



WE THINK WE HAVE A BETTER WAY.....

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INTERNATIONAL NORTH STAR USERS ASSOCIATION  
PUBLISHERS OF THE COMPASS NEWSLETTER  
POST OFFICE BOX 1318, ANTIOCH, CA. 94509

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# PLANETS

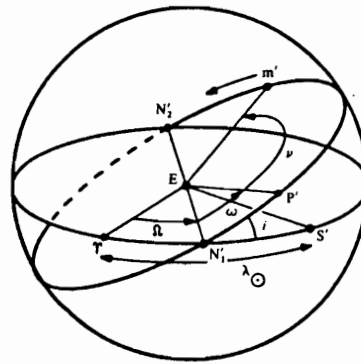
## Planetary Orbits R. Beaver

From time to time we learn of events which occur in the heavens, be it a landing on the Moon, an encounter with Saturn or Uranus, or a spectacular total eclipse of the Sun. These events give us pause to consider the vastness of creation, and provide a moment of surprise, and wonder.

It should be no surprise, however, to realize that with the aid of your personal computer you can predict the positions of the planets, the stars, satellites, and space vehicles, and thus can you gain a front row seat to the drama above. It might even be more fun than Space Invaders!

Here, for your entertainment, is a North Star Basic program that will calculate the positions of the planets at any time of your choosing (4700 BC and later). For dates between 1880 and 2080 the results should be accurate to within a degree. A Map of the solar system is provided for convenient plotting of the results.

While it is beyond the scope of this article to instruct in the calculational details used here, the methods and data are from "Practical Astronomy With Your Calculator", second edition, written by Peter Duffett-Smith and published by Cambridge University Press (1981).



To plot the solar system at a given time, calculate the planet coordinates using the program shown. Place a ruler to line up the Sun and the latitude (degrees) of the planet on the outer scale of the plot. Mark a point along this line which corresponds to the distance (astronomical units). That's the position of your planet!

SUN	☉	SATURN	♄
MERCURY	☿	JUPITER	♃
VENUS	♀	URANUS	♅
EARTH	♁	NEPTUNE	♆
MARS	♂	PLUTO	♇

Plots of the positions of planets make a great gift if calculated for the person's birth date.

New Objects can be added to your solar system by providing orbital elements indicated in the data statements. The calculation should be acceptably accurate for comets with eccentricities 0 to 1, and does not require objects to be in the plane of the Earth's orbit (ecciptic). However, for plotting purposes the plot coordinates are projected onto the plane of the ecciptic, and the scale used for the plot distance from the Sun is not linear.

(Program Listing Continued From Previous Page)

```
800 REM SUBROUTINE TO READ IN THE DATA ELEMENTS
805 READ N
810 DIM O1(N),O2(N),O3(N),O4(N),O5(N),O6(N),O7(N),O8(N),N$(10*N)
815 FOR I = 1 TO N : READ N$(10*I-9,10*I)
820 READ O1(I),O2(I),O3(I),O4(I),O5(I),O6(I),O7(I),O8(I)
825 O3(I)=FNR(O3(I)) : O4(I)=FNR(O4(I))
830 O7(I)=FNR(O7(I)) : O8(I)=FNR(O8(I))
835 NEXT I
840 I"* ORBITAL ELEMENTS READ "*" : RETURN
845 REM ORBITAL ELEMENTS FOR THE SOLAR SYSTEM (DEGREES)
850 REM NAME, EPOCH (JULIAN DAY), PERIOD, LONGITUDE AT EPOCH,
855 REM LONGITUDE AT PERIHELION, ECCENTRICITY, SEMI-MAJOR AXIS,
860 REM ORBITAL INCLINATION, LONGITUDE OF ASCENDING NODE
865 REM (ANGLES IN DEG, DISTANCE IN AU, PERIOD IN YEARS)
870 DATA 9 : REM NUMBER OF PLANETS
875 DATA "MERCURY"
880 DATA 2444238.5,0.24085,231.30,77.14,0.2056,.3871,7.00,48.09
885 DATA "VENUS"
890 DATA 2444238.5,0.61521,355.73,131.29,0.0068,.7233,3.39,76.50
895 DATA "EARTH"
900 DATA 2444238.5,1.00004,98.83,102.60,0.0167,1.000,0.00,0.00
905 DATA "MARS"
910 DATA 2444238.5,1.881,126.31,335.69,0.0934,1.5237,1.85,49.40
915 DATA "JUPITER"
920 DATA 2444238.5,11.862,146.97,14.01,0.0484,5.20,1.304,100.25
925 DATA "SATURN"
930 DATA 2444238.5,29.458,165.32,92.66,0.0556,9.55,2.489,113.49
935 DATA "URANUS"
940 DATA 2444238.5,84.012,228.07,172.74,0.0463,19.22,0.77,73.87
945 DATA "NEPTUNE"
950 DATA 2444238.5,164.80,260.36,47.87,0.009,30.11,1.77,131.56
955 DATA "PLUTO"
960 DATA 2444238.5,250.9,209.43,222.97,0.254,39.78,17.14,109.94
965 REM END OF ORBITAL ELEMENTS
```

Halley's Comet data (in order shown in data statements):  
DATA "Halley"  
DATA 2446472,76.01,170.01,170.01,0.9673,17.94,162.24,58.15  
Note that this comet has a high eccentricity (.9673), is highly inclined relative to the Earth's orbit (162 deg), and has a long period (76 years). Halley's comet is due in early 1986.

```
* ORBITAL POSITIONS OF THE PLANETS *
* FOR 4/ 1/ 1982 ( 2445060.5 JD) *
OBJECT          ANGLE          DISTANCE
-----          (DEG)          (AU)
MERCURY         331.8           .39
VENUS           233.5           .72
EARTH           190.9           1.00
MARS            190.6           .1.64
JUPITER         213.4           .5.43
SATURN          199.0           9.66
URANUS          242.6           18.88
NEPTUNE         264.7           30.32
PLUTO           205.4           28.65
```

(Example Calculation)

# CLIP TIPS

## BASIC

North Star confirms that BASIC Release 5.2 will crash if the EDIT command is misspelled.

```

100 I"          *** ORBITAL POSITIONS OF THE PLANETS ***"
101 I"          ***          ROBERT BEAVER          ***"
102 I"          *** FOR 'THE COMPASS' V2 N1 (1982) ***"
103 IçI
105 REM          ** FUNCTIONS **
110 P1=3.1415927 çREM          -VALUE OF PI.
115 DEF FND(Z)=180*Z/P1 çREM          -RADIAN TO DEGREE.
120 DEF FNR(Z)=P1*Z/180 çREM          -DEGREE TO RADIAN.
125 DEF FNS(Z)=ATN(Z/SQRT(1-Z*Z)) çREM          -ARCSIN.
130 DEF FNT(Y,X) çREM          -4 QUAD ARCTAN.
135 Z=ATN(Y/X) ç IF X<0 THEN Z=Z+P1 ç IF Z<0 THEN Z=Z+2*P1
140 RETURN Z ç FNEND
145 DEF FNC(Z)çREM          -RADIAN MODULO 2*PI.
150 IF Z < 0 THEN Z=Z+2*P1 ç IF Z > 2*P1 THEN Z=Z-2*P1
155 IF Z<0 OR Z>2*P1 THEN 150
160 RETURN Z ç FNEND
165 DEF FNJ(D,M,Y)çREM          -JULIAN DAY.
170 Z=1720994.5ç IF M>2 THEN 175 ç Y=Y-1 ç M=M+12
175 IF Y+M/12+D/365 < 1582.875 THEN 185
180 Z=Z+2-INT(Y/100)+INT(INT(Y/100)/4)
185 Z=Z+INT(365.25*Y)+INT(30.6001*(M+1))+D
190 RETURN Z ç FNEND
195 REM          ** END FUNCTIONS **
200 GOSUB 800 çREM READ ORBITAL ELEMENTS
300 INPUT"* ENTER MONTH,DAY,YEAR FOR CALCULATION (IE 2,1,1982) *",M,D,Y
305 INPUT"* OUTPUT TO DEVICE #",P
310 J=FNJ(D,M,Y)
315 I#PçI#P,"* ORBITAL POSITIONS OF THE PLANETS *"
316 I#P,"* FOR ",M,"/",D,"/",Y," ("",J," JD) *"
320 I#P," OBJECT          ANGLE          DISTANCE"
325 I#P,"-----          (DEG)          (AU)"
330 FOR I=1 TO N ç GOSUB 500
340 I#P,N$(10*I-9,10*I),%10F1,FND(L1)," ",%10F2,R1
350 NEXT I
355 I#P,"----- "
380 END
500 REM COORDINATE CALCULATION FOR I TH OBJECT ON DAY J
501 REM RETURN HELIOCENTRIC LONGITUDE,LATITUDE,AND DISTANCE (L,S,R)
502 REM RETURN PLANE OF ECCLIPTIC PROJECTION (L1,R1)
505 M1=FNR(0.98564733*(J-O1(I))/O2(I))+O3(I)-O4(I)çM1=FNC(M1)çE=M1
510 R=E-O5(I)*SIN(E)-M1çIF ABS(R)<1.0E-6 THEN 520
515 E=E-R/(1-O5(I)*COS(E))çGOTO 510
520 V1=SQRT((1+O5(I))/(1-O5(I)))*SIN(E/2)çV2=COS(E/2)
525 V=2*FNT(V1,V2)çV=FNC(V)çL=FNC(V+O4(I))
530 R=O6(I)*(1-O5(I)*O5(I))/(1+O5(I)*COS(V))
535 S=SIN(O7(I))*SIN(L-O8(I))çS=FNS(S)
540 V1=COS(O7(I))*SIN(L-O8(I))çV2=COS(L-O8(I))çL1=O8(I)+FNT(V1,V2)
545 L1=FNC(L1)çR1=R*COS(S)ç RETURN

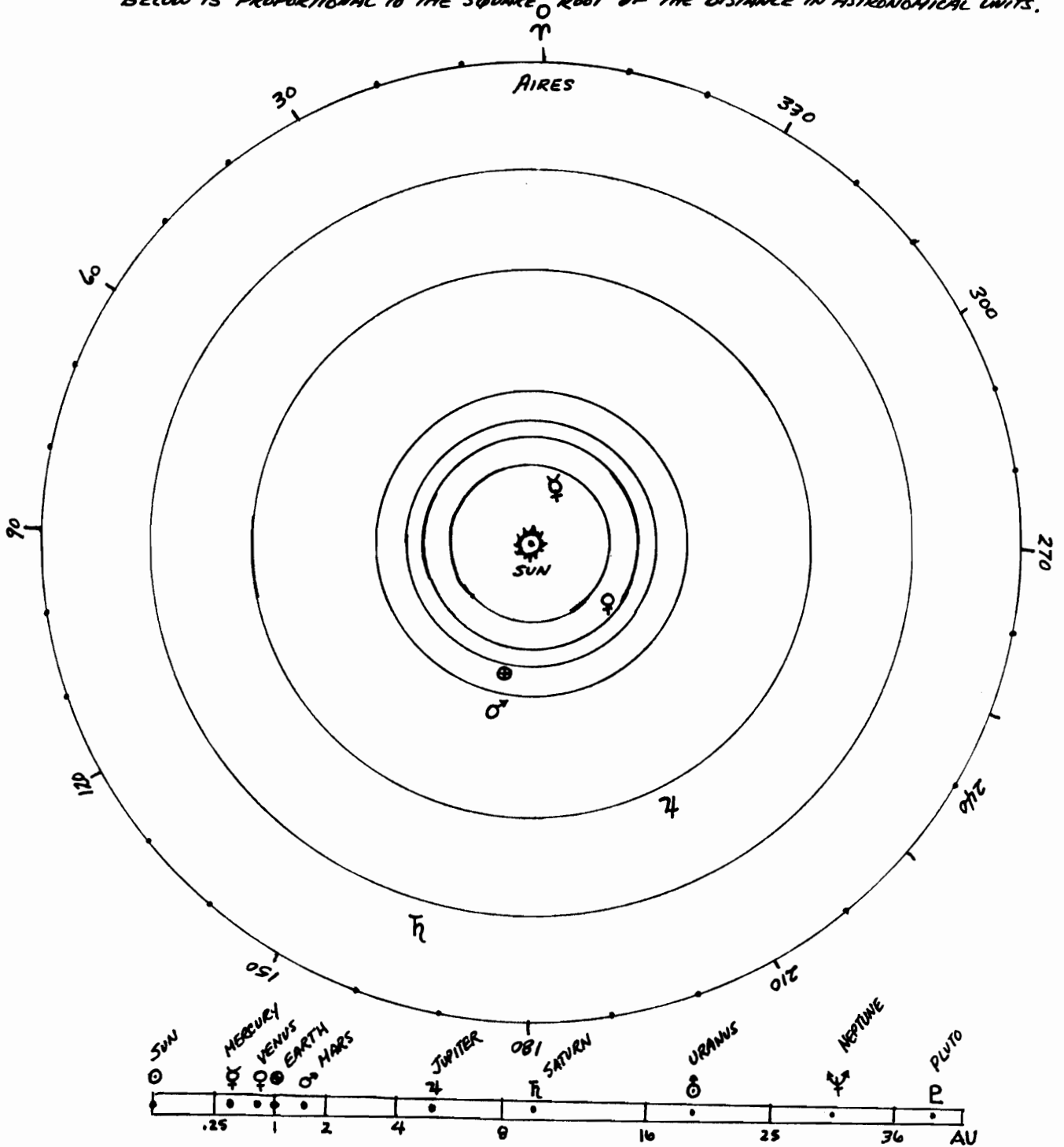
```

(Program Listing Continued on Next Page)

NOTE	PLANETS and other programs appearing in the 'Compass' are available from the INSUA Library.
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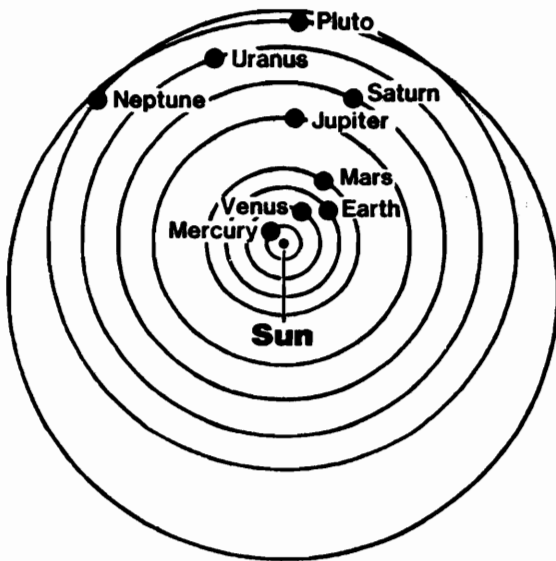
# SOLAR SYSTEM PLOTTER

TO PLOT THE PLANET POSITION, PLACE RULER TO JOIN THE SUN AND THE PLANET ANGLE ON THE OUTER SCALE. MARK A POINT WHERE THE RULER LINES UP WITH THE PLANET ORBIT ON THE INNER RINGS. NOTE THAT THE DISTANCE SCALE SHOWN BELOW IS PROPORTIONAL TO THE SQUARE ROOT OF THE DISTANCE IN ASTRONOMICAL UNITS.



We ran Bob Beaver's PLANETS program for March 10, 1982--anticipated as a day of world-wide catastrophe because of the line-up of all the planets on one side of the sun (an event which occurs on the average of once every 179 years). If you read this note, it will probably mean you will have to wait another 179 years before the real catastrophe occurs.--Ed.

The diagram below shows the "line-up" visually. In fact, the planets do not really line up, but come within an arc of about  $90^\circ$ .



\* ORBITAL POSITIONS OF THE PLANETS

OBJECT	ANGLE (DEG)	DISTANCE (AU)
MERCURY	262.4	.47
VENUS	198.2	.72
EARTH	169.1	.99
MARS	180.7	1.65
JUPITER	211.7	5.44
SATURN	198.3	9.66
URANUS	242.4	18.87
NEPTUNE	264.5	30.32
PLUTO	205.3	28.65

\* FOR 3/ 10/ 1982 ( 2445038.5 JD)

# 64k UPDATE

By Peter Jonas  
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Much has happened since the article "64K for \$100" was written [see Compass, Volume 1 Number 3], all of it good news! The module has been streamlined considerably; it now fits into 3 sockets on the N\* board and should cost less than \$4. THE PARITY FEATURE WORKS FINE! All previous problems disappeared when I discovered and straightened the BENT PIN on one of the 74LS280 (parity check) IC's. While I am somewhat embarrassed about the oversight, I am elated over the end result: PARITY WORKS FINE! The RAM's have already DROPPED IN PRICE; current best price (May 1981 issues of magazines) is \$80 for 64K, add \$10 for parity. The 64K board has passed many hours of testing using RAMTEST3 and RAMTEST5 from the new N\* DOS, version 5.2; these give the full board a real workout, and have yet to show as much as a single error. Converting the N\* 32K board to 64K is a "piece of cake" compared to the 16K-to-64K conversion, at least in theory; instructions are available now for this conversion (either set is \$10 +SASE); the 32K-to-64K conversion is unverified at this time since I do not have the 32K board.

[This article was originally written April 24, 1981, so prices may have changed, in fact probably **dropped**--Ed.]



Special Keys for MicroPro's  
WordStar

When the project ended, I was left with no computer, lots of money and a strong appreciation of North Star BASIC, so near and dear to my favorite BASIC dialect: Hewlett-Packard's desktop computer BASIC. At this time I had started my venture into writing and wanted a computer that would be an excellent word processor as well.

Candidates were Vector Graphics MZ with Memorite III and a North Star Horizon with WordStar. After studying the Vector, I decided I really wanted to stick with North Star. On the other hand, Vector took advantage of their own memory-mapped video and special keyboard to give Memorite good flexibility.

WordStar already can handle memory-mapped video. If you haven't seen WordStar running

# THE I/O FARM

by  
Steve Leibson  
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Boulder, CO 80303

As I promised in the last installment of the I/O Farm, this issue, we are going to soup up MicroPro's WordStar with a little help from the Farm's Software Patch (pun intended). Six months ago, when I wrote the last article, I called this software Warp Drive for WordStar. Since then Bill Godbout has trademarked the Warp Drive name for one of his products so I guess I'll have to think of another (hyperdrive?).

## Introductory Material

Way back in 1977, I had to specify a computer for a consulting job I was doing which produced a telephone for the handicapped. The idea was to cut development time of a microprocessor-based product by writing the program for the prototype in a BASIC with a lot of I/O savvy, a technique to be discussed in the next I/O Farm. This computer turned out to be a SOL with a North Star MDS system added.

this type of display, you haven't seen WordStar really run. I bought a Vector Flashwriter II board for my North Star especially to take advantage of this WordStar feature. It required that I write 1K of code to emulate a Soroc IQ120 terminal most of the time but the performance I get makes it all worth it.

With a serial terminal, whenever WordStar wants to change something on the screen, the following sequence takes place:

1. The 2K-byte screen image in memory is updated.
2. WordStar determines the proper escape sequence required to move the terminal's cursor to the proper place on the screen.
3. The escape sequence is transmitted.
4. If a deletion is to occur, the character is deleted.

5. If a character is to be added to the screen, it is also sent to the terminal.

If WordStar is dealing with a memory-mapped video display, only step 1 takes place. This results in a tremendous performance improvement.

### WordStar's Weak Link

The complaint I always hear about WordStar is that it has too many keyboard control

sequences to memorize. Since I use WordStar constantly, people ask me what control sequences will invoke a particular WordStar feature. Truthfully, I haven't the slightest idea.

It was immediately clear to me that there really were too many control sequences to deal with. Before I started using WordStar, I added the assembly language routine in this article, and never concerned myself with the control codes again.

### Listing 1

```
*****
*
*       SPECIAL KEYBOARD INPUT ROUTINE FOR WORDSTAR
*
* THIS ROUTINE IS PLACED IN THE MORPAT AREA OF WORDSTAR
* AND ADDS USER-DEFINABLE KEYS. IT IS DESIGNED FOR THE
* CHERRY KEYBOARD WHICH HAS 24 SPECIAL KEYS IN ADDITION
* TO A NUMBER PAD. THE SPECIAL KEYS IN THE NUMBER PAD
* ALL SEND VALUES GREATER THAN 127 (THE MOST SIGNIFICANT
* BIT IS SET). THESE NON-ASCII VALUES ARE USED TO DETECT
* THE SPECIAL KEYS. EACH SPECIAL KEY IS TRANSLATED TO
* THE CONTROL CODE DESIRED BY WORDSTAR.
*
* THIS TECHNIQUE DOES NOT REQUIRE ANY INFORMATION ABOUT
* WORDSTAR OTHER THAN THAT SUPPLIED IN THE INSTALLATION
* MANUAL SUPPLIED WITH EVERY SOFTWARE PACKAGE.
*
* NOTE THAT THE ASSUMPTION IS MADE THAT THE CP/M CONSOLE
* STATUS ROUTINE ALREADY WORKS WITH THE KEYBOARD.
*
* STEVE LEIBSON           10/17/81
*
*****
*
* FIRST, DECLARE THE ABSOLUTE LOCATIONS
UCNSTA EQU    02BAH           ;USER CONSOLE STATUS CALL
UCONI  EQU    02BDH           ;USER CONSOLE INPUT CALL
KEYSTAT EQU    8              ;KEYBOARD STATUS PORT
KEYDATA EQU    9              ;KEYBOARD INPUT DATA PORT
MORPAT EQU    02E0H           ;WORDSTAR USER PATCH AREA
KEYRDY EQU    1              ;KEYBOARD READY BIT
PERIOD EQU    0BEH           ;VALUE FOR NUMBER PAD "."
*
* CONSOLE KEYBOARD INPUT CALL
*
ORG      UCNSTA
        NOP
        NOP
        RET
*
ORG      UCONI
        JMP      STATUS
```



## Hardware You Need

This technique requires that you have a keyboard with special function keys. I have a Cherry CB80-12AA keyboard connected to my system. It has 24 user-definable keys which now bear legends such as "Delete Line" and "Scroll Up". The keys have been given the functions of those nasty WordStar control codes.

## The Technique

WordStar has two patch points called UCNSTA and UCONI where you can insert calls to your own keyboard status and input routines. Normally, these are not used and the regular CP/M keyboard status and data routine calls are made. In addition, WordStar has a large patch area called MORPAT where you may place whatever code you wish.

```
*
* NOW FOR THE ROUTINES
*
ORG      MORPAT                ;START OF PATCH AREA
*
STATUS   IN      KEYSTAT       ;READ KEYBOARD STATUS PORT
         ANI     KEYRDY        ;MASK ALL BUT READY BIT
         JNZ     STATUS        ;WAIT FOR READY
*
KEYIN1   IN      KEYDATA       ;GET THE KEYCODE
         ORA     A              ;PREPARE SIGN FLAG
         RP      ;IF MSB NOT SET, DONE
*
* THE DECIMAL POINT ON THE NUMBER PAD IS SPECIAL
*
KEYIN2   CPI     PERIOD        ;CHECK FOR NUMBER PAD POINT
         JNZ     KEYIN3        ;IF NOT, GO ON
         ANI     02EH          ;MASK PERIOD AND MAKE ASCII
         RET
*
* NUMBER PAD KEYS ARE EASY, CHECK FOR THEM
* IF THE KEY IS FROM THE NUMBER PAD, THE CHARACTER IS
* DERIVED BY CLEARING THE MOST SIGNIFICANT BIT.
*
KEYIN3   PUSH    PSW           ;SAVE THE CHARACTER
         ANI     0F0H          ;MASK OUT LOW FOUR BITS
         CPI     0B0H          ;CHECK FOR OTHER # PAD KEYS
         JNZ     KEYIN4        ;IF NOT, USER DEF KEY
         POP     PSW           ;NUMBER KEY, RETRIEVE IT
         ANI     07FH          ;WHACK OFF MSB
         RET
*
* MUST BE A USER DEFINABLE KEY, USE TABLE LOOKUP
*
KEYIN4   POP     PSW           ;GET BACK THE KEYCODE
         ANI     07FH          ;MASK OFF THE MSB

         PUSH    D             ;SAVE D AND E
         PUSH    H             ;SAVE H AND L
         LXI    H, TABLE     ;GET TABLE BASE ADDRESS
         MOV    E, A           ;PUT CHARACTER INDEX IN E
         MVI    D, 0          ;ZERO OUT TOP OF DE
         DAD    D              ;HL=HL+DE
         MOV    A, M           ;LOAD VALUE FROM TABLE
         POP    H              ;RESTORE HL
         POP    D              ;RESTORE DE
         RET                  ;RETURN CONVERTED CHARACTER
```

I have installed the routine of listing 1 at MORPAT with the appropriate corrections to UCNSTA and UCONI. With these, pressing one of the user-definable keys on my keyboard

causes the appropriate control code to be delivered to WordStar. I have accomplished this without spending an extra \$100 for the WordStar customization notes which tell

```

*
* KEYCODE CONVERSION TABLE
*
TABLE      DB      RETURN VALUE      FOR KEYCODE      MEANING
DB          25      ;80H      DELETE LINE
DB          20      ;81H      DELETE RIGHT WORD
DB          7       ;82H      DELETE RIGHT CHAR
DB          1       ;83H      MOVE LEFT ONE WORD
DB          6       ;84H      MOVE RIFHT ONE WORD
DB          12      ;85H      REPEAT FIND
DB          2       ;86H      REFORM PARAGRAPH
DB          15      ;87H      FORMAT PREFIX
DB          16      ;88H      PRINT PREFIX
DB          17      ;89H      COMMAND PREFIX
DB          11      ;8AH      EDIT PREFIX
DB          26      ;8BH      SCROLL UP ONE LINE
DB          3       ;8CH      PAGE UP
DB          18      ;8DH      PAGE DOWN
DB          23      ;8EH      SCROLL DOWN 1 LINE
DB          22      ;8FH      INSERT TOGGLE
DB          9       ;90H      BREAK INTERRUPT
DB          8       ;91H      EXTRA BACKSPACE
DB          14      ;92H      TAB

```

```

*
* THE NEXT 17 TABLE ENTRIES ARE ZERO BECAUSE THE KEYBOARD
* DOESN'T GENERATE THESE CODES
*

```

```

DB          0       ;93H
DB          0       ;94H
DB          0       ;95H
DB          0       ;96H
DB          0       ;97H
DB          0       ;98H
DB          0       ;99H
DB          0       ;9AH
DB          0       ;9BH
DB          0       ;9CH
DB          0       ;9DH
DB          0       ;9EH
DB          0       ;9FH
DB          0       ;A0H
DB          0       ;A1H
DB          0       ;A2H
DB          0       ;A3H

```

```

*
* NOW FOR THE CURSOR CONTROL KEYS
*

```

```

DB          5       ;A4H      UP ARROW
DB          24      ;A5H      DOWN ARROW
DB          21      ;A6H      BREAK INTERRUPT
DB          4       ;A7H      RIGHT ARROW
DB          0       ;A8H      CHERRY SKIPPED ONE
DB          8       ;A9H      LEFT ARROW

```

```

*
* END OF TABLE

```

you how to change the control codes required by the program. (Latest and greatest, MicroPro now wants \$500 for the customization notes!)

Some explanations are in order:

The console status routine is a do-nothing piece of code. The keyboard status isn't checked until the console input routine is called. I originally wrote the routine to work as MicroPro intended and got annoying flicker in the CRT cursor. Now the call to the keyboard input routine traps execution of the program until a key is pressed and the cursor doesn't flicker any more.

All special keys on my keyboard deliver a keycode with the most significant bit set. In addition, the number pad delivers keycodes that look like ASCII codes for the numerals and a period but the most significant bit is again set. Routines KEYIN2 and KEYIN3 screen for number-pad keycodes and simply strip the eighth bit off.

By the time we reach KEYIN4, we have determined that a user-

definable key was pressed. A simple table-lookup routine converts the code from the keyboard into the control code WordStar wants to see and we are done.

This routine has worked on versions 2.1, 2.26 and 3.0 of WordStar. I realize that most of you do not have the keyboard I refer to but many of you have terminals with user-definable keys. The same techniques apply to those terminals. The new Xerox SAM, IBM PC and Osborne 1 computers also have keyboards which can take advantage of this technique.

In addition, I have doubly labelled my keys so that command key words for North Star BASIC and the North Star Editor also reside on these keys. That code lives with my terminal emulator code in ROM at location F000 hex and above. One interesting capability this has provided is with a single-step function while in BASIC. When WordStar is in operation, this code is not used, so the WordStar definitions prevail. If there is enough interest in that code, it will appear in a later I/O Farm.

# GOOFS

Two errors crept inadvertently into the previous issue of Compass (Volume I Number 4).

1) Because of a problem of compatibility, two punctuation-marks in Alan Nelson's **NONUMBER** program were printed as periods. Once again, North\* BASIC makes the following changes:

```
[ becomes (
] becomes )
: becomes \
; becomes ,
```

The documentation provided with **NONUMBER** should facilitate the preservation of [ ] ; ; when BASIC is used for text files.

2) Two diagrams were left off Steve Leibson's **I/O FARM**. Here they are:

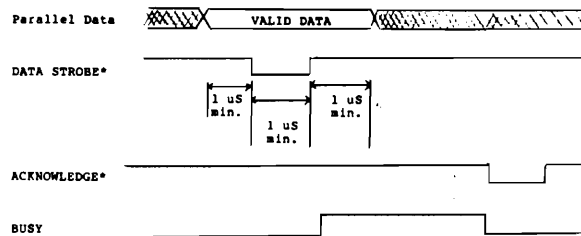


Figure 1: Centronics Parallel Interface Timing

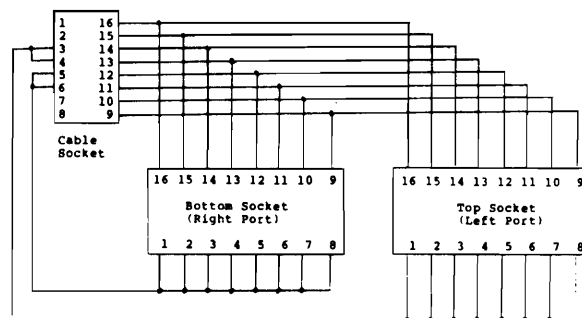


Figure 1: Bit Rate Switch Schematic

# CPMPOWER IS HERE

CPMPOWER--A REVIEW

By Clyde Steiner

Pavel Breder's new software tames the CP/M operating system. With his CPMPOWER you can now even run CP/M without a system disk in drive A ... and no crashes.

For us NorthStar users it means we can access tracks, sectors, and groups on a CP/M disk with the ease that we have always had with good old Dos.

CPMPOWER is more than a user-controlled monitor for CP/M. Like Breder's DOSPOWER, it provides fast disk-to-disk copy by menu-listed number file directory. No more typing or mistyping of file names; just enter the program's assigned number.

The numbered menu is available for RENAMEing files, ERASEing files, TYPING out files, etc.

The disk test command allows you to make use of what might otherwise be a flaky disk. It collects the bad sectors in a special file so they will appear already used to CP/M and will never be written on. All the good sectors on the disk are then still available to the operating system.

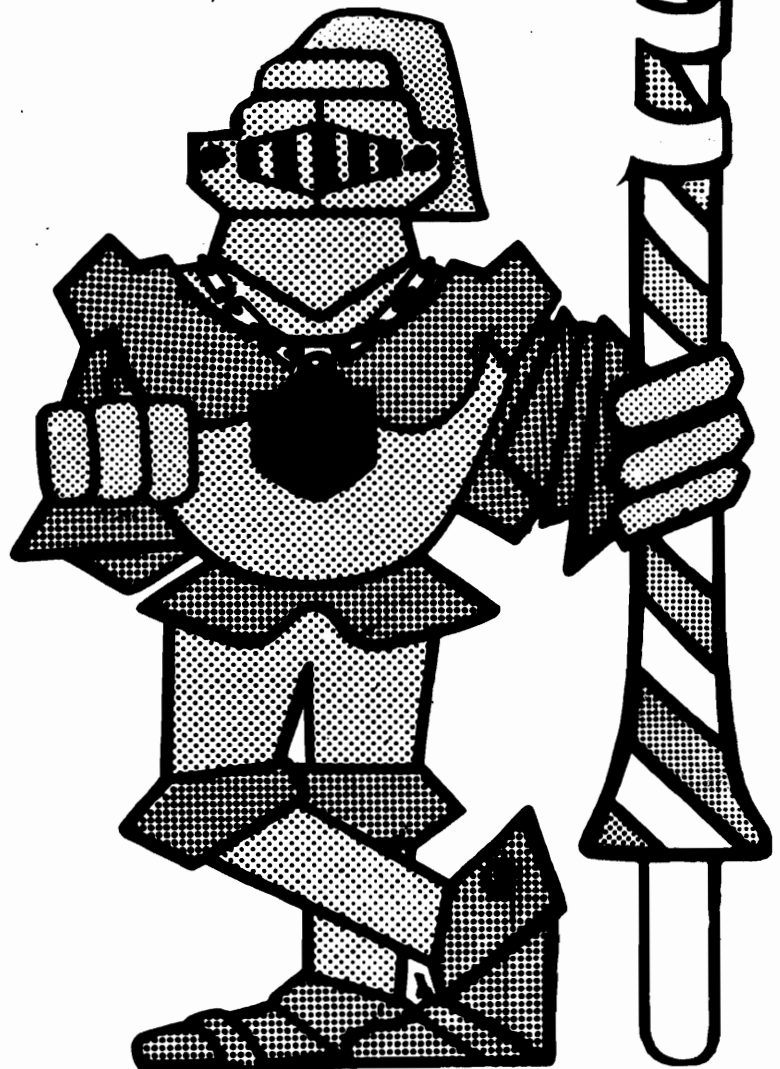
If you ever accidentally erase valuable files on your disks, CPMPOWER can RECLAIM them for you.

CPMPOWER also allows you to LOAD and RUN special programs anywhere in memory (not just 100 HEX). Of course, you can save programs from anywhere in memory. Furthermore, the program transfer to and from memory and disk can either follow the logic of CP/M's access to sector and track, or can individually access any sector and track.

Let me emphasize that all this is done under CP/M's rules, using their "logical" groups, not just duplicating North Star's limited "physical" track and sector access.

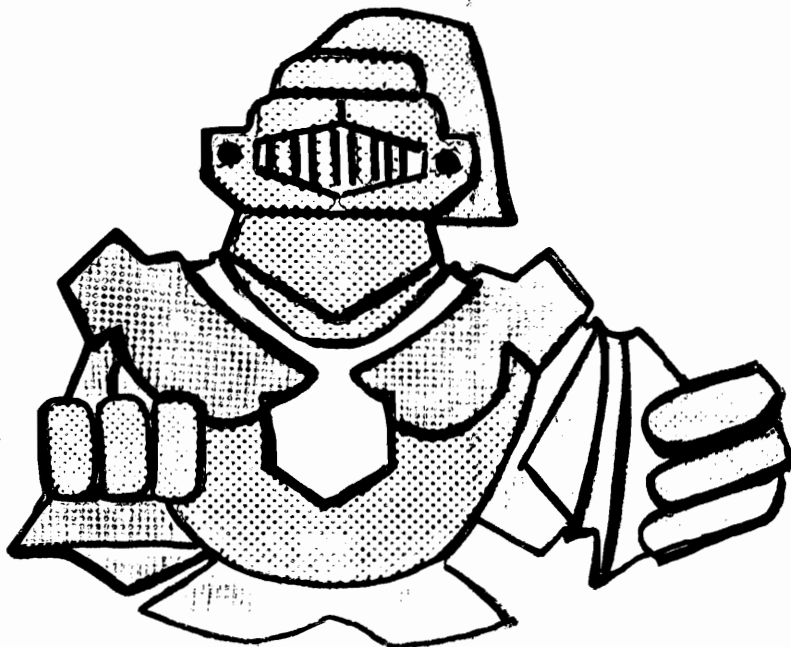
After you have lifted code off the disk into memory, you can manipulate it with CPMPOWER'S own built-in monitor/editor. You can display and change memory in ASCII and HEX, BINARY, and DECIMAL simultaneously.

You can step backward and forward through memory scanning for code and patching it before saving it back to the original disk file, or a new file created by a CPMPOWER.



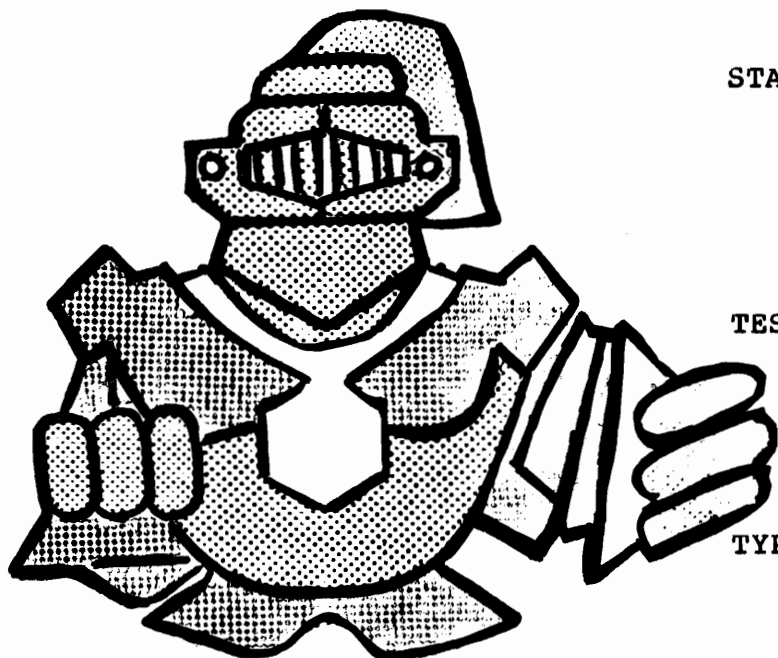
If manual searching does not entice you, CPMPOWER provides for autosearch of memory (with wildcards.) For example, C3 ? ? E8 will find all references to the E8000 block. The SEARCH string in ASCII or HEX can be 128 characters long.

