HELP WANTED

We need to expand our base of operations. The more members we have, the more people who know we exist, the more knowledge we'll accumulate in the areas of program and hardware availability, and the more influence we'll have in the marketplace. I see ads for systems configured for CP/M and Northstar. If we had 300 eligible buyers we could probably convince a software developer to also implement a Micropolis version of the system.

I know that all of you don't have the time or the inclination to write articles for the newsletter. But I really need each and every one of you to assist in documenting the Group's knowledge and in expanding its sphere of influence. Here's how.

(1) MUG exists. Tell your friends, your computer store, your club, your customers.
(2) Send me a list of your friends, computer store, club and customers. The response to my writing to people directly has been good.
(3) Send me a list of your commercial software. It doesn't have to be an article - just the name, cost, where available, and a few choice words expressing your opinion of the package.
(4) Send me a disk of your non-commercial software. I'll add it to the library, copy the library back to your disk and return your disk. Please include return postage.
(5) Send me a list of your peripherals. State whether serial or parallel. For each device, tell me about its dependability, its assets and liabilities. This information will aid me, or anyone developing software for the group, to insert code for customization.

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AN 'IN-PLACE' SORT

by Ed Burkhardt, Box 97, Mequon WI 53092

The following listing, GENSORT, is a routine that I have incorporated into my business software. It is generally used when a few items are added to a data list at a time. Larger files required building a new file while sorting. This was time consuming and hard on the equipment. In addition, it required maintaining two copies of each data disk (the current file and the file that had just been re-ordered).

This program is contrived to take the last few records and blend them into batches taken from the old file, in order. The batch size is determined by the amount of available memory (which is measured by the SPACELEFT function in MDOS).

As each consecutive batch is read from the file, any data from the reserve list (received from the end of the file) is blended into the current batch. Data replaced by the insertion is exchanged in the reserve batch.

Ultimately, the reserve batch contains the data belonging at the end of the file, and is placed there at the conclusion of the run.

