# DECUS
## PROGRAM LIBRARY

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| DECUS NO. | 8-296 |
| TITLE | EDIT ROUTINE |
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| COMPANY | United States Air Force<br>Rome Air Development Center<br>Rome, New York |
| DATE | November 1, 1969 |
| SOURCE LANGUAGE | PAL |

# EDIT ROUTINE

DECUS Program Library Write-up

DECUS No. 8-296

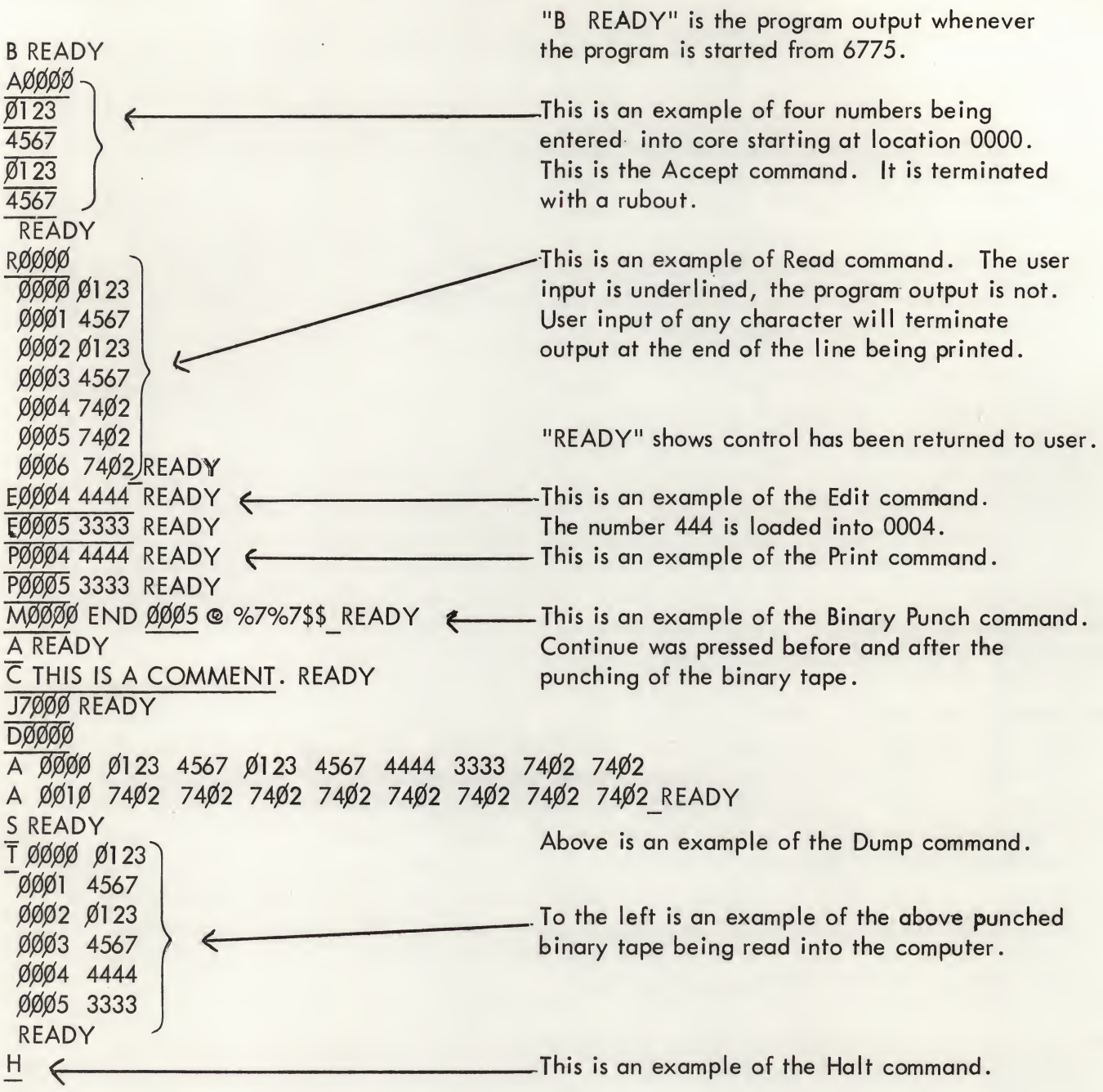
EDIT ROUTINE is a minimum length program that will enable the user to change, examine, or jump to any core location. Program has twelve instructions which are called by a single ASCII character. If an invalid character is entered, it is not accepted and there is no echo. If a valid character is entered and an address or other numerical input is required, octal characters will only be accepted and echoed. In the event of an error, a rubout will return the user to the beginning of the program. The user is in command at all times. He may always stop output with the input of any character.