All told, there are about 40 commands available in this intelligent interface to the CP/M operating system. The price for INSUA members for the disk and manual is \$98.00 plus California sales tax. Order from COMPUTING! 2519 Greenwich St., San Francisco CA 94123.

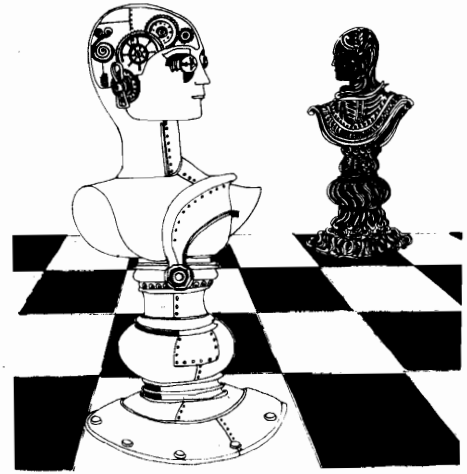


### CPMPOWER COMMANDS

CHECK	read a disk file or program and calculate a CHECKsum	EXEC	jump to address entered and EXECute a program and then return to CPMPOWER
COPY	COPY a file or files from drive to drive	EXIT	EXIT CPMPOWER and jump to custom address (current default is 00 for CP/M warm boot)
DIR	list the DIRectory	FILL	FILL block of memory with Hex byte
DISK	list the DISK parameters and formatting of disk currently in logged disk drive	GO	load and auto-execute a program at any location in memory
DS	Display and optionally Substitute Hex, Ascii, Binary, or Decimal code starting at address entered and single-stepping through memory	JP	JUMP to address entered to execute program or routine and then return to CP/M warm boot
DUMP	DUMP a block of Ascii exactly as contained in memory	LOAD	LOAD a file from disk to any location in memory
DUMPA	DUMP a block of memory in formatted Ascii listing	LOG	list the LOG of CPMPOWER default setting
DUMPH	DUMP a block of memory in formatted Hex listing	MOVE	MOVE block of memory to specified location
DUMPX	DUMP a block of memory in formated Hex & Ascii	READ	READ any track & sector from disk to memory location specified
ERA	ERASE file		



		SPEED	set display SPEED of listings on console
		STAT	list STATistics on remaining free disk space for drives that have been accessed (use ^C first to assure updated statistics if disks have changed)
		TEST	TEST disk media for reading and writing and print unique checksum for entire disk. Collect bad blocks in a file
		TYPE	TYPE a text or ascii file exactly as on the disk
		TYPEA	TYPE an ascii disk file in formatted and numbered 16 character lines
READGR	READ any cpm file group from disk		
RECLAIM	recover previously deleted files from disk and RECLAIM their names in disk directory	TYPEH	TYPE a .COM or other binary file in formatted and numbered 16 Hex character lines
REN	REName file	TYPEX	TYPE a .COM or other Binary disk file in formatted Hex and Ascii listing
RUN	RUN a program from CPMPOWER		
SAVE	SAVE a file to disk from any location in memory	USER	set files to an exclusive USER area (0 to 31)
SEARCH	SEARCH memory for Ascii, Hex or both using wild cards and numbered Hex lines with Ascii letterd at right	USR1-4	space for four USER configurable custom commands is provided. See CUSTOMIZATION notes for entering your own jumps to your own routines.
SETDIR	SET file to \$DIR (listed in directory)		
SETRO	SET file to \$R/O (read only)	WRITE	WRITE memory to any track and sector disk location
SETSYS	SET file to \$SYS (not listed in directory)	WRITEGR	WRITE any cpm file group to disk
SETWR	SET file to \$R/W (read and write)		
SIZE	list file SIZE in sectors and kilobytes	XUSER	set new USER area to recieve transferred files. Thrity two destination user areas available.



# BETTER MEMORY

EXPANDORAM-II WITH N\*

By Warren Lambert

The price of dynamic memory has fallen in the years since the North Star memory board was designed, and N\* memory is very expensive compared to more recent designs. Now you can buy a fast, low-power 32K static memory board with cute features (8/16 bit data, 16/24 bit address, 2k blocking, EPROM substitution, 0.6 amp) for less than \$500, when N\*'s 32K dynamic memory board still costs around \$700.

When I acquired a used 24K Horizon, I bought a 48K Expandoram-II for about \$350 (assembled and tested). The Expandoram-II (E-II) uses the 200 nanosecond 16Kx1 bit dynamic RAM chip which now cost as little as \$2 each, or \$64 for 64K bytes (512K bits) in memory chips. The E-II is available as a kit for about \$50 less.

My long distance N\* dealer advised me against getting the E-II (not a N\* product), and the N\* hotline (back in the days when you could talk to a technician) hinted that I would be sorry for buying a

competitor's product. But if N\* is an S-100 computer you shouldn't have to buy a turnkey system composed entirely of one manufacturer's products; if you want a rigid, inflexible, mother-knows-best computer, it would make more sense to buy Apple or TRS-80 and have a local dealer to scream at.

Technicians at Jade Computer Products said the E-II would work, as did an engineer at SD systems, maker of the E-II and other S-100 boards. SD sent me technical bulletins #109 and #111 which describe revisions to the board. There were six modifications (cuts or jumpers) needed to make the E-II compatible with N\*; the modifications were clearly stated, and it took about half an hour to make the changes with a knife and soldering iron. I called SD systems twice for technical information, and both times an engineer provided information in a clear and nonevasive way.

## The Good News

My 48K E-II board worked flawlessly in memory tests; I've used it for over a year and I

don't remember any memory errors. Every six months or so, I retest it for a few hours with the N\* DOS5.2 memory test program and so far the tests have been perfect. The board has never needed repair, and it runs fine with the 4 megahertz Z-80 central processor without any wait states. At present, I run my 48K E-II with an old Seals 8K MBA static RAM, and the 56K system works fine with N\* DOS and Lifeboat CP/M without any special software patches.

### The Bad News

There were two compatibility problems. First, the E-II and my 16K N\* board were incompatible. When they shared the bus, the N\* board failed to pass memory tests. Second, the reset switch frequently failed to restart the computer. These problems were not important in my case. Having the E-II, I had no use for the 16K N\* board, and to restart, I power down for a few seconds rather than resetting. This cold start is no problem for me, since I use the computer for word processing and rarely restart, but repeated cold starts might stress the

hardware in a system which was often cold-started as assembly language programs go gently into that good night.

### Banking

The E-II has 4 banks of 16K, but the top 16K is not useful, since it overlaps the memory location of the N\* memory-mapped controller. When I tried to use a 64K E-II on my Horizon, the computer failed to bootstrap due to the overlap between RAM and the N\* controller overlap.

The E-II can also be set up in 8 48K byte pages with 16K of common space. This multi-user configuration uses the 64Kx1 bit (4164) dynamic RAM, which now costs around \$20, or about \$600 for 256K bytes, a price which should go down rapidly in the near future. While this 256K byte configuration sounds ideal for MP/M-II (multi-user CP/M), there are serious problems in trying to implement MP/M on a N\* due to the memory-mapped controller.

Overall, I feel that I got good value per dollar with the Expandoram-II; in return for some minor incompatibilities, I saved \$350 and got 48K of reliable memory.

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# MICRO FIX

## FIX FOR MICRO-COUNT II

T. I. Warshauer, author of Micro-Count II, distributed free to original recipients of Compass Volume 1 Number 4 and available subsequently through the INSUA Library, has sent in two fixes to his BASIC GLPREP file.

1) Either delete LINE 12700, or, in the service of possible future debugging, turn it into a REM statement, as follows:

```
12700 REM CLOSE #1
```

2) Change LINE 13000 as follows:

Old version:

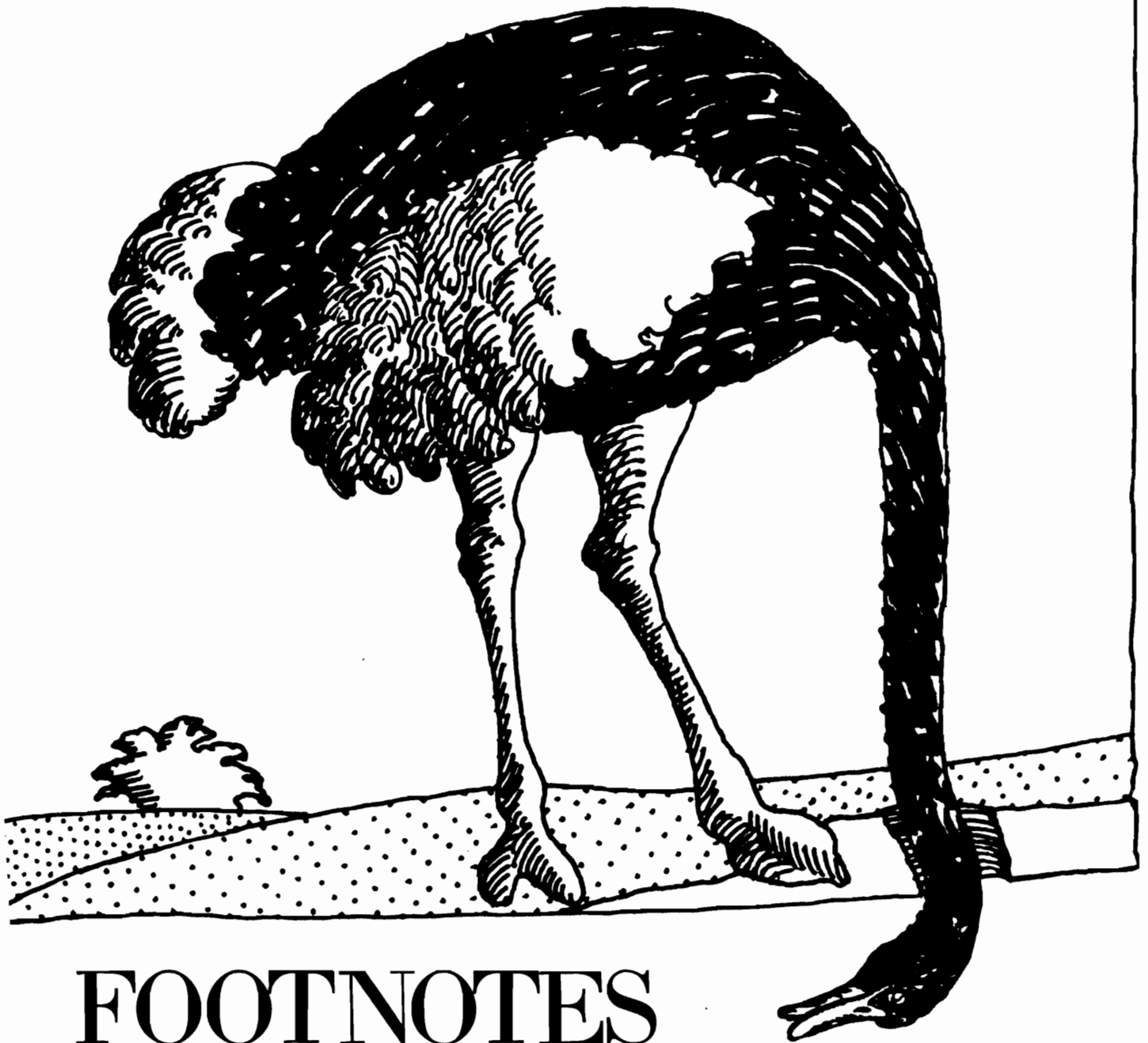
```
13000 CLOSE #2
```

Corrected version:

```
13000 CLOSE #1 \ CLOSE #2
```

INSUA members who acquire Micro-Count II after the period of free distribution should check the GLPREP file to see whether or not the correction has already been made.





# FOOTNOTES

FOOTNOTE--A REVIEW

By Alan H. Nelson

Having first learned word-processing on a large main-frame system, I became used to having powerful editing and formatting commands at my beck and call. Nevertheless, the necessity of going to the machine or tying up a phone line, the tendency of the time-sharing system to be down at crucial times, the sense of the meter running whenever I sat at a terminal, and the

ponderous speed of the system when it became overloaded with users, drove me into the world of microcomputers, specifically the world of Northstar.

With CP/M and WordStar giving me editing and formatting capability as great as and in some respects greater than the main-frame, I willingly resigned myself to the loss of such advanced facilities as footnote handling and automatic numbering. The loss, I argued to myself, was more than offset by the gain in speed and

convenience. Nevertheless, though I realized that WordStar, capable of so much, could not be expected to do automatic footnote formatting, I did think that a numbering facility should have been provided--such a facility was even available on TFS, a somewhat more primitive editor which I learned to use on Northstar DOS as my first micro editor.

An inquiry into another matter (bibliography programs--still an unsolved problem for me) brought me to a telephone acquaintance with Paul Brest of Palo Alto, president of Pro/Tem Software, Inc. To my delight I found that he had devised FOOTNOTE, a complete package for handling footnotes in any one of several clever ways.

I purchased FOOTNOTE from Digital Marketing of 2670 Cherry Lane, Walnut Creek CA 94596, for \$125.00 plus tax, and have been delighted with the results. The program is relatively easy to use and worth the effort of learning well. It handles footnotes expertly, and only when pressed to its limits does it operate in other than a completely straightforward manner.

FOOTNOTE runs on CP/M. Two versions of the program come on the master diskette, FNE.COM for the 8080/8085, and FNZ.COM for the Z-80. The text is typed in using WordStar. Normal formatting conventions are employed, except that a special character is embedded in the text wherever a footnote number is intended. The text of the footnote can be entered in any one of three ways: it may be imbedded within a paragraph, placed at the end of a paragraph, or typed along with all the other footnotes in a separate file. The @ character must appear wherever a footnote number is required, whether in the text or at the beginning of the corresponding footnote. The text of the footnote is preceded by a control-R and finished off with a .pa command. Footnotes

may be typed singly or in groups.

When the text with all the footnotes is completed, it is saved and then FOOTNOTE (logically abbreviated to FN) is run in a separate operation. Running FN brings up a menu with six principal options. Normally the numbering option is invoked first to insert numbers, placing the number 1, for example, in the text and placing the same number at the head of the first footnote, then on to number 2, and so forth. Several numbering styles may be used: the default style is a simple superscripted number, like this.<sup>1</sup> The numbering command will produce an error message if the number of footnote calls in the text does not match the number of footnotes.

The next step is to choose one of three formatting options. The first option will place all the footnotes at the bottom of the page, like this.<sup>2</sup> The second will place the footnotes in a separate file so that they may be placed at the end of the paper, like this.<sup>3</sup> (Actually, I had to cheat a little to put footnotes in both places.) A third option will merge notes from a separate file into the text, so that they may eventually appear at the bottom of the page.

A control-E which appears in front of every footnote number in the file (and on the screen) allows FN to renumber after insertions or deletions, but kindly disappears from print-out.

FOOTNOTE is well documented, and comes with a sample legal text on which to experiment (it makes sense to make a new copy of the sample for each test).

---

<sup>1</sup> And here is the associated footnote.

<sup>2</sup> Here is the note at the foot of the page.

An early version of FOOTNOTE prohibited the use of the .pa command except at the end of each footnote or group of footnotes--this restriction has been corrected in the current release. PRO/TEM is interested in hearing about other bugs if any are discovered (one minor bug has already been corrected).

Out of sheer orneriness, I inserted a twenty-line footnote about two thirds of the way down the first page of a text to see how FOOTNOTE would handle it. Since the first page could not hold both the preceding text and the entire footnote, the program forced the line with the note-call over onto the top of page 2, placing the footnote at the bottom of the new page. A fair amount of blank space was left on page 1. This situation is a typographic nightmare, however, and the program handled it as well as could be expected.

The new user should be cautioned that it takes some practice to get everything just right (for example, it is imperative that the final line of text be finished off with a carriage return). However, the time spent learning the system will be well worth the effort.

## Numbering

FN is extremely useful for automatic numbering, a function which is mentioned in the documentation, but not well described. Examples of this function will serve better than explanations.

Type a list, something like this; the material could be a list of names, paragraphs, or virtually anything at all:

```
^R
@ Bob
@ Dick
@ Joe
@ Harry
```

Bring up FN; make certain the "footnote style" option is set at 2; then run the "number" program (1 or N). Ignore the

error message ("discrepancy between call and footnote number"). The file will now look like this on the screen:

```
^R
^E1. Bob
^E2. Dick
^E3. Joe
^E4. Harry
```

And here is the print-out:

```
1. Bob
2. Dick
3. Joe
4. Harry
```

The file can be edited via WordStar, with insertions and/or deletions:

```
^R
^E1. Bob
^E2. Dick
^E4. Harry
```

```
@ Mary
```

After FN is used again, following the same instructions, the revised print-out will look like this:

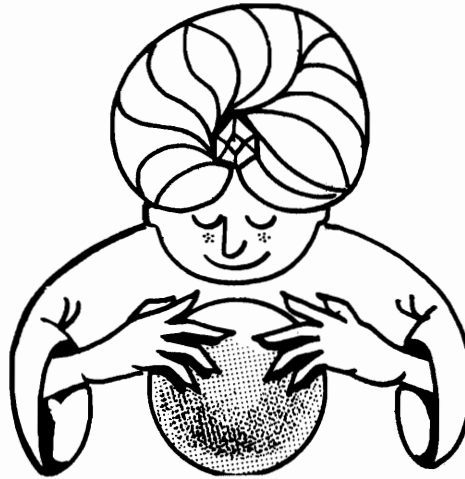
```
1. Bob
2. Dick
3. Harry
4. Mary
```

A bit of ingenuity in running FN and in editing the resulting text (e.g. using other FN options and deleting control-T's), will permit the operator to produce other numbering styles.

## PAIR

FOOTNOTE comes with a useful bonus program called PAIR, which will match up print-control characters like control-S and control-T to make certain that print options like underscoring and superscripting are turned off after they are turned on, or turned on before they are turned off. PAIR will not necessarily pinpoint the missing control character, but will normally alert the user to a problem and will give some idea of where the problem occurs.

3 Here is the footnote appended to the end of the text from a separate file.



# INSIDE THE PROM

By Lance Rose

Accompanying this note are two assembly language programs for North Star's double density disk-controller PROM. The first program is a disassembled North Star PROM commented by Lance Rose; the second includes Rose's modifications for I/O port addressing, again heavily commented. A third assembly language program, a DOS modified by Rose

for I/O port addressing, is too long to print in Compass, but will be included on the INSUA library disk for Volume II Number 1 (the present issue) of Compass. Ask for INSUA disk Number 1010.

Readers interested in I/O port addressing should consult DISKS ON N\* I/O PORT in the previous issue of Compass (Volume I Number 4), by the same author.

;NORTH STAR DOUBLE DENSITY DISK CONTROLLER PROM

```
;
;
      ORG      0E800H
LE800: MVI      C,0AH          ;Set retry counter to 10
      LDA      0EB15H        ;Turn on motors
      MVI      D,30H        ;Wait 48 sector times
      LXI      H,LE80D
      JMP      LE8D3
LE80D: LDA      0EA01H        ;Select drive 1
      LXI      H,LE816        ;Wait 2 sector times
      JMP      LE84D
LE816: MVI      B,0CH        ;Allow 12 sector times to find index hole
LE818: LXI      H,LE81E        ;Wait for sector pulse
      JMP      LE8D1
LE81E: LDA      0EB10H        ;Read A-status
      ANI      40H          ;Check for index hole detect
      JNZ      LE82D        ;Found it
      DCR      B            ;No, try again
      JNZ      LE818
LE82A: JMP      LE82A        ;Didn't find index hole, stop
LE82D: LDA      0EA21H        ;Set step direction to in
      LDA      0EA31H        ;Step in
      LDA      0EA21H
      JMP      LE84A
```

```

LE839:  LDA      0EB20H      ;Read B-status
        ANI      01H        ;Track zero?
        JNZ      LE852      ;Yes
        LDA      0EA01H      ;No, set step direction to out
        LDA      0EA11H      ;Step out
        LDA      0EA01H
LE84A:  LXI      H,LE839    ;Return to check for track zero
LE84D:  MVI      D,02H      ;Wait 2 sector times
        JMP      LE8D3
LE852:  LXI      H,LE858    ;Wait 1 sector time
        JMP      LE8D1
LE858:  LDA      0EB35H      ;Read C-status
        ANI      0FH        ;Mask off sector counter
        CPI      04H        ;Sector 4?
        JNZ      LE852      ;No, try next sector
LE862:  LDA      0EB10H      ;Read A-status
        ANI      04H        ;PLL enabled?
        JZ       LE862      ;No, keep trying
        MVI      A,09H      ;Time delay
LE86C:  DCR      A
        JNZ      LE86C
        LDA      0EB10H      ;Read A-status
        ANI      20H        ;Diskette double density?
        JNZ      LE897      ;Yes
        LDA      0EA21H      ;Set step direction to in
        LDA      0EA31H      ;Step in to track 1
        LDA      0EA21H
        LXI      H,LE887    ;Wait 2 sector times
        JMP      LE84D
LE887:  LXI      H,LE88D    ;Wait for sector pulse
        JMP      LE8D1
LE88D:  LDA      0EB35H      ;Read C-status
        ANI      0FH        ;Mask off sector counter
        CPI      08H        ;Sector 8?
        JNZ      LE887      ;No, try next sector
LE897:  MVI      B,8CH      ;Set time limit to find sync character
        LXI      D,0EB40H    ;Prepare to read data
LE89C:  LDA      0EB10H      ;Read A-status
        RRC
        JC       LE8AE      ;Sync detected?
        DCR      B          ;Yes
        JNZ      LE89C      ;No, try again
LE8A7:  DCR      C          ;Decrement retry counter
        JNZ      LE82D
LE8AB:  JMP      LE8AB      ;Tried 10 times, stop
LE8AE:  LDAX     D          ;Read first byte in block
        MOV      H,A        ;Use it for load address
        MVI      L,01H
        MOV      M,A
        RLC
        MOV      B,A
LE8B5:  LDAX     D          ;Read a byte
        MOV      M,A        ;Store it
        XRA      B          ;Compute CRC
        RLC
        MOV      B,A
        INR      L          ;Increment load address
        JNZ      LE8B5      ;If first 256 bytes, continue
        INR      H          ;Go to next 256 bytes

```

```

LE8BF: LDAX    D           ;Read a byte
      MOV    M,A         ;Store it
      XRA   B           ;Compute CRC
      RLC
      MOV    B,A
      INR   L           ;Increment load address
      JNZ   LE8BF       ;If more, load it
      LDAX  D           ;Read CRC check byte
      XRA   B           ;Compute CRC
      JNZ   LE8A7       ;If non-zero, retry
      DCR   H           ;Back up 100H for go address
      MVI   L,0AH       ;Jump to load address plus 10
      PCHL
LE8D1: MVI    D,01H      ;Wait for sector pulse
LE8D3: LDA    0EB11H     ;Reset sector flag
LE8D6: LDA    0EB10H     ;Read A-status
      ORA   A           ;Sector hole detected?
      JP    LE8D6       ;No, loop again
      DCR   D           ;Count # of sectors in D register
      LDA   0EB11H     ;Reset sector flag in case done
      JNZ   LE8D3       ;More sectors to go
      PCHL
      DB    00H,00H,00H,00H,00H,00H,00H,00H,00H,00H
      DB    00H,00H,00H,00H,00H,00H,00H,00H,00H,00H
      DB    00H,00H,00H,00H,00H,0E1H,0E9H
      END

```



```

;      North Star double density disk controller prom
;      modified for I/O port addressing
;
LE800 EQU    0E800H      ;Disk controller address
;
      ORG    0E800H
;
LE800: MVI    C,0AH      ;Set retry counter to 10
      MVI    A,15H      ;Turn on motors
      IN     LE800/100H+03H
      MVI    D,30H      ;Wait 48 sector times
      LXI   H,LE80D
      JMP    LE8D3
LE80D: MVI    A,01H      ;Select drive 1
      IN     LE800/100H+02H
      LXI   H,LE816      ;Wait 2 sector times
      JMP    LE84D
LE816: MVI    B,0CH      ;Allow 12 sector times to find index hole
LE818: LXI   H,LE81E      ;Wait for sector pulse
      JMP    LE8D1
LE81E: MVI    A,10H      ;Read A-status
      IN     LE800/100H+03H
      ANI   40H          ;Check for index hole detect
      JNZ   LE82D        ;Found it
      DCR   B           ;No, try again
      JNZ   LE818
LE82A: JMP    LE82A      ;Didn't find index hole, stop

```

```

LE82D:  MVI      A,21H           ;Set step direction to in
        IN       LE800/100H+02H
        MVI      A,31H           ;Step in
        IN       LE800/100H+02H
        MVI      A,21H
        IN       LE800/100H+02H
        JMP      LE84A
LE839:  MVI      A,20H           ;Read B-status
        IN       LE800/100H+03H
        ANI      01H             ;Track zero?
        JNZ      LE852           ;Yes
        MVI      A,01H           ;No, set step direction to out
        IN       LE800/100H+02H
        MVI      A,11H           ;Step out
        IN       LE800/100H+02H
        MVI      A,01H
        IN       LE800/100H+02H
LE84A:  LXI      H,LE839         ;Return to check for track zero
LE84D:  MVI      D,02H           ;Wait 2 sector times
        JMP      LE8D3
LE852:  LXI      H,LE858         ;Wait 1 sector time
        JMP      LE8D1
LE858:  MVI      A,35H           ;Read C-status
        IN       LE800/100H+03H
        ANI      0FH             ;Mask off sector counter
        CPI      04H             ;Sector 4?
        JNZ      LE852           ;No, try next sector
LE862:  MVI      A,10H           ;Read A-status
        IN       LE800/100H+03H
        ANI      04H             ;PLL enabled?
        JZ       LE862           ;No, keep trying
        MVI      A,09H           ;Time delay
LE86C:  DCR      A
        JNZ      LE86C
        MVI      A,10H           ;Read A-status
        IN       LE800/100H+03H
        ANI      20H             ;Diskette double density?
        JNZ      LE897           ;Yes
        MVI      A,21H           ;Set step direction to in
        IN       LE800/100H+02H
        MVI      A,31H           ;Step in to track 1
        IN       LE800/100H+02H
        MVI      A,21H
        IN       LE800/100H+02H
        LXI      H,LE887         ;Wait 2 sector times
        JMP      LE84D
LE887:  LXI      H,LE88D         ;Wait for sector pulse
        JMP      LE8D1
LE88D:  MVI      A,35H           ;Read C-status
        IN       LE800/100H+03H
        ANI      0FH             ;Mask off sector counter
        CPI      08H             ;Sector 8?
        JNZ      LE887           ;No, try next sector
LE897:  MVI      B,8CH           ;Set time limit to find sync character
LE89C:  MVI      A,10H           ;Read A-status
        IN       LE800/100H+03H
        RRC                     ;Sync detected?
        JC       LE8AE           ;Yes
        DCR      B               ;No, try again
        JNZ      LE89C

```

# LETS MEET

AGENDA FOR INSUA ANNUAL MEETING  
SAN FRANCISCO COMPUTER FAIRE

SAN FRANCISCO CIVIC AUDITORIUM

ROOM 403

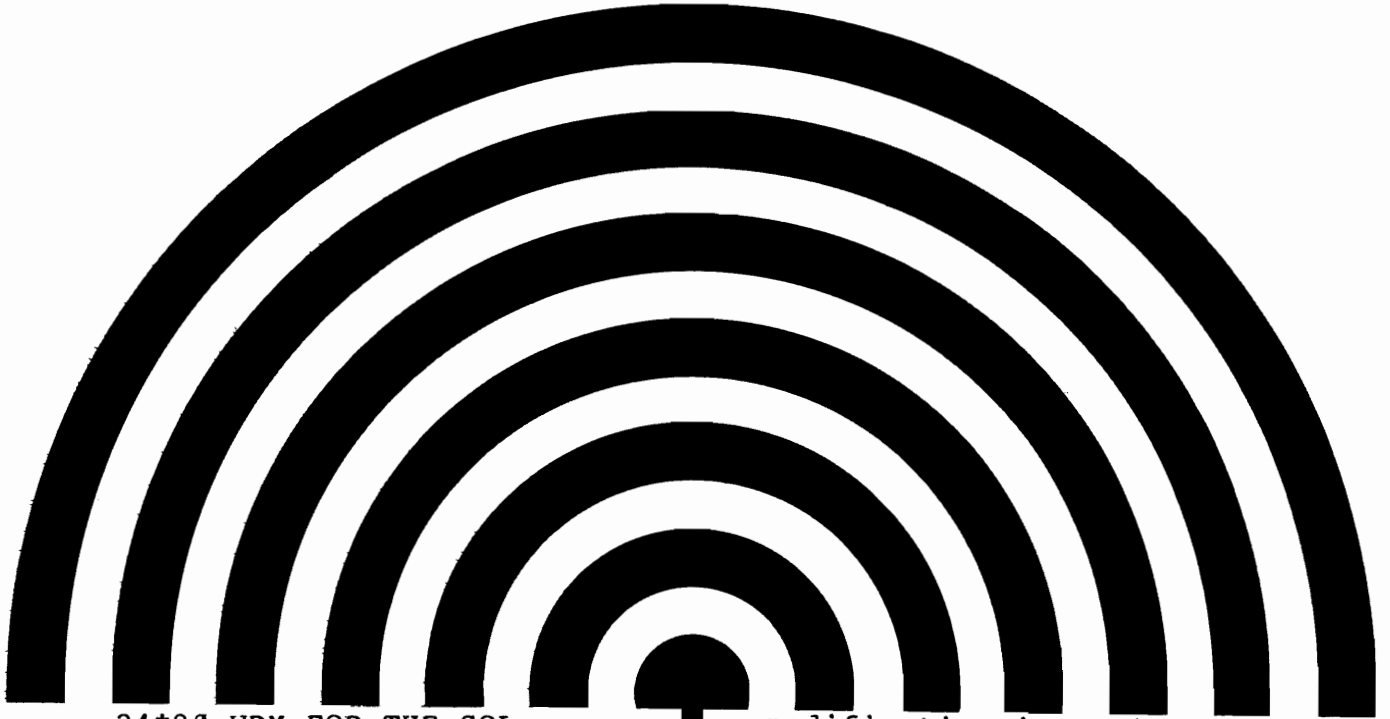
MARCH 20, 1982 12 NOON TO 4 P.M.

12-1 pm	Reception
1-3 pm	Panel Discussion Tentative Panel: T. Warschauer Harley Licht
3 pm	Formal Business Meeting including Elections, followed by informal discussion
4 pm	Vacate Room

```
LE8A7: DCR C ;Decrement retry counter
        JNZ LE82D
LE8AB: JMP LE8AB ;Tried 10 times, stop
LE8AE: MVI A,40H ;Read first byte in block
        IN LE800/100H+03H
        MOV H,A ;Use it for load address
        MVI L,01H
        MOV M,A
        RLC ;Start CRC check
        MOV B,A
LE8B5: MVI A,40H ;Read a byte
        IN LE800/100H+03H
        MOV M,A ;Store it
        XRA B ;Compute CRC
        RLC
        MOV B,A
        INR L ;Increment load address
        JNZ LE8B5 ;If first 256 bytes, continue
        INR H ;Go to next 256 bytes
LE8BF: MVI A,40H ;Read a byte
        IN LE800/100H+03H
        MOV M,A ;Store it
        XRA B ;Compute CRC
        RLC
        MOV B,A
        INR L ;Increment load address
        JNZ LE8BF ;If more, load it
        MVI A,40H ;Read CRC check byte
        IN LE800/100H+03H
        XRA B ;Compute CRC
        JNZ LE8A7 ;If non-zero, retry
        DCR H ;Back up 100H for go address
        MVI L,0AH ;Jump to load address plus 10
        PCHL ;Execute
LE8D1: MVI D,01H ;Wait for sector pulse
LE8D3: MVI A,11H ;Reset sector flag
        IN LE800/100H+03H
LE8D6: MVI A,10H ;Read A-status
        IN LE800/100H+03H
        ORA A ;Sector hole detected?
        JP LE8D6 ;No, loop again
        DCR D ;Count # of sectors in D register
        MVI A,11H ;Reset sector flag in case done
        IN LE800/100H+03H
        JNZ LE8D3 ;More sectors to go
        PCHL ;Done, return to address in H,L
        END
```



# SOL MOVES UP



24\*80 VDM FOR THE SOL

A Hardware Review

By Clyde Steiner

SOL owners who cherish their magnificent machines but bemoan their dinky 64 character screens in the face of modern 80 character terminal oriented software need cry no longer.

Bob Hogg, the creator of the address-relocateable North Star look-alike controller, has come to their rescue.

His VDM modification board uses the standard SOL character generator but produces either an 80\*24 or 16\*64 screen image. The display width is switch-selectable to be compatible with any software.

Is bringing the SOL up to date worth while? When you see 80 beautifully-formed characters on each line with no annoying widow wrap arounds, you will wonder how you did without it.

The key word in that assessment is "when." The

modification is a piggy-back for the SOL's mother board. It is not, however, just plug in and run.

Hogg's modification board is an assembled and tested board--not a kit--but you'll have to have some hardware savvy to install it.

You remove 20 odd chips from the SOL mother board to plug in the 5x8 piggy-back.

There are a couple of jumpers to solder between other chips on the mother board--as well as replacing the SOLOS personality module with HOGG's. It contains new ROMS to handle both the 64 and 80 character video drivers--as well as a bonus of new FILL, MOVE memory, ASCII dump, etc. monitor commands.

The board also provides the SOL with an bell that responds to the standard 07 Hex software error code. In addition, there is a software selectable facility for taking SOL and the VDM in and out of memory if desired.

The 80 characters won't

display properly on the little SANYO monitors used for 64 characters. You'll need a 12" monitor--they run under \$200 now.

The piggy-back board costs about \$250.

We anticipated difficulty with mating dozens of pins that stick down from the piggy-back into the now empty sockets on the SOL motherboard. But Bob Hogg ingeniously got around the problem with a couple of dual ended separate pins that are stuck into empty sockets by themselves before the piggy-back is lowered into place.

The prospective user should be aware, however, that he will have to remove the SOL's backplane and motherboard to do a decent job of installing the VDM expander--there are about 20 screws involved.

We made our modifications in an hour or two and presto! had 80 characters on the screen. But they were all zeros and nines.

It seems that our vintage SOL did not have the factory modifications that were later standard, and our own CPU, though OK in the previous environment, was not up to the demands of this modern VDM environment.

Fortunately Hogg's MICRO COMPLEX Company will put all this stuff right for \$50. He can't fix dead SOLs at that price, of course. But, he will install the VDM modification and make the necessary but perhaps neglected factory designed revisions to your SOL if you ship him the computer or the motherboard.

Bottom line is ... once it was properly installed, the 80 character VIDEO has been running 8-10 hours a day for three months now.

For more information contact: Bob Hogg, MICRO COMPLEX, 25651 Minos St., Mission Viejo CA. 92691

# WANTED



## ARTICLES WANTED

Alan H. Nelson has joined Clyde Steiner as associate editor of Compass for the 1982-1983 INSUA year.

The editors of Compass are on the lookout for articles, reviews, hardware or software information, programs, tips, and news of interest to INSUA members. Volume I of Compass suggests the variety of topics which will be considered appropriate. INSUA presumes an interest in North Star programs and equipment, but extends its interests to a wide range of topics relevant to users with North Star compatible software or hardware. Thus acceptable topics include the Z-80, the S-100 bus, floppy or hard disks and disk drives, BASIC, Pascal, CP/M, machine language and assembly language programs, interfacing with printers, modems, and other computers, editors and applications software, club news, and so forth.

Editors will try to respond to all inquiries, or forward inquiries to appropriate members of INSUA.

In the interest of convenience and accuracy, please send submissions, especially programs and lengthy articles, on hardcopy and on disk (we can handle material written on most editors). Transfer of text or programs over phone by modem can also be arranged.

# GROUPS

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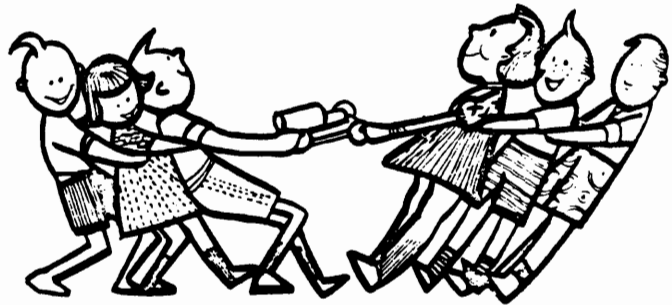
1 CHICAGO AREA NORTH\* USERS GROUP

BY Edgar F. Coudal

**MIDWEST North\* USER** group software Librarian Bob Fulton distributed program disks at the snowy January meeting. All who took disks were to bring them back with disk.doc files at either the February Technical meeting house, or the regular February CACHE meeting. The disk.doc files were to be pure BASIC REM files with the evaluator's comment on each of the programs. [See NONUMBER, Vol. 1 No. 4, for an alternative way of handling text--Ed.] Existing 8" CP/M disks will be downloaded to standard North\* 5" format for the general use of all in the user group.

