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PROGRAM LIBRARY

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| DECUS NO. | 12-11 |
| TITLE | ODTAPE (OCTAL DEBUGGING FOR PDP-12 LINCTAPE) |
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| COMPANY | University of Washington Anesthesia Research Center Seattle, Washington |
| DATE | May 26, 1970 |
| SOURCE LANGUAGE | LAP6-DIAL |

ODTAPE (OCTAL DEBUGGING FOR PDP-12 LINCTAPE)

DECUS Program Library Write-up

DECUS No. 12-11

Abstract: ODTAPE is a utility routine for scanning blocks of LINC tape. The operator may choose to list the block in total, line by line, or word by word. He may also scan the block for a certain word or change the contents of a word or group of words. It is an aid in debugging tapes, by-passing the error prone switch method.

ODTAPE

Octal Debugging for PDP-12 Tape: ODTAPE is self starting when loaded with DIAL. The operator answers the UNIT and BLOCK questions from the teletype (the program will translate any response to the Unit number question into either 0 or 1). The specified block is then transferred to a buffer, the program enters the command mode and a back arrow is typed. The operator now has the following options.

| <u>Key Typed</u> | <u>Function</u> |
|---------------------------|---|
| CTRL O (Output) | The starting address is given and the rest of the block is typed. |
| CTRL (List) | The starting address is given and one-line (8 locations) are typed. |
| ALT MODE (Single Step) | The starting address is given and one location is typed. Subsequent ALT MODES will then list sequential locations. (Note that after each output the program is in the command mode. All legal entries will be accepted except for ALT, which lists the next location). |
| CTRL M (Modify) | The starting address is given, the address and its contents are typed followed by an up-arrow. The operator now types the new octal value to replace the old, and hits return. The next location is now opened for modification. |
| CTRL S (Search) | <p>The following questions are asked: SEARCH FOR; MASKED BY. The word searched for is entered, as is the mask. The entire block is searched, and any locations satisfying the requirements are typed in the form: LOCATION CONTENTS. Masks are bit oriented to the searched word. For example:</p> <p>SEARCH FOR: 1234 MASKED BY: 7777 will only output 1234. SEARCH FOR: 0004 MASKED BY: 0004 will output all words in the block with bit 9 set to a 1.</p> <p>Note that with a search bit set the corresponding mask bit must be set.</p> |
| CTRL F (File) | The buffer is transferred back onto tape. |
| CTRL C (Restart) | <p>This has two functions depending on the mode:</p> <ul style="list-style-type: none">A. Command mode (after ←) or after ALT MODE. ODTAPE is restarted at the Unit and Block commands.B. After Modify (and return) the program returns to command mode. |

Any other key will not decode, and the command mode will be acknowledged. (Note that Return (215) is the same as CTRL M (215). In the Command Mode it will initiate a Modify).

After an L command the command mode is re-entered. During an O or S output the keyboard is queried after each line. Any input typed during this output is treated as a command input.

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0000          *20
0001          / ODTAPE
0002          /
0003          / OCTAL TAPE DEBUGGING FOR THE PDP-12
0004          /
0005          / ROGER A. NACE
0006          / UNIVERSITY OF WASHINGTON
0007          / ANESTHESIA RESEARCH CENTER
0010          / RR-405 UNIVERSITY HOSPITAL
0011          / SEATTLE, WASHINGTON 98105
0012          /
0013          / MAY, 1970
0014          PMODE
0015          *20          /PAGE ZERO
0016          TYPE=.          /OUTPUT ROUTINE
0017          0020 0000          0
0020          0021 6041          TSF
0021          0022 5021          JMP .-1
0022          0023 6046          TLS
0023          0024 7200          CLA
0024          0025 5420          JMP I TYPE
0025          CRLF=.          /C RET + L FEED
0026          0026 0000          0
0027          0027 7200          CLA
0030          0030 1111          TAD C215          /RETURN
0031          0031 4020          JMS TYPE
0032          0032 1110          TAD C212          /LINE FEED
0033          0033 4020          JMS TYPE
0034          0034 5426          JMP I CRLF
0035          SPC=.          /SPACE ROUTINE
0036          0035 0000          0
0037          0036 1113          TAD C240          /SPACE
0040          0037 4020          JMS TYPE
0041          0040 5435          JMP I SPC
0042          0041 0000          LSTN, 0
0043          0042 6031          KSF
0044          0043 5042          JMP .-1
0045          0044 6036          KRB
0046          0045 5441          JMP I LSTN
0047          RUBOUT=.          /CORRECTION
0050          0046 1114          TAD C334          /BACKSHASH
0051          0047 4020          JMS TYPE
0052          0050 1062          TAD FINL          /GET PRODUCT
0053          0051 7110          CLL RAR          /ERASE LAST
0054          0052 7110          CLL RAR          /NUMBER
0055          0053 7110          CLL RAR
0056          0054 5455          JMP I .+1          /TO DCA FINL
0057          0055 1170          SII          /IN S1
0060          /
0061          0056 0000          TEMP, 0
0062          0057 0000          TEMP1, 0
0063          0060 0000          TEMP2, 0
0064          0061 0000          HOLD, 0
0065          0062 0000          FINL, 0
0066          0063 0000          CNT1, 0
0067          0064 0000          CS2, 0
0070          0065 0000          CS3, 0
0071          /
0072          0066 7777          M1, -1
0073          0067 7776          M2, -2
0074          0070 7775          M3, -3
0075          71 7774          M