The program is designed to be versatile. The program can edit itself. If 7064 is changed to 0200, an input of "S" (Start) will jump the user to 0200. If 7432 is changed to 5213, the binary punch is changed to a RIM punch. Those with EAE will have a monitor of the location being punched in the MQ. Those without EAE should change 7426 to 7000. The Tape Input ("T") can be used to just examine binary or RIM tape by changing 7356 to 7300. The program subroutines can be used from anywhere in core. The Print Alpha Subroutine starts printing from the location carried into the subroutine in the AC. A negative number stops printout. Control is then returned to the calling program. The Read and the Print Number Subroutines may also be used. The number to be read or printed is returned or sent in the AC. Both of these subroutines have ASCII octal input or output of the format XXXX.

The twelve input characters are A, C, D, E, H, J, M, P, R, S, T, & Z. The first command is the Accept command of the format A aaaa,nnnn,nnnn,nnnn, . . .rubout. It will deposit the first number (nnnn) into the first address (aaaa), and succeeding numbers into succeeding addresses. A rubout terminates input. The next command is the Comment of the form C any data or comment . . .rubout. It can also be used to copy paper tapes. The Dump command is of the format Daaaa. The computer will start dumping the contents of core until any character is entered. The output is of the format of one address and the contents of the next eight addresses. The Edit command is of the format E aaaa,nnnn. The number nnnn will be loaded into location aaaa. The Halt (format H) stops the computer just before the beginning of the program. User may press Continue to start program.

The command Jump of format J aaaa will cause a jump to location aaaa. The binary punch is called with the format M aaaa END bbbb. A binary tape is punched from locations aaaa to bbbb. After the input format is typed, user is to turn punch on and press Continue. After the tape is punched, user is to turn punch off and then press Continue. The command P aaaa will Print the contents of aaaa. The Read continuous of format R aaaa will print the location and contents of aaaa and succeeding locations until any character is pressed. The command Start (format S) is a reserve symbol that now jumps to 7000, the beginning of the program. The command Tape (format T) will translate any binary or RIM tape to octal ASCII printout of address and contents and also load tape into core. The command Zero (format Z) clears core, and places 7402 in all core locations from 0000 to 6757.

# EDIT ROUTINE - Sample Run




"B READY" is the program output whenever the program is started from 6775.

This is an example of four numbers being entered into core starting at location 0000. This is the Accept command. It is terminated with a rubout.

This is an example of Read command. The user input is underlined, the program output is not. User input of any character will terminate output at the end of the line being printed.

"READY" shows control has been returned to user.

This is an example of the Edit command. The number 444 is loaded into 0004.

This is an example of the Print command.

This is an example of the Binary Punch command. Continue was pressed before and after the punching of the binary tape.

Above is an example of the Dump command.

To the left is an example of the above punched binary tape being read into the computer.

This is an example of the Halt command.