Also of interest in the program (and not found in the literature) is the use of the backslash "\" for intergral division. When using terminals equipped with this key, a good deal of time and memory is saved by not having to code the INT(var) device.

```
10      ! GENSORT by Ed Burkhardt, 12/10/80
20      !
50      ! CLEAR SCREEN WITH YOUR SYSTEM COMMAND
90      !
```

```
100     ! ************** SELECT AND OPEN FILE ********************
110     PRINT:PRINT:PRINT:INPUT"  ENTER NAME OF FILE TO BE SORTED ";F$
120     PRINT:INPUT"  ENTER DISK DRIVE NUMBER OF FILE ";E$
130     OPEN 1, E$+":"+F$:L1 = SIZE(1)
140     0%=0:PRINT: !     0% = OFFSET FROM BEGINNING OF FILE
180     !
190     ! ************** SET UP SORT PARAMETERS ******************
200     INPUT"  ENTER NUMBER OF RECORDS TO BE MERGED INTO FILE ";R:PRINT
210     INPUT"  ENTER LENGTH OF LONGEST RECORD (IF UNKNOWN, ENTER MINUS ONE)";LO:PR
        INT
220     DIMT$(250):IF LO>0 GOTO 260
230     LO=0:STRING CHAR$(200):FORI%=1TOL1:GET1,T$:L=LEN(T$):IFL>LO LO=L
240     NEXT I%
250     PRINT"  **** LONGEST RECORD IN THIS FILE IS ";LO: ! MARG OF SAFETY
260   > L3=LO+25 : !                    ADD LENGTH OF KEY SEGMENT
270     L2=SPACELEFT\L3:L2=L2-2*R-20: ! BACKSLASH=INTEGRAL DIV; L2 IS SIZE OF BATCH
        TO BE SORTED
280     ! >>>  CAUTION - SPACELEFT cannot be used after a SIZES statement.If using
        SIZES, enter a STOP line just prior to the SPACELEFT. Determine remaining s
        pace with a direct command, and substitute this value for SPACELEFT.
290     ! ************** SPECIFY DELIMITER FOR KEY RECORD ********
300     INPUT " ENTER THE NORMAL DELIMITER FOR THIS FILE ";I$: ! TO SEPARATE KEY
380     !
390     ! ************** ERROR MESSAGE ********************************
400     IF R>L2 PRINT"   IT IS IMPRACTICAL TO SORT THIS FILE WITH ";R;" SUBSTITUION
        S. USE ANOTHER SORTING METHOD.":CLOSE 1:END
450     DIM E$(L2+R,LO),C$(L2+R,25),R$(R,LO)
480     !
490     ! ***** RE-ENTRY POINT FOR READING IN SORT BATCHES ***************
500     FOR I=1 TO R:GET 1 RECORD (L1-R+I)R$(I):NEXTI: ! BUILD RESERVE
980     !
990     ! *** GET BATCH FROM DISK AND ADD RESERVE TO BE DISSOLVED INTO BATCH **
1000  > IF 0%+L2>L1-R L2=L1-0%-R: ! MOPPING UP - ALMOST FINISHED
1010    GOSUB 5000: ! GET NEXT BATCH FOR SORTING
1020    FOR I=1 TO R:E$(L2+I)=R$(I):NEXT I: ! ADD RESERVE BATCH
1030    FORI=1TOL2+R:C$(I)=LEFT$(E$(I),INDEX(E$(I),I$)-1:NEXTI:  ! GET KEY
1980    !
1990    ! **** SORTING GOES ON HERE - SUBSTITUTE YOUR OWN FAVORITE ROUTINE
2000    L5=L2+R:M=L5:C=0:N=N+1:PRINT:PRINT"SORTING BATCH ";N;": PASS ";
2010  > M=M\2
2020    C=C+1:PRINT C;
2030    IF M=0 THEN 3000
2040    J=1:K=L5-M
2050  > I=J
2060  > L=I+M
2070    IF C$(I)<=C$(L) THEN 2130
2080    T$=E$(I):E$(I)=E$(L):E$(L)=T$
2090    T$=C$(I):C$(I)=C$(L):C$(L)=T$
2100    I = I-M
2110    IF I<1 THEN 2130
2120    GOTO 2060
2130  > J = J+1
2140    IF J>K THEN 2010
2150    GOTO 2050
2990    !
3000  > GOSUB 6000: ! RETURN ORDERED BATCH TO PROPER POSITION IN FILE
3010    FOR I=1TOR:R$(I)=E$(L2+I):NEXT I:! BUILD NEW RESERVE WITH LEFT-OVERS
```

```
3020      IF (0%+L2)<(L1-R) 0%=0%+L2:GOTO 1000: ! GO BACK FOR NEXT BATCH
3980      !
3990      ! ********** GOING HOME !! *****************
4000      0%=0%+L2
4010      FORI=1TOR:PUT 1 RECORD(0%+I)R$(I):NEXT I: ! REPLACE RESERVE
4020      CLOSE 1
4030      PRINT:PRINT:PRINT" >>>>>>>>>>>>>>>>> FINISHED !!!!"
4040      END
4960      !
4970      !
4980      !
4990      ! ********** GET BATCH FROM DISK ************
5000 ><   FOR I%=1TOL2:GET1 RECORD(0%+I%)E$(I%):NEXTI%:RETURN
5980      !
5990      ! ********** REPLACE SORTED BATCH
6000 ><   FOR I%=1TOL2:PUT1 RECORD(0%+I%)E$(I%):NEXTI%:RETURN
```

EDITOR'S COMMENT

ALL RIGHT! Now there's a handy program, Ed. Just the thing for my address lists. Just the thing for anyone's sorted list. I can't say I've figured out exactly what you're doing - yet. But I will. Anyway, it works. However, the field you are sorting on is at the front of the record. I wanted to sort on the sixth field. To allow sorting on any field, I changed your code as follows:

```
 205 INPUT "  ENTER (START=0) NUMBER OF FIELD ON WHICH TO SORT";T:PRINT
 215 DIM D$(250)
1030 FOR I=1 TO L2+R:D$=E$(I):IF T=0 GOTO 1040
1035 FOR Q=1 TO T:B=INDEX(D$,I$):D$=RIGHT$(D$,LEN(D$)-B):NEXT Q
1040 C$(I)=LEFT$(D$,INDEX(D$,I$)-1):NEXT I:!  GET KEY
```

If one is sorting on a short key, say a 5-digit ZIP code, you could add a prompt which asks for field length. The variable receiving the answer would replace "25" in lines 260 and 450. This would save memory space, allowing larger batches. I have another comment about your selection of variables, but that will wait until next month. The program will be speeded up a bit if you put your 5000 & 6000 subroutines inline. Finally, the backslash key on a VG is CNTL SQUARE BRACKET (also useful to know for the BONJOEL database system).