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|------|------|------|---------------|-----------|------------------|
| 0076 | 0072 | 7772 | M6, | -6 | |
| 0077 | 0073 | 7770 | M10, | -10 | |
| 0100 | 0074 | 7745 | M33, | -33 | |
| 0101 | 0075 | 7735 | M43, | -43 | |
| 0102 | 0076 | 7626 | M152, | -152 | |
| 0103 | 0077 | 7575 | M203, | -203 | |
| 0104 | 0100 | 7563 | M215, | -215 | |
| 0105 | 0101 | 7403 | M375, | -375 | |
| 0106 | 0102 | 7401 | M377, | -377 | |
| 0107 | 0103 | 7400 | M400, | -400 | |
| 0110 | 0104 | 3400 | M4400, | -4400 | |
| 0111 | | | / | | |
| 0112 | 0105 | 0004 | C4, | 4 | |
| 0113 | 0106 | 0010 | C10, | 10 | |
| 0114 | 0107 | 0100 | C100, | 100 | |
| 0115 | 0110 | 0212 | C212, | 212 | |
| 0116 | 0111 | 0215 | C215, | 215 | |
| 0117 | 0112 | 0260 | C260, | 260 | |
| 0120 | 0113 | 0240 | C240, | 240 | |
| 0121 | 0114 | 0334 | C334, | 334 | |
| 0122 | 0115 | 0336 | C336, | 336 | |
| 0123 | 0116 | 0337 | C337, | 337 | |
| 0124 | 0117 | 0700 | C700, | 700 | |
| 0125 | 0120 | 4377 | C4377, | 4377 | |
| 0126 | 0121 | 5000 | C5000, | 5000 | |
| 0127 | | | / | | |
| 0130 | 0122 | 0007 | MASK, | 0007 | |
| 0131 | 0123 | 0777 | MASK2, | 0777 | |
| 0132 | | | / | | |
| 0133 | 0124 | 5176 | TXT0, | TXX0+3777 | |
| 0134 | 0125 | 5202 | TXT1, | TXX1+3777 | |
| 0135 | 0126 | 5207 | TXT2, | TXX2+3777 | |
| 0136 | 0127 | 5215 | TXT3, | TXX3+3777 | |
| 0137 | 0130 | 5224 | TXT4, | TXX4+3777 | |
| 0140 | 0131 | 1007 | TXTOUP, | TXTOUT | |
| 0141 | 0132 | 1075 | LINOUP, | LINOUT | |
| 0142 | 0133 | 1144 | S1P, | S1 | |
| 0143 | 0134 | 1035 | RDBLKP, | RDBLK | |
| 0144 | 0135 | 1053 | BLOCKP, | BLOCK | |
| 0145 | 0136 | 0226 | DSRST, | DSPH | |
| 0146 | 0137 | 1117 | S2P, | S2 | |
| 0147 | | | / | | |
| 0150 | | | | *200 | |
| 0151 | 0200 | 7300 | CLA CLL | | |
| 0152 | 0201 | 6046 | TLS | | /SET FLAG |
| 0153 | 0202 | 7040 | CMA | | /FORM -1 |
| 0154 | 0203 | 1121 | TAD C5000 | | /MAKE 4777 |
| 0155 | 0204 | 3010 | DCA 10 | | /INDEX |
| 0156 | 0205 | 1073 | TAD M10 | | /-10 |
| 0157 | 0206 | 3063 | DCA CNT1 | | /COUNT |
| 0160 | 0207 | 3410 | DCA I 10 | | /ZERO TOP OF BUF |
| 0161 | 0210 | 2063 | ISZ CNT1 | | |
| 0162 | 0211 | 5207 | JMP *-2 | | |
| 0163 | 0212 | 4026 | RST, JMS CRLF | | /C RTN + L FEED |
| 0164 | 0213 | 1124 | TAD TXT0 | | /"UNIT :" |
| 0165 | 0214 | 4531 | JMS I TXTOUP | | |
| 0166 | 0215 | 4533 | JMS I SIP | | |
| 0167 | 0216 | 4026 | JMS CRLF | | |
| 0170 | 0217 | 1062 | TAD FINL | | |
| 0171 | 0220 | 3060 | DCA TEMP2 | | |
| 0172 | 0221 | 1125 | TAD TXT1 | | /"BLOCK" |
| 0173 | 0222 | 4531 | JMS I TXTOUP | | /OUTPUT TEXT |
| 017 | | | SIP | | /GET ROUTINE |

