT LINE FEEDS

THE PROGRAM WILL START THROUGH THE TEST SEQUENCE BEGINNING WITH THE
SELECTED TEST UNLESS SWITCH 12 IS SET TO LOOP ON TEST (SEE SECTION
5.1)

4.3 PROGRAM AND/OR OPERATOR ACTION

DURING INITIAL START-UP OF THE LINE PRINTER DIAGNOSTIC TEST, THE
HEADER MESSAGE "LPOS 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 DAFFU IS AVAILABLE
AND SWITCH 14 IS SET, THE DAFFU 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 176 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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3. SWITCH - 12

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

4. SWITCH - 13

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

5. SWITCH - 14

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

6. SWITCH - 15

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

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

5.2 IOT CHANGES

THE LINE PRINTER STATUS IS LOCATION 177514 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).

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. ROLLER STALL CONDITION
4. POWER SUPPLY FAULT
5. HAMMER BANK FAULT
6. DATA 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. WHICHEVER 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.

7.2.2 TEST 3 - CHARACTER GENERATOR AND COMPARATOR TEST

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

7.2.3 TEST 4 - OVER PRINT TEST

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

7.2.4 TEST 5 - SHUTTLE POSITIONING TEST

THIS TEST CHECKS THE HAMMER SHUTTLE FOR CORRECT OPERATION. FULL LINES OF E'S ARE PRINTED BY PRINTING A PAIR OF E'S AT A TIME THEN OVERPRINTING THOSE E'S PRINTED WITH SPACES AND ADDING ANOTHER PAIR OF E'S TO THE LINE UNTIL THE LINE IS COMPLETED. THEN A FULL LINE OF M'S ARE PRINTED FOR COMPARISON. A TOTAL OF 16 LINES ARE PRINTED DURING THIS TEST.

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.

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:

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*****
0000-----0000
AAAA-----AAAA
BBBB-----BBBB
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ZZZZ-----ZZZZ

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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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;***** 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 DAYFU 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