The January Technical meeting was held on the coldest day in Chicago's history--26 below with a wind chill factor of 83 below--as would seem fitting for a North\* group. Mike Pickard demonstrated his "Northcalc," a Visicalc look-alike written in North\* BASIC, with many powerful features. The February Technical meeting scheduled a further presentation of the ins and outs of the North\* DOS by Steve Keith, further comment on Northcalc by Pickard, and library-building.

**SOFTWARE REVIEWS** at the January CACHE meeting dealt primarily with modem communications. Pickard noted that "Remote," available from Microstuff of Atlanta, is a receive-only program which runs on PMMI hardware. Among its nice features, according to Pickard, are the fact that it is relocatable, picks up the baud rate, and re-boots the entire system when the carrier is broken.



Bob Strand, in discussing "Modem4," noted that it links directly into the North\*, finding itself a nice out-of-the-way niche in high memory, then quietly and efficiently monitors in, out and phone numbers.

Tom Wick keyed in the "NSCOM" program printed in the Jan. 82 Kilobaud Microcomputing and found that one of the nice things about it is that North\* Basic treats input from the phone line just as if it were input from the keyboard, with all the ease of RAM manipulation and disk access which that implies.

Reviews of software at the December meeting covered 3 largely unrelated packages. Steve Keith discussed his modification of a North\* DOS Directory alphabetizer and compacter. Anyone who struggles trying to find something on a Directory that has grown to 3 screens will appreciate that one, as will anyone frustrated by finding the Directory listing for the most recently SAVED program stuck in somewhere up in the top of the directory. Steve also discussed his modification of the DOS queuing, or "type-ahead" program which appeared in Dr. Dobbs last fall. With that one, the user can enter commands while the computer is off somewhere doing its thing. The DOS remembers those commands and executes them when the computer

comes back. Very nice. Finally, Supersoft's "Disk Doctor," a 5-routine package for resurrecting crashed CP/M disks, was reviewed by the correspondent. A must utility program for the serious CP/M user!

**TATE YOSHIDA** reported on interfacing an Epsom 80 printer to the North\*, and displayed some lovely graphics samples generated with the combination, along with the Basic programs that produced them. Tate says that it's done by using the spare, rather than the 8th bit, for the strobe. It's not supposed to be done that way, some say, but it's relatively quick and easy...and works.



**MAJOR NEWS** on the North\* corporate front is the recent deal involving General Binding Corporation of Northbrook IL, wherein a multi-year deal to market North\*-built Horizon and Advantage machines under the GBC brand name was announced. Sales will be handled by GBC's more than 700-person sales and service force, and will include North\* software and other proprietary applications. According to GBC, "We're not just selling a sophisticated piece of hardware...we're providing effective use of that equipment..." GBC expects its new line of North\* computers to build on its already well-established position as a supplier to the office market. Chuck Grant, president of North\*, said that the deal was the largest in the five-year history of the privately held company and will generate an anticipated \$25 million in sales for North\* over the next three years.

**MINOR NEWS** on the North\* corporate front is the reported withdrawal--for the time being, at least--of the storied "octal drives," those 96-track, 5" floppies. Trusted reporter tells us that North\* has scrapped the octal because of "quality control" problems in the manufacturing process.

**JOE ALONSO**, President of Omni Software, the country's largest supplier of business and accounting software for the North\* DOS, notes that he has a connection with a southern California distributor, whereby The Advantage can be purchased for under \$3K (plus freight), which compares to the bare-bones list of \$3995. Omni now is offering more than 30 separate software packages and is readying a new catalog addition, which will include a truly nifty income/expense manager which summarizes everything--gross and net receivables and payables, income tax liability and so on--on one screen, as one of its 12 routines. Ideal for the small businessman.

Joe is at OMNI Software Systems, Inc., 146 Broad St., Griffith, IN.

**FINALLY**, the "Devil's DP Dictionary" defines a number of languages for the uninitiated:

**FORTRAN**--A language developed to boost sale of 80-column cards to engineers.

**COBOL**--A procedurally disoriented language developed by the US Navy...a tot of rum is forced down the throats of middy programmers before they swab their daily deck of cards.

**BASIC**--A simple, mid-level language designed to test students' ability to increment line numbers.

**APL**-- There are three things a man must do

Before his life is done:

Write two lines in APL,

And make the mothers run.



By Wm. David Armstrong

# CALORIES

The program I am contributing should be of benefit to those of us who, after long hours and many Coca Cola's at our terminals, have developed the dread "programmer's spread." It may also answer that perennial question posed by spouse and friends, "So what's it (the computer) good for anyway?" Some time ago I ran across a medical journal article on metabolic rates and decided to incorporate the information into a program which would automatically determine calorie intake requirements for adults. The program asks for your age, sex, height, and daily activity information, and from this data tailors a weight loss program specifically for you.

A few words of caution are in order: It is not wise to attempt

a diet plan which seeks to lose more than about a pound per week. Before starting any weight loss program, check with your doctor. Finally, do not overestimate your daily activity--"vigorous exercise" means activity which causes you to work up a sweat. Activity categories are general classes of energy expended: e.g. riding a bicycle may equal "walking" if done for pleasure, or "vigorous work" if done in competition.

Note that line 50 of the program, which performs direct computer addressing, has two options--one for the SOL-20 computer, and one for computers which use the SORROC IQ120 terminal. A different sequence may be needed for other types of terminals. Also, lines 820 and 1200 contain FILL statements which alter the video display speed in a SOL-20. These lines should be deleted if the program is to be run on a Horizon computer. Finally, the clear screen instruction for a SOL-20 --PRINT CHR\$(11)--should, of course, be changed to PRINT CHR\$(27),"\*" for a Horizon with an IQ120 terminal.

For those who wish to avoid the exercise of typing in the program from the LISTing given here, this program is available on North Star single density diskette for \$10 (plus 6% tax in California) from Armstrong Corporation, P.O. Box 10533, Costa Mesa CA 92627.

```

10 REM CALORIE PROGRAM for North Star BASIC rel.4
15 REM
20 REM (C)1982 Armstrong Corporation
30 REM P.O. Box 10533
35 REM Costa Mesa, CA 92627
40 REM
45 DEF FNA$(X,Y)
50 REM SOROC IQ120: X1$=CHR$(27)+"="+CHR$(Y+32)+CHR$(X+32)
50 REM SOL-20: X1$=CHR$(27)+CHR$(1)+CHR$(X)+CHR$(27)+CHR$(2)+CHR$(Y)
60 RETURN X1$
70 FNEND
80 PRINT CHR$(11) \ FOR I=1 TO 63 \ PRINT "*", \ NEXT \ PRINT
90 PRINT "CALORIE CALCULATION, METABOLIC RATE, DIET PROGRAM"
100 PRINT "By Wm. David Armstrong - (C)1982"
110 FOR I=1 TO 63 \ PRINT "*", \ NEXT \ PRINT
120 DIM Z$(30)
130 PRINT "This program takes age, height, and weight to ",
140 PRINT "determine basic"
150 PRINT "metabolic rate. Daily activity (the number of ",
160 PRINT "hours/day a"
170 PRINT "person sleeps, sits, stands, walks, and has vigorous ",
180 PRINT "activity)"
190 PRINT "determines daily calorie requirement. If the ",
200 PRINT "person desires to"
210 PRINT "lose weight he can input the amount of desired weight ",
220 PRINT "loss and"
230 PRINT "number of weeks. The program then determines the ",
240 PRINT "calories/day"
250 PRINT "by which you must increase your activity to achieve ",
260 PRINT "the loss."
270 PRINT "Also, it will print maximum daily calorie intake ",
280 PRINT "schedule for"
290 PRINT "each week of the diet. The program works for ",
300 PRINT "male or females,"
310 PRINT "age 20-80 with storage of the appropriate constants. ",
320 PRINT "Maximum"
330 PRINT "weight loss should rarely exceed 1 pound/week."
340 PRINT TAB(15), \ INPUT"Press RETURN key to continue: ",Z$
350 PRINT CHR$(11) \ PRINT \ PRINT \ PRINT \ PRINT
360 PRINT "This program is designed for hard copy output."
370 PRINT "You must specify the output port assignment as follows:"
380 PRINT \ PRINT "0 For output to the video screen only."
390 PRINT "1 For output to the serial port device."
400 PRINT "2 For output to the parallel port device."
410 PRINT \ PRINT \ INPUT"ENTER OUTPUT PORT ASSIGNMENT: ",Z
420 IF Z>2 THEN 350
430 PRINT CHR$(11) \ INPUT "ENTER YOUR NAME: ",Z$
440 INPUT"ENTER MALE OR FEMALE: ",A$
450 IF A$(1,1)="F" THEN 480
460 IF A$(1,1)<>"M" THEN 440
470 S=1
480 IF S=1 THEN 510
490 M=-.080769 \ B=37.5769
500 GOTO 520
510 M=-.084615 \ B=39.8
520 INPUT"ENTER HEIGHT (FT,IN): ",H5,H6
530 H=H5*12+H6
540 INPUT"ENTER AGE IN YEARS: ",A
550 INPUT"ENTER WEIGHT IN POUNDS: ",W
560 Y1=6 \ GOTO 590

```

```

570 PRINT CHR$(11)
580 PRINT "HOURS DO NOT EQUAL 24 - TRY AGAIN"
590 PRINT "INPUT HRS/DAY FOR EACH OF THE FOLLOWING ACTIVITIES:" \ PRINT
600 Y1=EXAM(51209)-1
610 PRINT "SLEEPING:      " \ PRINT "SITTING:      "
615 PRINT "STANDING:      "
620 PRINT "WALKING:      " \ PRINT "VIGOROUS WORK: "
625 PRINT FNA$(0,Y1)
630 INPUT1"SLEEPING:      ",S1
635 T=S1 \ PRINT TAB(20),"(24 -",T," =",24-T,")"
640 INPUT1"SITTING:      ",S2
645 T=T+S2 \ PRINT TAB(20),"(24 -",T," =",24-T,")"
650 INPUT1"STANDING:      ",S3
655 T=T+S3 \ PRINT TAB(20),"(24 -",T," =",24-T,")"
660 INPUT1"WALKING:      ",W1
665 T=T+W1 \ PRINT TAB(20),"(24 -",T," =",24-T,")"
670 INPUT1"VIGOROUS WORK: ",V
675 T=T+V \ PRINT TAB(20),"(24 -",T," =",24-T,")"
680 IF T<>24 THEN 570
690 PRINT \ INPUT"ENTER DESIRED WEIGHT LOSS IN POUNDS: ",L
700 INPUT"ENTER NO. WEEKS IN WHICH WEIGHT IS TO BE LOST: ",N
710 S4=(W^.425)*(H^.725)/99
720 B1=M*A+B \ B2=B1*S4
730 D1=0 \ C1=S1*B2
740 C2=S2*(B2+(85-B2)*W/154)
750 C3=S3*(B2+(150-B2)*W/154)
760 C4=W1*(B2+(240-B2)*W/154)
770 C5=V*(B2+(350-B2)*W/154)
780 D1=C1+C2+C3+C4+C5 \ C6=L/N*500
790 IF Z=0 THEN 820
800 PRINT "INSERT PAPER INTO PRINTER - "
810 GOTO 830
820 FILL 51211,12 \ REM SLOWS VIDEO SPEED IN SOL-20
830 INPUT"PRESS RETURN KEY TO CONTINUE: ",B$
840 FOR I=1 TO 60 \ PRINT #Z,"*", \ NEXT \ PRINT #Z
850 PRINT #Z,"COMPUTER DIET PLAN ANALYSIS FOR ",Z$
860 PRINT #Z,"COMPLIMENTS OF <YOUR NAME AT LINE 860>"
870 FOR I=1 TO 60 \ PRINT #Z,"*", \ NEXT \ PRINT #Z \ PRINT #Z,""
880 PRINT #Z,"SEX - ",
890 IF S=1 THEN PRINT #Z,"MALE" \ IF S=0 THEN PRINT #Z,"FEMALE"
900 PRINT #Z,"HEIGHT (IN) = ",H
910 PRINT #Z,"WEIGHT (LBS)= ",W
920 PRINT #Z,"AGE (YRS) = ",A \ PRINT #Z,""
930 PRINT #Z,"HRS/DAY SLEEPING = ",S1," CALORIES = ",C1
940 PRINT #Z,"HRS/DAY SITTING = ",S2," CALORIES = ",C2
950 PRINT #Z,"HRS/DAY STANDING = ",S3," CALORIES = ",C3
960 PRINT #Z,"HRS/DAY WALKING = ",W1," CALORIES = ",C4
970 PRINT #Z,"HRS/DAY VIGOROUS WK= ",V," CALORIES = ",C5
980 PRINT #Z,"" \ PRINT #Z,"DAILY CALORIES TO MAINTAIN WEIGHT = ",D1
990 PRINT #Z,"" \ PRINT #Z,"DESIRED WEIGHT LOSS (LBS) = ",L
1000 PRINT #Z,"NUMBER OF WEEKS = ",N
1010 PRINT #Z,"CHANGE IN CALORIES PER DAY = ",C6
1020 W2=W \ D2=D1
1030 PRINT \ INPUT"DO YOU WISH TO GENERATE WEEKLY SCHEDULE? ",A$
1040 IF A$(1,1)="N" THEN 1200 \ IF A$(1,1)<>"Y" THEN 1030
1050 FOR I=1 TO N
1060 PRINT #Z,"" \ PRINT #Z,"WEEK NO. ",I
1070 PRINT #Z,"WEIGHT      ",W2
1080 A3=D1-C6
1090 PRINT #Z,"MAXIMUM ALLOWABLE CALORIE INTAKE      ",A3
1100 W2=W2-L/N
1110 S9=(W2^.425)*(H^.725)/99
1120 B9=B1*S9
1130 E1=S1*B9

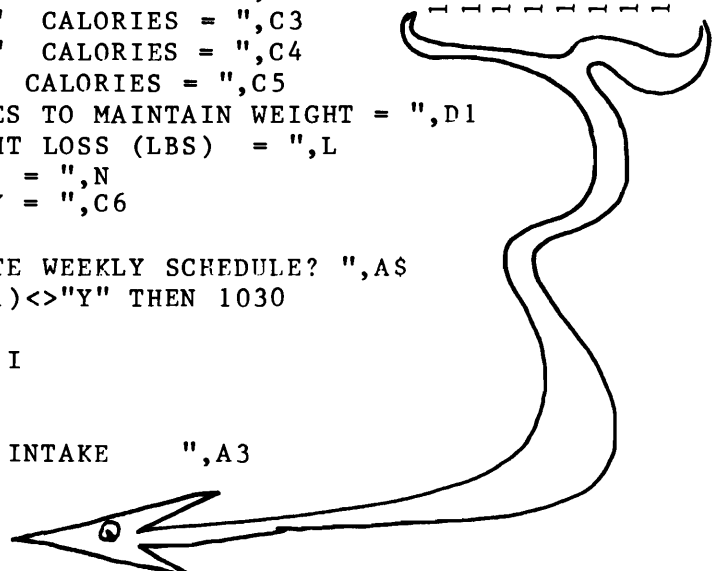
```

```

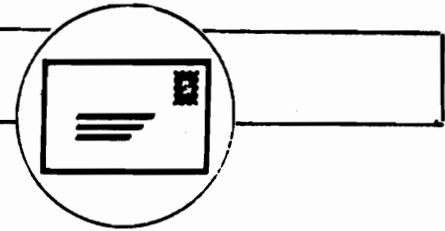
1140 E2=S2*(B9+(85-B9)*W2/154)
1150 E3=S3*(B9+(150-B9)*W2/154)
1160 E4=W1*(B9+(240-B9)*W2/154)
1170 E5=V*(B9+(350-B9)*W2/154)
1180 D1=E1+E2+E3+E4+E5
1190 NEXT I
1200 FILL 51211,0 \ REM RETURN SOL-20 VIDEO SPEED TO NORMAL
1210 END

```

REM RETURN SOL-20 VIDEO SPEED TO NORMAL



# LETTERS



Dear Editor:

[Compass #2 lost in mail.]

...

The other two newsletters I've received have been so good that I would hate to miss out on any issues.

Speaking of the other two Compass's, I would like to tell you how pleased I am with them. Fantastic! DOS 5.2 was a great bargain. I was very glad to hear about Bob Hogg's offer (through Micro Computer Devices) to supply PROM's so that the disk controller address can be changed. I had been wondering for some time how I could relocate the controller, since I don't have the facilities for programming PROM's.

The article that particularly interested me in Compass #3 was Joe Maguire's about using bigger disks with DOS, and the note about using 40 tracks on our "35-track" Shugart drives. As advertised, it works! Your readers may be interested that, after some disassembling, I have got the CD utility program to copy the 5 new tracks as well. There are 5 instructions which must be modified:

```
CD ORG  0D00H
-----
ORG  CD+73H
LD  BC,TRACKS*20  ;<= patch
-----
ORG  CD+8AH
LD  BC,TRACKS*10  ;<= patch
-----
ORG  CD+24DH
LD  A,2*TRACKS    ;<= patch
LD  DE,-TRACKS*20 ;<= patch
RET  C
RRCA
LD  DE,-TRACKS*10 ;<= patch
-----
```

As I hardly ever use BASIC, I'll leave it to someone else to figure out the necessary changes.

The changes to the disk drivers of North Star Pascal are even easier. There are only 3 instructions affected:

```
DISK-
IO ORG  0000H
-----
ORG  DISKIO+0264H
CP  TRACKS      ;<= patch
JP  C,DISKIO+27CH
CP  2*TRACKS    ;<= patch
-----
ORG  DISKIO+279H
LD  A,2*TRACKS-1 ;<= patch
-----
```

The IN and CD utility programs supplied by North Star can be modified by changing the appropriate constants and recompiling. I also wrote a very simple Pascal program which I used to initialize the sectors in the extra 5 tracks of all my disks (Pascal or DOS. For Pascal disks, the program also updates the field in the directory which gives the number of 512-byte blocks on the volume. The field is located 14 (OEH) bytes from the start of the Pascal directory and occupies 2 bytes. (For my double-density system, that word contains the value 340 (0154H).) The directory itself starts in Pascal block #2 (and again in block #6 if the directory is duplicated). Block #2 translates into DOS sector #12 for double- and quad-density drives (block #6 is sector #16). It's great having all this extra space!

Ron Hayter  
3565 W 24th Ave  
Vancouver BC V6S 1L5



# NON CENTS

By Sid Owen

BALANCE = \$ 173.2352 !!??!!

That's non-cents!

You want your new financial program to PRINT "BALANCE = \$173.24." Or maybe you are working in dollars and want "BALANCE = \$173."

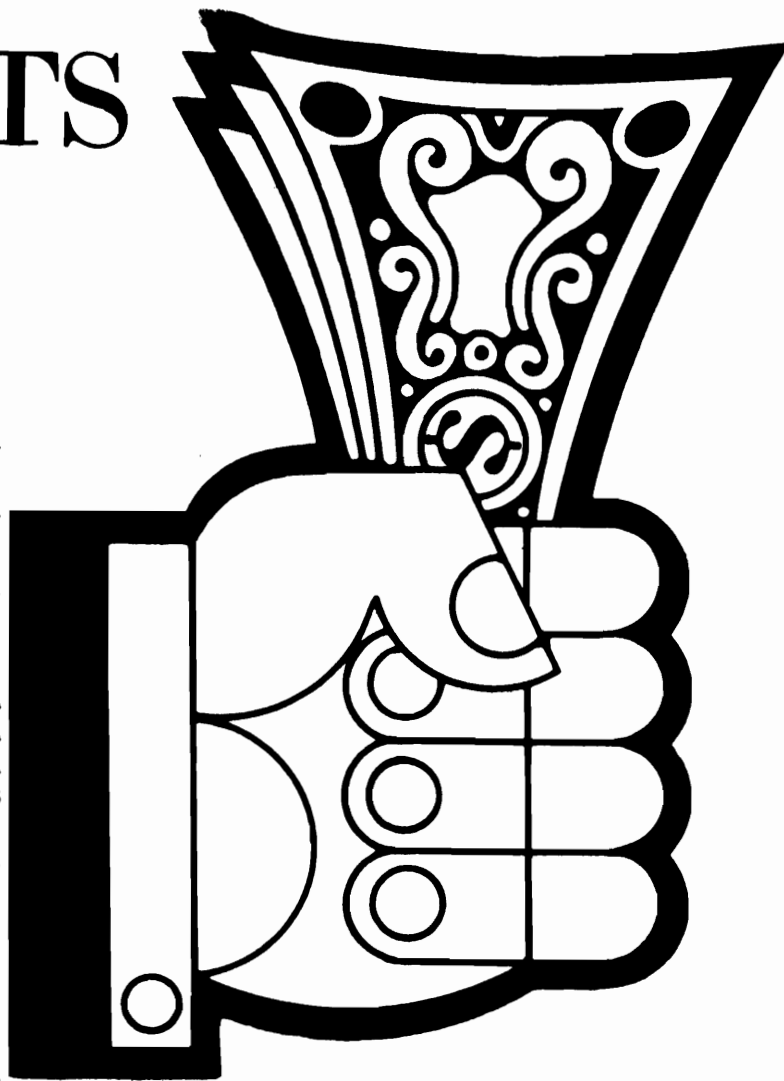
It is time to add a round-off routine.

Fortunately, rounding off can be done in one or two steps in most high level program languages. The illustrations below are in eight-digit BASIC, but the principles are general for most languages.

First let's look at rounding off to the nearest dollar since it is simpler. The INTEger function can be used to discard everything to the right of the decimal point and leave only dollars, but it does not round upward when appropriate. The solution is first to add 50 cents to your amount and then use the INTEger function. If the pennies in that original amount were less than 50, then the dollar digit will not be affected when 50 cents is added. The INTEger function will strip off pennies, leaving the correct dollar amount. If the original amount included 50 or more pennies, then adding 50 cents raises the dollar digit by one. Now the INTEger function will leave the correct, rounded up dollar value. This can be done in a one line routine:

```
N2 = INT (N1 + .50)
```

where N1 is the original amount and N2 is the dollar-rounded equivalent of N1.



Rounding off to the nearest penny is nearly as easy. When working with pennies, we want to round off the pennies digit and then discard digits smaller than pennies. This is done in four steps:

1. Add 1/2 cent (i.e. .005). This will round upward the pennies digit if appropriate.
2. Multiply the new value by 100. Dollars and cents (already rounded) will then be to the left of the decimal point.
3. Discard digits to the right of the decimal point with the INTEger function.
4. Divide by 100 to undo step 2 and put the decimal point back where it belongs.

## AUTOMATIC ROUNDING OFF

Suppose that you are working with large values. Your eight digit BASIC language can keep track of dimes but not pennies when seven digits are needed to express the dollars, so the machine rounds off to the nearest dime.

### Program 1: Machine Round-Off

```
10 INPUT N1
20 PRINT N1
```

RUN

```
?1000000.45
1000000.5
```

READY

If you must frequently work with large values the best solution is a higher precision BASIC.

But did you note in Program 1 that the round-off was automatic? Suppose you needed only six digits for dollars. Then your eight digit language will handle \$700,000.25, but \$700,000.255 would be rounded to \$700,000.26 automatically. This suggests the round-off technique of Program 2:

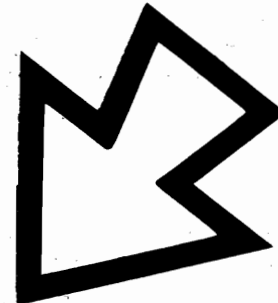
### Program 2: Forced Round-Off

```
10 INPUT N1
20 N2 = N1 + 100000
30 N3 = N2 - 100000
40 PRINT N3
```

RUN

```
?173.2352
173.24
```

READY



## INSUA LIBRARY NEWS

The INSUA library system has run into a slight problem as a result of a clash between its two goals of providing up-to-date files and programs, and giving the best value for money. Compass 3 and Compass 4 of the first INSUA year have now been made available on a single disk. The resulting renumbering caused some confusion in the last issue

of Compass. Sid Owen reports that the numbering of disks 1001 through 1008 has now been fixed in perpetuity. The present issue of Compass will be available on disk 1010. Number 1009 will probably not be assigned. The correct INSUA library numbering is given in the accompanying list; in any case, all disk orders should include **Number, Title, and Cost.**

Number	Title	Cost
1001	DOS, 5.2, Single Density	\$10
1002	DOS, 5.2, Double Density	10
1003	Telestar	15
1004	Compass 1	15
1005	Compass 2	15
1006	Assembler, Disassembler	15
1007	Compass 3 & Compass 4	15
1008	Micro-Count II	15
1009	(none)	15
1010	Compass II, Number 1	15

Adding the 100,000 forces 6 digits to be used for dollars, leaving two digits for dimes and cents. The machine will automatically round off fractions of a cent without being commanded. Then subtracting 100,000 recovers the rounded off input. This method may be reduced to one line of computation:

Program 3:  
**One-Step Forced Round-Off**

```
10 INPUT N1
20 PRINT N1 + 1E5 - 1E5
```

If you are working with even dollars, use:

```
PRINT N1 + 1E7 - 1E7
```

You will probably round off frequently in your program, so early in the program let  $S = 1E5$  and  $O = 1E7$ . The line above then simplifies to:

```
PRINT N1 + O - O
```

Why "S" and "O" for the constants? Because those letters are your author's initials! Ahhh SO!

Program 4: **Error Due To Rounding Off Too Late**

[Note: Some spaces have been deleted from programs 4 and 5 to make lines fit column--Ed.]

```
10 PRINT "PRINCIPAL = ",
20 INPUT N1
30 I1 = N1 * .0725
40 PRINT "INTEREST = ",I1
50 N2 = N1 + I1
60 PRINT "SUM = ",N2
70 N3 = INT(100*(N2+.005))/100
80 PRINT "ROUNDED SUM = ",N3
```

RUN

The one line BASIC routine to accomplish this is:

```
N2 = INT (100 * (N1 + .005))/100
```

This is the classical round-off technique. Now look at another method.

```
PRINCIPAL = ?10000.20
INTEREST = 725.0145
SUM = 10725.215
ROUNDED SUM = 10725.22
```

READY

Program 5: **Correct Rounding Off During Calculations**

```
10 S = 1E5
20 PRINT "PRINCIPAL = ",
30 INPUT N1
40 I1 = N1 * .0725
50 PRINT "INTEREST = ",I1
60 I2 = I1 + S - S
70 PRINT "ROUNDED INTEREST=",I2
80 N2 = N1 + I2
90 PRINT "SUM = ",N2
```

RUN

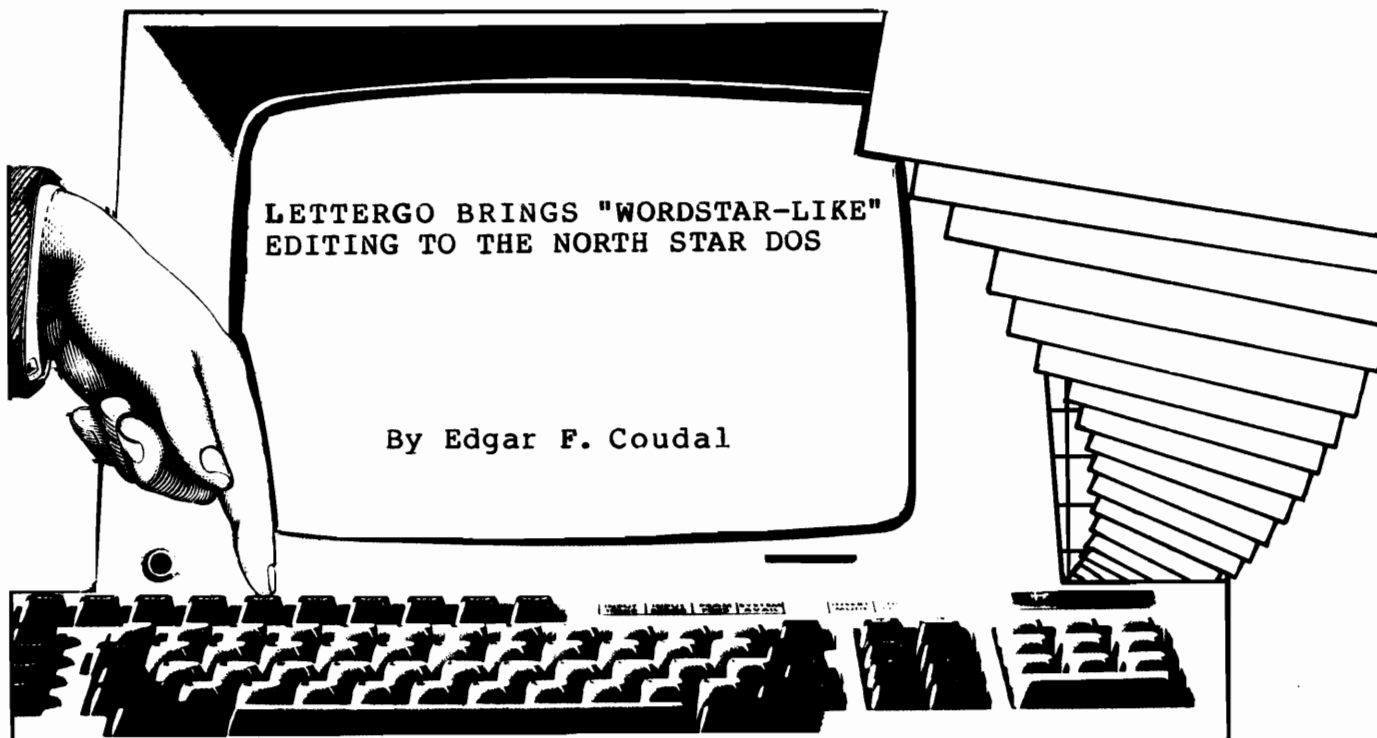
```
PRINCIPAL = ?10000.20
INTEREST = 725.0145
ROUNDED INTEREST= 725.01
SUM = 10725.21
```

READY

**GOOD PROGRAMMING PRACTICE**

As a general precaution you should round off at every logical point in your program to avoid computational errors from unexpected automatic rounding off. That is, do not wait until the end of the program to round off. Programs 4 and 5 illustrate this problem and the solution. They compute 7-1/4 percent interest of the input and add the interest to the input. The programs also show the two methods of rounding off.

The problem with delayed rounding off as shown in Program 4 is that the language rounded off the SUM to fit into eight digits and then the program round-off step rounded off the seventh digit based on the altered eighth. Since most values do not cause machine round-off, this type of error is difficult to trace. Program 5 avoided the error by rounding the interest before it was added so that no uncontrolled machine rounding-off occurred. continued



# LETTERGO

A new word processor is on the market for the North Star DOS, and it has capabilities rivalling those of such high performance CP/M word processors as Wordstar.

LetterGo is priced at \$495 and is a product of Datek Systems, Inc., of Arlington, Va.

LetterGo offers you one menu, for disk operations, and a 10-command print formatting line at the top of the working screen. The rest of what you need is in the manual, not in the program.

The great beauty of the program is that it turns the North Star--and other S-100 mainframes--into fully flexible, cursor/screen oriented word processors, with all the capabilities of those \$7,000 to \$15,000 stand-alone processors being peddled today, but which can't handle data base management, accounting, scientific, business, or pure calculation applications as can a microcomputer such as the North Star.

The system can be configured for various manufacturers' hardware, upon order from the

publisher or distributor, and can be re-configured to accommodate user changes in hardware.

A review copy came ready to run on my double-density North Star, and was pre-set to accommodate its Soroc 120 terminal and Diablo 1610 printer...Boot, load and edit.

After seeing the system in action, and using it almost exclusively for the last six months, I have the same two major beefs with LetterGo, but they are complaints that extend to virtually all other word processors as well. First, it will not show righthand justification on the screen, but instead lets you estimate what those final lines are going to look like. Second, it won't spool-print, which means that a long manuscript coming off my relatively slow Diablo ties up the computer while it's printing.

One other complaint is the excess of riches. With LetterGo, one can direct the printer to overstrike, boldface, and underline simultaneously. Why on earth would anyone want to do that?

LetterGo was written by Gregory Heise, owner of a computer shop, and a high-class

hacker of long standing, who has seen uninitiated users struggle with unnecessary complication and poor documentation. As a result, Heise has tried to simplify the world as much as possible.

LetterGo will do everything that leading word processors should do: automatic line wraparound on input, block moves, global search and replace, right margin justification, automatic pagination, automatic headers and footers, underscoring, sub- and superscripting, and on and on.

Word processing packages have been refined to the point where one should really take certain specific features, as mentioned above, almost for granted and begin to ask, "What can it do--that's really useful--that the others can't?" and "How easy is it to learn, use and adapt?"

The user gets one menu--disk operation commands--and that's it. And that menu is so spartan (Save, Load, Directory, Kill, Quit, Merge, and Free) that Heise used part of it for the copyright.

The CONTROL key gets a workout on the LetterGo system. It operates entirely with control characters for editing purposes. Control-B returns the cursor to the beginning of the document; control-E scrolls toward the end and control-X reverse scrolls (both stopped by the space bar), control-P starts the printer running from the cursor location, and so on, through all the letters of the alphabet. Even after extended use, I'd hate to take a test on all the keys and what they mean. About 99% of all work can be performed with fewer than half of the control keys, so the memory process is not formidable, as it might seem at first.

The special things I like about LetterGo:

1. For all its versatility, it is remarkably easy to learn and operate. While Heise's

excellent manual does not make any untoward claims about ease of learning, my writer wife, faced with a sudden realization that a truly massive work she had undertaken would require at least one full rewrite, and a final re-type, dove in and learned to operate it (with no previous computer experience) in a long afternoon.

2. LetterGo drives the printer out of memory, rather than off the disk, which means that print speed is limited only by the speed of the printer.

3. LetterGo comes with a nice, chatty manual, which manages not to talk down to a user, but presumes virtually no previous computer knowledge. The manual is, in fact, a very basic tutorial, followed by a more complete reference manual, expanding on that first section, and concluding with a section on how to set up the various types of hardware that might be used in a LetterGo word processing installation.

4. LetterGo exceeds in ease of formatting. The top line of the beginning text screen contains 10 single letters followed by two numbers each, which provide full control over what the printer will produce. These include L for line length, P for lines to a page, S for line spacing, and so on. Very quick. Very handy. And always there. Any of those formatting commands can be changed at any time, or any place, in the document, through the use of "dot commands"--a period followed by the letter indicating which formatting command is to be changed. For instance, .L78-58 will shorten the line-length of text following the command by 20 characters. Then, .L58-78 will return the text to the original length. This is not a unique system, but many word processors do not show the changes on the screen, as LetterGo does.

5. LetterGo takes care of automatic compacting of disks. If a revised file is longer than

the space allotted for the original, LetterGo will save it anyway, further along on the disk, and then kill the original, without even telling the user. When disk capacity is reached, the program will automatically compact the disk, thus eliminating all those holes along the way. This can be user-directed, though Heise did not include it in the Disk menu. (Nor did he tell the user that one can direct output to devices other than the CRT or printer, though that capability is also there in a single control character from the disk menu. This capability is handy if one has a homebrew spooler sitting around in high memory, disguised as another device.)

#### NON CENTS continued

Timely rounding off is mandatory in certain programs. For instance, most savings banks give daily interest, but they round off your interest and "credit" it to your account quarterly. If they credited it daily, it could round off to zero on smaller accounts. To check on your bank's computations, your own compound interest programs should also round off quarterly.

#### SUMMARY

1. Round off frequently, at every appropriate point, in order to avoid errors from expected machine rounding-off.

2. For dollar round-off, use:

$N2 = INT (N1 + .5)$   
 or  $N2 = N1 + 1E7 - 1E7$   
 or  $O = 1E7 \setminus N2 = N1 + O - O$

3. For penny round-off, use:

$N2 = INT (100 * (N1 + .005)) / 100$   
 or  $N2 = N1 + 1E5 - 1E5$   
 or  $S = 1E7 \setminus N2 = N1 + S - S$

#### CONCLUSION

Round off those "non-cents" to produce professional printouts!

And the things I don't like about LetterGo:

1. Two operations are necessary to move a block of type: One to move it to the new location; the second to kill the block at the old location. An option that automatically deletes at the old location while moving to the new location would be most useful. Heise claims the two-step operation is a safeguard.

2. Maximum output line length is 78 characters. If one is trying to cheat for space with a 12 pitch daisy wheel type font, that is a bit restricting. Similarly, financial documents are out.

3. As noted, no spooling capability, or screen-visible right hand justification.

**CONCLUSION:** LetterGo brings something to the North Star DOS user that has not been available previously: truly flexible, powerful and complete screen-oriented word processing.

The price--just under \$500--is not excessive, considering the true power provided. According to Heise, LetterGo has been proved in government offices before being offered to the public. That field proof is a huge plus in a time when some high-priced software does not deliver anywhere near what is promised.

This system does.

#### BACK ISSUES

During the 1982-1983 INSUA year, Volume I of COMPASS will be available as a complete package (Numbers 1-4) only, at a cost of \$20.00. Price includes postage. MICRO-COUNT II, originally distributed as a free disk with Number 4, will **not** be included in this offer, but can be ordered from the INSUA library.