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|------|------|------|---------|--------------|------------------|
| 0175 | 0224 | 4026 | | JMS CRLF | |
| 0176 | 0225 | 4534 | | JMS I RDBLKP | /READ BLOCK |
| 0177 | 0226 | 7200 | DSPH, | CLA | /START DISPATCH |
| 0200 | 0227 | 1116 | | TAD C337 | /BACK ARROW |
| 0201 | 0230 | 4020 | | JMS TYPE | |
| 0202 | 0231 | 4041 | | JMS LSTN | |
| 0203 | 0232 | 1077 | | TAD M203 | /+C |
| 0204 | 0233 | 7450 | | SNA | |
| 0205 | 0234 | 5212 | | JMP RST | /RESTART |
| 0206 | 0235 | 1066 | | TAD M1 | /+D |
| 0207 | 0236 | 7450 | | SNA | |
| 0210 | 0237 | 5671 | | JMP I PDIAL | /CALL MONITOR |
| 0211 | 0240 | 1067 | | TAD M2 | /+F |
| 0212 | 0241 | 7450 | | SNA | |
| 0213 | 0242 | 4670 | | JMS I PRFIL | /FILE CORRECTION |
| 0214 | 0243 | 1072 | | TAD M6 | /+L |
| 0215 | 0244 | 7450 | | SNA | |
| 0216 | 0245 | 5667 | | JMP I PLIST1 | /LIST 1 LINE |
| 0217 | 0246 | 1066 | | TAD M1 | /+M |
| 0220 | 0247 | 7450 | | SNA | |
| 0221 | 0250 | 5666 | | JMP I PMOD | /MODIFY |
| 0222 | 0251 | 1067 | | TAD M2 | /+O |
| 0223 | 0252 | 7450 | | SNA | |
| 0224 | 0253 | 5665 | | JMP I POUT | /OUTPUT BLOCK |
| 0225 | 0254 | 1071 | | TAD M4 | /+S |
| 0226 | 0255 | 7450 | | SNA | |
| 0227 | 0256 | 5664 | | JMP I PSRCH | /SEARCH |
| 0230 | 0257 | 1076 | | TAD M152 | /ALT MODE |
| 0231 | 0260 | 7450 | | SNA | |
| 0232 | 0261 | 5663 | | JMP I PADR | /1 LOCATION OUT |
| 0233 | 0262 | 5226 | | JMP DSPH | /NONE FOUND |
| 0234 | 0263 | 1420 | PADR, | ADRCNS | /POINTERS |
| 0235 | 0264 | 1456 | PSRCH, | SRCH | |
| 0236 | 0265 | 1403 | POUT, | OUTPT | |
| 0237 | 0266 | 1526 | PMOD, | MOD | |
| 0240 | 0267 | 1400 | PLIST1, | LIST1 | |
| 0241 | 0270 | 1060 | PRFIL, | WRBLK | |
| 0242 | 0271 | 1000 | PDIAL, | DIAL | |
| 0243 | | | | *1000 | |
| 0244 | 1000 | 6141 | DIAL, | LINC | /CALL MONITOR |
| 0245 | 1001 | 0642 | | 0642 | /LDF2 |
| 0246 | 1002 | 0700 | | 0700 | |
| 0247 | 1003 | 4270 | | 4270 | |
| 0250 | 1004 | 0643 | | 0643 | /LDF3 |
| 0251 | 1005 | 0602 | | 0602 | /LIF2 |
| 0252 | 1006 | 6016 | | 6016 | /JMP 16 |
| 0253 | 1007 | 0000 | TXTOUT, | 0 | /ROUTINE TO TYPE |
| 0254 | 1010 | 3213 | | DCA .+3 | /TEXT, ENTER |
| 0255 | 1011 | 6141 | | LINC | /WITH |
| 0256 | | | | LMODE | /ADDRESS+3777 |
| 0257 | 1012 | 0070 | | SET I 10 | /IN AC |
| 0260 | 1013 | 0000 | | 0 | |
| 0261 | 1014 | 1330 | GO, | LDH I 10 | /GET HALF WORD |
| 0262 | 1015 | 0002 | | PDP | |
| 0263 | | | | PMODE | |
| 0264 | 1016 | 7450 | | SNA | /0=TERMINATOR |
| 0265 | 1017 | 5607 | | JMP I TXTOUT | |
| 0266 | 1020 | 3061 | | DCA HOLD | |
| 0267 | 1021 | 1061 | | TAD HOLD | |
| 0270 | 1022 | 1075 | | TAD M43 | /TEST RETURN |
| 0271 | 1023 | 7650 | | SNA CLA | |
| 0272 | 1 | 5 | | F | |