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000049
000050

R0=X0
R1=X1
R2=X2
R3=X3
R4=X4
R5=X5
R6=X6
R7=X7
SP=R6
PC=R7

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

.=0

.REPT 100

851				.+2	
852				HALT	
853				.ENDR	
854					
855					
856		000030		.=30	
857					
858	000030	010040		TYP	
859	000032	000340		340	
860					
861					
862		000042		.=42	
863					
864	000042	000000		0	
865					
866		000046		.=46	
867	000046	007662		LOGICAL	
868		000052		.=52	
869	000052	040000		BIT14	
870					
871					
872		000100		.=100	
873					
874	000100	002620		LKSRV	;LINE CLOCK SERVICE ROUTINE
875	000102	000340		340	
876					
877	000104	002630		CONVRT	
878	000106	000340		340	
879					
880		000174		.=174	
881	000174	000000		DISPREG: 0	
882	000176	000000		SWREG: 0	
883					
884		000200		.=200	
885					
886	000200	012706	001000	MOV	#1000,%6
887	000204	000137	001060	JMP	SETUP
888					
889					
890		000300		.=300	
891					
892					;START FOR DAYFU TESTS
893	000300	000137	003424	JMP	INDAT
894	000304	000137	003574	JMP	INDAT
895	000310	000137	012416	JMP	DAYFU
896	000314	000137	013134	JMP	DAY2
897					;CHANNEL SLEW TEST
898					
899		000400		.=400	
900					
901					;1 MINUTE PRINT SPEED CHECK
902	000400	000137	002240	JMP	SWTIME
903	000404	000137	002344	JMP	KW11L
904	000410	000137	002302	JMP	KW11P

```

905 000414 000137 003030      JMP      SLEWCK      ;CHECK TOP OF FORM SWITCH
906
907
908
909      000500      . = 600
910
911 000600 012736 001000      MOV      #1000,%6      ;START OF PRINTING TESTS SEQUENCE
912 000604 000137 004060      JMP      TEST2      ;TEST 2
913 000610 000137 004304      JMP      TEST3      ;TEST 3
914 000614 000137 004642      JMP      CHRCHK      ;TEST 4
915 000620 000137 005106      JMP      OVRPRT      ;TEST 5
916 000624 000137 005366      JMP      PRTCTL      ;TEST 6
917 000630 000137 005650      JMP      MLF      ;TEST 7
918 000634 000137 006046      JMP      HSPRT      ;TEST 8
919 000640 000137 006352      JMP      SNGCHR      ;TEST 9
920 000644 000137 006530      JMP      ROTATE      ;TEST 10
921 000650 000137 007006      JMP      LFTTR      ;TEST 11
922 000654 000137 007504      JMP      HAMALN      ;TEST 12
923
924
925      000700      . = 700
926
927 000700 012737 014554 014600      MOV      #LSCA,LOSCOP      ;SEND LF AFTER 132 CHARS
928 000706 000137 014450      JMP      SCOPE
929
930      000720      . = 720
931
932 000720 012737 014450 014600      MOV      #SCOPE,LOSCOP      ;NO LF'S SENT IN SCOPE ROUTINE
933 000726 000137 014450      JMP      SCOPE      ;DO SCOPE ROUTINE
934
935
936      001000      . = 1000
937
938      ;LINE PRINTER HARDWARE REGISTERS
939
940 001000 177514      LPS:      177514      ;STATUS REGISTER
941      ;BIT 15=ERROR
942      ;BIT 7=READY
943      ;BIT 6=INTERRUPT ENABLE
944
945 001002 177516      LPB:      177516      ;DATA BUFFER REGISTER
946      ;BITS 0-6=7 BIT ASCII CHARACTER BUFFER
947      ;BITS 7-15=NOT USED
948
949
950 001004 177570      SWR:      177570
951 001006 177570      DISPLAY: 177570
952 001010 177776      PSW:      177776
953 001012 177566      TPB:      177566
954 001014 177562      TKB:      177562
955 001016 177564      TPS:      177564
956 001020 177560      TKS:      177560
957 001022 172542      CSBR:     172542
958 001024 172540      PLKS:     172540

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959 001026 177546      LKS: 177546
960
961      000240      NOP      =240
962      000000      N        =0
963      000002      M        =2
964
965      ;MACRO FOR SETTING UP ERROR COUNT
966
967      .LIST ME
968
969      .MACR  SEPROR X
970 ERR'X': MOV    BX,      ERCOUNT      ;SET UP ERROR COUNT X
971      N=N+1
972      .ENDM  SEPROR
973
974
975      ;MACRO FOR PRINTING TEST NUMBER AT START OF TEST
976
977      .LIST ME
978
979      .MACR  SPRINT Y
980      MOV    TWO'Y',MES15      ;SET TEST NUMBER FOR MESSAGE
981      JSR    %4,PRINT          ;PRINT TEST NUMBER
982      M=M+1
983      .ENDM  SPRINT
984
985
986      ;MACRO FOR WAITING FOR PRINTER TO PRINT OR SLEW
987
988      .LIST ME
989
990      .MACR  SWAIT
991      TSTB   ALPS              ;TEST READY
992      BPL    -4                ;WAIT FOR READY
993      .ENDM  SWAIT
994
995
996
997
998
999
1000      ;MEMORY LOCATIONS USED AS PROGRAM FLAGS AND COUNTERS
1001
1002 001030 000000      SEGCNT: 0
1003 001032 000000      CHFCNT: 0
1004 001034 000000      CHFLCN: 0
1005 001036 000000      LINCNT: 0
1006 001040 000000      CYCCNT: 0
1007 001042 000000      WORK: 0
1008 001044 000000      SAVE: 0
1009 001046 000000      ERCOUNT: 0
1010 001050 000000      STRCHR: 0
1011 001052 000000      STRCNT: 0
1012 001054 000000      LEGCHR: 0

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1013 001056 000000          NUMCHR: 0
1014
1015          ;ROUTINE TO TEST THE MECH. OPERATION OF THE LPOS
1016
1017 001060 004437 010022      SETUP: JSR      %4,TYPINT
1018 001064 000005          RESET
1019 001066 013746 000004      MOV      4,-(SP)          ;CLEAR WORLD
1020 001072 013746 000006      MOV      6,-(SP)          ;SAVE CURRENT VECTORS
1021 001076 012737 001112 000004  MOV      #15,4          ;SET UP TIMEOUT VECTOR
1022 001104 005777 177674      TST      @SWR          ;TRY TO ACCESS HARDWARE SWR
1023 001110 000406          BR      2$          ;IF THERE, GO TO 2$
1024 001112
1025 001112 012737 000176 001004 1$: MOV      @SWREG,SWR          ;POINT TO SOFTWARE SWR
1026 001120 012737 000174 001006  MOV      @DISPREG,DISPLAY ;POINT TO SOFTWARE DISPLAY
1027 001126 2$:
1028 001126 022626          CMP      (SP)+,(SP)+          ;RESTORE STACK
1029 001130 012637 000004      MOV      (SP)+,4          ;RESTORE TIMEOUT VECTORS
1030 001134 012637 000006      MOV      (SP)+,6
1031 001140 104000          ENT      +0
1032 001142 010642          MES1
1033 001144 104000          ENT      +0          ;TYPE DIAGNOSTIC TITLE
1034 001146 010673          MES2
1035 001150 104000          ENT      +0          ;TYPE RESTART ADDRESS INFO
1036 001152 010720          MES3
1037 001154 000000          HALT          ;TYPE MESSAGE
1038                                     ;POWER UP
1039                                     ;DEPRESS CONTINUE WHEN READY TO START TEST
1039 001156 005777 177616      STP1:  TST      @LPS          ;TEST FOR ERROR
1040 001162 100006          BPL      STP2          ;NO ERROR TEST FOR READY
1041 001164
1042 001164 012737 000000 001046  ERR0: MOV      #0,          ERCOUNT          ;SET UP ERROR COUNT 0
1043 001172 000001          N=N+1
1044 001176 004537 010236      JSR      %5,STAER          ;REPORT ERROR BIT SET
1045 001176 000767          BR      STP1          ;GO TEST FOR ERROR
1046 001200 105777 177574      STP2:  TSTB     @LPS          ;TEST FOR READY
1047 001204 100406          BMI      STP3          ;READY SET OK
1048 001206
1049 001206 012737 000001 001046  ERR1: MOV      #1,          ERCOUNT          ;SET UP ERROR COUNT 1
1050 001206 000002          N=N+1
1051 001214 004537 010236      JSR      %5,STAER          ;REPORT READY NOT SET
1052 001220 000767          BR      STP2          ;GO TEST FOR READY
1053 001222 104000          STP3:  ENT      +0          ;TYPE MESSAGE
1054 001224 010751          MES4          ;PRINTER OK "READY SET" TRY TORN PAPER SWITCH
1055 001226 000000          HALT          ;DEPRESS CONTINUE WHEN READY
1056 001230
1057 001230 012777 000014 177544      STP4:  MOV      #14,@LPB          ;SEND A "FF" TO THE PRINTER
1058 001236 012777 000015 177536      MOV      #15,@LPB          ;ATTEMPT "FF" BY SENDING A "CR"
1059 001244 005777 177530          TST      @LPS          ;TEST FOR ERROR
1060 001250 100406          BMI      STP5          ;BRANCH IF ERROR SET
1061 001252
1062 001252 012737 000002 001046  ERR2: MOV      #2,          ERCOUNT          ;SET UP ERROR COUNT 2
1063 001252 000003          N=N+1
1064 001260 004537 010236      JSR      %5,STAER          ;REPORT ERROR NOT SET
1065 001264 000761          BR      STP4          ;LOOP ON ERROR
1066 001266 104000          STP5:  ENT      +0          ;TYPE MESSAGE

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K02

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1067 001270 011062      MES6      ;ERROR SET OK - TURN ON LINE
1068 001272 000000      HALT        ;WAIT FOR OPERATOR
1069
1070 001274 005777 177500 STP5A: TST      2LPS      ;TEST FOR ERROR
1071 001300 100006      BFL      STP5B      ;NO ERROR CONTINUE
1072 001302      $ERROR \N
1073 001302 012737 000003 001046 ERR3: MOV      #3,      ERCOUNT      ;SET UP ERROR COUNT 3
1074      000004      N=N+1
1075 001310 004537 010236      JSR      %5,STAER      ;REPORT ERROR SET
1076 001314 000767      BR      STP5A      ;LOOP ON ERROR
1077 001316 105777 177456 STP5B: TSTB     2LPS      ;TEST READY
1078 001322 100406      BMI      STP5C      ;READY SET OK
1079 001324      $ERROR \N
1080 001324 012737 000004 001046 ERR4: MOV      #4,      ERCOUNT      ;SET UP ERROR COUNT 4
1081      000005      N=N+1
1082 001332 004537 010236      JSR      %5,STAER      ;REPORT ERROR NOT SET
1083 001336 000767      BR      STP5B      ;LOOP ON ERROR
1084 001340 104000      STP5C: EMT      +0      ;TYPE MESSAGE
1085 001342 011015      MESS      ;READY SET OK - TRY DRUM GATE SWITCH
1086 001344 000000      HALT        ;DEPRESS CONTINUE WHEN READY
1087
1088 001346 005777 177426 STP6: TST      2LPS      ;TEST FOR ERROR
1089 001352 100406      BMI      STP7      ;BRANCH IF ERROR SET
1090 001354      $ERROR \N
1091 001354 012737 000005 001046 ERR5: MOV      #5,      ERCOUNT      ;SET UP ERROR COUNT 5
1092      000006      N=N+1
1093 001362 004537 010236      JSR      %5,STAER      ;REPORT ERROR NOT SET
1094 001366 000767      BR      STP6      ;LOOP ON ERROR
1095 001370 104000      STP7: EMT      +0      ;TYPE MESSAGE
1096 001372 011062      MES6      ;ERROR SET OK - TURN ON LINE
1097 001374 000000      HALT        ;DEPRESS CONTINUE WHEN READY
1098
1099      ;TEST 1
1100      ;PERFORMS PRELIMINARY COMMAND AND REGISTER TESTING.
1101
1102      ;IS THE PRINTER FREE OF ERRORS
1103
1104 001376 000005      TEST1: RESET      ;CLEAR THE WORLD
1105 001400 005777 177374      TST      2LPS      ;IS ERROR FLAG CLEAR
1106 001404 100006      BPL      TEST1A     ;ERROR IS CLEAR OK
1107 001406      $ERROR \N
1108 001406 012737 000006 001046 ERR6: MOV      #6,      ERCOUNT      ;SET UP ERROR COUNT 6
1109      000007      N=N+1
1110 001414 004537 010236      JSR      %5,STAER      ;REPORT ERROR SET
1111 001420 000766      BR      TEST1      ;LOOP ON ERROR
1112
1113      ;IS READY SET (NO ERRORS EXIST)
1114
1115 001422 000005      TEST1A: RESET      ;CLEAR THE WORLD
1116 001424 105777 177350      TSTB     2LPS      ;IS READY SET
1117 001430 100406      BMI      TEST1B     ;READY SET! PRINTER OK
1118 001432      $ERROR \N
1119 001432 012737 000007 001046 ERR7: MOV      #7,      ERCOUNT      ;SET UP ERROR COUNT 7
1120      000010      N=N+1

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1121 001440 004537 010236      JSR      %5,STAER      ;REPORT READY NOT SET
1122 001444 000766      BR        TEST1A      ;LOOP ON ERROR
1123
1124      ;DOES LOADING THE BUFFER RESET READY
1125
1126 001446 005037 001042      TEST1B: CLR      WORK      ;CLEAR COUNTER
1127 001452 012777 000015 177322  MOV      #15,2LPB      ;LOAD CARRIAGE RETURN INTO BUFFER
1128 001460 105777 177314      TSTB      2LPB      ;IS READY CLEAR
1129 001464 100006      BPL        LP1      ;READY IO CLEAR OK!
1130 001466      $ERROR      \N
1131 001466 012737 000010 001046  ERR10: MOV      #10,      ERCOUNT      ;SET UP ERROR COUNT 10
1132      000011      N=N+1
1133 001474 004537 010236      JSR      %5,STAER      ;REPORT READY STILL SET
1134 001500 000762      BR        TEST1B      ;LOOP ON ERROR
1135 001502 005777 177272      LP1:   TST      2LPB      ;IS THERE AN ERROR
1136 001506 100006      BPL        LP2      ;NO ERROR CONTINUE
1137 001510      $ERROR      \N
1138 001510 012737 000011 001046  ERR11: MOV      #11,      ERCOUNT      ;SET UP ERROR COUNT 11
1139      000012      N=N+1
1140 001516 004537 010236      JSR      %5,STAER      ;REPORT ERROR OCCURRED
1141 001522 000751      BR        TEST1B      ;LOOP ON ERROR
1142 001524 105777 177250      LP2:   TSTB      2LPB      ;IS THE PRINTER STILL BUSY
1143 001530 100411      BMI        TEST1C      ;NO! GO TO NEXT TEST
1144 001532 005237 001042      INC      WORK      ;YES! GO CHECK FLAGS
1145 001536 001361      BNE        LP1      ;PRINTER STILL BUSY WAIT
1146 001540      $ERROR      \N
1147 001540 012737 000012 001046  ERR12: MOV      #12,      ERCOUNT      ;SET UP ERROR COUNT 12
1148      000013      N=N+1
1149 001546 004537 010236      JSR      %5,STAER      ;ERROR REPORT TIME OUT
1150 001552 000735      BR        TEST1B      ;LOOP ON ERROR
1151
1152      ;CHECK INTERRUPT LEVEL OF PRINTER
1153      ;THE PRINTER SHOULD BE AT LEVEL 4
1154
1155      ;TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 7
1156
1157 001554 012737 002010 000200  TEST1C: MOV      #INT1C,200      ;SET UP INT VECTOR
1158 001562 012737 000340 000202  MOV      #340,202      ;SET PRIORITY
1159 001570 005777 177204      TST      2LPB      ;TEST FOR ERROR
1160 001574 100006      BPL        LP3      ;NO ERROR CONTINUE
1161 001576      $ERROR      \N
1162 001576 012737 000013 001046  ERR13: MOV      #13,      ERCOUNT      ;SET UP ERROR COUNT 13
1163      000014      N=N+1
1164 001604 004537 010236      JSR      %5,STAER      ;REPORT ERROR SET
1165 001610 000761      BR        TEST1C      ;LOOP ON ERROR
1166 001612 105777 177162      LP3:   TSTB      2LPB      ;TST FOR READY
1167 001616 100406      BMI        LP3X      ;READY SET OK
1168 001620      $ERROR      \N
1169 001620 012737 000014 001046  ERR14: MOV      #14,      ERCOUNT      ;SET UP ERROR COUNT 14
1170      000015      N=N+1
1171 001626 004537 010236      JSR      %5,STAER      ;REPORT READY NOT SET
1172 001632 000750      BR        TEST1C      ;LOOP ON ERROR
1173 001634      $ERROR      \N
1174 001634 012737 000015 001046  ERR15: MOV      #15,      ERCOUNT      ;SET UP ERROR COUNT 15

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1175      000016      N=N+1
1176 001642 012777 000340 177140      MOV      #340,2PSW      ;LOCKUP PROCESSOR
1177 001650 052777 000100 177122      BIS      #100,2LPS      ;SET PRINTER INTO ENABLE
1178 001656 000240      NOP      ;WAIT
1179 001660 042777 000100 177112      BIC      #100,2LPS      ;CLEAR PRINTER INT. ENABLE
1180
1181      ;TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 6
1182
1183 001666      $ERROR \N
1184 001666 012737 000016 001046 ERR16: MOV      #16,      ERCOUNT      ;SET UP ERROR COUNT 16
1185      000017      N=N+1
1186 001674 012777 000300 177106      MOV      #300,2PSW      ;SET PROCESSOR PRIORITY LEVEL 6
1187 001702 052777 000100 177070      BIS      #100,2LPS      ;SET PRINTER INT ENABLE
1188 001710 000240      NOP      ;WAIT
1189 001712 042777 000100 177060      BIC      #100,2LPS      ;CLEAR PRINTER INT. ENABLE
1190
1191      ;TEST THAT THE PRINTER WILL NOT INT. AT
1192      ;PROCESSOR LEVEL 5
1193
1194 001720      $ERROR \N
1195 001720 012737 000017 001046 ERR17: MOV      #17,      ERCOUNT      ;SET UP ERROR COUNT 17
1196      000020      N=N+1
1197 001726 012777 000240 177054      MOV      #240,2PSW      ;SET UP PROCESSOR TO LEVEL 5
1198 001734 052777 000100 177036      BIS      #100,2LPS      ;SET PRINTER INT ENABLE
1199 001742 000240      NOP      ;WAIT
1200 001744 042777 000100 177026      BIC      #100,2LPS      ;CLEAR INT ENABLE PRINTER OK
1201
1202      ;TEST THAT THE PRINTER WILL NOT INT
1203      ;WHEN THE PROCESSOR IS AT LEVEL 4
1204
1205 001752      $ERROR \N
1206 001752 012737 000020 001046 ERR20: MOV      #20,      ERCOUNT      ;SET UP ERROR COUNT 20
1207      000021      N=N+1
1208 001760 012777 000200 177022      MOV      #200,2PSW      ;SET PROCESSOR TO LEVEL 4
1209 001766 052777 000100 177004      BIS      #100,2LPS      ;SET PRINTER INT. ENABLE
1210 001774 000240      NOP      ;WAIT
1211 001776 042777 000100 176774      BIC      #100,2LPS      ;CLEAR PRINTER INT ENABLE
1212 002004 000137 002022      JMP      TEST10      ;PRINTER OK CONTINUE
1213
1214      ;INTERRUPT HANDLE FOR TEST1C
1215      ;RESTORE STACK AND REPORT ERROR
1216
1217 002010 022626      INT1C: CMP      (6)+,(6)+      ;RESTORE STACK
1218 002012 004537 010236      JSR      %S,STAER      ;REPORT ERROR
1219 002016 000137 001554      JMP      TEST1C      ;RE-ENTER TEST1C
1220
1221      ;TEST THE ABILITY OF THE PRINTER TO INTERRUPT
1222      ;AT PRIORITY LEVEL 4
1223
1224 002022 012737 002134 000200 TEST1D: MOV      #INT1D,200      ;SET UP INTERRUPT VECTOR
1225 002030 012737 000340 000202      MOV      #340,202      ;LOCK UP PRIORITIES
1226 002036 005777 176736      TST      2LPS      ;IS THERE A PRINTER ERROR
1227 002042 100006      BPL      LP4      ;NO! CONTINUE
1228 002044      $ERROR \N

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1229 002044 012737 000021 001046 ERR21: MOV      #21,      ERCOUNT      ;SET UP ERROR COUNT 21
1230      000022      N=N+1
1231 002052 004537 010236      JSR      %5,STAER      ;REPORT PRINTER ERROR
1232 002056 000761      BR      TEST1D      ;LOOP ON ERROR
1233 002060 105777 176714      LP4:  TSTB      @LPS      ;IS READY SET
1234 002064 100406      BMI      LPS      ;YES - PRINTER READY
1235 002066      $ERROR      \N
1236 002066 012737 000022 001046 ERR22: MOV      #22,      ERCOUNT      ;SET UP ERROR COUNT 22
1237      000023      N=N+1
1238 002074 004537 010236      JSR      %5,STAER      ;REPORT READY NOT SET
1239 002100 000750      BR      TEST1D      ;LOOP ON ERROR
1240 002102 012777 000140 176700 LPS:  MOV      #140,@PSW      ;SET PRIORITY TO LEVEL 3
1241 002110 052777 000100 176662      BIS      #100,@LPS      ;SET PRINTER INTERRUPT ENABLE
1242 002116 000240      NOP
1243 002120      $ERROR      \N
1244 002120 012737 000023 001046 ERR23: MOV      #23,      ERCOUNT      ;SET UP ERROR COUNT 23
1245      000024      N=N+1
1246 002126 004537 010236      JSR      %5,STAER      ;REPORT ERROR
1247 002132 000733      BR      TEST1D      ;LOOP ON ERROR
1248
1249      ;INTERRUPT HANDLER FOR TEST1D
1250
1251 002134 022626      INT1D:  CMP      (6)+,(6)+      ;RESET STACK
1252 002136 042777 000100 176634      BIC      #100,@LPS      ;CLEAR INT. ENABLE FOR PRINTER
1253 002144 005077 176640      CLR      @PSW      ;CLEAR PROCESSOR STATUS
1254 002150 012737 012706 000200      MOV      #12706,200      ;RESET INSTRUCTION AT 200
1255 002156 012737 001000 000202      MOV      #1000,202      ;RESET INSTRUCTION AT 202
1256
1257      ;1 MINUTE PRINT SPEED CHECK
1258      ;IF A KW11-L OR KW11-P ARE NOT AVAILABLE, THE SR BIT0 IS USED
1259      ;FOR MANUAL TIMING OF THE PRINTER.
1260
1261 002164 012737 000002 000006 CLCKAV: MOV      #RTI,@#6      ;SET TRAP TO RETURN
1262 002172 012737 000006 000004      MOV      #6,@#4
1263 002200 000261      SEC
1264 002202 105777 176620      TSTB      @LKS      ;KW11-L AVAILABLE?
1265 002206 103404      BCS      IS      ;NO, BRANCH
1266 002210 005037 000004      CLR      @#4      ;RESET TRAP VECTOR TO HALT
1267 002214 000137 002344      JMP      KW11L      ;USE KW11L FOR TIMING
1268 002220 000261      IS:  SEC
1269 002222 105777 176576      TSTB      @PLKS      ;KW11-P AVAILABLE?
1270 002226 103404      BCS      SWTIME      ;NO, USE SWITCH REG FOR TIMING
1271 002230 005037 000004      CLR      @#4      ;RESET TRAP VECTOR TO HALT
1272 002234 000137 002302      JMP      KW11P      ;USE KW11-P FOR TIMING
1273 002240 005037 001036      SWTIME: CLR      L1,CNT      ;CLEAR LINE COUNT
1274 002244 004437 010022      JSR      %4,TYPINT
1275 002250 005037 000004      CLR      @#4      ;RESET TRAP VECTOR TO HALT
1276 002254 104000      ENT      +0      ;TYPE MESSAGE
1277 002256 010427      MESC
1278 002260 012737 000002 002616      MOV      #2,DIA      ;PRINT SPEED CHECK USING MANUAL TIMING
1279 002266 032777 000001 176510 IS:  BIT      #BIT0,@SWR      ;SET DUMMY ADDRESS
1280 002274 001774      BEQ      IS      ;START?
1281 002276 000137 002402      JMP      STARO      ;WAIT FOR START
1282      STARO      ;START PRINTING

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1283
1284
1285
1286 002302 005037 001036
1287 002302 004437 010022
1288 002312 012706 001000
1289 002316 013777 002612 176476
1290 002324 013737 001024 002616
1291 002332 012777 000105 176464
1292 002340 000137 002402
1293
1294
1295
1296 002344 005037 001036
1297 002350 004437 010022
1298 002354 012706 001000
1299 002358 013737 002612 002614
1300 002366 013737 001026 002616
1301 002374 012777 000100 176424
1302
1303
1304
1305 002402 012777 020000 176374
1306 002410 001007
1307 002412 012737 000140 001054
1308 002420 012737 000100 001056
1309 002426 000406
1310 002430 012737 000200 001054
1311 002436 012737 000140 001056
1312 002444 012737 000204 001032
1313 002452 012737 000210 001050
1314 002458 012737 000221 001040
1315 002506 017737 176356 001034
1316 002514 063737 001036 001034
1317 002522 023737 001054 001034
1318 002530 003004
1319 002538 163737 001056 001034
1320 002546 000770
1321 002554 013777 001034 176252
1322 002562 005337 001032
1323 002570 001410
1324 002578 005337 001040
1325 002586 001367
1326 002594 062737 000002 001050
1327 002602 000137 002460
1328 002610 002337 001036
1329 002618 012777 000012 176212
1330 002626 105777 176204
1331 002634 100375
1332 002642 022777 000001 176200
1333 002650 001411
1334 002658 000137 002402
1335
1336

;START FOR KW11-P.....
KW11P: CLR LINCNT ;CLEAR LINE COUNT
        JSR X4,TYPINT
        MOV #1000,%B ;RESET STACK
        MOV MINCNT,DCSR ;SET CLOCK COUNT
        MOV PLKS,DIA ;STORE PLKS ADDRESS
        MOV #105,2PLKS ;START CLOCK
        JMP STARO ;START PRINTING

;START FOR KW11-L.....
KW11L: CLR LINCNT ;CLEAR LINE COUNT
        JSR X4,TYPINT
        MOV #1000,%B ;RESET STACK
        MOV MINCNT,CNTR ;SET CLOCK COUNT
        MOV LKS,DIA ;STORE LKS ADDRESS
        MOV #100,2LKS ;ENABLE CLOCK INTERRUPT

;PRINTING ROUTINE.....
STARO: BIT #BIT13,2SWR ;CHECK CHAR SET
        BNE STAROA ;BRANCH IF 96
        MOV #140,LEGCHR ;LEGAL CHECK
        MOV #100,NUMCHR ;#CHARS
        BR STAROB ;CONTINUE
STAROA: MOV #200,LEGCHR ;LEGAL CHECK
        MOV #140,NUMCHR ;#CHARS
STAROB: MOV #132,CHRCNT ;SET CHAR COUNT
        MOV #PATTB,STRCHR ;INITIALIZE TABLE POINTER
STARA: MOV #17,CYCNT ;SET GROUP COUNT
        MOV 2STRCHR,CHRCNT ;GET CHAR FROM TABLE
        ADD LINCNT,CHRCNT ;ADD LINE COUNT
        CMP LEGCHR,CHRCNT ;LEGAL CHAR?
        BGT STAR1 ;YES, BRANCH
        SUB NUMCHR,CHRCNT ;NO, MAKE LEGAL
        BR IS ;RECHECK CHAR
        MOV CHRCNT,2LPB ;LOAD BUFFER
        DEC CHRCNT ;DECREMENT CHAR COUNT
        BEQ STARO ;BRANCH IF DONE LINE
        DEC CYCNT ;DECREMENT CYCLE COUNT
        BNE STAR1 ;CONTINUE IF NOT DONE GROUP
        ADD #2,STRCHR ;ADD 2 TO TABLE POINTER
        JMP STARA ;CONTINUE
        INC LINCNT ;INCREMENT LINE COUNT
        MOV #12,2LPB ;SEND LF
        WAIT
        TSTB 2LPS ;TEST READY
        BPL -4 ;WAIT FOR READY
        BIT #BIT0,2SWR ;STOP PRINT?
        BEQ CONVAT ;YES, BRANCH
        JMP STARO ;CONTINUE

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1337
1338 002612 007020      MINCNT: 7020
1339 002614 000000      CNTR: 0
1340 002616 000002      DIA: 2
1341
1342
1343 ;NOTE -- PLACE 5670 (8) IN MINCNT FOR 50 HZ. LINE FREQUENCY !!!
1344
1345 ;LINE CLOCK SERVICE ROUTINE FOR KMI1-L
1346
1347 002620 005337 002614 LKSRV: DEC      CNTR      ;DECREMENT COUNTER