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COMMUNICATIONS PLUS

by Bob Barnum, 1500 S. Ridge Rd., Beloit, WI 53511 WB9UBM

Enlighten MDOS with this console driver (and turn on your modem).

This program was written for SOL-20 using Micropois D.O.S and 8080 assembly language. However, it could be easily modified for other MDOS systems by changing the input, output, and the CRT driver ports.

The program takes the place of the MDOS (CDIN) Console Device Input and gives the user the following advantages; direct control of RS232 input and output, the ability to act as a teminal and be compatable with any modem that uses the RS232 interface.

Once the program is assembled it can be executed by simply typing EXEC D000 or by saving it as a 1B (auto execute). I prefer the latter. Once the program starts, it loads the new value of CDIN at 04F6 in the @CIOTABLE of the RES module, and

(text continued on Page 7)

```
ADDR B1 B2 B3 E LINE LABEL          OPCD   OPERAND

0000            0010 *EQUATES FOR ALL PORTS ARE DEFINED IN THIS TABLE*******
0000            0020 *FA=USERS KEYBOARD INPUT STATUS************************
0000            0030 *FC=USERS KEYBOARD DATA READY**************************
0000            0040 *F8=SERIAL INPUT STATUS********************************
0000            0050 *F9=SERIAL DATA TO INTERNAL DATA BUS*******************
0000            0060 *VDMOT=C054H: SOL'S CRT DRIVER.REPLACE WITH USER'S CRT*
0000            0070 *C04A=SOL'S SERIAL OUTPUT, USER'S SERIAL DRIVER HERE***
0000            0080 *PMOUT IS THE MODEM OR PRINTER DRIVER******************
0000            0090 *DPORT=04EBH IS MICROPOLIS PHYSICAL STREAM CONTROL*****
0000            0100 *FLAG SETUPS ARE DEFINED AS FOLLOWS********************
0000            0110 *SETUP=RS232 ON & OFF (CTRL R & S)*********************
0000            0120 *TERM, TERMINAL ON & OFF (CTRL T & E)******************
0000            0130 *ECHO=NO DOUBLE CHARACTERS ON & OFF (CTRL X & Z)*******
0000            0140 *NOLF=NO LINEFEED OUTPUT (CTRL D & P)******************
0000            0150 *LOAD KEY TURNS PRINTER OR MODEM ON********************
0000            0160 *ESCAPE KEY TURNS MODEM OR PRINTER OFF*****************
0000            0170 *CTRL W = WARMSTART. IT RESETS EVERYTHING**************
0000            0180                ORG    0D000H          ;MODEM FOR SOL
D000 C3 09 D0   0190                JMP    LOAD            ;BY BOB BARNUM
D003 C3 1E D0   0200                JMP    PUSH            ;01/15/81
D006 C3 07 D1   0210                JMP    PMOUT           ;ADDRESS = D006
D009 21 F6 04   0220 LOAD           LXI    H,04F6H         ;I.O ADDRESS
D00C 3E 03      0230                MVI    A,03            ;1ST BYTE TO I.O
D00E 77         0240                MOV    M,A             ;STORE IT
D00F 23         0250                INX    H               ;MOVE POINTER
D010 3E D0      0260                MVI    A,0D0H          ;NEXT BYTE
D012 77         0270                MOV    M,A             ;TO MEMORY
D013 21 0A 05   0280                LXI    H,050AH         ;CONFIGURE PRNT
D016 3E 06      0290                MVI    A,06H           ;LOAD IT
D018 77         0300                MOV    M,A             ;TO MEMORY
D019 23         0310                INX    H               ;INCREMENT PNTR
D01A 3E D0      0320                MVI    A,0D0H
D01C 77         0330                MOV    M,A             ;TO MEMORY