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|------|------|------|---------|--------------------------------|-----------------|
| 0274 | 1026 | 1074 | | TAD M33 | /TEST ALPHA |
| 0275 | 1027 | 7710 | | SPA CLA | |
| 0276 | 1030 | 1107 | | TAD C100 | |
| 0277 | 1031 | 1061 | | TAD HOLD | |
| 0300 | 1032 | 4020 | | JMS TYPE | /OUTPUT CHARCTR |
| 0301 | 1033 | 6141 | | LINC | |
| 0302 | 1034 | 7014 | | 6\ GO | /JMP GO |
| 0303 | 1035 | 0000 | RDBLK, | 0 | /GET BLOCK |
| 0304 | 1036 | 1062 | | TAD FINL | /BLOCK NO. |
| 0305 | 1037 | 0123 | | AND MASK2 | /0777 |
| 0306 | 1040 | 1121 | | TAD C5000 | /5000 |
| 0307 | 1041 | 3253 | | DCA BLOCK | |
| 0310 | 1042 | 7301 | | CLA CLL IAC | /0 OR 1 FOR |
| 0311 | 1043 | 0060 | | AND TEMP2 | /SELECTED UNIT |
| 0312 | 1044 | 7006 | | RTL | |
| 0313 | 1045 | 7004 | | RAL | |
| 0314 | 1046 | 1117 | | TAD C700 | /RDC |
| 0315 | 1047 | 3252 | | DCA UNIT | |
| 0316 | 1050 | 6141 | | LINC | /FILL BUFFER |
| 0317 | 1051 | 0642 | | 0642 | /LDF 2 |
| 0320 | 1052 | 0000 | UNIT, | 0 | /RDC 1 OR 0 |
| 0321 | 1053 | 0000 | BLOCK, | 0 | /FROM ABOVE |
| 0322 | 1054 | 0643 | | 0643 | /LDF 3 |
| 0323 | 1055 | 0002 | | 0002 | /PDP |
| 0324 | 1056 | 7200 | | CLA | |
| 0325 | 1057 | 5635 | | JMP I RDBLK | |
| 0326 | 1060 | 0000 | WRBLK, | 0 | /WRITE BLOCK |
| 0327 | 1061 | 1253 | | TAD BLOCK | /GET INPUT NO. |
| 0330 | 1062 | 3271 | | DCA WUNIT+1 | |
| 0331 | 1063 | 1252 | | TAD UNIT | |
| 0332 | 1064 | 1105 | | TAD C4 | /MAKE WRITE |
| 0333 | 1065 | 3270 | | DCA WUNIT | |
| 0334 | 1066 | 6141 | | LINC | |
| 0335 | 1067 | 0642 | | 0642 | /LDF 2 |
| 0336 | 1070 | 0000 | WUNIT, | 0 | /WRITE |
| 0337 | 1071 | 0000 | | 0 | |
| 0340 | 1072 | 0643 | | 0643 | /LDF 3 |
| 0341 | 1073 | 0002 | | 0002 | /PDP |
| 0342 | 1074 | 5660 | | JMP I WRBLK | |
| 0343 | 1075 | 0000 | LINOUT, | 0 | /TYPE 1 LINE |
| 0344 | 1076 | 3060 | | DCA TEMP2 | /ENTER WITH |
| 0345 | 1077 | 1060 | | TAD TEMP2 | /ADDRESS IN AC |
| 0346 | 1100 | 4317 | | JMS S2 | /PRINT ADDRESS |
| 0347 | 1101 | 1060 | | TAD TEMP2 | |
| 0350 | 1102 | 1120 | | TAD C4377 | /4377 |
| 0351 | 1103 | 3010 | | DCA I0 | /SETUP INDEX |
| 0352 | 1104 | 1073 | | TAD M10 | /-10 |
| 0353 | 1105 | 3063 | | DCA CNT1 | /SETUP COUNT |
| 0354 | 1106 | 4035 | | JMS SPC | /SPACE ROUTINE |
| 0355 | 1107 | 4035 | | JMS SPC | |
| 0356 | 1110 | 4035 | | JMS SPC | |
| 0357 | 1111 | 1410 | OUT, | TAD I 10 | /GET WORD |
| 0360 | 1112 | 4317 | | JMS S2 | /OUTPUT IT |
| 0361 | 1113 | 2063 | | ISZ CNT1 | /10? |
| 0362 | 1114 | 5311 | | JMP .-3 | /NO |
| 0363 | 1115 | 4026 | | JMS CRLF | /YES, NEW LINE |
| 0364 | 1116 | 5675 | | JMP I LINOUT | /AND EXIT |
| 0365 | | | S2=. | /OUTPUT OCTAL C(AC) SUBROUTINE | |
| 0366 | 1117 | 0000 | | 0 | |
| 0367 | 1120 | 3061 | | DCA HOLD | /PUT AWAY |
| 0370 | 1121 | 1071 | | TAD M4 | /-4 |
| 0371 | 11 2 | 3 | | C 2 | / AR COUNTER |