1348 002624 001401      BEQ      CONVRT    ;EXIT IF 1 MINUTE
1349 002626 000002      RTI      ;RETURN
1350
1351 ;ROUTINE TO PRINT NUMBER OF LINES PRINTED IN 1 MINUTE
1352
1353 002630 042777 000100 177760 CONVRT: BIC      #100,201A ;DISABLE CLOCK INTERRUPT IF CLOCK AVAILABLE
1354 002636 005037 010152 CLR      TYPDAT ;CLEAR DIGIT COUNT
1355 002642 012703 011442      MOV      #MES12,X3 ;SET MESSAGE POINTER
1356 002646 022737 000144 001036 18:  CMP      #100.,LINCNT ;GREATER THAN 100?
1357 002654 003006      BGT      25      ;NO, PRINT HUNDRED'S DIGIT
1358 002656 182737 000144 001036      SUB      #100.,LINCNT ;YES, SUBTRACT 100
1359 002664 002737 010152      INC      TYPDAT ;INCREMENT HUNDRED'S DIGIT
1360 002670 002737 010152      BR      18 ;CONTINUE CONVERSION
1361 002672 062737 000060 010152 25:  ADD      #60,TYPDAT ;MAKE ASCII
1362 002674 113723 010152      MOVVB   TYPDAT,(X3)+ ;STORE DIGIT
1363 002676 002737 010152      CLR      TYPDAT ;CLEAR DIGIT COUNTER
1364 002678 002737 000012 001036 35:  CMP      #10.,LINCNT ;GREATER THEN 10?
1365 002680 003006      BGT      45      ;NO, PRINT DIGIT
1366 002682 182737 000012 001036      SUB      #10.,LINCNT ;YES, SUBTRACT 10
1367 002684 002737 010152      INC      TYPDAT ;INCREMENT TEN'S DIGIT
1368 002686 002737 010152      BR      35 ;CONTINUE CONVERSION
1369 002688 062737 000060 010152 45:  ADD      #60,TYPDAT ;MAKE ASCII
1370 002690 113723 010152      MOVVB   TYPDAT,(X3)+ ;STORE DIGIT
1371 002692 013737 001036 010152      MOV      LINCNT,TYPDAT ;GET ONE'S DIGIT
1372 002694 062737 000060 010152      ADD      #60,TYPDAT ;MAKE ASCII
1373 002696 113723 010152      MOVVB   TYPDAT,(X3)+ ;STORE DIGIT
1374 002698 104000      ENT      +0 ;TYPE MESSAGE
1375 002700 011404      MES11 ;TYPE PRINT SPEED
1376 002702 012737 011402 010020      MOV      #MES11A,PRMSG ;SET PRINTER MESSAGE ADDRESS
1377 002704 004437 010002      JSR      X4,RINT ;PRINT PRINTER SPEED ON LINE PRINTER
1378 002706 000137 003030      JMP      SLEWCK ;NEXT TEST
1379
1380
1381
1382
1383 003010 000040      PATTB: 40
1384 003012 000117      117
1385 003014 000076      76
1386 003016 000055      55
1387 003020 000134      134
1388 003022 000113      113
1389 003024 000072      72
1390 003026 000051      51

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1391
1392
1393 ;CHECK TOP OF FORM SWITCH
1394 003030 004437 010022 SLEWCK: JSR %4,TYPINT
1395 003034 004537 007676 JSR %5,PRINT ;INITIALIZE PRINTER
1396 003040 000406 BR SLW ;BRANCH IF OK
1397 003042 ERROR \N
1398 003042 012737 000024 001046 ERR24: MOV #24, ERCOUNT ;SET UP ERROR COUNT 24
1399 000025 N=N+1
1400 003050 004537 010236 JSR %5,STAER ;REPORT PRINTER NOT READY
1401 003054 000000 HALT ;HALT ON ERROR
1402 003056 012737 003272 001036 SLW: MOV #FFTAB,LINCONT ;LINE COUNT FOR SWITCH SETTING
1403 003064 012704 003350 MOV #FFSET,%4 ;INIT SWITCH SETTING TABLE POINTER
1404 003070 012703 011156 SLW0: MOV #MES8,%3 ;INIT MESSAGE POINTER
1405 003074 012702 011271 MOV #MES10,%2
1406 003100 111413 SLW1: MOVB (%4),(%3) ;PUT SWITCH SETTINGS INTO MESSAGES
1407 003102 111412 MOVB (%4),(%2)
1408 003104 122423 CHPB (%4)+,(%3)+ ;INCREMENT POINTERS
1409 003106 105722 TSTB (%2)+
1410 003110 105714 TSTB (%4)
1411 003112 001372 BNE SLW1 ;DONE MOVING SWITCH SETTINGS TO MSG'S?
1412 003114 005204 INC %4 ;BRANCH IF NOT DONE
1413 003116 104000 ENT +0 ;TABLE POINTER SET FOR NEXT SWITCH SETTING
1414 003120 011122 MES7 ;TYPE MESSAGE
1415 003122 000000 HALT ;SET TOP OF FORM SWITCH TO ---
1416 003124 005777 175706 SLW11: TST 2LINCONT ;WAIT FOR OPERATOR TO SET SWITCH
1417 003130 001003 BNE SLW1A ;CHECK LINE COUNT
1418 003132 012737 011471 010020 MOV #MES13,PRMSG ;BRANCH IF NOT ZERO
1419 003140 005777 175634 SLW1A: TST 2LPS ;CHANGE PRINTER MESSAGE
1420 003144 100006 BPL SLW2 ;TEST FOR ERRORS
1421 003146 ERROR \N ;BRANCH IF NO ERROR
1422 003146 012737 000025 001046 ERR25: MOV #25, ERCOUNT ;SET UP ERROR COUNT 25
1423 000026 N=N+1
1424 003154 004537 010236 JSR %5,STAER ;REPORT ERROR SET
1425 003160 000000 HALT ;HALT ON ERROR
1426 003162 012777 000014 175612 SLW2: MOV #14,2LPB ;SEND FF
1427 003170 WAIT
1428 003170 105777 175604 TSTB 2LPS ;TEST READY
1429 003174 100375 BPL -4 ;WAIT FOR READY
1430 003176 004437 010002 JSR %4,RINT ;PRINT MESSAGE ON LINE PRINTER
1431 003202 062737 000032 001036 MOV #2,LINCONT ;NEXT LINE COUNT
1432 003210 022737 003346 001036 CHPB #FTABE,LINCONT ;DONE TEST?
1433 003216 001410 BEQ DAVAV ;YES, EXIT
1434 003220 005777 175612 TST 2LINCONT ;DONE CHECK OF THIS SWITCH SETTING?
1435 003224 001721 BEQ SLW0 ;YES, NEXT SWITCH SETTING
1436 003226 012737 011174 010020 MOV #MES9,PRMSG ;NO, CHECK THIS SETTING
1437 003234 000137 003124 JMP SLW11 ;CONTINUE
1438 003240 013737 012404 011156 DAVAV: MOV TNO13,MES9 ;SET MESSAGE
1439 003246 104000 ENT +0 ;TYPE MESSAGE
1440 003250 011120 MES7A ;RESET TOP OF FORM SWITCH
1441 003252 000000 HALT ;WAIT FOR OPERATOR
1442 003254 032777 040000 175522 BIT #BIT14,2SWR ;DAVFU AVAILABLE?
1443 003262 001060 BNE INOAT ;YES, DO DAVFU TESTS
1444 003264 000000 HALT ;DONE OPERATOR TESTS - HALT

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E03

MAINDEC-11-DZLPK-C-D
DZLPK0.P11

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1445 003266 000137 004060      JMP      TEST2      ;DEPRESS CONTINUE TO START PRINTING TESTS
1446                                     FFTAB: 0      ;LOOP COUNTS FOR SLEW CHECKS
1447 003272 000000
1448 003274 000022
1449 003276 000000
1450 003300 000025
1451 003302 000000
1452 003304 000030
1453 003306 000000
1454 003310 000041
1455 003312 000000
1456 003314 000044
1457 003316 000000
1458 003320 000052
1459 003322 000000
1460 003324 000060
1461 003326 000000
1462 003330 000063
1463 003332 000000
1464 003334 000102
1465 003336 000000
1466 003340 000110
1467 003342 000000
1468 003344 000124
1469 003346 000000      FTAB: 0
1470
1471
1472 003350 020063 000040      FFSET: .ASCIZ /3 /      ;SWITCH SETTINGS FOR MESSAGES
1473 003354 027053 000065      .ASCIZ /3.5/
1474 003358 020064 000040      .ASCIZ /4 /
1475 003364 027065 000065      .ASCIZ /5.5/
1476 003370 020066 000040      .ASCIZ /6 /
1477 003374 020067 000040      .ASCIZ /7 /
1478 003400 020070 000040      .ASCIZ /8 /
1479 003404 027070 000065      .ASCIZ /8.5/
1480 003410 030461 000040      .ASCIZ /11 /
1481 003414 031061 000040      .ASCIZ /12 /
1482 003420 032061 000040      .ASCIZ /14 /
1483
1484
1485      .EVEN
1486
1487      ;CHECK THAT VFU WILL NOT ACCEPT INCOMPLETE DATA
1488
1489 003424 004437 010022      INDAT: JSR      X4,TYPINT
1490 003430 012737 003560 001034      MOV      @INDAT,CHGEN      ;SET TABLE POINTER
1491 003436 005777 175336      INDO: TST      @LPS      ;TEST FOR ERROR
1492 003442 100010      BPL      INDAT0      ;BRANCH IF NO ERROR
1493 003444      $ERROR      \N
1494 003444 012737 000026 001046      ERR26: MOV      #26,      ERCOUNT      ;SET UP ERROR COUNT 26
1495 003452 000027      N=N+1
1496 003456 004537 010236      JSR      X5,STAER      ;REPORT ERROR SET
1497 003456 000000      HALT
1498 003460 000137 003424      JMP      INDAT      ;RESTART TEST

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1499 003464 017777 175344 175310 INDATO: MOV 2CHRGEN,2LPB ;LOAD BUFFER
1500 003472 062737 000002 001034 ADD #2,CHRGEN ;NEXT DATA
1501 003500 005777 175330 TST 2CHRGEN ;TEST CHAR
1502 003504 001405 BEQ IND1 ;CONTINUE IF DONE
1503 003506 $WAIT
1504 003506 105777 175266 TSTB 2LPS ;TEST READY
1505 003512 100375 BPL -4 ;WAIT FOR READY
1506 003514 000137 003436 JMP IND0
1507 003520 005777 175254 IND1: TST 2LPS ;TEST FOR ERROR SET
1508 003524 100410 BMI INDAT1 ;BRANCH IF ERROR SET
1509 003526 $ERROR \N
1510 003526 012737 000027 001046 ERR27: MOV #27, ERCOUNT ;SET UP ERROR COUNT 27
1511 003526 000030 N=N+1
1512 003534 004537 010236 JSR X5,STAER ;REPORT ERROR NOT SET
1513 003540 000000 HALT ;HALT ON ERROR
1514 003542 000137 003424 JMP INDAT ;RESTART TEST
1515 003546 104000 INDAT1: ENT +0 ;TYPE MESSAGE
1516 003550 010307 MESA ;ERROR SET OK - CLEAR & TURN ON LINE
1517 003552 000000 HALT ;WAIT FOR OPERATOR
1518 ;DEPRESS CONTINUE WHEN READY FOR NEXT TEST
1519 003554 000137 003574 JMP NODAT ;NEXT TEST
1520
1521 003560 000356 INDATT: 356 ;DATA TABLE FOR ABOVE TEST
1522 003562 000001 1
1523 003564 000002 2
1524 003566 000003 3
1525 003570 000357 357
1526 003572 000000 0
1527
1528 ;CHECK THAT CHANNELS WITH NO STOP BITS CAUSE ERRORS IF CHANNEL SELECTED
1529
1530 003574 004437 010022 NODAT: JSP X4,TYPINT
1531 003580 012737 000030 001050 MOV #200,STRCHR ;SET PAPER INSTRUCTION
1532 003606 012737 004000 001034 NODOA: MOV #NODAT3,CHRGEN ;SET TABLE POINTER FOR LOAD
1533 003614 005777 175160 NODD: TST 2LPS ;TEST FOR ERROR
1534 003620 100007 BPL NODATO ;BRANCH IF NO ERROR
1535 003622 $ERROR \N
1536 003622 012737 000030 001046 ERR30: MOV #30, ERCOUNT ;SET UP ERROR COUNT 30
1537 003622 000031 N=N+1
1538 003630 004537 010236 JSR X5,STAER ;REPORT ERROR SET
1539 003634 000000 HALT ;HALT ON ERROR
1540 003636 000756 BR NODAT ;RESTART TEST
1541 003640 017777 175170 175134 NODATO: MOV 2CHRGEN,2LPB ;LOAD BUFFER
1542 003646 062737 000002 001034 ADD #2,CHRGEN ;NEXT DATA
1543 003654 062737 004060 001034 CMP #NODAT4+2,CHRGEN ;DONE LOAD?
1544 003662 001405 BEQ NODATA ;BRANCH IF DONE
1545 003664 $WAIT
1546 003664 105777 175110 TSTB 2LPS ;TEST READY
1547 003670 100375 BPL -4 ;WAIT FOR READY
1548 003672 000137 003614 JMP NODD
1549 003676 013777 001050 175076 NODATA: MOV STRCHR,2LPB ;SEND DATA
1550 003704 005037 001032 CLR CHRCNT ;DELAY
1551 003710 005237 001032 IS: INC CHRCNT
1552 003714 001375 BNE IS

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1553 003716 005777 175056      TST      2LPS      ;TEST FOR ERROR SET
1554 003722 100410      BMI      NODAT1    ;BRANCH IF ERROR SET
1555 003724      ERROR      VN
1556 003724 012737 000031 001046 ERR31: MOV      #31,      ERCOUNT      ;SET UP ERROR COUNT 31
1557      003032      N=N+1
1558 003732 004537 010236      JSR      X5,STAER      ;REPORT ERROR NOT SET
1559 003736 000000      HALT      ;HALT ON ERROR
1560 003740 000137 003606      JMP      NODAT1    ;RETEST
1561 003744 005237 001050      INC      STRCHR      ;NEXT PAPER INSTRUCTION
1562 003750 002737 000214 001050 NODAT1: CMP      #214,STRCHR ;DONE TEST?
1563 003756 001404      BEQ      NODAT2    ;CONTINUE IF NOT DONE
1564 003760 104000      EMT      +0      ;TYPE MESSAGE
1565 003762 010354      MESB      ;ERROR SET OK - CLEAR & TRY NEXT CHANNEL
1566 003764 000000      HALT      ;WAIT FOR OPERATOR
1567 003766 000707      BR      NODAT2    ;RELOAD & TEST NEXT CHANNEL
1568 003770 104000      EMT      +0      ;TYPE MESSAGE
1569 003772 010307      MESA      ;ERROR SET OK - TURN ON LINE
1570 003774 000137 004060      JMP      TEST2      ;JUMP
1571
1572
1573 004000 000356      NODAT3: 356      ;START LOAD
1574 004002 000000      0
1575 004004 000000      0
1576 004006 000000      0
1577 004010 000000      0
1578 004012 000000      0
1579 004014 000000      0
1580 004016 000000      0
1581 004020 000000      0
1582 004022 000000      0
1583 004024 000000      0
1584 004026 000000      0
1585 004030 000000      0
1586 004032 000000      0
1587 004034 000000      0
1588 004036 000000      0
1589 004040 000000      0
1590 004042 000000      0
1591 004044 000000      0
1592 004046 000000      0
1593 004050 000000      0
1594 004052 000000      0
1595 004054 000000      0
1596 004056 000357      NODAT4: 357      ;STOP LOAD
1597
1598      ;TEST 2
1599      ;TESTS INTERFACE AND PRINTER DATA PATHS
1600      ;WITH ALTERNATING ONES AND ZEROS
1601
1602 004060 004437 010022      TEST2: JSR      X4,TYPINT
1603 004064 004537 007676      JSR      X5,PRINT      ;INITIALIZE PRINTER
1604 004070 000406      BR      TS12AX      ;BRANCH IF OK
1605 004072      ERROR      VN
1606 004072 012737 000032 001046 ERR32: MOV      #32,      ERCOUNT      ;SET UP ERROR COUNT 32

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1607		000033				N=N+1		
1608	004100	014537	010236			JSR	%5,STAER	;REPORT PRINTER NOT READY
1609	004104	000000				HALT		;HALT ON ERROR
1610	004106				TST2AX:	\$PRINT	\M	
1611	004106	013737	012362	011716		MOV	TN02,MES15	;SET TEST NUMBER FOR MESSAGE
1612	004114	004437	007752			JSR	%4,PRINT	;PRINT TEST NUMBER
1613		000033				M=M+1		
1614	004120	012737	177740	001040		MOV	#-32,CYCNT	;SET UP LINE COUNT FOR 32 LINES
1615	004126	012737	177574	001032		MOV	#-132,CHCNT	;SET CHAR COUNT TO 132
1616	004134	013737	004210	001050		MOV	SCHRSW,STRCHR	;SET CHAR. SWITCH TO U
1617	004142	005777	174632		T3A:	TST	ALPS	;TEST FOR ERROR
1618	004146	100006				BPL	LP2B	;NO ERROR CONTINUE
1619	004150					\$ERROR	\M	
1620	004150	012737	000033	001046	ERR33:	MOV	#33, ERCOUNT	;SET UP ERROR COUNT 33
1621		000034				N=N+1		
1622	004156	004137	010236			JSR	%5,STAER	;REPORT ERROR SET
1623	004162	000000				HALT		;HALT ON ERROR
1624	004164	000177	174660		LP2B:	JMP	STRCHR	;LOAD CHAR
1625	004170	013737	004212	001050	T2A:	MOV	RCHRSW,STRCHR	;RESET CHAR. SWITCH
1626	004176	012737	000125	001044		MOV	#125,SAVE	;STORE CHAR
1627	004204	000137	004230			JMP	T5A	;LOAD CHAR
1628								
1629	004210	004170			SCHRSW:	T2A		
1630	004212	004214			RCHRSW:	T1A		
1631								
1632	004214	013737	004210	001050	T1A:	MOV	SCHRSW,STRCHR	;SET CHAR. SWITCH TO U
1633	004222	012737	000052	001044		MOV	#52,SAVE	;STORE CHAR
1634	004230	013777	001044	174544	T5A:	MOV	SAVE,ALPB	;LOAD BUFFER
1635	004236	005237	001032			INC	CHCNT	;INC CHARACTER COUNT
1636	004242	001337				BNE	T3A	;CONTINUE
1637	004244	012777	000012	174530		MOV	#12,ALPB	;SEND LF
1638	004252					\$WAIT		
1639	004252	105777	174522			TSTB	ALPS	;TEST READY
1640	004256	100375				BPL	-4	;WAIT FOR READY
1641	004260	012737	177574	001032		MOV	#-132,CHCNT	;RESET CHAR COUNT
1642	004266	005237	001040			INC	CYCNT	;INC CYCLE COUNT
1643	004272	001356				BNE	T5A	;CONTINUE IF NOT DONE
1644	004274	032777	010000	174502		BIT	#BIT12,ASWR	;LOOP ON TEST?
1645	004302	001266				BNE	TEST2	;LOOP
1646								
1647								
1648								
1649								
1650								
1651	004304	004437	010022		TEST3:	JSR	%4,TYPINT	
1652	004310					\$PRINT	\M	
1653	004310	013737	012364	011716		MOV	TN03,MES15	;SET TEST NUMBER FOR MESSAGE
1654	004316	004437	007752			JSR	%4,PRINT	;PRINT TEST NUMBER
1655		000004				M=M+1		
1656	004322	012737	177765	001040		MOV	#-13,CYCNT	;SET 21 LINES
1657	004330	000137	004462			JMP	LP2H	;SEND ILLEGAL CHARS FIRST TO GIVE BLANK LINE
1658	004334	012737	177574	001032	T2B0:	MOV	#-132,CHCNT	;SET CHAR COUNT FOR 132
1659	004342	012737	000040	001034	T2B0A:	MOV	#40,CHGEN	;SET FIRST CHAR.
1660	004350	005777	174424		T2B1:	TST	ALPS	;DOES THE PRINTER HAVE AN ERROR

Line	Address	Hex	Label	Op	Op2	Op3	Op4	Op5	Op6	Op7	Op8	Op9	Op10	Op11	Op12	Op13	Op14	Op15	Op16	Op17	Op18	Op19	Op20	Op21	Op22	Op23	Op24	Op25	Op26	Op27	Op28	Op29	Op30	Op31	Op32	Op33	Op34	Op35	Op36	Op37	Op38	Op39	Op40	Op41	Op42	Op43	Op44	Op45	Op46	Op47	Op48	Op49	Op50	Op51	Op52	Op53	Op54	Op55	Op56	Op57	Op58	Op59	Op60	Op61	Op62	Op63	Op64	Op65	Op66	Op67	Op68	Op69	Op70	Op71	Op72	Op73	Op74	Op75	Op76	Op77	Op78	Op79	Op80	Op81	Op82	Op83	Op84	Op85	Op86	Op87	Op88	Op89	Op90	Op91	Op92	Op93	Op94	Op95	Op96	Op97	Op98	Op99	Op100	Op101	Op102	Op103	Op104	Op105	Op106	Op107	Op108	Op109	Op110	Op111	Op112	Op113	Op114	Op115	Op116	Op117	Op118	Op119	Op120	Op121	Op122	Op123	Op124	Op125	Op126	Op127	Op128	Op129	Op130	Op131	Op132	Op133	Op134	Op135	Op136	Op137	Op138	Op139	Op140	Op141	Op142	Op143	Op144	Op145	Op146	Op147	Op148	Op149	Op150	Op151	Op152	Op153	Op154	Op155	Op156	Op157	Op158	Op159	Op160	Op161	Op162	Op163	Op164	Op165	Op166	Op167	Op168	Op169	Op170	Op171	Op172	Op173	Op174	Op175	Op176	Op177	Op178	Op179	Op180	Op181	Op182	Op183	Op184	Op185	Op186	Op187	Op188	Op189	Op190	Op191	Op192	Op193	Op194	Op195	Op196	Op197	Op198	Op199	Op200	Op201	Op202	Op203	Op204	Op205	Op206	Op207	Op208	Op209	Op210	Op211	Op212	Op213	Op214	Op215	Op216	Op217	Op218	Op219	Op220	Op221	Op222	Op223	Op224	Op225	Op226	Op227	Op228	Op229	Op230	Op231	Op232	Op233	Op234	Op235	Op236	Op237	Op238	Op239	Op240	Op241	Op242	Op243	Op244	Op245	Op246	Op247	Op248	Op249	Op250	Op251	Op252	Op253	Op254	Op255	Op256	Op257	Op258	Op259	Op260	Op261	Op262	Op263	Op264	Op265	Op266	Op267	Op268	Op269	Op270	Op271	Op272	Op273	Op274	Op275	Op276	Op277	Op278	Op279	Op280	Op281	Op282	Op283	Op284	Op285	Op286	Op287	Op288	Op289	Op290	Op291	Op292	Op293	Op294	Op295	Op296	Op297	Op298	Op299	Op300	Op301	Op302	Op303	Op304	Op305	Op306	Op307	Op308	Op309	Op310	Op311	Op312	Op313	Op314	Op315	Op316	Op317	Op318	Op319	Op320	Op321	Op322	Op323	Op324	Op325	Op326	Op327	Op328	Op329	Op330	Op331	Op332	Op333	Op334	Op335	Op336	Op337	Op338	Op339	Op340	Op341	Op342	Op343	Op344	Op345	Op346	Op347	Op348	Op349	Op350	Op351	Op352	Op353	Op354	Op355	Op356	Op357	Op358	Op359	Op360	Op361	Op362	Op363	Op364	Op365	Op366	Op367	Op368	Op369	Op370	Op371	Op372	Op373	Op374	Op375	Op376	Op377	Op378	Op379	Op380	Op381	Op382	Op383	Op384	Op385	Op386	Op387	Op388	Op389	Op390	Op391	Op392	Op393	Op394	Op395	Op396	Op397	Op398	Op399	Op400	Op401	Op402	Op403	Op404	Op405	Op406	Op407	Op408	Op409	Op410	Op411	Op412	Op413	Op414	Op415	Op416	Op41
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1715 ;TEST 4
1716 ;OVER PRINT TEST
1717 ;OVER PRINT FULL LINES OF ALTERNATING E'S AND SPACES
1718
1719 004642 004437 010022 CHRCHK: JSR %4,TYPINT
1720 004646 SPRINT \M
1721 004646 013737 012366 011716 MOV TNO4,MES15 ;SET TEST NUMBER FOR MESSAGE
1722 004654 004437 007752 JSR %4,PRNNT ;PRINT TEST NUMBER
1723 000005 M=M+1
1724 004660 012737 177750 001036 MOV #-24,LINCNT ;SET UP LINE COUNT FOR 24 LINES
1725 004666 012737 177776 001040 MOV #-2,CYCNT ;SET UP CYCLE COUNT
1726 004674 013737 005036 001050 MOV CHRE,STRCHR ;SET CHAR TAG TO SPACE
1727 004702 012737 177574 001032 CR: MOV #-132,CHRCNT ;SET CHAR COUNT
1728 004710 005777 174064 CR0: TST ALPS ;TEST FOR ERROR
1729 004714 100006 BPL CR1 ;CONTINUE IF NO ERROR
1730 004716 SERRR \N
1731 004716 012737 000036 001046 ERR36: MOV #36, ERRCOUNT ;SET UP ERROR COUNT 36
1732 000037 N=N+1
1733 004724 004537 010236 JSR %5,STAER ;REPORT ERROR SET
1734 004730 000000 HALT ;HALT ON ERROR
1735 004732 000177 174112 CR1: JMP @STRCHR ;OPPOSITE CHAR
1736 004736 013737 005036 001050 CR2: MOV CHRE,STRCHR ;SET CHAR SWITCH TO SPACE
1737 004744 012737 000105 001044 CR3: MOV #105,SAVE ;SEND E
1738 004752 013777 001044 174022 CR3: MOV SAVE,ALPB ;LOAD BUFFER
1739 004760 005237 001032 INC CHRCNT ;INCREMENT CHAR COUNT
1740 004764 001251 BNE CR0 ;BRANCH IF NOT DONE
1741 004766 005237 001040 INC CYCNT ;INCREMENT CYCLE COUNT
1742 004772 001422 BEQ CR5 ;BRANCH IF FINISHED OVERPRINTS
1743 004774 012777 000015 174000 MOV #15,ALPB ;SEND CR
1744 005002 $WAIT
1745 005002 105777 173772 TSTB ALPS ;TEST READY
1746 005006 100375 BPL -4 ;WAIT FOR READY
1747 005010 000137 004702 JMP CR ;OVERPRINT LINE
1748 005014 013737 005034 001050 CR7: MOV CHRS,STRCHR ;RESET CHAR SWITCH
1749 005022 012737 000040 001044 CR7: MOV #40,SAVE ;SEND SPACE
1750 005030 000137 004752 JMP CR3 ;CONTINUE
1751
1752 005034 004736 CHRS: CR2
1753 005036 005014 CHRE: CR7
1754 005040 012777 000012 173734 CR5: MOV #12,ALPB ;SEND LF
1755 005046 000046 $WAIT
1756 005046 105777 173726 TSTB ALPS ;TEST READY
1757 005052 100375 BPL -4 ;WAIT FOR READY
1758 005054 012737 177776 001040 MOV #-2,CYCNT ;RESET CYCLE COUNT
1759 005062 012737 177574 001032 MOV #-132,CHRCNT ;RESET CHAR COUNT
1760 005070 005237 001036 INC LINCNT ;INCREMENT LINE COUNT
1761 005074 001326 BNE CR3 ;BRANCH IF NOT DONE
1762 005076 032777 010000 173700 BIT #BIT12,@SWR ;LOOP ON TEST?
1763 005104 001256 BNE CHRCHK ;YES, LOOP
1764
1765
1766 ;TEST 5
1767 ;SHUTTLE POSITIONING TEST
1768

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K03

MAINDEC-11-DZLPK-D-D
DZLPK0.P11

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1769 ;SENDS PAIRS OF E'S, THEN OVER PRINTS THEM WITH SPACES AND ADDS ANOTHER
1770 ;PAIR OF E'S TO THE LINE --- THIS IS REPEATED UNTIL A FULL LINE OF E'S
1771 ;HAVE BEEN PRINTED, THEN A FULL LINE OF M'S ARE PRINTED.
1772
1773 005106 004437 010022 OVRPRT: JSR %4,TYPINT
1774 005112 $PRINT \M
1775 005112 013737 012370 011716 MOV TNOS,MES15 ;SET TEST NUMBER FOR MESSAGE
1776 005120 004437 007752 JSR %4,PRNTT ;PRINT TEST NUMBER
1777 000006 M=M+1
1778 005124 012737 177760 001036 MOV #16,LINCNT ;SET LINE COUNT FOR 16 LINES
1779 005132 012737 177574 001032 OVR: MOV #132,CHRCNT ;SET CHAR COUNT
1780 005140 012737 177776 001040 OVR0: MOV #2,CYCCNT ;SET CYCLE COUNT FOR A PAIR OF E'S
1781 005146 013737 001032 001052 MOV CHRCNT,STRCNT ;NO. CHARS LEFT TO PRINT
1782 005154 062737 000005 001052 ADD #133,STRCNT ;NO. SPACES +1
1783 005162 012737 000040 001034 MOV #40,CHRCNT ;SEND SPACE
1784 005170 000406 BR OVR2 ;BRANCH
1785 005172 012737 000105 001034 OVR4: MOV #105,CHRCNT ;SEND E
1786 005200 013777 001034 173574 OVR1: MOV CHRCNT,ALPB ;LOAD BUFFER
1787 005206 005777 173566 OVR2: TST ALPB ;TEST FOR ERROR
1788 005212 100006 BPL OVR3 ;BRANCH IF NO ERROR
1789 005214 $ERROR \M
1790 005214 012737 000037 001046 ERR37: MOV #37, ERCOUNT ;SET UP ERROR COUNT 37
1791 000040 N=N+1
1792 005222 005237 010236 JSR %5,STAER ;REPORT ERROR SET
1793 005236 000000 HALT
1794 005236 005337 001052 OVR3: DEC STRCNT ;DECREMENT SPACE COUNTER
1795 005236 003361 BGT OVR1 ;BRANCH IF NOT DONE SPACES
1796 005236 001755 BEQ OVR4 ;BRANCH IF NOT FIRST E
1797 005240 005237 001032 INC CHRCNT ;INCREMENT CHAR COUNT
1798 005244 001437 BEQ OVR8 ;BRANCH IF DONE LINE
1799 005246 005237 001040 OVR5: INC CYCCNT ;INCREMENT CYCLE COUNT
1800 005252 001352 BNE OVR1 ;CONTINUE SENDING E'S IF NOT DONE
1801 005254 012777 000015 173520 MOV #15,ALPB ;SEND CR
1802 005262 OVR6: $WAIT
1803 005262 105777 173512 TSTB ALPB ;TEST READY
1804 005266 100375 BPL #4 ;WAIT FOR READY
1805 005270 005737 001032 TST CHRCNT ;LINE DONE?
1806 005274 001321 BNE OVR0 ;NO. CONTINUE OVER PRINT
1807 005276 005237 001036 INC LINCNT ;YES. INCREMENT LINE COUNT
1808 005302 001425 BEQ OVREXT ;EXIT IF DONE TEST
1809 005304 032737 000001 001036 BIT #1,LINCNT ;WHICH LINE NEXT?
1810 005312 001707 BEQ OVR ;BRANCH TO SEND E'S
1811 005314 012737 000115 001034 MOV #115,CHRCNT ;SET UP TO SEND M'S
1812 005322 012737 177573 001032 MOV #133,CHRCNT ;SET CHAR COUNT
1813 005330 005037 001052 CLR STRCNT ;CLEAR SPACE COUNT
1814 005334 005037 001040 CLR CYCCNT ;CLEAR CYCLE COUNT
1815 005340 000137 005206 JMP OVR2 ;PRINT LINE OF M'S
1816 005344 012777 000012 173430 OVR8: MOV #12,ALPB ;SEND LF
1817 005352 000137 005262 JMP OVR6 ;CONTINUE
1818 005356 032777 010000 173420 OVREXT: BIT #8,ALPB ;LOOP ON TEST?
1819 005364 001250 BNE OVRPRT ;LOOP
1820
1821 ;TEST 6
1822 ;PRINT CONTROL TEST

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L03

MAINDEC-11-DZLPK-D-D
DZLPKD.P11

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1823                                     ; SENDS FULL LINE OF SAME CHARACTER THEN FULL CHAR SET
1824                                     ; SHOULD ONLY PRINT THE FIRST 132 CHARACTERS RECEIVED
1825
1826 005366 004437 010022          PRTCTL: JSR      %4, TYPINT
1827 005372                                     SPRINT  \M
1828 005372 013737 012372 011716      MOV      TN06, MES15          ; SET TEST NUMBER FOR MESSAGE
1829 005400 004437 007752          JSR      %4, PRNNT          ; PRINT TEST NUMBER
1830                                     M=M+1
1831 005404 012737 000060 001050      MOV      #60, STRCHR          ; FIRST START CHAR
1832 005412 032777 020000 173364      PRT0:  BIT      #BIT13, 2SWR          ; TEST FOR CHAR SET
1833 005420 001404                                     PRT1:  BEQ      PRT1          ; BRANCH IF 64 CHARS
