

LP11/LP05

LINE PRINTER TEST
MD-11-DZLPK-G

EP-DZLPK-G-DL-C
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FICHE 1 OF 1

JUN 1977
digital
MADE IN USA



LP14/11/05

LINE PRINTER TEST
MD-11-DZLPK-G

EP-DZLPK-G-DL-C

JUN 1977

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PRODUCT CODE: MAINDEC-11-DZLPK-G-D
PRODUCT NAME: LP14/LP11/LPOS LINE PRINTER TEST
DATE : APRIL 15, 1977
MAINTAINER: DIAGNOSTIC GROUP

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 2
DZLPKG.P11 06-APR-77 12:13

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CONTENTS

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

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 3
DZLPKG.P11 06-APR-77 12:13

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- 7.0 TEST DESCRIPTIONS
- 7.1 TEST 1 CONTROL AND OPERATOR INTERACTION
 - 7.1.1 TEST 1 SECTION 1 PRINTER READY TESTS POWER UP
 - 7.1.2 TEST 1 SECTION 2 MANUAL PRINT SPEED TEST
 - 7.1.3 TEST 1 SECTION 3 TOP OF FORM SWITCH TEST
 - 7.1.4 TEST 1 SECTION 4 DAVFU TESTS
- 7.2 PRINTING TESTS
 - 7.2.1 TEST 2 DATA TRANSFER PATHS TEST
 - 7.2.2 TEST 3 CHARACTER GENERATOR AND COMPARATOR TESTS
 - 7.2.3 TEST 4 OVER PRINT TEST
 - 7.2.4 TEST 5 SHUTTLE POSITIONING TEST
 - 7.2.5 TEST 6 PRINT CONTROL TEST
 - 7.2.6 TEST 7 MULTIPLE LINE ADVANCE TEST
 - 7.2.7 TEST 8 HIGH SPEED PRINT TEST
 - 7.2.8 TEST 9 SINGLE CHARACTER, ALL COLUMNS TEST
 - 7.2.9 TEST 10 DRUM PATTERN TEST
 - 7.2.10 TEST 11 RIGHT & LEFT HAND WEDGES
 - 7.2.11 TEST 12 HAMMER ALIGNMENT TEST
 - 7.2.12 TESTS D1&D2 DAVFU - LINE COUNT SLEWING TEST
 - 7.2.13 TEST D3 DAVFU - CHANNEL SLEWING TEST
- 7.3 SCOPE DRIVE TEST

1.0 ABSTRACT

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

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

2.0 REQUIREMENTS

2.1 EQUIPMENT

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

LPC11	LINE PRINTER INTERFACE
LP05	DATAPRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER
LP11	DATAPRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER
LP14	DATAPRODUCTS 132 COLUMN 64 OR 96 CHARACTER LINE PRINTER
TELETYPE MODEL 33 OR EQUIVALENT CONSOLE UNIT	

2.2 STORAGE

MEMORY LOCATIONS 0 - TO - 17012 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 LP14/LP11/LP05 DIAGNOSTIC IS LOCATION 200(8). TO SKIP THE OPERATOR INTERVENTION TESTS AND START WITH THE PRINTING TESTS, START AT LOCATION 600(8). TO RUN THE SPECIAL SCOPE DRIVER ROUTINE USE START ADDRESS 700(8) OR 720(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

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CHECK TOP OF FORM SWITCH SETTINGS

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 6
DZLPKG.P11 06-APR-77 12:13

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

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

4.3 PROGRAM AND/OR OPERATOR ACTION

DURING INITIAL START-UP OF THE LINE PRINTER DIAGNOSTIC TEST, THE
HEADER MESSAGE "LP05/LP11/LP14 LINE PRINTER TEST" WILL BE TYPED OUT ON THE
TELEPRINTER FOLLOWED BY EXECUTION OF THE PRINTER READY PORTION OF TEST
1. PRINTING OF THE MESSAGE "POWER-UP" ON THE TELEPRINTER FOLLOWING
THE TEST HEADER PRINT-OUT INDICATES START OF THIS TEST SEQUENCE. THIS
TEST IS CARRIED OUT BY AN INTERACTIVE EXCHANGE BETWEEN THE OPERATOR
AND THE TEST PROGRAM. THE OPERATIONAL DESCRIPTION OF THIS TEST
APPEARS AS PART OF THE TEST DESCRIPTION FOR TEST 1 (SEE SECTION
7.1.1). AFTER SUCCESSFUL COMPLETION OF THIS SECTION OF TEST 1, THE
PRINT SPEED AND TOP OF FORM SWITCH SETTINGS TESTS WILL BE PERFORMED.
(SEE SECTIONS 7.1.2 AND 7.1.3 RESPECTIVELY.) IF THE DAYFU IS AVAILABLE
AND SWITCH 14 IS SET, THE DAYFU 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.

5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

THE USE OF THIS PROGRAM ON PROCESSORS NOT HAVING A HARDWARE SWITCH REGISTER NECESSITATES OPERATOR INTERACTION: THE OPERATOR MUST SET UP LOCATION 174 WITH THE SOFTWARE DISPLAY VALUES AND LOCATION 176 WITH THE SOFTWARE SWITCH VALUES. (SEE SECTION 5.2)

SWITCH	FUNCTION IN "UP" POSITION
15	LOOP ON ERROR (IN TEST 1 ONLY)
14	OPTIONAL DAVFU AVAILABLE
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
10	UP - LP14 DOWN - LP05/LP11
9	INHIBIT ERROR REPORTS
0	USED FOR PRINT SPEED MANUAL TIMING IF NO CLOCK AVAILABLE

1. SWITCH - 0

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

2. SWITCH - 9

SWITCH 9 IN THE UP POSITION WILL INHIBIT ERROR REPORTS ON THE TTY.

3. SWITCH - 10

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

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LINE PRINTER. SWITCH 10 SHOULD BE SET DOWN FOR TESTING
THE LPOS/LP11 LINE PRINTER.

4. 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.

4. SWITCH - 12

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

6. SWITCH - 13

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

7. SWITCH - 14

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

8. SWITCH - 15

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

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

5.2 ABSENCE OF HARDWARE SWITCH REGISTER

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

THE DIAGNOSTIC WILL PROMPT THE OPERATOR WITH THE MESSAGE:

SWR = XXXXXX NEW SWR =

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

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

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

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

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 8-1
DZLPKG.P11 06-APR-77 12:13

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

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

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

SWR = XXXXXX NEW SWR =

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

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

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

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

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

5.3 IOT CHANGES

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

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

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 8-2
DZLPKG.P11 06-APR-77 12:13

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6.0 ERRORS

6.1 COMPUTER DETECTED ERRORS

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

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

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

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

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

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

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6.2 VISUALLY DETECTED ERRORS

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

7.0 TEST DESCRIPTIONS

7.1 TEST 1 - CONTROL TESTS AND OPERATOR INTERACTIVE TESTS

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

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

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

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

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

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

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

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.

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7.1.2 TEST 1 - SECTION 2 - PRINT SPEED TIMING TEST.

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

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

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

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

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

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

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

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

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

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

7.1.4 TEST 1 - SECTION 4 - DAVFU ERROR TESTS

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

7.2 LINE PRINTER PRINTING TESTS

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

7.2.1 TEST 2 - DATA TRANSFER PATHS TEST

THIS TEST IS DESIGNED TO TEST THE DATA TRANSFER PATHS (WITH ALTERNATING ONES AND ZEROS), FROM THE PROCESSOR INTERFACE, THRU THE LINE PRINTER INPUT REGISTER, AND INTO THE PRINTER'S BUFFER. AN ALTERNATING STRING OF "*" AND "U" CHARACTERS ARE TRANSMITTED TO THE PRINTER ON A FULL 132 COLUMN BASIS. SINCE THESE CHARACTERS ARE COMPLEMENTARY 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. THERE IS NO SHUTTLE IN THE LP14 LINE PRINTER. EACH COLUMN HAS A HAMMER. THE PRINTER LOGIC SELECTS WHICH HAMMER IS TO FIRE.

7.2.5 TEST 6 - PRINT CONTROL TEST

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

7.2.6 TEST 7 - MULTIPLE LINE ADVANCE TEST

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

7.2.7 TEST 8 - HIGH SPEED PRINT TEST

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

7.2.8 TEST 9 - SINGLE CHAR, ALL COLUMNS TEST

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

```

?????-----?????
zzzzz-----zzzzz
aaaaa-----aaaaa
bbbbbb-----bbbbbb
-----
zzzzz-----zzzzz

```

7.2.9 TEST 10 - DRUM PATTERN TEST

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

7.2.10 TEST 11 - SPURIOUS HAMMER FIRING TEST

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

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

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

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

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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 PRUPOSE OF THIS TEST SEQUENCE IS TO PROVIDE THE OPERATOR WITH A SHORT BUT COMPREHENSIVE SCOPE DRIVER ROUTINE FOR USE IN TROUBLE SHOOTING THE PRINTER INTERFACE CONTROL MODULE WITH THE SCOPE. DEPENDING ON THE SETTING OF SWITCH 11 THIS TEST WILL EITHER CONTINUALLY SEND WHATEVER CHARACTER IS SET IN THE SWITCH REGISTER TO THE LINE PRINTER, OR ONLY SEND IT ONCE AND HALT. (SEE DESCRIPTION OF SWITCH 11 OPERATION IN SECTION 5.1)

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

;ENDR
;

882
883
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885
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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-1
 DZLPKG.P11 06-APR-77 12:13

SEQ 0021

.TITLE MAINDEC-11-DZLPK-G-D
 .NLIST MC
 ;COPYRIGHT (C) 1977,1974 DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

;***** LP14/LP11/LPOS LINE PRINTER TEST *****

;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
10	DOWN - LPOS/LP11, UP - LP14
9	"UP" - INHIBIT ERROR REPORTS
0	USED TO TEST PRINT SPEED IN TEST 1 IF NO CLOCK IS AVAILABLE

000000
 000001
 000002
 000003
 000004
 000005
 000006
 000007
 000006
 000007

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

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

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

.ENABLE ABS
 .ENABLE AMA

000000

. =0

J02

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-2
 DZLPKG.P11 06-APR-77 12:13

SEQ 0022

969					
970		000030		.=30	
971					
972	000030	011524		TYP	
973	000032	000340		340	
974					
975					
976		000042		.=42	
977					
978	000042	000000		0	
979					
980		000046		.=46	
981	000046	011316		LOGICAL	
982		000052		.=52	
983	000052	040000		BIT14	
984					
985					
986		000060		.=60	
987	000060	011762		TKINT	
988	000062	000300		300	;KEYBOARD INTERRUPT ROUTINE
989					
990					
991		000100		.=100	
992					
993	000100	003220		LKSRV	
994	000102	000340		340	;LINE CLOCK SERVICE ROUTINE
995					
996	000104	003230		CONVRT	
997	000106	000340		340	
998					
999		000174		.=174	
1000	000174	000000		DISPREG: 0	
1001	000176	000000		SWREG: 0	
1002					
1003		000200		.=200	
1004					
1005	000200	012706	001000	MOV	#1000,%6
1006	000204	000137	001100	JMP	SETUP
1007					
1008					
1009		000300		.=300	
1010					
1011					;START FOR DAVFU TESTS
1012	000300	000137	004042	JMP	INDAT
1013	000304	000137	004230	JMP	NODAT
1014	000310	000137	014576	JMP	DAVFU
1015	000314	000137	015332	JMP	DAV2
1016					;CHANNEL SLEW TEST
1017					
1018		000400		.=400	
1019					
1020					;1 MINUTE PRINT SPEED CHECK
1021	000400	000137	002452	JMP	SWTIME
1022	000404	000137	002612	JMP	KW11L
1023	000410	000137	002532	JMP	KW11P
1024	000414	000137	003430	JMP	SLEWCK
					;START FOR USING SWITCH REG FOR TIMING
					;START FOR KW11-L LINE CLOCK
					;START FOR KW11-P LINE CLOCK
					;CHECK TOP OF FORM SWITCH

K02

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-3
 DZLPKG.P11 06-APR-77 12:13

SEQ 0023

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1025
1026
1027
1028      000600      . = 600
1029
1030      000600      012706      001000      MOV      #1000,%6      ; START OF PRINTING TESTS SEQUENCE
1031      000604      000137      004534      JMP      TEST2      ; TEST 2
1032      000610      000137      004776      JMP      TEST3      ; TEST 3
1033      000614      000137      005352      JMP      CHRCHK      ; TEST 4
1034      000620      000137      005634      JMP      OVRPRT      ; TEST 5
1035      000624      000137      006132      JMP      PRTCTL      ; TEST 6
1036      000630      000137      006432      JMP      MLF      ; TEST 7
1037      000634      000137      006646      JMP      HSPRT      ; TEST 8
1038      000640      000137      007450      JMP      SNGCHR      ; TEST 9
1039      000644      000137      007644      JMP      ROTATE      ; TEST 10
1040      000650      000137      010406      JMP      LFTTR      ; TEST 11
1041      000654      000137      011122      JMP      HAMALN      ; TEST 12
1042
1043
1044      000700      . = 700
1045
1046      000700      012737      017006      017032      MOV      #LSCA,LOSCOP      ; SEND LF AFTER 132 CHARS
1047      000706      000137      016664      JMP      SCOPE
1048
1049      000720      . = 720
1050
1051      000720      012737      016664      017032      MOV      #SCOPE,LOSCOP      ; NO LF'S SENT IN SCOPE ROUTINE
1052      000726      000137      016664      JMP      SCOPE      ; DO SCOPE ROUTINE
1053
1054
1055      001000      . = 1000
1056
1057      ; LINE PRINTER HARDWARE REGISTERS
1058
1059      001000      177514      LPS:      177514      ; STATUS REGISTER
1060      ; BIT 15=ERROR
1061      ; BIT 7=READY
1062      ; BIT 6=INTERRUPT ENABLE
1063
1064      001002      177516      LPB:      177516      ; DATA BUFFER REGISTER
1065      ; BITS 0-6=7 BIT ASCII CHARACTER BUFFER
1066      ; BITS 7-15=NOT USED
1067
1068
1069      001004      177570      SWR:      177570
1070      001006      177570      DISPLAY: 177570
1071      001010      177776      PSW:      177776
1072      001012      177566      TPB:      177566
1073      001014      177562      TKB:      177562
1074      001016      177564      TPS:      177564
1075      001020      177560      TKS:      177560
1076      001022      172542      CSBR:     172542
1077      001024      172540      PLKS:     172540
1078      001026      177546      LKS:      177546
1079      001030      000200      PTRVEC:   .WORD      200
1080      001032      000202      PTRPSW:   .WORD      202

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L02

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-4
 DZLPKG.P11 06-APR-77 12:13

SEQ 0024

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1081      000240      NOP      =240
1082      000000      N        =0
1083      000002      M        =2
1084
1085      ;MACRO FOR SETTING UP ERROR COUNT
1086
1087      .LIST ME
1088
1089      .MACR  SERROR X
1090      ERR'X': MOV    BX,      ERCOUNT      ;SET UP ERROR COUNT X
1091      N=N+1
1092      .ENDM  SERROR
1093
1094
1095      ;MACRO FOR PRINTING TEST NUMBER AT START OF TEST
1096
1097      .LIST ME
1098
1099      .MACR  SPRINT Y
1100      MOV    TNO'Y',MES15      ;SET TEST NUMBER FOR MESSAGE
1101      JSR    %4,PRINT          ;PRINT TEST NUMBER
1102      M=M+1
1103      .ENDM  SPRINT
1104
1105
1106      ;MACRO FOR WAITING FOR PRINTER TO PRINT OR SLEW
1107
1108      .LIST ME
1109
1110      .MACR  SWAIT
1111      TSTB   ALPS              ;TEST READY
1112      BPL    -4                ;WAIT FOR READY
1113      .ENDM  SWAIT
1114
1115
1116
1117      ;MACRO FOR ENABLING KEYBOARD INTERRUPT IF THERE IS NO
1118      ;H/W SWITCH REGISTER AND THERE IS A S/W SWITCH REGISTER
1119
1120
1121      .LIST ME
1122
1123      .MACR  SENABLE
1124      CMP    #176,SWR          ;S/W SWR ?
1125      BNE    .+10              ;NO- CONTINUE
1126      BIS    #100,JKTS         ;ENABLE KEYBOARD INTERRUPT
1127      .ENDM  SENABLE
1128
1129
1130
1131      ;MACRO USED TO LOAD THE PSW WITH THE
1132      ;CORRECT PROCESSOR PRIORITY LEVEL
1133
1134
1135
1136      .LIST ME

```

MO2

SEQ 0025

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1174
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1177
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1181
1182
1183
1184
1185
1186
1187
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1189
1190
1191
1192

.MACR SSETPSW
MOV PC,-(SP)
ADD #6,(SP)
RTI
.ENOM SSETPSW

;MOVE PRESENT LOCATION TO STACK
;SET UP FOR NEXT INSTRUCTION
;LOAD PSW

;MEMORY LOCATIONS USED AS PROGRAM FLAGS AND COUNTERS

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

;ROUTINE TO TEST THE MECH. OPERATION OF THE LP05

SETUP: JSR %4,TYPINT
RESET
MOV 4,-(SP)
MOV 6,-(SP)
MOV #15,4
TST 2SWR
BR 2S
1S: MOV #SWREG,SWR
MOV #DISPREG,DISPLAY
CMP (SP)+,(SP)+
2S: MOV (SP)+,6
MOV (SP)+,4
EMT +0
MES1
EMT +0
MES2

;CLEAR WORLD
;SAVE CURRENT VECTORS
;SET UP TIMEOUT VECTOR
;TRY TO ACCESS HARDWARE SWR
;IF THERE, GO TO 2S
;POINT TO SOFTWARE SWR
;POINT TO SOFTWARE DISPLAY
;RESTORE STACK
;RESTORE TIMEOUT VECTORS
;
;TYPE DIAGNOSTIC TITLE
;TYPE RESTART ADDRESS INFO

001034 000000
001036 000000
001040 000000
001042 000000
001044 000000
001046 000000
001050 000000
001052 000000
001054 000000
001056 000000
001060 000000
001062 000000
001064 000000
001066 000000
001070 000000
001072 000000
001074 000000
001076 000000
001100 004437 011506
001104 000005
001106 013746 000004
001112 013746 000006
001116 012737 001132 000004
001124 005777 177654
001130 000407
001132
001132 012737 000176 001004
001140 012737 000174 001006
001146 022626
001150 012637 000006
001154 012637 000004
001160 104000
001162 012741
001164 104000
001166 013004

N02

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-6
 DZLPKG.P11 06-APR-77 12:13

SEQ 0026

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1193
1194
1195
1196
1197
1198
1199
1200
1201 001170 022737 000176 001004      CMP      #176,SWR
1202 001176 001044      BNE      SKIP
1203 001200 005037 001070      CLR      SIGNAL
1204 001204 005037 001066      CLR      DIGITS
1205 001210 005037 001072      CLR      SET
1206 001214 005037 001074      CLR      CHAR
1207 001220 013746 000034      MOV      34,-(SP)
1208 001224 013746 000036      MOV      36,-(SP)
1209 001230 012737 011762 000034      MOV      #TKINT,34
1210 001236 012737 000300 000036      MOV      #300,36
1211 001244 005237 001072      INC      SET
1212 001250 104400      TRAP     +0
1213 001252 005037 001072      CLR      SET
1214 001256 012637 000036      MOV      (SP)+,36
1215 001262 012637 000034      MOV      (SP)+,34
1216 001266 012777 000100 177524      MOV      #100,ATKS
1217 001274 000001      WT:      WAIT
1218 001276 000240      NOP
1219 001300 022737 000001 001070      CMP      #1,SIGNAL
1220 001306 001772      BEQ      WT
1221 001310 000240      SKIP:   NOP
1222
1223
1224
1225 001312 000005      RESET
1226
1227
1228
1229 001314 104000      EMT      +0
1230 001316 013031      MES3
1231 001320 000000      HALT
1232
1233
1234
1235
1236
1237 001322 005777 177452      STP1:   TST      @LPS
1238 001326 100006      BPL      STP2
1239 001330 012737 000000 001052      ERR0:   MOV      #0,      ERCOUNT
1240 (1) 001336 004537 011722      JSR      %S,STAER
1241 001342 000767      BR       STP1
1242 001344 105777 177430      STP2:   TSTB    @LPS
1243 001350 100406      BMI      STP3
1244 001352 012737 000001 001052      ERR1:   MOV      #1,      ERCOUNT
1245 (1) 001360 004537 011722      JSR      %S,STAER
1246 001364 000767      BR       STP2

```

; GET INITIAL SWR VALUE
 ; IF THERE IS NO H/W SWR
 ; S/W SWR ?
 ; NO- CONTINUE
 ; INITIALIZE INTERRUPT ROUTINE
 ;
 ; SAVE VECTOR
 ; SAVE VECTOR
 ; SET UP NEW VECTOR
 ; SET UP NEW VECTOR
 ; SET HEADER FLAG
 ; ENTER INTERRUPT ROUTINE
 ; CLEAR HEADER FLAG
 ; RESTORE VECTOR
 ; RESTORE VECTOR
 ; ENABLE KEYBOARD INTERRUPT
 ;
 ; SWR VALUE ENTERED ?
 ; NO- WAIT
 ;
 ; TYPE MESSAGE
 ; POWER UP
 ; DEPRESS CONTINUE WHEN READY TO START TEST
 ;
 ; TEST FOR ERROR
 ; NO ERROR TEST FOR READY
 ; SET UP ERROR COUNT 0
 ;
 ; REPORT ERROR BIT SET
 ; GO TEST FOR ERROR
 ; TEST FOR READY
 ; READY SET OK
 ; SET UP ERROR COUNT 1
 ;
 ; REPORT READY NOT SET
 ; GO TEST FOR READY