D01D C9         0340                RET                    ;READ EXEC 4-11
D01E            0350 *NOW CDIN AND THE PRINTER ARE CONFIGURED.
D01E            0360 *KEYBOARD INPUT ROUTINE STARTS HERE********************
D01E E5         0370 PUSH           PUSH   H               ;SAVE THIS ONE
D01F DB FA      0380 KEYIN          IN     0FAH            ;KEYBOARD INPUT
D021 2F         0390                CMA                    ;COMPLEMENT A
D022 E6 01      0400                ANI    01H             ;TEST BIT
D024 CA A5 D0   0410                JZ     FLAG            ;SET UP 232
D027 DB FC      0420                IN     0FCH            ;GET PORT DATA
D029 47         0430                MOV    B,A             ;SAVE FOR CRT
D02A FE 18      0440                CPI    018H            ;CTRL X
D02C CA F7 D0   0450                JZ     NECHO           ;NO ECHO
D02F FE 1A      0460                CPI    01AH            ;CTRL Z
D031 CA FF D0   0470                JZ     DOECHO          ;DO ECHO
D034 FE 05      0480                CPI    05H             ;CTRL E
D036 CA DF D0   0490                JZ     TOFF            ;TERMINAL OFF
D039 FE 14      0500                CPI    14H             ;CTRL T
D03B CA D7 D0   0510                JZ     TON             ;TERMINAL MODE
D03E FE 10      0520                CPI    10H             ;CRTL P
D040 CA E7 D0   0530                JZ     PRTON
D043 FE 04      0540                CPI    04H             ;CTRL D
D045 CA EF D0   0550                JZ     PRTOF           ;TERM PRINT OFF
D048 FE 17      0560                CPI    27Q             ;CTRL W
D04A CA AF D0   0570                JZ     WSTART          ;TO ORINGNAL I.O
D04D FE 12      0580                CPI    22Q             ;CTRL R KEY?
```

```
ADDR B1 B2 B3 E LINE LABEL          OPCD   OPERAND

D04F CA 9D D0   0590                JZ     ON232          ;SET UP 232 ON
D052 FE 13      0600                CPI    23Q            ;CTRL S KEY ?
D054 CA 95 D0   0610                JZ     OFF32          ;SET UP 232 OFF
D057 FE 1B      0620                CPI    01BH           ;ESCAPE KEY
D059 CA 83 D0   0630                JZ     STOP           ;JUMP IF IT IS
D05C FE 8C      0640                CPI    08CH           ;LOAD KEY
D05E CA 8C D0   0650                JZ     START          ;JUMP IF IT IS
D061 3A 49 D1   0660                LDA    TERM           ;TERMINAL STATUS
D064 A7         0670                ANA    A
D065 C2 C7 D0   0680                JNZ    POUT           ;FOOL MDOS
D068 E1         0690 HERE           POP    H              ;PUT H BACK
D069 C9         0700                RET
D06A            0710 *RS232 INPUT BEGINS HERE IF SETUP FLAG EQUALS A 1**
D06A DB F8      0720 IN232          IN     0F8H           ;UART STATUS ?
D06C E6 40      0730                ANI    040H           ;TEST FOR DATA
D06E CA 1F D0   0740                JZ     KEYIN          ;IF NOT JUMP
D071 DB F9      0750                IN     0F9H           ;READ DATA
D073 47         0760                MOV    B,A            ;SAVE FOR CRT
D074 3A 49 D1   0770                LDA    TERM           ;TERMINAL STATUS
D077 A7         0780                ANA    A
D078 CA 81 D0   0790                JZ     HERE1
D07B CD 54 C0   0800                CALL   VDMOT          ;IN TERM MODE
D07E C3 1F D0   0810                JMP    KEYIN