1834 005422 012737 177641 001030      MOV      #-95., SEGCNT          ; SET OVERFLOW COUNT
1835 005430 000403                                     PRT2:  BR          ; BRANCH
1836 005432 012737 177701 001030      PRT1:  MOV      #-63., SEGCNT          ; SET OVERFLOW COUNT
1837 005440 012737 177574 001032      PRT2:  MOV      #-132., CHRCNT          ; SET CHAR COUNT
1838 005446 013737 001050 001034      MOV      STRCHR, CHRCNT          ; GET START CHAR
1839 005454 005777 173320          PRT3:  TST      2LPS          ; TEST FOR ERROR
1840 005460 100006                                     PRT4:  BPL      PRT4          ; BRANCH IF NO ERROR
1841 005462                                     SERR0R  \M
1842 005462 012737 000040 001046      ERR40: MOV      #40,   ERCOUNT          ; SET UP ERROR COUNT 40
1843                                     N=N+1
1844 005470 004537 010236          JSR      %5, STAER          ; REPORT ERROR SET
1845 005474 000000                                     HALT          ; HALT ON ERROR
1846 005476 013777 001034 173276      PRT4:  MOV      CHRCNT, 2LPB          ; LOAD BUFFER
1847 005504 005237 001032          INC      CHRCNT          ; INCREMENT CHAR COUNT
1848 005510 002761                                     BLT      PRT3          ; BRANCH IF NOT 132 CHARS
1849 005512 001433                                     BEQ      PRTA          ; START OVERFLOW
1850 005514 005237 001034          INC      CHRCNT          ; NEXT CHAR

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1851	005520	005237	001030		INC	SEGCNT	: INCREMENT OVERFLOW COUNT
1852	005524	001353			BNE	PRT3	: CONTINUE IF NOT DONE
1853	005526	012777	000012	173246	MOV	#12,ALPB	: SEND LF
1854	005534				SWAIT		
1855	005534	105777	173240		TSTB	ALPS	: TEST READY
1856	005540	100375			BPL	.-4	: WAIT FOR READY
1857	005542	022737	000040	001050	CMP	#40,STRCHR	: LAST START CHAR SPACE?
1858	005550	001421			BEQ	PRT6	: YES BRANCH
1859	005552	022737	000065	001050	CMP	#65,STRCHR	: LAST START CHAR 5?
1860	005560	001422			BEQ	PRT7	: YES BRANCH
1861	005562	022737	000071	001050	CMP	#71,STRCHR	: DONE?
1862	005570	001423			BEQ	PRT8	: YES
1863	005572	005237	001050		INC	STRCHR	: NO, GET NEXT START CHAR
1864	005576	000137	005412		JMP	PRT0	: CONTINUE
1865	005602	012737	000041	001034	MLF: MOV	#41,CHRCNT	: GET FIRST CHAR IN SET
1866	005610	000137	005454		JMP	PRT3	: START OVERFLOW
1867	005614	012737	000066	001050	PRT6: MOV	#66,STRCHR	: SET START CHAR TO 6
1868	005622	000137	005412		JMP	PRT0	: CONTINUE
1869	005626	012737	000040	001050	PRT7: MOV	#40,STRCHR	: SET START CHAR TO SPACE
1870	005634	000137	005412		JMP	PRT0	: CONTINUE
1871	005640	032777	010000	173136	PRT8: BIT	#BIT12,2SWR	: CHECK LOOP ON TEST
1872	005646	001247			BNE	PRTCTL	: LOOP
1873							
1874							
1875							
1876							
1877							
1878							
1879	005650	004437	010022		MLF: JSR	%4,TYPINT	
1880	005654				SPRINT	%M	
1881	005654	013737	012374	011716	MOV	TN07,MES15	: SET TEST NUMBER FOR MESSAGE
1882	005662	004437	007752		JSR	%4,PRINT	: PRINT TEST NUMBER
1883		000910			M=M+1		
1884	005666	012737	006020	001050	MOV	#TABSTR,STRCHR	: FIRST CHAR
1885	005674	012737	177574	001032	MLFA: MOV	#-132,CHRCNT	: SET CHAR COUNT
1886	005702	117737	173142	001034	MOV	2STRCHR,CHRCNT	: GET CHAR
1887	005710	001452			BEQ	MLF4	: BRANCH IF DONE
1888	005712	005777	173062		MLFO: TST	ALPS	: TEST FOR ERROR
1889	005716	100006			BPL	MLF1	: CONTINUE IF NO ERROR
1890	005720				SEERROR	%N	
1891	005720	012737	000041	001046	ERR41: MOV	#41, ERRCOUNT	: SET UP ERROR COUNT 41
1892		005042			N=N+1		
1893	005726	004537	010236		JSR	%5,STAER	: REPORT ERROR
1894	005732	000000			HALT		: HALT ON ERROR
1895	005734	013777	001034	173040	MLF1: MOV	CHRCNT,ALPB	: LOAD BUFFER
1896	005742	005237	001032		INC	CHRCNT	: INCREMENT CHAR COUNT
1897	005746	001361			BNE	MLFO	: CONTINUE
1898	005750	117737	173074	001036	MOV	2STRCHR,LINCNT	: GET ASCII LINE COUNT
1899	005756	042737	177770	001036	BIC	#177770,LINCNT	: MAKE OCTAL
1900	005764	005237	001036		INC	LINCNT	: ADD 1
1901	005770	012777	000012	173004	MLF2: MOV	#12,ALPB	: SEND LF
1902	005776				SWAIT		
1903	005776	105777	172776		TSTB	ALPS	: TEST READY
1904	006002	100375			BPL	.-4	: WAIT FOR READY

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

N03

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DZLPKD.P11

1905	006004	005337	001036
1906	006010	001367	
1907	006012	005237	001050

DEC	LINCNT
BNE	MLF2
INC	STRCHR

;DECREMENT LINE COUNT
;CONTINUE
;NEXT CHAR

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1908 006016 000726 BR MLFA ;CONTINUE
1909
1910 006020 033462 033062 033463 TABSTR: .ASCIZ /272637463540/
1911 006025 033064 032463 030064
1912 006034 000
1913
1914 006036 .EVEN
1915
1916 006036 032777 010000 172740 MLF4: BIT #BIT12,2SWR ;CHECK LOOP ON TEST
1917 006044 001301 BNE MLF ;LOOP
1918 .EVEN
1919
1920 ;TEST 8
1921 ;HIGH SPEED PRINT TEST
1922
1923 006046 004437 010022 HSPRT: JSR %4,TYPINT
1924 006052 $PRINT %N
1925 006052 013737 012376 011716 MOV TNO10,MES15 ;SET TEST NUMBER FOR MESSAGE
1926 006060 004437 007752 JSR %4,PRINT ;PRINT TEST NUMBER
1927 000011 M=M+1
1928 006064 032777 020000 172712 BIT #BIT13,2SWR ;CHECK CHAR SET
1929 006072 001007 BNE HS00A ;BRANCH IF %6 CHAR SET
1930 006074 012737 000140 001054 MOV #140,LEGCHR ;LEGAL CHK
1931 006102 012737 000100 001056 MOV #100,NUMCHR ;#CHARS
1932 006110 000406 BR HS00 ;CONTINUE
1933 006112 012737 000200 001054 HS00A: MOV #200,LEGCHR ;LEGAL CHECK
1934 006120 012737 000140 001056 MOV #140,NUMCHR ;#CHARS
1935 006126 012737 000040 001050 HS00: MOV #40,STRCHR ;SET UP FIRST LINE
1936 006134 012737 000177 001036 MOV #127,LINCNT ;SET LINE COUNT FOR 2 PAGES
1937 006142 012737 177574 001032 HS0: MOV #132,CHRCNT ;SET CHAR COUNT
1938 006150 012737 177757 001040 MOV #17,CYC CNT ;SET GROUP COUNT
1939 006156 013737 001050 001034 MOV STRCHR,CHRCNT ;STORE START CHAR
1940 006164 005777 172612 HS1: TST 2LPB ;TEST FOR ERROR
1941 006170 100006 BPL HS2 ;BRANCH IF NO ERROR
1942 006172 $ERROR %N
1943 006172 012737 000042 001046 ERR42: MOV #42, ERCOUNT ;SET UP ERROR COUNT 42
1944 000043 N=N+1
1945 006200 004537 010236 JSR %5,STAER ;REPORT ERROR SET
1946 006204 000000 HALT ;HALT ON ERROR
1947 006206 013777 001034 172566 HS2: MOV CHRCNT,2LPB ;LOAD BUFFER
1948 006214 005237 001032 INC CHRCNT ;INCREMENT CHAR COUNT
1949 006220 001424 BEQ HS4 ;BRANCH IF DONE LINE
1950 006222 005237 001034 INC CHRCNT ;NEXT CHAR
1951 006226 005237 001040 INC CYC CNT ;INCREMENT GROUP COUNT
1952 006232 001410 BEQ HS3 ;BRANCH IF DONE GROUP
1953 006234 023737 001054 001034 CMP LEGCHR,CHRCNT ;LEGAL CHAR?
1954 006242 001350 BNE HS1 ;BRANCH AND CONTINUE IF LEGAL CHAR
1955 006244 163737 001056 001034 SUB NUMCHR,CHRCNT ;MAKE LEGAL
1956 006252 000744 BR HS1 ;CONTINUE
1957 006254 013737 001050 001034 HS3: MOV STRCHR,CHRCNT ;GET FIRST CHAR IN GROUP
1958 006262 012737 177757 001040 MOV #17,CYC CNT ;RESET CYCLE COUNT
1959 006270 000735 BR HS1 ;CONTINUE
1960 006272 012777 000012 172502 HS4: MOV #12,2LPB ;SEND LF
1961 006300 $WAIT

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C04

MAINDEC-11-DZLPK-D-D
DZLPK.D.P11

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1962	006300	105777	172474		TSTB	2LPS		:TEST READY
1963	006304	100375			BPL	-4		:WAIT FOR READY
1964	006306	000337	001036		DEC	LINCNT		:DECREMENT LINE COUNT
1965	006312	000413			BLT	HS6		:EXIT TEST IF DONE
1966	006314	162737	000004	001050	SUB	84,STRCHR		:SKIP 4 LINES ON DRUM, FIND START CHAR
1967	006322	000737	000040	001050	CMP	840,STRCHR		:START CHAR A LEGAL CHAR?
1968	006330	003704			BLE	HS0		:CONTINUE IF LEGAL START CHAR
1969	006332	002737	000100	001050	ADD	8100,STRCHR		:MAKE LEGAL AND CONTINUE
1970	006340	000700			B1	HS0		:CONTINUE
1971	006342	002777	010000	172434	BIT	8BIT12,2SWR		:LOOP ON TEST?
1972	006350	001236			BNE	HSPT		:LOOP
1973								
1974								
1975								
1976								
1977								
1978	006352	004437	010022		SNGCHR:	JSR	X4,TYPINT	
1979	006356					SPRINT	\N	
1980	006356	013737	012400	011716	MOV	TN011,MES!5		:SET TEST NUMBER FOR MESSAGE
1981	006364	004437	007752		JSR	X4,PRINT		:PRINT TEST NUMBER
1982		000012				N=N+1		
1983	006370	002777	020000	172406	BIT	8BIT13,2SWR		:TEST CHAR SET
1984	006376	001404			BEQ	S2		:BRANCH IF 64
1985	006400	012737	177640	001036	MOV	8-96.,LINCNT		:96 CHAR.
1986	006406	000403			BR	+10		:BRANCH
1987	006410	012737	177700	001036	MOV	8-64.,LINCNT		:64 CHAR.
1988	006416	012737	000040	001034	MOV	840,CHRCN		:SET UP SPACE
1989	006424	012737	177574	001032	MOV	8-132.,CHRCN		:SET CHAR COUNT FOR 132
1990	006432	005777	172342		S1:	TST	2LPS	:TEST FOR ERRORS
1991	006436	100006			BPL	XS1X		:BRANCH IF NO ERRORS
1992	006440				SERROR	\N		
1993	006440	012737	000043	001046	ERR43:	MOV	843, ERCOUNT	:SET UP ERROR COUNT 43
1994		000044				N=N+1		
1995	006446	004537	010236		JSR	X5,STAER		:REPORT ERROR
1996	006452	000000			HALT			:HALT ON ERROR
1997	006454	013777	001034	172320	XS1X:	MOV	CHRCN,2LPB	:LOAD PRINTER BUFFER
1998	006462	005237	001032		INC	CHRCN		:INCREMENT CHAR COUNT
1999	006466	001361			BNE	S1		:CONTINUE IF NOT DONE LINE
2000	006470	012777	000012	172304	S4X2:	MOV	812,2LPB	:ISSUE LINE FEED
2001	006476				SWAIT			
2002	006476	105777	172276		TSTB	2LPS		:TEST READY
2003	006482	100375			BPL	-4		:WAIT FOR READY
2004	006504	000737	001034		INC	CHRCN		:+1 CHAR.
2005	006510	000737	001036		INC	LINCNT		:+1 LINE COUNT
2006	006514	002743			BLT	S2A		:CONTINUE IF NOT DONE
2007	006516	001764			BEQ	S4X2		:SEND BLANK LINE AT END OF TEST
2008	006520	002777	010000	172256	LPS7:	BIT	8BIT12,2SWR	:CHECK TO LOOP ON TEST
2009	006526	001311			BNE	SNGCHR		:LOOP ON TEST
2010								
2011								
2012								
2013								
2014								
2015								

:TEST 9
:WORST CASE NOISE TEST
:SINGLE CHAR. ACROSS ALL COLS.

:TEST 10
:DRUM PATTERN CHARACTER TEST

2016	005533	004437	010022		ROTATE: JSR	X4, TYPINT	
2017	005534				SPRINT	\M	
2018	005534	013737	012402	011716	MOV	TN012, MES15	; SET TEST NUMBER FOR MESSAGE
2019	006542	004437	007752		JSR	X4, PRINT	; PRINT TEST NUMBER
2020		000013			M=M+1		
2021	005546	032777	020000	172230	BIT	#BIT13, JSR	; TEST CHAR SET
2022	00554	001012			BNE	ROT0	; SKIP IF 96 CHAR
2023	00556	012737	000137	001036	MOV	#137, LINCNT	; LAST CHAR
2024	005564	012737	000140	001054	MOV	#140, LEGCHR	; LEGAL CHK
2025	005572	012737	000100	001056	MOV	#100, NUMCHR	; #CHARS
2026	005500	000411			BR	ROT1	; CONTINUE
2027	005502	012737	000177	001036	ROT0: MOV	#177, LINCNT	; LAST CHAR
2028	006610	012737	000200	001054	MOV	#200, LEGCHR	; LEGAL CHK
2029	006616	012737	000140	001056	MOV	#140, NUMCHR	; #CHARS
2030	005524	005537	001040		ROT1: CLR	CYC CNT	; CLEAR CYCLE COUNT
2031	005530	005537	001040		ROT2: INC	CYC CNT	; INC CYCLE COUNT
2032	006634	005537	001034		CLR	CH GEN	; CLEAR POINTER
2033	005540	005537	001034		ROT3: INC	CH GEN	; INC POINTER
2034	005544	013737	001034	001050	MOV	CH GEN, STRCHR	; STORE POINTER
2035	005552	063737	001036	001050	ADD	LINCNT, STRCHR	; FIND CHAR
2036	005560	063737	001050	001054	CMP	STRCHR, LEGCHR	; LEGAL?
2037	005566	002403			BLT	ROT4	; BRANCH IF LEGAL
2038	005570	163737	001056	001050	SUB	NUMCHR, STRCHR	; MAKE LEGAL
2039	005576	005577	172076		ROT4: TST	ALPS	; TEST FOR ERRORS
2040	005502	100006			BPL	ROT5	; BRANCH IF NO ERRORS
2041	005704				SERROR	\N	
2042	006704	012737	000044	001046	ERR44: MOV	#44, ERCOUNT	; SET UP ERROR COUNT 44
2043		000045			M=M+1		
2044	005712	005537	010236		JSR	X5, STAER	; REPORT ERROR
2045	005716	000000			HALT		; HALT ON ERROR
2046	006720	013777	001050	172054	ROT5: MOV	STRCHR, ALPB	; LOAD BUFFER
2047	006726	023727	001034	000021	CMP	CH GEN, #17.	; DONE GROUP?
2048	006734	001341			B'E	ROT3	; NO GET NEXT CHAR
2049	006736	023727	001040	000010	CMP	CYC CNT, #8.	; DONE LINE?
2050	006744	001331			BNE	ROT2	; NO, NEXT GROUP
2051	005746	012777	000012	172026	MOV	#12, ALPB	; YES, SEND LF
2052	005754				WAIT		
2053	005754	105777	172020		TSTB	ALPS	; TEST READY
2054	005760	105375			BPL	-4	; WAIT FOR READY
2055	005762	005337	001036		DEC	LINCNT	; DECREMENT LINE COUNT
2056	005766	023727	001036	000037	CMP	LINCNT, #37	; DONE?
2057	005774	003313			BGT	ROT1	; NO, NEXT LINE
2058	006776	032777	010000	172000	BIT	#BIT12, JSR	; LOOP ON TEST?
2059	007004	001251			BNE	ROTATE	; LOOP
2060							
2061							
2062							
2063							
2064							
2065							
2066	007006	004437	010022		LFTTR: JSR	X4, TYPINT	
2067	007012				SPRINT	\M	
2068	007012	013737	012404	011716	MOV	TN013, MES15	; SET TEST NUMBER FOR MESSAGE
2069	007020	004437	007752		JSR	X4, PRINT	; PRINT TEST NUMBER

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

; STARTING WITH A LEFT TRIANGLE

DZL PWD. P11

2070		000014			M=M+1		
2071	007024	012737	000204	001036	LFT:	MOV	#132., LINCNT
2072	007032	013737	001036	001032	LFT0:	MOV	LINCNT, CHRCNT
2073	007040	012737	177757	001040		MOV	#-17., CYCCNT
2074	007046	013737	001032	001034		MOV	CHRCNT, CHRGEN
2075	007054	022737	000022	001034	LFT1:	CMP	#18., CHRGEN
2076	007062	003004			BGT	LFT2	
2077	007064	162737	000021	001034	SUB	#17., CHRGEN	
2078	007072	000770			BR	LFT1	
2079	007074	005437	001034		LFT2:	NEG	CHRGEN
2080	007100	062737	000100	001034	ADD	#100, CHRGEN	
2081	007106	013737	001034	001050	MOV	CHRGEN, STRCHR	
2082	007114	005777	171660		LFT3:	TST	ALPS
2083	007120	100006			BPL	LFT4	
2084	007122				SERROR	N	
2085	007122	012737	000045	001046	ERR45:	MOV	#45, ERCOUNT ;SET UP ERROR COUNT 45
2086		000046			N=N+1		
2087	007130	004537	010236		JSR	X5, STAER	;REPORT ERROR SET
2088	007134	000000			HALT		;HALT ON ERROR
2089	007136	013777	001034	171636	LFT4:	MOV	CHRGEN, ALPB
2090	007144	005337	001032		DEC	CHRCNT	;LOAD BUFFER
2091	007150	001415			BEQ	LFT6	;DECREMENT CHAR COUNT
2092	007152	005237	001040		INC	CYCCNT	;BRANCH IF DONE LINE
2093	007156	001403			BEQ	LFT5	;INCREMENT GROUP COUNT
2094	007160	005237	001034		INC	CHRGEN	;BRANCH IF DONE GROUP
2095	007164	000753			BR	LFT3	;NEXT CHAR IN GROUP
2096	007166	013737	001050	001034	LFT5:	MOV	STRCHR, CHRGEN
2097	007174	012737	177757	001040	MOV	#-17., CYCCNT	;CONTINUE
2098	007202	000744			BR	LFT3	;GET START CHAR AGAIN
2099	007204	012777	000012	171570	LFT6:	MOV	#12, ALPB
2100	007212				SWAIT		;RESET GROUP COUNT
2101	007212	105777	171562		TSTB	ALPS	;CONTINUE
2102	007216	101375			BPL	-4	;SEND LF
2103	007220	005337	001036		DEC	LINCNT	;TEST READY
2104	007224	003302			BGT	LFT0	;WAIT FOR READY
2105	007226	001766			BEQ	LFT6	;DECREMENT LINE COUNT
2106	007230	032777	010000	171546	BIT	#BIT12, JSWR	;BRANCH IF NOT DONE
2107	007236	001263			BNE	LFTTR	;SEND BLANK LINE AT END OF TEST
2108							;LOOP ON TEST*
2109							;LOOP
2110							
2111							
2112	007240	012737	000001	001036	RTTR:	MOV	#1, LINCNT
2113	007246	012737	000077	001034	RT1:	MOV	#77, CHRGEN
2114	007254	013737	001036	001040		MOV	LINCNT, CYCCNT
2115	007262	012737	177757	001052		MOV	#-17., STACNT
2116	007270	012737	000204	001032		MOV	#132., CHRCNT
2117	007276	163737	001036	001032		SUB	LINCNT, CHRCNT
2118	007304	001425			BEQ	RT3	
2119	007306	005777	171466		RT2:	TST	ALPS
2120	007312	100006			BPL	RT2A	
2121	007314				SERROR	N	
2122	007314	012737	000046	001046	ERR46:	MOV	#46, ERCOUNT ;SET UP ERROR COUNT 46
2123		000047			N=N+1		

2124	007322	004537	010236		JSR	%5, STAER	: REPORT ERROR SET
2125	007326	000000			HALT		: HALT ON ERROR
2126	007330	012777	000040	171444	RT2A:	MOV	: #40, 2LPB
2127	007336	007237	001052		INC	STCNT	: INCREMENT GROUP COUNT
2128	007342	001003			BNE	RT2AA	: BRANCH IF NOT DONE GROUP
2129	007344	012737	177757	001052	MOV	%-17, STCNT	: RESET GROUP COUNT
2130	007352	005337	001032		RT2AA:	DEC	: CHRCNT
2131	007356	001353			BNE	RT2	: BRANCH IF NOT DONE SPACES
2132	007360	005777	171414		RT3:	TST	: 2LPS
2133	007364	100006			BPL	RT3A	: CONTINUE IF NO ERROR
2134	007366				SERROR	%N	
2135	007366	012737	000047	001046	ERR47:	MOV	: #47, ERCOUNT ; SET UP ERROR COUNT 47
2136		000050			N=N+1		
2137	007374	004537	010236		JSR	%5, STAER	: REPORT ERROR SET
2138	007400	000000			HALT		: HALT ON ERROR
2139	007402	013777	001034	171372	RT3A:	MOV	: CHRCNT, 2LPB
2140	007410	005237	001034		INC	CHRCNT	: NEXT CHAR
2141	007414	005237	001052		INC	STCNT	: INCREMENT GROUP COUNT
2142	007420	001006			BNE	RT3B	: BRANCH IF NOT DONE GROUP
2143	007422	012737	177757	001052	MOV	%-17, STCNT	: RESET GROUP COUNT
2144	007430	162737	000021	001034	SUB	%17, CHRCNT	: GET FIRST GROUP CHAR
2145	007436	005337	001040		RT3B:	DEC	: CYCNT
2146	007442	001346			BNE	RT3	: CONTINUE
2147	007444	012777	000012	171330	MOV	%12, 2LPB	: SEND LF
2148	007452				SWAIT		
2149	007452	105777	171322		TSTB	2LPS	: TEST READY
2150	007456	100375			BPL	%-4	: WAIT FOR READY
2151	007460	005237	001036		INC	LINCNT	: INCREMENT LINE COUNT
2152	007464	022737	000205	001036	CHP	%133, LINCNT	: DONE
2153	007472	003265			BGT	RT1	: BRANCH IF NOT DONE
2154	007474	032777	010000	171302	BIT	%BIT12, 2SWR	: LOOP ON TEST
2155	007502	001256			BNE	RT1R	: LOOP
2156							
2157					: TEST 12		
2158					: HAMMER ALIGNMENT		
2159							
2160	007504	004437	010022		HAMALN:	JSR	: %4, TYPINT
2161	007510				SPRINT	%N	
2162	007510	013737	012406	011716	MOV	TN014, MES15	: SET TEST NUMBER FOR MESSAGE
2163	007516	004437	007752		JSR	%4, PRINT	: PRINT TEST NUMBER
2164		000015			N=N+1		
2165	007522	012737	177701	001036	MOV	%-63, LINCNT	: SET UP FOR 63 LINES
2166	007530	012737	177574	001032	HAMIX:	MOV	: %-132, CHRCNT
2167	007536	005777	171236		HAM2:	TST	: 2LPS
2168	007542	100006			BPL	XHAM1	: CHECK FOR ERROR
2169	007544				SERROR	%N	: BRANCH IF NO ERROR
2170	007544	012737	000050	001046	ERR50:	MOV	: %50, ERCOUNT ; SET UP ERROR COUNT 50
2171		007551			N=N+1		
2172	007552	007537	010236		JSR	%5, STAER	: REPORT ERROR OCCURRED
2173	007556	000000			HALT		: HALT ON ERROR
2174	007560				XHAM1:	SWAIT	
2175	007560	105777	171214		TSTB	2LPS	: TEST READY
2176	007564	100375			BPL	%-4	: WAIT FOR READY
2177	007566	100375			BPL	%-4	: WAIT FOR READY

2178	007570	012777	000105	171204	XHAMIX:	MOV	#105,2LPB	; TRANSMIT E TO PRINTER
2179	007576	005237	001032			INC	CHRCNT	; +1 CHAR COUNT
2180	007602	001355				BNE	HAM2	; TRANSMIT ANOTHER CHAR.
2181	007604	012777	000012	171170		MOV	#12,2LPB	; TRANSMIT LINE FEED
2182	007612					SWAIT		
2183	007612	105777	171162			TSTB	2LP5	; TEST READY
2184	007616	100375				BPL	.-4	; WAIT FOR READY
2185	007620	005237	001036			INC	LINCNT	; +1 TO COUNT
2186	007624	001341				BNE	HAMIX	; GO DO NEXT LINE
2187	007626	032777	010000	171150		BIT	#BIT12,2SMR	; CHECK TO LOOP ON TEST
2188	007634	001323				BNE	HAMALN	; LOOP ON TEST
2189								
2190	007636	032777	040000	171140		BIT	#BIT14,2SMR	; DAVFU AVAILABLE?
2191	007644	001402				BEQ	HAMX	; NO, RECYCLE PRINTING TESTS
2192	007646	000137	012416			JMP	DAVFU	; YES, DO DAVFU PRINTING TESTS
2193	007652				HAMX:			
2194	007652	013700	000042			MOV	2142,RO	
2195	007656	001405				BEQ	DOAGN	
2196	007660	000005				RESET		
2197	007662				LOGICAL:			
2198	007662	004710				JSR	PC,(RO)	
2199	007664	000240				NOP		
2200	007666	000240				NOP		
2201	007670	000240				NOP		
2202	007672				DOAGN:			
2203	007672	000137	004060			JMP	TEST2	; RESTART
2204								
2205								
2206								
2207								
2208								
2209								
2210								
2211								
2212								
2213								
2214	007676	005777	171076		PRINT:	TST	2LPS	; TEST FOR ERROR
2215	007702	100403				BMI	PRIND	; BRANCH IF ERROR
2216	007704	105777	171070			TSTB	2LPS	; TEST FOR READY
2217	007710	100403				BMI	RDYOK	; READY SET OK
2218	007712	062705	000002		PRIND:	ADD	#2,X5	; SET UP FOR ERROR REPORT
2219	007716	000005				RTS	X5	; REPORT READY NOT SET
2220	007720	012777	000014	171054	RDYOK:	MOV	#14,2LPB	; ISSUE FORM FEED
2221	007726	105777	171046			TSTB	2LPS	; TEST FOR READY NOT SET
2222	007732	100003				2PL	NTRDY	; READY NOT SET OK
2223	007734	062705	000002			ADD	#2,X5	; SET UP FOR REPORT
2224	007740	000205				RTS	X5	; EXIT AND REPORT
2225	007742				NTRDY:	SWAIT		
2226	007742	105777	171032			TSTB	2LPS	; TEST READY
2227	007746	100375				BPL	.-4	; WAIT FOR READY
2228	007750	000205				RTS	X5	; READY SET EXIT
2229								
2230								
2231								

;MISC. ROUTINES

;ROUTINE TO INITIALIZE PRINTER
;ENTER FROM JSR X5, PRINT

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2232 ;ROUTINE TO OUTPUT ASCII MESSAGES ON THE LINE PRINTER
2233
2234 007752 012737 011700 010020 PRINT: MOV #MES14,PRMSG ;PRINT TEST NUMBER
2235 007760 005777 171014 TST @LPS ;TEST FOR ERROR
2236 007764 100006 BPL RINT ;BRANCH IF OK
2237 007766 \N
2238 007766 012737 000051 001046 ERRS1: MOV #51, ERCOUNT ;SET UP ERROR COUNT 51
2239 000052 N=N+1
2240 007774 004537 010236 JSR %5,STAER ;REPORT ERROR SET
2241 010000 000000 HALT ;HALT ON ERROR
2242 010002 012737 177514 001016 RINT: MOV #177514,TPS ;SET VECTORS -
2243 010010 012737 177516 001012 MOV #177516,TPB ;TO PRINT ON LINE PRINTER
2244 010016 104000 EMT +0 ;PRINT
2245 010020 011700 PRMSG: MES14 ;MESSAGE
2246 010022 012737 177564 001016 TYPINT: MOV #177564,TPS ;RESET VECTORS
2247 010030 012737 177566 001012 MOV #177566,TPB ;FOR TTY
2248 010036 000204 RTS %4 ;RETURN
2249
2250 ;SUBROUTINE TO OUTPUT ASCII MESSAGES ON TELETYPE PRINTER
2251
2252 010040 011600 TYP: MOV @%6,%0 ;GET ADDR. THAT CONTAINS MESS.
2253 010042 062716 000002 ADD #2,%6 ;SET UP EXIT
2254 010046 011000 MOV @%0,%0 ;ADDRESS OF MESSAGE IN RO
2255 010050 112037 010152 TYPB: MOVB (0),TYPDAT ;GET CHARACTER
2256 010054 001001 BNE TYPB ;BRANCH IF NOT DONE
2257 010056 000002 RTI ;EXIT
2258 010060 122737 000045 010152 TYPB: CMPB #45,TYPDAT ;CHECK FOR "X"
2259 010066 001416 BEQ TYPF ;BRANCH IF "X"
2260 010070 122737 000043 010152 CMPB #43,TYPDAT ;CHECK FOR "B"
2261 010076 001417 BEQ TYPG ;BRANCH IF "B"
2262 010100 004737 010106 JSR %7,TYPD ;TYPE CHARACTER IN TYPDAT
2263 010104 000761 BR TYPB ;NEXT CHAR IN MESSAGE
2264 010106 113777 010152 170676 TYPD: MOVB TYPDAT,@TPB ;OUTPUT CHARACTER TO PRINTER
2265 010114 105777 170676 TYPD: TSTB @TPS
2266 010120 100375 BPL -4
2267 010122 000207 RTS %7 ;CHAR. TYPED EXIT
2268 010124 112737 000012 010152 TYPF: MOVB #12,TYPDAT ;OUTPUT LF
2269 010132 004737 010106 JSR %7,TYPD ;GO TYPE CHAR.
2270 010136 112737 000015 010152 TYPG: MOVB #15,TYPDAT ;OUTPUT CR
2271 010144 004737 010106 JSR %7,TYPD ;GO TYPE CHAR.
2272 010150 000737 BR TYPB
2273 010152 000000 TYPDAT: 0
2274
2275 ;ROUTINE TO CONVERT OCTAL TO ASCII
2276
2277 ;ENTER ROUTINE AS FOLLOWS
2278 JSR %5,CONV
2279 ;XXXXXX=ADDRESS OF NUMBER TO BE CONVERTED
2280 ;XXXXXX=ADDRESS OF ASCII MESSAGE
2281 ;XXXXXX=NUMBER OF OCTAL NO.'S TO BE CONVERTED
2282
2283 010154 013537 010234 CONV: MOV @%5+,ACNVX ;ADDRESS OF NO. TO BE CONVERTED
2284 010160 012501 MOV (%5)+,%1 ;ADDRESS OF MESSAGE

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2286 010162 012502      MOV      (5)+,%2      ;NUMBER OF ASCII CHARACTERS
2287 010164 060201      ADD      %2,%1      ;FIRST CHAR ADDRESS
2288 010166 013703 010234 ACVN:  MOV      ACNVX,%3      ;STORE NUMBER
2289 010172 042703 177770 BIC      #177770,%3      ;ISOLATE LEAST SIGNIFICANT BIT
2290 010176 062703 000060 ADD      #60,%3      ;SET UP ASCII CHARACTER
2291 010202 110341      MOV      %3,-(1)      ;STORE CHARACTER
2292 010204 000241      CLC      ;GET NEXT SIGNIFICANT BIT ...
2293 010206 006037 010234 ROR      ACNVX
2294 010212 000241      CLC
2295 010214 006037 010234 ROR      ACNVX
2296 010220 000241      CLC
2297 010222 006037 010234 ROR      ACNVX
2298 010226 005302      DEC      %2      ;-1 FROM ASCII CHAR. CNT
2299 010230 001356      BNE      ACVN      ;CONVERT NEXT CHARACTER
2300 010232 000205      RTS      %5      ;EXIT! CONVERSION DONE

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2301
2302 010234 000000      ACNVX:  0      ;WORK REGISTER
2303
2304
2305

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;ROUTINE TO REPORT ERROR COUNT