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|------|------|------|---------------|------------------------|
| 0373 | 1124 | 3065 | DCA CS3 | /ROTATE COUNTER |
| 0374 | 1125 | 1061 | TAD HOLD | /GET NUMBER |
| 0375 | 1126 | 7104 | CLL RAL | /GET SEGNIF 3 |
| 0376 | 1127 | 7430 | SZL | /CORRECT LINK |
| 0377 | 1130 | 7001 | IAC | /TESTS OLD AC0 |
| 0400 | 1131 | 2065 | ISZ CS3 | /BUMP CNTR |
| 0401 | 1132 | 5326 | JMP -4 | /GO AGAIN |
| 0402 | 1133 | 3061 | DCA HOLD | /PUT AWAY NEW |
| 0403 | 1134 | 1061 | TAD HOLD | |
| 0404 | 1135 | 0122 | AND MASK | /0007 |
| 0405 | 1136 | 1112 | TAD C260 | /260 |
| 0406 | 1137 | 4020 | JMS TYPE | /OUTPUT MOST SEG |
| 0407 | 1140 | 2064 | ISZ CS2 | /ALL 4? |
| 0410 | 1141 | 5323 | JMP S2+4 | /NO, GO BACK |
| 0411 | 1142 | 4035 | JMS SPC | /YES, SPACE |
| 0412 | 1143 | 5717 | JMP I S2 | /AND RETURN |
| 0413 | | | S1=. | /GET KBD INPUT (OCTAL) |
| 0414 | 1144 | 0000 | 0 | |
| 0415 | 1145 | 7300 | CLA CLL | |
| 0416 | 1146 | 3061 | DCA HOLD | |
| 0417 | 1147 | 4041 | JMS LSTN | /1 CHARACTER |
| 0420 | 1150 | 1100 | TAD M215 | /-215 (RETURN) |
| 0421 | 1151 | 7450 | SNA | /RETURN? |
| 0422 | 1152 | 5744 | JMP I S1 | /YES, QUIT |
| 0423 | 1153 | 6036 | KRB | /NO, PROCEED |
| 0424 | 1154 | 1102 | TAD M377 | /-377 (RUBOUT) |
| 0425 | 1155 | 7450 | SNA | /RUBOUT? |
| 0426 | 1156 | 5046 | JMP RUBOUT | /YES |
| 0427 | 1157 | 6036 | KRB | /NO, PROCEED |
| 0430 | 1160 | 1077 | TAD M203 | /+C? |
| 0431 | 1161 | 7450 | SNA | |
| 0432 | 1162 | 5536 | JMP I DSRST | /BACK TO DISPATC |
| 0433 | 1163 | 6036 | KRB | /NO, PROCEED |
| 0434 | 1164 | 4020 | JMS TYPE | /ECHO |
| 0435 | 1165 | 6036 | KRB | |
| 0436 | 1166 | 0122 | AND MASK | /0007 |
| 0437 | 1167 | 1061 | TAD HOLD | /GET PRODUCT |
| 0440 | 1170 | 3062 | S11, | DCA FINL |
| 0441 | 1171 | 1062 | TAD FINL | /STORE |
| 0442 | 1172 | 7104 | CLL RAL | /SHIFT LEFT |
| 0443 | 1173 | 7104 | CLL RAL | |
| 0444 | 1174 | 7104 | CLL RAL | |
| 0445 | 1175 | 3061 | DCA HOLD | /PUT AWAY |
| 0446 | 1176 | 5347 | JMP S1+3 | /GO AGAIN |
| 0447 | | | LMODE | |
| 0450 | | | /OUTPUT TEXTS | |
| 0451 | 1177 | 2516 | | |
| 0451 | 1200 | 1124 | | |
| 0451 | 1201 | 4072 | | |
| 0451 | | | TXX0, | TEXT +UNIT :+ |
| 0452 | 1202 | 0000 | 0 | |
| 0453 | 1203 | 0214 | | |
| 0453 | 1204 | 1703 | | |
| 0453 | 1205 | 1340 | | |
| 0453 | 1206 | 7200 | | |
| 0453 | | | TXX1, | TEXT +BLOCK :+ |
| 0454 | 1207 | 0000 | 0 | |
| 0455 | 1210 | 0104 | | |
| 0455 | 1211 | 0422 | | |
| 0455 | 1212 | 0523 | | |
| 0455 | 1213 | 2340 | | |
| 0455 | 1214 | 7200 | | |