Make your check for \$20.00 payable to INSUA, and mail check to INSUA, P.O. Box 1324, Antioch CA 94509. (See Membership/Order form on last page.)

# EASY SWITCH II

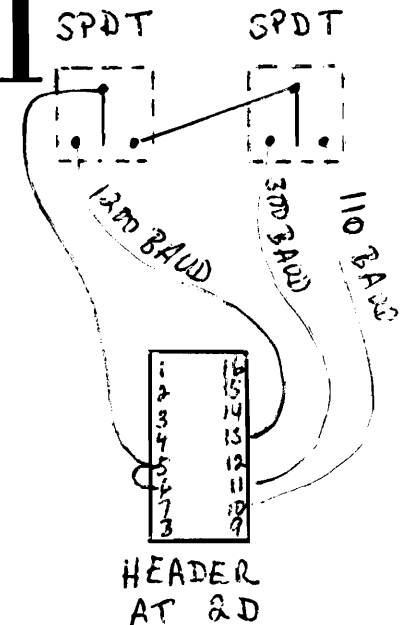
EASY SWITCH Ver. 2.0

by John A. Bryant  
6648 N. Canandaigua Rd.  
Holcomb, NY 14469

If you haven't taken Alan Nelson's advice in Volume 1 Number 4 of COMPASS and haven't wired the baud rate header and the configuration header to the back panel so that you can control those functions from outside the computer, then get out that soldering iron and get to work. The job will take an hour or so, and after that you may never have to take the cover off of your computer again.

I'd like to point out a couple of variations I use which Alan didn't mention. He described using two SPDT switches, one to give two baud rates on the right serial port, the other to give two baud rates on the left serial port. The only thing I ever hook to my left serial port is my terminal, and thus have no need to change the baud rate there, so I haven't wired in a switch for that purpose. However, I do have need for three different baud rates on the right serial port--in my case 110 for a Selectric-based printer, 300 for a modem, and 1200 for a dot matrix printer. As shown in Figure 1, with two SPDT switches wired together and to the header at location 2D on the motherboard, I have switch selection of all three baud rates. (See page 75 of the Horizon Double Density Manual for pins and baud rates if your needs differ.)

For added convenience I wired up a 3-foot cable with a female DB-25S connector on one end and a male DB-25P connector on the other. I plug one end into the computer and plug whatever device I want to use into the

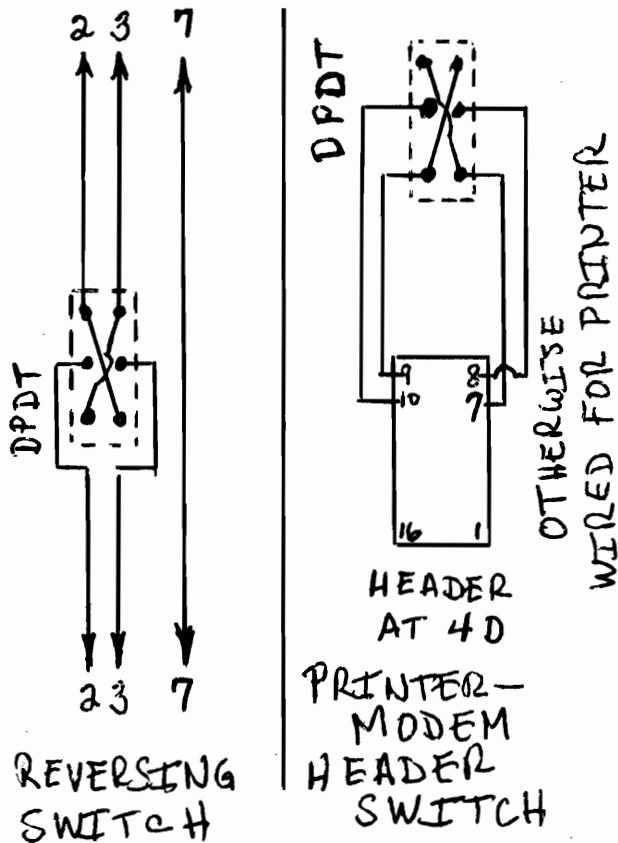


other end of that cable, which I can then pull up where I can see it whenever I want to change devices. It sure beats trying to make a change by feeling around with my fingers behind the computer.

Like Alan, I have need to change the computer's configuration from a modem to a terminal when using TELESTAR, but the method I used doesn't require a hard-to-find 8PDT switch. I merely ran wires from all the pins on the configuration header at location 4D on the motherboard to a DB-25S connector mounted in one of the top slots on the back panel. I then wired up two DB-25P plugs with jumpers within the hood, configuring one for modem, the other for terminal. (See page 72 of the Horizon Double Density Manual for pin connections.) To change from modem to terminal or vice versa I just unplug one and plug in the other. Stick-on Dymo labels attached to the hoods of the DB-25Ps identify one as "MODEM," and the other as "TERM" (for TERMINAL). Since I used one of the top slots for the socket, I can tell at a glance whether the computer is set up as a modem or as a terminal.

Try these changes. You'll wonder why the computer wasn't wired this way at the factory.

# EASY SWITCH III



EASY SWITCH Ver. 2.1-2.5

By Alan H. Nelson

Many thanks to John Bryant for a quick response to my EASY-SWITCH article. Even before the ink was dry on the last issue of Compass, I realized that my solution, which required a hard-to-find 8PDT switch, was more difficult than necessary--in fact, it was a classic example of overkill (it does work!!!) Even John Bryant's solution is more complex than most users will require, since many if not most modems require only three pins to be connected in order to operate correctly, i.e. pins 2, 3, and 7. The important point is this: if the header is wired up for the printer, the wires from pins 2 and 3 of the computer to pins 2 and 3 of the modem must be reversed at some point along the way.

1) One easy solution, therefore, is to solder up the header at location D-4 for the printer, and to make up a special three-wire cable to go from the second port to the modem. One wire goes from pin 7 of a 25-pin male plug to pin 7 of the plug at the other end; then the wires from pins two and three at one end are reversed at the other end so as to connect to pins three and two.

2) Another solution is to make up a coupling consisting of a male plug at one end and a female at the other, joined by a three-wire cable, pins connected as in 1). This coupling can simply be attached to either end of an **existing** cable (almost any cable will do) which joins like pin to like.

3) A third solution is a truncated version of 2): instead of joining male and female plugs with a cable, mount them rigidly back to back, about 1/2" apart, joining the pins (crossing pins 2 and 3) with very short bits of wire. I threaded the holes in the plugs, and joined the two plugs together with two round-headed bolts 1-1/4" in length; a piece of rigid tubing could also be used as a stand-off. This link can go at either end of an existing cable.

4) An easy-to-find DPDT switch can be wired into any cable so as to reverse the connections to pins 2 and 3 (see diagram).

5) John Carmichael, a student at the University of California, Berkeley, has soldered a DPDT switch directly to the header, mounting the switch at the back of the Horizon (see diagram).

Any switch mounted at the back of the computer should, if possible, be inserted in such a way that switching can be done without looking. (My baud-rate

continued



# DIR CLEANER



"DIRALPHA" SOLVES  
TWO ANNOYING PROBLEMS  
OF NORTH STAR  
DIRECTORY FILE

By Edgar F. Coudal

A utility that solves annoying and otherwise unsolvable petty problems is one of the little delights in life, like finding a full six-pack in the back of the refrigerator when you thought you'd have to run out in the cold.

Such a utility is DIRALPHA, an assembly language program that takes care of two of the most annoying shortcomings of the North Star Disk Operating System: its habit of putting new directory entries into the first available slot in the directory even though that slot is somewhere back among the files you created six months ago; and the DOS's inability to sort itself in any meaningful way.

North Star users will attest that a directory on a frequently used disk, such as a correspondence disk or a program development disk, becomes a totally hopeless and disorganized mess after a while.

The seed program

0E00		ORG	0E00H	
0100		DOS	0100H	
0122		DCOM	DOS + 22H	
0125		LIST	DOS + 25H	
0128		RET	DOS + 28H ; WARM BOOT	
0181		READ	0181H	; READ, DOUBLE, D
0081	RIVE#	WRIT	0081H	; WRITE, DOUBLE,
	DRIVE#			
0001		DRIV	01H	; DRIVE#1
007F		FILE	7FH	; 128 FILES
0E00	01 8101	SDIR	LXI	B, READ
0E03	CD 730E		CALL	SDCOM ; CALL DCOM SET
	UP			
0E06	CD 1A0E		CALL	BODY ; CALL MAIN BOD
	Y			
0E09	01 8100		LXI	B, WRIT
0E0C	CD 730E		CALL	SDCOM ; CALL DCOM SET
	UP			
0E0F	21 0000		LXI	H, 0000H
0E12	3E 01		MVI	A, DRIV
0E14	CD 2501		CALL	LIST ; CALL DOS LIST
0E17	C3 2801		JMP	RET ; RETURN TO DOS
0E1A	3E 7F	BODY	MVI	A, FILE ; MAIN BODY OF
	PROGRAM			
0E1C	32 7FOE		STA	SAVE ; SAVE FILE COU
	NT			
0E1F	11 1000		LXI	D, 10H ; SET D=16 CHAR
	/FILE			
0E22	21 800E		LXI	H, DIR ; SET H,L TO EN
	D FOR DIR			
0E25	44		MOV	B, H
0E26	4D		MOV	C, L
0E27	19		DAD	D
0E28	CD 3FOE		CALL	CMPR ; COMPARE TWO F
	ILES			
0E2B	D2 340E		JNC	BODY+1AH ; DON'T SWITCH
	FILES			
0E2E	CD 5FOE		CALL	SW ; SWITCH FILES
0E31	C3 1A0E		JMP	BODY ; RETURN TO MAI
	N BODY			
0E34	3A 7FOE		LDA	SAVE
0E37	3D		DCR	A
0E38	32 7FOE		STA	SAVE
0E3B	C2 250E		JNZ	BODY+OBH
0E3E	C9		RET	
0E3F	E5	CMPR	PUSH	H ; / SAVE
0E40	D5		PUSH	D ; - ALL
0E41	C5		PUSH	B ; * REGISTERS
0E42	7E		MOV	A, M



# HOW NOT TO

## A TALE OF HORROR

In the hopes that this story might spare someone an unnecessary nightmare, I will share with you the gruesome details of a recent evening that I would rather forget.

I had been working with data files for weeks, using the WRITE instruction in my BASIC programs to send data out to the files, and using the READ instruction to retrieve data from the files. Late in the evening I decided to compact the disk using the N\* utility CO. About halfway through the compaction process, things ground to a halt and I found the not-too-encouraging message 'HARD DISK ERROR' glaring at me from the CRT.

A little investigation showed that the problem was apparently some badly written data in sector 3 which is part of the DIRECTORY for the disk. Curiosity being the name of the game, I immediately called on the N\* DOS to write the directory out onto RAM so that I could examine the data. This is the innocuous looking statement that I used:

```
WR 0 5000 4
```

I thought that this would WRITE from disk address 0 out to RAM address 5000 (hex) a total of 4 sectors, which is the first half of the directory. When I looked at the data using the N\* Monitor I had absolute gibberish instead of neat directory entries.

Undaunted by this faux pas, and completely convinced that this was all part of my HARD DISK ERROR problem, I inserted a different disk that was in perfect condition and which was jam-packed with files, program, and other goodies. Once again I winged it with WR 0 5000 4, and once again I got gibberish. At about this time which was very late in the evening, I thought that it might be in order to check with the N\* software

manual to see what was happening.

(When all else fails, read the instructions.)

DIGRESSION: HAVE YOU EVER BEEN ON STAGE? DO YOU KNOW THE DIFFERENCE BETWEEN STAGE RIGHT AND AUDIENCE RIGHT? OR HAVE YOU EVER TAUGHT A CLASS AND TOLD EVERYONE TO RAISE THEIR RIGHT HAND, ONLY TO SEE A WHOLE SEA OF LEFT HANDS IN THE AIR BECAUSE THE STUDENTS WERE

Well, that's all that my numbed brain could flash at me as I read N\*'s warning about possible catastrophic effects when using WR and RD: STAGE RIGHT --- STAGE RIGHT --- STAGE RIGHT ! You get the message, I am sure. Instead of WRiting my directory out to RAM, I had instead WRitten FROM RAM TO my directory, which surely has to qualify as a catastrophic effect. Indeed, I did it to TWO directories! Thus in two or three brief minutes did I manage to obscure almost a full year's work. It took almost an entire week to create reasonable facsimilies of the original directories. A week full of cussin'.

Page B-3 of my DOS manual is now emblazoned with the following messages in bright red ink:

```
FROM DISK TO RAM: RD or LF
FROM RAM TO DISK: WR or SF
PWJonas,
```

### EASY SWITCH III

switch and modem-printer switch both go to the left for printing mode, and to the right for modem-mode.)

Doubtless other readers have come up with other solutions, and some readers may know reasons for avoiding certain solutions. Any more ideas???? How about a way to change both **baud-rate** and **printer-modem** configuration with a single stroke of a **single switch**? An 8PDT perhaps?

[See also Steve Leibson's I/O Farm, Volume I Number 2 (printer interfacing) and Volume I Number 4 (bit rate switches).]

for DIRALPHA was found in a crude common domain form on a disk given the Chicago Area North Star User Group. As with so many disks that find their way into user group libraries, it only ran under a single density disk controller. Such challenges interest Steve Keith, a group member, author of various utilities, and a user with more than passing knowledge of the DOS structure.

Keith's modification, now known as DIRALPHA, answers both the above needs, without any commands, questions, or possible ways to go wrong, except perhaps by forgetting to load the program.

No commands? Exactly. You place the disk containing DIRALPHA in Drive 2 and the disk whose directory you want straightened out in Drive 1, then type GO DIRALPHA,2. After a second or two, you see the new directory, alphabetized, and the familiar DOS + prompt. In that brief period, two things have happened:

--The Directory has been read out to memory, alphabetized according to ASCII precedence



OE43	FE 20		CPI	20H		; CHECK FOR BLA
	NK					
OE45	CA 5BOE		JZ	EBLK+02H		
OE48	OA		LDAX	B		
OE49	FE 20		CPI	20H		; CHECK FOR BLA
	NK					
OE4B	CA 590E		JZ	EBLK		; EXIT IF BLANK
OE4E	OA		LDAX	B		
OE4F	BE		CMP	M		
OE50	3F		CMC			
OE51	23		INX	H		
OE52	03		INX	B		
OE53	CA 4EOE		JZ	CMPR+OFH		; CONTINUE IF E
	QUAL					
OE56	D2 5BOE		JNC	EBLK+02H		
OE59	AF	EBLK	XRA	A		
OE5A	37		STC			
OE5B	C1		POP	B		; / RESTORE
OE5C	D1		POP	D		; - ALL
OE5D	E1		POP	H		; ® REGISTERS
OE5E	C9		RET			
OE5F	E5	SW	PUSH	H		; / SAVE
OE60	D5		PUSH	D		; - ALL
OE61	C5		PUSH	B		; ® REGISTERS
OE62	16 10		MVI	D, 10H		; D=16 CHAR/FIL
	E					
OE64	5E		MOV	E, M		
OE65	OA		LDAX	B		; / EXCHANGE
OE66	77		MOV	M, A		; - THESE
OE67	7B		MOV	A, E		; - TWO
OE68	02		STAX	B		; ® FILES
OE69	03		INX	B		
OE6A	23		INX	H		
OE6B	15		DCR	D		
OE6C	C2 640E		JNZ	SW+05H		; JUMP IF MORE
	TO SWITCH					
OE6F	C1		POP	B		; / RESTORE
OE70	D1		POP	D		; - ALL
OE71	E1		POP	H		; ® REGISTERS
OE72	C9		RET			
OE73	11 800E	SDCOM	LXI	D, DIR		
OE76	21 0000		LXI	H, 0000H		
OE79	3E 04		MVI	A, 04H		
OE7B	CD 2201		CALL	DCOM		; CALL DOS DCOM
OE7E	C9		RET			
OE7F	00	SAVE	NOP			; # OF FILES SA
	VE POINT					
OE80	00	DIR	NOP			; START OF DIR
	LOCATION					

convention (numbers first, then letters, etc.), and then written back to the disk directory file.

--All the blanks in the Directory caused by killing old files have been removed. Now, any new file saved to the disk shows up at the end of the directory. To re-alphabetize, simply GO DIRALPHA again.

To complete the cleanup, simply type GO CO from the system disk to compact the entire disk. The program does NOT change any data, nor does it relocate files. It simply re-organizes the Directory so that it makes sense.

The version of DIRALPHA shown in the program listing is written to deal with double density, 5.2 files, which load at E00H. However, modifying the program to run on different systems is easy enough. To change the memory address, simply change the 0E00H in the routine source list at the top of the program to wherever your BASIC loads (2D00 or 2A00 for instance). Similarly, you may have to change the point where the DOS loads in the second line of the program.

To use DIRALPHA on a single density system, change line 6 of the source list from 0181H to 0101H and change line 7 from 0081H to 0001H. Finally, if you are changing the program to run under single density, change line 9 from 7FH to 3FH to refelect the fact that the single density directory will only hold 64 entries, rather than the 128 which the user gets under double density. The body of the program needs no changes once these corrections are made in the routine source list.

There's a side benefit ... one begins to give more thought to what new files are named. In my business, for instance, which is marketing communications for a number of different clients, I have prefixed the name of each file for an individual client with the initial letter of the client's name. An article on Conveyor Accessories' newest product might have been called TITAN in the past. Now I call it CTITAN. As a result, all the Conveyor Accessories files on a disk are grouped together after running DIRALPHA.

I think I'll go have one of those beers found in the back of the fridge.

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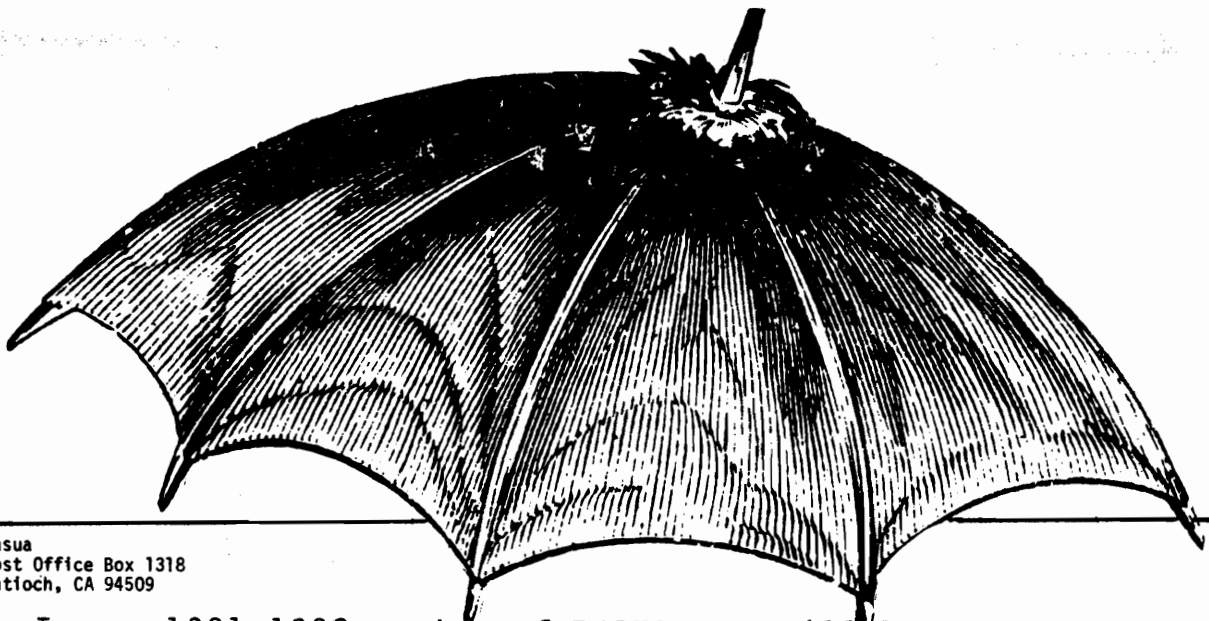
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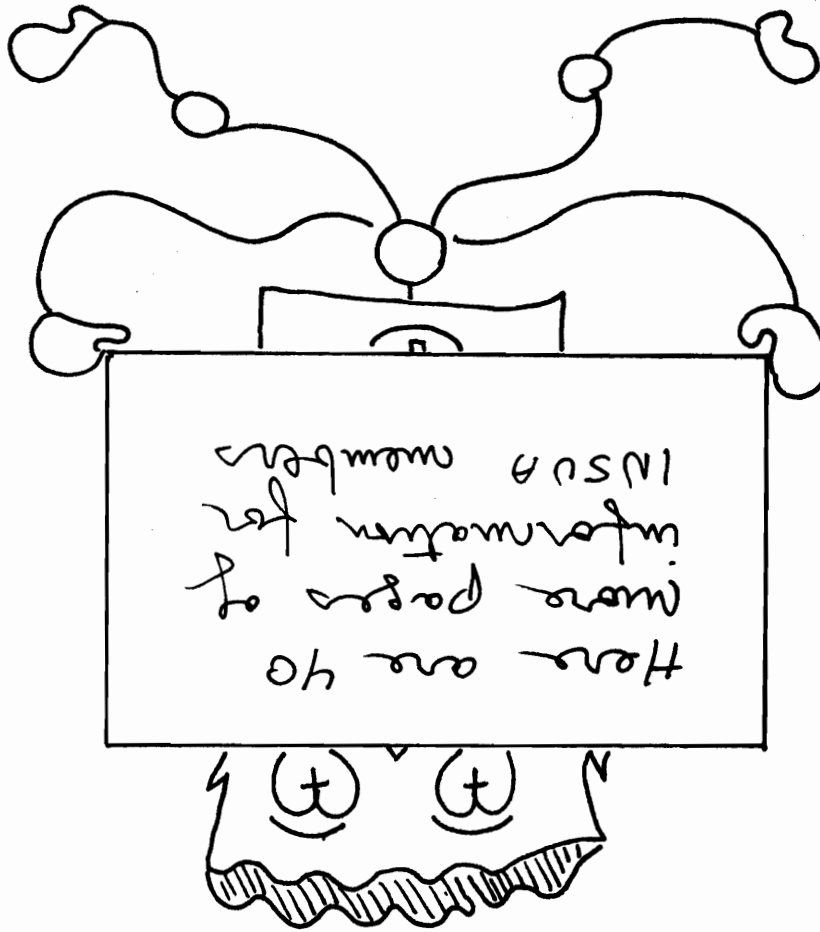
Name: \_\_\_\_\_

Street: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_



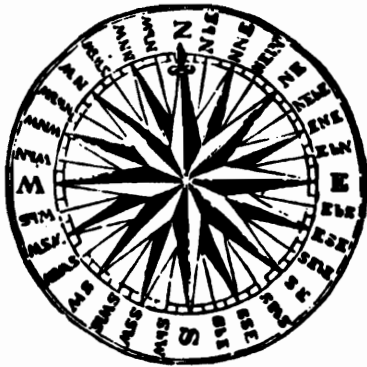
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# The COMPASS

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# The COMPASS

VOLUME TWO NUMBER TWO



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## WHO WE ARE

### INSUA BOARD OF DIRECTORS

In accordance with its by-laws, the INSUA Board of Directors has appointed two new members. George Riddle was appointed as membership chairman and supervisor of the mail box operation. Mark Shepherd has been appointed Disk Librarian to fill the vacancy left by the resignation of Sid Owen. The Board expresses its appreciation to Sid for his help during the past year, and welcomes George and Paul. The Board now consists of the following:

Clyde Steiner, Chairman  
Bob Beaver, Treasurer  
Sarah Wasserman, Secretary  
George Riddle, Membership  
Ed Coudal, Clubs  
Mark Shepherd, Disk Librarian  
Pavel Breder, Software  
Alan Nelson, Assoc. Editor

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# USER FRIENDLY INPUT



BASIC's INPUT statement is very handy for writing programs quickly and easily, but it isn't well suited for extensive error trapping nor will it allow single keystroke entries. With this in mind, I started writing my own error trapped numeric input routines.

The first routines that I wrote were unique to each program and had to be written from scratch each time. I have now written three routines which cover most of these problems (another version for dollars and cents is forthcoming). If you install these routines in your program as subroutines, then GOSUB will bring them in as easily as using BASIC's INPUT statement. Even though subroutines of this type are rather long, they enable programmers to write programs that are more "User Friendly."

WRITTEN BY ..... Roy Chadwick  
DATE ..... 12/3/81  
VERSION ..... 1.0  
LANGUAGE ..... N BASIC 5.0

This documentation covers the three numeric input subroutines called "NUMINP", "NUMINPD" and "NUMINPCD". Additional documentation is included within the text of each of these. These subroutines offer the following features.

(1) Only a specific number of characters will be accepted as an entry. This number can easily be set by the programmer. This feature insures that an operator cannot overwrite any existing screen format. This is particularly important when working with a crowded screen format.

# USER FRIENDLY INPUT

(2) Only legitimate numeric entries will be accepted. This minimizes the number of entry errors that an operator can make.

(3) Operators may enter commas if they choose to do so. However, the entry will be rejected if the commas are not in the correct position within the entry. Also, comma and zero are rejected as a first character in the entry. Like feature #2, this helps minimize the number of entry errors that an operator can make.

"NUMINP" is the bare bones version. It will accept numeric integers only.

"NUMINPD" is an enhanced version that will accept both integers and decimal fractions.

"NUMINPCD" is the fully enhanced version. It will accept integers, decimal fractions and commas.

"MENU" is a sample program that utilizes "NUMINP". It has been set up as a stand-alone program so that you may RUN it. This



(4) Programmers may designate any key on the keyboard to be a special purpose key. "Press C to cancel" is one example of utilizing this feature. These routines are presently set up to accept "C" when the cursor is in the first input character position only. This method enables the programmer to program the "RETURN" key to perform a special function in addition to its' normal use as an entry terminator. An example of this could be "Press RETURN to view the next page."

(5) These subroutines are easily modified to fit a wide variety of program requirements without changing the basic structure of the routines. Modification instructions are in the form of REM statements in each of the subroutines.

sample program has several optional lines in the form of REMark statements. These lines may be activated by EDITing and using CONTROL-Z to delete the characters "R", "E", "M", "BLANK", "~" and "BLANK". Be sure to complete the line by pressing CONTROL-G before you press RETURN.

If your program requires that the input routine should accept more than one character, then the evaluation of K5 on line 15600 should be set to that number of characters.

If you set the routine to accept more than one character then you must activate lines 10800 and 13700. Also, the evaluation of N on line 18100 may need to be adjusted so that the input routine will accept only the numeric values that

## VARIABLE ASSIGNMENTS for "MENU"

A contains the ASCII value of the input character.  
C counts the characters during the comma scan routine.  
C1 is the loop for the comma scan routines.  
C2 aids in the omission of commas to N1\$.  
D is the loop for the decimal scan routine.  
D1 counts the decimals in N\$.  
D2 contains the numeric position of the decimal in N\$.  
K5 counts the characters that are input by INCHAR\$.  
N contains the numeric equivalent of the input string.  
A\$ is the cursor address for the first input character.  
A0\$ is the cursor address for the "CANCEL" message.  
A1\$ is the cursor address for the "INPUT" message.  
A2\$ is the cursor address for the "STAND BY" message.  
B\$ contains BLANKS that are used to erase a false entry.  
? \$ clears the screen.  
A\$ contains the input characters.  
N1\$ receives all characters (except commas) from N\$.  
X7\$ rings the bell.  
X8\$ backspaces the cursor.  
Z9\$ returns the cursor to the "HOME" position.

# USER FRIENDLY INPUT



fall within the parameters of your program.

If your program requires that the input routine should accept more than 9 characters, then line 10100 must be activated with N\$ DIMensioned to that value plus 1.

If your program requires that the input routine should accept more than 10 characters, then line 10200 must be activated with B\$ DIMensioned to that value and B\$ (on line 10800) must be filled with an equal number of BLANKS.

If you activate lines 15200, 16000, 16100 and 16200 then the routine becomes "NUMINPD".

If you also activate lines 10300, 15300 and 16500 thru

## EDITORS' NOTE

The three programs, "NUMINP", "NUMINPB", and "NUMINPCD", will be available on the Library Disk for this issue of Compass.

# USER FRIENDLY INPUT

17600 then the routine becomes "NUMINPCD". Also, N1\$ (on line 10300) must be DIMensioned to the same value as N\$. Then, N1\$ (line 16500) must be filled with an equal number of BLANKS.

"NUMINP" starts at line 13400 and ends at line 18100. It will input one character at a time, count the character and then examine the character as to how it relates to the rest of the program. It will either reject the character and ring the bell, or it will accept the character and PRINT it. After having received a completed entry of valid characters, it will change the character string to the numeric equivalent of the string. At this point in the routine, it will examine the numeric equivalent of the string as to how it relates to the rest of program. If it rejects this

value it will ring the bell, erase the entry from the screen, and return to the start of the input. If it accepts this value it will proceed on to subsequent program statements.

## CAUTION

If you use BASIC's REnumber function, the line numbers within the text of the REMark statements may no longer apply.

## AUTHOR'S FOOTNOTE

If you change the "Numeric Constants," which control the "Input Parameters," to "Numeric Variables," then your program can be written to automatically adjust the "Input Parameters" to the immediate needs of the program each time GOSUB calls up the routine.

## CLIP TIPS

### Diablo 1620 Baud Rate Switch

Those who use the Diablo 1620 printer for several different applications may need to change the baud rate from 300 to 1200 with some frequency. Later Diablo printers, e.g. 1640/50 and 630, have a baud-rate switch on an easily accessible panel, but to make the change on a 1620 requires installing a jumper on the HPR02 board. This is a simple chore if the rate is to be set permanently, but a nuisance if the rate has to be changed often, since the cover must be removed, together with

the platen and any paper feeder; then the board must be pulled, and a couple of cables detached, before the jumper location is accessible.

An on-off switch installed in place of the jumper makes life much easier. Rather than soldering wires to the board, melt some solder onto the ends of the wires (18 guage is best), then insert the wires into the jumper-wire holes. Bring the leads outside the printer, and fasten them to the switch, which can be mounted at any convenient place, or can just be left dangling.

# FREE FOR THE ASCII



DOS to CP/M: FREE FOR THE ASCII

BY Alan H. Nelson

Bob Stek discussed BASIC file transfers from N\* DOS to CP/M in the very first issue of Compass. (Ann Hernandez added to that discussion in the fourth issue.) Bob assessed two commercial programs, both of which cost money. With no more than the standard DOS monitor, you can transfer ascii (i.e. text) files for free!!!

I purchased TFS (Text Formatting System) as my first editor; I also learned to use N\* BASIC (running on DOS) as a primitive but useful editor (see "NO-NUMBERS" in the fourth issue of Compass); and I began making constant use of the TELESTAR modem program to transfer text files from a main-frame to my

North Star. Once I discovered the screen-oriented editing power of WordStar, I decided that was the way to go. But what of my DOS ascii files?

As an experiment, and following the suggestions given by Stek and Hernandez, I booted up in DOS, loaded a small BASIC text file at 0100, booted up in CP/M using the reset button, and saved the file. I then brought up WordStar, gave the necessary commands to edit my new file, and what did I see?--well, it was wasn't very encouraging.

My text had obviously been transferred to the CP/M file, but so had a lot of "junk." The beginning of every line had some odd-looking characters; certain upper-case words were lacking letters; some punctuation marks had been transformed into other characters. More dismaying



AFTER EDITING:

Here is a text which I originally wrote as a BASIC file.  
This line number will end up as 1A hex.  
BECAUSE THIS IS AN EXAMPLE, I WILL INCLUDE CAPITALS AND PUNCTUATION.  
!#\$%&'()\*+={}~+`|<>?:-[]^;\,./"

# FREE FOR THE ASCII

still, the end of the file was missing. I decided to do what editing I could, starting with the first line, which was entirely junk. I deleted the line with ^Y: to my dismay, the entire file disappeared!

Could this ascii file be saved?

## Transfer Problems

Not to prolong the mystery, yes, the file could be saved. First, however, I had to understand what had gone "wrong." With a little application of the grey matter, and some trial and error, I discovered the following:

1) BASIC stores line numbers not as ascii characters but (insofar as they are accessible to the user) as hex codes. BASIC also stores the line-length at the beginning of each line. The "junk" at the beginning of each line in WordStar was in actuality three information bytes interpreted, to the best of WordStar's ability, as characters. These characters look random because they were never intended as true ascii characters.

2) Lines in BASIC are separated by carriage returns (0D hex); lines in a WordStar file are separated by carriage returns plus line-feeds (0D plus 0A). WordStar therefore thinks the entire transferred file consists of a single line of text: hence the ^Y disaster.

3) The WordStar end-of-file marker is 1A (hex); but 1A can also occur as part of a BASIC line-number (e.g. 26 decimal): when WordStar encounters a 1A, it naturally cuts off the rest of the file.

4) BASIC stores certain uppercase reserved words as "tokens": thus EXAM is stored as DA hex, so EXAMPLE will be transferred as ZPLE (note that Z is 5A hex). (For more on BASIC tokens, see CLIP TIPS, "North Star Basic Token Codes," in the first issue of Compass.)

5) BASIC uses idiosyncratic codes for several marks of punctuation; thus, in the process of transfer BASIC "-" becomes "e", while BASIC "[" becomes "`", and so forth.

## Transfer Solutions

Now, it may seem as if all these problems add up to an impossible situation, but in fact most of the problems are easily taken care of, as follows:

1) The "junk" letters at the beginning of each line in CP/M can be removed with the WordStar "wild-card" search-and-replace function.

2) Similarly, the carriage return (0D) can be replaced by a carriage return plus linefeed (0D+0A) in the same search-and-replace operation.

# FREE FOR THE ASCII

3) The troublesome 1A's can be fixed with the DOS monitor.

4) The BASIC tokens occur only in upper-case letter groups, and thus may not appear at all in the WordStar file; if they are transferred over, they can be fixed individually.

5) Some of the altered punctuation marks can be fixed with global search-and-replace commands in WordStar; those which appear as letters are not so easily fixed and should be avoided in the DOS file, or globally changed to harmless characters or character-combinations with a BASIC editor like N-BUS, and then fixed up with WordStar.

## Procedure

Before explaining exactly how I make the transfer, I should emphasize that the process is really trivial, and need not give much trouble even to a newcomer.

To make the transfer even easier to understand, I will follow my explanation of the necessary steps with an example.

Now for the steps. To avoid confusion, I will change from numbers to letters. The procedure assumes the minimum configuration necessary for WordStar, that is, 48K of memory starting at 0000.

A. Boot up in DOS; load file into memory at 6700 with the LF command.

B. Bring up the M5700 DOS monitor.

Use of the M5700 monitor is the closest thing to a clever trick in this procedure. This monitor operates without DOS, and virtually bisects a 48K memory, leaving 86 blocks free between 0100 and 5700, and 88 blocks between 6700 and BFFF (48K).

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C. Using the SM command, search memory from 6700 to the end of the ascii file (or to the end of memory) for 1A hex (see below). Use the FM command to replace these 1A's with any harmless code, e.g. 20 (space).

D. Use the MM command to move the file, which can be up to 86 blocks (56 hex) in length, down to 0100.

E. Place a WordStar disk in drive A. Boot up in CP/M using the RESET switch, or, more elegantly, by giving the command JP E800 from the monitor.

The secret of the success of the entire operation lies in these two steps, for CP/M boots up without disturbing memory from 0100 to near the top; hence the file will survive intact through a boot operation.

F. Save the file to disk with the following command (note that 86 is the maximum size):

save 86 filename

or (to save onto drive B):

save 86 b:filename

G. Bring up WordStar and give commands to edit the new file.

H. After the file appears on the screen, type ^QA (control-Q, then A). In answer to the FIND? query, type ^P^M^P^A^P^A^P^A, that is, the carriage-return symbol (^M) followed by three wild-card symbols (^A). (The prefix ^P insures that these control characters are interpreted literally.) The ^P^M "character" will not appear on your screen: instead, the cursor will move to the left margin (carriage return); then the string ^A^A^A will appear. In answer to the REPLACE WITH? query, type ^N (EOL). In answer





# FREE FOR THE ASCII

to the **OPTIONS?** query, type **gn** (for global replace, no questions asked). Now hit **RETURN**, then **ESCAPE** (to save yourself the trouble of watching each step of the search-and-replace operation). The cursor should end up at the end of the file.

I. If you are looking at junk, type a **^KK** marker at the end of the file. Type **^QR** to get to the top of the file. Order should have been restored, though the first line may be junk. Zap it with **^Y**. Check through the file with the **^C** command to look for any problems. You may come to a point where your ascii file ends and junk begins. Place a **^KB** marker after the last character of your file; type **^KY** and watch the junk disappear.



## EDITORS' APOLOGY

The editors of Compass have received some material which they have not had the time or stamina to acknowledge (both Clyde Steiner and Alan Nelson also work for a living!) They apologize for their bad manners,

J. Use the **^QA** search-and-replace function to fix up any punctuation marks which have been changed to something else. Use the same function or other editing functions to restore any groups of capital letters truncated by BASIC's tokenization procedure.

That's all, folks!!! If you have the impression that the procedure is too cumbersome, be assured that a little practice will bring the time down to about three minutes per file transfer.