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2306 010236 004537 010154 STRAR: JSR      %5,CONV      ;CONVERT OCTAL TO ASCII
2307 010242 001046      ERCOUNT
2308 010244 010266      HED1
2309 010246 000003      3
2310 010250 104000      ENT      +0      ;TYPE ERROR MESSAGE
2311 010252 010266      HED1
2312 010254 005777 170524 TST      %SWR      ;TEST FOR HALT ON ERROR
2313 010260 100401      BMI      .+4      ;BRANCH IF NO HALT WANTED
2314 010262 000000      HALT
2315 010264 000205      RTS      %5      ;RETURN
2316
2317

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010266 020040 020040 051105 HED1:  .ASCIIZ  /  ERROR COUNT%/
010307 105 051122 051117 MESA:  .ASCIIZ  /ERROR SET OK - CLEAR & TURN ON LINE%/
010354 051105 047522 020122 MESB:  .ASCIIZ  /ERROR SET OK - CLEAR AND TRY NEXT CHANNEL%/
010427 120 044522 052116 MESC:  .ASCII  /PRINT SPEED CHECK USING MANUAL TIMING%/
010475 120 052125 051440      .ASCII  /PUT SWITCH 0 UP TO START TIMING%/
010535 120 052125 051440      .ASCIIZ  /PUT SWITCH 0 DOWN AT END OF 1 MINUTEX/
010603 123 043524 052122 MES00:  .ASCIIZ  /STARTING DAYFU PRINTING TESTS%/
010642 046045 030120 020065 MES1:  .ASCIIZ  /%LPOS LINE PRINTER TEST%/
010673 122 051505 040524 MES2:  .ASCIIZ  /RESTART ADDRESS 600%/
010720 047520 042527 020122 MES3:  .ASCIIZ  /POWER ON - TURN ON LINE%/
010751 117 020116 044514 MES4:  .ASCIIZ  /ON LINE OK - TRY TORN PAPER SWITCH%/
011015 122 040505 054504 MES5:  .ASCIIZ  /READY SET OK - TRY DRUM GATE SWITCH%/
011062 051105 047522 020122 MES6:  .ASCIIZ  /ERROR SET OK - TURN ON LINE%/
011120 011120      .EVEN
011120 047522 020124 047524 MES7A:  .ASCII  /RE/
011122 047523 020124 047524 MES7:  .ASCII  /SET TOP OF FORM SWITCH TO /
011156 020040 020040 044440 MES8:  .ASCIIZ  /  INCHES%/
011174 011174      .EVEN
011174 026455 026455 026455 MES9:  .ASCII  /----- THIS LINE SHOULD BE /
011271 040 020040 020040 MES10:  .ASCIIZ  /  INCHES FROM THE LAST LINE -----
011402 005012      MES11A:  .ASCII  <12><12>
011404 051120 047111 020124 MES11:  .ASCII  /PRINT SPEED IS APPROXIMATELY /

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J04

MAINDEC-11-DZLPK-D-D
DZLPK0.P11

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011442	020040	020040	046040	MES12:	.ASCII	/	LINES PER MINUTEX/
011471	055	026455	026455	MES13:	.ASCII	/	-----/
011553	055	026455	026455		.ASCII	/	-----/
011635	055	026455	026455		.ASCII	/	-----8/
	011700				.EVEN		
011700	005012	042524	052123	MES14:	.ASCII	<12><12>/	TEST NUMBER /
011716	020040	005012	000012	MES15:	.ASCII	/	<12><12><12>
					.EVEN		
011724	044124	051511	046040	MES16:	.ASCII	/	THIS LINE SHOULD BE PRINTED8/
011761	040	020040	020040	MES17:	.ASCII	/	ALL ON ONE LINE --- IF SLEWED 0 LINESX/
					.EVEN		
012064	026455	026455	026455	MES18:	.ASCII	/	----- THERE SHOULD BE /
012156	020040	020040	020040	MES19:	.ASCII	/	BLANK LINES BEFORE THIS LINE
					.EVEN		
012272	052040	051505	044524	MES20:	.ASCII	/	TESTING CHANNEL SLEWING USING CHANNEL NO. /
012346	020040	000		MES20A:	.ASCII	/	/
	012352				.EVEN		
012352	030504			TNDAY1:	.ASCII	/D1/	;TEST NUMBERS FOR DAYFU TESTS
012354	031104			TNDAY2:	.ASCII	/D2/	
012356	031504			TNDAY3:	.ASCII	/D3/	
012360	020061			TNO1:	.ASCII	/1 /	
012362	020062			TNO2:	.ASCII	/2 /	
012364	020063			TNO3:	.ASCII	/3 /	
012366	020064			TNO4:	.ASCII	/4 /	
012370	020065			TNO5:	.ASCII	/5 /	
012372	020066			TNO6:	.ASCII	/6 /	
012374	020067			TNO7:	.ASCII	/7 /	
012376	020070			TNO10:	.ASCII	/8 /	
012400	020071			TNO11:	.ASCII	/9 /	
012402	030061			TNO12:	.ASCII	/10/	
012404	030461			TNO13:	.ASCII	/11/	
012406	031061			TNO14:	.ASCII	/12/	
012410	031461			TNO15:	.ASCII	/13/	
012412	032061			TNO16:	.ASCII	/14/	
012414	032461			TNO17:	.ASCII	/15/	
					.EVEN		

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;DAYFU PRINTING TESTS IF DAYFU IS AVAILABLE -- SET SWITCH 14

;TESTS D1 AND D2
;CHECK DAYFU LINE COUNT SLEWING

DAYFU:	JSR	X4, TYPINT	;INITIALIZE
	MOV	SPSP, MES19+2	
	ENT	+0	;TYPE MESSAGE
	MES00		;STARTING DAYFU TESTS
	MOV	#220, DAY11	;SET DAYFU INSTRUCTIONS
	MOV	#221, DAY12	
	MOV	TNDAY1, MES15	
	JSR	X4, PRMNT	;SET TEST NUMBER FOR MESSAGE
DAY0:	MOV	#DAYTAB, CHGEN	;PRINT TEST NUMBER
DAY00:	TST	ALPS	;SET TABLE POINTER
			;TEST FOR ERROR

K04

MAINDEC-11-DZLPK-D-D
DZLPKD.P11

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2334	012474	100010				BPL	DAV1	;BRANCH IF NO ERROR
2335	012476					SERROR	\N	
2336	012476	012737	000052	001046	ERR52:	MOV	#52, ERCOUNT	;SET UP ERROR COUNT 52
2337		000053				N=N+1		
2338	012504	004537	010236			JSR	%5, STAER	;REPORT ERROR SET
2339	012510	000000				HALT		;HALT ON ERROR
2340	012512	000137	012462			JMP	DAV0	;RESTART TEST
2341	012516	017777	166312	166256	DAV1:	MOV	@CHRGEN, @LPB	;LOAD DAVFU
2342	012524	062737	000002	001034		ADD	#2, CHRGEN	;INCREMENT TABLE POINTER
2343	012528	005777	166276			TST	@CHRGEN	;TEST IF DONE LOAD
2344	012536	001405				BEQ	D5	;CONTINUE IF DONE
2345	012540					SWAIT		;WAIT
2346	012540	105777	166234			TSTB	@LPS	;TEST READY
2347	012540	100375				BPL	.-4	;WAIT FOR READY
2348	012540	000137	012470			JMP	DAV00	
2349	012540	012737	000002	001040	D5:	MOV	#2, CYCNT	;SET CYCLE COUNT
2350	012560	012737	011724	010020	D0:	MOV	#MES16, PRMSG	;SET MESSAGE ADDRESS
2351	012566	004437	010002			JSR	%4, RINT	;PRINT MESSAGE
2352	012572	005777	166202			TST	@LPS	;TEST FOR ERROR
2353	012576	100006				BPL	D1	;CONTINUE IF NO ERROR
2354	012600					SERROR	\N	
2355	012600	012737	000053	001046	ERR53:	MOV	#53, ERCOUNT	;SET UP ERROR COUNT 53
2356		000054				N=N+1		
2357	012606	004537	010236			JSR	%5, STAER	;REPORT ERROR SET
2358	012612	000000				HALT		;HALT ON ERROR
2359	012614	013777	013130	166160	D1:	MOV	DAV11, @LPB	;SEND DAVFU INSTRUCTION, SKIP 0 LINES
2360	012622					SWAIT		
2361	012622	105777	166152			TSTB	@LPS	;TEST READY
2362	012626	100375				BPL	.-4	;WAIT FOR READY
2363	012630	012737	011761	010020		MOV	#MES17, PRMSG	;SET PRINTER MESSAGE ADDRESS
2364	012636	004437	010002			JSR	%4, RINT	;PRINT MESSAGE
2365	012642	012737	012064	010020		MOV	#MES18, PRMSG	;SET MESSAGE ADDRESS
2366	012650	013737	013132	001034		MOV	DAV12, CHRGEN	;FIRST DAVFU INSTRUCTION
2367	012656	012737	012360	001050		MOV	#TN01, STRCHR	;SET TABLE POINTER
2368	012664	012737	000017	001032		MOV	#15, CHRCNT	;SET TABLE COUNT
2369	012672	005777	166102		D2:	TST	@LPS	;TEST FOR ERROR
2370	012676	100006				BPL	D3	;CONTINUE IF NO ERRORS
2371	012700					SERROR	\N	
2372	012700	012737	000054	001046	ERR54:	MOV	#54, ERCOUNT	;SET UP ERROR COUNT 54
2373		000055				N=N+1		
2374	012706	004437	010236			JSR	%4, STAER	;REPORT ERROR SET
2375	012712	000000				HALT		;HALT ON ERROR
2376	012714	013777	001034	166060	D3:	MOV	CHRGEN, @LPB	;SEND DAVFU INSTR.
2377	012722					SWAIT		;WAIT
2378	012722	105777	166052			TSTB	@LPS	;TEST READY
2379	012726	100375				BPL	.-4	;WAIT FOR READY
2380	012730	017737	166114	012156		MOV	@STRCHR, MES19	;SET PRINTER MESSAGE
2381	012736	004437	010002			JSR	%4, RINT	;PRINT MESSAGE
2382	012742	005337	001032			DEC	CHRCNT	;DEC TABLE COUNT
2383	012746	001407				BEQ	D4	;EXIT TEST IF DONE
2384	012750	005237	001034			INC	CHRGEN	;NEXT DAVFU INSTR.
2385	012754	002737	000002	001050		ADD	#2, STRCHR	;INC TABLE POINTER
2386	012762	000137	012672			JMP	D2	;CONTINUE
2387	012766	005337	001040		D4:	DEC	CYCNT	;DEC CYCLE COUNT

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2388 012772 001415      BEQ      DEXO      ;EXIT IF DONE
2389 012774 062737 000140 013130      ADD      #140,DAVI1 ;CHANGE DAVFU INSTR.
2390 013002 062737 000140 013132      ADD      #140,DAVI2 ;CHANGE DAVFU INSTR.
2391 013010 013737 012354 011716      MOV      TNDV2,MES15 ;SET TEST NUMBER FOR MESSAGE
2392 013016 004437 007752      JSR      %4,PRNNT ;PRINT TEST NUMBER
2393 013022 000137 012560      JMP      DO      ;RETEST LINE COUNT SLEWING
2394 013026 012737 000220 013130 DEXO: MOV      #220,DAVI1 ;RESET DAVFU INSTR.
2395 013034 012737 000221 013132      MOV      #221,DAVI2 ;RESET DAVFU INSTR.
2396 013042 032777 010000 165734      BIT      #BIT12,2SWR ;LOOP ON TEST?
2397 013050 001002      BNE      1$      ;LOOP
2398 013052 000137 013134      JMP      DAV2      ;NEXT TEST
2399 013056 000137 012416      1$: JMP      DAVFU      ;LOOP
2400
2401
2402 013062 000356      DAVTAB: 356      ;DAVFU LOAD TABLE
2403 013064 000001      1
2404 013066 000002      2
2405 013070 000003      3
2406 013072 000004      4
2407 013074 000005      5
2408 013076 000006      6
2409 013100 000007      7
2410 013102 000010      10
2411 013104 000011      11
2412 013106 000012      12
2413 013110 000013      13
2414 013112 000014      14
2415 013114 000015      15
2416 013116 000016      16
2417 013120 000017      17
2418 013122 000020      20
2419 013124 000357      357
2420 013126 000000      0
2421
2422
2423 013130 000220      DAVI1: 220
2424 013132 000221      DAVI2: 221
2425
2426      ;TEST D3
2427      ;CHECK DAVFU CHANNEL SLEW COMMANDS
2428
2429 013134 004437 010022      DAV2: JSR      %4,TYPINT ;INITIALIZE
2430 013140 013737 014446 012160      MOV      SPSP,MES19+2 ;SAT TEST NUMBER FOR MESSAGE
2431 013146 013737 012256 011716      MOV      TNDV3,MES15 ;PRINT TEST NUMBER D3
2432 013154 004437 007752      JSR      %4,PRNNT ;SET MESSAGE TABLE POINTER
2433 013160 012737 014430 013712      MOV      #MTAB,MTABP ;SET INSTRUCTION TABLE POINTER
2434 013166 012737 014376 013706      MOV      #ITAB,ITABP ;SAT FIRST INSTRUCTION
2435 013174 017737 000506 001050      MOV      #ITABP,STCHR ;SET HEADER MESSAGE TABLE POINTER
2436 013202 012737 012360 013714      MOV      #TMO1,MTABP ;SET INSTR COUNT TABLE POINTER
2437 013210 012737 014360 013710      MOV      #ICTAB,ICTABP ;GET FIRST INSTR COUNT
2438 013216 017737 000466 001052      MOV      #ICTABP,STCNT ;SET DATA TABLE POINTER
2439 013224 012737 013716 013704      LOAD: MOV      #OTAB,OTABP ;SET FIRST DATA PAIR
2440 013232 017737 000446 001034      MOV      #OTABP,CHRGEN ;TEST FOR ERROR
2441 013240 005777 165534      TST      ALPS

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2442	013244	100007				BPL	DL1		;BRANCH IF NO ERROR
2443	013246					\$ERROR	\N		
2444	013246	012737	000055	001046	ERR55:	MOV	#55,	ERCOUNT	;SET UP ERROR COUNT 55
2445		000056				N=N+1			
2446	013254	004537	010236			JSR	%5,STAER		;REPORT ERROR SET
2447	013260	000000				HALT			;HALT ON ERROR
2448	013252	000760				BR	LOAD		;RESTART LOAD
2449	013254	012737	000002	001032	DL1:	MOV	#2,CHRCNT		;SET PAIR COUNT
2450	013272	013777	001034	165502	DL2:	MOV	CHRCNT,ALPB		;LOAD DAVFU
2451	013300					\$WAIT			;WAIT
2452	013300	105777	165474			TSTB	ALPS		;TEST READY
2453	013304	100375				BPL	.-4		;WAIT FOR READY
2454	013306	005777	165466			TST	ALPS		;TEST FOR ERROR
2455	013312	100010				BPL	DL6		;BRANCH IF NO ERROR
2456	013314					\$ERROR	\N		
2457	013314	012737	000056	001046	ERR56:	MOV	#56,	ERCOUNT	;SET UP ERROR COUNT 56
2458		000057				N=N+1			
2459	013322	004537	010236			JSR	%5,STAER		;REPORT ERROR SET
2460	013326	000000				HALT			;HALT ON ERROR
2461	013330	000137	013224			JMP	LOAD		;RESTART LOAD
2462	013334	022737	000356	001034	DL6:	CMP	#356,CHRCNT		;LOAD COMMAND?
2463	013342	001407				BEQ	DL6A		;YES, SEND ONLY ONCE
2464	013344	022737	000357	001034		CMP	#357,CHRCNT		;LOAD COMMAND?
2465	013352	001403				BEQ	DL6A		;YES, SEND ONLY ONCE
2466	013354	005337	001032			DEC	CHRCNT		;DEC PAIR COUNT
2467	013360	001344				BNE	DL2		;FINISH PAIR IF NOT DONE
2468	013362	062737	000002	013704	DL6A:	ADD	#2,DTABP		;INC DATA TABLE POINTER
2469	013370	017737	000310	001034		MOV	DTABP,CHRCNT		;SET NEXT DATA PAIR
2470	013376	022737	077777	001034		CMP	#77777,CHRCNT		;DONE LOAD?
2471	013404	001327				BNE	DL1		
2472									
2473									
2474									
2475	013406								
2476	013406	013777	001050	165366	DL8:	MOV	STRCHR,ALPB		;SEND DAVFU INSTRUCTION
2477	013414					\$WAIT			
2478	013414	105777	165360			TSTB	ALPS		;TEST READY
2479	013420	100375				BPL	.-4		;WAIT FOR READY
2480	013422	105777	165352			TSTB	ALPS		;TEST READY
2481	013426	100375				BPL	.-4		;WAIT FOR READY
2482	013430								
2483	013430	017737	000260	012346	DL8A:	MOV	DTABP,MES20A		;SET HEADER MSG ADDRESS
2484	013436	012737	012272	010020		MOV	MES20,PRMSG		;SET HEADER MSG ADDRESS
2485	013444	004437	010002			JSR	%4,RINT		;PRINT HEADER MESSAGE
2486	013450	013777	001050	165324	DL9:	MOV	STRCHR,ALPB		;SEND DAVFU INSTRUCTION
2487	013456					\$WAIT			;WAIT
2488	013456	105777	165316			TSTB	ALPS		;TEST READY
2489	013462	100375				BPL	.-4		;WAIT FOR READY
2490	013464	005777	165310			TST	ALPS		;TEST FOR ERROR
2491	013470	100010				BPL	DL10		;BRANCH IF OK
2492	013472					\$ERROR	\N		
2493	013472	012737	000057	001046	ERR57:	MOV	#57,	ERCOUNT	;SET UP ERROR COUNT 57
2494		000050				N=N+1			
2495	013500	004537	010236			JSR	%5,STAER		;REPORT ERROR SET

;START OF CHANNEL SLEW TESTS

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2496	013504	000000			HALT						
2497	013506	000137	013224		JMP	LOAD					
2498	013512	017737	000174	012156	MOV	DMTABP, MES19					
2499	013520	027727	000164	000001	DL10: CMP	DMCTABP, #1					
2500	013526	001004			BNE	DL10A					
2501	013530	013737	014444	012160	MOV	FS, MES19+2					
2502	013536	000403			BR	DL10B					
2503	013540	012737	014446	012160	DL10A: MOV	SPSP, MES19+2					
2504	013546	012737	012064	010020	DL10B: MOV	#MES18, PRMSG					
2505	013554	004437	010002		JSR	%4, RINT					
2506	013560	005337	001052		DEC	STRCNT					
2507	013564	001331			BNE	DL9					
2508	013566	052737	000002	013712	ADD	#2, MTABP					
2509	013574	062737	000002	013714	ADD	#2, HTABP					
2510	013602	062737	000002	013710	ADD	#2, ICTABP					
2511	013610	005777	000074		TST	DMCTABP					
2512	013614	001006			BNE	DL12					
2513	013616	012737	014360	013710	MOV	#ICTAB, ICTABP					
2514	013624	012737	014430	013712	MOV	#MTAB, MTABP					
2515	013632	017737	000052	001052	DL12: MOV	DMCTABP, STRCNT					
2516	013640	062737	000002	013706	ADD	#2, ITABP					
2517	013646	017737	000034	001050	MOV	DMITABP, STRCHR					
2518	013654	001254			BNE	DL8					
2519	013656	013737	014446	012160	MOV	SPSP, MES13+2					
2520	013664	032777	010000	165112	BIT	#BIT12, ASWR					
2521	013672	001402			BEQ	DLEX					
2522	013674	000137	013134		JMP	DAV2					
2523	013700	000137	004060		DLEX: JMP	TEST2					
2524											
2525	013704	000000			DTABP: 0						
2526	013706	000000			ITABP: 0						
2527	013710	000000			ICTABP: 0						
2528	013712	000000			MTABP: 0						
2529	013714	000000			HTABP: 0						
2530											
2531											
2532											
2533	013716	000356			DTAB: 356						
2534	013720	000077			77						
2535	013722	000000			0						
2536	013724	000001			1						
2537	013726	000002			2						
2538	013730	000005			5						
2539	013732	000000			0						
2540	013734	000003			3						
2541	013736	000010			10						
2542	013740	000005			5						
2543	013742	000002			2						
2544	013744	000001			1						
2545	013746	000000			0						
2546	013750	000007			7						
2547	013752	000000			0						
2548	013754	000011			11						
2549	013756	000002			2						

;DATA TABLE FOR DAVFU LOAD

;START LOAD
;HEADER MESSAGES

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DZLPK0.P11

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2603	014132	000002
2602	014130	000003
2601	014126	000004
2600	014122	000005
2599	014120	000006
2598	014116	000007
2597	014114	000008
2596	014112	000009
2595	014110	000010
2594	014106	000011
2593	014104	000012
2592	014102	000013
2591	014100	000014
2590	014096	000015
2589	014094	000016
2588	014092	000017
2587	014090	000018
2586	014086	000019
2585	014084	000020
2584	014082	000021
2583	014080	000022
2582	014076	000023
2581	014074	000024
2580	014072	000025
2579	014070	000026
2578	014066	000027
2577	014064	000028
2576	014062	000029
2575	014060	000030
2574	014056	000031
2573	014054	000032
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2571	014050	000034
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2568	014042	000037
2567	014040	000038
2566	014036	000039
2565	014034	000040
2564	014032	000041
2563	014030	000042
2562	014026	000043
2561	014024	000044
2560	014022	000045
2559	014020	000046
2558	014016	000047
2557	014014	000048
2556	014012	000049
2555	014010	000050
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2553	014004	000052
2552	014002	000053
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2546	013766	000059
2545	013764	000060
2544	013762	000061
2543	013760	000062

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2539 013752 000066
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2510 013694 000095
2509 013692 000096
2508 013690 000097
2507 013688 000098
2506 013686 000099
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2257 013188 000348
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2219 013112 000386
2218 013110 000387
2217 013108 000388
2216 013106 000389
2215 013104 000390
2214 013102 000391
2213 013100 000392
2212 013098 000393
2211 013096 000394
2210 013094 000395
2209 013092 000396
2208 013090 000397
2207 013088 000398
2206 013086 000399
2205 013084 000400
2204 013082 000401
2203 013080 000402
2202 013078 000403
2201 013076 000404
2200 013074 000405
2199 013072 000406
2198 013070 000407
2197 013068 000408
2196 013066 000409
2195 013064 000410
2194 013062 000411
2193 013060 000412
2192 013058 000413
2191 013056 000414
2190 013054 000415
2189 013052 000416
2188 013050 000417
2187 013048 000418
2186 013046 000419
2185 013044 000420
2184 013042 000421
2183 013040 000422
2182 013038 000423
2181 013036 000424
2180 013034 000425
2179 013032 000426
2178 013030 000427
2177 013028 000428
2176 013026 000429
2175 013024 000430
2174 013022 000431
2173 013020 000432
2172 013018 000433
2171 013016 000434
2170 013014 000435
2169 013012 000436
2168 013010 000437
2167 013008 000438
2166 013006 000439
2165 013004 000440
2164 013002 000441
2163 013000 000442
2162 012998 000443
2161 012996 000444
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2159 012992 000446
2158 012990 000447
2157 012988 000448
2156 012986 000449
2155 012984 000450
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2153 012980 000452
2152 012978 000453
2151 012976 000454
2150 012974 000455
2149 012972 000456
2148 012970 000457
2147 012968 000458
2146 012966 000459
2145 012964 000460
2144 012962 000461
2143 012960 000462
2142 012958 000463
2141 012956 000464
2140 012954 000465
2139 012952 000466
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2137 012948 000468
2136 012946 000469
2135 012944 000470
2134 012942 000471
2133 012940 000472
2132 012938 000473
2131 012936 000474
2130 012934 000475
2129 012932 000476
2128 012930 000477
2127 012928 000478
2126 012926 000479
2125 012924 000480
2124 012922 000481
2123 012920 000482
2122 012918 000483
2121 012916 000484
2120 012914 000485
2119 012912 000486
2118 012910 000487
2117 012908 000488
2116 012906 000489
2115 012904 000490
2114 012902 000491
2113 012900 000492
2112 012898 000493
2111 012896 000494
2110 012894 000495
2109 012892 000496
2108 012890 000497
2107 012888 000498
2106 012886 000499
2105 012884 000500
2104 012882 000501
2103 012880 000502
2102 012878 000503
2101 012876 000504
2100 012874 000505
2099 012872 000506
2098 012870 000507
2097 012868 000508
2096 012866 000509
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2094 012862 000511
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2092 012858 000513
2091 012856 000514
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2088 012850 000517
2087 012848 000518
2086 012846 000519
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2079 012832 000526
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2077 012828 000528
2076 012826 000529
2075 012824 000530
2074 012822 000531
2073 012820 000532
2072 012818 000533
2071 012816 000534
2070 012814 000535
2069 012812 000536
2068 012810 000537
2067 012808 000538
2066 012806 000539
2065 012804 000540
2064 012802 000541
2063 012800 000542
2062 012798 000543
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2060 012794 000545
2059 012792 000546
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2055 012784 000550
2054 012782 000551
2053 012780 000552
2052 012778 000553
2051 012776 000554
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2049 012772 000556
2048 012770 000557
2047 012768 000558
2046 012766 000559
2045 012764 000560
2044 012762 000561
2043 012760 000562
2042 012758 000563
2041 012756 000564
2

2604	014134	000011
2605	014136	000000
2606	014140	000007
2607	014142	000000
2608	014144	000001
2609	014146	000002
2610	014150	000005
2611	014152	000010
2612	014154	000003
2613	014156	000009
2614	014160	000005
2615	014162	000002
2616	014164	000001
2617	014166	000000
2618	014170	000017
2619	014172	000000
2620	014174	000001
2621	014176	000002
2622	014183	000005
2623	014182	000002
2624	014184	000003
2625	014186	000000
2626	014210	000005
2627	014212	000002
2628	014214	000001
2629	014216	000000
2630	014220	000007
2631	014222	000000
2632	014224	000011
2633	014226	000002
2634	014230	000025
2635	014232	000000
2636	014234	000003
2637	014236	000000
2638	014240	000005
2639	014242	000012
2640	014244	000001
2641	014246	000000
2642	014250	000007
2643	014252	000000
2644	014254	000001
2645	014256	000002
2646	014260	000015
2647	014262	000000
2648	014264	000003
2649	014266	000000
2650	014270	000005
2651	014272	000002
2652	014274	000001
2653	014276	000010
2654	014300	000007
2655	014302	000000
2656	014304	000001
2657	014306	000002

[illegible]

2659	014310	000005
2659	014312	000020
2660	014314	000013
2661	014316	000000
2662	014318	000000
2663	014320	000002
2664	014324	000001
2665	014326	000000
2666	014330	000007
2667	014332	000010
2668	014334	000001
2669	014336	000002
2670	014340	000005
2671	014342	000000
2672	014344	000003
2673	014346	000000
2674	014350	000001
2675	014352	000000
2676	014354	000357
2677	014356	077777
2678		
2679		
2680		
2681	014360	000105
2682	014362	000056
2683	014364	000042
2684	014366	000023
2685	014370	000005
2686	014372	000001
2687	014374	000000
2688		
2689		
2690		
2691	014376	000200
2692	014380	000201
2693	014382	000002
2694	014384	000003
2695	014386	000004
2696	014390	000005
2697	014392	000006
2698	014394	000007
2699	014396	000210
2700	014398	000211
2701	014400	000212
2702	014402	000213
2703	014404	000000
2704		
2705		
2706		
2707	014430	030440
2708	014432	031040
2709	014434	031440
2710	014436	032040
2711	014440	032062

5
20
13
00
00
02
01
00
07
10
01
02
05
00
03
00
01
00
00
00
01
00
00
00
357
77777

:STOP LOAD
:STOP !!!!!

;INSTRUCTION COUNT TABLE - FOR DAYFU CHANNEL SLEW INSTRUCTIONS

ICTAB: 105
56
42
23
05
01
0

;END OF TABLE

;INSTRUCTION TABLE - DAYFU CHANNEL SLEW INSTRUCTIONS

ITAB: 200
201
202
203
204
205
206
207
210
211
212
213
0

: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 / 1/
.ASCII / 2/
.ASCII / 3/
.ASCII / 6/
.ASCII /24/

E05

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```

2712 014442 032061
2713 014444 020063
2714 014446 020040
2715
2716
2717
2718
2719
2720 014450 004437 010022
2721 014454 017737 164324 001044
2722 014462 012737 177574 001032
2723 014470 042737 177400 001044
2724 014476
2725 014476 105777 164276
2726 014502 100375
2727 014504 005777 164270
2728 014510 100006
2729 014512
2730 014512 012737 000060 001046
2731 000061
2732 014520 004537 010236
2733 014524 000000
2734 014526 013777 001044 164246
2735 014524 032777 004000 164242
2736 014542 001402
2737 014544 000000
2738 014546 000740
2739 014550 000177 000024
2740 014554 005237 001032
2741 014560 001346
2742 014562 012777 000012 164212
2743 014570
2744 014570 105777 164204
2745 014574 100375
2746 014576 000724
2747
2748
2749 014600 014554
2750
2751
2752
2753 000001