MAINDEC-11-DZLPK-G-0 MACY11 27(1006) 06-APR-77 12:14 PAGE 17-7
 DZLPKG.P11 06-APR-77 12:13

SEQ 0027

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1247 001366 104000          STP3:  ENT      +0          ;TYPE MESSAGE
1248 001370 013063          MES4          ;PRINTER OK "READY SET" TRY TORN PAPER SWITCH
1249 001372 000000          HALT          ;DEPRESS CONTINUE WHEN READY
1250 001374          STP4:          ;SEND A "FF" TO THE PRINTER
1251 001374 012777 000014 177400      MOV      #14,ALPB      ;ATTEMPT "FF" BY SENDING A "CR"
1252 001402 012777 000015 177372      MOV      #15,ALPB      ;TEST FOR ERROR
1253 001410 005777 177364          TST      ALPS          ;BRANCH IF ERROR SET
1254 001414 100406          BMI      STP5          ;SET UP ERROR COUNT 2
1255 001416 012737 000002 001052  ERR2:  MOV      #2,      ERCOUNT
(1) 000003          N=N+1
1256 001424 004537 011722          JSR      %5,STAER      ;REPORT ERROR NOT SET
1257 001430 000761          BR          STP4          ;LOOP ON ERROR
1258 001432 104000          STP5:  ENT      +0          ;TYPE MESSAGE
1259 001434 013174          MES6          ;ERROR SET OK - TURN ON LINE
1260 001436 000000          HALT          ;WAIT FOR OPERATOR
1261
1262 001440 005777 177334          STPSA:  TST      ALPS          ;TEST FOR ERROR
1263 001444 100006          BPL      STPSB          ;NO ERROR CONTINUE
1264 001446 012737 000003 001052  ERR3:  MOV      #3,      ERCOUNT      ;SET UP ERROR COUNT 3
(1) 000004          N=N+1
1265 001454 004537 011722          JSR      %5,STAER      ;REPORT ERROR SET
1266 001460 000767          BR          STPSA          ;LOOP ON ERROR
1267 001462 105777 177312          STPSB:  TSTB     ALPS          ;TEST READY
1268 001466 100406          BMI      STPSC          ;READY SET OK
1269 001470 012737 000004 001052  ERR4:  MOV      #4,      ERCOUNT      ;SET UP ERROR COUNT 4
(1) 000005          N=N+1
1270 001476 004537 011722          JSR      %5,STAER      ;REPORT ERROR NOT SET
1271 001502 000767          BR          STPSB          ;LOOP ON ERROR
1272 001504 104000          STPSC:  ENT      +0          ;TYPE MESSAGE
1273 001506 013127          MESS          ;READY SET OK - TRY DRUM DATE SWITCH
1274 001510 000000          HALT          ;DEPRESS CONTINUE WHEN READY
1275
1276 001512 005777 177262          STP6:  TST      ALPS          ;TEST FOR ERROR
1277 001516 100406          BMI      STP7          ;BRANCH IF ERROR SET
1278 001520 012737 000005 001052  ERR5:  MOV      #5,      ERCOUNT      ;SET UP ERROR COUNT 5
(1) 000006          N=N+1
1279 001526 004537 011722          JSR      %5,STAER      ;REPORT ERROR NOT SET
1280 001532 000767          BR          STP6          ;LOOP ON ERROR
1281 001534 104000          STP7:  ENT      +0          ;TYPE MESSAGE
1282 001536 013174          MES6          ;ERROR SET OK - TURN ON LINE
1283 001540 000000          HALT          ;DEPRESS CONTINUE WHEN READY
1284
1285          ;TEST 1
1286          ;PERFORMS PRELIMINARY COMMAND AND REGISTER TESTING.
1287
1288          ;IS THE PRINTER FREE OF ERRORS
1289
1290 001542 000005          TEST1:  RESET          ;CLEAR THE WORLD
1291 001544 005777 177230          TST      ALPS          ;IS ERROR FLAG CLEAR
1292 001550 100006          BPL      TEST1A          ;ERROR IS CLEAR OK
1293 001552 012737 000006 001052  ERR6:  MOV      #6,      ERCOUNT      ;SET UP ERROR COUNT 6
(1) 000007          N=N+1
1294 001560 004537 011722          JSR      %5,STAER      ;REPORT ERROR SET
1295 001564 000766          BR          TEST1          ;LOOP ON ERROR
1296
1297          ;IS READY SET (NO ERRORS EXIST)

```



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1298
1299 001566 000005 TEST1A: RESET ;CLEAR THE WORLD
1300 001570 105777 177204 TSTB 2LPS ;IS READY SET
1301 001574 100406 BMI TEST1B ;READY SET! PRINTER OK
1302 001576 012737 000007 001052 ERR7: MOV #7, ERCOUNT ;SET UP ERROR COUNT 7
(1) 000010
1303 001604 004537 011722 JSR %5,STAER ;REPORT READY NOT SET
1304 001610 000766 BR TEST1A ;LOOP ON ERROR
1305
1306 ;DOES LOADING THE BUFFER RESET READY
1307
1308 001612 005037 001046 TEST1B: CLR WORK ;CLEAR COUNTER
1309 001616 012777 000012 177156 MOV #12,2LPB ;LOAD LINE FEED INTO BUFFER
1310 001624 105777 177150 TSTB 2LPS ;IS READY CLEAR
1311 001630 100006 BPL LP1 ;READY TO CLEAR OK!
1312 001632 012737 000010 001052 ERR10: MOV #10, ERCOUNT ;SET UP ERROR COUNT 10
(1) 000011
1313 001640 004537 011722 JSR %5,STAER ;REPORT READY STILL SET
1314 001644 000762 BR TEST1B ;LOOP ON ERROR
1315 001646 005777 177126 LP1: TST 2LPS ;IS THERE AN ERROR
1316 001652 100006 BPL LP2 ;NO ERROR CONTINUE
1317 001654 012737 000011 001052 ERR11: MOV #11, ERCOUNT ;SET UP ERROR COUNT 11
(1) 000012
1318 001662 004537 011722 JSR %5,STAER ;REPORT ERROR OCCURRED
1319 001666 000751 BR TEST1B ;LOOP ON ERROR
1320 001670 105777 177104 LP2: TSTB 2LPS ;IS THE PRINTER STILL BUSY
1321 001674 100411 BMI TEST1C ;NO! GO TO NEXT TEST
1322 001676 005237 001046 INC WORK ;YES! GO CHECK FLAGS
1323 001702 001361 BNE LP1 ;PRINTER STILL BUSY WAIT
1324 001704 012737 000012 001052 ERR12: MOV #12, ERCOUNT ;SET UP ERROR COUNT 12
(1) 000013
1325 001712 004537 011722 JSR %5,STAER ;ERROR REPORT TIME OUT
1326 001716 000735 BR TEST1B ;LOOP ON ERROR
1327
1328 ;CHECK INTERRUPT LEVEL OF PRINTER
1329 ;THE PRINTER SHOULD BE AT LEVEL 4
1330
1331 ;TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 7
1332
1333 001720 012777 002204 177102 TEST1C: MOV #INT1C,2PTRVEC ;SET UP INT VECTOR
1334 001726 012777 000340 177076 MOV #340,2PTRPSW ;SET PRIORITY
1335 001734 005777 177040 TST 2LPS ;TEST FOR ERROR
1336 001740 100006 BPL LP3 ;NO ERROR CONTINUE
1337 001742 012737 000013 001052 ERR13: MOV #13, ERCOUNT ;SET UP ERROR COUNT 13
(1) 000014
1338 001750 004537 011722 JSR %5,STAER ;REPORT ERROR SET
1339 001754 000761 BR TEST1C ;LOOP ON ERROR
1340 001756 105777 177016 LP3: TSTB 2LPS ;TST FOR READY
1341 001762 100406 BMI LP3X ;READY SET OK
1342 001764 012737 000014 001052 ERR14: MOV #14, ERCOUNT ;SET UP ERROR COUNT 14
(1) 000015
1343 001772 004537 011722 JSR %5,STAER ;REPORT READY NOT SET
1344 001776 000750 BR TEST1C ;LOOP ON ERROR
1345 002000
(1) 002000 012737 000015 001052 LP3X: MOV #15, ERCOUNT ;SET UP ERROR COUNT 15
(1) 000016

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-9
 DZLPKG.P11 06-APR-77 12:13

SEQ 0029

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1346 002006 012746 000340      MOV      #340, -(SP)      ;LOCKUP PROCESSOR, NEW PRIORITY
1347 002012 010746      MOV      PC, -(SP)      ;MOVE PRESENT LOCATION TO STACK
(1) 002014 062716 000006      ADD      #6, (SP)      ;SET UP FOR NEXT INSTRUCTION
(1) 002020 000002      RTI      ;LOAD PSW
1348 002022 052777 000100 176750  BIS      #100, 2LPS      ;SET PRINTER INTO ENABLE
1349 002030 000240      NOP      ;WAIT
1350 002032 042777 000100 176740  BIC      #100, 2LPS      ;CLEAR PRINTER INT. ENABLE
1351
1352      ;TEST THAT THE PRINTER WILL NOT INTERRUPT AT LEVEL 6
1353
1354 002040 012737 000016 001052 ERR16: MOV      #16,      ERCOUNT      ;SET UP ERROR COUNT 16
(1) 000017
1355 002046 012746 000300      MOV      #300, -(SP)      ;SET PROCESSOR PRIORITY LEVEL 6
1356 002052 010746      MOV      PC, -(SP)      ;MOVE PRESENT LOCATION TO STACK
(1) 002054 062716 000006      ADD      #6, (SP)      ;SET UP FOR NEXT INSTRUCTION
(1) 002060 000002      RTI      ;LOAD PSW
1357 002062 052777 000100 176710  BIS      #100, 2LPS      ;SET PRINTER INT ENABLE
1358 002070 000240      NOP      ;WAIT
1359 002072 042777 000100 176700  BIC      #100, 2LPS      ;CLEAR PRINTER INT. ENABLE
1360
1361      ;TEST THAT THE PRINTER WILL NOT INT. AT
1362      ;PROCESSOR LEVEL 5
1363
1364 002100 012737 000017 001052 ERR17: MOV      #17,      ERCOUNT      ;SET UP ERROR COUNT 17
(1) 000020
1365 002106 012746 000240      MOV      #240, -(SP)      ;SET UP PROCESSOR TO LEVEL 5
1366 002112 010746      MOV      PC, -(SP)      ;MOVE PRESENT LOCATION TO STACK
(1) 002114 062716 000006      ADD      #6, (SP)      ;SET UP FOR NEXT INSTRUCTION
(1) 002120 000002      RTI      ;LOAD PSW
1367 002122 052777 000100 176650  BIS      #100, 2LPS      ;SET PRINTER INT ENABLE
1368 002130 000240      NOP      ;WAIT
1369 002132 042777 000100 176640  BIC      #100, 2LPS      ;CLEAR INT ENABLE PRINTER OK
1370
1371      ;TEST THAT THE PRINTER WILL NOT INTERRUPT
1372      ;WHEN THE PROCESSOR IS AT LEVEL 4
1373
1374 002140 012737 000020 001052 ERR20: MOV      #20,      ERCOUNT      ;SET UP ERROR COUNT 20
(1) 000021
1375 002146 012746 000200      MOV      #200, -(SP)      ;SET PROCESSOR TO LEVEL 4
1376 002152 010746      MOV      PC, -(SP)      ;MOVE PRESENT LOCATION TO STACK
(1) 002154 062716 000006      ADD      #6, (SP)      ;SET UP FOR NEXT INSTRUCTION
(1) 002160 000002      RTI      ;LOAD PSW
1377 002162 052777 000100 176610  BIS      #100, 2LPS      ;SET PRINTER INT. ENABLE
1378 002170 000240      NOP      ;WAIT
1379 002172 042777 000100 176600  BIC      #100, 2LPS      ;CLEAR PRINTER INT ENABLE
1380 002200 000137 002216      JMP      TEST1D      ;PRINTER OK CONTINUE
1381
1382      ;INTERRUPT HANDLE FOR TEST1C
1383      ;RESTORE STACK AND REPORT ERROR
1384
1385 002204 022626      INT1C: CMP      (6)+, (6)+      ;RESTORE STACK
1386 002206 004537 011722      JSR      %5, STAER      ;REPORT ERROR
1387 002212 000137 001720      JMP      TEST1C      ;RE-ENTER TEST1C
1388
1389      ;TEST THE ABILITY OF THE PRINTER TO INTERRUPT
1390      ;AT PRIORITY LEVEL 4

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1391
1392 002216 012777 002336 176604 TEST1D: MOV #INT1D, @PTRVEC ;SET UP INTERRUPT VECTOR
1393 002224 012777 000340 176600 MOV #340, @PTRPSW ;LOCK UP PRIORITIES
1394 002232 005777 176542 TST @LPS ;IS THERE A PRINTER ERROR
1395 002236 100006 BPL LP4 ;NO! CONTINUE
1396 002240 012737 000021 001052 ERR21: MOV #21, ERCOUNT ;SET UP ERROR COUNT 21
(1) 000022 N=N+1
1397 002246 004537 011722 JSR %5, STAER ;REPORT PRINTER ERROR
1398 002252 000761 BR TEST1D ;LOOP ON ERROR
1399 002254 105777 176520 LP4: TSTB @LPS ;IS READY SET
1400 002260 100406 BMI LPS ;YES - PRINTER READY
1401 002262 012737 000022 001052 ERR22: MOV #22, ERCOUNT ;SET UP ERROR COUNT 22
(1) 000023 N=N+1
1402 002270 004537 011722 JSR %5, STAER ;REPORT READY NOT SET
1403 002274 000750 BR TEST1D ;LOOP ON ERROR
1404 002276 012746 000140 LP5: MOV #140, -(SP) ;SET PRIORITY TO LEVEL 3
1405 002302 010746 MOV PC, -(SP) ;MOVE PRESENT LOCATION TO STACK
(1) 002304 062716 000006 ADD #6, (SP) ;SET UP FOR NEXT INSTRUCTION
(1) 002310 000002 RTI ;LOAD PSW
1406 002312 052777 000100 176460 BIS #100, @LPS ;SET PRINTER INTERRUPT ENABLE
1407 002320 000240 NOP ;WAIT
1408 002322 012737 000023 001052 ERR23: MOV #23, ERCOUNT ;SET UP ERROR COUNT 23
(1) 000024 N=N+1
1409 002330 004537 011722 JSR %5, STAER ;REPORT ERROR
1410 002334 000730 BR TEST1D ;LOOP ON ERROR
1411
1412 ;INTERRUPT HANDLER FOR TEST1D
1413
1414 002336 022626 INT1D: CMP (6)+, (6)+ ;RESET STACK
1415 002340 042777 000100 176432 BIC #100, @LPS ;CLEAR INT. ENABLE FOR PRINTER
1416 002346 012746 000000 MOV #0, -(SP) ;CLEAR PROCESSOR STATUS
1417 002352 010746 MOV PC, -(SP) ;MOVE PRESENT LOCATION TO STACK
(1) 002354 062716 000006 ADD #6, (SP) ;SET UP FOR NEXT INSTRUCTION
(1) 002360 000002 RTI ;LOAD PSW
1418 002362 012777 012706 176440 MOV #12706, @PTRVEC ;RESET INSTRUCTION AT 200
1419 002370 012777 001000 176434 MOV #1000, @PTRPSW ;RESET INSTRUCTION AT 202
1420
1421
1422
1423
1424
1425
1426
1427
1428 ;1 MINUTE PRINT SPEED CHECK
1429 ;IF A KW11-L OR KW11-P ARE NOT AVAILABLE, THE SR BIT0 IS USED
1430 ;FOR MANUAL TIMING OF THE PRINTER.
1431
1432 002376 012737 000002 000006 CLCKAV: MOV #RTI, @#6 ;SET TRAP TO RETURN
1433 002404 012737 000006 000004 MOV #6, @#4
1434 002412 000261 SEC
1435 002414 105777 176406 TSTB @LKS ;KW11-L AVAILABLE?
1436 002420 103404 BCS 1$ ;NO, BRANCH
1437 002422 005037 000004 CLR @#4 ;RESET TRAP VECTOR TO HALT
1438 002426 000137 002612 JMP KW11L ;USE KW11L FOR TIMING
1439 002432 000261 1$: SEC

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-11
 DZLPKG.P11 06-APR-77 12:13

SEQ 0031

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1440 002434 105777 176364 TSTB 3PLKS ;KW11-P AVAILABLE?
1441 002440 103404 BCS SWTIME ;NO USE SWITCH REG FOR TIMING
1442 002442 005037 000004 CLR 384 ;RESET TRAP VECTOR TO HALT
1443 002446 000137 002532 JMP KW11P ;USE KW11-P FOR TIMING
1444 002452
(1) 002452 022737 000176 001004 SWTIME: CMP #176,SWR ;S/W SWR ?
(1) 002460 001003 BNE .+10 ;NO- CONTINUE
(1) 002462 052777 000100 176330 BIS #100,3TKS ;ENABLE KEYBOARD INTERRUPT
1445 002470 005037 001042 CLR LINCNT ;CLEAR LINE COUNT
1446 002474 004437 011506 JSR %4,TYPINT
1447 002500 005037 000004 CLR 384 ;RESET TRAP VECTOR TO HALT
1448 002504 104000 EMT +0 ;TYPE MESSAGE
1449 002506 012522 MESC ;PRINT SPEED CHECK USING MANUAL TIMING
1450 002510 012737 000002 003216 MOV #2,DIA ;SET DUMMY ADDRESS
1451 002516 032777 000001 176260 15: BIT #BIT0,3SWR ;START?
1452 002524 001774 BEQ 15 ;WAIT FOR START
1453 002526 000137 002666 JMP STARD ;START PRINTING
1454
1455
1456 ;START FOR KW11-P.....
1457
1458 002532 KW11P:
(1) 002532 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
(1) 002540 001003 BNE .+10 ;NO- CONTINUE
(1) 002542 052777 000100 176250 BIS #100,3TKS ;ENABLE KEYBOARD INTERRUPT
1459 002550 005037 001042 CLR LINCNT ;CLEAR LINE COUNT
1460 002554 004437 011506 JSR %4,TYPINT
1461 002560 012706 001000 MOV #1000,%6 ;RESET STACK
1462 002564 013777 003212 176230 MOV MINCNT,3CSBR ;SET CLOCK COUNT
1463 002572 013737 001024 003216 MOV PLKS,DIA ;STORE PLKS ADDRESS
1464 002600 012777 000105 176216 MOV #105,3PLKS ;START CLOCK
1465 002606 000137 002666 JMP STARD ;START PRINTING
1466
1467 ;START FOR KW11-L.....
1468
1469 002612 KW11L:
(1) 002612 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
(1) 002620 001003 BNE .+10 ;NO- CONTINUE
(1) 002622 052777 000100 176170 BIS #100,3TKS ;ENABLE KEYBOARD INTERRUPT
1470 002630 005037 001042 CLR LINCNT ;CLEAR LINE COUNT
1471 002634 004437 011506 JSR %4,TYPINT
1472 002640 012706 001000 MOV #1000,%6 ;RESET STACK
1473 002644 013737 003212 003214 MOV MINCNT,CNTR ;SET CLOCK COUNT
1474 002652 013737 001026 003216 MOV LKS,DIA ;STORE LKS ADDRESS
1475 002660 012777 000100 176140 MOV #100,3LKS ;ENABLE CLOCK INTERRUPT
1476
1477 ;PRINTING ROUTINE.....
1478
1479 002666 032777 020000 176110 STARD: BIT #BIT13,3SWR ;CHECK CHAR SET
1480 002674 001007 BNE STARDA ;BRANCH IF 96
1481 002676 012737 000140 001060 MOV #140,LEGCHR ;LEGAL CHECK
1482 002704 012737 000100 001062 MOV #100,NUMCHR ;#CHARS
1483 002712 000406 BR STARDC ;CONTINUE
1484 002714 012737 000200 001060 STARDA: MOV #200,LEGCHR ;LEGAL CHECK
1485 002722 012737 000140 001062 MOV #140,NUMCHR ;#CHARS
1486 002730 013737 001060 001054 STAROC: MOV LEGCHR,STRCHR ;SET FIRST CHAR IF LP14

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1487 002736 032777 002000 176040 STAROB: BIT #BIT10,JSWR ;CHECK FOR NEW DRUM(LP14)/OLD DRUM
1488 002744 001063 TIMST
1489 002746 012737 000204 001036 MOV #132,CHRCNT ;SET CHAR COUNT
1490 002754 012737 003410 001054 MOV #PAT1B,STRCHR ;INITIALIZE TABLE POINTER
1491 002762 012737 000021 001044 STARA: MOV #17,CYCCNT ;SET GROUP COUNT
1492 002770 017737 176060 001040 MOV STRCHR,CHGEN ;GET CHAR FROM TABLE
1493 002776 063737 001042 001040 ADD LINCNT,CHGEN ;ADD LINE COUNT
1494 003004 023737 001060 001040 1S: CMP LEGCHR,CHGEN ;LEGAL CHAR?
1495 003012 003004 BGT STAR1 ;YES, BRANCH
1496 003014 163737 001062 001040 SUB NUMCHR,CHGEN ;NO, MAKE LEGAL
1497 003022 000770 BR 1S ;RECHECK CHAR
1498 003024 013777 001040 175750 STAR1: MOV CHGEN,ALPB ;LOAD BUFFER
1499 003032 005337 001036 DEC CHRCNT ;DECREMENT CHAR COUNT
1500 003036 001410 BEQ STARED ;BRANCH IF DONE LINE
1501 003040 005337 001044 DEC CYCCNT ;DECREMENT CYCCLE COUNT
1502 003044 001367 BNE STAR1 ;CONTINUE IF NOT DONE GROUP
1503 003046 062737 000002 001054 ADD #2,STRCHR ;ADD 2 TO TABLE POINTER
1504 003054 000137 002762 JMP STARA ;CONTINUE
1505 003060 005237 001042 STARED: INC LINCNT ;INCREMENT LINE COUNT
1506 003064 012777 000012 175710 MOV #12,ALPB ;SEND LF
1507 003072 105777 175702 TSTB ALPB ;TEST READY
(1) 003076 100375 BPL -4 ;WAIT FOR READY
1508 003100 032777 000001 175676 BIT #BIT0,JSWR ;STOP PRINT?
1509 003106 001450 BEQ CONVRT ;YES, BRANCH
1510 003110 000137 002736 JMP STAROB ;CONTINUE

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;LP14 PRINTING ROUTINE