### Additional Hints

Since any procedure can be improved upon, I offer a few hints here to make life easier once the steps given above have been mastered.

1) Locating the end of the ascii file with the DOS monitor can be a nuisance. I add a line to the end of my ascii files consisting only of the letters "XXX". With the DOS monitor, I search from 6700 to BFFF for "X","X","X". I use the FM function to place a 1A hex at the address shown. Then I search from 6700 to that address for 1A's, replacing them (all but the last, which is now the EOF marker) with 20 hex. In this way, the end of the file is marked, and no "junk" will appear at the end of the CP/M file.

and promise a complete catch-up operation in September, after the rigors of temporary summer displacements, and in time for the next issue of Compass. Thanks to all contributors for your patience and understanding.

# FREE FOR THE ASCII

2) The size of the file would be calculated precisely by a true professional; being a slob at heart, I just specify a large number (e.g. 86), and worry later about any trash which may get added to the end of the file. If I think 86 is much too large, I use a smaller number instead.

3) Files transferred from BASIC will not have the soft carriage returns which are necessary to enable reformatting in WordStar. Following the instructions in the WordStar manual, for each paragraph, replace the end of each line (^N) with a space, using the n option; then reformat each paragraph with ^B.

4) If your BASIC file consists of REM or PRINT (or !) statements, these can be cleared from the beginning of the lines by adding more ^A's at step H, or subsequently replacing ^N^A^A^A

... (as many ^A's as are necessary) with ^N, globally.

5) TFS files contain five rather than three informational bytes at the beginning of each line, plus a space: use six ^A's to clear out the "junk."

6) Files created by TELESTAR are easy to deal with, since they use the same line protocol as WordStar. They may transfer cleanly, perhaps with some "junk" at the end; however, this "junk" can be dealt with by block deletions or by placing an "XXX" type of marker at the end of the file while it still on the other system.

If you use TELESTAR often for this purpose, make up a disk with the following files: DOS, TELESTAR, the M5700 monitor, and "temporary" type 3 files in **single density**: I call mine T1, T2, and T3; each is 86 blocks

## CLIP TIPS



### PRINTER-SCREEN ECHO

Making your printer echo what appears on your terminal screen, or vice versa, can be a simple matter for a program running on 5.0 N\* DOS. The DOS I/O listing for the two serial ports looks like this (see Manual):

```
293E DB03      COU0 IN 3
2940 E601      ANI 1
2942 CA3E29    JZ COU0
2945 78        MOV A,B
2946 D302      OUT 2
2948 C9        RET
2949 DB05      COU1 IN 5
294B E601      ANI 1
294D CA4929    JZ COU1
2950 78        MOV A,B
2951 D304      OUT 4
2953 C9        RET
```

1) Address 2948 contains a RET (C9), which, if replaced by a NOP (00), will cause the program to execute an output to the printer after it has executed an output to the screen. Use your monitor to make the change as follows:

```
>FM 2948 00
```

Change back by typing C9 instead of 00. From BASIC the same thing can be accomplished by using FILL with decimal equivalents, as follows:

```
FILL 10568,00
      (to initiate echo)
```

```
FILL 10568,201
      (to stop echo)
```

# THE ASCII

long. Simply keep using the same files over and over.

8) More memory space could be gained for longer files and some steps could be saved by using a DOS and a monitor which have been moved to the top of memory--however, I have not tried this.

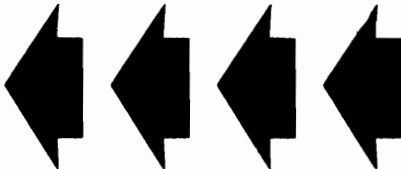
## Capitals

THIS IS AN EXAMPLE AND A REMINDER OF WHAT HAPPENS TO CAPS

THIS IS AN ZPLE 1 A ^OINDER OF WHAT HAPPENS 1 CAPS

Sample reserved words:

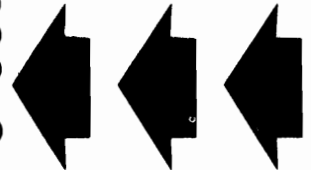
LET	==>	^@
IF	==>	^D
GOTO	==>	^H
STOP	==>	^L
FN	==>	^P
OUT	==>	^T
LIST	==>	!
CAT	==>	/
NOT	==>	w
EXAM	==>	Z



## Punctuation Marks

Some punctuation marks are problems because they turn into characters which will not be unique in an ascii file, and cannot be replaced globally:

!	==>	^R
(	==>	`
*	==>	b (problem)
=	==>	u (problem)
+	==>	c (problem)
<	==>	t (problem)
>	==>	v (problem)
:	==>	\
-	==>	e (problem)
[	==>	`
]	==>	)
^	==>	a (problem)
;	==>	,
/	==>	g (problem)



It is simple to use global search-and-replace commands to fix "!" and "(" but fixing such punctuation as hyphens and slashes is trickier, since lower case letters occur so often in normal text. If possible, avoid using them in the original text; alternatively, surround them with double quotes, or use an editor like N-BUS to change them to character groups which can be changed back globally in WordStar.



2) Similarly, it is possible to make the screen echo the printer by inserting a jump instruction beginning at 2953 (this will be harmless unless you use your parallel port). From monitor, type

```
>FM 2953 C3 (cancel with C9)
>FM 2954 3E
>FM 2955 29
```

From BASIC, type

```
FILL 10579,195
FILL 10580,62
FILL 10581,41
```

To cancel, type

```
FILL 10579,201
```

It's ok to make one or the other of the two changes, but if you make both, you'll end up in an endless loop.

If you have another DOS, you should still be able to accomplish the same effect by studying the I/O routines as listed in your Manual, and making similar changes in the I/O listings, which should be much the same, although at a different address. BASIC fill statements will have to be recalculated for the new address.

Final note: for the self-contained M5700 North Star monitor, the C9 byte is at 5F48: FM with 00 for the echo.



So if you have an Epson, and can't get the graphics characters to print, you are probably running the software version of the handshake. The hardware is still there so you can change the port driver code and your printer cable to use the hardware handshake and activate graphics on your Epson.

My article on the keyboard driver modifications for WordStar generated a lot of interest also. I have been asked if you must have a Cherry keyboard like mine to make the changes. That answer is of course, "No you don't". The technique I wrote about can be used to change any set of keycodes into those required by WordStar. If your keyboard has any special keys that have unique keycodes, my technique will work. Even if you just

# THE I/O FARM

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## I/O Drivers in BASIC

In this installment of the I/O Farm we are going to look at creating I/O drivers in North Star BASIC. First I want to clear up two items of old business.

In my article on parallel ports, I explained how North Star discovered that the parallel output port on the Horizon would not drive Centronics printers because of timing problems. North Star's solution was to rewrite the I/O driver for the port and use the eighth data bit as a slower handshake line instead of the hardware handshake.

A reader in Chicago called to let me know that Epson MX series printers use that eighth bit for specifying the graphics character set. He also told me that the North Star hardware handshaking worked with the Epsoms.

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want to change the control codes around, you may use the published technique.

One thing to remember is that produce from the I/O Farm comes to you in a rather raw, unprocessed state. I don't always provide you with pat solutions. You're supposed to take the examples, think about them and use them to learn about your computer. Just about every North Star system in use is different and all my ideas don't necessarily work on every one of them. Now for the new business.

## I/O Drivers in BASIC

Most programmers feel that all I/O should be done in machine code or assembly language. There are good reasons for this attitude. I/O speeds are usually too high to get good throughput using a BASIC program. BASIC language

statements aren't as good for working with bits as assembly instructions so drivers run even slower.

On the other hand, there are times when you want to experiment with a new I/O device. You may even write a quick program which uses an older device in a new way. Instead of having to develop an assembly language routine, it is not only possible but easy to control I/O devices from BASIC.

### Address Spaces

Before we take on the task of writing drivers, let's look at how a microprocessor accesses memory and I/O devices. In an 8080 or Z80 microprocessor, which are found in the Sol and Horizon computers respectively, there are two address spaces. One is called the memory space and the other, I/O space.

Each address space is divided

into "locations". Memory space has exactly 65536 locations, each of which may be used to access a unique byte in memory. Generally North Star systems don't use that much memory because of conflicts with the disk controller, which also lives in memory space.

I/O address space is more limited, having only 256 locations. Each location is called an "I/O port". Usually, the system I/O devices are located in the I/O space but that isn't mandatory.

North Star BASIC has the statement FILL and the function EXAM which can be used to directly write to and read from memory respectively. These BASIC statements replace the assembly language MOV (move) instruction.

North Star BASIC also has an OUT (output) statement and an INP (input) function which are

used in a similar manner to write to and read from I/O ports. OUT and INP directly correspond to the OUT and INP assembly language instructions.

The only significant difference between the assembly language instructions and their BASIC counterparts is that assembly language is roughly 1000 time faster than BASIC. For I/O drivers, this isn't always a problem.

### The Program

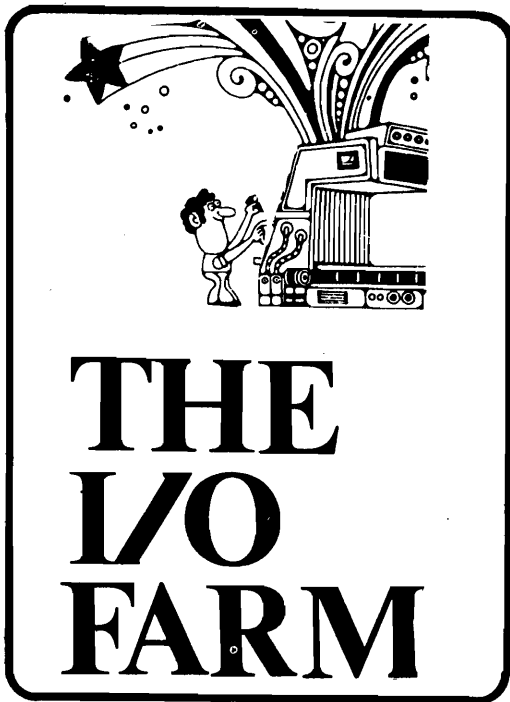
Listing 1 is a program I developed in an evening to solve a specific problem. I was trying to send a file to the system operator (SYSOP) of a local computerized bulletin board. He had a program which would accept files and I had one that could transmit them. Both programs were written in assembly language.

The problem was, as usual,

there were handshaking problems. My program sent the bytes too quickly. When the SYSOP's system received enough bytes for a disk sector, it stored them on disk. Meanwhile, my program merrily proceeded to transmit more bytes, which were ignored by the receiving program until the disk access was finished.

The SYSOP's program had a protocol for requesting a transmission pause but my program did not recognize the request. A quick solution which has worked well is the program in listing 1. It is a simple BASIC program which reads a disk file one byte at a time and sends it out over my Horizon's left serial port, the one most of you use for a terminal connection, which I have connected to a modem.

The program then waits for the receiving computer to echo the transmitted character. This



way, my computer can never overrun the other computer because each character is effectively its own handshake.

The heart of the program is the function FNB which starts on line 1322. It reads an I/O port, isolates a single bit, and returns the value of that bit. The parameters passed to the function are the bit to be read and the port number which contains the byte that the bit resides in. The value returned is the value of the bit of interest.

Line 1323 reads the specified port and line 1324 divides the value obtained from the port by a power of 2 calculated to bring the desired bit to the right of the decimal point. Then the integer part of that same number is subtracted off, leaving only the fraction. Multiplying by 2 and taking the integer part of the number produces the desired bit value.

The effect of lines 1323 and 1324 are to take a byte value, subtract off all the higher bits, and shift the remainder to the right until only the bit of interest remains. This function is a good example of the poor ability of BASIC to operate at

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the bit level. Other BASIC interpreters have a MOD function which makes bit manipulation easier but North Star's does not.

What is the use of the FNB function? Almost all programmed I/O works in a single manner. The I/O peripheral device has two registers or ports. One is a data port and the other a control and status port. A bit in the status port is continuously tested until a ready status is indicated. Then a byte is transferred to or from the data port. FNB allows the main program to call a function which returns a specified bit of a specified port, perfect for programmed I/O.

The subroutine starting at line 2000 performs the I/O transfers. Line 2040 calls FNB to test whether the "transmitter ready" bit in the serial status port is asserted. If not, line 2050 loops back to the function call. Thus the subroutine waits until the serial transmitter is ready to accept a character.

Line 2090 performs the output to the serial data port, which will cause the byte to be transmitted. Then a similar wait for the character to be echoed by the other computer is started on line 2130. A different bit in the serial status port is tested until the "receiver ready" bit is asserted. That signifies that a character has been received and is ready to be read. Line 2150 reads the character from the serial data port.

There are some advanced concepts to be studied here. How did I know the addresses of the serial data and status port? How did I know what bits to test and what they meant? Port addresses are specified in the Horizon hardware manual. The integrated circuit used for the serial port is an 8251. The data sheets on the 8251, found in the Intel Component Data catalog describe the operation of the part. That is how I knew what bits to test.

Many other serial chips are used for serial ports as well as parallel ports and other functions. As long as the speed BASIC offers is sufficient to perform your I/O task, there really isn't any reason to warm up the assembler.

### Why Would I Use This?

The main reason for writing BASIC I/O drivers is for speed

of development. BASIC makes many operations simple, such as the disk file manipulation in my program. I really don't want to write my own disk handler. Also, BASIC offers math functions which I wouldn't want to write in assembler. Finally, BASIC allows me to quickly write and test an idea for an I/O driver. If the idea works, I can later incorporate it into an assembly language program.

```
1000 REM *****
1010 REM *
1020 REM * FILE TRANSFER PROGRAM TO FORUM BULLETIN BOARD
1030 REM * SYSTEM, BLOCK TRANSFER MODE.
1040 REM *
1050 REM * THIS PROGRAM WILL OUTPUT A FILE TO A FORUM
1060 REM * BULLETIN BOARD SYSTEM IN BLOCK MODE. THIS
1070 REM * MODE REQUIRES TWO CAPABILITIES OF THE REMOTE
1080 REM * SYSTEM\
1090 REM *           1. WAIT FOR CURSOR-ON CHARACTER BEFORE
1100 REM *                SENDING A LINE. FOR SOROC IQ-120, A
1110 REM *                CURSOR-ON CHARACTER IS CHR$(?)
1120 REM *           2. TRANSMISSION OF A CARRIAGE RETURN AT
1130 REM *                LEAST EVERY 255 CHARACTERS.
1140 REM *
1150 REM * IN ADDITION, THIS PROGRAM ONLY TRANSMITS ONE
1160 REM * CHARACTER AT A TIME AND WAITS FOR THE HOST SYSTEM
1170 REM * TO ECHO THAT CHARACTER.
1180 REM *
1190 REM *           STEVE LEIBSON           SEPTEMBER 19, 1981
1200 REM *
1210 REM *****
1220 REM
1230 REM FIRST, SET UP SOME CONSTANTS
1240 C$=CHR$(27)+"+"\REM CLEAR SCREEN SEQUENCE
1250 O=15\REM CURSOR ON CHARACTER
1260 PO=2\REM SERIAL DATA PORT
1270 P1=3\REM SERIAL CONTROL PORT
1280 BO=0\REM TRANSMITTER READY BIT NUMBER
1290 B1=1\REM RECEIVER READY BIT NUMBER
1300 VO=1\REM TRANSMITTER READY BIT VALUE
1310 V1=1\REM RECEIVER READY BIT VALUE
1315 E=26\REM END OF FILE CHARACTER ON DISK
1316 F=20\REM CHARACTER TO SEND FOR END OF FILE
1320 REM
1321 REM PORT READ AND BIT ISOLATOR FUNCTION
1322 DEF FNB(B,P)
1323 V=INP(P)
1324 I=(V/(2^(B+1)))-INT(V/(2^(B+1)))
1325 V=INT(I*2)
1326 RETURN V
1327 FNEND
```

# THE I/O FARM

```
1328 REM
1330 REM NOW, WE ASK FOR THE FILE TO BE TRANSFERRED
1340 INPUT "WHICH FILE DO YOU WISH TRANSFERRED ",F$
1350 IF F$<>" " THEN 1380
1360 PRINT "HOW ABOUT A FILE NAME WHEN I ASK FOR IT?"
1370 GOTO 1320
1380 REM ASSUME A .D SUFFIX
1390 F$=F$+".D"
1400 REM
1410 REM NOW WE NEED A DRIVE NUMBER
1420 INPUT "ON WHICH DRIVE IS THE FILE ",D
1430 IF D>0 AND D<5 THEN 1460
1440 PRINT "DRIVE ",D," DOESN'T EXIST, TRY AGAIN"
1450 GOTO 1420
1460 REM
1470 F$=F$+", "+CHR$(D+48)
1480 REM
1490 REM OPEN THE FILE
1500 OPEN #1,F$
1510 REM
1520 REM MAIN LOOP
1530 REM
1540 REM READ ONE BYTE FROM FILE
1550 READ #1,&C
1555 IF C>127 THEN C=C-128\REM DONT SEND NONASCII
1560 IF C<>E THEN 1640\REM CHECK FOR END OF FILE
1570 REM END OF FILE
1580 C=F
1590 GOSUB 2000\REM SEND CHARACTER
1600 END
1610 REM SEND CHARACTER
1630 REM TRANSMIT THE CHARACTER
1640 GOSUB 2040
1650 GOTO 1550
2000 REM SUBROUTINE FOR SENDING A CHARACTER
2010 REM THIS ROUTINE WAITS FOR THE ECHO
2020 REM
2030 REM FIRST, CHECK FOR TRANSMITTER READY
2040 Z=FNB(B0,P1)
2050 IF Z<>V0 THEN 2040
2060 REM
2070 REM NOW SEND THE CHARACTER
2080 REM
2090 OUT P0,C
2100 REM
2110 REM WAIT FOR THE ECHO
2120 REM
2130 Z=FNB(B1,P1)
2140 IF Z<>V1 THEN 2130
2150 C2=INP(P0)
2154 IF C2>127 THEN C2=C2-128
2155 PRINT CHR$(C2),
2160 RETURN
```





# WHAT SNEW

The 7<sup>th</sup> Annual Computer Faire at Brooks Hall in San Francisco was only a bit short of amazing for a first timer like myself. In spite of the fact that I slipped into the show disguised as a dealer (donning a red "Dealer" sticker) and hoping for the extra attention afforded those in such positions, I nonetheless found myself quite below the salt, flailing, along with everyone else, through a sea of delirious technophiles most of whom seemed stricken with that insidious affliction--microchip madness.

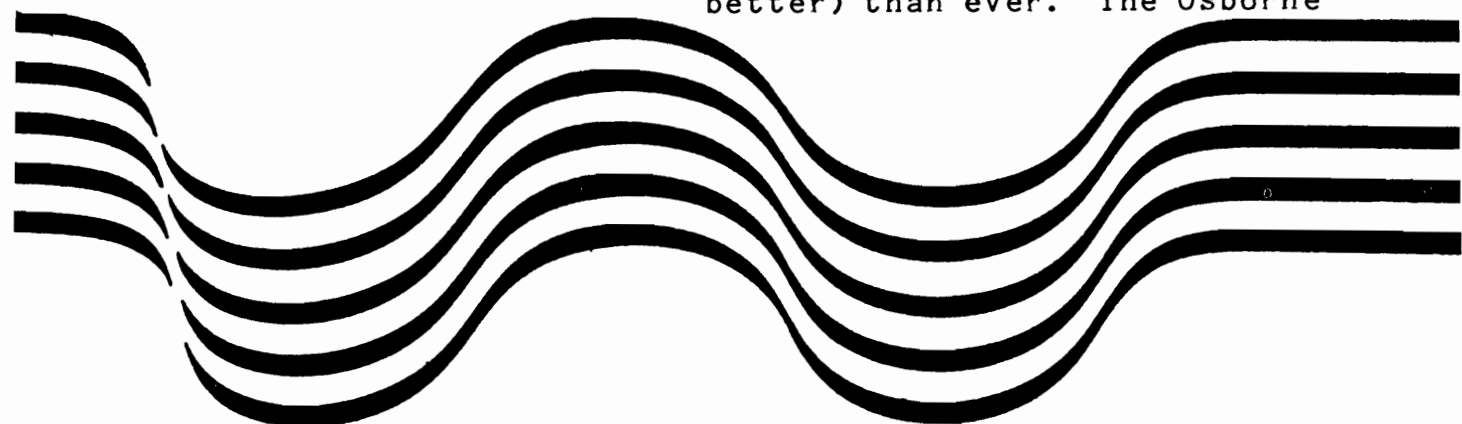
Whether the fashion of High-Tech fluency is indicative of the rising of the Third Wave of human knowledge come to ameliorate the problems of mankind, or is a portent of the alienation to which the man/machine relationship will undoubtedly contribute, remains to be seen. Regardless, being a high-tech junkie myself, I was fascinated and even awe-struck by the div-

Some time has passed since the Faire, but I will do my best to recall the more memorable attractions. Of course there was the usual array of electronics parts suppliers selling those hard-to-get connectors, keyboards, UART's, memory chips, etc. Some of the bigger suppliers were there too, like Jade for instance, marketing disk drives, printers, monitors, modems. The usual. Then, of course, the specialized interest groups, like North Star and Forth Users' groups.

But maybe because they were just more visible, I was most impressed by the new additions in the hardware department.

>>> Eight Bit Dept.

The look-alikes are proliferating. This year is worse (or better) than ever. The Osborne



ersity of silicon-based gizmos and the creativity they represented.

is being given a run for its money by the Kaycomp II by Non-linear Systems. Priced at

\$1795, with the same kind of software Osborne is famous for including, it comes in a more sturdy all-metal housing with two double-density drives and a larger screen.

Next there was the Fox at \$3995, which includes 1.2 meg of disk space and 64K of RAM, detachable keyboard, 9-inch monitor, 12 programmable keys, 3 serial ports and 1 parallel port, and weighs under 30 lbs!

The EAGLE looked pretty promising also. Produced by Eagle Computers of Campbell, CA, there are 3 models, including a one-

this surprising considering that the Expander was designed by the man who created the SOL--Lee Felsenstein? That's right! Oddly enough, this text is being written on a SOL keyboard I picked up at a swap meet (San Jose, CA). Best keyboard I have ever used. The Expander also comes with a 24 hour repair turnaround, and a 1 year warranty. From Micro Expander Inc. in NYC. Also a 15 day money back guarantee.

Not in the imitation department: another oldtimer, IMSAI, was apparently alive and



# WHAT SNEW

piece format with 12" screen, dual 5" drives, good looking keyboard and software. Their business model has 1.6 meg on disk.

Back to the look-alikes, The ACE 100 is a professional personal computer which is software- and hardware-compatible with the Apple. All Apple peripherals will work with it, and it has a real keyboard too, as well as a 12-key numeric pad.

One of the more interesting newcomers to me was called the Expander, and is actually a new incarnation of the old beloved Sol. Aimed at the potential Apple, IBM, or Pet buyer, the marketers claim they have the lowest priced 64K S-100 computer on the market. At \$1795 they may be right. Not to mention that it also includes 265 color graphics, interface for cassette, 6 floppies or 3 hard disks. It also has an 80 key keyboard, simultaneous use of all 256 colors, 80 by 24 display in black and white mode, 4 S-100 slots for expansion, and is the size of the Sol. Runs CP/M and has a 4K monitor in ROM. Is

well in their own booth, selling the famous original IMSAI boards, etc. A few new products as well.

I noticed a TRS-80 imitation which appeared to be built far better, in a metal, attractive chassis, with a decent keyboard, but I forget the name.

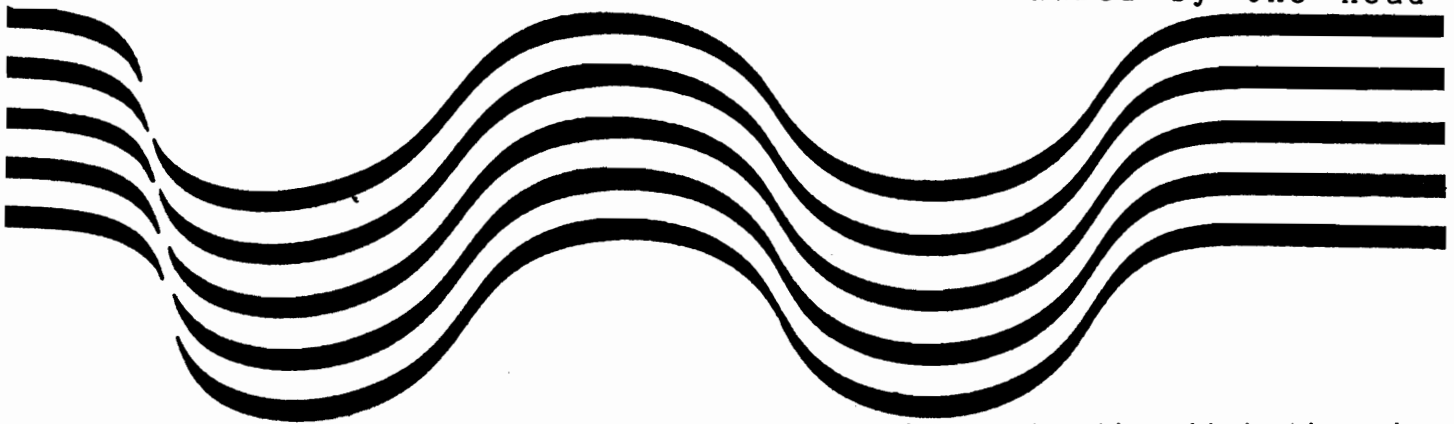
Another attractive system was the Alspa computer. These people have taken one or two (your choice) thin line Tandon drives, and a single board 64K computer and packaged it all in a box the size of a normal single 8" drive. With the double-sided drives, the disk capacity is 2.2 meg. Hard disk interface included, ready to plug into a Corvus drive.

In the area of S-100 boards, the main attraction was the mass-memory disk-drive emulators, of which I saw two. These perform the function of receiving all the information on your disks and then executing

your programs from RAM with no disk accesses. One brand, called the SEMI DISK, comes in two models--a 512K and a 1Meg version at \$1995 and \$2995 respectively. The 1Meg version will allow you to download two double-density single-sided drives into memory. Programs are supposed to run faster even compared to a hard disk. SEMI-DISK Systems is in Beavertown, Oregon. The only competition I saw for this type of product is called the WARP DRIVE, and appeared to be a little less sophisticated.

>>> Peripherals.

In the arena of peripherals, which is a giant one, I noticed that 8" drives are becoming more and more affordable. I, in fact, picked up a couple of slim line TANDON double-sided drives. These are interesting in that the heads are always loaded, but the motor which spins the disk turns off a few seconds after the last disk access. In the long run they are quieter and faster than the average drive, and the media lasts longer. According to Tandon, more media wear is caused by the head



>>> Sixteen Bit Dept.

I suppose the real excitement was in the 16-Bit camp, since it appears that the future is headed, as usual, in the "bigger is better" direction. Of greatest interest to me was the SAGE from Reno. This machine is the width of two 5" drives, but contains one 5" Winchester and one 5" floppy. The processor is the Motorola 68000 running at 8 megahertz. RAM is 128K expandable to .5Meg. All the circuitry is one one board, and this includes a real-time clock, a printer port, a modem port, and an IEEE 488 interface. The operating system is UCSD including Pascal, FORTRAN, BASIC, and Assembler. The SAGE representatives said that UNIX was also available in its complete form. The power supply is a 50 watt switcher, allowing the entire unit to weigh only 25 pounds.

banging onto the disk than by having the head always loaded and stopping the drive when not in active use. Also, the stepper motors step in 3 msec. instead of the usual 8 msec for Shugart SA800's. The only sticky point is that you need a pretty beefy 24-volt power supply, since they don't use 110v for the spindle motors. Only two voltages are required-- +5 and +24.

Modem prices seemed to be coming down, with some direct-connect 300 Baud models coming in around 100 dollars.

I vaguely recall seeing a plotter which had a number of colored pens lined up in holders. The computer could direct the plotter to pick up or return the different pens to change the plotting colors.

In light of the fact that there are so many TRS-80, Apple, and other memory-mapped video users out there, the CRT Monitor market was well represented.

# WHAT SNEW

(Anyone with the ability to hear sounds above 15 KHz couldn't escape developing a headache after an hour or so on the main floor with all the monitors on simultaneously.)

Actually, I was in the market for one, so I really looked into these. Most attractive was an amber-colored job by USI International. Amber has been required by the German government for all CRT work in that country, and I can see why. Thinking that I needed a green screen, I was surprised to find that the amber was much more pleasant to the eye.

Computerland stores are carrying these monitors. The price war, waged primarily by Zenith, has weighed heavily on the monitor market, bringing prices down into the 150-dollar or less range. The Zenith, Amdek, and NEC models all looked good, but I ended up going for an Electrohome from Canada because I knew that they were used in professional applications, and this model used an all-metal cabinet instead of the usual all-plastic.

In the way of accessories designed for those concerned with the health hazards associated with computers, I chatted with a man who markets a lead-impregnated acrylic screen which he claims will block all the x-ray radiation coming out of your CRT. Says this is the same material used in x-ray labs, dentist offices, etc. The I-protect, (213)-673-1587.

## WE MOVE

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>>> Software

### The Word Plus

This was a very impressive spelling-corrector, selling for about \$125 at the fair, maybe less, but normally for \$150. I have been using Spelstar since then, but, as I recall, this one was much faster, and included a lot of other interesting data as well. If you need a spelling corrector, definitely check this one out.

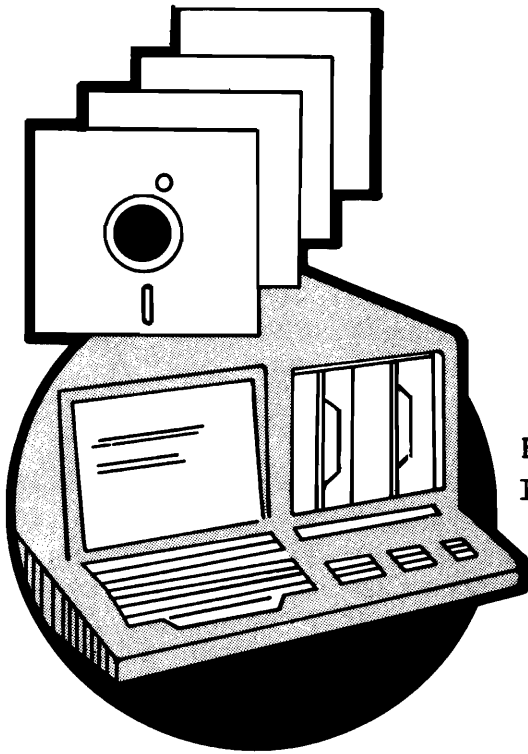
### Pearl

I was given demonstration of Personal Pearl, which is a database program. I have been using dBASE II, which I like very much, but Pearl was easier to use in some ways. Formatting the screen for data entry was easier, though the package as a whole was not as flexible in terms of writing command files and programs as dBASE. If you are looking for a data-base program and you are not interested in learning programming, check this one out.

Well, this is about all I have to report on. Until the next Computer Faire we will all have to be content with reading the magazines. [--and Compass--Eds.]

INSUA has moved!!! Please make a note of its new address:

INSUA  
Box 2789  
Fairfield, CA 94585



By Mark Shepherd  
INSUA Disk Librarian

# CPM LIBRARY DISK

This disk, the 11th in the INSUA library, marks a widening of our horizons. Previously, INSUA disks were solely in Northstar format. Due to the wide acceptance of CP/M as a standard operating system, we will be including many CP/M programs in our library. The first few CP/M disks will concentrate on utilities.

Disk #1011 contains the following files:

1. D.COM                    3K

This utility will keep a record of what is new and what is missing on a given disk since the last time the program was run. This program contains its own Help file. Type D HELP to access the Help file.

2. SD.COM                    2K

This utility is somewhat like a combination of DIR and STAT. It will provide a Sorted Directory

of a disk including the size of each file. It also provides the amount of free space on the disk. SD will take all standard CP/M file names including the ambiguous characters "\*" and "?". To find everything on a disk just type "SD". To find all COM files on the disk type "\*.COM". If SD is on disk A: and you want a directory of disk B: type "SD B:". SD.COM and D.COM are usually kept on each disk.

3. FLS-11.COM            9K  
4. SQ15.COM            14K  
5. USQ15.COM            10K  
6. TYPESQ2.COM        8K  
7. SQUEEZER.DQC        16K

Files #3 thru #7 are a group of related utilities and documentation. SQ15.COM will analyze a given file, and by giving each unique word a token, produce a new file of substantially smaller size. CBASIC and Wordstar files are often reduced in size by 35% to 40%. The new file will be of the same name but the extension

# CPM LIBRARY DISK

(.xxx) will have a "Q" in the middle. Note that #7 is "SQUEEZER.DQC". The "DQC" means that "SQUEEZER.DOC" has been squeezed by SQ15 and a new file produced. Note that after squeezing both the old and the new files will be on the disk.

To read a "squeezed" file you can do either of two things: run Typesq2 for a squeezed file (works the same as Type for a normal not squeezed file) or USQ15.COM. This reverses the effects of SQ15.COM. After USQ15 you will have both the squeezed file and the unsqueezed file on the disk. Before running USQ15 make sure that you have enough space on the disk. IF the squeezed file is 16K you will need at least 24K of free space. Do a CTRL-C and then run SD for that disk to find out how much free space you have.

Before doing anything else I recommend unsqueezing SQUEEZER.DQC and reading it completely. (USQ15 SQUEEZER.DQC will unsqueeze it. Put both USQ15.COM and SQUEEZER.DQC on drive A:.) A printed copy would be very useful. Then go on and try FLS-11.

FLS-11.COM will give you a type of super-SUBMIT capability. It is patterned after the UNIX "pipeline" feature. If you want to squeeze all .DOC files on a disk you can enter a command like:

```
FLS-11 A:SQ15 A:*.DOC |A:
```

Like Submit, FLS-11 works best if it is on your A: drive. Read the documentation and then give it a try.

Using the combination of SQ15 and USQ15 has two benefits.  
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First, you can hold much more on each disk. Secondly, if you send (or receive) files by modem, it can save you much money on phone costs. A file that is 40% shorter takes 40% less phone time to transmit. So your phone bill can be much less.

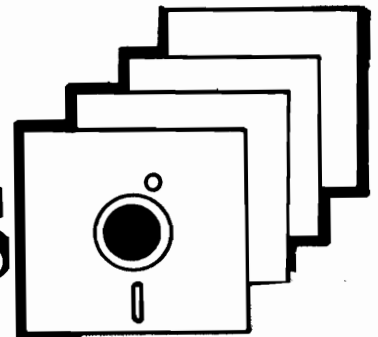
```
8. CRCK.COM      2K
9. CRCKLIST.CRC 1K
```

These last two files will tell you if you received good program copies on this disk. CRCK.COM computes a checksum for each program on the disk. CRCKLIST.CRC is a list of these checksums as computed on the INSUA library master disks. To use these, get a hardcopy of CRCKLIST.CRC. CTRL-P and then TYPE CRCKLIST.CRC will do fine. Then enter

```
CRCK *.*
```

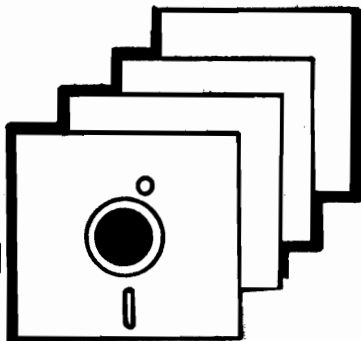
and compare the listing on the screen with the listing on the hardcopy. If the numbers for each file are OK then you have received good copies of the programs.

## NS DISKS



TELSTAR is an assembly language program written by Leonard E. Garcia for transferring named disc files, either single or double density, thru the telephone via a modem. According to Garcia, an additional program included on the disc, TELSHARE, is designed to run in high memory and allows a remote user to access and share all inputs and outputs of any program running

# NS DISKS



under DOS with the local user. Included on the disc is a program by Pavel Breder, MODEM, which makes it possible through the use of a modem to tie into Bulletin Boards and other informational networks as well as interact with other users.

The ASSEMBLER disc includes both the single density and the double density adaptation of the self contained system (assembler/editor) originally released through Processor Technology and now adapted for NORTHSTAR.

The #1001-DOS holds the 5.2 single density relocatable NORTHSTAR DOS and #1002-DOS DD holds the double density version. This makes it possible to move the DOS to other more appropriate locations.

The programs in each COMPASS newsletter are also available on disk. One disk for each issue.

The #1001 disc, DOS and the #1002 DOS DD are each \$10. The others, are each \$15.

Please indicate by number which you want and send check or money order to INSUA



International North Star  
Users Association  
P.O. Box 2789  
Fairfield, CA 94533

## HOUSEKEEPER

A multi-utility package  
for North Star DOS.

Available from:  
The SOFTWARE WORKS  
1032 Elwell Court  
Palo Alto CA 94303

Review by Clyde Steiner

If you're looking for an easy way to salvage a North Star disk after you inadvertantly destroyed the directory, or a way to insert a ready-made heapsort into your BASIC programs...then this classic package of house-keeping utilities is for you.

All told there are 45 different programs on the two disks that The Software Works furnish. Eighty-four pages of clear documentation explain the routines.

The majority of the programs are in North Star BASIC. You can append them to or incorporate them as subroutines in BASIC programs that you write. This approach relieves you of the chore of reinventing the wheel every time you want to sort data, create data storage, etc.