# EDIT ROUTINE

STARTING LOCATION = 6775 NOVEMBER 1969 J. R. LEMON

| D676Ø | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|---|
| A 676Ø | 73ØØ | 3356 | 3357 | 73ØØ | 1373 | 3757 | 2357 | 1356 | "Z" = Zero and set to 7402 |
| A 677Ø | 744Ø | 5375 | 5363 | 74Ø2 | "B" | 73ØØ | 1374 | 6Ø44 | locations 0000 to 6756 |
| A 7ØØØ | 7ØØØ | 73ØØ | 1277 | 43ØØ | 7ØØØ | 6Ø31 | 52Ø5 | 6Ø36 | INSTRUCTION LOGIC |
| A 7Ø1Ø | 324Ø | 1242 | 3241 | 1641 | 745Ø | 52Ø4 | 7Ø41 | 124Ø | |
| A 7Ø2Ø | 744Ø | 5234 | 1641 | 6Ø41 | 5223 | 6Ø46 | 73Ø1 | 1241 | Looks for instruction character |
| A 7Ø3Ø | 3241 | 1641 | 3241 | 5641 | 2241 | 2241 | 73ØØ | 5213 | and jumps to appropriate sub- |
| A 7Ø4Ø | AAAA | AAAA | 7043 | "J" | 7310 | "E" | 7313 | "P" | routine at address after character. |
| A 7Ø5Ø | 726Ø | "A" | 7243 | "R" | 7265 | "M" | 74ØØ | "C" | |
| A 7Ø6Ø | 7322 | "D" | 752Ø | "S" | 7ØØØ | "T" | 7336 | "Z" | "S" = Special |
| A 7Ø7Ø | 676Ø | "H" | 6773 | ØØØØ | 7Ø75 | Ø24Ø | 424Ø | 7115 | "H" = Halt |
| A 71Ø0 | AAAA | 3314 | 73ØØ | 1714 | 6Ø41 | 53Ø4 | 6Ø46 | 751Ø | PRINT ALPHA SUBROUTINE |
| A 711Ø | 57ØØ | 2314 | 53Ø2 | 57ØØ | 7565 | Ø24Ø | Ø322 | Ø3Ø5 | "READY CR LF: |
| A 712Ø | Ø3Ø1 | Ø3Ø4 | Ø331 | Ø215 | 4212 | AAAA | 73Ø1 | 337Ø | |
| A 713Ø | 6Ø31 | 533Ø | 6Ø36 | 3371 | 1371 | 1372 | 745Ø | 52ØØ | READ NUMBER SUBROUTINE |
| A 714Ø | 73ØØ | 1371 | Ø375 | 1374 | 744Ø | 533Ø | 73ØØ | 1371 | Reads 4 octal numbers and |
| A 715Ø | 6Ø41 | 535Ø | 6Ø46 | Ø376 | 7ØØØ | 3371 | 73ØØ | 137Ø | returns with number in ACC. |
| A 716Ø | 7ØØ6 | 7ØØ4 | 1371 | 743Ø | 5725 | 5327 | 74Ø2 | 74Ø2 | |
| A 717Ø | 1676 | ØØØØ | 74Ø1 | Ø4ØØ | 772Ø | Ø17Ø | ØØØ7 | 7777 | Rubout returns to instruction logic |
| A 72ØØ | AAAA | 324Ø | 1234 | 3233 | 1236 | 3235 | 1237 | 522Ø | |
| A 721Ø | 7Ø1Ø | 7Ø12 | 7Ø1Ø | 7Ø12 | 7Ø1Ø | 7Ø12 | Ø241 | 1242 | PRINT NUMBER SUBROUTINE |
| A 722Ø | 6Ø41 | 522Ø | 6Ø46 | 2235 | 2235 | 73ØØ | 124Ø | 2233 | Prints number in ACC and |
| A 723Ø | 5635 | 56ØØ | ØØ2Ø | ØØØØ | 7773 | 722Ø | 72Ø6 | Ø24Ø | returns to instruction logic |
| A 724Ø | 724Ø | ØØØ7 | Ø26Ø | 4655 | 33Ø7 | 1257 | 4656 | 4655 | "A" = Accept |
| A 725Ø | 37Ø7 | 23Ø7 | 5245 | 74Ø2 | 7ØØØ | 7125 | 71ØØ | 7123 | Addresses of subroutine |
| A 726Ø | 4655 | 33Ø7 | 17Ø7 | 42ØØ | 5654 | 4655 | 33Ø7 | 73ØØ | "P" = Print |
| A 727Ø | 1257 | 4656 | 73ØØ | 13Ø7 | 42ØØ | 73ØØ | 17Ø7 | 42ØØ | |
| A 73ØØ | 23Ø7 | 6Ø31 | 5267 | 5654 | 424Ø | 73Ø4 | AAAA | AAAA | "R" = Print continuous |
| A 731Ø | 4655 | 33Ø7 | 57Ø7 | 4655 | 33Ø7 | 13Ø5 | 4656 | 4655 | "J" = Jump |
| A 732Ø | 37Ø7 | 5654 | 73ØØ | 6Ø31 | 5323 | 6Ø36 | 6Ø41 | 5326 | "E" = Edit |
| A 733Ø | 6Ø46 | 1335 | 744Ø | 5322 | 5654 | 74Ø1 | 73ØØ | 6Ø31 | "C" = Copy |
| A 734Ø | 5337 | 6Ø36 | 7ØØ6 | 7ØØ6 | 751Ø | 5372 | 7ØØ6 | 6Ø31 | "T" = Tape input |
| A 735Ø | 5347 | 6Ø34 | 743Ø | 5376 | 33Ø7 | 13Ø7 | 37Ø6 | 13Ø6 | |
| A 736Ø | 42ØØ | 73ØØ | 13Ø7 | 42ØØ | 73ØØ | 1257 | 4656 | 23Ø6 | Binary and RIM input loaded |
| A 737Ø | 6Ø32 | 5336 | 1232 | 745Ø | 5654 | 5336 | 33Ø6 | 537Ø | with echo in ASCII |
| A 74ØØ | 4716 | 331Ø | 13Ø7 | 4715 | 4716 | 7Ø4Ø | 131Ø | 3311 | |
| A 741Ø | 74Ø2 | 1263 | 4715 | 73ØØ | 131Ø | 712Ø | 424Ø | 131Ø | "M" = Punch Binary Tape |
| A 742Ø | 4253 | 171Ø | 424Ø | 171Ø | 4253 | 131Ø | 7421 | 231Ø | if location 7432 is changed to |
| A 743Ø | 7ØØØ | 2311 | 5221 | 1263 | 4715 | 74Ø2 | 5713 | 74Ø2 | 5213, tape punched in RIM. |
| A 744Ø | AAAA | 7Ø12 | 7Ø12 | 7Ø12 | Ø252 | 6Ø41 | 5245 | 6Ø46 | Punch first two numbers subroutine |
| A 745Ø | 73ØØ | 564Ø | Ø177 | AAAA | Ø262 | 6Ø41 | 5255 | 6Ø46 | Punch last two numbers subroutine |
| A 746Ø | 73ØØ | 5653 | ØØ77 | 7464 | Ø2ØØ | Ø2ØØ | Ø2ØØ | Ø2ØØ | |
| A 747Ø | Ø2ØØ | Ø2ØØ | Ø2ØØ | Ø2ØØ | Ø2ØØ | Ø2ØØ | Ø2ØØ | 42ØØ | Leader code |