```

```

      FS:      .ASCII /14/
      SPSP:    .ASCII /3 /
;SCOPE LOOP ROUTINE
;SET CHARACTER IN SWITCH REGISTER -0.
SCOPE: JSR      X4,TYPINT
        MOV     @SWR,SAVE      ;FETCH SWITCHES
        MOV     @-132,CHRCNT   ;SET CHAR COUNT
        BIC     @177400,SAVE   ;MASK CHARACTER
LDLPX:  $WAIT
        TSTB    @LPS           ;TEST READY
        BPL     -4             ;WAIT FOR READY
        TST     @LPS           ;TEST FOR ERROR
        BPL     LPSCOPE        ;BRANCH IF NO ERROR
        $ERROR  \N
ERR60:  MOV     @60, ERCOUNT   ;SET UP ERROR COUNT 60
        N=N+1
        JSR     X5,STAER        ;REPORT ERROR SET
        HALT    ON ERROR
LPSCOPE:MOV     SAVE,@LPB       ;LOAD PRINTER BUFFER
        BIT     @BIT11,@SWR    ;SEND ONLY ONE CHAR?
        BEQ     LSCO           ;NO, BRANCH
        HALT    - WAIT FOR OPERATOR
        BR      SCOPE          ;NEXT CHAR
LSCO:   JMP     @LOSCOP        ;SEND LF?
LSCA:   INC     CHRCNT         ;INCREMENT CHAR COUNT
        BNE     LDLPX         ;CONTINUE IF NOT DONE LINE
        MOV     @12,@LPB      ;SEND LF
        $WAIT
        TSTB    @LPS           ;TEST READY
        BPL     -4             ;WAIT FOR READY
        BR      SCOPE          ;CONTINUE
LOSCOP: LSCA
      .END