A particularly interesting program, and one not often seen in this type of basic routine compilation, is the Soundex function. This function, added to your BASIC program, gives you the ability to translate names or phrases to Soundex-based code. Searching for the data later can then be done with only approximate spelling rather than letter-for-letter accuracy.

The Housekeeper package is not limited to North Star BASIC program modules, but also includes a number of specialized utilities such as a single disk drive copy program, a disk file renamer, an automatic memory map, a directory sorter, etc.

There is nothing startlingly new in the package, which was first released in 1978. But the programs have stood the test of time and offer an important bonus to the North Star user. They work.

# GROUPS

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## CHICAGO AREA NORTH\* USERS GROUP

By Ed Coudal  
627 S. Crescent Ave.  
Park Ridge, IL 60068

The March Technical meeting of the North Star User Group was held at Lake Forest College, where the Computer Sciences department uses six North Star Horizons for teaching purposes, as well as using the machines in hardware/software development.

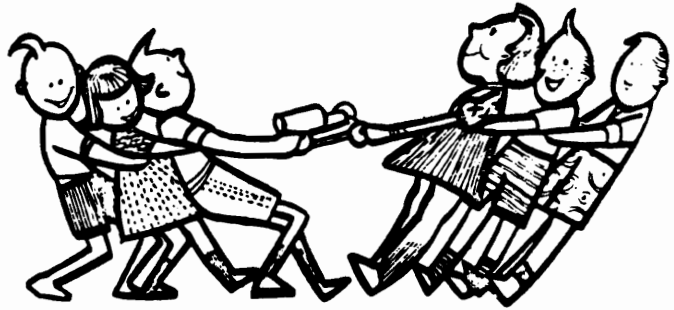
The head of the department, Dr. Schmidt, was kind enough to open the facility on a Sunday afternoon, and about 15 SIG members attended.

The school has done quite a bit in the speech synthesis area and this proved to be of great interest, along with turtles and other futuristic stuff that most of us only see in the pages of Byte and other magazines.

One of the most impressive, and in some ways important displays was that of a North Star interfaced to a gas chromatograph through a Vector Graphic analog-to-digital board, which simply dropped into the N\* S-100 bus.

The beauty of interfacing such sophisticated lab instruments to a computer is that a lot of the drudge work--collection of data, for instance--can be eliminated from the teaching process. Secondly, the future of laboratory analysis seems to be tending toward computer-aided analysis of results, and the display at Lake Forest indicated that such work does not necessarily demand a \$30,000 dedicated machine to produce highly useful results. [See "Analog to Digital" in this issue. -Ed.]

THE APRIL technical meeting was devoted to a presentation by Mike Pickard on speech synthesis, tracing the history of  
COMPASS PAGE 26



the technology's development to the present state of the popular art, the Votrax.

Mike had tape recordings of early speech synthesis efforts, which sounded like a cross between Louis Armstrong and two rocks being rapped together, and the Votrax. The Votrax will not remind anyone of John Cameron Swayze (or even Lynn Burton) but was clearly understandable, and more important, easy to program, as Mike demonstrated on the spot by making my Norty say words I didn't think he knew. I was shocked.

On the subject of speech synthesis, if there was one area that was particularly interesting at the Computer Faire in San Francisco, it was the number of new speech recognition and synthesis devices being offered.

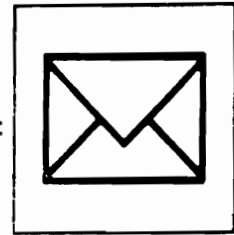
NORTH STAR has issued the latest of its User Newsletters and everyone should have received it by now. If you didn't, you're not on the big S-100's mailing list, and should write to them to make sure you get future issues. Write:

Sherry Corea  
Marketing Communications dept.  
North Star Computers  
14440 Catalina st.  
San Leandro, CA, 94577

NORTH STAR also has just published its first-ever "Compatible Software Directory," which is a directory of all



# LETTERS



INSUA:

We are establishing a North Texas Bulletin Board and hope to sponsor a user's group here. The Bulletin Board number will be (214) 341-9651. Our Horizon DD has a Hayes S-100 modem and their terminal program. We have Microstuff bulletin board and remote software.

Y'all Call  
Dave Seveland  
Camelot Computers  
11325 Pegasus, Suite W218  
Dallas, TX 75238

INSUA:

Help Wanted!

Have "OASIS" multi-user operating system running on N\*. Want to correspond with others doing the same.

Roy Keeley  
Rt. 3, Box 316  
Theodore, AL 36582

## ALIENS!

- \*\*Like your Clyde brand gimcrack?
- \*\*Hate your Lincadillac S-100 board??
- \*\*Find anything plug-compatible with N\*???

S-100 sympathizers, come out of the closet  
Send me brief war stories about specific hardware or software not made by North Star, products that darken or brighten your Horizon. Name names, model numbers, prices, and evaluate the product. Was there user support? Did you discover something clever to make it work? Help fellow buyers avoid Easter egg hunts for the right patch. I'll compile these experiences for *COMPASS*.

Don't be a turnkey! Send ready-to-print short articles (preferably on a N\* CP/M disk, which I'll return); or, write a letter or call me, and I'll write it up. Please make your communication transparently self-evident for the user who (like me) is not an engineer. Let's steer each other to products that work as we stand in the rain waiting for Baudot & the S-100 bus.

Warren Lambert      O:615 584-1561 x7753  
5908 Lyons View Dr.      H:615 938-3482  
Knoxville TN 37919

## GROUPS

the software houses offering programs that run on the North Star. It's indexed by subject matter, and cross-indexed by software publisher. There are 95 publishers listed. Obviously, there are some notable omissions, but it's the best listing I've come across. Don't know if they're making it generally available without asking, so you may have to write to the address above.

THE INTERNATIONAL North Star User Group held elections during the Computer Faire and your correspondent was elected to the board of directors, and has been put specifically in charge of clubs and users' groups. Please pass along any thoughts, ideas, suggestions, or articles, particularly about clubs, and also programs for the newsletter and I'll forward them to INSUA.

There are now about 600 members nationwide in INSUA, and there is a move afoot to put up a national BBS solely for the organization. Any thoughts on that? Let me know.

# LETTERS

INSUA:

For some time I have had a sneaking feeling that there was something about our organization, the International North Star Users Association, Inc., that didn't quite make sense.

When I received the ballot for the election of officers, with the brief notes on the candidates, I suddenly realized what was bothering me. The name of the organization is misleading! Six of the ten candidates for office say that they are computer hobbyists. The content of the Compass is largely aimed at the hobbyist. We come closer to being a North Star Hobbyist-User's organization than a Business-User's organization. Someone who bought a North Star computer as a business tool rather than an adult toy doesn't find much nourishment. The newcomer who has just bought his first computer must be almost totally confused by most of the contents of a typical issue of the Compass.

I'm not knocking hobbyists. Without them we'd still be in the golf ball age, using calculators and Selectrics instead of computers and daisy wheels. But if we are to be a real User's organization, we need to add to the present content of the Compass material for the business user who wants to get the most out of the tool he bought for bookkeeping, word processing, inventory, scientific research, genealogy or what have you.

Please don't interpret this as criticism of INSUA. The officers and directors have worked hard to make the organization what it is today. It is presently filling a definite need, and doing it well. But

I'd like to see INSUA go much further.

Much of information needed by the business user will seem elementary, even obvious to the hobbyist. But we don't have their background in hardware and software, so we can't figure things out for ourselves. We can follow detailed instructions on an elementary level for making patches. We might even be able to change chips and make minor hardware modifications. But we do need to be told how to do it from the ground up.



Many of us don't have a soul to turn to for help. We may have found that the local dealer is no longer interested in us after the check has cleared. Perhaps he doesn't know the answers and hasn't the time to find out. Or the one man who knows the answers is only available the fifth Monday of the month, in leapeyears, from 10 to 11 am. Our supplier may have gone out of business. Or we bought our systems by mail because we couldn't afford to pay full list price. And we have no friends who are more experienced than we are.

# LETTERS

Could the Compass become our friend in need? Can we have articles, features, tutorials, columns covering such things as:

Listings of friendly dealers who stock NorthStars, peripherals and software for sale, and will give the time of day to someone who isn't going to spend \$5,000 this week.

Listings of competent repair services who don't care where you bought your equipment, but are satisfied to make a living doing honest work? This could include drop in repair shops, and perhaps board exchanges.

Listings of reputable mail order hardware and software houses who give prompt service?

Listings of qualified members who are available for consultation on hardware or software problems, with an indication of how they base their charges? Is there a charge for asking what it would cost to do a job? How do you work with such consultants?

A question-and-answer column with a competent expert giving answers to questions of general interest?

A practical article on how to turn a North Star Horizon into a true 64K machine? Some seem to say it calls for modification of the CPU board, others the Controller board. But many of us can't afford to send either away for modification; we use our machines daily and would be helpless without them. Some of us might be able to do the necessary hardware modifications ourselves.

Reviews, or even just lists, of peripherals that are compatible with North Stars, and the

necessary software to make them work? (Clocks, modems, bit pads, hard discs, etc.)

Lead-by-the-hand instructions on modifying software (for instance, how to modify WordStar to use the function keys on a terminal)? Mention of software bugs, even those later corrected? Many naive users assume that they, not the software are the problem.

An index of some of the highly specialized programs that have been written for various businesses? For instance there is a program available for those



##&'s who tow away our cars. It keeps track of what cars they have seized, where they are, what the ransom is, and even prints out a bill for the victim, accurate to a tenth of a second or better. There are many more programs out there, equally specialized, unknown to those who badly need them and either can't afford to pay for custom programming or lack the time and/or expertise to do the job themselves.

Tutorials on what to do when faced with an assembly level listing that we'd like to feed into our machines? What programs do we need to do the job with? How do we go about it?

Reviews of utility software packages that can be so useful, like N<sup>S</sup> SORT, N<sup>S</sup> BUS, DOCUMATE, FN, PAIR and so on?

Book reviews of especially helpful books on programming in various languages, using CP/M, WordStar, etc.?

More information on the Micro-Count II system we received as a bonus recently? The documentation is helpful, but maddeningly laconic



A) Microcomputer Index, published quarterly, is a subject index to about 25 computer magazines. To use MI, you generally decide on a subject, and then scan through the articles listed under that subject.. "North Star" is one such subject. The October-December 1981 issue, for example, lists eighteen articles under this heading. The second half of the volume contains abstracts (or summaries) of the articles. Thus, to get a general idea of what's in Joseph Roehrig's Byte article entitled "Computer Scrabble," listed under the North Star subject headings, all

# BIBLIOGRHIES

## Computer Bibliographies

A feature article in the University of Chicago daily paper some years back contained an interview with the mother of the captain of the new football team (the former Big Ten team had been defunct since the 1930's). Asked if her son had ever played football before, she replied, "No, but he's been reading up on it all summer."

North Star users who get their knowledge of computing by reading rather than by consulting with friends should know about two bibliographical publications.

MORE....

# LETTERS

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Information on new editions of NorthStar documentation, new versions of NorthStar DOS, BASIC, CP/M and a review of the new features?

Could we make the format of the Compass a little more dignified? The present format pro-  
COMPASS PAGE 30

that's necessary is to look up the abstract numbered 8146133:

**Presents a program in North Star BASIC that is capable of handling every two- and three-letter word conceivable and maximizes the placement of the selected word.**

B) The Index, subtitled "The ultimate information index for all personal computer users," comes in paperback format. It summarizes information from some 44 magazines, generally surveying the magazines from their beginning to Summer 1981. The logical way to use The Index is to check under the headings

jects the wrong image if we are trying to attract and hold the business user. Maybe we should have separate sections for the user, the hardware nut and the software bug.

A strong user's organization is vitally important to each of

# BIBLIOGRHIES

which are listed in bold type at the top of the page. The heading "NORTH STAR ARTICLES" extends over four pages. The entries are highly redundant, however, for the following reason:

An article such as TAX CALCULATION PROGRAM is also listed under CALCULATION PROGRAM\* TAX and under PROGRAM\* TAX CALCULATION. Articles with four significant words are listed four times, and so forth. Although this system takes some getting used to, it makes articles easy to spot. Also listed are author (last name only), journal, and date. No abstracts are given: the titles are, in a sense, thumbnail abstracts.

The second half of The Index, entitled GENERAL ARTICLES, lists additional articles, and should therefore be consulted also: two additional articles concerning North Star appear in this list.

Both publications are very useful, and should be considered by clubs if not necessarily by all individuals. Compass art-

icles are not yet listed in either publication, but should be listed in the future. Either publication will save club librarians the nuisance of making their own abstracts.

Here's the necessary information:

(A)

Microcomputer Index  
Microcomputer Information  
Services  
2464 El Camino Real #247  
Santa Clara, CA 95051

(\$30.00 per year)

(B)

The Index  
Post Office Box 301  
St. Ann, Missouri 63074

(Suggested Retail price  
\$14.95; checks payable to  
Missouri Indexing, Inc.)

Toll Free 800-835-2246  
In Kansas 800-362-2421  
Ex. 467

# LETTERS

us. We can't rely on the manufacturer or the dealers to give us of the information we need. How can they, when we often don't know what we need until we see it in print! The magazines help, but they can't focus on the needs of a relatively small group.

There is a great need for an organization to serve all NorthStar users, whether they be beginners, business people, programmers or hardware and software hobbyists. I'd like INSUA be that organization.

Best regards,

HENRY M. SPELMAN III  
P.O. Box 645  
San Anselmo, CA 94960

--This letter raises many issues which have been discussed at length by INSUA, and then some! Compass is trying to answer some of the needs addressed in this letter, particularly by encouraging reviews of commercially available software. The editors, however, can't write all the articles by themselves. Further contributions in any of these areas are most welcome!

We have discussed format, and have decided that the 8-1/2x11 format, suitable for saving in a ring binder, is most suitable for this fast-moving field. It is also a format which is easy to produce and to mail. We feel that content is more important than a slick appearance. Eds.

ON A TREE-studded campus nestled in the wealthy Chicago North Shore suburbs, a young chemistry professor is using a unique, home-made analog-to-digital computer system to take the drudgery out of advanced chemistry instruction. His system could have broad and significant application in commercial laboratories.

By Edgar F. Coudal

(Article printed with the express permission of the author--Eds.)

# \$50 ANALOGUE - DIGITAL

Larry Shoer, Assistant Professor in chemistry at Lake Forest College, said the idea is to give students data to manipulate and to learn from. "Yet," he said, "students spend much time of their time collecting data, not learning from it. I felt there had to be a better way than teaching serious chemistry students how to heat ovens and turn knobs and read dials. In the real world, that's the domain of the technician, not the chemist."

To Shoer, the obvious answer was adding an instrument: a micro-computer. "My starting premise," he said, "was that with a computer we could store data of all kinds, arrived at under a variety of conditions, present it to the students, and say, 'Here are the results of your instruments' work. What do they mean?' That's what one should really do in teaching chemistry."

Shoer said, "While large industrial companies can buy highly specialized...and expensive...computer equipment that interfaces to chemical laboratory instruments, there are a great many small labs and educational facilities which cannot justify the high costs of such equipment, especially when it may become obsolete in two or three years."

For schools and private labs, Shoer said, the microcomputer is the answer. Shoer teaches courses including a senior level course in instrumental methods and analysis. After receiving his doctorate from Princeton in 1978, he went on to post-doctorate studies in computer applications at the University of Illinois. In the course of his work at Lake Forest, Shoer had access to a North Star Horizon. The university has six such machines in its computer sciences department.

Shoer said, "The problem with interfacing laboratory instruments and microcomputers is that they are different beasts...computers deal with digital signals, most laboratory instruments with analog signals. A gas chromatograph, for example, takes a complex sample of a substance and breaks it down into its component parts, then outputs its analog results to a strip chart recorder or to a needle on a scale. Someone has to look at the strip chart or read the dials and make judgments."

A computer could have a library of standards, plus other functions, to do that kind of judgment work. The problem, Shoer said, was in making the analog instruments talk to the

# ANALOGUE

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---

digital computer and having final output that could be manipulated. After some trial and error, Shoer arrived at the set-up which is being used successfully today in Lake Forest College's chemistry department.

FIRST, AN amplifier to boost the lab instruments' signals was needed. "Typically, a lab instrument puts out a signal in the one to 10 millivolt range," Shoer said, "while an analog to digital converter works with signals in the one to 10 volt range." Shoer's answer was to simply build an amplifier "for less than 50 dollars." With the North Star Horizon, a high-end micro designed for scientific and business applications, already at hand, Shoer selected a Vector Graphics analog-to-digital 12-bit converter board which dropped right into the North Star's S-100 bus mainframe.

Keyboard input and print output are handled by an enhanced DECWriter II with graphics capabilities. All components are mounted in a wheeled rack "so we can take the whole system to the instrument." For software development, a CRT is added to the system, "but it isn't necessary for the instrumental analysis," Shoer said.

The system was completed with software written by Shoer in North Star BASIC. The program for the gas chromatograph is less than 20 K long, Shoer said, adding, "and that's heavily remarked, with one statement to a line. It could be considerably shorter." Further, the program is a turnkey system, which means that there are no boots, loads, and runs to get in the way of the student's use of its capabilities. "We're teaching chemistry," Shoer said, "not computing."

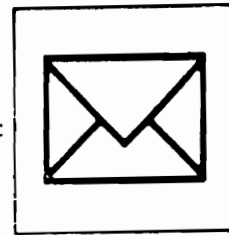
The program combines and evaluates the data and prints it out as a highly refined peak-and-valley chart, accompanied by alphanumeric indications of just what the peaks and valleys show. Built in to the program are various ways to manipulate the data to achieve different results and compare them, or to access a variety of data and compare what the differences in the gathering of that data means to its evaluation. A leading Midwestern forensic and industrial chemist studied print outputs of Shoer's A-to-D gas chromatograph system and offered to market it on the spot as something "that every lab in the country needs."

SUMMING UP, Shoer said, "The computer is a laboratory instrument, just as mass spectrometers or X-ray fluorescence machines are lab instruments. There are only two constraints, both of which seem to be solvable. First, there's the question of cost. Microcomputers are solving that, as prices come down and computing power goes up.

"Second, there's the uneasiness with which many approach a computer. A chemist wants to be a chemist; he does not want to be a computer expert, and he shouldn't have to be. When the computer becomes as friendly as a television set, that second constraint also will be conquered. And micros will find their way into almost all labs to raise the creativity and efficiency of the chemists working there.

# ==DIGITAL

# LETTERS



INSUA:

The NONUMBER program in Volume #4 did not work on my computer.

The MICRO-COUNT program [distributed free with #4 to first-year members] appears to be a far better program than the one I paid \$150.00 for.

Yours sincerely,

Robert Floyd  
1109 Maple Street  
Mtn. Home, Ark. 72653

P.S. I would like to get in touch with someone who is using the North Star time share (multi-user).

---Parts of NONUMBER were inserted in Compass out of order; also, by error, it was stated that this program was on DOS 5.2; in fact, it was written on DOS 5.0, Double Density. We hope to have more on NONUMBER in the next issue. --Eds.

\* \* \*

INSUA:

Having joined the user group during the 1981/2 session, may I congratulate you on producing a most informative and useful newsletter.

My system is comprised of an Horizon 2DD-64K, Televideo monitor and a Microline 80 printer, and my main interests include NS BASIC, NS Pascal, CP/M utilities (WordStar, Xassemblers, etc.) and 6800/8080/Z80 assembler development. I also have available eprom programming and erasure facilities which are controlled directly from the NS Horizon, having done assembler program development on the CP/M assembler or 6800 Xassembler.

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If this is of any interest to other users I would be pleased to pass the details on to them.

I would very much like to see some reference in the newsletter to the NS UCSD Pascal system on which I have done a little work. One area that is of interest to me is the generation and use of text and record type files within Pascal programs ...

One of my current problems is that of accepting data though the 2<sup>nd</sup> serial and parallel ports into Pascal programs, and I wonder whether any user can give me any suggestions in this area. That is, is there any current NS Pascal system which supports this facility, or can a system be modified to provide it, or has anyone written low level Procedures to provide these options--in other words, HELP!

Information of [or from?] other UK user members would also be of interest.

Thank you once again, and I look forward to the next issue of Compass. Please keep up the good work--we in the UK need your help.

Yours sincerely,  
George Farnworth  
271a Blackpool Road  
Poulton-le-Fylde  
Blackpool FY6 7QT  
United Kingdom

[We are soliciting articles on Pascal, and plan to get this part of our operation better organized. We are delighted to have such enthusiastic responses to our work, and are also delighted to hear from users who justify the "I" which is the first letter in the INSUA acronym! --Eds.]



# LETTERS

INSUA:

[Subscription problem...]

May I make a suggestion? It would be nice if the subscription information could be encoded on the mailing label so a subscriber would be aware of their subscription status.

It was wonderful to receive the free disk with the latest issue, and by the description it sounds like something I would very much like to use. However I bought my North Star in 1977 before double density was offered. I don't know how many there are of us single density users that are members but what can be provided for us in this instance and on such future occasions? Could the member's preferred density also be indicated on the address label so that when you have a mailing you know what to send, and to whom?

...

In spite of the above questions and problems, I am still a satisfied member.

Terry V. Reed

\* \* \*

INSUA:

I have discovered "Data File Programming in Basic" by Leroy Finkel and Jerald R. Brown, published by John Wiley & Son.

This book is a self-teaching guide for programming and managing data files in Microsoft BASIC. It has a cross referenced appendix for North Star BASIC with notes, annotations, and instructions supplementing the preceding chapters. It is quite complete in discussing the differences between Microsoft and N\* so that one could transpose a program written in on one dialect into the other using the techniques analyzed in the book.

I would certainly appreciate learning of other books that recognize N\* BASIC and hope that a mention in the Compass will be productive.

Larry Clark  
One Fountain Court  
1201 Pacific Avenue  
Tacoma WA 98402

\* \* \*

INSUA:

... I note that a Chicago Club of NS users exists. There used to be quite a few NS users in and around Orange County. If you have any significant membership of Orange County people, it might be possible to use that as a nucleus to start a local NS users group....

R. Alden Rhoads  
26502 Morena Dr.  
Mission Viejo, CA 92691

\* \* \*



INSUA:

I am writing in response to the announcement regarding user groups of the first **North Star Notes**. A small number of us in the New York Amateur Computer Club have decided to resuscitate the New York City North Star Users' Group, which had become inoperative for about half a year. We are going to meet on the last Thursday of each month, at a location to be arranged. It would be of great use to us to have as many members as possible, and we know that the presence of strong users' groups is an argument in favor of using a particular computer.

Dr. Jeremy J. Shapiro  
302 West 86th Street #3B  
New York, NY 10024

[See note concerning the name and zip-code list to be published in the next Compass--Eds.]



# INVENTORY-2

## MANUFACTURER'S SPECIFICATIONS & CLAIMS (excerpta):

### "FUNCTION:

Stockroom/Warehouse Control  
Sales Order Processing  
Purchase Order Processing

"The system provides all of the necessary functions to control small to medium sized inventories in typical distributor, wholesaler, and retailer environments.

"Inventories in excess of ten thousand items are within the scope of 5 1/4 inch floppy disk based systems. Despite the frugal use of disk storage, the open ended file design provides a good match to the newer hard disk based microcomputer systems.

COMPASS PAGE 36

### "HARDWARE REQUIREMENTS:

Processor: 8080 or Z80.

Memory: 18K user space.

Printer: 72 character wide min., 80-132 char. preferable; 10 characters/inch & 6 lines/in. preferred.

System Console: 24 L X 80 C preferred 16 L X 64 C acceptable.

Disk system: North Star MDS Double Density or Quad Capac. preferred.

### "SOFTWARE REQUIREMENTS:

Operating System: North Star DOS.

Language: North Star Basic.

'The operation of Inventory-2 is divided into four functionally distinct sub-systems: inventory control, sales order processing, purchase order proces-

sing, and system control. Each sub-system is fully integrated into each of the others. An optional item transaction file can be maintained by the system for integration of the order processing functions into external accounting systems (either manual or computer based).

"INVENTORY CONTROL sub-system maintains files of 17 important elements of data pertaining to each inventory item. This functions to provide capability to enter, edit and report on the individual items

"SALES ORDER entry sub-system provides for efficient processing of customer orders for items which are in the inventory. Orders may be filled from the "on hand" location, from the warehouse, or from both locations with preference given to either. Orders may be partially filled as items become available or may be held until all items on the order are available. Open orders are held on an open sales order disk file for as long as necessary.



"Invoices and packing slips may be printed either on plain paper or on New England Business Service forms. Either invoice is formatted to fit into the NEBS #771 double window envelope.

"PURCHASE ORDER sub-system provides the functions necessary for the entry, printing, and

receipt of vendor purchase orders. Shortage reports generated by the inventory control sub-system may guide the user to enter purchase orders into the system. Once on file, the



purchase orders will remain in the system until the goods are received from the vendor or the order is cancelled. Receipts of partial shipments are credited to the purchase order so that the open order reports will always show the current status of each open order.

"Purchase orders are formatted to fit NEBS #771 double window envelopes which entirely eliminates envelope addressing.

"SYSTEM CONTROL sub-system provides a means to alter system control parameters such as date, shipping and billing addresses, and the definition of system printer and console.

"Operation of the various system functions is through the use of a series of one word commands.

"System operation is initiated by loading and running the BASIC program named ICS. All subsequent changes of programs are handled automatically."

#### REVIEWER'S IMPRESSION

The package looks good. The manual is easy to read and easy to refer to for guidance. A few well chosen quotes promote a good mood in which to learn the use of this software.

Illustrations help to clarify function. Examples of reports and lists acquaint one with the printed output. Means for its



generation, its uses and formatting are clearly presented.

Appendices assist one with installation, start up, conversion from Inventory-1, and acquaint one with file structures used by Inventory-2 programs.

The section "About Backing-up" deserves to be included with software documentation generally. The quotations which open and close this section are choice reminders for anyone with growing (or overgrown) confidence.

# INVENTORY-2

## INSTALLATION:

The program can be personalized for the following 9 consoles by merely making a selection.

Hazeltine 1400, 1400 & Mod-1  
 Soroc  
 HP 2620 series & 2640 series  
 Intertech Intertube II  
 Infoton I-100  
 Synertek KTM-2/80  
 SWTPC CT-82  
 Heath H-19  
 IMSAI VIO-C

However, Selection of one of the following 5 consoles produces a reference to Appendix 'F' (should be 'E')

Proc. Tech. SOL & VDM-1  
 Vector Flashwriter  
 Beehive/Cromemco  
 ANSI Standard  
 Poly. VTI

COMPASS PAGE 38

Appendix E along with help from Appendix G and from the equipment manual provides the necessary information to install Inventory-2 for one of the five consoles in this second group.

Servicable installation for my SOL was effected by running the program 'CFU' and entering the following values:

Clear screen  
 C\$=CHR\$(11)

Home cursor  
 H\$=CHR\$(27)+CHR\$(2)+CHR\$(0)  
 +CHR\$(27)+CHR\$(1)+CHR\$(0)  
 or H\$=CHR\$(14) Both appeared to work.

Form feed  
 F\$=CHR\$(12)

Cursor down  
 \*CHR\$(26) didn't work.  
 Cursor right CHR\$(19) worked.  
 C1\$=CHR\$(19)  
 Cursor right \*CHR\$(19) didn't work. Cursor down CHR\$(26) worked.  
 C2\$=CHR\$(26)

Printer  
 P4=2 for parallel printer.

For convenience while trying out the program, I edited the 'CONSOLE' program to contain the installation values for SOL once they were determined.

A 'defect' in my installation (to date) is that space bar and another character are both required to produce a space during entry of inventory items. Back space during such entry is occasionally effective and when successful produces an entry out of line in printed reports.

Another puzzle is that Inventory-2 installed for 16 line screen does not function quite properly with my 16 line screen DOS but does a perfect job on the 24 line screen option of Micro Complex's SOL update. (I have not asked for help with these aspects.)

# INVENTORY-2

INVENTORY-2 is USER FRIENDLY

Screen displays are clear and attractive. There is always something on the screen to indicate what is going on.

Simple, brief instruction prompts are a helpful and unobtrusive presence during operation of the program. This enables occasional or novice users to perform tasks with ease.

A histogram shows the progress of reports and of functions which take time to accomplish.

The programs seem acceptably efficient. Perhaps the Z80 version has more pep. Warning is given for functions that are time consuming.

Error trapping & messages are good. Entry of strings where numbers are required and numbers where strings are expected is impossible. Misspelled commands bring a list of commands beginning with same letter as the mistaken word. Instruction for handling paper jams is clear.

## SUPPORT

The people at The Software Works are helpful. They respond effectively to questions and invite comments regarding their products. They are available by phone to help you see that "The Software Works".

INVENTORY - 2

In North Star Basic  
THE SOFTWARE WORKS, INC.  
1032 Elwell Court  
Palo Alto CA 94303

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# WANTED

The editors of Compass are looking for articles on the following topics:

- 1) **The North Star Advantage.** (Any owners out there who wish to report on their machine? Any opinions as to whether Compass should try to shift some of its interest to the Advantage?)
- 2) **Modems and modem programs.** (We'd like to devote the major part of an issue to this interesting, useful, and timely subject.)
- 3) **CP/M.** (General information about CP/M; also, opinions on whether Compass should devote a major share of its space to CP/M articles.)
- 4) **Pascal, FORTH, and other programming languages.**

# FOR SALE!

MEMORY BOARDS...24K GODBOUT  
STATIC \$175 each; 16k DYNABYTE  
DYNAMIC \$75 each; 8K GODBOUT  
STATIC \$75. All perfect and with  
documentation. Steiner, 2519  
Greenwich St., San Francisco, CA  
94124 Tel (415) 346-0625

North Star Single Density Disk  
Controller Board. Board became  
surplus when Horizon was up-  
graded to Double Density.  
\$150.00 or best offer. Gary  
Orkin, 1960 Los Angeles Avenue,  
Berkeley, CA 94707. (415) 525-  
1653.

North Star MDS single density  
disk controller board, manual,  
and disk. \$75.00. Gary Cyr,  
1566 Brookvale Dr., San Jose, CA  
95129.



# EPSON

Tate Yoshida  
N\*SIG CACHE  
Chicago, IL.

I was asked to prepare a little note to help other N\*/Epson MX-80 owners get their printers working from the Horizon parallel port, when "COMPASS #4" arrived. Our I/O Farmer, Steve Liebson, detailed a method different from what I had done. A Phone call to Steve assured me that no hardware changes had been made to the Horizon motherboard, only that changes were to the "COUT2" subroutines in DOS 5.1 and 5.2. Steve said, that what I had done was perfectly O.K.

First: The header at 9-C was wired as per instructions in the Horizon manual (HRZ-D-DOC Rev 1).

Pin 1 to 14  
2 to 13  
4 to 12

Second: A cable was set-up from the Horizon to Epson MX-80

	North Star HRZ Pin		Pin Epson MX-80
▶▶▶▶▶	Spare 8	→	1 Strobe
	Data-0 5		2 Data-0
▶▶▶▶▶	Data-1 12		3 Data-1
	Data-2 4		4 Data-2
▶▶▶▶▶▶▶▶▶▶	Data-3 11		5 Data-3
	Data-4 10		6 Data-4
▶▶▶▶▶▶▶▶▶▶	Data-5 2		7 Data-5
	Data-6 9		8 Data-6
▶▶▶▶▶▶▶▶▶▶	Data-7 1		9 Data-7
◆◆◆◆◆◆◆◆◆◆	Acknowledge 7	←	10 Acknowledge
◆◆◆◆◆◆◆◆◆◆	Ground 3	=====	16 Signal Ground

The 8th bit was included, as I intend to use the graphics.

OK ! SO LET'S TRY IT !!

+LI #2 WHAT! NO ALPHA! only block graphics.

Third: WHAT'S WRONG !!

Investigation showed that "COUT2" in DOS was toggling the 8th bit. Let's try NOP-ing those ORI's and XRI's. SUCCESS! So we end up with what amounts to the "POUT" routine on page 78 of the HRZ-D-DOC manual.

```

▶▶▶▶▶ POUT IN 6 ;Read motherboard status
▶▶▶▶▶ ANI 1 ;Mask to get PO flag
▶▶▶▶▶ JZ POUT ;Printer not yet ready
▶▶▶▶▶ MOV A,B ;Move data to A-Reg
▶▶▶▶▶ OUT 0 ;PRINT
▶▶▶▶▶ MVI A,20H ;Load command to A-Reg
▶▶▶▶▶ OUT 6 ;Reset PO flag
▶▶▶▶▶ RET ;Return

```

# EPSON

## PARALLEL-OUT ROUTINE

```

0AC5          COUT2 EQU $          ;From DOS 5.2
0AC5 3E 20    MVI A,20H
0AC7 D3 06    OUT 06             ;Reset
0AC9 78      MOV A,B             ;Move data
0ACA F6 80    ORI 80H       ;Toggle (NOP)
0ACC D3 00    OUT 00             ;PRINT
0ACE EE 80    XRI 80H       ;Toggle (NOP)
0AD0 D3 00    OUT 00         (NOP)
0AD2 EE 80    XRI 80H       ;Toggle (NOP)
0AD4 D3 00    OUT 00         (NOP)
0AD6 78      MOV A,B       ;Restore Data (NOP)
0AD7 C9      RET                 ;Return

```

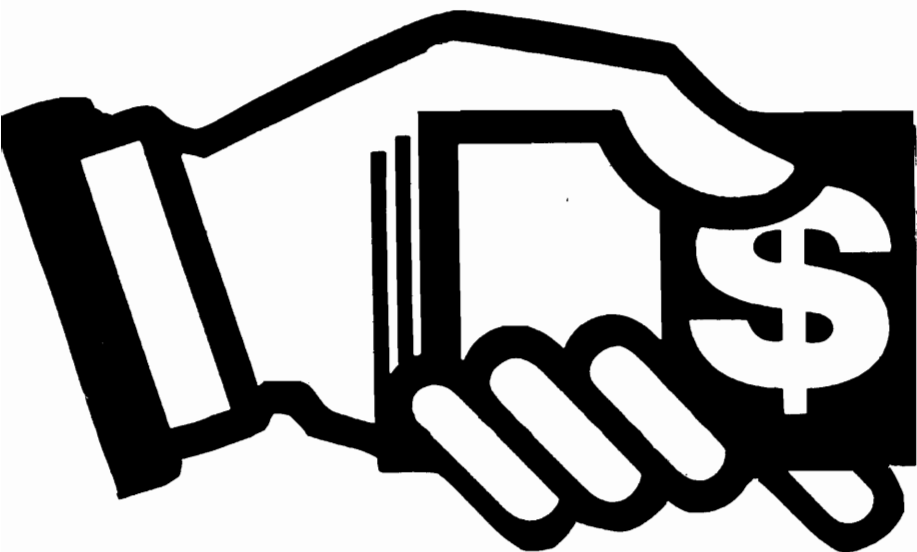
```

2954          COUT2 EQU $          ;From DOS 5.1
2954 DB 06    IN 06
2956 E6 01    ANI 01
2958 CA 54 29 JZ COUT2           ;Printer not yet ready
295B 3E 20    MVI A,20H
295D D3 06    OUT 06             ;Reset PO flag
295F 78      MOV A,B             ;Move data
2960 F6 80    ORI 80H       ;Set bit 7 (NOP)
2962 D3 00    OUT 00             ;PRINT
2964 EE 80    XRI 80H       ;Reset hi ord bit (NOP)
2966 D3 00    OUT 00         (NOP)
2968 EE 80    XRI 80H       ;Toggle (NOP)
296A D3 00    OUT 00         (NOP)
296C E6 7F    ANI 7F       ;Restore data (NOP)
296E C9      RET                 ;Return

```

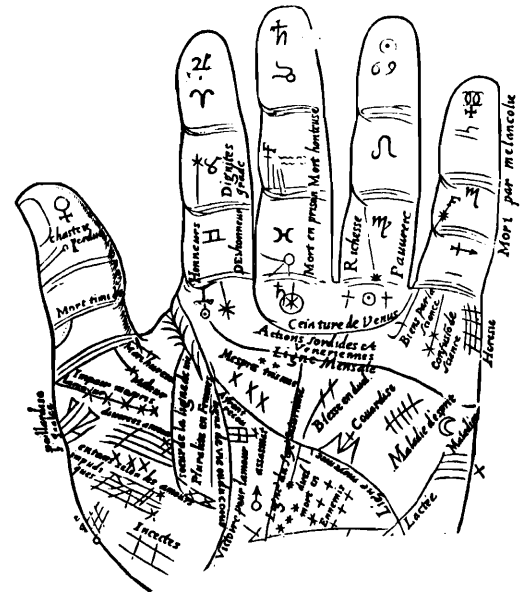
After I found that NOP-ing would work, I closed up the gaps in the code. Re-coded the TRS-80 sample programs in Dr. Lien's manual and obtained the same results.

I won't swear that this method would work for other N\* Horizons, but I hope this may help somebody.



**North Star's Number 2!**  
 INC., a financial journal, published a list in its December 1981 issue called "The INC. Private 100." This list ranks private companies by the percentage increase in sales growth between 1976 and 1980. North Star Computers ranked second, with a total percent increase of 7,650, and a compound annual growth rate of 197%. Total sales in 1976 were 200; total sales in 1980 were 15,500.