```

1514 003114 012737 000204 001036 TIMST: MOV #132,CHRCNT ;SET CHARACTER COUNT
1515 003122 005337 001054 001036 DEC STRCHR ;GET NEXT STARTING CHARACTER
1516 003126 023727 001054 000040 CMP STRCHR,#40 ;LEGAL CHARACTER ?
1517 003134 100003 BPL 3S ;YES-CONTINUE
1518 003136 063737 001062 001054 ADD NUMCHR,STRCHR ;NO-MAKE LEGAL
1519 003144 013737 001054 001040 3S: MOV STRCHR,CHGEN ;GET CHARACTER
1520 003152 023727 001040 000040 TMTST2: CMP CHGEN,#40 ;LEGAL CHARACTER ?
1521 003160 100003 BPL 1S ;YES-CONTINUE
1522 003162 063737 001062 001040 ADD NUMCHR,CHGEN ;NO-MAKE LEGAL
1523 003170 013777 001040 175604 1S: MOV CHGEN,ALPB ;SEND CHARACTER
1524 003176 005337 001036 DEC CHRCNT ;DECREMENT CHARACTER COUNT
1525 003202 001726 BEQ STARED ;LINE FINISHED
1526 003204 005337 001040 DEC CHGEN ;GET NEXT CHARACTER
1527 003210 000760 TMTST1: BR TMTST2 ;CONTINUE

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```

1528
1529
1530 003212 007020 MINCNT: 7020
1531 003214 000000 CNTR: 0
1532 003216 000002 DIA: 2

```

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

;LINE CLOCK SERVICE ROUTINE FOR KW11-L

```

1533
1534
1535
1536
1537
1538
1539 003220 005337 003214 LKSRV: DEC CNTR ;DECREMENT COUNTER
1540 003224 001401 BEQ CONVRT ;EXIT IF 1 MINUTE
1541 003226 000002 RTI ;RETURN

```

H03

MAINDEC-11-DZLPK-C-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-13
 DZLPKG.P11 06-APR-77 12:13

SEQ 0033

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1542
1543
1544
1545 ;ROUTINE TO PRINT NUMBER OF LINES PRINTED IN 1 MINUTE
1546 003230 042777 000100 177760 CONVRT: BIC #100,201A ;DISABLE CLOCK INTERRUPT IF CLOCK AVAILABLE
1547 003236 005037 011636 CLR TYPDAT ;CLEAR DIGIT COUNT
1548 003242 012703 013555 MOV #MES12,%3 ;SET MESSAGE POINTER
1549 003246 022737 000144 001042 1$: CMP #100.,LINCNT ;GREATER THAN 100?
1550 003254 003006 2$: BGT 2$ ;NO, PRINT HUNDRED'S DIGIT
1551 003256 162737 000144 001042 SUB #100.,LINCNT ;YES, SUBTRACT 100
1552 003264 005237 011636 INC TYPDAT ;INCREMENT HUNDRED'S DIGIT
1553 003270 000766 1$: BR 1$ ;CONTINUE CONVERSION
1554 003272 062737 000060 011636 2$: ADD #60,TYPDAT ;MAKE ASCII
1555 003300 113723 011636 MOVVB TYPDAT,(%3)+ ;STORE DIGIT
1556 003304 005037 011636 CLR TYPDAT ;CLEAR DIGIT COUNTER
1557 003310 022737 000012 001042 3$: CMP #10.,LINCNT ;GREATER THEN 10?
1558 003316 003006 4$: BGT 4$ ;NO, PRINT DIGIT
1559 003320 162737 000012 001042 SUB #10.,LINCNT ;YES, SUBTRACT 10
1560 003326 005237 011636 INC TYPDAT ;INCREMENT TEN'S DIGIT
1561 003332 000766 3$: BR 3$ ;CONTINUE CONVERSION
1562 003334 062737 000060 011636 4$: ADD #60,TYPDAT ;MAKE ASCII
1563 003342 113723 011636 MOVVB TYPDAT,(%3)+ ;STORE DIGIT
1564 003346 013737 001042 011636 MOV LINCNT,TYPDAT ;GET ONE'S DIGIT
1565 003354 062737 000060 011636 ADD #60,TYPDAT ;MAKE ASCII
1566 003362 113723 011636 MOVVB TYPDAT,(%3)+ ;STORE DIGIT
1567 003366 104000 EMT +0 ;TYPE MESSAGE
1568 003370 013516 MES11 ;TYPE PRINT SPEED
1569 003372 012737 013514 011470 MOV #MES11A,PRMSG ;SET PRINTER MESSAGE ADDRESS
1570 003400 004437 011452 JSR %4,RINT ;PRINT PRINTER SPEED ON LINE PRINTER
1571 003404 000137 003430 JMP SLEWCK ;NEXT TEST
1572
1573
1574
1575 003410 000040
1576 003412 000117
1577 003414 000076
1578 003416 000055
1579 003420 000134
1580 003422 000113
1581 003424 000072
1582 003426 000051
1583
1584 ;CHECK TOP OF FORM SWITCH
1585
1586 003430
1587 (1) 003430 022737 000176 001004 SLEWCK: CMP #176,SWR ;S/W SWR ?
1588 (1) 003436 001003 BNE .+10 ;NO- CONTINUE
1589 (1) 003440 052777 000100 175352 BIS #100,2TKS ;ENABLE KEYBOARD INTERRUPT
1590 003446 004437 011506 JSR %4,TYPINT
1591 003452 004537 011332 JSR %5,PRINT
1592 003456 000406 BR SLW ;INITIALIZE PRINTER
1593 003460 012737 000024 001052 ERR24: MOV #24, ERCOUNT ;BRANCH IF OK
1594 (1) 003466 004537 011722 N=N+1 ;SET UP ERROR COUNT 24
1595 003472 000000 JSR %5,STAER ;REPORT PRINTER NOT READY
1596 003474 012737 003710 001042 SLW: HALT ;HALT ON ERROR
1597 MOV #FFTAB,LINCNT ;LINE COUNT FOR SWITCH SETTING

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MAINDEC-11-DZLPK-G-0 MACY11 27(1006) 06-APR-77 12:14 PAGE 17-14
 DZLPKG.P11 06-APR-77 12:13

SEQ 0034

1594	003502	012704	003766			MOV	#FFSET,%4	:	INIT SWITCH SETTING TABLE POINTER
1595	003506	012703	013270			SLW0:	MOV	#MES8,%3	:
1596	003512	012702	013403				MOV	#MES10,%2	:
1597	003516	111413				SLW1:	MOVB	(%4),(%3)	:
1598	003520	111412					MOVB	(%4),(%2)	:
1599	003522	122423					CMPS	(%4)+,(%3)+	:
1600	003524	105722					TSTB	(%2)+	:
1601	003526	105714					TSTB	(%4)	:
1602	003530	001372					BNE	SLW1	:
1603	003532	005204					INC	%4	:
1604	003534	104000					EMT	+0	:
1605	003536	013234					MES7		:
1606	003540	000000					HALT		:
1607	003542	005777	175274			SLW11:	TST	2LINCNT	:
1608	003546	001003					BNE	SLW1A	:
1609	003550	012737	013604	011470			MOV	#MES13,PRMSG	:
1610	003556	005777	175216			SLW1A:	TST	2LPS	:
1611	003562	100006					BPL	SLW2	:
1612	003564	012737	000025	001052		ERR25:	MOV	#25, ERCOUNT	:
(1)		000026					N=N+1		:
1613	003572	004537	011722				JSR	%5,STAER	:
1614	003576	000000					HALT		:
1615	003600	012777	000014	175174		SLW2:	MOV	#14,2LPB	:
1616	003606	105777	175166				TSTB	2LPS	:
(1)	003612	100375					BPL	.-4	:
1617	003614	004437	011452				JSR	%4,RINT	:
1618	003620	062737	000002	001042			ADD	#2,LINCNT	:
1619	003626	022737	003764	001042			CMPS	#FTABE,LINCNT	:
1620	003634	001410					BEQ	DAVAV	:
1621	003636	005777	175200				TST	2LINCNT	:
1622	003642	001721					BEQ	SLW0	:
1623	003644	012737	013306	011470			MOV	#MES9,PRMSG	:
1624	003652	000137	003542				JMP	SLW11	:
1625	003656	013737	014564	013270		DAVAV:	MOV	TN013,MES8	:
1626	003664	104000					EMT	+0	:
1627	003666	013232					MES7A		:
1628	003670	000000					HALT		:
1629	003672	032777	040000	175104			BIT	#BIT14,2SWR	:
1630	003700	001060					BNE	INDAT	:
1631	003702	000000					HALT		:
1632	003704	000137	004534				JMP	TEST2	:
1633									:
1634	003710	000000				FFTAB:	0		:
1635	003712	000022					18.		:
1636	003714	000000					0		:
1637	003716	000025					21.		:
1638	003720	000000					0		:
1639	003722	000030					24.		:
1640	003724	000000					0		:
1641	003726	000041					33.		:
1642	003730	000000					0		:
1643	003732	000044					36.		:
1644	003734	000000					0		:
1645	003736	000052					42.		:
1646	003740	000000					0		:
1647	003742	000060					48.		:

```

: INIT SWITCH SETTING TABLE POINTER
: INIT MESSAGE POINTER
: PUT SWITCH SETTINGS INTO MESSAGES
: INCREMENT POINTERS
: DONE MOVING SWITCH SETTINGS TO MSG'S?
: BRANCH IF NOT DONE
: TABLE POINTER SET FOR NEXT SWITCH SETTING
: TYPE MESSAGE
: SET TOP OF FORM SWITCH TO ---
: WAIT FOR OPERATOR TO SET SWITCH
: CHECK LINE COUNT
: BRANCH IF NOT ZERO
: CHANGE PRINTER MESSAGE
: TEST FOR ERRORS
: BRANCH IF NO ERROR
: SET UP ERROR COUNT 25

: REPORT ERROR SET
: HALT ON ERROR
: SEND FF
: TEST READY
: WAIT FOR READY
: PRINT MESSAGE ON LINE PRINTER
: NEXT LINE COUNT
: DONE TEST?
: YES, EXIT
: DONE CHECK OF THIS SWITCH SETTING?
: YES, NEXT SWITCH SETTING
: NO, CHECK THIS SETTING
: CONTINUE
: SET MESSAGE
: TYPE MESSAGE
: RESET TOP OF FORM SWITCH
: WAIT FOR OPERATOR
: DAVFU AVAILABLE?
: YES, DO DAVFU TESTS
: DONE OPERATOR TESTS - HALT
: DEPRESS CONTINUE TO START PRINTING TESTS

: LOOP COUNTS FOR SLEW CHECKS

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1648 003744 000000
1649 003746 000063
1650 003750 000000
1651 003752 000102
1652 003754 000000
1653 003756 000110
1654 003760 000000
1655 003762 000124
1656 003764 000000
1657
1658
1659 003766 020063 000040
1660 003772 027063 000065
1661 003776 020064 000040
1662 004002 027065 000065
1663 004006 020066 000040
1664 004012 020067 000040
1665 004016 020070 000040
1666 004022 027070 000065
1667 004026 030461 000040
1668 004032 031061 000040
1669 004036 032061 000040
1670
1671
1672
1673
1674
1675
1676 004042
(1) 004042 022737 000176 001004
(1) 004050 001003
(1) 004052 052777 000100 174740
1677 004060 004437 011506
1678 004064 012737 004214 001040
1679 004072 005777 174702
1680 004076 100010
1681 004100 012737 000026 001052
(1) 000027
1682 004106 004537 011722
1683 004112 000000
1684 004114 000137 004042
1685 004120 017777 174714 174654
1686 004126 062737 000002 001040
1687 004134 005777 174700
1688 004140 001405
1689 004142 105777 174632
(1) 004146 100375
1690 004150 000137 004072
1691 004154 005777 174620
1692 004160 100410
1693 004162 012737 000027 001052
(1) 000030
1694 004170 004537 011722
1695 004174 000000
1696 004176 000137 004042
1697 004202 104000

FTABE: 0
FFSET: .ASCIZ /3 / ; SWITCH SETTINGS FOR MESSAGES
        .ASCIZ /3.5 /
        .ASCIZ /4 /
        .ASCIZ /5.5 /
        .ASCIZ /6 /
        .ASCIZ /7 /
        .ASCIZ /8 /
        .ASCIZ /8.5 /
        .ASCIZ /11 /
        .ASCIZ /12 /
        .ASCIZ /14 /

.EVEN
; CHECK THAT VFU WILL NOT ACCEPT INCOMPLETE DATA
INDAT:  CMP #176,SWR ; S/W SWR ?
        BNE .+10 ; NO- CONTINUE
        BIS #100,STKS ; ENABLE KEYBOARD INTERRUPT
        JSR %4,TYPINT
        MOV #INDATT,CHRGEN ; SET TABLE POINTER
INDO:   TST @LPS ; TEST FOR ERROR
        BPL INDATO ; BRANCH IF NO ERROR
ERR26:  MOV #26, ERRCOUNT ; SET UP ERROR COUNT 26
        N=N+1
        JSR %5,STAER ; REPORT ERROR SET
        HALT ; HALT ON ERROR
        JMP INDAT ; RESTART TEST
INDATO: MOV @CHRGEN,@LPB ; LOAD BUFFER
        ADD #2,CHRGEN ; NEXT DATA
        TST @CHRGEN ; TEST CHAR
        BEQ IND1 ; CONTINUE IF DONE
        TSTB @LPS ; TEST READY
        BPL .-4 ; WAIT FOR READY
        JMP INDO
IND1:   TST @LPS ; TEST FOR ERROR SET
        BMI INDAT1 ; BRANCH IF ERROR SET
ERR27:  MOV #27, ERRCOUNT ; SET UP ERROR COUNT 27
        N=N+1
        JSR %5,STAER ; REPORT ERROR NOT SET
        HALT ; HALT ON ERROR
        JMP INDAT ; RESTART TEST
INDAT1: EMT +0 ; TYPE MESSAGE

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K03

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-16
 DZLPKG.P11 06-APR-77 12:13

SEQ 0036

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1698 004204 012402 MESA ;ERROR SET OK - CLEAR & TURN ON LINE
1699 004206 000000 HALT ;WAIT FOR OPERATOR
1700 ;DEPRESS CONTINUE WHEN READY FOR NEXT TEST
1701 004210 000137 004230 JMP NODAT ;NEXT TEST
1702 ;DATA TABLE FOR ABOVE TEST
1703 004214 000356 INDATT: 356
1704 004216 000001 1
1705 004220 000002 2
1706 004222 000003 3
1707 004224 000357 357
1708 004226 000000 0
1709
1710 ;CHECK THAT CHANNELS WITH NO STOP BITS CAUSE ERRORS IF CHANNEL SELECTED
1711
1712 004230 NODAT:
(1) 004230 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
(1) 004236 001003 BNE .+10 ;NO- CONTINUE
(1) 004240 052777 000100 174552 BIS #100,ATKS ;ENABLE KEYBOARD INTERRUPT
1713 004246 004437 011506 JSR %4,TYPINT
1714 004252 012737 000200 001054 MOV #200,STRCHR ;SET PAPER INSTRUCTION
1715 004260 012737 004454 001040 NODDA: MOV #NODAT3,CHRGEN ;SET TABLE PCINTER FOR LOAD
1716 004266 005777 174506 NODD: TST @LPS ;TEST FOR ERROR
1717 004272 100007 BPL NODATO ;BRANCH IF NO ERROR
1718 004274 012737 000030 001052 ERR30: MOV #30, ERCOUNT ;SET UP ERROR COUNT 30
(1) 000031 N=N+1
1719 004302 004537 011722 JSR %5,STAER ;REPORT ERROR SET
1720 004306 000000 HALT ;HALT ON ERROR
1721 004310 000747 BR NODAT ;RESTART TEST
1722 004312 017777 174522 174462 NODATO: MOV @CHRGEN,@LPB ;LOAD BUFFER
1723 004320 062737 000002 001040 ADD #2,CHRGEN ;NEXT DATA
1724 004326 022737 004534 001040 CMP #NODAT4+2,CHRGEN ;DONE LOAD?
1725 004334 001405 BEQ NODATA ;BRANCH IF DONE
1726 004336 105777 174436 TSTB @LPS ;TEST READY
(1) 004342 100375 BPL .-4 ;WAIT FOR READY
1727 004344 000137 004266 JMP NODD
1728 004350 013777 001054 174424 NODATA: MOV STRCHR,@LPB ;SEND DATA
1729 004356 005037 001036 CLR CHRCNT ;DELAY
1730 004362 005237 001036 IS: INC CHRCNT
1731 004366 001375 BNE IS
1732 004370 005777 174404 TST @LPS ;TEST FOR ERROR SET
1733 004374 100410 BMI NODAT1 ;BRANCH IF ERROR SET
1734 004376 012737 000031 001052 ERR31: MOV #31, ERCOUNT ;SET UP ERROR COUNT 31
(1) 000032 N=N+1
1735 004404 004537 011722 JSR %5,STAER ;REPORT ERROR NOT SET
1736 004410 000000 HALT ;HALT ON ERROR
1737 004412 000137 004260 JMP NODDA ;RETEST
1738 004416 005237 001054 NODAT1: INC STRCHR ;NEXT PAPER INSTRUCTION
1739 004422 022737 000214 001054 CMP #214,STRCHR ;DONE TEST?
1740 004430 001404 BEQ NODAT2 ;CONTINUE IF NOT DONE
1741 004432 104000 EMT +0 ;TYPE MESSAGE
1742 004434 012447 MESB ;ERROR SET OK - CLEAR & TRY NEXT CHANNEL
1743 004436 000000 HALT ;WAIT FOR OPERATOR
1744 004440 000707 BR NODDA ;RELOAD & TEST NEXT CHANNEL
1745 004442 104000 EMT +0 ;TYPE MESSAGE
1746 004444 012402 MESA ;ERROR SET OK - TURN ON LINE
1747 004446 000000 HALT

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1748 004450 000137 004534      JMP      TEST2      ;JUMP
1749
1750
1751 004454 000356      NODAT3: 356      ;START LOAD
1752 004456 000000
1753 004460 000000
1754 004462 000000
1755 004464 000000
1756 004466 000000
1757 004470 000000
1758 004472 000000
1759 004474 000000
1760 004476 000000
1761 004500 000000
1762 004502 000000
1763 004504 000000
1764 004506 000000
1765 004510 000000
1766 004512 000000
1767 004514 000000
1768 004516 000000
1769 004520 000000
1770 004522 000000
1771 004524 000000
1772 004526 000000
1773 004530 000000
1774 004532 000357      NODAT4: 357      ;STOP LOAD
1775
1776      ;TEST 2
1777      ;TESTS INTERFACE AND PRINTER DATA PATHS
1778      ;WITH ALTERNATING ONES AND ZEROS
1779
1780 004534      TEST2:
(1) 004534 022737 000176 001004      CMP      #176,SWR      ;S/W SWR ?
(1) 004542 001003      BNE      +10      ;NO- CONTINUE
(1) 004544 052777 000100 174246      BIS      #100,ATKS      ;ENABLE KEYBOARD INTERRUPT
1781 004552 004437 011506      JSR      %4,TYPINT
1782 004556 004537 011332      JSR      %5,PRINT      ;INITIALIZE PRINTER
1783 004562 000406      BR      TST2AX      ;BRANCH IF OK
1784 004564 012737 000032 001052      ERR32: MOV      #32, ERCOUNT      ;SET UP ERROR COUNT 32
(1) 000033      N=N+1
1785 004572 004537 011722      JSR      %5,STAER      ;REPORT PRINTER NOT READY
1786 004576 000000      HALT      ;HALT ON ERROR
1787 004600      TST2AX:
(1) 004600 013737 014542 014030      MOV      TNO2,MES15      ;SET TEST NUMBER FOR MESSAGE
(1) 004606 004437 011406      JSR      %4,PRINT      ;PRINT TEST NUMBER
(1) 000003      M=M+1
1788 004612 012737 177740 001044      MOV      #-32,CYCCNT      ;SET UP LINE COUNT FOR 32 LINES
1789 004620 012737 177574 001036      MOV      #-132,CHRCNT      ;SET CHAR COUNT TO 132
1790 004626 013737 004702 001054      MOV      SCHRSW,STRCHR      ;SET CHAR. SWITCH TO U
1791 004634 005777 174140      T3A: TST      @LPS      ;TEST FOR ERROR
1792 004640 100006      BPL      LP2B      ;NO ERROR CONTINUE
1793 004642 012737 000033 001052      ERR33: MOV      #33, ERCOUNT      ;SET UP ERROR COUNT 33
(1) 000034      N=N+1
1794 004650 004537 011722      JSR      %5,STAER      ;REPORT ERROR SET
1795 004654 000000      HALT      ;HALT ON ERROR

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MO3

 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-18
 DZLPKG.P11 06-APR-77 12:13