```

ACVX	010234	2284#	2288#	2293#	2295#	2297#	2302#								
ACVN	010166	2288#	2299												
BIT0	= 000001	842#	1279	1334											
BIT1	= 000002	841#													
BIT10	= 000000	832#													
BIT11	= 004000	831#	2735												
BIT12	= 010000	830#	1644	1712	1762	1818	1871	1916	1971	2008	2058	2106	2154	2187	
		2396	2520												
BIT13	= 020000	829#	1305	1671	1711	1832	1928	1983	2021						
BIT14	= 040000	828#	869	1442	2190										
BIT15	= 100000	827#													
BIT2	= 000004	840#													
BIT3	= 000010	839#													
BIT4	= 000020	839#													
BIT5	= 000040	837#													
BIT6	= 000100	836#													
BIT7	= 000200	835#													
BIT8	= 000400	834#													
BIT9	= 001000	833#													
CHRCNK	004642	914	1719#	1763											
CHRCNT	001032	1003#	1313#	1323#	1550#	1551#	1615#	1635#	1641#	1658#	1668#	1727#	1739#	1759#	
		1779#	1781	1797#	1805	1812#	1837#	1847#	1895#	1896#	1937#	1948#	1989#	1998#	
		2072#	2074	2090#	2116#	2117#	2130#	2166#	2179#	2368#	2382#	2449#	2466#	2722#	
		2740#													
CHRE	005036	1726	1736	1753#											
CHRCN	001034	1004#	1316#	1317#	1318	1320#	1322	1490#	1499	1500#	1501	1532#	1541	1542#	
		1543	1659#	1667	1670#	1673	1676	1693#	1691	1692#	1693	1695	1697	1699	
		1703#	1704	1783#	1785#	1786	1811#	1838#	1846	1850#	1865#	1886#	1895	1939#	
		1947	1950#	1953	1955#	1957#	1988#	1997	2004#	2032#	2033#	2034	2047	2074#	
		2075	2077#	2079#	2080#	2081	2089	2094#	2096#	2113#	2139	2140#	2144#	2332#	
		2341	2342#	2343	2366#	2376	2384#	2440#	2450	2462	2464	2469#	2470		
CHRS	005034	1748	1752#												
CLKAV	002164	1261#													
CNTR	002614	1299#	1339#	1347#											
CONV	010154	2294#	2306												
CONVRT	002630	877	1315	1348	1354#										
CR	004702	1727#	1747												
CR0	004710	1728#	1740												
CR1	004732	1729	1735#												