Tailor your file names to make them easier to use. Although N\* DOS systems allow eight characters for a file name, and CP/M allows eight characters plus an extension of three characters, no rule says you must use all the character spaces available. Frequently-used files should probably have very short names, to make them easier to type and to make for fewer possibilities of typing errors.



# FILENAMEAMES

Filenames serve two purposes. The first purpose is to allow the computer to identify the file: the only requirement on this score is that the file-name be unique on a particular disk (operating systems have built-in error checking to make certain that you can't create two files with the same name). The second purpose is to allow the user to recognize a file at the sight of the file-name: the chief requirement on this score is that the filename remind the user of its contents by the power of mnemonic suggestion.

**When one or two characters can serve the mnemonic purpose, it is hard to think of a good reason for using more.**

Here are a couple of examples. If you use a particular monitor frequently, say M0000 or M5700, save the monitor to a file named M. BASIC can be saved in a file named B. In CP/M, the STAT program can be renamed S, or perhaps X.

No matter how short your filenames, it is unlikely that you will run out of possible names for a given disk. After all, the alphabet has 26 characters, allowing for 26 unique one-letter filenames and 26<sup>2</sup> or 736 two-letter filenames. In CP/M, files can be named by single numbers (such as "1") and even by punctuation marks

("#" or "%"). Then, files can be named with a combination of letters and numbers, giving the possibility of 260 unique filenames from A0 to Z9, and another 260 the other way around, from 0A to 9Z.

In DOS it is difficult (but not impossible) to change filenames once they have been assigned. Since renaming files is so simple in CP/M, it might be a good idea to assign a two-character filename when creating a file, then assigning a longer name when it is to be stored for later use.

Seldom-used files or files consigned to an archive may be given longer filenames both to preserve a more complicated mnemonic message and to keep names unique not only to a given disk, but to a user's entire disk library. Particularly in CP/M, the extension can be used as a type-identifier, or as a reminder concerning the use which has been made of a file. J or J.LET might identify a letter while it is still being composed; the name might be changed to JACK.SNT once the letter has been sent off.

In summary: make certain that file-names are used efficiently; don't let them make unnecessary work for you; and remember, the longer a name, the greater the possibility of making errors in typing.



By Burt Andrews  
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board. Examining the N<sup>\*</sup> manual shows that only two interconnections on this header need to be moved in order to shift the forced-jump to F400. The wiring modification is simply to install a DPDT switch anywhere suitable (mine went on the front panel), and connect it to the header to make the changes. Leave the switch in the PROM

---

# AFTERCRAASH

---

When a BASIC program crashes while running on a North Star machine and it is necessary to reboot by hitting the RESET button, that process wipes out the first lines of the program that was being run. It is possible, but not quick and easy, to restore the lost lines or to recover the program minus them.

A more convenient alternative would be a way to recover from the crash without having to reboot, without changing the contents of RAM, and even without change to the values of the program variables at the moment of crash. The procedures described below do provide such an alternative, with essentially trivial wiring effort. I have detected no glitches in the operation of my system as a result of the minor changes involved (Horizon II, late '78 model, single-density, 62k static RAM (non-N<sup>\*</sup>), and the N<sup>\*</sup> floating-point board. Software has been N<sup>\*</sup> 4.0, 5.1S, 5.2S, and the old 1.4CP/M.

In the unmodified system, at Power-On and at ReSet there is a forced jump to the PROM at address E800/E900 which then boots in the DOS. The address of this forced jump is determined by the wiring of a plug-in DIP header easily accessed on the mother-

position for start-up, and shift it to the other position after that if you need to recover from a crash. To make the process still easier, install a front-panel ReSet switch (spring-return, like the one in the back) alongside the new DPDT.

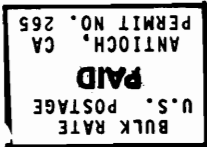
Why F400, instead of some other place? Only because it is outside of the normal usable RAM space, and North Star does have an excellent Monitor which runs there and from which you can jump anywhere you wish. And if you set the DOS to automatically "GO" the F400 monitor, you never have to worry about jumping to an empty address.

Although not perhaps really necessary, I added one more small refinement by modifying the Monitor to give it its own I/O block. Some of the N<sup>\*</sup> Monitors do have their own I/O, but the one at F400 does not (single-density version anyway). Instead, it uses the regular DOS I/O at 2900-29FFH. Adding an I/O to the Monitor allows its use without regard to the rest of RAM and what may--or may not--be in it.

Overall, I have found the changes useful and easy to make. If there should be enough interest in the details I will be happy to provide them.

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PUBLISHERS OF THE COMPASS NEWSLETTER  
INTERNATIONAL NORTH STAR USERS ASSOCIATION  
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# MEMBER LIST

At the annual INSUA meeting at the San Francisco Computer Faire on March 20, several members requested that Compass publish a list of INSUA members so that members in any local area could get in touch with one another to make inquiries, exchange information, form clubs, and so forth.

1981-82 INSUA president Bill Banaghan pointed out that this issue had been raised before, and always ran into the objection that certain members may not wish to have their names and addresses made public, for any one of a number of reasons. Bill announced, however, that the INSUA board would be happy to consider the matter once again.

On its April 20 meeting, the INSUA board hit upon the idea of

publishing a list of names and zip codes only. Local users could check the zip codes and look up local INSUA members in the telephone book. In this way, the list would be useful to INSUA members without being useful to mail order houses, etc.

Compass therefore announces that a name-and-zip-code list of all members will be published in the next issue. INSUA members who do not wish to have their names listed in Compass should

write **INSUA**  
**now**

# The COMPASS

VOL II NO III

## Members List

### INSUA MEMBERS' LIST

The following list of INSUA members should be accurate as of 9-5-82. If your name is not on the list, and you are not a brand new member, drop a note to INSUA at P.O. Box 2789, Fairfield, CA 94533.

Several members have requested that their names not be included on the list. (In the last issue of Compass) we gave members an opportunity to request that their names not be published.) We have tried to protect the privacy of all members by publishing names and zip-codes only. To contact members in your zip-code area, use your local phone book.

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## Editor's Note

### EDITORS' NOTE

Recently we arranged for an interview with Lisa Hogeboom, Secretary for Marketing Communications at North Star in San Leandro, CA. We came away feeling that the best things about North Star are as good as ever, while the traditionally sticky area of user support is definitely on the upswing.

North Star has recently reviewed its dealer list with a view to insuring that only dealers who are enthusiastic and responsible in their support of end-users should continue to stock North Star Horizons and

Advantages. Try your dealer first!

Six months ago, North Star had two employees on its Technical Support staff; today there are seven employees plus a supervisor.

Technical Support's charge is to answer questions from dealers, distributors, and OEM'S (original equipment manufacturers). If your dealer cannot answer your question, have him or her phone North Star's Technical Support office. If your dealer will not answer your question, report this fact to North Star.

North Star is concerned about user support, and is reviewing

its present policy of giving support principally through dealers.

If you have strong feelings about the nature of support North Star should offer its end-users, please write to

Lisa Hogeboom, Secretary  
Marketing Communications  
North Star Computers Inc.  
14440 Catalina St.  
San Leandro, CA 94577

You can also write INSUA, or leave a message on North Star's "Proxima" BBS at (415) 357-1130.

# Wordstar w/ Epson



## WordStar with Epson

by Jim Woolley

[This article and the following addendum first appeared in Foghorn, the official newsletter of the First Osborne Group, PO Box 11683-A, Palo Alto, CA 94306. They are reprinted here by permission of the author. Although a few minor revisions have been incorporated (references are to the 3.0 WordStar manual rather than to the Osborne User's Guide), original references to the Osborne 1 are retained. In almost all respects, the procedure is equally applicable to the North Star. See accompanying articles in this issue for initial installation of CP/M and WordStar. --Ed.]

If you have an Epson printer, you should consider patching WordStar to make use of the special printing features of the Epson. This article describes a step-by-step procedure for installing the necessary patches.

The procedure is designed for an Epson MX-80, but should be applicable to an MX-100 as well. It is very easy to do, so don't be intimidated if you're a novice. Patching WordStar is described in Section 3-9 of the MicroPro WordStar User's Guide. Use the following recipe:

1. Put a copy of your WordStar disk in drive A. Put a disk containing INSTALL.COM ... in drive B. After the CP/M prompt, execute INSTALL using

A>B:INSTALL

2. Refer to Section 3-2 of the User's Guide. Assuming you have a previously-installed WordStar, answer the first question regarding "normal first-time IN-



# Wordstar w/ Epson

## CONTINUED...

STALLation" with N for NO.

3. Answer with option D to modify and replace your existing WS.COM file. When asked for WordStar filename, answer

A:WS.COM

4. INSTALL then asks about your terminal, printer, communications protocol, and printer driver. Answer U for UNCHANGED and Y for YES to each.

5. The next question asks if modifications are complete. Answer N for NO in order to make additional patches. Section 3-9 to 3-10 of the WordStar User's Guide to Installation describes how to make patches. Refer to pages F-6 thru F-10 to see where patches will be made. Section 7-3 to 7-4 discusses print control characters, indicated by "^" in the following text. In WordStar edit mode, these print control characters are entered into the file by preceding each with a ^P.

6. Patch PSCR: = 01 for more efficient operation of the Epson. My version of INSTALL did not recognize PSCR:, so I referenced location 06A1 instead.

7. To enable use of subscript (^V) and superscript (^T), make the following patches:

PSCRLF: = 03  
PSCRLF:+3 = 0A

PSHALF: = 02  
PSHALF:+1 = 0D  
PSHALF:+2 = 0A

Additional patches to PSINIT: and PSFINI: in step 11 will provide half-line spacing. If subscript and superscript are not important, skip both this step 7 and the half-line spacing

patches in step 11 for more efficient printing.

8. To use alternate character pitch (^A) for Epson condensed mode (132 char/line) and standard pitch (^N) for normal mode (80 char/line), patch the following:

PALT: = 01  
PALT:+1 = 0F

PSTD: = 01  
PSTD:+1 = 12

9. The four user functions enable setting and cancelling Epson emphasized and expanded modes:

^Q = Set emphasized mode.  
^W = Cancel emphasized mode.  
^E = Set expanded mode.  
^R = Cancel expanded mode.

Use of these functions is described after step 11. Patches are:

USR1: = 02  
USR1:+1 = 1B  
USR1:+2 = 45

USR2: = 02  
USR2:+1 = 1B  
USR2:+2 = 46

USR3: = 01  
USR3:+1 = 0E

USR4: = 01  
USR4:+1 = 14

10. I use the change ribbon color toggle (^Y) to set or cancel Epson emphasized-double (wallbanger) mode. Patch

RIBBON: = 04  
RIBBON:+1 = 1B  
RIBBON:+2 = 45  
RIBBON:+3 = 1B  
RIBBON:+4 = 47  
RIBOFF: = 04  
RIBOFF:+1 = 1B  
RIBOFF:+2 = 46  
RIBOFF:+3 = 1B  
RIBOFF:+4 = 48

Emphasized-double mode may also be set by ^Q^D. If you have Graftrax, you may wish to use ^Y for italics. [See below --Ed.]

11. For initializing and restoring the Epson print modes, patch PSINIT: and PSFINI:. Since my version of INSTALL did not recognize PSFINI:, I have referenced everything to PSINIT:

PSINIT:	= 0C	0A*
PSINIT:+2	= 12	
PSINIT:+3	= 14	
PSINIT:+4	= 1B	
PSINIT:+5	= 46	
PSINIT:+6	= 1B	
PSINIT:+7	= 48	
PSINIT:+8	= 1B	
PSINIT:+9	= 41	
PSINIT:+A	= 06	
PSINIT:+B	= 1B	00*
PSINIT:+C	= 32	00*
PSINIT:+11	= 0B	09*
PSINIT:+12	= 12	
PSINIT:+13	= 14	
PSINIT:+14	= 1B	
PSINIT:+15	= 46	
PSINIT:+16	= 1B	
PSINIT:+17	= 48	
PSINIT:+18	= 1B	
PSINIT:+19	= 41	
PSINIT:+1A	= 0C	
PSINIT:+1B	= 1B	00*
PSINIT:+1C	= 32	00*

[ \*Substitute these codes in these locations for Epson MX-80 III F/T with Graftrax Plus --Eds.]

If subscript and superscript are not important and you have skipped step 7, then patch

PSINIT: = 07  
PSINIT:+11 = 06  
and skip the patches indicated for

PSINIT:+8 thru +C

and for

PSINIT:+18 thru +1C.

These are all of the patches required to use the special

Epson printer features. Print control characterers described in Table 7-1 of the WordStar User's Guide (General Information) will enable these features as follows:

[Cautions in parentheses apply only to older Epsoms without Graftrax Plus: see below for further information. --Ed.]

^Y = Emphasized-double print toggle. (Do not use twice in the same line, as the second will cancel the feature for the entire line. Do not use with ^A.)

^A = Alternate pitch (132 char/line). (Do not use in the same line as ^N, since ^N will cancel the feature for the entire line. Do not use with ^Y or ^Q, as these will temporarily suspend the effect of ^A.)

^N = Standard pitch (80 char/line). This is the default mode. (Do not use in the same line as ^A.)

^Q = Set emphasized mode. (Do not use with ^A.)

^W = Cancel emphasized mode. This is the default mode. (Do not use in the same line as ^Q, since ^W will cancel the feature for the entire line.)

^E = Set expanded pitch, 40 char/line if used with standard



pitch ^N, or 66 char/line if used with alternate pitch ^A. This mode is automatically cancelled at the end of the line. It may be cancelled in mid-line by use of ^R.

^R = Cancel expanded pitch. This is the default mode.

All of the other print control characters function as described in Table 10-1. Subscript and superscript toggles ^V and ^T make use of half-line spacing if the patches described in steps 7 and 11 are utilized.

(The above description includes some information which is not clearly stated in the Epson User's Manual before Graftrax. Namely, if in the same line you set and cancel condensed, emphasized, or emphasized-double mode, the overall effect is to cancel each. Also, if you set emphasized or emphasized-double while in the condensed mode, when emphasized or emphasized-double is cancelled, condensed mode is resumed.)

Additional patches may be used to customize the WordStar sign-on message. To make the printer description read "Epson MX-80 Printer," patch the following hex representation of ASCII characters beginning at location 01B4: 45, 70, 73, 6F, 6E, 20, 4D, 58, 2D, 38, 30, 20, 50, 72, 69, 6E, 74, 65, 72, followed by 9 20's (blanks). I also made the terminal description read "Woolley's Osborne 1" by patches beginning at location 0190: 57, 6F, 6F, 6C, 6C, 65, 79, 27, 73, 20, 4F, 73, 62, 6F, 72, 6E, 65, 20, 31. You can put in your own name using locations 0190 thru 01B0 and any ASCII chart. You can also add further information about your particular Epson in place of the 9 20's beginning at 01C7.

While you're at it, you may

wish to install additional modifications described in Section 8 of the WordStar User's Guide (Installation). To make WordStar work more like a typewriter, I made the following patches:

ITITOG: = 00, to make WordStar start with INSERT OFF.

INITWF:+1 = 00 to start with JUSTIFICATION OFF.

ITPOPN: = FF, to omit page numbers by default.

A further change was:

DEL3: = 23

for longer delay before a menu (Section 6-10).

There used to be a program selling for around \$85.00 to make these Epson patches to WordStar for you. By following the simple recipe given in this article, you can do the job yourself.

---

---

## WordStar Patches Revisited

By Jim Woolley

In my first article on WordStar patches for the Epson printer, I pointed out that if in the same line you set and cancel condensed or emphasized typefaces, the overall effect is to cancel each. That is, in WordStar you could not use ^A and ^N print control characters in the same line. Nor would ^Q and ^W in the same line be meaningful.

Well, the above statement is only valid for those of us who do not have the Graftrax option installed in our Epson. Bill Hooker of Westerville, Ohio, was kind enough to experiment for me

on his Graftrax-equipped Epson. It turns out that Graftrax is smart enough to switch between condensed mode and normal 10 characters per inch in the same line. It will also turn emphasized mode on and off in the same line if requested. I was so impressed, I've purchased Epson's latest package called Graftrax Plus.

All of the newest Epson printers are supplied with Graftrax Plus. Italics, some line graphics, and some international symbols are substituted for the original MX-80's (TRS-80) block graphics. Dot graphics are also possible. Some of the latest features include continuous expanded mode, skip-over-perforations, half-high superscript/subscript characters, underline mode, line spacing resolution to 1/216 inch, and unidirectional print mode.

I'd like to make one last comment about Epson printers. I have an MX-80 F/T: the F/T stands for friction/tractor feed. To support friction feed,

it has a rubberized roller. The other day, I used a "plain vanilla" MX-80 and was surprised at the terrible noise it made while printing. It seems that the MX-80 roller is aluminum; without the rubber covering it sounds like B-B's from a machine gun hitting tin cans during target practice. If you are planning to buy an Epson, I urge you to give a listen to both models.

Some people have informed me that my WordStar patching articles did not fully describe use of print control characters. Of course, these are described in the WordStar User's Manual. They involve the use of ^P followed by a character such as ^A (for alternate pitch). When this print control character is entered, ^A will appear in the text on the screen. For those unwilling to read the WordStar instruction manual, simply pressing ^P while in edit mode will display a menu describing use of print control characters.



[Editors' Additions:

Fired up by Jim Woolley's articles, we tried a few additional features on a new Epson with Graftrax Plus.

See the accompanying article for general hints on installing WordStar. For the Epson, only two significant choices have to be made during INSTALL, i.e. the terminal and the kind of printer. You should know the name of your terminal. The Epson is not named by name, but you should press "C" for "Teletype-like Printer that can Backspace," or, better, "I" for "Half-Line Feed Printer," since

the latter will install the PSCRLF: and PSHALF: patches for you, and you can forget about them. Choose "U" for "No change" of communications protocol and printer driver: you want no communications protocol and CP/M's list device.

Now for the user-installed patches. At first, Epson's own superscript/subscript system, which prints tiny letters above or below within the 9x9 matrix, refused to work. A call to Epson in Torrance, CA revealed that the Control-Code table in the new manual (Appendix B-2) contains errors. Make the fol-

lowing corrections about the middle of the page:

Correct Decimal	Incorrect Hex	Correct Hex
81	5B	51
83	5D	53
84	5E	54
85	5F	55
87	61	57

With these corrections incorporated, everything worked fine.

To invoke italic characters on an Epson with Graftrax Plus, install the following patches and use the ^Y toggle:

RIBBON: = 02  
RIBBON:+1 = 1B  
RIBBON:+2 = 34

RIBOFF: = 02  
RIBOFF:+1 = 1B  
RIBOFF:+2 = 35

Alternatively, the ^Y toggle can be used to give continuous underlining rather than the broken underlining achieved on Epson with ^S. Use the following patches:

RIBBON: = 03  
RIBBON:+1 = 1B  
RIBBON:+2 = 2D  
RIBBON:+3 = 01

RIBOFF: = 03  
RIBOFF:+1 = 1B  
RIBOFF:+2 = 2D  
RIBOFF:+3 = 00

Super/subscripts can be installed as follows:

USR1: = 03  
USR1:+1 = 1B  
USR1:+2 = 53  
USR1:+3 = 00

USR2: = 02  
USR2:+1 = 1B  
USR2:+2 = 54

USR3: = 03  
USR3:+1 = 1B  
USR3:+2 = 53  
USR3:+3 = 01

USR4: = 02  
USR4:+1 = 1B  
USR4:+2 = 54

With this configuration, ^Q will invoke superscripts, while ^W will turn them off; ^E will set subscripts, while ^R will turn them off. Note that the code for ^W and for ^R is identical, and therefore somewhat redundant: however, the symmetry of the four user-installed print codes is preserved. Jim Woolley suggests that you retain one of these four for expanded characters, which will be automatically cancelled at end-of-line <CR>; e.g.

USR4: = 01  
USR4:+1 = 0E

Within limits it is possible to install these routines wherever convenience dictates. The choice of location may depend on whether it is more convenient to use two control characters, one to turn the function on, and another to turn it off, or a toggle, i.e. the same character to turn a function on and off.

The Epson can carry out so many special functions that it will not be possible to put them all on any single copy of WordStar. Decide which of Epson's functions you need for any given printing task, and install a copy of WordStar for that task; install other copies for other tasks. Mark the disks clearly, so you know which is which. You might use Jim Woolley's banner-modification technique to display the information on the screen when you bring up WordStar.

Many, but not all, type-faces can be mixed. WordStar will not take the mixture of expanded, normal, and compressed type-faces into account in providing

~continued next page →





## Epson on CP/M

INSTALLING EPSON ON N\* CP/M  
and  
USING DOS MONITOR TO MODIFY CP/M

By Alan H. Nelson

In the last Compass, Tate Yoshida described his procedure for connecting an Epson printer to a North Star Horizon. This involved making a simple modification to the header at 9C in the Horizon, soldering up a cable to connect the Horizon to the Epson, and making some software changes to the DOS I/O routine.

But what if an Epson printer is to be used on a Horizon in conjunction with CP/M, and, moreover, what if it is to be used in conjunction with WordStar?

First, starting with North Star's CP/M 2.2, it would seem logical to use the installation program which North Star has provided. And for the most part it works. Using the "cpmgen" program which comes with CP/M, answer all the questions as you

justification, so lines of text with mixed type-faces may have to be doctored to make them come out as you intended.

Warning: .LH commands do not work on the Epson or on (any?) other non-daisy printers, and therefore cannot be used to provide double-spacing. Use the ^OS2 spacing command instead, and if necessary format with ^B. Use ^N instead of <CR> between paragraphs if you are reformatting existing text. The ^B command will double-space within paragraphs, but not between paragraphs; with ^OS2 set, <CR> will result in triple-spacing between paragraphs, while ^N will result in proper double-spacing.

did the first time, except that this time you select "PARALLEL PORT" by typing "P".

This should be all that's necessary to make the Epson spring to life when the ^P (i.e. print") option is used along with such a command as

```
A>dir
```

The odd thing, however, is that with this configuration of CP/M, the Epson with Graftrax prints only in italic; with the earlier Epson's, the situation is even more confusing, since block graphic characters will appear, as Tate Yoshida reported in his article on DOS. (A WordStar run on this CP/M will also print only italics or graphic characters.)

Tate Yoshida identified the problem clearly: by logical manipulations with 80 Hex's, the standard I/O routine sets the eighth bit, and thus the Epson receives the wrong ASCII code. (See accompanying assembly program).

To keep the eighth bit from being set except when it should

## Epson on CP/M

be (i.e. when graphics or italics are actually intended), it is necessary to alter the I/O routine. This can be done either by rewriting the I/O entirely, or, less elegantly but more simply, by doctoring the routine installed by "cpmgen."

In Dr. Dobb's Journal, No. 67 (May, 1982), in an article entitled "A Simpler Way: North Star-to-Epson," Larry Shoer provides an I/O routine which he wrote for his copy of Lifeboat's CP/M; he also provides a similar I/O which he installed directly in WordStar's port driver section. I followed Tate Yoshida's still simpler way and remained satisfied with a preexisting I/O, letting it work for both CP/M and WordStar.

Patching CP/M is slightly more complex than patching WordStar, but in the final analysis is not difficult. This can be done by editing the USER.ASM file and reassembling according to CP/M instructions, or it can be done with the DOS monitor. North Star's "CP/M 2.2 Preface," pp. 29-30, explains a method for using the DOS monitor to alter CP/M, and as an old friend of the DOS monitor, I thought I'd give it a try. It worked, as follows:

1) Place your normal DOS with its M0000 monitor in the first drive, and the CP/M disk installed for parallel port in the second. Boot up, then type

```
+LF USER,2 7A00
```

This will load USER, i.e. CP/M on drive 2, into memory at 7A00. Now invoke the monitor, typing

```
+GO M0000
```

Using the SM function, search for any code you are looking for, in this case

```
>SM 7A00-BFFF 3E,20,D3,06
```

(I decided to search far into memory, since I had no idea where CP/M ended.) The monitor should return

```
7A74
```

which is the address of the 3E byte in the search string. Check to see if this is the routine you are looking for, e.g.

```
>DH 7A70,20
```

Starting at 7A70, you should get following bytes:

```
01 CA 6D DA 3E 20 D3 06
```

```
79 00 F6 80 D3 00 EE 00
```

```
D3 00 EE 80 D3 00 C9 AF
```

```
C9 00 00 00 AF D3 06 D3
```

Yes, the code matches the standard I/O routine, and there are the offending 80Hex's. Replace all the code from the F6 at 7A7A up to but not including the C9 jump at 7A86 with 00's: the only exception is the D3 at 7A7C, which should be left alone. The easiest way to do this is to begin with the command

```
>DS 7A7A
```

then mostly insert 00's until the C9 appears. Hitting the space bar will bring up the next byte in turn. Hit the space bar without typing 00 when the first D3 shows up. When the C9 shows up, hit <CR> to get back to the monitor command mode.

Now type

```
>OS
```

to get back to DOS, and type

```
+SF USER,2 7A00
```

to save the file back to the

## Epson on CP/M...

CP/M disk in drive 2. After the save is complete, place the CP/M disk in drive 1, boot up, and try the printer once more with ^P. The messages should now be in standard typeface rather than italic.

WordStar will work fine if left to use the CP/M list device (the default option of INSTALL). Alternatively, you can install a port driver in WordStar following Larry Schoer's instructions.

### CP/M PARALLEL PORT OUTPUT ROUTINE

```
                ;OUTPUT TO PARALLEL PORT - IF CPMGEN TOLD THAT PRINTER
                ;                IS PARALLEL, JUMP VECTOR ALTERED TO JUMP HERE
DB 06          COUTP IN      6          ;MOTHERBOARD STATUS
E6 01          ANI          1          ;TEST PO FLAG
CA 6D DA      JZ           COUTP      ;EXTERNAL DEVICE NOT READY YET
3E 20          MVI          A,20H     ;RESET THE FLAG
D3 06          OUT          6
79            MOV          A,C        ;CHAR TO BE SENT TO A
00            NOP
F6 80          TOGGLEP     ORI          80H ;SET STROBE FALSE
D3 00          OUT          0          ;SEND CHARACTER
EE 80          XRI          80H       ;TOGGLE STROBE TO TRUE
D3 00          OUT          0          ;KEEP SENDING
EE 80          XRI          80H       ;TOGGLE STROBE BACK TO FALSE
D3 00          OUT          0
C9            RET                    ;DONE
```

# Hints For Installing Wordstar

## HINTS FOR INSTALLING WORDSTAR including DIABLC PRINTERS at 1200 baud

By Alan H. Nelson

WordStar may be far easier to install than MicroPro's installation manual would have you believe, depending on your printer; in particular, it is easier than you may have guessed to install WordStar to drive a Diablo 1600-series printer (1610, 1620, 1640, 1650, etc.), or a Diablo 630 at 1200 baud. This is because the WordStar designed to work on a North Star Horizon or its equivalent already contains the instructions

to run a Diablo printer at 1200 baud--MicroPro just doesn't go out of its way to tell you that, or to tell you what to do about it. Here are some hints.

The single most important key for easy installation of WordStar is the <CR> (RETURN) key. Hitting <CR> gives the INSTALL defaults, whether in answering "YES" or "NO", in choosing an option, or in providing information.

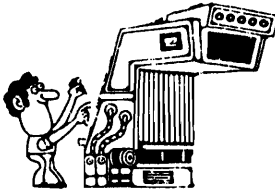
1) When INSTALL presents you with a YES/NO option, hitting the carriage return is always equivalent to choosing Y for "YES."

## Hints... continued

2) When INSTALL presents you with a menu of choices, e.g. a choice of terminals or printers, hitting <CR> is usually equivalent to choosing U for "No Change."

3) When INSTALL presents you with any other option, hitting <CR> means that you are choosing the default, i.e. in general the most likely option for a first-time installation, including the most likely choices for the Diablo printers.

The function of the <CR> is important not only to first-time installations, but to the insertion of new patches into previously-installed WordStars.



Let's see how this works. First, I am assuming you have a 3.0 version of WordStar; if not, experiment with a non-critical copy before you put complete faith in my words.

Boot up in CP/M with WS.COM or WSU.COM in your first drive, and INSTALL.COM on either drive. Invoke INSTALL.

The first option you face is to decide whether this is a first-time installation or not. You know the answer to this one: if yes, press <CR>, otherwise press N.

If you pressed N, you will see a new menu. The nearly inevitable choice is D, for a new copy with the old name.

The next problem is to name the existing WordStar file to be installed or re-installed. Pressing <CR> will give you the default of WSU.COM, the uninstalled WordStar. For a pre-

viously installed version, the usual choice is WS.COM, but in fact you need only type

WS

since INSTALL knows that WordStar must always be in a com file. With an uninstalled WordStar you will have come to the same point by answering "Y" or <CR> to the very first question asked.

(Remember that at any point up to the very last question asked by INSTALL, you can abort by pressing ^C. You can also begin INSTALL all over again by answering "N" to the final question. Of course you can also abort by taking out your disks or by rebooting with the reset switch.)

---

### PREVIOUSLY INSTALLED WORDSTARS

With a previously installed WordStar, to get this far from the beginning, you only need to have typed:

N D WS <CR>

Ahead lie four areas of concern, followed by an optional fifth. It is possible to negotiate each of these areas with two keystrokes, first a choice from a menu, and then a Y/N confirmation. Since <CR> gives a "No Change" response to a menu and a "YES" response to a Y/N option, it is possible to get all the way through these four areas of concern with eight slightly spaced <CR>'s.

Unless fundamental changes of terminal or printer are being made with INSTALL, it is usually logical to proceed through the four areas without requesting changes. In many cases, selecting a different option for the printer (e.g. "I" for "Half-Line-Feed" Printers when WordStar was previously installed with "C" for "Teletype-like"

printer that can BACKSPACE, will rewrite user-installed patch areas. You may find hash in your previous installation routines. If in doubt, practice on a copy of a previously installed WordStar to discover the effects of any major change.

**Most changes to installed versions are in the fifth area (user-installed patches): it's good to know that you can get all the way to the entry point by typing four alphabetic characters followed by nine carriage returns.**

Now a new option is presented: a Y declares that changes are complete, while an N calls for an entry into the user-patch area. If you've come all this way on <CR>'s, you will want to type N or else INSTALL will have accomplished nothing.

Typing patches in the user-patch area is a tedious business at best, and here I have but three suggestions.

1) If an address is specified by Hex number, only four keystrokes are required, followed by a <CR>; but if an address is specified by symbolic name, from four to six keystrokes are required, followed by a colon (: ) and by a <CR>. Numerical addresses thus are often the designation of choice.

2) If a numerical extension is added to a symbolic address, the colon is not required. Type

RIBOFF+1

rather than

RIBOFF:+1

3) The default value of many patchable addresses is already 00: thus it may be possible to skip over certain addresses during a patching session. If in doubt, consult the listings at the end of the manual.

An address of 0 designates the end of patching. The ensuing OK? option can be answered with a <CR> for Y.

To conclude this part of the discussion, it should be clear that the use of <CR>'s rather than Y's and U's should greatly speed up installation, particularly in negotiating your way to the user-patch area.



#### FIRST-TIME INSTALLATION

Now let's go back to the four first installation areas, the ones of greatest concern in a first-time installation. Here they are:

- 1) Choice of terminal.
- 2) Choice of printer.
- 3) Choice of communications protocol.
- 4) Choice of port driver.

The first of these choices is usually a breeze, since you almost certainly know what terminal you're using. The second is also relatively easy, since you probably know the name and number of your printer.

(Diablo owners may skip this section.) If your printer is not among those named, or if in doubt, try a simple installation the first time around, and then try more and more advanced options on subsequent installations. (Try out the options before you install user patches, however, since the choice of another option could make hash of your patches.)

Option "A" of the Printer Menu fits "almost any printer," as the text says--finish INSTALL

## Hints...

with a series of uninterrupted carriage returns, and see whether your printer doesn't work at least at slow speeds, i.e. 300 baud or less.

Most printers nowadays can at least backspace, so try "C" next time around. Dot matrix and Selectric printers can usually also do half-line feeds, so use choose "I". If your printer works well with any of these options, fine. Remember the Peter Principle, however, and retreat to the previous choice if a more advanced choice results in problems. (For Epson choose "C" or, to save yourself some patches, "I".)

With the third area, things get a little tougher. Do you need a communications protocol, or not?

If your printer can operate at speeds higher than 300 baud (essentially equivalent to 30 characters per second), and if it is connected to the second serial port, and if you do not have a hardware connection to do the job, chances are you will want to choose a protocol. If your printer is connected to the parallel port, you should not need a protocol, and you don't need more than the standard CP/M list device in part 4, which you may select with a <CR> for "No Change."

### DIABLO PRINTERS

Daisy-wheel printers like the Diablo connected to the serial port and switched to 1200 baud must be able to tell the computer to start or stop sending characters, to prevent buffer overflow and loss of text.

It is possible to handle the communications problem through hardware--see the conclusion to "Questions, Questions" in this issue. The ETX/ACK option in part 3 assumes that communications will be handled by WordStar's software, as implemented

in part 4.

It was this fourth area, which deals with port drivers, which always put me into a cold sweat. No matter how I answered the questions, randomly or after hours of study, the outcome was either that my Diablo printer would only poke along at 300 baud, or that it would fail to work period, or would print for a short time, and then stop.

Finally, when all was nearly lost, I decided to play it really dumb: then along came the <CR> to my rescue! →



## CLIP TIPS

### CLIP-TIP

#### DOTTY WORDSTAR

WordStar will not print a line with a period (dot) in the first column of the text file, since it will interpret the period as part of a dot command, even if no intelligible command follows.

If you really want to print a dot in the first column, e.g. for ellipsis, type first a space, then a backspace (^H, invoked by the sequence ^P^H), and then the dot or dots. Thus

^H...

will result in the printing of

...

and so forth.



Back to part 3. I knew that ETX/ACK was the communications protocol I wanted, so I pressed

E

Up came an admonitory message. OK?

<CR> = "Yes."

Now a selection of drivers. I knew the Horizon had ports, so I pressed

P

A new message. OK?

<CR> = "Yes."

The game was on. I abandoned myself to the carriage return:

I/O or memory?

<CR> = I/O.

Do you want WordStar to determine or accept the output port?

<CR> = Accept.

What is the output port?

<CR> = 04.

Do you want WordStar to determine or accept the output status port?

<CR> = Accept

What is the output status port?

<CR> = 05

What are the output status bits?

<CR> = 01

Which bit change(s) from 0 to 1?

<CR> = 01

Do you want WordStar to determine or accept the input port?

<CR> = Accept.

What is the input port?

<CR> = 04.

Do you want WordStar to determine or accept the input status port?

<CR> = Accept.

What is the input status port?

<CR> = 05

Do you want WordStar to determine or accept the input status bits?

<CR> = Accept

What are the status bits?

<CR> = 02

Which bit change(s) from 0 to 1?

<CR> = 02

(Those were the very numbers I needed but couldn't come up with--and WordStar knew the answers all the time!!!! If you don't believe it, look at the printer-driver listing on page 11 of Appendix F: only the list-

ing doesn't tell you how to get itself installed!)

Are modifications complete? Better say "Yes" for now, and try enhancement patches once we know the communications protocol is working:

<CR> = Yes

Final confirmation:

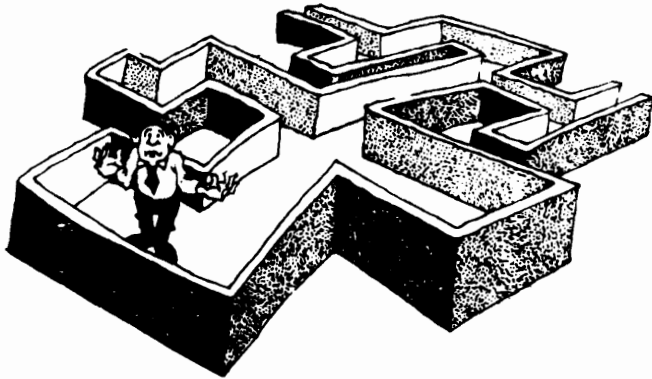
<CR> = Yes

This last <CR> should lead to a successful installation and, then, to a Diablo printer chattering happily away while interfaced to the second serial port at 1200 baud. Note: nothing but <CR>'s since typing "P" for "Port Driver" way back at the first entry into area four!

## Calendar Routines

### Calendar Routines for N\* BASIC R Beaver

Have you ever wondered what day of the week you were born on, or needed to calculate days between dates for compound interest formulas, or needed to know the date of a day 90 days in the future (lawyers take note)?



On the next page find some helpful subroutines which can be used in your very own programs to perform these pesky calculations.

These little routines are short, to the point, and valid for dates from 4713 BC on.

Function FNJ(D,M,Y) at line 220 will calculate the Julian Day for a given day (D), month (M), and year (Y). Function FNW(J) at line 210 will calculate the day of the week for a given Julian Day (J), with 0=Sun, 1=Mon, ..6=Sat.

Some of you may recognize the Julian Day function as coming from 'PLANETS' in Vol 2 No 1 Compass. Right you are. This is the same as is used in astronomical calculations.

Subroutine 530 will calculate the day, month, and year (D,M,Y) for any given Julian Day (J). Subroutine 610 will calculate and print the day of the week, month, day of the month, year, and day of the year for a given Julian Day.

It is interesting to note that function FNJ will calculate the Julian Day for Feb 30 1982 (an invalid date) and subroutine 610 will correctly print out Mar 2 1982 when this Julian Day is used.