SEQ 0038

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1796 004656 000177 174172 LP28: JMP 2STRCHR ;LOAD CHAR
1797 004662 013737 004704 001054 T2A: MOV RCHRSW,STRCHR ;RESET CHAR. SWITCH
1798 004670 012737 000125 001050 MOV #125,SAVE ;STORE CHAR
1799 004676 000137 004722 JMP TSA ;LOAD CHAR
1800
1801 004702 004662 SCHRSW: T2A
1802 004704 004706 RCHRSW: T1A
1803
1804 004706 013737 004702 001054 T1A: MOV SCHRSW,STRCHR ;SET CHAR. SWITCH TO U
1805 004714 012737 000052 001050 MOV #52,SAVE ;STORE CHAR
1806 004722 013777 001050 174052 TSA: MOV SAVE,2LPB ;LOAD BUFFER
1807 004730 005237 001036 INC CHRCNT ;INC CHARACTER COUNT
1808 004734 001337 BNE T3A ;CONTINUE
1809 004736 012777 000012 174036 MOV #12,2LPB ;SEND LF
1810 004744 105777 174030 TSTB 2LPB ;TEST READY
1811 (1) 004750 100375 BPL -4 ;WAIT FOR READY
1812 004752 012737 177574 001036 MOV #-132.,CHRCNT ;RESET CHAR COUNT
1813 004760 005237 001044 INC CYCCNT ;INC CYCLE COUNT
1814 004764 001356 BNE TSA ;CONTINUE IF NOT DONE
1815 004766 032777 010000 174010 BIT #BIT12,2SWR ;LOOP ON TEST?
1816 004774 001257 BNE TEST2 ;LOOP
1817
1818 ;TEST 3
1819 ;TEST CHARACTER COMPARATOR WITH ALTERNATE LINES OF
1820 ;ALL CHARACTERS AND ILLEGAL CHARACTERS
1821
1821 004776 TEST3:
1822 (1) 004776 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
1823 (1) 005004 001003 BNE .+10 ;NO- CONTINUE
1824 (1) 005006 052777 000100 174004 BIS #100,2TKS ;ENABLE KEYBOARD INTERRUPT
1825 005014 004437 011506 JSR %4,TYPINT
1826 005020 013737 014544 014030 MOV TN03,MES15 ;SET TEST NUMBER FOR MESSAGE
1827 (1) 005026 004437 011406 JSR %4,PRNNT ;PRINT TEST NUMBER
1828 (1) 000004 M=M+1
1829 005032 012737 177765 001044 MOV #-13,CYCCNT ;SET 21 LINES
1830 005040 000137 005172 JMP LP2H ;SEND ILLEGAL CHARS FIRST TO GIVE BLANK LINE
1831 005044 012737 177574 001036 T2B0: MOV #-132.,CHRCNT ;SET CHAR COUNT FOR 132
1832 005052 012737 000040 001040 T2B0A: MOV #40,CHRCNT ;SET FIRST CHAR.
1833 005060 005777 173714 T2B1: TST 2LPB ;DOES THE PRINTER HAVE AN ERROR
1834 005064 100006 BPL LP2E ;BRANCH IF NO ERROR
1835 005066 012737 000034 001052 ERR34: MOV #34, ERCCOUNT ;SET UP ERROR COUNT 34
1836 (1) 000035 N=N+1
1837 005074 004537 011722 JSR %5,STAER ;REPORT ERROR
1838 005100 000000 HALT ;HALT ON ERROR
1839 005102 013777 001040 173672 LP2E: MOV CHRCNT,2LPB ;PRINT CHARACTER
1840 005110 005237 001036 INC CHRCNT ;INC. CHAR. COUNT
1841 005114 001420 BEQ T2B2 ;BRANCH IF LINE IS FINISHED
1842 005116 005237 001040 INC CHRCNT ;NEXT CHAR
1843 005122 032777 020000 173654 BIT #BIT13,2SWR ;CHECK CHAR SET
1844 005130 001405 BEQ T2B2B ;BRANCH IF 64 CHARS
1845 005132 022737 000200 001040 CMP #200,CHRCNT ;LEGAL CHAR?
1846 005140 001744 BEQ T2B0A ;MAKE SPACE IF ILLEGAL
1847 005142 000746 BR T2B1 ;CONTINUE IF LEGAL CHAR
1848 005144 022737 000140 001040 T2B2B: CMP #140,CHRCNT ;LEGAL CHAR?
1849 005152 001737 BEQ T2B0A ;MAKE SPACE IF ILLEGAL
1850 005154 000741 BR T2B1 ;CONTINUE IF LEGAL CHAR

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N03

 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 17-19
 DZLPKG.P11 06-APR-77 12:13

SEQ 0039

1845	005156	012777	000012	173616	T2B2:	MOV	#12,ALPB	:ISSUE LINE FEED
1846	005164	105777	173610			TSTB	ALPS	:TEST READY
(1)	005170	100375				BPL	.-4	:WAIT FOR READY
1847	005172	005037	001040		LP2H:	CLR	CHGEN	:FIRST ILLEGAL CHAR
1848	005176	005777	173576		T2B3:	TST	ALPS	:TEST FOR ERROR
1849	005202	100006				BPL	LDCH	:BRANCH IF NO ERROR
1850	005204	012737	000035	001052	ERR35:	MOV	#35, ERCOUNT	:SET UP ERROR COUNT 35
(1)		000036				N=N+1		
1851	005212	004537	011722			JSR	%5,STAER	:REPORT ERROR SET
1852	005216	000000				HALT		:HALT ON ERROR
1853	005220	013777	001040	173554	LDCH:	MOV	CHGEN,ALPB	:TRANSMIT CHARACTER
1854	005226	005237	001040		T2B4:	INC	CHGEN	:NEXT CHAR
1855	005232	022737	000012	001040		CMP	#12,CHGEN	:TEST FOR LINE FEED
1856	005240	001772				BEQ	T2B4	:SKIP IF LF
1857	005242	022737	000014	001040		CMP	#14,CHGEN	:TEST FOR FORM FEED
1858	005250	001766				BEQ	T2B4	:SKIP IF FF
1859	005252	022737	000015	001040		CMP	#15,CHGEN	:TEST FOR CARRIAGE RETURN
1860	005260	001762				BEQ	T2B4	:SKIP IF CR
1861	005262	023727	001040	000040		CMP	CHGEN,#40	:CHECK IF LEGAL CHAR
1862	005270	002753				BLT	LDCH	:CONTINUE IF STILL ILLEGAL CHAR
1863	005272	032777	020000	173504		BIT	#BIT13,ASMR	:CHECK CHAR SET
1864	005300	001007				BNE	T2B5	:BRANCH IF %6 CHAR SET
1865	005302	052737	000100	001040		BIS	#100,CHGEN	:SET BIT 7 IF NOT SET
1866	005310	032737	000200	001040		BIT	#200,CHGEN	:DONE ILLEGAL CHARS?
1867	005316	001740				BEQ	LDCH	:BRANCH IF NOT DONE
1868	005320	012777	000012	173454	T2B5:	MOV	#12,ALPB	:ISSUE LINE FEED
1869	005326	105777	173446			TSTB	ALPS	:TEST READY
(1)	005332	100375				BPL	.-4	:WAIT FOR READY
1870	005334	005237	001044			INC	CYC CNT	:INCREMENT LINE COUNT
1871	005340	001241				BNE	T2B0	:CONTINUE IF NOT DONE
1872	005342	032777	010000	173434		BIT	#BIT12,ASMR	:CHECK TO LOOP ON TEST
1873	005350	001212				BNE	TEST3	:LOOP
1874								
1875								
1876								
1877								
1878								
1879	005352							
(1)	005352	022737	000176	001004	CHCHK:	CMP	#176,SWR	:S/W SWR ?
(1)	005360	001003				BNE	.-+10	:NO- CONTINUE
(1)	005362	052777	000100	173430		BIS	#100,ATKS	:ENABLE KEYBOARD INTERRUPT
1880	005370	004437	011506			JSR	%4,TYPINT	

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

B04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 18
DZLPKG.P11 06-APR-77 12:13

SEQ 0040

1882 005374 013737 014546 014030
(1) 005402 004437 011406
(1) 000005

MOV TN04,MES15
JSR %4,PRINT
M=M+1

;SET TEST NUMBER FOR MESSAGE
;PRINT TEST NUMBER

C04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 19
DZLPKG.P11 06-APR-77 12:13

SEQ 0041

1884	005406	012737	177750	001042	MOV	8-24.,LINCNT	;SET UP LINE COUNT FOR 24 LINES
1885	005414	012737	177776	001044	MOV	8-2,CYCCNT	;SET UP CYCLE COUNT
1886	005422	013737	005564	001054	MOV	CHRE,STRCHR	;SET CHAR TAG TO SPACE

004

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 20
 DZLPKG.P11 06-APR-77 12:13

SEQ 0042

1888	005430	012737	177574	001036	CR:	MOV	8-132.,CHRCNT	:SET CHAR COUNT
1889	005436	005777	173336		CR0:	TST	2LPS	:TEST FOR ERROR
1890	005442	100006				BPL	CR1	:CONTINUE IF NO ERROR
1891	005444	012737	000036	001052	ERR36:	MOV	836, ERCOUNT	:SET UP ERROR COUNT 36
(1)		000037				N=N+1		
1892	005452	004537	011722			JSR	X5,STAE	:REPORT ERROR SET
1893	005456	000000				HALT		:HALT ON ERROR
1894	005460	000177	173370		CR1:	JMP	2STRCHR	:OPPOSITE CHAR
1895	005464	013737	005564	001054	CR2:	MOV	CHRE,STRCHR	:SET CHAR SWITCH TO SPACE
1896	005472	012737	000105	001050		MOV	8105,SAVE	:SEND E
1897	005500	013777	001050	173274	CR3:	MOV	SAVE,2LPB	:LOAD BUFFER
1898	005506	005237	001036			INC	CHRCNT	:INCREMENT CHAR COUNT
1899	005512	001351				BNE	CR0	:BRANCH IF NOT DONE
1900	005514	005237	001044			INC	CYCCT	:INCREMENT CYCLE COUNT

E04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 21
DZLPKG.P11 06-APR-77 12:13

SEQ 0043

1902 005520 001422

BEQ CRS

;BRANCH IF FINISHED OVERPRINTS

F04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 22
DZLPKG.P11 06-APR-77 12:13

SEQ 0044

1904 005522 012777 000015 173252
1905 005530 105777 173244
(1) 005534 100375

MOV #15,ALPB
TSTB ALPS
BPL .-4

;SEND CR
;TEST READY
;WAIT FOR READY

G04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 23
DZLPKG.P11 06-APR-77 12:13

SEQ 0045

1907	005536	000137	005430		JMP	CR	;OVERPRINT LINE
1908	005542	013737	005562	001054	CR7:	CHRS,STRCHR	;RESET CHAR SWITCH
1909	005550	012737	000040	001050	MOV	#40,SAVE	;SEND SPACE

H04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 24
DZLPKG.P11 06-APR-77 12:13

SEQ 0046

1911	005556	000137	005500		JMP	CR3		;CONTINUE
1912								
1913	005562	005464			CHRS:	CR2		
1914	005564	005542			CHRE:	CR7		
1915	005566	012777	000012	173206	CRS:	MOV	#12,ALPB	;SEND LF
1916	005574	105777	173200			TSTB	ALPS	;TEST READY
(1)	005600	100375				BPL	.-4	;WAIT FOR READY
1917	005602	012737	177776	001044		MOV	#-2,CYCCNT	;RESET CYCLE COUNT
1918	005610	012737	177574	001036		MOV	#-132.,CHRCNT	;RESET CHAR COUNT
1919	005616	005237	001042			INC	LINCNT	;INCREMENT LINE COUNT
1920	005622	001326				BNE	CR3	;BRANCH IF NOT DONE
1921	005624	032777	010000	173152		BIT	#BIT12,ASWR	;LOOP ON TEST?
1922	005632	001247				BNE	CHRCHK	;YES, LOOP
1923								
1924								
1925								
1926								
1927								
1928								

;TEST 5
;SHUTTLE POSITIONING TEST
;SENDS PAIRS OF E'S, THEN OVER PRINTS THEM WITH SPACES AND ADDS ANOTHER

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 28
 DZLPKG.P11 06-APR-77 12:13

SEQ 0047

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1933                                     :PAIR OF E'S TO THE LINE --- THIS IS REPEATED UNTIL A FULL LINE OF E'S
1934                                     :HAVE BEEN PRINTED, THEN A FULL LINE OF M'S ARE PRINTED.
1935
1936 005634                                OVRPRT:
   (1) 005634 022737 000176 001004      CMP      #176,SWR                :S/W SWR ?
   (1) 005642 001003                      BNE      .+10                :NO- CONTINUE
   (1) 005644 052777 000100 173146      BIS      #100,STKS              :ENABLE KEYBOARD INTERRUPT
1937 005652 004437 011506                      JSR      %4,TYPINT
1938 005656 013737 014550 014030      MOV      TN05,MES15          :SET TEST NUMBER FOR MESSAGE
   (1) 005664 004437 011406                      JSR      %4,PRNT              :PRINT TEST NUMBER
   (1) 000006                                M=M+1
1939 005670 012737 177760 001042      MOV      #-16,LINCNT          :SET LINE COUNT FOR 16 LINES
1940 005676 012737 177574 001036      OVR:  MOV      #-132,CHRCNT        :SET CHAR COUNT
1941 005704 012737 177776 001044      OVR0: MOV      #-2,CYCCNT        :SET CYCLE COUNT FOR A PAIR OF E'S
1942 005712 013737 001036 001056      MOV      CHRCNT,STRCNT      :NO. CHARS LEFT TO PRINT
1943 005720 062737 000205 001056      ADD      #133,STRCNT        :NO. SPACES +1
1944 005726 012737 000040 001040      MOV      #40,CHRGEN        :SEND SPACE
1945 005734 000406                      BR      OVR2                :BRANCH
1946 005736 012737 000105 001040      OVR4: MOV      #105,CHRGEN      :SEND E

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J04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 29
 DZLPKG.P11 06-APR-77 12:13

SEQ 0048

1948	005744	013777	001040	173030	OVR1:	MOV	CHRGEN, 2LPB	;LOAD BUFFER
1949	005752	005777	173022		OVR2:	TST	2LPS	;TEST FOR ERROR
1950	005756	100006				BPL	OVR3	;BRANCH IF NO ERROR
1951	005760	012737	000037	001052	ERR37:	MOV	#37, ERCOUNT	;SET UP ERROR COUNT 37
(1)		000040				N=N+1		
1952	005766	004537	011722			JSR	%5, STAER	;REPORT ERROR SET
1953	005772	000000				HALT		
1954	005774	005337	001056		OVR3:	DEC	STRCNT	;DECREMENT SPACE COUNTER

K04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 31
DZLPKG.P11 06-APR-77 12:13

SEQ 0049

1957 006000 003361

BGT OVR1

;BRANCH IF NOT DONE SPACES

L04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 32
DZLPKG.P11 06-APR-77 12:13

SEQ 0050

1959	006002	001755		BEQ	OVR4	: BRANCH IF NOT FIRST E
1960	006004	005237	001036	INC	CHRCNT	: INCREMENT CHAR COUNT
1961	006010	001437		BEQ	OVR8	: BRANCH IF DONE LINE
1962	006012	005237	001044	INC	CYCCNT	: INCREMENT CYCLE COUNT

OVR5:

M04

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 33
 DZLPKG.P11 06-APR-77 12:13

SEQ 0051

1964	006016	001352			BNE	OVR1	:CONTINUE SENDING E'S IF NOT DONE
1965	006020	012777	000015	172754	MOV	#15,ALPB	:SEND CR
1966	006026				OVR6:		
(1)	006026	105777	172746		TSTB	ALPS	:TEST READY
(1)	006032	100375			BPL	-4	:WAIT FOR READY
1967	006034	005737	001036		TST	CHRCNT	:LINE DONE?
1968	006040	001321			BNE	OVR0	:NO, CONTINUE OVER PRINT
1969	006042	005237	001042		INC	LINCNT	:YES, INCREMENT LINE COUNT
1970	006046	001425			BEQ	OVR6EXT	:EXIT IF DONE TEST
1971	006050	032737	000001	001042	BIT	#1 LINCNT	:WHICH LINE NEXT?
1972	006055	001707			BEQ	OVR	:BRANCH TO SEND E'S
1973	006060	012737	000115	001040	MOV	#115,CHRCNT	:SET UP TO SEND M'S
1974	006066	012737	177573	001036	MOV	#-133,CHRCNT	:SET CHAR COUNT
1975	006074	005037	001056		CLR	STRCNT	:CLEAR SPACE COUNT
1976	006100	005037	001044		CLR	CYCCNT	:CLEAR CYCLE COUNT

NO4

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 34
DZLPKG.P11 06-APR-77 12:13

SEQ 0052

1978	006104	000137	005752			JMP	OVR2		;PRINT LINE OF M'S
1979	006110	012777	000012	172664	OVR8:	MOV	#12,2LPB		;SEND LF

B05

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 36
DZLPKG.P11 06-APR-77 12:13

SEQ 0053

1982 006116 000137 006026

JMP

OVR6

;CONTINUE

C05

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 37
 DZLPKG.P11 06-APR-77 12:13

SEQ 0054

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1984 006122 032777 010000 172654 OVREXT: BIT      #BIT12,2SWR      ;LOOP ON TEST?
1985 006130 001241                      BNE      OVRPRT      ;LOOP
1986
1987      ;TEST 6
1988      ;PRINT CONTROL TEST
1989      ;SENDS FULL LINE OF SAME CHARACTER THEN FULL CHAR SET
1990      ;SHOULD ONLY PRINT THE FIRST 132 CHARACTERS RECEIVED
1991
1992 006132                      PRTCTL:
   (1) 006132 022737 000176 001004      CMP      #176,SWR      ;S/W SWR ?
   (1) 006140 001003                      BNE      .+10      ;NO- CONTINUE
   (1) 006142 052777 000100 172650      BIS      #100,2TKS      ;ENABLE KEYBOARD INTERRUPT
1993 006150 004437 011506      JSR      %4,TYPINT

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005

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 38
 DZLPKG.P11 06-APR-77 12:13

SEQ 0055

1995	006154	013737	014552	014030		MOV	TN06,MES15		;SET TEST NUMBER FOR MESSAGE
(1)	006162	004437	011406			JSR	%4,PRINT		;PRINT TEST NUMBER
(1)		000007				M=M+1			
1996	006166	012737	000060	001054		MOV	#60,STRCHR		;FIRST START CHAR
1997	006174	032777	020000	172602	PRT0:	BIT	#81113,2SWR		;TEST FOR CHAR SET
1998	006202	001404				BEQ	PRT1		;BRANCH IF 64 CHARS
1999	006204	012737	177641	001034		MOV	#-95.,SEGCNT		;SET OVERFLOW COUNT
2000	006212	000403				BR	PRT2		;BRANCH
2001	006214	012737	177701	001034	PRT1:	MOV	#-63.,SEGCNT		;SET OVERFLOW COUNT
2002	006222	012737	177574	001036	PRT2:	MOV	#-132.,CHRCNT		;SET CHAR COUNT
2003	006230	013737	001054	001040		MOV	STRCHR,CHRCNT		;GET START CHAR
2004	006236	005777	172536		PRT3:	TST	2LPS		;TEST FOR ERROR
2005	006242	100006				BPL	PRT4		;BRANCH IF NO ERROR
2006	006244	012737	000040	001052	ERR40:	MOV	#40, ERCOUNT		;SET UP ERROR COUNT 40
(1)		000041				N=N+1			
2007	006252	004537	011722			JSR	%5,STAER		;REPORT ERROR SET
2008	006256	000000				HALT			;HALT ON ERROR
2009	006260	013777	001040	172514	PRT4:	MOV	CHRCNT,2LPB		;LOAD BUFFER
2010	006266	005237	001036			INC	CHRCNT		;INCREMENT CHAR COUNT
2011	006272	002761				BLT	PRT3		;BRANCH IF NOT 132 CHARS
2012	006274	001433				BEQ	PRTA		;START OVERFLOW
2013	006276	005237	001040			INC	CHRCNT		;NEXT CHAR

E05

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 39
 DZLPKG.P11 06-APR-77 12:13