D081 E1         0820 HERE1          POP    H              ;PUT H BACK
D082 C9         0830                RET                   ;BACK TO CDIN
D083            0840 *ALL THE REST ARE FLAG SETTING ROUTINES**************
D083 21 EB 04   0850 STOP           LXI    H,DPORT        ;STREAM 2 PORT
D086 3E 00      0860                MVI    A,0            ;DRIVER OFF
D088 77         0870                MOV    M,A            ;TO MEMORY
D089 C3 1F D0   0880                JMP    KEYIN          ;NOW OUTPUTS OFF
D08C 21 EB 04   0890 START          LXI    H,DPORT        ;STREAM 2 PORT
D08F 3E 03      0900                MVI    A,3            ;SAME AS ASSIGN
D091 77         0910                MOV    M,A            ;TO MEMORY
D092 C3 1F D0   0920                JMP    KEYIN          ;ITS ON LETS GO
D095 3E 00      0930 OFF32          MVI    A,0            ;SET UP STORAGE
D097 32 48 D1   0940                STA    SETUP
D09A C3 1F D0   0950                JMP    KEYIN
D09D 3E 01      0960 ON232          MVI    A,1            ;SETUP 232 ON
D09F 32 48 D1   0970                STA    SETUP          ;STORE IT
DOA2 C3 1F D0   0980                JMP    KEYIN
DOA5 3A 48 D1   0990 FLAG           LDA    SETUP
DOA8 A7         1000                ANA    A              ;DO MATH
DOA9 C2 6A D0   1010                JNZ    IN232          ;INPUT 232
DOAC C3 1F D0   1020                JMP    KEYIN
DOAF 21 F6 04   1030 WSTART         LXI    H,04F6H        ;START OVER
DOB2 3E 00      1040                MVI    A,00H          ;FIRST BYTE
DOB4 77         1050                MOV    M,A            ;TO MEMORY
DOB5 23         1060                INX    H              ;ICR POINTER
DOB6 3E 06      1070                MVI    A,006H         ;NEXT BYTE
DOB8 77         1080                MOV    M,A            ;TO MEMORY
DOB9 21 0A 05   1090                LXI    H,050AH        ;RELOAD LDOUT
DOBC 3E E4      1100                MVI    A,0E4H         ;MY SPECIAL CONF
DOBE 77         1110                MOV    M,A            ;YOURS COULD BE
DOBF 23         1120                INX    H              ;DIFFERENT.  NOW
DOC0 3E 05      1130                MVI    A,05H          ;PUT IN VALUE OF
DOC2 77         1140                MOV    M,A            ;CDOUT
DOC3 E1         1150                POP    H
```

```
ADDR B1 B2 B3 E LINE LABEL          OPCD   OPERAND

D0C7 CD 07 D1   1170 POUT           CALL   PMOUT          ;PRINTER OUT
D0CA 3A 4A D1   1180                LDA    ECHO           ;SETUP STATUS
D0CD A7         1190                ANA    A
D0CE C2 1F D0   1200                JNZ    KEYIN
D0D1 CD 54 C0   1210                CALL   VDMOT          ;CRT DRIVER
D0D4 C3 1F D0   1220                JMP    KEYIN          ;FOOL MDOS
D0D7 3E 01      1230 TON            MVI    A,1
D0D9 32 49 D1   1240                STA    TERM           ;STORE IT
D0DC C3 1F D0   1250                JMP    KEYIN
D0DF 3E 00      1260 TOFF           MVI    A,0            ;TERMINAL OFF
D0E1 32 49 D1   1270                STA    TERM           ;STORE IT
D0E4 C3 1F D0   1280                JMP    KEYIN
D0E7 3E 00      1290 PRTON          MVI    A,0            ;LOAD BYTE
D0E9 32 4B D1   1300                STA    NOLF           ;STORE NEW FLAG
D0EC C3 1F D0   1310                JMP    KEYIN
D0EF 3E 01      1320 PRTOF          MVI    A,1            ;LOAD BYTE
D0F1 32 4B D1   1330                STA    NOLF