[illegible]

ERR34	004356	1663#						
ERR35	004474	1687#						
ERR36	004716	1731#						
ERR37	005214	1790#						
ERR4	001324	1080#						
ERR40	005462	1842#						
ERR41	005720	1891#						
ERR42	006172	1943#						
ERR43	006440	1993#						
ERR44	006704	2042#						
ERR45	007122	2085#						
ERR46	007314	2122#						
ERR47	007366	2135#						
ERR5	001354	1091#						
ERR50	007544	2170#						
ERR51	007766	2238#						
ERR52	012476	2336#						
ERR53	012600	2355#						
ERR54	012700	2372#						
ERR55	013246	2444#						
ERR56	013314	2457#						
ERR57	013472	2493#						
ERR6	001406	1108#						
ERR60	014512	2730#						
ERR7	001432	1119#						
FFSET	003350	1403	1472#					
FFTAB	003272	1402	1447#					
FS	014444	2501	2713#					
FTABE	003346	1432	1469#					
HAMALN	007504	922	2160#	2188				
HAMX	007652	2191	2193#					
HAMIX	007530	2166#	2186					
HAM2	007536	2167#	2180					
HED1	010266	2308	2311	2317#				
HSPRT	006046	918	1923#	1972				
HS0	006142	1937#	1958	1970				
HS00	006126	1932	1935#					
HS00A	006112	1929	1933#					
HS1	006164	1940#	1954	1956	1959			
HS2	006206	1941	1947#					
HS3	006254	1952	1957#					
HS4	006272	1949	1960#					
HS6	006342	1965	1971#					
HTABP	013714	2436#	2483	2509#	2529#			
ICTAB	014360	2437	2513	2681#				
ICTABP	013710	2437#	2438	2499	2510#	2511	2513#	2515
INDAT	003424	893	1443	1489#	1498	1514		2527#
INCATT	003560	1490	1521#					
INCATO	003464	1492	1499#					
INCATI	003546	1508	1515#					
INCO	003436	1491#	1506					
IND1	003520	1502	1507#					
INTIC	002010	1157	1217#					
INTIO	002134	1224	1251#					

ITAB	014376	2434	2691#																
ITABP	013706	2434#	2435	2516#	2517	2526#													
KWILL	002344	903	1267	1296#															
KWILP	002302	904	1272	1286#															
LDCM	004510	1685	1691#	1700	1705														
LDLPX	014476	2724#	2741																
LEGCHR	001054	1012#	1307#	1310#	1318	1930#	1933#	1953	2024#	2028#	2036								
LFT	007024	2071#																	
LFTTR	007006	921	2063#	2107															
LFTD	007032	2072#	2104																
LFT1	007054	2075#	2078																
LFT2	007074	2076	2079#																
LFT3	007114	2082#	2095	2098															
LFT4	007136	2083	2099#																
LFT5	007166	2093	2096#																
LFT6	007204	2091	2099#	2105															
LINCNT	001036	1005#	1273#	1286#	1296#	1317	1329#	1357	1359#	1365	1367#	1372	1402#	1416					
		1431#	1432	1434	1724#	1760#	1778#	1807#	1809	1898#	1899#	1900#	1905#	1936#					
		1964#	1935#	1987#	2005#	2023#	2027#	2035	2055#	2056	2071#	2072	2103#	2112#					
		2114	2117	2151#	2152	2165#	2185#												
		959#	1264	1300	1301#														
LKS	001026	874	1347#																
LKSRV	002620	2439#	2448	2461	2497														
LOAD	013224	867	2197#																
LOGICA	007662	927#	932#	2739	2749#														
LOSCOP	014600	945#	1057#	1058#	1127#	1322#	1330#	1426#	1499#	1541#	1549#	1634#	1637#	1667#					
LPB	001002	1679#	1691#	1706#	1738#	1743#	1754#	1796#	1801#	1816#	1846#	1853#	1895#	1901#					
		1940	1947#	1960#	1997#	2000#	2046#	2051#	2089#	2099#	2126#	2139#	2147#	2178#					
		2181#	2220#	2341#	2359#	2376#	2450#	2476#	2486#	2734#	2742#								
LPS	001000	940#	1039	1046	1059	1070	1077	1088	1105	1116	1128	1135	1142	1159					
		1166	1177#	1179#	1187#	1189#	1198#	1200#	1209#	1211#	1226	1233	1241#	1252#					
		1332	1419	1428	1491	1504	1507	1533	1546	1553	1617	1639	1660	1681					
		1684	1708	1728	1745	1756	1787	1803	1839	1855	1888	1903	1962	1990					
		2002	2039	2053	2082	2101	2119	2132	2149	2167	2175	2183	2214	2216					
		2221	2226	2235	2333	2346	2352	2361	2369	2378	2441	2452	2454	2478					
		2480	2488	2490	2725	2727	2744												
LPSCOP	014526	2728	2734#																
LPS7	006520	2008#																	
LP1	001502	1129	1135#	1145															
LP2	001524	1136	1142#																
LP29	004164	1618	1624#																
LP2E	004372	1661	1667#																
LP2H	004462	1657	1693#																
LP3	001612	1160	1156#																
LP3X	001634	1167	1153#																
LP4	002060	1227	1233#																
LP5	002102	1234	1240#																
LSCA	014554	927	2740#	2749															
LSCO	014550	2736	2739#																
M	* 000015	963#	1610	1613#	1652	1655#	1720	1723#	1774	1777#	1827	1830#	1880	1883#					
		1924	1927#	1979	1982#	2017	2020#	2067	2070#	2161	2164#								
MESA	010307	1516	1569	2317#															
MESB	010354	1565	2317#																
MESC	010427	1277	2317#																

[illegible]

Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value	Variable	Value
OVR	005132	1779#	1810																
OVR EXT	005356	1808	1818#																
OVR PRT	005106	915	1773#	1819															
OVR0	005140	1780#	1806																
OVR1	005200	1786#	1795	1800															
OVR2	005206	1784	1787#	1815															
OVR3	005230	1798	1794#																
OVR4	005172	1785#	1796																
OVR5	005246	1799#																	
OVR6	005262	1802#	1817																
OVR8	005344	1798	1816#																
PATTB	003010	1314	1383#																
PC	=%000007	625#	2199#																
PLKS	001024	958#	1269	1290	1291#														
PRINT	007752	1612	1654	1722	1776	1829	1882	1926	1981	2019	2069	2163	2234#	2331					
		2392	2432																
PRTA	005602	1849	1855#																
PRTCTL	005366	916	1826#	1872															
PRTINT	007676	1395	1603	2214#															
PRTINO	007712	2215	2218#																
PRTMSG	010020	1377#	1418#	1436#	2234#	2245#	2350#	2363#	2365#	2484#	2504#								
PRT0	005412	1832#	1864	1868	1870														
PRT1	005432	1833	1836#																
PRT2	005440	1835	1837#																
PRT3	005454	1839#	1848	1852	1866														
PRT4	005476	1840	1846#																
PRT6	005614	1858	1867#																
PRT7	005626	1860	1869#																
PRT8	005640	1862	1871#																
PSW	001010	952#	1176#	1186#	1197#	1208#	12												

```

R6          =%0000006
R7          =%0000007
SAVE        001044
SCHPSM      004210
SCOPE       014-50
SEGCNT      001030
SETUP       001050
SLEWCK      003230
SLW         003256
SLW0        003270
SLW1        003100
SLW1A       003140
SLW11       003124
SLW2        003162
SNGCHR      006352
SP          =%0000006
SPSP        014446
STRER       010236

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[illegible]

[illegible]

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 DZLPKD.P11 CROSS REFERENCE TABLE

XSIX 006454
 . = 014602

1991	1997#													
848#	854	856#	862#	866#	868#	872#	880#	884#	890#	899#	909#	925#		
930#	936#	1333	1429	1505	1547	1640	1682	1709	1746	1757	1804	1856		
1904	1914#	1963	1986	2003	2054	2102	2150	2176	2177	2184	2227	2266		
2313	2317#	2347	2362	2379	2453	2479	2481	2489	2726	2745				

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 DZLPK.D.P11 CROSS REFERENCE TABLE

SERROA	9698	1041	1048	1061	1072	1079	1090	1107	1118	1130	1137	1146	1161	1168	1173
	1183	1194	1205	1228	1235	1243	1397	1421	1493	1509	1535	1555	1625	1619	1642
	1686	1730	1759	1841	1890	1942	1952	2041	2084	2121	2134	2169	2237	2335	2354
	2371	2443	2456	2492	2729										
SPRINT	9798	1610	1652	1720	1774	1827	1880	1924	1979	2017	2067	2161			
SWAIT	9908	1331	1427	1503	1545	1638	1680	1707	1744	1755	1802	1854	1902	1961	2001
	2052	2100	2148	2174	2182	2225	2345	2360	2377	2451	2477	2487	2724	2743	

ADD	1317	1327	1362	1370	1373	1431	1500	1542	1782	1969	2035	2080	2218	2223	2253
	2297	2230	2342	2385	2369	2390	2468	2508	2509	2510	2516				
BOS	1255	1270													
BEQ	1280	1324	1335	1348	1433	1435	1502	1544	1563	1669	1672	1674	1677	1694	1696
	1698	1705	1742	1796	1798	1808	1810	1832	1849	1858	1860	1862	1887	1949	1952
	1994	2007	2091	2093	2105	2118	2191	2195	2259	2261	2344	2333	2388	2463	2465
	2521	2736													
BGT	1319	1358	1366	1795	2057	2076	2104	2153							
BIC	1179	1189	1200	1211	1252	1354	1899	2289	2723						
BIS	1177	1187	1198	1209	1241	1703									
BIT	1279	1305	1334	1442	1644	1671	1701	1704	1712	1762	1809	1818	1832	1871	1916
	1929	1971	1983	2008	2021	2058	2106	2154	2187	2190	2396	2520	2735		
BLE	1968														
BLT	1700	1848	1965	2006	2037										
BMI	1047	1060	1078	1089	1117	1143	1167	1234	1508	1554	2215	2217	2313		
BNE	1145	1306	1326	1411	1417	1443	1552	1636	1643	1645	1702	1711	1713	1740	1761
	1763	1800	1806	1819	1852	1872	1897	1906	1917	1929	1954	1972	1999	2009	2022
	2048	2050	2059	2107	2128	2131	2142	2146	2155	2180	2186	2188	2256	2299	2397
	2467	2471	2500	2507	2512	2518	2741								
BPL	1040	1071	1106	1129	1136	1160	1227	1333	1420	1429	1492	1505	1534	1547	1618
	1640	1661	1682	1685	1709	1729	1746	1757	1788	1804	1840	1856	1889	1904	1941
	1963	1991	2003	2040	2054	2083	2102	2120	2133	2150	2168	2176	2177	2184	2222
	2227	2236	2266	2334	2347	2353	2362	2370	2379	2442	2453	2455	2479	2481	2489
	2491	2726	2728	2745											
BR	1023	1045	1052	1065	1076	1083	1094	1111	1122	1134	1141	1150	1165	1172	1232
	1239	1247	1309	1321	1361	1369	1396	1540	1567	1604	1675	1678	1784	1835	1908
	1932	1956	1959	1970	1986	2026	2078	2095	2098	2263	2272	2448	2502	2738	2746
CLC	2292	2294	2296												
CLR	1126	1253	1266	1271	1273	1275	1286	1296	1355	1364	1550	1683	1813	1814	2030
	2032														
CMP	1028	1217	1251	1318	1357	1365	1432	1543	1562	1673	1676	1693	1695	1697	1699
	1857	1859	1861	1953	1967	2036	2047	2049	2056	2075	2152	2462	2464	2470	2499
CMPB	1408	2253	2260												
DEC	1323	1325	1347	1794	1905	1964	2055	2030	2103	2130	2145	2298	2382	2387	2466
	2506														
ENT	1031	1033	1035	1053	1066	1084	1095	1276	1375	1413	1439	1515	1564	1568	2244
	2310	2326													
HALT	854	1037	1055	1068	1086	1097	1401	1415	1425	1441	1444	1497	1513	1517	1539
	1559	1566	1609	1623	1666	1690	1734	1753	1845	1894	1946	1996	2045	2088	2125
	2138	2173	2241	2314	2339	2358	2375	2447	2460	2496	2733	2737			
INC	1144	1329	1360	1348	1412	1551	1561	1605	1642	1659	1670	1692	1710	1739	1741
	1760	1797	1799	1807	1847	1850	1851	1853	1836	1900	1907	1948	1950	1951	1998
	2004	2005	2031	2033	2092	2094	2127	2141	2141	2151	2179	2185	2384	2740	
JMP	887	893	894	895	896	902	903	904	905	912	913	914	915	916	917
	918	919	920	921	922	928	933	1202	1219	1267	1272	1281	1292	1309	1336
	1379	1437	1445	1458	1506	1514	1519	1548	1550	1570	1624	1627	1657	1735	1747
	1750	1815	1817	1854	1866	1868	1870	2132	2203	2340	2348	2386	2393	2398	2399
	2461	2497	2522	2523	2739										
JSR	1017	1044	1051	1064	1075	1082	1093	1110	1121	1133	1140	1149	1164	1171	1218
	1231	1238	1246	1274	1287	1297	1378	1394	1395	1400	1424	1430	1489	1496	1512
	1530	1538	1548	1602	1603	1608	1612	1622	1651	1654	1665	1689	1719	1722	1733
	1773	1776	1782	1806	1829	1844	1879	1882	1833	1923	1926	1945	1978	1981	1995
	2016	2019	2044	2066	2069	2087	2124	2137	2160	2163	2172	2198	2240	2262	2269
	2271	2306	2324	2331	2338	2351	2357	2364	2374	2381	2392	2429	2432	2446	2459

MOV	2405	2495	2505	2720	2732										
	1053	1073	1080	1091	1108	1119	1127	1131	1138	1147	1157	1162	1169	1174	
	1175	1194	1186	1195	1197	1206	1208	1224	1225	1229	1236	1240	1244	1254	1255
	1261	1262	1278	1288	1289	1290	1291	1298	1299	1300	1301	1307	1308	1310	1311
	1313	1314	1315	1316	1322	1330	1356	1372	1377	1393	1402	1403	1404	1405	1418
	1422	1426	1436	1438	1440	1494	1499	1510	1531	1532	1536	1541	1549	1556	1606
	1611	1614	1615	1616	1620	1625	1626	1632	1633	1634	1637	1641	1653	1656	1658
	1659	1663	1667	1679	1687	1691	1706	1721	1724	1725	1726	1727	1731	1736	1737
	1738	1743	1748	1749	1754	1758	1759	1775	1778	1779	1780	1781	1783	1795	1786
	1790	1801	1811	1812	1816	1828	1831	1834	1836	1837	1838	1842	1846	1853	1865
	1869	1869	1891	1894	1895	1891	1895	1901	1925	1930	1931	1933	1934	1935	1936
	1937	1939	1939	1943	1947	1957	1958	1960	1980	1985	1987	1988	1989	1993	1997
	2000	2018	2023	2024	2025	2027	2028	2029	2034	2042	2046	2051	2068	2071	2072
	2073	2074	2081	2085	2089	2096	2097	2099	2112	2113	2114	2115	2116	2122	2126
	2129	2135	2139	2143	2147	2162	2165	2166	2170	2178	2181	2194	2220	2234	2238
	2242	2243	2246	2247	2252	2254	2294	2355	2356	2388	2325	2328	2329	2330	2332
	2336	2341	2349	2350	2355	2353	2363	2365	2366	2367	2368	2372	2376	2380	2391
	2394	2395	2430	2431	2433	2434	2435	2436	2437	2438	2439	2440	2444	2449	2450
	2457	2469	2476	2483	2484	2486	2493	2498	2501	2503	2504	2513	2514	2515	2517
	2519	2721	2722	2730	2734	2742									
MOV8	1363	1371	1374	1406	1407	1836	1898	2255	2264	2268	2270	2291			
NEG	2079														
NOP	1178	1188	1199	1210	1242	2199	2200	2201							
RESET	1018	1104	1115	2196											
FOR	2293	2295	2297												
RTI	1261	1349	2257												
RTS	2219	2224	2228	2248	2267	2300	2315								
SEC	1263	1268													
SUB	1320	1359	1367	1955	1966	2038	2077	2117	2144						
TST	1022	1039	1059	1070	1098	1105	1135	1159	1226	1416	1419	1434	1491	1501	1507
	1533	1553	1617	1660	1684	1728	1787	1805	1839	1868	1940	1990	2039	2092	2119
	2132	2167	2214	2235	2312	2333	2343	2353	2369	2441	2454	2490	2511	2727	
TSTB	1046	1077	1116	1128	1142	1166	1233	1264	1269	1332	1409	1410	1428	1504	1546
	1639	1681	1708	1745	1756	1903	1855	1903	1962	2002	2053	2101	2149	2175	2183
	2216	2221	2226	2255	2346	2361	2378	2452	2478	2480	2488	2725	2744		
.ASCII	2317	2707	2708	2709	2710	2711	2712	2713	2714						
.ASCII2	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1910	2317		
.EVAL	844	845													
.END	2753														
.EVEN	1495	1914	1918	2317											
.LIST	967	977	979	2317											
.MACR	969	979	980												
.MLIST	2317														
.PAGE	797														
.REPT	1	850													
.TITLE	797														

ERRORS DETECTED: 0

*,DZLPK.D.PRT+DZLPK.D.P11/CRF/SOL

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E06

RUN-TIME: 11 19 3 SECONDS
CORE USED: 14K

[illegible]