SEQ 0056

2015	006302	005237	001034		INC	SEGCNT	: INCREMENT OVERFLOW COUNT
2016	006306	001353			BNE	PRT3	: CONTINUE IF NOT DONE
2017	006310	012777	000012	172464	MOV	#12,ALPB	: SEND LF
2018	006316	105777	172456		TSTB	ALPS	: TEST READY
(1)	006322	100375			BPL	.-4	: WAIT FOR READY
2019	006324	022737	000040	001054	CMP	#40,STRCHR	: LAST START CHAR SPACE?
2020	006332	001421			BEQ	PRT6	: YES, BRANCH
2021	006334	022737	000065	001054	CMP	#65,STRCHR	: LAST START CHAR 5?
2022	006342	001422			BEQ	PRT7	: YES, BRANCH
2023	006344	022737	000071	001054	CMP	#71,STRCHR	: DONE?
2024	006352	001423			BEQ	PRT8	: YES
2025	006354	005237	001054		INC	STRCHR	: NO, GET NEXT START CHAR
2026	006360	000137	006174		JMP	PRT0	: CONTINUE
2027	006364	012737	000041	001040	MOV	#41,CHRCNT	: GET FIRST CHAR IN SET
2028	006372	000137	006236		JMP	PRT3	: START OVERFLOW
2029	006376	012737	000066	001054	MOV	#66,STRCHR	: SET START CHAR TO 6
2030	006404	000137	006174		JMP	PRT0	: CONTINUE
2031	006410	012737	000040	001054	MOV	#40,STRCHR	: SET START CHAR TO SPACE
2032	006416	000137	006174		JMP	PRT0	: CONTINUE
2033	006422	032777	010000	172354	BIT	#BIT12,SWR	: CHECK LOOP ON TEST
2034	006430	001240			BNE	PRTCTL	: LOOP
2035							
2036							
2037							
2038							
2039							
2040							
2041	006432						
(1)	006432	022737	000176	001004	MLF:	CMP	#176,SWR
(1)	006440	001003			BNE	.-10	: S/W SWR ?
(1)	006442	052777	000100	172350	BIS	#100,STKS	: NO- CONTINUE
2042	006450	004437	011506		JSR	%4,TYPINT	: ENABLE KEYBOARD INTERRUPT
2043	006454	013737	014554	014030	MOV	TN07,MES15	: SET TEST NUMBER FOR MESSAGE
(1)	006462	004437	011406		JSR	%4,PRNNT	: PRINT TEST NUMBER
(1)		000010			M=M+1		
2044	006466	012737	006620	001054	MOV	#TABSTR,STRCHR	: FIRST CHAR
2045	006474	012737	177574	001036	MLFA:	MOV	#-132,CHRCNT
2046	006502	117737	172346	001040	MOV	#STRCHR,CHRCNT	: SET CHAR COUNT
2047	006510	001452			BEQ	MLF4	: GET CHAR
2048	006512	005777	172262		MLFO:	TST	: BRANCH IF DONE
2049	006516	100006			BPL	MLF1	: TEST FOR ERROR
2050	006520	012737	000041	001052	ERR41:	MOV	: CONTINUE IF NO ERROR
(1)		000042			N=N+1		: SET UP ERROR COUNT 41
2051	006526	004537	011722		JSR	%5,STAER	: REPORT ERROR
2052	006532	000000			HALT		: HALT ON ERROR
2053	006534	013777	001040	172240	MLF1:	MOV	: LOAD BUFFER
2054	006542	005237	001036		INC	CHRCNT	: INCREMENT CHAR COUNT
2055	006546	001361			BNE	MLFO	: CONTINUE
2056	006550	117737	172300	001042	MOV	#STRCHR,LINCNT	: GET ASCII LINE COUNT
2057	006556	042737	177770	001042	BIC	#177770,LINCNT	: MAKE OCTAL
2058	006564	005237	001042		INC	LINCNT	: ADD 1
2059	006570	012777	000012	172204	MLF2:	MOV	: SEND LF
2060	006576	105777	172176		TSTB	ALPS	: TEST READY
(1)	006602	100375			BPL	.-4	: WAIT FOR READY
2061	006604	005337	001042		DEC	LINCNT	: DECREMENT LINE COUNT
2062	006610	001367			BNE	MLF2	: CONTINUE

F05

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 39-1
DZLPKG.P11 06-APR-77 12:13

SEQ 0057

2063 006612 005237 001054

INC

STRCHR

;NEXT CHAR

G05

 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42
 DZLPKG.P11 06-APR-77 12:13

SEQ 0058

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2067 006616 000726 BR MLFA ;CONTINUE
2068
2069 006620 033462 033062 033463 TABSTR: .ASCIZ /272637463540/
      006626 033064 032463 030064
      006634 000
2070
2071 006636 006636 .EVEN
2072
2073 006636 032777 010000 172140 MLF4: BIT #BIT12,JSWR ;CHECK LOOP ON TEST
2074 006644 001272 BNE MLF ;LOOP
2075
2076
2077 ;TEST 8
2078 ;HIGH SPEED PRINT TEST
2079
2080 006646 HSPRT:
      (1) 006646 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
      (1) 006654 001003 BNE .+10 ;NO- CONTINUE
      (1) 006656 052777 000100 172134 BIS #100,ATKS ;ENABLE KEYBOARD INTERRUPT
2081 006664 004437 011506 JSR %4,TYPINT
2082 006670 013737 014556 014030 MOV TNO10,MES15 ;SET TEST NUMBER FOR MESSAGE
      (1) 006676 004437 011406 JSR %4,PRINT ;PRINT TEST NUMBER
      (1) 000011 M=M+1
2083 006702 032777 002000 172074 BIT #BIT10,JSWR ;CHECK FOR NEW DRUM / OLD DRUM
2084 006710 001135 BNE HSPRT ;BRANCH IF NEW DRUM
2085 006712 032777 020000 172064 BIT #BIT13,JSWR ;CHECK CHAR SET
2086 006720 001007 BNE HSD00A ;BRANCH IF 96 CHAR SET
2087 006722 012737 000140 001060 MOV #140,LEGCHR ;LEGAL CHK
2088 006730 012737 000100 001062 MOV #100,NUMCHR ;#CHARS
2089 006736 000406 BR HSD00 ;CONTINUE
2090 006740 012737 000200 001060 HSD00A: MOV #200,LEGCHR ;LEGAL CHECK
2091 006746 012737 000140 001062 MOV #140,NUMCHR ;#CHARS
2092 006754 012737 000040 001054 HSD0: MOV #40,STRCHR ;SET UP FIRST LINE
2093 006762 012737 000177 001042 MOV #127,LINCNT ;SET LINE COUNT FOR 2 PAGES
2094 006770 012737 177574 001036 HSD: MOV #-132,CHRCNT ;SET CHAR COUNT
2095 006776 012737 177757 001044 MOV #-17,CYCCNT ;SET GROUP COUNT
2096 007004 013737 001054 001040 MOV STRCHR,CHRGEN ;STORE START CHAR
2097 007012 005777 171762 HS1: TST ALPS ;TEST FOR ERROR
2098 007016 100006 BPL HS2 ;BRANCH IF NO ERROR
2099 007020 012737 000042 001052 ERR42: MOV #42, ERRCOUNT ;SET UP ERROR COUNT 42
      (1) 000043 N=N+1
2100 007026 004537 011722 JSR %5,STAER ;REPORT ERROR SET
2101 007032 000000 HALT ;HALT ON ERROR
2102 007034 013777 001040 171740 HS2: MOV CHRGEN,ALPB ;LOAD BUFFER
2103 007042 005237 001036 INC CHRCNT ;INCREMENT CHAR COUNT
2104 007046 001424 BEQ HS4 ;BRANCH IF DONE LINE
2105 007050 005237 001040 INC CHRGEN ;NEXT CHAR
2106 007054 005237 001044 INC CYCCNT ;INCREMENT GROUP COUNT
2107 007060 001410 BEQ HS3 ;BRANCH IF DONE GROUP
2108 007062 023737 001060 001040 CMP LEGCHR,CHRGEN ;LEGAL CHAR?
2109 007070 001350 BNE HS1 ;BRANCH AND CONTINUE IF LEGAL CHAR
2110 007072 163737 001062 001040 SUB NUMCHR,CHRGEN ;MAKE LEGAL
2111 007100 000744 BR HS1 ;CONTINUE
2112 007102 013737 001054 001040 HS3: MOV STRCHR,CHRGEN ;GET FIRST CHAR IN GROUP
2113 007110 012737 177757 001044 MOV #-17,CYCCNT ;RESET CYCLE COUNT
2114 007116 000735 BR HS1 ;CONTINUE

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H05

 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-1
 DZLPKG.P11 06-APR-77 12:13

SEQ 0059

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2115 007120 012777 000012 171654 HS4: MOV #12,ALPB ;SEND LF
2116 007126 105777 171646 TSTB ALPS ;TEST READY
(1) 007132 100375 BPL -4 ;WAIT FOR READY
2117 007134 005337 001042 DEC LINCNT ;DECREMENT LINE COUNT
2118 007140 002413 BLT HS6 ;EXIT TEST IF DONE
2119 007142 162737 000004 001054 SUB #4,STRCHR ;SKIP 4 LINES ON DRUM, FIND START CHAR
2120 007150 022737 000040 001054 CMP #40,STRCHR ;START CHAR A LEGAL CHAR?
2121 007156 003704 BLE HS0 ;CONTINUE IF LEGAL START CHAR
2122 007160 063737 001062 001054 ADD NUMCHR,STRCHR ;MAKE LEGAL AND CONTINUE
2123 007166 000700 BR HS0 ;CONTINUE
2124 007170 032777 010000 171606 HS6: BIT #BIT12,JSWR ;LOOP ON TEST?
2125 007176 001223 BNE HSPRT ;LOOP
2126
2127
2128 007200 000137 007450 JMP SNGCHR ;JUMP TO TEST 9 AFTER COMPLETION
2129
2130
2131 ;NEW DRUM (LP14) HIGH SPEED PRINT TEST
2132
2133 007204 032777 020000 171572 NHSVRT: BIT #BIT13,JSWR ;CHECK CHARACTER SET
2134 007212 001007 BNE NHS00A ;BRANCH IF 96 CHARACTER SET
2135
2136 007214 012737 000140 001060 MOV #140,LEGCHR ;LEGAL CHARACTER CHECK
2137 007222 012737 000100 001062 MOV #100,NUMCHR ;# CHARACTERS = 64
2138 007230 000406 BR NHS00 ;CONTINUE
2139 007232 012737 000200 001060 NHS00A: MOV #200,LEGCHR ;LEGAL CHARACTER CHECK
2140 007240 012737 000140 001062 NHS00: MOV #140,NUMCHR ;# CHARACTERS = 96
2141 007246 012737 000003 001064 NHS00: MOV #3,OFFSET ;COLUMN/CHARACTER OFFSET
2142 007254 012737 000040 001054 MOV #40,STRCHR ;SET UP FIRST CHARACTER OF FIRSTLINE
2143 007262 012737 000177 001042 MOV #127,LINCNT ;SET LINE COUNT FOR 2 PAGES
2144 007270 012737 177574 001036 NHS0: MOV #-132,CHRCNT ;SET CHARACTER COUNT = # COLUMNS
2145 007276 013737 001054 001040 NHS1: MOV STRCHR,CHRCNT ;STORE STARTING CHARACTER
2146 007304 005777 171470 NHS1: TST ALPS ;TEST FOR ERROR
2147 007310 100006 BPL NHS2 ;BRANCH IF NO ERROR
2148 007312 012737 000043 001052 ERR43: MOV #43, ERRCOUNT ;SET UP ERROR COUNT 43
(1) 000044 N=N+1
2149 007320 004537 011722 JSR %5,STAER ;REPORT ERROR SET
2150 007324 000000 HALT ;HALT ON ERROR
2151 007326 013777 001040 171446 NHS2: MOV CHRCNT,ALPB ;LOAD PRINTER BUFFER
2152 007334 005237 001036 INC CHRCNT ;INCREMENT CHARACTER COUNT
2153 007340 001413 BEQ NHS4 ;BRANCH IF LINE DONE
2154 007342 063737 001064 001040 ADD OFFSET,CHRCNT ;NEXT CHARACTER
2155 007350 023737 001060 001040 CMP LEGCHR,CHRCNT ;LEGAL CHARACTER
2156 007356 003352 BGT NHS1 ;BRANCH + CONTINUE IF LEGAL CHARACTER
2157 007360 163737 001062 001040 SUB NUMCHR,CHRCNT ;MAKE LEGAL
2158 007366 000746 BR NHS1 ;CONTINUE
2159 007370 012777 000012 171404 NHS4: MOV #12,ALPB ;SEND LINE FEED.
2160 007376 105777 171376 TSTB ALPS ;TEST READY
(1) 007402 100375 BPL -4 ;WAIT FOR READY
2161 007404 005337 001042 DEC LINCNT ;DECREMENT LINE COUNT
2162 007410 002413 BLT NHS6 ;EXIT IF TEST IS DONE
2163 007412 162737 000004 001054 SUB #4,STRCHR ;SKIP 4 LINES DOWN DRUM, FIND STARTING CHARACTER
2164 007420 022737 000040 001054 CMP #40,STRCHR ;START CHARACTER A LEGAL CHARACTER
2165 007426 003720 BLE NHS0 ;CONTINUE IF LEGAL START CHARACTER
2166 007430 063737 001062 001054 ADD NUMCHR,STRCHR ;MAKE LEGAL + CONTINUE
2167 007436 000714 BR NHS0 ;CONTINUE

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-2
 DZLPKG.P11 06-APR-77 12:13

SEQ 0060

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2168 007440 032777 010000 171336 NHS6: BIT #BIT12,JSWR ;LOOP ON TEST
2169 007446 001256 BNE NHSPT ;LOOP
2170
2171 ;TEST 9
2172 ;WORST CASE NOISE TEST
2173 ;SINGLE CHAR. ACROSS ALL COLS.
2174
2175 007450 SNGCHR:
(1) 007450 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
(1) 007456 001003 BNE .+10 ;NO- CONTINUE
(1) 007460 052777 000100 171332 BIS #100,JKTS ;ENABLE KEYBOARD INTERRUPT
2176 007466 004437 011506 JSR %4,TYPINT
2177 007472 013737 014560 014030 MOV TN011,MES15 ;SET TEST NUMBER FOR MESSAGE
(1) 007500 004437 011406 JSR %4,PRNT ;PRINT TEST NUMBER
(1) 000012 M=M+1
2178 007504 032777 020000 171272 BIT #BIT13,JSWR ;TEST CHAR SET
2179 007512 001404 BEQ S2 ;BRANCH IF 64
2180 007514 012737 177640 001042 MOV #96.,LINCNT ;96 CHAR.
2181 007522 000403 BR .+10 ;BRANCH
2182 007524 012737 177700 001042 S2: MOV #64.,LINCNT ;64 CHAR.
2183 007532 012737 000040 001040 MOV #40,CHGEN ;SET UP SPACE
2184 007540 012737 177574 001036 S2A: MOV #132.,CHRCNT ;SET CHAR COUNT FOR 132
2185 007546 005777 171226 S1: TST ALPS ;TEST FOR ERRORS
2186 007552 100006 BPL XS1X ;BRANCH IF NO ERRORS
2187 007554 012737 000044 001052 ERR44: MOV #44, ERCOUNT ;SET UP ERROR COUNT 44
(1) 000045 N=N+1
2188 007562 004537 011722 JSR %5,STAER ;REPORT ERROR
2189 007566 000000 HALT ;HALT ON ERROR
2190 007570 013777 001040 171204 XS1X: MOV CHGEN,ALPB ;LOAD PRINTER BUFFER
2191 007576 005237 001036 INC CHRCNT ;INCREMENT CHAR COUNT
2192 007602 001361 BNE S1 ;CONTINUE IF NOT DONE LINE
2193 007604 012777 000012 171170 S4X2: MOV #12,ALPB ;ISSUE LINE FEED
2194 007612 105777 171162 TSTB ALPS ;TEST READY
(1) 007616 100375 BPL .-4 ;WAIT FOR READY
2195 007620 005237 001040 INC CHGEN ;+1 CHAR.
2196 007624 005237 001042 INC LINCNT ;+1 LINE COUNT
2197 007630 002743 BLT S2A ;CONTINUE IF NOT DONE
2198 007632 001764 BEQ S4X2 ;SEND BLANK LINE AT END OF TEST
2199 007634 032777 010000 171142 LPS7: BIT #BIT12,JSWR ;CHECK TO LOOP ON TEST
2200 007642 001302 BNE SNGCHR ;LOOP ON TEST
2201
2202
2203
2204 ;TEST 10
2205 ;DRUM PATTERN CHARACTER TEST
2206
2207 007644 ROTATE:
(1) 007644 022737 000176 001004 CMP #176,SWR ;S/W SWR ?
(1) 007652 001003 BNE .+10 ;NO- CONTINUE
(1) 007654 052777 000100 171136 BIS #100,JKTS ;ENABLE KEYBOARD INTERRUPT
2208 007662 004437 011506 JSR %4,TYPINT
2209 007666 013737 014562 014030 MOV TN012,MES15 ;SET TEST NUMBER FOR MESSAGE
(1) 007674 004437 011406 JSR %4,PRNT ;PRINT TEST NUMBER
(1) 000013 M=M+1
2210
2211 007700 032777 002000 171076 BIT #BIT10,JSWR ;CHECK FOR NEW DRUM/OLD DRUM

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2212 007706 001122      BNE      NROTAT      ; BRANCH IF NEW DRUM
2213 007710 032777 020000 171066  BIT      #BIT13,2SWR  ; TEST CHAR SET
2214 007716 001012      BNE      ROT0      ; SKIP IF 96 CHAR
2215 007720 012737 000137 001042  MOV      #137,LINCNT  ; LAST CHAR
2216 007726 012737 000140 001060  MOV      #140,LEGCHR  ; LEGAL CHK
2217 007734 012737 000100 001062  MOV      #100,NUMCHR  ; #CHARS
2218 007742 000411      BR      ROT1      ; CONTINUE
2219 007744 012737 000177 001042  ROT0:  MOV      #177,LINCNT  ; LAST CHAR
2220 007752 012737 000200 001060  MOV      #200,LEGCHR  ; LEGAL CHK
2221 007760 012737 000140 001062  MOV      #140,NUMCHR  ; #CHARS
2222 007766 005037 001044      ROT1:  CLR      CYCCNT      ; CLEAR CYCLE COUNT
2223 007772 005237 001044      ROT2:  INC      CYCCNT      ; INC CYCLE COUNT
2224 007776 005037 001040      CLR      CHRGEN      ; CLEAR POINTER
2225 010002 005237 001040      ROT3:  INC      CHRGEN      ; INC POINTER
2226 010006 013737 001040 001054  MOV      CHRGEN,STRCHR ; STORE POINTER
2227 010014 063737 001042 001054  ADD      LINCNT,STRCHR ; FIND CHAR
2228 010022 023737 001054 001060  CMP      STRCHR,LEGCHR ; LEGAL?
2229 010030 002403      BLT      ROT4      ; BRANCH IF LEGAL
2230 010032 163737 001062 001054  SUB      NUMCHR,STRCHR ; MAKE LEGAL
2231 010040 005777 170734      ROT4:  TST      2LPS      ; TEST FOR ERRORS
2232 010044 100006      BPL      ROT5      ; BRANCH IF NO ERRORS
2233 010046 012737 000045 001052  ERR45: MOV      #45,   ERCOUNT ; SET UP ERROR COUNT 45
(1) 000046      N=N+1
2234 010054 004537 011722      JSR      %5,STAER      ; REPORT ERROR
2235 010060 000000      HALT      ; HALT ON ERROR
2236 010062 013777 001054 170712  ROT5:  MOV      STRCHR,2LPB      ; LOAD BUFFER
2237 010070 023727 001040 000021  CMP      CHRGEN,#17.  ; DONE GROUP?
2238 010076 001341      BNE      ROT3      ; NO GET NEXT CHAR
2239 010100 023727 001044 000010  CMP      CYCCNT,#8.  ; DONE LINE?
2240 010106 001331      BNE      ROT2      ; NO, NEXT GROUP
2241 010110 012777 000012 170664  MOV      #12,2LPB      ; YES, SEND LF
2242 010116 105777 170656      TSTB     2LPS      ; TEST READY
(1) 010122 100375      BPL      -4      ; WAIT FOR READY
2243 010124 005337 001042      DEC      LINCNT      ; DECREMENT LINE COUNT
2244 010130 023727 001042 000037  CMP      LINCNT,#37  ; DONE?
2245 010136 003313      BGT      ROT1      ; NO, NEXT LINE
2246 010140 032777 010000 170636  BIT      #BIT12,2SWR  ; LOOP ON TEST?
2247 010146 001236      BNE      ROTATE      ; LOOP
2248
2249 010150 000137 010406      JMP      LFTTR      ; JUMP TO TEST 11 AFTER COMPLETION
2250
2251
2252      ;NEW DRUM (LP14) PATTERN CHARACTER TEST
2253
2254 010154 032777 020000 170622  NROTAT: BIT      #BIT13,2SWR  ; TEST CHARACTER SET
2255 010162 001012      BNE      NROT0      ; SKIP IF 96 CHARACTERS
2256 010164 012737 000137 001042  MOV      #137,LINCNT  ; LAST CHARACTER
2257 010172 012737 000140 001060  MOV      #140,LEGCHR  ; LEGAL CHECK
2258 010200 012737 000100 001062  MOV      #100,NUMCHR  ; # OF CHARACTERS
2259 010206 000411      BR      NROT1      ; CONTINUE
2260 010210 012737 000177 001042  NROT0: MOV      #177,LINCNT  ; LAST CHARACTER
2261 010216 012737 000200 001060  MOV      #200,LEGCHR  ; LEGAL CHECK
2262 010224 012737 000140 001062  MOV      #140,NUMCHR  ; # OF CHARACTERS
2263 010232 012737 000040 001040  NROT1: MOV      #40,CHRGEN ; GET POINTER
2264 010240 005237 001040      NROT6: INC      CHRGEN      ; SET POINTER
2265 010244 013737 001040 001054  MOV      CHRGEN,STRCHR ; STORE POINTER

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 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-4
 DZLPKG.P11 06-APR-77 12:13