D0F4 C3 1F D0   1340                JMP    KEYIN
D0F7 3E 01      1350 NECHO          MVI    A,1            ;SET UP BYTE
D0F9 32 4A D1   1360                STA    ECHO           ;STORE IT
D0FC C3 1F D0   1370                JMP    KEYIN
D0FF 3E 00      1380 DOECHO         MVI    A,0
D101 32 4A D1   1390                STA    ECHO
D104 C3 1F D0   1400                JMP    KEYIN
D107            1410 *PRINTER ROUTINE STARTS HERE**************************
D107            1420 *IF TERM IS SET TO 1 OUTPUT ALL ASCII CHARACTERS AS**
D107            1430 *SENT FROM THE KEYBOARD*******************************
D107            1440 *IF NOLF IS SET TO 1 EVERYTHING BUT LINEFEED IS******
D107            1450 *SENT OUT TO THE SERIAL PORT**************************
D107            1460 *IF NOLF AND TERM ARE SET TO ZERO THE LINEFEED IS****
D107            1470 *DELETED BUT C.R. THEN L.F. IS OUTPUT*****************
D107            1480 *IS SENT AFTER A C.R., NOW EVERYTHINGS OKAY**********
D107 C5         1490 PMOUT          PUSH   B              ;SAVE REGISTERS
D108 D5         1500                PUSH   D
D109 E5         1510                PUSH   H
D10A F5         1520                PUSH   PSW
D10B 3A 49 D1   1530                LDA    TERM           ;AM I A TERMINAL
D10E A7         1540                ANA    A
D10F C2 40 D1   1550                JNZ    SKIPA          ;IF YES JMP
D112 3A 4B D1   1560                LDA    NOLF           ;LOAD NO L.F.
D115 A7         1570                ANA    A
D116 C2 3A D1   1580                JNZ    CR
D119 78         1590 CRLF           MOV    A,B
D11A FE 0A      1600                CPI    0AH             ;IS IT L.F.
D11C CA 35 D1   1610                JZ     SKIP
D11F FE 0D      1620                CPI    0DH             ;IS IT C.R.
D121 CA 2A D1   1630                JZ     RWAY            ;FORCE C.R. L.F.
D124 CD 4A C0   1640                CALL   OCO4AH          ;OUTPUT IT IT
D127 C3 43 D1   1650                JMP    PUSH1           ;SKIP THE REST
D12A CD 4A C0   1660 RWAY           CALL   OCO4AH          ;OUTPUT C.R.
D12D 06 0A      1670                MVI    B,0AH           ;L.F. NOW
D12F CD 4A C0   1680                CALL   OCO4AH          ;PRINT L.F.
D132 C3 43 D1   1690                JMP    PUSH1
D135 06 00      1700 SKIP           MVI    B,0             ;NULL OUT B
D137 C3 43 D1   1710                JMP    PUSH1
D13A            1720 *SKIP LINEFEED ROUTINE********************************
D13A 78         1730 CR             MOV    A,B
D13B FE 0A      1740                CPI    0AH             ;IS IT L.F.
```

```
ADDR B1 B2 B3 E LINE LABEL          OPCD   OPERAND

D13D CA 35 D1   1750                JZ     SKIP
D140 CD 4A C0   1760 SKIPA          CALL   0C04AH        ;PRINT THE REST
D143 F1         1770 PUSH1          POP    PSW           ;GET THEM BACK
D144 E1         1780                POP    H
D145 D1         1790                POP    D
D146 C1         1800                POP    B
D147 C9         1810                RET
D148 00         1820 SETUP          DB     0
D149 00         1830 TERM           DB     0
D14A 00         1840 ECHO           DB     0
D14B 00         1850 NOLF           DB     0
D14C    C054    1860 VDMOT          EQU    0C054H        ;SOL CRT DRIVER
D14C    04EB    1870 DPORT          EQU    04EBH         ;ASSIGN STRM 2
D14C            1880                END

ERRORS THIS ASSEMBLY  0000
```