## EDIT ROUTINE (Continued)

| D676Ø | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|---|
| A 75ØØ | Ø24Ø | Ø3Ø5 | Ø316 | Ø3Ø4 | 424Ø | 424Ø | 742Ø | 75ØØ | "END" |
| A 751Ø | AAAA | AAAA | AAAA | 7ØØØ | 7562 | 71ØØ | 7125 | 72ØØ | Addresses of subroutines |
| A 752Ø | 4716 | 3312 | 73ØØ | 1314 | 4715 | 73ØØ | 1312 | 4717 | "D" = Dump |
| A 753Ø | 435Ø | 435Ø | 435Ø | 435Ø | 435Ø | 435Ø | 435Ø | 435Ø | |
| A 754Ø | 7ØØØ | 7ØØØ | 6Ø31 | 5322 | 5713 | 74Ø2 | 74Ø2 | 74Ø2 | Prints the contents of core |
| A 755Ø | AAAA | 73ØØ | 1712 | 4717 | 73ØØ | 7ØØØ | 7ØØØ | 2312 | |
| A 756Ø | 575Ø | 74Ø2 | Ø377 | Ø215 | Ø212 | 43Ø1 | 74Ø2 | 74Ø2 | Not used |
| A 757Ø | 74Ø2 | 742Ø | 742Ø | 742Ø | 742Ø | 742Ø | 742Ø | 74Ø2 | |
| A 76ØØ | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | |
| A 761Ø | 74Ø2 | 74Ø2 | ØØØØ | 62Ø1 | Ø2ØØ | Ø353 | 4177 | 74Ø2 | |
| A 762Ø | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 74Ø2 | 7725 | 3212 | |
| A 763Ø | 426Ø | 13ØØ | 775Ø | 5237 | 2212 | 7Ø4Ø | 5227 | 1212 | BINARY LOADER |
| A 764Ø | 764Ø | 523Ø | 1214 | Ø354 | 1341 | 751Ø | 2226 | 775Ø | |
| A 765Ø | 5626 | 1214 | Ø256 | 1257 | 3213 | 523Ø | ØØ7Ø | 62Ø1 | |
| A 766Ø | 7631 | 5262 | 6Ø31 | 5262 | 6Ø36 | 3214 | 1214 | 566Ø | |
| A 767Ø | 6Ø11 | 527Ø | 6Ø12 | 6Ø14 | 5265 | 4343 | 7Ø41 | 1215 | |
| A 77ØØ | 74Ø2 | 6Ø32 | 6Ø14 | 6224 | 1257 | 3213 | 76Ø4 | 77ØØ | |
| A 771Ø | 1353 | 1352 | 3261 | 4226 | 5313 | 3215 | 1213 | 3336 | |
| A 772Ø | 1214 | 3376 | 426Ø | 3355 | 4226 | 5275 | 4343 | 742Ø | |
| A 773Ø | 5336 | 3216 | 1376 | 1355 | 1215 | 5315 | 62Ø1 | 3616 | |
| A 774Ø | 2216 | 76ØØ | 5332 | 7676 | 1376 | 71Ø6 | 7ØØ6 | 7ØØ6 | |
| A 775Ø | 1355 | 5743 | 5262 | ØØØ6 | Ø3ØØ | ØØØ2 | 6Ø32 | 6Ø31 | |
| A 776Ø | 5357 | 6Ø36 | 71Ø6 | 7ØØ6 | 751Ø | 5357 | 7ØØ6 | 6Ø31 | RIM LOADER |
| A 777Ø | 5367 | 6Ø34 | 742Ø | 3776 | 3376 | 5356 | ØØØ3 | 53Ø1 | |