SEQ 0062

2266	010252	005037	001036		CLR	CHRCNT	:# CHARACTERS PRINTED
2267	010256	005237	001036		INC	CHRCNT	:INCREMENT CHARACTERS PRINTED
2268	010262	063737	001064	001054	NR0T2:	ADD	:INCREMENT POINTER
2269	010270	023737	001054	001060		OFFSET,STRCHR	:LEGAL CHARACTER?
2270	010276	002403			CMP	STRCHR,LEGCHR	:BRANCH IF LEGAL
2271	010300	163737	001062	001054		BLT	:MAKE LEGAL
2272	010306	005777	170466		SUB	NUMCHR,STRCHR	:TEST FOR ERRORS
2273	010312	100006			NR0T4:	TST	:BRANCH IF NO ERRORS
2274	010314	012737	000046	001052	ERR46:	BPL	:SET UP ERROR COUNT 46
(1)		000047				NR0T5	
2275	010322	004537	011722		MOV	#46, ERRCOUNT	
2276	010326	000000			N=N+1		
2277	010330	013777	001054	170444	JSR	%5,STAER	:REPORT ERROR
2278	010336	023727	001036	000204	NR0T5:	HALT	
2279	010344	001344			MOV	STRCHR,ALPB	:LOAD BUFFER
2280	010346	012777	000012	170426	CMP	CHRCNT,#132.	:LINE FINISHED?
2281	010354	105777	170420		BNE	NR0T2	:NO GET NEXT CHARACTER
(1)	010360	100375			MOV	#12,ALPB	:YES SEND LINE FEED
2282	010362	005337	001042		TSTB	ALPS	:TEST READY
2283	010366	023727	001042	000037	BPL	-4	:WAIT FOR READY
2284	010374	003321			DEC	LINCNT	:DECREMENT LINE COUNT
2285	010376	032777	010000	170400	CMP	LINCNT,#37	:PATTERN FINISHED
2286	010404	001263			BGT	NR0T6	:NO, DO NEXT LINE
2287					BIT	#BIT12,JSWR	:LOOP ON TEST
2288					BNE	NR0TAT	:LOOP
2289							
2290							
2291							
2292							
2293	010406						
(1)	010406	022737	000176	001004	LFTTR:	CMP	:S/W SWR ?
(1)	010414	001003				#176,SWR	:NO- CONTINUE
(1)	010416	052777	000100	170374		.+10	:ENABLE KEYBOARD INTERRUPT
2294	010424	004437	011506		BIS	#100,ATKS	
2295	010430	013737	014564	014030	JSR	%4,TYPINT	
(1)	010436	004437	011406		MOV	TN013,MES15	:SET TEST NUMBER FOR MESSAGE
(1)		000014			JSR	%4,PRINT	:PRINT TEST NUMBER
2296	010442	012737	000204	001042	M=M+1		
2297	010450	013737	001042	001036	LFT:	MOV	:SET LINE COUNT
2298	010456	012737	177757	001044	LFT0:	MOV	:STORE CHAR COUNT
2299	010464	013737	001036	001040		MOV	:SET GROUP COUNT
2300	010472	022737	000022	001040		MOV	:FIND FIRST CHAR ON LINE...
2301	010500	003004			LFT1:	CMP	:MORE THAN 17 CHARS?
2302	010502	162737	000021	001040		BGT	:BRANCH IF LESS THAN 17
2303	010510	000770				LFT2	:SUBTRACT 17, IF > 17
2304	010512	005437	001040		SUB	#17,CHGEN	:CONTINUE
2305	010516	062737	000100	001040	BR	LFT1	:NEGATE CHGEN
2306	010524	013737	001040	001054	LFT2:	NEG	:START CHAR IN CHGEN
2307	010532	005777	170242		ADD	#100,CHGEN	:STORE STARTING CHAR
2308	010536	100006			MOV	CHGEN,STRCHR	:TEST FOR ERROR
2309	010540	012737	000047	001052	LFT3:	TST	:CONTINUE IF NO ERROR
(1)		000050			BPL	LFT4	:SET UP ERROR COUNT 47
2310	010546	004537	011722		ERR47:	MOV	
2311	010552	000000				N=N+1	
2312	010554	013777	001040	170220	JSR	%5,STAER	:REPORT ERROR SET
2313	010562	005337	001036		HALT		:HALT ON ERROR
					LFT4:	MOV	:LOAD BUFFER
					DEC	CHRCNT	:DECREMENT CHAR COUNT

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

; STARTING WITH A LEFT TRIANGLE

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-5
 DZLPKG.P11 06-APR-77 12:13

SEQ 0063

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2314 010566 001415 BEQ LFT6 ;BRANCH IF DONE LINE
2315 010570 005237 001044 INC CYCCNT ;INCREMENT GROUP COUNT
2316 010574 001403 BEQ LFT5 ;BRANCH IF DONE GROUP
2317 010576 005237 001040 INC CHRCNT ;NEXT CHAR IN GROUP
2318 010602 000753 BR LFT3 ;CONTINUE
2319 010604 013737 001054 001040 LFT5: MOV STRCHR,CHRCNT ;GET START CHAR AGAIN
2320 010612 012737 177757 001044 MOV #17.,CYCCNT ;RESET GROUP COUNT
2321 010620 000744 BR LFT3 ;CONTINUE
2322 010622 012777 000012 170152 LFT6: MOV #12,ALPB ;SEND LF
2323 010630 105777 170144 TSTB ALPS ;TEST READY
(1) 010634 100375 BPL .-4 ;WAIT FOR READY
2324 010636 005337 001042 DEC LINCNT ;DECREMENT LINE COUNT
2325 010642 003302 BGT LFT0 ;BRANCH IF NOT DONE
2326 010644 001766 BEQ LFT6 ;SEND BLANK LINE AT END OF TEST
2327 010646 032777 010000 170130 BIT #BIT12,ASWR ;LOOP ON TEST?
2328 010654 001254 BNE LFTTR ;LOOP
2329
2330 ;TEST 11 ----- CONTINUED
2331 ;RIGHT TRIANGLE
2332
2333 010656 012737 000001 001042 RTTR: MOV #1,LINCNT ;INITIALIZE LINE
2334 010664 012737 000077 001040 RT1: MOV #77,CHRCNT ;FIRST CHAR IS A ?
2335 010672 013737 001042 001044 MOV LINCNT,CYCCNT ;SAVE NO. CHARS ON LINE
2336 010700 012737 177757 001056 MOV #17.,STRCNT ;SET GROUP COUNT
2337 010706 012737 000204 001036 MOV #132,CHRCNT ;NO. CHARS PER LINE
2338 010714 163737 001042 001036 SUB LINCNT,CHRCNT ;SUBTRACT NO.. OF CHARS ON LINE
2339 010722 001425 BEQ RT3 ;BRANCH IF NO SPACES ON THIS LINE
2340 010724 005777 170050 RT2: TST ALPS ;TEST FOR ERROR
2341 010730 100006 BPL RT2A ;CONTINUE IF NO ERROR
2342 010732 012737 000050 001052 ERR50: MOV #50, ERCOUNT ;SET UP ERROR COUNT 50
(1) 000051 N=N+1
2343 010740 004537 011722 JSR %5,STAER ;REPORT ERROR SET
2344 010744 000000 HALT ;HALT ON ERROR
2345 010746 012777 000040 170026 RT2A: MOV #40,ALPB ;LOAD BUFFER
2346 010754 005237 001056 INC STRCNT ;INCREMENT GROUP COUNT
2347 010760 001003 BNE RT2AA ;BRANCH IF NOT DONE GROUP
2348 010762 012737 177757 001056 MOV #17.,STRCNT ;RESET GROUP COUNT
2349 010770 005337 001036 RT2AA: DEC CHRCNT ;DECREMENT SPACE COUNT
2350 010774 001353 BNE RT2 ;BRANCH IF NOT DONE SPACES
2351 010776 005777 167776 RT3: TST ALPS ;TEST FOR ERROR
2352 011002 100006 BPL RT3A ;CONTINUE IF NO ERROR
2353 011004 012737 000051 001052 ERR51: MOV #51, ERCOUNT ;SET UP ERROR COUNT 51
(1) 000052 N=N+1
2354 011012 004537 011722 JSR %5,STAER ;REPORT ERROR SET
2355 011016 000000 HALT ;HALT ON ERROR
2356 011020 013777 001040 167754 RT3A: MOV CHRCNT,ALPB ;LOAD BUFFER
2357 011026 005237 001040 INC CHRCNT ;NEXT CHAR
2358 011032 005237 001056 INC STRCNT ;INCREMENT GROUP COUNT
2359 011036 001006 BNE RT3B ;BRANCH IF NOT DONE GROUP
2360 011040 012737 177757 001056 MOV #17.,STRCNT ;RESET GROUP COUNT
2361 011046 162737 000021 001040 SUB #17.,CHRCNT ;GET FIRST GROUP CHAR
2362 011054 005337 001044 RT3B: DEC CYCCNT ;DECREMENT CHAR COUNT
2363 011060 001346 BNE RT3 ;CONTINUE
2364 011062 012777 000012 167712 MOV #12,ALPB ;SEND LF
2365 011070 105777 167704 TSTB ALPS ;TEST READY
(1) 011074 100375 BPL .-4 ;WAIT FOR READY

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 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-6
 DZLPKG.P11 06-APR-77 12:13

SEQ 0064

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2366 011076 005237 001042      INC      LINCNT      ; INCREMENT LINE COUNT
2367 011102 022737 000205 001042  CMP      #133.,LINCNT ; DONE?
2368 011110 003265      BGT      RT1      ; BRANCH IF NOT DONE
2369 011112 032777 010000 167664 BIT      #BIT12,2SWR ; LOOP ON TEST?
2370 011120 001256      BNE      RTTR      ; LOOP
2371
2372      ; TEST 12
2373      ; HAMMER ALIGNMENT
2374
2375 011122      HAMALN:
(1) 011122 022737 000176 001004  CMP      #176,SWR      ; S/W SWR ?
(1) 011130 001003      BNE      .+10      ; NO- CONTINUE
(1) 011132 052777 000100 167660  BIS      #100,2TKS      ; ENABLE KEYBOARD INTERRUPT
2376 011140 004437 011506      JSR      %4,TYPINT
2377 011144 013737 014566 014030  MOV      TNO14,MES15 ; SET TEST NUMBER FOR MESSAGE
(1) 011152 004437 011406      JSR      %4,PRINT      ; PRINT TEST NUMBER
(1)      000015      M=M+1
2378 011156 012737 177701 001042  MOV      #-63.,LINCNT ; SET UP FOR 63 LINES
2379 011164 012737 177574 001036  HAM1X: MOV      #-132.,CHRCNT ; SET CHAR COUNT
2380 011172 005777 167602      HAM2: TST      2LPS      ; CHECK FOR ERROR
2381 011176 100006      BPL      XHAM1      ; BRANCH IF NO ERROR
2382 011200 012737 000052 001052  ERR52: MOV      #52, ERRCOUNT ; SET UP ERROR COUNT 52
(1)      000053      N=N+1
2383 011206 004537 011722      JSR      %5,STAER      ; REPORT ERROR OCCURRED
2384 011212 000000      HALT      ; HALT ON ERROR
2385 011214      XHAM1:
(1) 011214 105777 167560      TSTB      2LPS      ; TEST READY
(1) 011220 100375      BPL      .-4      ; WAIT FOR READY
2386 011222 100375      BPL      .-4      ; WAIT FOR READY
2387 011224 012777 000105 167550  XHAM1X: MOV      #105,2LPB      ; TRANSMIT E TO PRINTER
2388 011232 005237 001036      INC      CHRCNT      ; +1 CHAR COUNT
2389 011236 001355      BNE      HAM2      ; TRANSMIT ANOTHER CHAR.
2390 011240 012777 000012 167534  MOV      #12,2LPB      ; TRANSMIT LINE FEED
2391 011246 105777 167526      TSTB      2LPS      ; TEST READY
(1) 011252 100375      BPL      .-4      ; WAIT FOR READY
2392 011254 005237 001042      INC      LINCNT      ; +1 TO COUNT
2393 011260 001341      BNE      HAM1X      ; GO DO NEXT LINE
2394 011262 032777 010000 167514  BIT      #BIT12,2SWR ; CHECK TO LOOP ON TEST
2395 011270 001314      BNE      HAMALN      ; LOOP ON TEST
2396
2397 011272 032777 040000 167504  BIT      #BIT14,2SWR ; DAVFU AVAILABLE?
2398 011300 001402      BEQ      HAMX      ; NO, RECYCLE PRINTING TESTS
2399 011302 000137 014576      JMP      DAVFU      ; YES, DO DAVFU PRINTING TESTS
2400 011306
2401 011306 013700 000042      HAMX: MOV      2#42,R0
2402 011312 001405      BEQ      DOAGN
2403 011314 000005      RESET
2404 011316      LOGICAL:
2405 011316 004710      JSR      PC,(R0)
2406 011320 000240      NOP
2407 011322 000240      NOP
2408 011324 000240      NOP
2409 011326
2410 011326 000137 004534      DOAGN: JMP      TEST2      ; RESTART
2411
2412      ; MISC. ROUTINES

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N05

SEQ 0065

2413
2414
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011332 005777 167442
011336 100403
011340 105777 167434
011344 100403
011346 062705 000002
011352 000205
011354 012777 000014 167420
011362 105777 167412
011366 100003
011370 062705 000002
011374 000205
011376
011376 105777 167376
011402 100375
011404 000205

011406 012737 014012 011470
011414 012746 000340
011420 010746
011422 062716 000006
011426 000002
011430 005777 167344
011434 100006
011436 012737 000053 001052
011444 004537 011722
011450 000000
011452 013737 001000 001016
011460 013737 001002 001012
011466 104000
011470 014012
011472 012746 000140
011476 010746
011500 062716 000006
011504 000002
011506 012737 177564 001016
011514 012737 177566 001012
011522 000204

011524 011600
011526 062716 000002
011532 011000

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

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

NTRDY: TSTB 2LPS ;TEST READY
BPL -4 ;WAIT FOR READY
RTS %S ;READY SET EXIT

;ROUTINE TO OUTPUT ASCII MESSAGES ON THE LINE PRINTER

PRNNT: MOV #MES14,PRMSG ;PRINT TEST NUMBER
MOV #340,-(SP) ;LOCK OUT KEYBOARD INTERRUPTS
MOV PC,-(SP) ;MOVE PRESENT LOCATION TO STACK
ADD #6,(SP) ;SET UP FOR NEXT INSTRUCTION
RTI ;LOAD PSW
TST 2LPS ;TEST FOR ERROR
BPL RINT ;BRANCH IF OK
ERR53: MOV #53, ERCOUNT ;SET UP ERROR COUNT 53
N=N+1
JSR %S,STAER ;REPORT ERROR SET
HALT ;HALT ON ERROR
RINT: MOV LPS,TPS ;SET VECTORS -
MOV LPB,TPB ;TO PRINT ON LINE PRINTER
EMT +0 ;PRINT
PRMSG: MES14 ;MESSAGE
MOV #140,-(SP) ;ALLOW KEYBOARD INTERRUPTS
MOV PC,-(SP) ;MOVE PRESENT LOCATION TO STACK
ADD #6,(SP) ;SET UP FOR NEXT INSTRUCTION
RTI ;LOAD PSW
TYPINT: MOV #177564,TPS ;RESET VECTORS
MOV #177566,TPB ;FOR TTY
RTS %4 ;RETURN

;SUBROUTINE TO OUTPUT ASCII MESSAGES ON TELETYPE PRINTER

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


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2462 011534 112037 011636      TYPB:  MOVB      (0)+, TYPDAT      ; GET CHARACTER
2463 011540 001001              BNE          TYPB              ; BRANCH IF NOT DONE
2464 011542 000002              RTI                          ; EXIT
2465 011544 122737 000045 011636  TYPB:  CMPB      #45, TYPDAT      ; CHECK FOR "%"
2466 011552 001416              BEQ          TYPB              ; BRANCH IF "%"
2467 011554 122737 000043 011636  TYPB:  CMPB      #43, TYPDAT      ; CHECK FOR "8"
2468 011562 001417              BEQ          TYPB              ; BRANCH IF "8"
2469 011564 004737 011572              JSR          %7, TYPD      ; TYPE CHARACTER IN TYPDAT
2470 011570 000761              BR          TYPB              ; NEXT CHAR IN MESSAGE
2471 011572 113777 011636 167212  TYPD:  MOVB      TYPDAT, ATPB      ; OUTPUT CHARACTER TO PRINTER
2472 011600 105777 167212      TYPD:  TSTB      ATPB
2473 011604 100375              BPL          -4
2474 011606 000207              RTS          %7
2475 011610 112737 000012 011636  TYPB:  MOVB      #12, TYPDAT      ; CHAR. TYPED EXIT
2476 011616 004737 011572              JSR          %7, TYPD      ; OUTPUT LF
2477 011622 112737 000015 011636  TYPB:  MOVB      #15, TYPDAT      ; GO TYPE CHAR.
2478 011630 004737 011572              JSR          %7, TYPD      ; OUTPUT CR
2479 011634 000737              BR          TYPB              ; GO TYPE CHAR.
2480 011636 000000      TYPDAT:  0
2481
2482
2483      ; ROUTINE TO CONVERT OCTAL TO ASCII
2484
2485      ; ENTER ROUTINE AS FOLLOWS
2486      JSR          %5, CONV
2487      ; XXXXXX=ADDRESS OF NUMBER TO BE CONVERTED
2488      ; XXXXXX=ADDRESS OF ASCII MESSAGE
2489      ; XXXXXX=NUMBER OF OCTAL NO.'S TO BE CONVERTED
2490
2491 011640 013537 011720      CONV:  MOV          #5, ACNVX      ; ADDRESS OF NO. TO BE CONVERTED
2492 011644 012501              MOV          (5)+, %1      ; ADDRESS OF MESSAGE
2493 011646 012502              MOV          (5)+, %2      ; NUMBER OF ASCII CHARACTERS
2494 011650 060201              ADD          %2, %1      ; FIRST CHAR ADDRESS
2495 011652 013703 011720      ACVN:  MOV          ACNVX, %3      ; STORE NUMBER
2496 011656 042703 177770              BIC          #177770, %3      ; ISOLATE LEAST SIGNIFICANT BIT
2497 011662 062703 000060              ADD          #60, %3      ; SET UP ASCII CHARACTER
2498 011666 110341              MOVB      %3, -(1)      ; STORE CHARACTER
2499 011670 000241              CLC                          ; GET NEXT SIGNIFICANT BIT ...
2500 011672 006037 011720              ROR          ACNVX
2501 011676 000241              CLC
2502 011700 006037 011720              ROR          ACNVX
2503 011704 000241              CLC
2504 011706 006037 011720              ROR          ACNVX
2505 011712 005302              DEC          %2
2506 011714 001356              BNE          ACVN
2507 011716 000205              RTS          %5
2508
2509 011720 000000      ACNVX:  0      ; WORK REGISTER
2510
2511      ; ROUTINE TO REPORT ERROR COUNT
2512
2513 011722 032777 001000 167054  STAER:  BIT          #BIT9, JSWR      ; INHIBIT ERROR REPORTS ?
2514 011730 001007              BNE          STAER1      ; YES
2515 011732 004537 011640              JSR          %5, CONV      ; CONVERT OCTAL TO ASCII
2516 011736 001052              ERCOUNT
2517 011740 012361              HED1

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2518	011742	000003			3				
2519	011744	104000			ENT	+0			; TYPE ERROR MESSAGE
2520	011746	012360			HED0				
2521	011750	005777	167030		STAER1: TST	2SWR			; TEST FOR HALT ON ERROR
2522	011754	100401			BMI	.+4			; BRANCH IF NO HALT WANTED
2523	011756	000000			HALT				; HALT ON ERROR
2524	011760	000205			RTS	%5			; RETURN
; KEYBOARD INTERRUPT ROUTINE									
; FOR ACCESS TO THE S/W SWITCH REGISTER									
2531	011762	010046			TKINT: MOV	%0, -(SP)			; SAVE REGISTERS
2532	011764	010146			MOV	%1, -(SP)			
2533	011766	010246			MOV	%2, -(SP)			
2534	011770	010346			MOV	%3, -(SP)			
2535	011772	010446			MOV	%4, -(SP)			
2536	011774	010546			MOV	%5, -(SP)			
2537	011776	005737	001072		TST	SET			; INITIAL SWR ENTRY ?
2538	012002	001130			BNE	TYP5WR			; YES-PRINT HEADER
2539	012004	005737	001070		TST	SIGNAL			; PREVIOUS CONTROL-G INPUT ?
2540	012010	001477			BEQ	CNTRLG			; YES-CONTINUE
2541	012012	017737	166776	001074	MOV	2TKB, CHAR			; GET INPUT CHARACTER
2542	012020	042737	177600	001074	BIC	#177600, CHAR			; STRIP OFF PARITY BIT
2543	012026	022737	000015	001074	CMF	#15, CHAR			; CARRIAGE RETURN ?
2544	012034	001456			BEQ	DGTS			; YES-CONTINUE
2545	012036	022737	000025	001074	CMF	#25, CHAR			; CONTROL-U INPUT ?
2546	012044	001530			BEQ	TK4			; YES-CONTINUE
2547	012046	023727	001074	000060	CMF	CHAR, #60			; LEGAL CHECK: LESS THAN 60 ?
2548	012054	100001			BPL	TK1			; NO-CONTINUE
2549	012056	000466			BR	WT3			; YES-PRINT "?"
2550	012060	022737	000067	001074	TK1: CMF	#67, CHAR			; LEGAL CHECK: GREATER THAN 67 ?
2551	012066	100001			BPL	TK2			; NO-CONTINUE
2552	012070	000461			BR	WT3			; YES-PRINT "?"
2553	012072	005237	001066		TK2: INC	DIGITS			; NEXT DIGIT OF SWR INPUT
2554	012076	022737	000006	001066	CMF	#6, DIGITS			; MORE THAN SIX DIGITS ?
2555	012104	100453			BMI	WT3			; YES-PRINT "?"
2556	012106	105777	166704		WT2: TSTB	2TPS			; TTY PRINTER READY ?
2557	012112	100375			BPL	WT2			; NO-WAIT
2558	012114	013777	001074	166670	MOV	CHAR, 2TPB			; PRINT CHARACTER
2559	012122	162737	000060	001074	SUB	#60, CHAR			; CONVERT TO OCTAL
2560	012130	022737	000001	001066	CMF	#1, DIGITS			; FIRST DIGIT ?
2561	012136	001411			BEQ	TK5			; YES-CONTINUE
2562	012140	000241			CLC				; ROTATE LEFT THREE
2563	012142	006137	001076		ROL	OCT			; TIMES
2564	012146	000241			CLC				; THIS WILL SHIFT
2565	012150	006137	001076		ROL	OCT			; SWR VALUE ONE
2566	012154	000241			CLC				; PLACE LEFT
2567	012156	006137	001076		ROL	OCT			; OCTAL
2568	012162	063737	001074	001076	TK5: ADD	CHAR, OCT			; NEW VALUE OF SWR
2569	012170	000464			BR	TK6			; RETURN FROM INTERRUPT
2570	012172	005737	001066		DGTS: TST	DIGITS			; SWR VALUE CHANGED ?
2571	012176	001451			BEQ	TK3			; NO-RETURN, NO CHANGE TO SWR
2572	012200	013777	001076	166576	MOV	OCT, 2SWR			; YES-ENTER NEW SWR VALUE
2573	012206	000445			BR	TK3			; RETURN FROM INTERRUPT