(text continued from Page 3)

the new printer configuration is at location 050A. The new value of CDIN is equated to D003 and the printer is configured at D006. These are the new entry points of CDIN and LDOUT. All MDOS commands remain the save but now there is more control over the situation. I might note that the keys that I am using could be changed to suit your system by changing the control characters. For output to the printer or modem, press the LOAD key. Press the ESCAPE key to turn off the driver. This is handy when sending programs via the modem. When sending source or BASIC files, it keeps the guy on the other end from seeing errors when appending or loading a file. An example would be to press the ESCAPE key, load or append the selected file. Now type LIST, press the LOAD key and RETURN key. The program was just listed as if he were typing in a program, and believe me, I can't type at 300 baud.

Also I might note, that for some reason which is unclear to me, Micropolis software outputs a linefeed and carriage return instead of the opposite. This is taken care of in the printer driver, so it is compatible with systems like CP/M. The other feature I have added is to delete linefeed output. The MDOS LINEEDITOR only looks at a C.R. at the end of a line of text. That is quite apparent if you dump memory and look at the hex format. Therefore, when sending source programs between MDOS systems, the linefeed option must be used, which is CTRL D. An example is to press the ESCAPE key, CTRL D, type LIST, press the LOAD key, and press RETURN. The program in the LINEEDITOR will be listed as usual, but the computer on the other end will be receiving the listing correctly. The CRT works correctly because all of the magic is done with the printer driver. Now press CTRL P to get back the C.R. and L.F. option.

Turn on the RS232 input by using CTRL R and turn it off with a CTRL S. When the program is initialized, it sets up the input and output to an off state. The terminal mode is executed by pressing CTRL T. When exiting the terminal mode, press CTRL E. Also note that CTRL R must be pressed to receive data.

The program flow for the terminal mode is explained for the person who may not have any experience in assembly language. After the program is executed, CDIN is looking for a key to be depressed; if it is a CTRL T it is compared at line 500. When statement at line 510 is true it then jumps to TON (1230) which loads the byte defined as TERM with a one. This sets up KEYIN and IN232 for the terminal mode. After jumping back to KEYIN, and assuming a key is pressed, the character will be stored in the B register at line 430. If the character passes by all of the masking routines, TERM is loaded at line 660 and is tested at 680. Since JNZ (jump not zero) is true we jump to POUT (1170) which calls PMOUT (the printer driver). The next call

is SOL's CRT driver if the echo byte is a zero. If the echo byte is a one, then the JNZ takes effect, and this skips the CRT. The echo is on when CTRL X is pressed, and off if CTRL Z. In either case, we jump back to KEYIN and stay in this loop until CTRL E is pressed. IN232 is handled almost the same way and it also loops back to KEYIN as long as a (C9) RET isn't encountered. This way MDOS doesn't even know we're there, so there aren't any error messages from the MDOS system.

The last function is to get everything back in it's original configuration. CNTL W is the warmstart routine (WSTART). It loads the @CIOTABLE and the @LIOTABLE with the original configuration and jumps to warmstart (04E7H) to reset the system.

The most time consuming part of the program was to find the byte that controlled the printer output. After many hours of looking and dumping memory, I listed SYSQ1 and SYSQ2 on the LINEEDITOR and came up with D1PORT for the logical stream output control byte and D2PORT (04EBH) as the printer control byte. Therefore, all that has to be changed is the number for D2PORT. By changing the byte to a three, the output echos anything that is displayed on the screen. Change the byte to a zero and the output stream is turned off. Also, I might mention that the printer driver is for a KSR 33 and it should be compatible with most serial printers.

In conclusion, this routine will save you time and be handy for using the RS232 interface when controlling the input or output of the modem. Also the ability to use things like the computer bulletin board services is an asset. The modem, by the way, is a DCAT, and it works very well.

EDITOR'S COMMENT

I haven't tried this, other than entering and assembling it. For those with SOL's and a communication need, it should work with minor modification. For other systems, one may have to not only change the port and driver references, but will have to make some changes in control keys and the load address. Since it is well documented, a lot of you will be able to play with it. If Bob, or anyone else, gets it running on other systems, I'll re-publish it. I'd prefer seeing all port, driver, and control key references on the front of the program as LABELS and EQUATES. For example:

```
0010  KBINPUT EQU OFAH    ;SOL KEYBOARD INPUT
0390  KEYIN   IN  KBINPUT ;KEYBOARD INPUT
```

I believe that the Vector Graphic port addresses should be changed as follows: FA=00, FC=01, F8=02, F9=03. If you have a Bitstreamer II, you may have your modem set at 04 and 05, or about forty other places. I haven't looked up the CRT or serial drivers, but they'll be dependent on whether you have a 48K or 56K system.