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|------|------|------|---------|---------------------|------------------|
| 0456 | 1215 | 0000 | | 0 | |
| 0457 | 1216 | 2305 | | | |
| 0457 | 1217 | 0122 | | | |
| 0457 | 1220 | 0310 | | | |
| 0457 | 1221 | 4006 | | | |
| 0457 | 1222 | 1722 | | | |
| 0457 | 1223 | 4072 | | | |
| 0457 | | | TXX3, | TEXT +SEARCH FOR :+ | |
| 0460 | 1224 | 0000 | | 0 | |
| 0461 | 1225 | 4015 | | | |
| 0461 | 1226 | 0123 | | | |
| 0461 | 1227 | 1305 | | | |
| 0461 | 1230 | 0440 | | | |
| 0461 | 1231 | 0231 | | | |
| 0461 | 1232 | 4072 | | | |
| 0461 | | | TXX4, | TEXT + MASKED BY :+ | |
| 0462 | 1233 | 0000 | | 0 | |
| 0463 | | | | PMode | |
| 0464 | | | | *1400 | |
| 0465 | 1400 | 4233 | LIST1, | JMS TXT20T | /"ADDRESS :" |
| 0466 | 1401 | 4532 | | JMS I LINOUTP | /PRINT LINE |
| 0467 | 1402 | 5536 | | JMP I DSRST | /DISPATCH AGAIN |
| 0470 | 1403 | 4233 | OUTPT, | JMS TXT20T | |
| 0471 | 1404 | 1103 | | TAD M400 | /-400 |
| 0472 | 1405 | 7700 | | SMA CLA | /LEGAL? |
| 0473 | 1406 | 5536 | | JMP I DSRST | /NO, DISPATCH |
| 0474 | 1407 | 1062 | | TAD FINL | /GET ADDRESS |
| 0475 | 1410 | 4532 | | JMS I LINOUTP | /1 LINE |
| 0476 | 1411 | 1062 | | TAD FINL | /BUMP FINAL |
| 0477 | 1412 | 1106 | | TAD C10 | /10 |
| 0500 | 1413 | 3062 | | DCA FINL | |
| 0501 | 1414 | 1062 | | TAD FINL | |
| 0502 | 1415 | 6031 | | KSF | /INTERUPT? |
| 0503 | 1416 | 5204 | | JMP OUTPT+1 | /NO, GO AGAIN |
| 0504 | 1417 | 5536 | | JMP I DSRST | /YES, DISPATCH |
| 0505 | 1420 | 4233 | ADRCNS, | JMS TXT20T | |
| 0506 | 1421 | 7200 | | CLA | /OUTPUT 1 WORD |
| 0507 | 1422 | 4242 | | JMS ADRPRT | |
| 0510 | 1423 | 4026 | | JMS CRLF | |
| 0511 | 1424 | 4041 | | JMS LSTN | /WHAT NEXT |
| 0512 | 1425 | 1101 | | TAD M375 | /ALT AGAIN? |
| 0513 | 1426 | 7650 | | SNA CLA | |
| 0514 | 1427 | 5221 | | JMP ADRCNS+1 | /1 MORE |
| 0515 | 1430 | 6036 | TERIG, | KRB | /NO, GET INPUT |
| 0516 | 1431 | 5632 | | JMP I .+1 | /CHECK WHERE |
| 0517 | 1432 | 0232 | | DSPH+4 | /TO GO NOW |
| 0520 | 1433 | 0000 | TXT20T, | 0 | /OUTPUT |
| 0521 | 1434 | 1126 | | TAD TXT2 | /"ADDRESS :" |
| 0522 | 1435 | 4531 | | JMS I TXTOUP | /AND GET |
| 0523 | 1436 | 4533 | | JMS I S1P | /ANSWER |
| 0524 | 1437 | 4026 | | JMS CRLF | |
| 0525 | 1440 | 1062 | | TAD FINL | /RTN WITH ANSWER |
| 0526 | 1441 | 5633 | | JMP I TXT20T | |
| 0527 | 1442 | 0000 | ADRPRT, | 0 | /OUTPUT ADDRESS |
| 0530 | 1443 | 1062 | | TAD FINL | /AND CONT. |
| 0531 | 1444 | 4537 | | JMS I S2P | |
| 0532 | 1445 | 1062 | | TAD FINL | |
| 0533 | 1446 | 1120 | | TAD C4377 | /4377 |
| 0534 | 1447 | 3010 | | DCA 10 | |
| 0535 | 1450 | 1410 | | TAD I 10 | |
| 0536 | 1451 | 4537 | | JMS I S2P | |
| 0537 | 1452 | 1062 | | TAD FINL | |