2574	012210	017737	166600	001074	CNTRLG:	MOV	@TKB,CHAR	;GET CHARACTER
2575	012216	042737	177600	001074		BIC	@177600,CHAR	;STRIP OFF PARITY BIT
2576	012224	022737	000007	001074		CMP	@7,CHAR	;CONTROL-G INPUT ?
2577	012232	001414				BEQ	TYP5WR	;YES-PRINT HEADER
2578	012234	105777	166556		WT3:	TSTB	@TPS	;TTY PRINTER READY ?
2579	012240	100375				BPL	WT3	;NO-WAIT
2580	012242	013777	001074	166542		MOV	CHAR,@TPB	;PRINT CHARACTER
2581	012250	104000				ENT	+0	;PRINT "?"
2582	012252	014466				MES22		
2583	012254	005737	001070			TST	SIGNAL	;BAD VALUE ?
2584	012260	001001				BNE	TYP5WR	;YES-PRINT HEADER
2585	012262	000427				BR	TK6	;RETURN FROM INTERRUPT
2586	012264	012737	000001	001070	TYP5WR:	MOV	@1,SIGNAL	;SET FLAG: CONTROL-G ENTERED
2587	012272	104000				ENT	+0	;PRINT HEADER
2588	012274	014472				MES23		
2589	012276	004537	011640			JSR	%5,CONV	;CONVERT SWR VALUE TO ASCII
2590	012302	000176				176		
2591	012304	014522				MES25		
2592	012306	000006				6		
2593	012310	104000				ENT	+0	;PRINT SWR VALUE
2594	012312	014522				MES25		
2595	012314	104000				ENT	+0	;PRINT HEADER
2596	012316	014503				MES24		
2597	012320	000404				BR	TK7	;RETURN FROM INTERRUPT
2598	012322	005037	001070		TK3:	CLR	SIGNAL	;CLEAR CONTROL-G FLAG
2599	012326	104000			TK4:	ENT	+0	;PRINT LINE FEED AND CARRIAGE RETURN
2600	012330	014464				MES21		
2601	012332	005037	001066		TK7:	CLR	DIGITS	;CLEAR DIGIT COUNT
2602	012336	005037	001076			CLR	OCT	;CLEAR SWR INPUT
2603	012342	012605			TK6:	MOV	(SP)+,%5	;RESTORE REGISTERS
2604	012344	012604				MOV	(SP)+,%4	
2605	012346	012603				MOV	(SP)+,%3	
2606	012350	012602				MOV	(SP)+,%2	
2607	012352	012601				MOV	(SP)+,%1	
2608	012354	012600				MOV	(SP)+,%0	
2609	012356	000002				RTI		;RETURN FROM INTERRUPT
2610								
2611								
2615								
2616	012360	045			HED0:	.ASCII	/%/	
2617	012361	040	020040	042440	HED1:	.ASCII	/	ERROR COUNT%/
2618	012402	051105	047522	020122	MES8:	.ASCII	/	ERROR SET OK - CLEAR & TURN ON LINE%/
2619	012447	105	051122	051117	MES8:	.ASCII	/	ERROR SET OK - CLEAR AND TRY NEXT CHANNEL%/
2620	012522	050045	044522	052116	MES8:	.ASCII	/	PRINT SPEED CHECK USING MANUAL TIMING%/
2621	012571	045	052520	020124	MES8:	.ASCII	/	PUT SWITCH 0 UP TO START TIMING%/
2622	012632	050045	052125	051440	MES8:	.ASCII	/	PUT SWITCH 0 DOWN AT END OF 1 MINUTE%/
2623	012701	045	052123	051101	MES00:	.ASCII	/	STARTING DAYFU PRINTING TESTS%/
2624	012741	045	050114	032460	MES1:	.ASCII	/	LP05-LP11-LP14 LINE PRINTER TEST%/
2625	013004	042522	052123	051101	MES2:	.ASCII	/	RESTART ADDRESS 600%/
2626	013031	045	047520	042527	MES3:	.ASCII	/	POWER ON - TURN ON LINE%/
2627	013063	117	020116	044514	MES4:	.ASCII	/	ON LINE OK - TRY TORN PAPER SWITCH%/
2628	013127	122	040505	054504	MES5:	.ASCII	/	READY SET OK - TRY DRUM GATE SWITCH%/
2629	013174	051105	047522	020122	MES6:	.ASCII	/	ERROR SET OK - TURN ON LINE%/
2630		013232			.EVEN			
2631	013232	042522			MES7A:	.ASCII	/RE/	
2632	013234	042523	020124	047524	MES7:	.ASCII	/	SET TOP OF FORM SWITCH TO /

E06

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-11
 DZLPKG.P11 06-APR-77 12:13

SEQ 0069

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2633 013270 020040 020040 044440 MES8: .ASCIZ / INCHES%/
2634 013306 013306 .EVEN
2635 013306 026455 026455 026455 MES9: .ASCIZ /----- THIS LINE SHOULD BE /
2636 013403 040 020040 020040 MES10: .ASCIZ / INCHES FROM THE LAST LINE -----
2637 013514 005012 MES11A: .ASCIZ <12><12>
2638 013516 050045 044522 052116 MES11: .ASCIZ /%PRINT SPEED IS APPROXIMATELY /
2639 013555 040 020040 020040 MES12: .ASCIZ / LINES PER MINUTE%/
2640 013604 026455 026455 026455 MES13: .ASCIZ /-----/
2641 013666 026455 026455 026455 .ASCIZ /-----/
2642 013750 026455 026455 026455 .ASCIZ /-----#/
2643 014012 005012 042524 052123 MES14: .ASCIZ <12><12>/TEST NUMBER /
2644 014030 020040 005012 000012 MES15: .ASCIZ / /<12><12><12>
2645 014036 044124 051511 046040 MES16: .ASCIZ /THIS LINE SHOULD BE PRINTED#/
2646 014073 040 020040 020040 MES17: .ASCIZ / ALL ON ONE LINE --- IF SLEWED 0 LINES%/
2647 014176 026455 026455 026455 MES18: .ASCIZ /----- THERE SHOULD BE /
2648 014270 020040 020040 020040 MES19: .ASCIZ / BLANK LINES BEFORE THIS LINE -----
2649 014404 052040 051505 044524 MES20: .ASCIZ / TESTING CHANNEL SLEWING USING CHANNEL NO. /
2650 014460 020040 000 .EVEN
2651 014464 000045 MES21: .ASCIZ /%/
2652 014466 037440 000045 MES22: .ASCIZ / ?%/
2653 014472 051445 051127 036440 MES23: .ASCIZ /%SWR = /
2654 014503 040 020040 042516 MES24: .ASCIZ / NEW SWR = /
2655 014522 020040 020040 020040 MES25: .ASCIZ / /
2656 014532 030504 TNDV1: .ASCIZ /D1/ ;TEST NUMBERS FOR DAVFU TESTS
2657 014534 031104 TNDV2: .ASCIZ /D2/
2658 014536 031504 TNDV3: .ASCIZ /D3/
2659 014540 020061 TN01: .ASCIZ /1 /
2660 014542 020062 TN02: .ASCIZ /2 /
2661 014544 020063 TN03: .ASCIZ /3 /
2662 014546 020064 TN04: .ASCIZ /4 /
2663 014550 020065 TN05: .ASCIZ /5 /
2664 014552 020066 TN06: .ASCIZ /6 /
2665 014554 020067 TN07: .ASCIZ /7 /
2666 014556 020070 TN010: .ASCIZ /8 /
2667 014560 020071 TN011: .ASCIZ /9 /
2668 014562 030061 TN012: .ASCIZ /10/
2669 014564 030461 TN013: .ASCIZ /11/
2670 014566 031061 TN014: .ASCIZ /12/
2671 014570 031461 TN015: .ASCIZ /13/
2672 014572 032061 TN016: .ASCIZ /14/
2673 014574 032461 TN017: .ASCIZ /15/
2674 .EVEN
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;DAVFU PRINTING TESTS IF DAVFU IS AVAILABLE -- SET SWITCH 14

;TESTS D1 AND D2
;CHECK DAVFU LINE COUNT SLEWING

F06

SEQ 0070

2692	014576	022737	000176	001004	DAVFU:	CMP	#176, SWR	;S/W SWR ?
(1)	014576	001003				BNE	.+10	;NO- CONTINUE
(1)	014604	052777	000100	164204		BIS	#100, JTKS	;ENABLE KEYBOARD INTERRUPT
2693	014614	004437	011506			JSR	%4, TYPINT	;INITIALIZE
2694	014620	013737	016662	014272		MOV	SPSP, MES19+2	
2695	014626	104000				ENT	+0	;TYPE MESSAGE
2696	014630	012701				MES00		;STARTING DAVFU TESTS
2697	014632	012737	000220	015326		MOV	#220, DAVI1	;SET DAVFU INSTRUCTIONS
2698	014640	012737	000221	015330		MOV	#221, DAVI2	
2699	014646	013737	014532	014030		MOV	TNDVI, MES15	;SET TEST NUMBER FOR MESSAGE
2700	014654	004437	011406			JSR	%4, PRINT	;PRINT TEST NUMBER
2701	014660	012737	015260	001040	DAVO:	MOV	#DAVTAB, CHGEN	;SET TABLE POINTER
2702	014666	005777	164106		DAVOO:	TST	ALPS	;TEST FOR ERROR
2703	014672	100010				BPL	DAVI	;BRANCH IF NO ERROR
2704	014674	012737	000054	001052	ERR54:	MOV	#54, ERCOUNT	;SET UP ERROR COUNT 54
(1)		000055				N=N+1		
2705	014702	004537	011722			JSR	%5, STAER	;REPORT ERROR SET
2706	014706	000000				HALT		;HALT ON ERROR
2707	014710	000137	014660			JMP	DAVO	;RESTART TEST
2708	014714	017777	164120	164060	DAVI:	MOV	CHGEN, ALPB	;LOAD DAVFU
2709	014722	062737	000002	001040		ADD	#2, CHGEN	;INCREMENT TABLE POINTER
2710	014730	005777	164104			TST	CHGEN	;TEST IF DONE LOAD
2711	014734	001405				BEQ	D5	;CONTINUE IF DONE
2712	014736	105777	164036			TSTB	ALPS	;TEST READY
(1)	014742	100375				BPL	.-4	;WAIT FOR READY
2713	014744	000137	014666			JMP	DAVOO	
2714	014750	012737	000002	001044	D5:	MOV	#2, CYCNT	;SET CYCLE COUNT
2715	014756	012737	014036	011470	D0:	MOV	#MES16, PRMSG	;SET MESSAGE ADDRESS
2716	014764	004437	011452			JSR	%4, RINT	;PRINT MESSAGE
2717	014770	005777	164004			TST	ALPS	;TEST FOR ERROR
2718	014774	100006				BPL	D1	;CONTINUE IF NO ERROR
2719	014776	012737	000055	001052	ERR55:	MOV	#55, ERCOUNT	;SET UP ERROR COUNT 55
(1)		000056				N=N+1		
2720	015004	004537	011722			JSR	%5, STAER	;REPORT ERROR SET
2721	015010	000000				HALT		;HALT ON ERROR
2722	015012	013777	015326	163762	D1:	MOV	DAVI1, ALPB	;SEND DAVFU INSTRUCTION, SKIP 0 LINES
2723	015020	105777	163754			TSTB	ALPS	;TEST READY
(1)	015024	100375				BPL	.-4	;WAIT FOR READY
2724	015026	012737	014073	011470		MOV	#MES17, PRMSG	;SET PRINTER MESSAGE ADDRESS
2725	015034	004437	011452			JSR	%4, RINT	;PRINT MESSAGE
2726	015040	012737	014176	011470		MOV	#MES18, PRMSG	;SET MESSAGE ADDRESS
2727	015046	013737	015330	001040		MOV	DAVI2, CHGEN	;FIRST DAVFU INSTRUCTION
2728	015054	012737	014540	001054		MOV	#TNO1, STRCHR	;SET TABLE POINTER
2729	015062	012737	000017	001036		MOV	#15, CHRCNT	;SET TABLE COUNT
2730	015070	005777	163704		D2:	TST	ALPS	;TEST FOR ERROR
2731	015074	100006				BPL	D3	;CONTINUE IF NO ERRORS
2732	015076	012737	000056	001052	ERR56:	MOV	#56, ERCOUNT	;SET UP ERROR COUNT 56
(1)		000057				N=N+1		
2733	015104	004437	011722			JSR	%4, STAER	;REPORT ERROR SET
2734	015110	000000				HALT		;HALT ON ERROR
2735	015112	013777	001040	163662	D3:	MOV	CHGEN, ALPB	;SEND DAVFU INSTR.
2736	015120	105777	163654			TSTB	ALPS	;TEST READY
(1)	015124	100375				BPL	.-4	;WAIT FOR READY
2737	015126	017737	163722	014270		MOV	STRCHR, MES19	;SET PRINTER MESSAGE
2738	015134	004437	011452			JSR	%4, RINT	;PRINT MESSAGE

G06

 MAINDEC-11-DZLPK-G-0 MACY11 27(1006) 06-APR-77 12:14 PAGE 42-13
 DZLPKG.P11 06-APR-77 12:13

SEQ 0071

2739	015140	005337	001036		DEC	CHRCNT	: DEC TABLE COUNT
2740	015144	001407			BEQ	D4	: EXIT TEST IF DONE
2741	015146	005237	001040		INC	CHRCNT	: NEXT DAVFU INSTR.
2742	015152	062737	000002	001054	ADD	#2, STRCHR	: INC TABLE POINTER
2743	015160	000137	015070		JMP	D2	: CONTINUE
2744	015164	005337	001044		D4: DEC	CYCCNT	: DEC CYCLE COUNT
2745	015170	001415			BEQ	DEXO	: EXIT IF DONE
2746	015172	062737	000140	015326	ADD	#140, DAVI1	: CHANGE DAVFU INSTR.
2747	015200	062737	000140	015330	ADD	#140, DAVI2	: CHANGE DAVFU INSTR.
2748	015206	013737	014534	014030	MOV	TNDV2, MES15	: SET TEST NUMBER FOR MESSAGE
2749	015214	004437	011406		JSR	%4, PRNNT	: PRINT TEST NUMBER
2750	015220	000137	014756		JMP	D0	: RETEST LINE COUNT SLEWING
2751	015224	012737	000220	015326	DEXO: MOV	#220, DAVI1	: RESET DAVFU INSTR.
2752	015232	012737	000221	015330	MOV	#221, DAVI2	: RESET DAVFU INSTR.
2753	015240	032777	010000	163536	BIT	#BIT12, 2SWR	: LOOP ON TEST?
2754	015246	001002			BNE	1\$	: LOOP
2755	015250	000137	015332		JMP	DAV2	: NEXT TEST
2756	015254	000137	014576		1\$: JMP	DAVFU	: LOOP
2757							
2758							
2759	015260	000356			DAVTAB: 356		: DAVFU LOAD TABLE
2760	015262	000001			1		
2761	015264	000002			2		
2762	015266	000003			3		
2763	015270	000004			4		
2764	015272	000005			5		
2765	015274	000006			6		
2766	015276	000007			7		
2767	015300	000010			10		
2768	015302	000011			11		
2769	015304	000012			12		
2770	015306	000013			13		
2771	015310	000014			14		
2772	015312	000015			15		
2773	015314	000016			16		
2774	015316	000017			17		
2775	015320	000020			20		
2776	015322	000357			357		
2777	015324	000000			0		
2778							
2779							
2780	015326	000220			DAVI1: 220		
2781	015330	000221			DAVI2: 221		
2782							
2783					: TEST D3		
2784					: CHECK DAVFU CHANNEL SLEW COMMANDS		
2785							
2786	015332				DAV2:		
(1)	015332	022737	000176	001004	CMP	#176, SWR	: S/W SWR ?
(1)	015340	001003			BNE	.+10	: NO- CONTINUE
(1)	015342	052777	000100	163450	BIS	#100, 2TKS	: ENABLE KEYBOARD INTERRUPT
2787	015350	004437	011506		JSR	%4, TYPINT	: INITIALIZE
2788	015354	013737	016662	014272	MOV	SPSP, MES19+2	
2789	015362	013737	014536	014030	MOV	TNDV3, MES15	: SAT TEST NUMBER FOR MESSAGE
2790	015370	004437	011406		JSR	%4, PRNNT	: PRINT TEST NUMBER D3
2791	015374	012737	016644	016126	MOV	#MTAB, MTABP	: SET MESSAGE TABLE POINTER

2792	015402	012737	016612	016122		MOV	#ITAB, ITABP	SET INSTRUCTION TABLE POINTER
2793	015410	017737	000506	001054		MOV	@ITAB, STRCHR	SAT FIRST INSTRUCTION
2794	015416	012737	014540	016130		MOV	#TNO1, ATABP	SET HEADER MESSAGE TABLE POINTER
2795	015424	012737	016574	016124		MOV	#ICTAB, ICTABP	SET INSTR COUNT TABLE POINTER
2796	015432	017737	000466	001056		MOV	@ICTAB, STRCNT	GET FIRST INSTR COUNT
2797	015440	012737	016132	016120	LOAD:	MOV	@DTAB, DTABP	SET DATA TABLE POINTER
2798	015446	017737	000446	001040		MOV	@DTABP, CHGEN	SET FIRST DATA PAIR
2799	015454	005777	163320			TST	@LPS	TEST FOR ERROR
2800	015460	100007				BPL	DL1	BRANCH IF NO ERROR
2801	015462	012737	000057	001052	ERR57:	MOV	#57, ERCOUNT	SET UP ERROR COUNT 57
(1)		000060				N=N+1		
2802	015470	004537	011722			JSR	%5, STAER	REPORT ERROR SET
2803	015474	000000				HALT		HALT ON ERROR
2804	015476	000760				BR	LOAD	RESTART LOAD
2805	015500	012737	000002	001036	DL1:	MOV	#2, CHRCNT	SET PAIR COUNT
2806	015506	013777	001040	163266	DL2:	MOV	CHGEN, @LPB	LOAD DAYFU
2807	015514	105777	163260			TSTB	@LPS	TEST READY
(1)	015520	100375				BPL	.-4	WAIT FOR READY
2808	015522	005777	163252			TST	@LPS	TEST FOR ERROR
2809	015526	100010				BPL	DL6	BRANCH IF NO ERROR
2810	015530	012737	000060	001052	ERR60:	MOV	#60, ERCOUNT	SET UP ERROR COUNT 60
(1)		000061				N=N+1		
2811	015536	004537	011722			JSR	%5, STAER	REPORT ERROR SET
2812	015542	000000				HALT		HALT ON ERROR
2813	015544	000137	015440			JMP	LOAD	RESTART LOAD
2814	015550	022737	000356	001040	DL6:	CMP	#356, CHGEN	LOAD COMMAND?
2815	015556	001407				BEQ	DL6A	YES, SEND ONLY ONCE
2816	015560	022737	000357	001040		CMP	#357, CHGEN	LOAD COMMAND?
2817	015566	001403				BEQ	DL6A	YES, SEND ONLY ONCE
2818	015570	005337	001036			DEC	CHRCNT	DEC PAIR COUNT
2819	015574	001344				BNE	DL2	FINISH PAIR IF NOT DONE
2820	015576	062737	000002	016120	DL6A:	ADD	#2, DTABP	INC DATA TABLE POINTER
2821	015604	017737	000310	001040		MOV	@DTABP, CHGEN	SET NEXT DATA PAIR
2822	015612	022737	077777	001040		CMP	#77777, CHGEN	DONE LOAD?
2823	015620	001327				BNE	DL1	
2824								
2825								
2826								
2827	015622							
2828	015622	013777	001054	163152	DL8:	MOV	STRCHR, @LPB	SEND DAYFU INSTRUCTION
2829	015630	105777	163144			TSTB	@LPS	TEST READY
(1)	015634	100375				BPL	.-4	WAIT FOR READY
2830	015636	105777	163136			TSTB	@LPS	TEST READY
2831	015642	100375				BPL	.-4	WAIT FOR READY
2832	015644							
2833	015644	017737	000260	014460	DL8A:	MOV	@HTABP, MES20A	SET HEADER MSGG ADDRESS
2834	015652	012737	014404	011470		MOV	#MES20, PRMSG	SET HEADER MSG ADDRESS
2835	015660	004437	011452			JSR	%4, RINT	PRINT HEADER MESSAGE
2836	015664	013777	001054	163110	DL9:	MOV	STRCHR, @LPB	SEND DAYFU INSTRUCTION
2837	015672	105777	163102			TSTB	@LPS	TEST READY
(1)	015676	100375				BPL	.-4	WAIT FOR READY
2838	015700	005777	163074			TST	@LPS	TEST FOR ERROR
2839	015704	100010				BPL	DL10	BRANCH IF OK
2840	015706	012737	000061	001052	ERR61:	MOV	#61, ERCOUNT	SET UP ERROR COUNT 61
(1)		000062				N=N+1		
2841	015714	004537	011722			JSR	%5, STAER	REPORT ERROR SET