In almost all cases, you will have to modify the load address. At least I don't have any memory at D000H. SOLs can use system RAM at CB00, 56K VGs can use FC00. Don't take my word for this stuff as I haven't tested it. Whatever you use, you'll have to change lines 180, 260, and 320 to equate to the new load address.

.....

LETTERS

Buzz,
I am pleased to announce the availability of discount purchase prices on all Systemation software products to active members of the Micropolis Users Groups.

Effective February 1,1981, and continuing for a period of 60 days, members may purchase any of our products directly from Systemation at a discount of 10%. Optionally, products may be purchased through any of our authorized dealers at the suggested

retail prices. In this instance, if membership in MUG is noted on our Customer License Agreement Registration card, Systemation will directly return a cash rebate of 15% to the member. Please do not request a discount from the dealer, as it may impose an undue accounting problem for them.

At first glance, the difference in discount rates might appear illogical. However, this philosophy was adopted for a very specific reason. We have made every attempt to price our software packages as reasonably as possible, and I believe that a comparison with other vendors will bear this out. Quite frankly, continuation of this discount program, after the "60 day trial period", will be possible only if it creates an increased sales volume. To this end, we feel that encouraging dealer cooperation will be most beneficial to all. If any MUG member patronizes a dealer who does not represent Systemation, please urge them to contact us. To further encourage support for this project, we have "relaxed" our initial order requirements for any new dealer referred by a MUG member.

In closing, let me commend you on an outstanding job in organizing and maintaining the Micropolis Users Group. If we may offer any support or assistance to the Group, or individual members, please do not hesitate to contact us.

Software Price List

MDOS* Software Packages:		Retail
AUTO/EXEC	System Generator	$40.00
BCMP	Basic Comparison	35.00
BEM	Basic Expansion Module	65.00
CRUNCH	Basic Compactor	35.00
DSM-1	8080/8085 Disk Disassembler	65.00
EDIT/S	Text Editor	45.00
SORT/A	Hybrid Sort	75.00
TR/II	Translator II- BASIC/ASCII	55.00
UTL-1	Disk Utility Package	95.00
XREF	Cross Reference Generator	85.00

MDOS compatible software is available on MOD I or MOD II diskette format. MDOS Rev. #4.0 or later is required.

CP/M** Software Packages:		Retail
UNDELETE	File Recovery	$ 45.00

CP/M compatible software is available on Micropolis MOD I or II, and IBM compatible 8" disk formats. CP/M Rev. #2.0 or later is required.

On all orders, be certain to specify both the operating system and the requested diskette format.

Remember ~ ~ We pay all shipping costs (UPS Blue Label ~ Air) on prepaid orders within the continental United States!!

~ All prices and terms are subject to change without notice ~

* Trademark of Micropolis Corp ** Trademark of Digital Research

Robert S. Zale
Systemation, inc., P.O. Box 75, Richton Park IL, 60471 (312)481-2420

Buzz,
Thank you for your review of the Software Vendor Directory in MUG Newsletter No. 5.

I am planning on a new update of the Directory in January, 1981, in which software for particular operating systems will be more clearly indicated. I also plan to respond to other suggestions for improvements which have been received from purchasers, vendors and reviewers and thereby improve my product.

Your comment that there is no distinction in the Software Vendor Directory between CP/M on Micropolis and Micropolis on Micropolis told me that I must improve my indexing scheme. Actually, I have a section entitled "CP/M" within which are listed software vendors for CP/M systems, which does include Micropolis hardware. However, I must admit that clarification is needed, and I assure you it will be provided in my next printing (No. 4, by the way, since last March).

Joan L. McDaniel, President
MICRO-SERVE, INC., 250 Cedar Hill Avenue, Nyack NY 10960

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Published monthly by the MUG
Subscription (August through July) rates:
U.S., Canada, Mexico; $12/year: Other, $25/year
Mid-year subscribers receive current year's back issues.

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MICROPOLIS USERS GROUP
Buzz Rudow, Editor
604 Springwood Circle
Huntsville AL 35803
(205) 883-2621

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