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| 0541 | 1454 | 3062 | | DCA FINL | /BUMP FINAL 1 |
| 0542 | 1455 | 5642 | | JMP I ADRPRT | |
| 0543 | 1456 | 4026 | SRCH, | JMS CRLF | /SEARCH ROUTINE |
| 0544 | 1457 | 1127 | | TAD TXT3 | /"SEARCH FOR :" |
| 0545 | 1460 | 4531 | | JMS I TXTOUP | |
| 0546 | 1461 | 4533 | | JMS I S1P | /GET WORD |
| 0547 | 1462 | 4026 | | JMS CRLF | |
| 0550 | 1463 | 1062 | | TAD FINL | |
| 0551 | 1464 | 7041 | | CIA | |
| 0552 | 1465 | 3056 | | DCA TEMP | /HOLD - TARGET |
| 0553 | 1466 | 1130 | | TAD TXT4 | /"MASKED BY :" |
| 0554 | 1467 | 4531 | | JMS I TXTOUP | |
| 0555 | 1470 | 4533 | | JMS I S1P | |
| 0556 | 1471 | 4026 | | JMS CRLF | |
| 0557 | 1472 | 1062 | | TAD FINL | |
| 0560 | 1473 | 3057 | | DCA TEMP1 | /HOLD MASK |
| 0561 | 1474 | 1120 | | TAD C4377 | /4377 |
| 0562 | 1475 | 3010 | | DCA 10 | /SETUP INDEX |
| 0563 | 1476 | 1103 | | TAD M400 | /SETUP COUNTER |
| 0564 | 1477 | 3063 | | DCA CNT1 | |
| 0565 | 1500 | 1410 | SRCHL, | TAD I 10 | /GET WORD |
| 0566 | 1501 | 0057 | | AND TEMP1 | /MASK |
| 0567 | 1502 | 1056 | | TAD TEMP | /CHECK |
| 0570 | 1503 | 7650 | | SNA CLA | |
| 0571 | 1504 | 5310 | | JMP .+4 | /GOOD FIND |
| 0572 | 1505 | 2063 | | ISZ CNT1 | /BAD, CHECK 400? |
| 0573 | 1506 | 5300 | | JMP SRCHL | /LOOK AGAIN |
| 0574 | 1507 | 5536 | | JMP I DSRST | /FINISHED, DISP. |
| 0575 | 1510 | 1010 | | TAD 10 | /OUTPUT FIND |
| 0576 | 1511 | 1104 | | TAD M4400 | /CORRECT ADDR |
| 0577 | 1512 | 3062 | | DCA FINL | |
| 0600 | 1513 | 1062 | | TAD FINL | |
| 0601 | 1514 | 4537 | | JMS I S2P | |
| 0602 | 1515 | 7240 | | CLA CMA | /-1 |
| 0603 | 1516 | 1010 | | TAD 10 | |
| 0604 | 1517 | 3010 | | DCA 10 | /DECREMENT 10 |
| 0605 | 1520 | 1410 | | TAD I 10 | /GET WORD |
| 0606 | 1521 | 4537 | | JMS I S2P | /OUTPUT |
| 0607 | 1522 | 4026 | | JMS CRLF | |
| 0610 | 1523 | 6031 | | KSF | /INTERUPT? |
| 0611 | 1524 | 5300 | | JMP SRCHL | /NO, GO BACK |
| 0612 | 1525 | 5230 | | JMP TERIG | /YES, DISPATCH |
| 0613 | 1526 | 4233 | MOD, | JMS TXT20T | /MODIFY A WORD |
| 0614 | 1527 | 7300 | | CLA CLL | |
| 0615 | 1530 | 4242 | | JMS ADRPRT | /WHICH WORD |
| 0616 | 1531 | 1115 | | TAD C336 | /"+" |
| 0617 | 1532 | 4020 | | JMS TYPE | |
| 0620 | 1533 | 4533 | | JMS I S1P | /GET NEW WORD |
| 0621 | 1534 | 7240 | | CLA CMA | /-1 |
| 0622 | 1535 | 1010 | | TAD 10 | |
| 0623 | 1536 | 3010 | | DCA 10 | |
| 0624 | 1537 | 1062 | | TAD FINL | /NEW WORD |
| 0625 | 1540 | 3410 | | DCA I 10 | /PUT AWAY |
| 0626 | 1541 | 1010 | | TAD 10 | /FIX UP FINAL |
| 0627 | 1542 | 1104 | | TAD M4400 | /(ADD -4377) |
| 0630 | 1543 | 7001 | | IAC | |
| 0631 | 1544 | 3062 | | DCA FINL | |
| 0632 | 1545 | 4026 | | JMS CRLF | |
| 0633 | 1546 | 5327 | | JMP MOD+1 | /BACK FOR MORE |
| 0634 | | | | / END OF ODTAPE | |