;START OF CHANNEL SLEW TESTS

Address	Hex	Dec	Label	Instruction	Comment
2842	015720	000000		HALT	:HALT ON ERROR
2843	015722	000137		JMP	:RELOAD DAVFU
2844	015726	017737		MOV	:SET MESSAGE
2845	015734	027727		CMP	:CHECK IF MAX LINE SLEW
2846	015742	001004		BNE	:NOT, CONTINUE
2847	015744	013737		MOV	:SET MESSAGE
2848	015752	000403		BR	:CONTINUE
2849	015754	013737		MOV	:SET MESSAGE
2850	015762	012737		MOV	:SET MSG ADDRESS
2851	015770	004437		JSR	:PRINT MESSAGE
2852	015774	005337		DEC	:DEC INSTR COUNT
2853	016000	001331		BNE	:FINISH TESTING THIS CHANNEL
2854	016002	062737		ADD	:INC MSG TABLE POINTER
2855	016010	062737		ADD	:INC HEADER MSG TABLE POINTER
2856	016016	062737		ADD	:INC INSTR COUNT TABLE POINTER
2857	016024	005777		TST	:CHECK INSTR COUNT
2858	016030	001006		BNE	
2859	016032	012737		MOV	:RESET TABLE POINTER
2860	016040	012737		MOV	:RESET MSG TABLE POINTER
2861	016046	017737		MOV	:GET INSTR COUNT
2862	016054	062737		ADD	:INC INSTR TABLE POINTER
2863	016062	017737		MOV	:GET INSTRUCTION
2864	016070	001254		BNE	:CONTINUE IF NOT DONE TEST
2865	016072	013737		MOV	:RESET MESSAGE
2866	016100	032777		BIT	:LOOP ON TEST?
2867	016106	001402		BEQ	
2868	016110	000137		JMP	:LOOP ON TEST
2869	016114	000137		JMP	:RECYCLE PRINTING TESTS
2870					
2871	016120	000000			:DATA TABLE POINTER
2872	016122	000000			:INSTRUCTION TABLE POINTER
2873	016124	000000			:INSTR COUNT TABLE POINTER
2874	016126	000000			:MESSAGE TABLE POINTER
2875	016130	000000			:HEADER MESSAGE TABLE POINTER
2876					
2877					
2878					
2879	016132	000356			
2880	016134	000077			
2881	016136	000000			
2882	016140	000001			
2883	016142	000002			
2884	016144	000005			
2885	016146	000000			
2886	016150	000003			
2887	016152	000010			
2888	016154	000005			
2889	016156	000002			
2890	016160	000001			
2891	016162	000000			
2892	016164	000007			
2893	016166	000000			
2894	016170	000011			
2895	016172	000002			
2896	016174	000005			
2897	016176	000000			

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99

K06

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 42-17
DZLPKG.P11 06-APR-77 12:13

SEQ 0075

2954	016360	000001
2955	016362	000022
2956	016364	000005
2957	016366	000010
2958	016370	000003
2959	016372	000000
2960	016374	000005
2961	016376	000002
2962	016400	000001
2963	016402	000000
2964	016404	000017
2965	016406	000000
2966	016410	000001
2967	016412	000002
2968	016414	000005
2969	016416	000000
2970	016420	000003
2971	016422	000010
2972	016424	000005
2973	016426	000002
2974	016430	000001
2975	016432	000000
2976	016434	000007
2977	016436	000000
2978	016440	000011
2979	016442	000002
2980	016444	000025
2981	016446	000000
2982	016450	000003
2983	016452	000000
2984	016454	000005
2985	016456	000012
2986	016460	000001
2987	016462	000000
2988	016464	000007
2989	016466	000000
2990	016470	000001
2991	016472	000002
2992	016474	000015
2993	016476	000000
2994	016500	000003
2995	016502	000000
2996	016504	000005
2997	016506	000002
2998	016510	000001
2999	016512	000010
3000	016514	000007
3001	016516	000000
3002	016520	000001
3003	016522	000002
3004	016524	000005
3005	016526	000020
3006	016530	000013
3007	016532	000000
3008	016534	000005
3009	016536	000002

1
2
10
10
2
17
1
1
1
10
2
1
1
1
5
12
1
1
5
10
3
10

3010 016540 000001
3011 016542 000000
3012 016544 000007
3013 016546 000010
3014 016550 000001
3015 016552 000002
3016 016554 000005
3017 016556 000000
3018 016560 000003
3019 016562 000000
3020 016564 000001
3021 016566 000000
3022 016570 000357
3023 016572 077777

1
0
7
10
1
2
5
0
0
3
0
0
1
0
357
77777

;STOP LOAD
;STOP !!!!!

;INSTRUCTION COUNT TABLE - FOR DAVFU CHANNEL SLEW INSTRUCTIONS

ICTAB: 105
56
42
23
5
1
0

;END OF TABLE

;INSTRUCTION TABLE - DAVFU CHANNEL SLEW INSTRUCTIONS

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/
.ASCII / 14/
FS: .ASCII / 3 /
SPSP: .ASCII / /

;SCOPE LOOP ROUTINE

;SET CHARACTER IN SWITCH REGISTER -0.

3053 016644 030440
3054 016646 031040
3055 016650 031440
3056 016652 033040
3057 016654 032062
3058 016656 032061
3059 016660 020063
3060 016662 020040
3061
3062
3063
3064
3065

M06

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 43
DZLPKG.P11 06-APR-77 12:13

SEQ 0077

3067 016664
(1) 016664 022737 000176 001004
(1) 016672 001003
(1) 016674 052777 000100 162116

SCOPE:

CMP #176,SWR
BNE +10
BIS #100,ATKS

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

N06

MAINDEC-11-DZLPK-C-D MACY11 27(1006) 06-APR-77 12:14 PAGE 44
DZLPKG.P11 06-APR-77 12:13

SEQ 0078

3069 016702 004437 011506
3070 016706 017737 162072 001050

JSR
MOV

%4, TYPINT
JSR, SAVE

;FETCH SWITCHES

B07

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 45
DZLPKG.P11 06-APR-77 12:13

SEQ 0079

3072	016714	012737	177574	001036	MOV	#-132, CHRCNT	; SET CHAR COUNT
3073	016722	042737	177400	001050	BIC	#177400, SAVE	; MASK CHARACTER
3074	016730				LDLPX:		
(1)	016730	105777	162044		TSTB	2LPS	; TEST READY
(1)	016734	100375			BPL	-4	; WAIT FOR READY
3075	016736	005777	162036		TST	2LPS	; TEST FOR ERROR

C07

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 46
 DZLPKG.P11 06-APR-77 12:13

SEQ 0080

3077	016742	100006				BPL	LPSCOPE				
3078	016744	012737	000062	001052	ERR62:	MOV	#62,	ERCOUNT			
(1)		000063				N=N+1					
3079											
3080	016752	004537	011722			JSR	%5,STAER				
3081	016756	000000				HALT					
3082	016760	013777	001050	162014	LPSCOPE:MOV		SAVE,ALPB				

;BRANCH IF NO ERROR
 ;SET UP ERROR COUNT 62
 ;REPORT ERROR SET
 ;HALT ON ERROR
 ;LOAD PRINTER BUFFER

D07

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 47
 DZLPKG.P11 06-APR-77 12:13

SEQ 0081

3084	016756	032777	004000	162010	BIT	#BIT11,2SWR	:SEND ONLY ONE CHAR?
3085	016774	001402			BEQ	LSC0	:NO, BRANCH
3086	016776	000000			HALT		:HALT - WAIT FOR OPERATOR
3087	017000	000731			BR	SCOPE	:NEXT CHAR
3088	017002	000177	000024		JMP	2LOSCOP	:SEND LF?
3089	017006	005237	001036		LSCA: INC	CHRCNT	:INCREMENT CHAR COUNT
3090	017012	001346			BNE	LDLPX	:CONTINUE IF NOT DONE LINE
3091	017014	012777	000012	161760	MOV	#12,2LPB	:SEND LF
3092	017022	105777	161752		TSTB	2LPS	:TEST READY
(1)	017026	100375			BPL	-4	:WAIT FOR READY
3093	017030	000715			BR	SCOPE	:CONTINUE
3094							
3095							
3096	017032	017006			LOSCOP: LSCA		
3097							
3098							
3099							
3100		000001			.END		

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48
DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-1
DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

G07

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-2
 DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0084

ERR31	004376	1734#							
ERR32	004564	1784#							
ERR33	004642	1793#							
ERR34	005066	1830#							
ERR35	005204	1850#							
ERR36	005444	1891#							
ERR37	005760	1951#							
ERR4	001470	1269#							
ERR40	006244	2006#							
ERR41	006520	2050#							
ERR42	007020	2099#							
ERR43	007312	2148#							
ERR44	007554	2187#							
ERR45	010046	2233#							
ERR46	010314	2274#							
ERR47	010540	2309#							
ERR5	001520	1278#							
ERR50	010732	2342#							
ERR51	011004	2353#							
ERR52	011200	2382#							
ERR53	011436	2444#							
ERR54	014674	2704#							
ERR55	014776	2719#							
ERR56	015076	2732#							
ERR57	015462	2801#							
ERR6	001552	1293#							
ERR60	015530	2810#							
ERR61	015706	2840#							
ERR62	016744	3078#							
ERR7	001576	1302#							
FFSET	003766	1594	1659#						
FFTAB	003710	1593	1634#						
FS	016660	2847	3059#						
FTABE	003764	1619	1656#						
HAMALN	011122	1041	2375#	2395					
HAMX	011306	2398	2400#						
HAMIX	011164	2379#	2393						
HAM2	011172	2380#	2389						
HEDO	012360	2520	2616#						
HED1	012361	2517	2617#						
HSPRT	006646	1037	2080#	2125					
HSO	006770	2094#	2121	2123					
HS00	006754	2089	2092#						
HS00A	006740	2086	2090#						
HS1	007012	2097#	2109	2111	2114				
HS2	007034	2098	2102#						
HS3	007102	2107	2112#						
HS4	007120	2104	2115#						
HS6	007170	2118	2124#						
HTABP	016130	2794#	2833	2855*	2875#				
ICTAB	016574	2795	2859	3027#					
ICTABP	016124	2795#	2796	2845	2856*	2857	2859*	2861	2873#
INDAT	004042	1012	1630	1676#	1684	1696			
INDATT	004214	1678	1703#						
INDATO	004120	1680	1685#						
INDAT1	004202	1692	1697#						

H07

 MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-3
 DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0085

IND0	004072	1679#	1690															
IND1	004154	1688	1691#															
INT1C	002204	1333	1385#															
INT1D	002336	1392	1414#															
ITAB	016612	2792	3037#															
ITABP	016122	2792*	2793	2862*	2863	2872#												
KW11L	002612	1022	1438	1469#														
KW11P	002532	1023	1443	1458#														
LDCH	005220	1849	1853#	1862	1867													
LDLPX	016730	3074#	3090															
LEGCHR	001060	1162#	1481*	1484*	1486	1494	2087*	2090*	2108	2136*	2139*	2155	2216*	2220*				
		2228	2257*	2261*	2269													
LFT	010442	2296#																
LFTTR	010406	1040	2249	2293#	2328													
LFT0	010450	2297#	2325															
LFT1	010472	2300#	2303															
LFT2	010512	2301	2304#															
LFT3	010532	2307#	2318	2321														
LFT4	010554	2308	2312#															
LFT5	010604	2316	2319#															
LFT6	010622	2314	2322#	2326														
LINCNT	001042	1155#	1445*	1459*	1470*	1493	1505*	1549	1551*	1557	1559*	1564	1593*	1607				
		1618#	1619	1621	1884*	1919*	1939*	1969*	1971	2056*	2057*	2058*	2061*	2093*				
		2117*	2143*	2161*	2180*	2182*	2196*	2215*	2219*	2227	2243*	2244	2256*	2260*				
		2282*	2283	2296*	2297	2324*	2333*	2335	2338	2366*	2367	2378*	2392*					
		1078#	1435	1474	1475*													
LKS	001026	993	1539#															
LKSRV	003220	2797#	2804	2813	2843													
LOAD	015440	981	2404#															
LOGICA	011316	1046*	1051*	3088	3096#													
LOSCOP	017032	1064#	1251*	1252*	1309*	1498*	1506*	1523*	1615*	1685*	1722*	1728*	1806*	1809*				
LPB	001002	1833*	1845*	1853*	1868*	1897*	1904*	1915*	1948*	1965*	1979*	2009*	2017*	2053*				
		2059*	2102*	2115*	2151*	2159*	2190*	2193*	2236*	2241*	2277*	2280*	2312*	2322*				
		2345*	2356*	2364*	2387*	2390*	2427*	2448	2708*	2722*	2735*	2806*	2828*	2836*				
		3082*	3091*															
LPS	001000	1059#	1237	1242	1253	1262	1267	1276	1291	1300	1310	1315	1320	1335				
		1340	1348*	1350*	1357*	1359*	1367*	1369*	1377*	1379*	1394	1399	1406*	1415*				
		1507	1610	1616	1679	1689	1691	1716	1726	1732	1791	1810	1828	1846				
		1848	1869	1889	1905	1916	1949	1966	2004	2018	2048	2060	2097	2116				
		2146	2160	2185	2194	2231	2242	2272	2281	2307	2323	2340	2351	2365				
		2380	2385	2391	2421	2423	2428	2432	2442	2447	2702	2712	2717	2723				
		2730	2736	2799	2807	2808	2829	2830	2837	2838	3074	3075	3092					
LPSCOP	016760	3077	3082#															
LPS7	007634	2199#																
LP1	001646	1311	1315#	1323														
LP2	001670	1316	1320#															
LP2B	004656	1792	1796#															
LP2E	005102	1829	1833#															
LP2H	005172	1825	1847#															
LP3	001756	1336	1340#															
LP3X	002000	1341	1345#															
LP4	002254	1395	1399#															
LP5	002276	1400	1404#															
LSCA	017006	1046	3089#	3096														
LSCO	017002	3085	3088#															
M	= 000015	1083#	1787#	1823#	1882#	1938#	1995#	2043#	2082#	2177#	2209#	2295#	2377#					

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-5
DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

NODAT0	004312	1717	1722#																	
NODAT1	004416	1733	1738#																	
NODAT2	004442	1740	1745#																	
NODAT3	004454	1715	1751#																	
NODAT4	004532	1724	1774#																	
NODO	004266	1716#	1727																	
NODOA	004260	1715#	1737	1744																
NOP =	000240	1081#																		
NROTAT	010154	2212	2254#	2286																
NROTO	010210	2255	2260#																	
NROT1	010232	2259	2263#																	
NROT2	010256	2267#	2279																	
NROT4	010306	2270	2272#																	
NROT5	010330	2273	2277#																	
NROT6	010240	2264#	2284																	
NTRDY	011376	2429	2432#																	
NUNCHR	001062	1163#	1482*	1485*	1496	1518	1522	2088*	2091*	2110	2122	2137*	2140*	2157						
OCT	001076	2166	2217*	2221*	2230	2258*	2262*	2271												
OFFSET	001064	1169#	2563*	2565*	2567*	2568*	2572	2602*												
OvR	005676	1164#	2141*	2154	2268															
OVR EXT	006122	1940#	1972																	
OVRPRT	005634	1970	1984#																	
OVRD	005704	1034	1936#	1985																
OvR1	005744	1941#	1968																	
OVR2	005752	1948#	1957	1964																
OvR3	005774	1945	1949#	1978																
OVR4	005736	1950	1954#																	
OvRS	006012	1946#	1959																	
OVR6	006026	1962#																		
OVRB	006110	1966#	1982																	
PATTB	003410	1961	1979#																	
PLKS	001024	1490	1575#																	
PRNNT	011406	1077#	1440	1463	1464*															
		1787	1823	1882	1938	1995	2043	2082	2177	2209	2295	2377	2439#	2700						
		2749	2790																	
PRTA	006364	2012	2027#																	

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-6
 DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0088

ROT1	007766	2218	2222#	2245															
ROT2	007772	2223#	2240																
ROT3	010002	2225#	2238																
ROT4	010040	2229	2231#																
ROT5	010062	2232	2236#																
RTTR	010656	2333#	2370																
RT1	010664	2334#	2368																
RT2	010724	2340#	2350																
RT2A	010746	2341	2345#																
RT2AA	010770	2347	2349#																
RT3	010776	2339	2351#	2363															
RT3A	011020	2352	2356#																
RT3B	011054	2359	2362#																
SAVE	001050	1158#	1798#	1805*	1806	1896*	1897	1909*	3070*	3073*	3082								
SCHRSW	004702	1790	1801#	1804															
SCOPE	016664	1047	1051	1052	3067#	3087	3093												
SEGCNT	001034	1152#	1999*	2001*	2015*														
SET	001072	1167#	1205*	1211*	1213*	2537													
SETUP	001100	1006	1174#																
SIGNAL	001070	1166#	1203*	1219	2539	2583	2586*	2598*											
SKIP	001310	1202	1221#																
SLEWCK	003430	1024	1571	1586#															
SLW	003474	1589	1593#																
SLWD	003506	1595#	1622																
SLW1	003516	1597#	1602																
SLW1A	003556	1608	1610#																
SLW11	003542	1607#	1624																
SLW2	003600	1611	1615#																
SNGCHR	007450	1038	2128	2175#	2200														
SPSP	016662	2694	2788	2849	2865	3060#													
STAER	011722	1240	1245	1256	1265	1270	1279	1294	1303	1313	1318	1325	1338	1343					
		1386	1397	1402	1409	1591	1613	1682	1694	1719	1735	1785	1794	1831					
		1851	1892	1952	2007	2051	2100	2149	2188	2234	2275	2310	2343	2354					
		2383	2445	2513#	2705	2720	2733	2802	2811	2841	3080								
STAER1	011750	2514	2521#																
STARA	002762	1491#	1504																
STARED	003060	1500	1505#	1525															
STARO	002666	1453	1465	1479#															
STAROA	002714	1480	1484#																
STAROB	002736	1487#	1510																
STAROC	002730	1483	1486#																
STAR1	003024	1495	1498#	1502															
STP1	001322	1237#	1241																
STP2	001344	1238	1242#	1246															
STP3	001366	1243	1247#																
STP4	001374	1250#	1257																
STP5	001432	1254	1258#																
STPSA	001440	1262#	1266																
STPSB	001462	1263	1267#	1271															
STP5C	001504	1268	1272#																
STP6	001512	1276#	1280																
STP7	001534	1277	1281#																
STRCHR	001054	1160#	1486#	1490*	1492	1503*	1515*	1516	1518*	1519	1714*	1728	1738*	1739					
		1790*	1796	1797*	1804*	1886*	1894	1895*	1908*	1996*	2003	2019	2021	2023					
		2025*	2029*	2031*	2044*	2046	2056	2063*	2092*	2096	2112	2119*	2120	2122*					
		2142*	2145	2163*	2164	2166*	2226*	2227*	2228	2230*	2236	2265*	2268*	2269					

MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-7
DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 48-8
 DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0090

TYP	011524	972	2459#															
TYPB	011534	2462#	2470	2479														
TYPC	011544	2463	2465#															
TYPD	011572	2469	2471#	2476	2478													
TYPDAT	011636	1547#	1552#	1554#	1555	1556#	1560#	1562#	1563	1564#	1565#	1566	2462#	2465				
		2467	2471	2475#	2477#	2480#												
TYPDO	011600	2472#																
TYPF	011610	2466	2475#															
TYPG	011622	2468	2477#															
TYPINT	011506	1174	1446	1460	1471	1587	1677	1713	1781	1822	1880	1937	1993	2042				
		2081	2176	2208	2294	2376	2453#	2693	2787	3069								
TYPSTR	012264	2538	2577	2584	2586#													
T1A	004706	1802	1804#															
T2A	004662	1797#	1801															
T2B0	005044	1826#	1871															
T2B0A	005052	1827#	1840	1843														
T2B1	005060	1828#	1841	1844														
T2B2	005156	1835	1845#															
T2B2B	005144	1838	1842#															
T2B3	005176	1848#																
T2B4	005226	1854#	1856	1858	1860													
T2B5	005320	1864	1868#															
T3A	004634	1791#	1808															
T5A	004722	1799	1806#	1813														
WORK	001046	1157#	1308#	1322#														
WT	001274	1217#	1220															
WT2	012106	2556#	2557															
WT3	012234	2549	2552	2555	2578#	2579												
XHAM1	011214	2381	2385#															
XHAM1X	011224	2387#																
XSIX	007570	2186	2190#															
.	= 017034	962#	967	970#	976#	980#	982#	986#	991#	999#	1003#	1009#	1018#	1028#				
		1044#	1049#	1055#	1444	1458	1469	1507	1586	1616	1676	1689	1712	1726				
		1780	1810	1821	1846	1869	1879	1905	1916	1936	1966	1992	2018	2041				
		2060	2071#	2080	2116	2160	2175	2181	2194	2207	2242	2281	2293	2323				
		2365	2375	2385	2386	2391	2432	2473	2522	2630#	2634#	2655#	2661#	2692				
		2712	2723	2736	2786	2807	2829	2831	2837	3067	3074	3092						

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MAINDEC-11-DZLPK-G-D MACY11 27(1006) 06-APR-77 12:14 PAGE 49
DZLPKG.P11 06-APR-77 12:13 CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0091

SENABL	11248	1444	1458	1469	1586	1676	1712	1780	1821	1879	1936	1992	2041	2080	2175
	2207	2293	2375	2692	2786	3067									
SERROR	10898	1239	1244	1255	1264	1269	1278	1293	1302	1312	1317	1324	1337	1342	1345
	1354	1364	1374	1396	1401	1408	1590	1612	1681	1693	1718	1734	1784	1793	1830
	1850	1891	1951	2006	2050	2099	2148	2187	2233	2274	2309	2342	2353	2382	2444
	2704	2719	2732	2801	2810	2840	3078								
SPRINT	10998	1787	1823	1882	1938	1995	2043	2082	2177	2209	2295	2377			
SSETFS	11398	1347	1356	1366	1376	1405	1417	2441	2452						
SWAIT	11108	1507	1616	1689	1726	1810	1846	1869	1905	1916	1966	2018	2060	2116	2160
	2194	2242	2281	2323	2365	2385	2391	2432	2712	2723	2736	2807	2829	2837	3074
	3092														

. ABS. 017034 000

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

DZLPKG.BIN,DZLPKG.LST/CRF/NL:TOC=DZLPKG.P11
RUN-TIME: 3 6 .9 SECONDS
RUN-TIME RATIO: 51/10=4.8
CORE USED: 9K (17 PAGES)

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