ADRCNS 1420
ADRPRT 1442
BLOCK 1053
BLOCKP 0135
CNT1 0063
CRLF 0026
CS2 0064
CS3 0065
C10 0106
C100 0107
C212 0110
C215 0111
C240 0113
C260 0112
C334 0114
C336 0115
C337 0116
C4 0105
C4377 0120
C5000 0121
C700 0117
DIAL 1000
DSPH 0226
DSRST 0136
FINL 0062
GO 1014
HOLD 0061
LINOUP 0132
LINOUT 1075
LIST1 1400
LSTN 0041
MASK 0122
MASK2 0123
MOD 1526
M1 0066
M10 0073
M152 0076
M2 0067
M203 0077
M215 0100
M3 0070
M33 0074
M375 0101
M377 0102
M4 0071
M400 0103
M43 0075
M4400 0104
M6 0072
OUT 1111
OUTPT 1403
PADR 0263
PDIAL 0271
PLIST1 0267
PMOD 0266
POUT 0265
PRFIL 0270
PSRCH 0264
RDBLK 1035
RDBLKP 0134
RST 0212
RUBOUT 0046
1 11

| | |
|--------|------|
| SPC | 0035 |
| SRCH | 1456 |
| SRCHL | 1500 |
| S1 | 1144 |
| S1P | 0133 |
| S2 | 1117 |
| S2P | 0137 |
| TEMP | 0056 |
| TEMP1 | 0057 |
| TEMP2 | 0060 |
| TERIG | 1430 |
| TXTOUP | 0131 |
| TXTOUT | 1007 |
| TXT0 | 0124 |
| TXT1 | 0125 |
| TXT2 | 0126 |
| TXT20T | 1433 |
| TXT3 | 0127 |
| TXT4 | 0130 |
| TXX0 | 1177 |
| TXX1 | 1203 |
| TXX2 | 1210 |
| TXX3 | 1216 |
| TXX4 | 1225 |
| TYPE | 0020 |
| UNIT | 1052 |
| WRBLK | 1060 |
| WUNIT | 1070 |

LO ODTAPE,0 ← Call from Dial

UNIT :1.

BLOCK :300

←ADDRESS :250 ← ↑O

| | | | | | | | | |
|------|------|------|------|------|------|------|------|------|
| 0250 | 1532 | 2150 | 0450 | 6256 | 0011 | 2161 | 4212 | 0050 |
| 0260 | 0175 | 6266 | 1000 | 0010 | 4175 | 7024 | 0053 | 0000 |
| 0270 | 6455 | 6013 | 6503 | 6277 | 6511 | 1140 | 0212 | 6442 |
| 0300 | 6351 | 6401 | 1000 | 0212 | 0450 | 6270 | 6013 | 0057 |
| 0310 | 0000 | 6455 | 6017 | 1000 | 0711 | 4470 | 2161 | 4350 |
| 0320 | 0054 | 0002 | 1324 | 1420 | 0000 | 6333 | 1362 | 6442 |
| 0330 | 6351 | 0016 | 6322 | 1362 | 6637 | 6702 | 0042 | 0014 |
| 0340 | 2463 | 4756 | 4350 | 6465 | 1020 | 0700 | 6652 | 6017 |
| 0350 | 0000 | 0055 | 0000 | 0220 | 1020 | 7377 | 1440 | 0002 |
| 0360 | 6000 | 6637 | 6702 | 6170 | 0062 | 6777 | 6455 | 4756 |
| 0370 | 6015 | 3775 | 4460 | 5472 | 4777 | 4037 | 3101 | 1725 |

←ADDRESS :0 ← ↑L

0000 7200 7410 7240 3003 1621 3620 1622 3617

←ADDRESS :20 ← ALT

0020 0640

0021 0720 ← Subsequent ALTs

0022 4310

0023 0720

0024 5311

0025 0720

0026 6312

ADDRESS :20 ← ↑M (Note direct entry after the last ALT)

0020 0640 ↑0000

0021 0720 ↑7707

0022 4310 ↑1357

0023 0720 ↑ ← ↑C to return to the command mode

SEARCH FOR :0720 ← ↑S

MASKED BY :7770

0023 0720

0025 0720

0027 0720

← ← automatic command return

UNIT : ← ↑C to restart.

(↑F is not listed, as it has no output)