A simple example of the days between two dates is shown. Substitute your own program lines in the 300-495 block for customization of this program.



100 REM CALENDAR ROUTINES

R BEAVER 1982

110 DIM W\$(21),M\$(36)

120 W\$="SUNMONTUEWEDTHUFRISAT"

130 M\$="JANFEBMARAPR MAYJUNJLYAUGSEPOCTNOVDEC"

140 GOTO 300

200 REM \*\* FUNCTIONS \*\*

205 REM CALCULATE DAY OF WEEK FROM JULIAN DAY J

210 DEF FNW(J)=INT(7\*((J+1.5)/7-INT((J+1.5)/7))+0.5) & REM WEEKDAY

215 REM CALCULATE JULIAN DAY J FROM M,D,Y (IE 2,1,1982)

220 DEF FNJ(D,M,Y)&REM JULIAN DAY.

225 Z=1720994.5& IF M>2 THEN 230 & Y=Y-1 & M=M+12

230 IF Y+M/12+D/365 < 1582.875 THEN 240

235 Z=Z+2-INT(Y/100)+INT(INT(Y/100)/4)

240 Z=Z+INT(365.25\*Y)+INT(30.6001\*(M+1))+D

245 RETURN Z & FNEND

300 REM

305 REM \*\* PROGRAM LINES 300-495 \*\*

310 REM

330 REM

495 END

500 REM \*\* SUBROUTINES \*\*

505 REM

510 REM CALCULATE D,M,Y FROM JULIAN DAY J

520 REM INPUT>J OUTPUT>D,M,Y MODIFIES>D,M,Y,Z

530 D=INT(J+0.5) & Z=D+1524 & IF D< 2299161 THEN 550

540 Z=INT((D-1867216.25)/36524.25) & Z=D+1+Z-INT(Z/4)+1524

550 Y=INT((Z-122.1)/365.25) & D=INT(365.25\*Y)

560 M=INT((Z-D)/30.6001) & D=Z-D-INT(30.6001\*M)

570 M=M-1 & IF M>12 THEN M=M-12

580 Y=Y-4716 & IF M<2.5 THEN Y=Y+1 & RETURN

585 REM

590 REM PRINT CALENDAR DATE FROM JULIAN DATE

600 REM INPUT>J OUTPUT>PRINT CALENDAR DATE MODIFIES>M,D,Y,Z,P

610 P=FNW(J) & GOSUB 530

620 I#V,W\$(3\*P+1,3\*P+3)," ",M\$(3\*M-2,3\*M),D," ",Y," /",J-FNJ(0,1,Y),

630 RETURN



-----  
E X A M P L E U S E  
-----

300 PRINT " DAYS BETWEEN TWO DATES"

305 INPUT "FIRST DATE (M,D,Y):",M1,D1,Y1

310 INPUT "SECOND DATE (M,D,Y):",M2,D2,Y2

315 J=FNJ(D1,M1,Y1) & GOSUB 610 & J1=J

320 I#V," -TO- "

325 J=FNJ(D2,M2,Y2) & GOSUB 610 & J2=J

330 I#V," ",ABS(J1-J2)," DAYS"

TUE FEB 27, 1979 / 58 -TO- FRI MAR 12, 1982 / 71

1109 DAYS

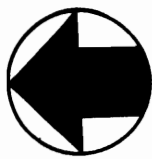


# **LIBRARY SOFTWARE EXPLOSION**

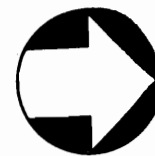
**NORTH STAR  
COMPUTERS INC  
DONATES  
DOZENS OF  
PROGRAMS**

**TO INSUA LIBRARY**

**DETAILS  
NEXT  
ISSUE**



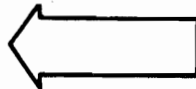
# Expanding Your Horizons!



## EXPANDING YOUR HORIZONS

By Bob Stek

Even now that you have a 64K CP/M system on your Horizon, do you still hanker for more speed, more memory, more power? Do you agonize over the time it takes even your compiled BASIC programs to access files on your hard disk? In short, have you become so jaded that you resent the fact that your Horizon isn't as fast as a Cray-1? Well, Bunky, help is at hand. With memory as cheap as it is today (how many of you remember when a 4K board cost \$300?), you can dramatically improve your system's performance with a technique called disk buffering--a scheme which can enhance the performance of disk-based application program whether with floppies or hard disks.



The principle behind disk buffering is pretty simple: accessing RAM is a lot faster than accessing a disk by a factor of 30 or more. Therefore if you can transfer some or all of your data from disk to RAM and make your operating system think it is accessing your disk when it really accessing RAM, you can realize a fantastic speed increase in "disk bound" programs (a disk bound program is one which spends a large percentage of its total execution time just waiting for the information it needs from the disk). Luckily there are several programs, patches, and devices around in a range of prices to suit all budgets (i.e., free to \$200 to \$3000) which will allow you to experiment with this technique.

For example, consider a BASIC program which has four open

files: 2 data files, each with their own index file - perhaps an inventory data file indexed on part number, and a supplier data file indexed on a supplier code contained in the main inventory data file. When you open the main data file, your program calls upon CP/M to make sure the files exist; it does so by searching the disk directory first. As you read a record, you must: access the directory to see in what disk sectors the index to the data is stored, access the index, access the directory to see in what disk sectors the main data is stored, access the data (getting the supplier code), access the directory to see in what disk sectors the index to the supplier data is stored, access the index, access the directory to see in what disk sectors the supplier data is stored, access the supplier data. Whew!



As you can see, a whole lot of time is spent going to the directory on the disk; the more files you have open, the worse it gets. If you could just store the disk directory into a memory buffer the first time it is accessed, from then on all reads from and writes to the directory could be carried out without physically moving the disk head from its current position. The head need only move to the actual index and data files.

But if we can buffer the directory, why not buffer the index and/or data files as well? If we have just a small index file (say 2 or 3 K), we could do a binary search in memory in blinding speed. And if we have the room, why not put



the entire data file in RAM? At that point, the only disk activity involved is transferring from the physical disk to the RAM-based disk, and that is done just once. From there on, you are navigating through your files at warp drive speed!

Thank goodness we don't have to re-invent the wheel on this one. Volumes 38 and 50 of the CP/M User's Group (1651 Third Avenue, New York, N.Y., 10028 - \$12 per volume) have the assembler source code for FAST and SPEED for CP/M 1.4 and 2.2. These programs provide a cheap way of increasing execution time by providing directory seek buffering, read buffering, and/or write buffering. The price to be paid is a reduced TPA; the more memory you commit to buffers, the less you have for your application program. The size of the buffers is adjustable on both FAST and SPEED however.

The September 1982 issue of LIFELINES (same address as CP/MUG) has an article dealing with adding on modules to an existing CP/M BIOS. The example source code provides a very small RAM-based disk drive (20K) at the top of the TPA. Although not actually implemented, the article does discuss a way of using additional bank selected memory to provide much larger RAM drives - limited only by your bank account for the additional memory boards.

The ultimate RAM-based disk drive is Semi-Disk (Semi-Disk Systems, PO Box GG, Beaverton, Oregon 97075). For \$1995 you can get a single S-100 512K RAM board and the auto-patch software to make it look like a 512K disk drive; you can get a full megabyte for \$2995. Imagine being able to load an entire quad capacity disk into memory and have room to spare! Or you could have your word

processor, spelling checker (and 40,000 word dictionary), and a 100 page manuscript in RAM memory simultaneously. No more annoying waits for accessing the disk!

For those with smaller budgets, Techne Software Corporation (3685 Mt. Diablo Blvd., Lafayette, CA 94549) has Cache/Q, an adaptable disk buffering enhancement for CP/M 2.2. It can be used with just 64K (or less) memory, but it really speeds things up when used with additional bank switched memory boards (to a maximum of 32 48K boards). It uses a sophisticated Least Recently Used (LRU) algorithm to determine buffer usage and can dynamically modify its buffering criteria. That is, you may specify that all disk sectors are to be buffered, that only the directory sectors are to be buffered, that the buffering selection is to be made on a file by file basis, etc.

I have tested a preliminary release of Cache/Q on a Horizon and can verify that it does improve performance even with just a 4K buffer in a 56K system. Unfortunately North Star's bank select scheme is not compatible with Cache/Q at this time (September, 1982). I have spoken with the author, Pete Roberts, and he assured me that he would modify Cache/Q so it could use the North Star bank select scheme. As soon as I am able to test the revised version, I will submit a review to the COMPASS with more details and timing comparisons.

My dream configuration utilizing these techniques would be to have at least 128K CP/M system with the 1 megabyte Semi-Disk. Instead of standard CP/M, my special CP/M would be loaded into the high end of the 2nd bank of memory, with the rest of the 2nd bank dedicated to



Cache/Q buffers. The 1st bank of memory would be the standard TPA starting at 100H and extending up to F000H or so (I figure you have to leave some memory for the bank switching software). While we are at it, why not make this CP/M a concurrent version? That is, it would be multi-tasking, with another 64K bank for each additional task. Imagine editing a program while your modem program downloads data from the Source while a third bank sorts several thousand records. And of course we will have figured out how to modify the Horizon so it is running a 6 MHz Z-80B instead of the "old" 4 MHz Z-80A. And then...

Back to reality. For an investment ranging from just a few dollars (and some software hacking) to several hundred to several thousand dollars, you can get a significant improvement in speed of most disk bound programs. Here is a good excuse to upgrade those 16K or 32K boards to 64K boards as suggested by Peter Jonas in COMPASS (Vol 1, #3 and Vol 2, #1). For less than \$100, you can double or quadruple your RAM to use in one of the above schemes. (I have successfully converted 2 of my 32K boards following Peter's plans.) If your floppies are slowing you down, speed up your programs!

## *CatChum*

**CatChum**

By Bob Stek

By the time you read this review, the program may no longer be available! CatChum (from Yahoo Software) is a PacMan clone for CP/M with a standard serial terminal with clear screen and direct cursor addressing. The way that Atari sues companies that come out with



PacMan look-a-likes, you may never get a chance to purchase a copy for your machine. So quick, order one from Discount Software, 6520 Selma Avenue, Suite 309, Los Angeles, CA 90028. I think the price is about \$40.

Now that it is on the way, let me tell you about it. It really is PacMan! If yours is one of the 30+ terminals in the installation routine or if you know the control codes for your terminal, you can be playing within a minute or two of logging in the disk. CatChum is written in compiled Microsoft BASIC and really zips along. The maze is drawn on your screen first, then the dots are filled in, then away we go. You control your "cat", a "C" which alternates between upper and lower case, by using 4 directional keys for "up", "down", "left", and "right"; you can choose any single character keys you wish during the installation routine. Capital "A"'s emerge from the center of the maze, determined to hunt you down and gobble up your "C"'s. Of course if as you gobble up the dots, you gobble up a power pill (an "o"), all the "A"'s turn to "M"'s which you can then gobble for bonus points. But after a short time, the "M"'s turn back to "A"'s, and they are back after you. And so it goes. →

There are 9 levels of difficulty in CatChum. At the lowest level, the "A"'s are slow, stupid, and are released only at long intervals. After you develop a strategy for gobbling dots and tricking "A"'s, you will eventually get to the second level where the "A"'s move a bit faster, get a bit smarter, and are released in shorter intervals. At the third level they are faster still and do not remain as "M"'s nearly long enough to be gobbled. And don't think the alleys at the top and bottom of the maze will work the way they did on the first two levels. Thankfully on the fourth level, "hyperspace" becomes active; if you are cornered by some "A"'s, you can press the space bar and Poof! You vanish in a cloud of orange smoke, only to be randomly re-

deposited somewhere else in the maze--hopefully, further away from the menacing "A"'s.

CatChum keeps a permanent record of the five highest scores in a disk file. That gives you a goal to shoot for. As with the arcade game, you can have a game for 1 player or for 2. CatChum is the cleverest arcade game to ever come along for standard serial terminals--you no longer need be snubbed by your less perspicacious friends who bought an Apple and chide you for not being able to play exciting arcade games. I hope CatChum catches the imagination of some budding game designers who will make lots more of these games available.



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## Letters

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### LETTERS TO THE EDITOR

INSUA:

Have enjoyed the articles, news, & tidbits, so here's the bread for another year ...

Keep up the good work, especially North Star-Sol & Bob Hogg type goodies, for out here few computer stores even know what a Proc. Tech SOL is, let alone North Star!

We have a local Fort Wayne S-100 & CP/M users' group (North Star Format SIG/M & CP/M Library). For any who are interested, first Thursday of each month. Any readers may write to me for meeting info.

Thanks again,

Don Slane P.D.  
7220 Miahqueah Ct.  
Fort Wayne, IN 46815

INSUA:

Just a short one. I don't know if there is a place in Compass for a list of Dealers who are deserving of Special Mention. If not, there should be.

Recently, I bought a copy of "Northword" and found that I couldn't get it to run my printer. "Northword" expects a standard serial assignment of the serial RS-232 ports and mine weren't.

After three days of software sleuthing I was unsuccessful in making the printer driver work. "Northword" is written in "C" language and, further, provides its own operating system.

Upon contacting the dealer, he offered to return my check or change my Horizon II to the standard configuration at no charge. I chose the latter. He made the change. I'm happy and

grateful to a caring dealer.  
Who is the dealer??

New Horizon Computer Center  
5787 South St. Suite #6  
Lakewood, CA 90713

Mgr.: Robert Tourula  
(213) 925-4661

Dealers like this are de-  
serving of our patronage.

Sincerely,

John D. Armstrong

[See Steve Leibson's I/O farm in  
Compass, Vol. I, no. 2, and  
"Easy Switch" in Vol. I, no. 4,  
and Vol. II, no. 1, for informa-  
tion concerning printer ports  
and headers. --Eds.]

☆☆☆☆☆☆☆☆

INSUA:

I have been a member of INSUA  
for a year, and, in general, I  
am very pleased with the news-  
letter. However, my main use  
for my Horizon is scientific,  
which probably puts me in the  
minority since I am neither a  
hobbyist nor a typical business  
user. The recent letter by Mr.  
Spelman in Compass Vol. II, no.  
2, echoed my feelings exactly.  
I strongly support his views  
that more articles for less  
expert members would be welcome.

I bought my Horizon 2DD, 64K  
with CP/M because it was S-100  
based and I had inherited an old  
Poly 88 with some boards I could  
use. One was a Cromemco D7+A  
which works great, and the other  
is a polymorphic VT-1, which  
doesn't. It seems to be missing  
a crystal.

To save money, I purchased  
mail-order from A.E.I. (Fountain  
View, CA) who were both friendly  
and helpful and quickly de-  
livered a pre-tested unit in

perfect condition.

I recently had a problem with  
Drive #2 which was handled by a  
local repair outfit (Advanced  
Computer Technological Services,  
Kenner, LA) in a most efficient  
manner. The first 'fix' didn't  
work so they swapped out the  
drive--total cost less than  
\$140, and less than three days  
down time.

If you begin to compile in-  
formation on good companies to  
deal with, please include these  
in the list.

I am very interested in tele-  
communication. I would also  
like to know where one may get  
an 8-pole, double throw switch,  
reported in an earlier Compass  
as being useful to switch the  
second serial port for modem or  
printer use. I also have in-  
terest in CP/M. WordStar is  
fantastic, but my IDS printer  
doesn't do it justice. One  
should be warned that for some  
purposes, the printer will de-  
termine whether the computer can  
put out final copy.

Finally, the newsletter is  
getting better and better. Con-  
sidering its current size (44  
pages), would it be possible to  
bring it out more often? In any  
case, it seems a change in for-  
mat would be appropriate, even  
if that would increase the mem-  
bership dues somewhat.

Sincerely,

Larry P. Feigen, Ph.D.  
Associate Professor  
Dept. of Physiology  
Tulane University  
New Orleans, LA 70112

☆☆☆☆☆☆☆☆

[The Compass editors welcome  
articles on a variety of topics,  
including topics for less expert  
members. We sometimes solicit  
articles, especially when we're  
short of copy for the next is-  
sue, but in the final analysis



## Letters



we're dependent on INSUA members for articles. We would particularly like to hear from relative beginners on how they solved the most recent problems they encountered. Of course, we also welcome inquiries from frustrated beginners and experts alike.

Compiling a "certified list" of particularly good dealers might be unfair to good dealers who have no one to speak for them; however, we will be happy to publish personal testimonials like this and the previous letter in the Letters column.

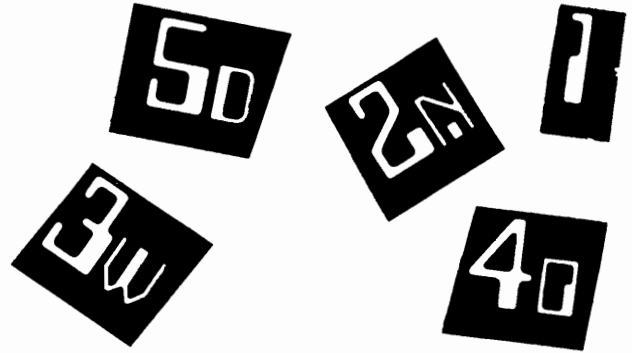
In fact, we'd like to offer our own testimonial for Epson customer services, and in particular to Epson's Justin Bell, for a model response to our inquiry concerning Epson's superscripts and subscripts--see "WordStar on Epson."

We too are interested in telecommunication, as evidenced by our material on modems. Several members have asked about an 8PDT switch. In the first place, such an elaborate switch is not necessary to make a modem work--see the followup article, "Easy-Switch III," in Vol. II, no. 1, of Compass. In the second place, however, if you do really want one, an 8PDT switch can be ordered from HW Electronics, 19511 Business Ctr. Dr., Northridge, CA 91324, Cat. number 1532, 2 for \$1.50, 10 for \$5.50. HW requires a \$15 minimum order, but stocks a variety of supplies, including diskettes. If it is the same switch we purchased from HW, it comes without a schematic, but can be figured out with some testing.

Compass wishes to be appreciated for its content rather than for its form--though we have had many compliments on Clyde Steiner's graphics! On the other hand, we are making changes, as you will have no-

ticed, and are considering a move to photo-typesetting (by microcomputer!), which would result in more compact and more readable text. Comments of INSUA members are solicited most earnestly!!!

Some members have urged us to bring Compass out more often. The editors volunteer their time, and are reluctant to promise more than they can reasonably deliver; but again, we will consider all requests. --Eds.)



INSUA:

Living in Europe now has made the INSUA and The Compass more worthwhile to me than ever. Here, there is no other way to get any information regarding my North Star. Your publication has been very useful.

... [mailing problems]

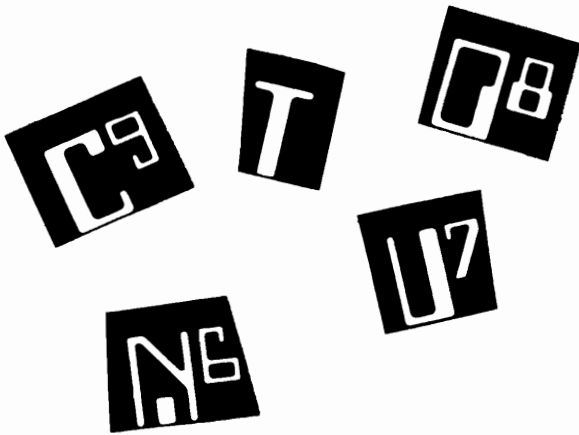
While I am writing, perhaps one of your members can help me a bit. I am running TPM [??CP/M?? --Eds.] as well as N DOS. However, I am attempting to update the BDOS to handle my quad density drives. Computer Design Labs have not answered any of my inquiries. Any help you may be able to offer would be greatly appreciated.

Yours truly,

Richard Derksen  
Leberstr. 51  
D3100 Celle  
West Germany

[Any experienced quad users should write to Richard Derksen, with a copy to us for future publication --Eds.]





INSUA:

Please send the FILL number to turn on and off the printer on the new 5.2 BASIC. On the old 5.0 BASIC it was FILL 10568,00 and FILL 10568,201.

Yours Truly,

Eugene Peterson  
T. I. Service  
Keaau, Hawaii 96749

INSUA:

Recently I saw in a Computer publication reference to a North Star users' magazine similar to those available to Tandy and Apple owners. Enquiries locally failed to produce results, and in answer to a letter to North Star they sent me a list of the Users' Groups known to them but no mention of the magazine.

If this magazine is available I would very much appreciate it if you would let me know the name and address so that I can arrange for a subscription.

I recently purchased an Advantage and am not only a new owner--I am a newcomer to computing in general. There are no North Star Users' groups in Australia, which is why I am keen to get hold of this magazine.

I would appreciate any assistance you could offer me.

Yours faithfully,

B. G. Burfield  
Adelaide, Australia

[We know of no existing magazine or journal other than Compass specifically designed for North Star users. Three general computer magazines which are particularly valuable to North Star users are Dr. Dobb's Journal, Microsystems, and Microcomputing. All three frequently run articles about North Star. Do INSUA members want to name others? --Eds.]

[We have been strongly advised that although the FILL statement works in 5.0 BASIC, it is not good programming practice to use this statement in a BASIC program--instead, use consecutive PRINT and PRINT#1 (or #2) statements.

The principal use of the printer-screen echo is to preserve a record of a working session at the console, e.g. while trying out commands and keeping track of whether they do or do not work. If, for example, you are using BASIC to perform calculations instead of making programs, you will have a record of the numbers you typed as well as the result.

One of our board members mulled this request over, and suggested that the following FILL statement might be the equivalent statement for 5.2 DOS and BASIC:

FILL 2794,00

He asked us, however, to test the routine carefully, and, as it turned out, with good reason. Although the routine looks like it should work, and will probably make the printer on your second port echo characters you type, it is not at all reliable, and many characters, including carriage-returns, will be lost. Why?

The FILL statement replaces a C9 jump instruction at address OAEA Hex with a 00, as in the patch to the 5.0 DOS I/O routine. The code beginning at

OAEB, however, is only the second half of the "character out" routine: characters are sent to the printer without a test to determine whether the printer is ready; most characters which are sent without this test will be lost.

There is apparently no single-bite fix and thus no simple FILL statement which can accomplish the task. Our suggestion is to use 5.0 DOS and BASIC for the simple printer-screen echo, or to rewrite the I/O of your 5.2 DOS entirely. Perhaps other INSUA members will have other suggestions or comments. --Eds.]

INSUA:

American Planning Corporation is interested in contacting North Star users. Do you rent your mailing list?

APC has three new products:

(1) APCBASIC which is 2-5 times faster than North Star BASIC and has many nice development features, (2) Electronic Spread Sheet which is a three dimensional spread sheet system that handles over 1,000,000 numbers and (3) Management Information System Builder which is designed for non programmer use.

Very respectfully,

John Cleckner  
Vice President  
American Planning Corporation  
2600 Duke Street, Suite 423  
Alexandria, VA 22304  
(703) 751-2574

[INSUA does not rent its mailing list, but will gladly accept and reprint information concerning products. Our thanks to John Cleckner for this inquiry, which we expect will be duly noted by readers of Compass. --Eds.]

## "C" on Advantage

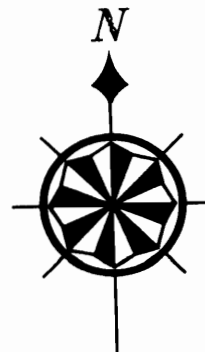
"C" on North Star ADVANTAGE

By Barry E. Abrahamsen

Rainier Software Services  
Box 31315  
Seattle, WA 98103

In the last issue of The Compass, the editors solicited opinions on whether or not more attention should be given to the ADVANTAGE. I own an ADAVNTAGE and would like to cast my vote for more information about it. Putting my fingers where my mouth is, I've included a short program for making the speaker in the ADVANTAGE make "musical" tones. It isn't much but it shows the technique for making sounds. I think a system could be written to make the ADVANTAGE as good as any other general-purpose computer at sound generation.

I would also like to see more program examples in languages other than BASIC: that's why I used C for my example. An educational group like INSUA should be interested in teaching its membership about more advanced computer languages. If the group is interested, I can contribute a number of useful programs from the BDC "C" Users' Group.



```
/*
This program, written in BDS C for the North Star ADVANTAGE, demonstrates
that it is at least feasible to make musical tones.
```

```
Barry E Abrahamsen
Rainier Software Services
Box 31315
Seattle, Washington 98103
```

```
*/
#define ctlreg 0xf0 /* this is the hex address of the CONTROL register */
#define biton 0x58 /* this is the usual value of that register */
#define bitoff 0x18 /* this is the value with the speaker bit off */
#define wait(x) for (k=0;k<x;k++) /* this inserts a variable delay between
turning the speaker bit off and on */

main()
{
int step,rate,k;
while (1) /* "while true do" this loops indefinitely */
{
for (step=0; step < 50; step++) /* generate 50 tones */
{
for (rate=0; rate < step*5; rate++) /* toggle the speaker bit */
{
outp(ctlreg,biton); /* outp writes directly to a port number */
wait(step);
outp(ctlreg,bitoff);
wait(step);
}
if (kbhit()) exit(); /* test the keyboard at the end of each cycle */
} /* and stop program if a key has been pressed */
}
}
```

## Questions, Questions

### QUESTIONS, QUESTIONS

[We decided to publish the following letter separately since it raises many issues fundamental to INSUA and enough questions to constitute a letter column in itself. --Eds.]

INSUA:

I have several questions relating to the group and to the use of WordStar on my North Star Advantage computer. I will be pleased with any information you can provide and any leads you may have which allow me to track down information.

[The editors of Compass and the INSUA board are indeed interested in the Advantage, and in the full range of computer languages. Since we are mostly old-timers, virtually all of us have Horizon's or Horizon-like machines. We are therefore entirely dependent on Advantage owners for Advantage articles. We take this opportunity to solicit articles on the Advantage and also on C, BASIC, Pascal, etc. etc. --Eds.]



## ^Questions^

1) Do you have user group meetings? Where, when, how often?

2) Does the group swap programs? What type? Are there fees for copies? How much?

3) Is there any assistance for WordStar problems? Do you have any WordStar updates? Is there a cost?

4) I have two specific problems with WordStar on my Advantage computer. Any ideas would be appreciated.

a) WordStar incorporates single-line headers. My work, as a technical writer for Qume, requires at least three header lines. Is there any way I can do that with my current WordStar program (3.0)?

b) WordStar allows long cursor movements within the document via the FIND command. However, that can be, and is often, confusing. Is there any way to move the cursor to a particular page in the text?

5) Having bought my computer from a mail order house on the East Coast, I have had the utmost difficulty conversing with both North Star and MicroPro (who makes WordStar). Can you offer any suggestions there?

6) I have a printer here at work. It is a 35 CPS daisy wheel printer, made by Qume for Vydec. I am having trouble talking to it via WordStar, and, as explained above, North Star and MicroPro are very closed-mouthed. What can I do? Do you have any specific information that would help? I am able to run on a Qume Sprint 5 with no problem. It's the Vydec that's a problem.

Any help you can provide will

be most appreciated. I await your response.

Alan Lewis Painter  
TechnicalWriter  
Qume Corporation  
2350 Qume Dr. #50  
San Jose, CA 95131

\* \* \* \* \*

### Editors' reply:

1) INSUA has one open meeting a year, at the San Francisco Computer Faire. Usually the Faire is in late March or early April. INSUA does not hold meetings during the remainder of the year, but encourages the formation of local North Star users' groups. See list of members in this issue, and check our reports on users' groups.

2) INSUA has a disk library and disk librarian--follow his column in Compass.

3) The current issue should answer many questions about WordStar. See also Steve Leibson's review of WordStar in Compass, Vol. I, no. 4.

We are happy to publish information concerning WordStar (or any other software), and hints for installing patches. We have no WordStar updates, and would expect a quick visit from MicroPro's lawyers if we tried to distribute any part of their wares. We understand that MicroPro will supply updated versions of their products to all legitimate owners at a nominal cost.

Updating to WordStar 3.0 is a must for any WordStar owners working with tables or with any material formatted in columns. Write directly to MicroPro.

We have heard rumors that MicroPro is considering automatic numbering, line-numbering, footnoting functions, and other improvements besides. If you can suggest specific improvements, MicroPro should certainly be delighted to hear from you,

# Q-A

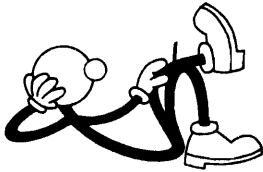
even if they cannot give you what you want immediately.

4a) We are pretty certain that the current WordStar can handle only single-line headers. We have no access to MicroPro's development software, and therefore don't know whether such an enhancement might be in store.

WordStar allows certain user-installed patches, but these are mostly for minor enhancements to printing, whereas three-line headers would probably constitute a major enhancement. Perhaps one of our readers can suggest a program or programmer capable of making the necessary major changes; however, we suggest that this legal quagmire be approached with caution.

Steve Leibson reported in Compass, Vol. II, no. 1, that WordStar wants \$500.00 for its customization notes.

Triple-line headers can be faked, however, as follows:



1. Insert a .mt 1 dot command at the top of your file.
2. Place the first line of your intended header in a .he dot command.
3. Type the second and third lines of the header as the first lines of your text.
4. When the file is entirely ready except for printing, save with ^KD, make a copy, and do the rest on this copy.
5. Following the third line of your header at the top of your file, add the space you wish to leave between all headers and text on all pages.

6. Mark the beginning of the second line of the header with the ^KB marker, and mark the beginning of the first line of text with ^KK.

7. Using the ^C command to scroll quickly through your text, place a copy of your "fake" header immediately after each page break, using ^KC. For faster scrolling, type two or three ^C's in succession.

8. Try to avoid making any further changes to this copy--altering line numbering by even one line will throw the whole system off.

Here's a sample of a test three-line header that worked for us:

```
.mt 1
.heTest header line 1.      #
<B>Test header line 2.
Test header line 3.
```

Any other suggestions from readers?

4b) WordStar does not provide for cursor movement to a particular page (except to the top of the first or bottom of the last). If you want to return to your present location when you know that you are going to make more than one intervening cursor movement, use the ^K# function (^K followed by a number, 1-9) to mark your location. Then use the ^Q# function to return to that spot at any time in the future. After return, a repeat of ^K# will remove the marker. The marker will be lost after a ^KD save (but not after ^KS).

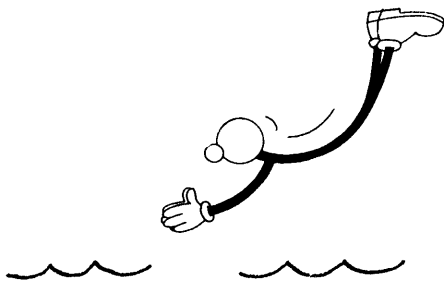
If you want to return to a particular spot but need to make a ^KD save first, enter any arbitrary character string (e.g. ZZZ), and use the ^QF function to get back to that spot later; better yet, use ^QA and replace with a null string--that way you can immediately erase your marker with a "Y" response if you wish to do so.

5) Manufacturers prefer to work

through dealers, and North Star fiercely embraces this principle; but we feel that manufacturers should also be responsive directly to users, who have chosen the manufacturer's product even if they have circumvented the dealership system.

If you did buy through a dealer, try your dealer first; whether or not you have purchased through a dealer, try your local computer club, a North Star club, a CP/M club, etc; try INSUA of course.

We often find that hobbyists know more than the dealers or manufacturers anyway, since hobbyists have a penchant for making computers do things the manufacturers never dreamed of--



this is particularly true for the field of telecommunications.

Somewhere along the way, try the manufacturer. If North Star and MicroPro do refuse to converse with you, at least let them have a piece of your mind, and threaten to go to the competition next time around. However, we will repeat that we think North Star is trying hard to improve its service to users.

6) Installation of particular printers can indeed be a headache, since there are so many printers on the market, and since the problem can be either in the hardware or in the software. We welcome information concerning the successful installation of particular printers. See articles on Epson and Diablo in this issue and the last issue for examples.

In any case, the most obvious things to look for are symmetry

of baud rate between devices, and correct wiring of headers and plugs.

If the problem is suspected in software, the first step in analyzing the problem would be to study the port driver in Appendix F-13 of the WordStar Manual ("PORT DRIVER. CALLED ONLY IF CSWITCH=1). Check to be certain that the printer can return the ETX/ACK needed by the port driver in WordStar.

Bob Cowart, who reviewed the San Francisco Computer Faire in our last issue, suggests that you get all the Vydec documentation and study the pin configuration, trying an approach which relies principally on hardware:



1. Make sure pin 20 on the Horizon serial port is connected to the line on the Vydec which goes high when the buffer is full. This may be pin 11 on the Vydec, rather than pin 20.



2. Check baud rate.
3. Install WordStar with no protocol.
4. Use the most general printer option, experimenting with 300 baud first before trying a higher rate. If the printer works at this setting, increase to 1200; if things are still o.k., select a more sophisticated printer option.
5. Contact technical support at Qume or Vydec.

If you've already done these things, once again we can only call on the assistance of our readers.

Any readers with a Vydec?

# Proxima

## NORTH STAR BBS

Peter Midnight of North Star maintains a North Star Bulletin Board System called "Proxima" at (415) 357-1130. It's wide open for calling in comments and for scanning the comments of others. Modem users should definitely give it a try! The accompanying table is a list of the commands, which you might want to keep handy when you call.

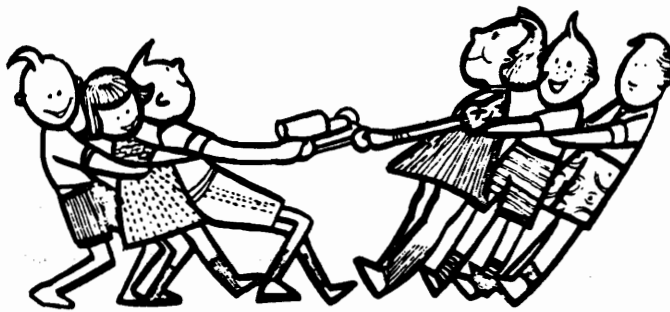
## FUNCTION:

A,B,C,D,E,G,H,K,N,P,Q,R,S,V,W,X  
(OR ? IF NOT KNOWN)

## ----FUNCTIONS SUPPORTED----

A=Alter Baud rate  
B=Reprint bulletin  
C=Case switch (upper/lower)  
D=Duplex switch (echo/no echo)  
E=Enter msg into system  
G=Good bye (leave system)  
H=Help with functions  
K=Kill msg from system  
N=Nulls: Set as many as req'd  
P=Prompt switch (BELL on/off)  
Q=Quick summary (Msg #, subject)  
R=Retrieve msgs by #  
S=Summarize msgs  
V=Video backspace  
W=Reprint welcome  
X=Expert user mode

## Users' Groups



### USERS' GROUPS

North Star users in the areas concerned should check out the following North Star groups:

North Star Computer Society  
P.O. Box 311  
Seattle, WA 98111  
Chuck Langenberg, Pres.  
(206) 285-0259  
Fred Volking, V.P.  
(206) 363-0886

Triangle North Star Users Group  
c/o Ted H. Emigh  
Box 5487  
Raleigh, NC 27650

North Star Users  
Wanda Johnson  
Route 5, Box 91  
Amarillo, TX 79118

## Conversions

### CONVERSIONS

By Jim Lind

Conversions are a natural for a computer but they can also take a lot of program space. I started with one small program which had a few math routines and decided to include some metric conversions. Before long the program was 100 blocks long and was becoming very slow. There had to be a better way.

The new method certainly reduced the size of the program and improved the speed. The following routine is not all-inclusive but is intended to present a concept that may be of help with a similar problem.

In the example below, the DATA statements include labels of length followed by a numerical conversion factor. All of the factors are in reference to the INCH, which means the answer is obtained by simply dividing the first factor (obtained by string match) by the second factor (also obtained by a string match), times the total number of units of the first.

# Conversions~

'0' is a flag which is set if a match can not be made and 'E' is the exponent variable which is set to 2 when an area is desired (i.e., when SQUARE INCH is entered). The length DATA statements also cover area and can be expanded to cover volume by changing the program to include 'CUBIC', similar to 'SQUARE'. The variable 'E' must be set accordingly.

The labels (MILLIMETER, CENTIMETER, etc.) can be abbreviated but it is sometimes more difficult to remember the abbreviation used in the program than it is to type the full title. 'CONVERT WHAT' requires a numeric value, i.e., 15 INCHES, and a space between the number (15) and label (INCHES).

If only the conversion factor is wanted, enter '1 INCH'. When converting area it is not necessary to enter 'SQUARE' for the second inquiry.

```
10 DIMA$(26),B$(26),C$(26),D$(26)
20 O=0\F=0\E=1\RESTORE30\GOSUB80\IFOTHEN20\RESTORE30\GOSUB110\GOTO20
30 DATA"MILLIMETER",3.9370079E-2,"CENTIMETER",.39370079,"METER",3.9370079
40 DATA"KILOMETER",39370.079,"INCH",1,"FEET",12,"YARD",36,"FATHOM",72
50 DATA"FURLONG",7920,"MILE",63360,"NAUTICAL MILE",72913.386,"ROD",198
60 DATA"MIL",.001,"MICRON",3.9370079E-5,"ANGSTROM",3.9370079E-9,"HAND",4,"",0
70 OUT2,13\OUT2,27\OUT2,84\REM ERASE TO END OF LINE
80 INPUT"CONVERT WHAT ? ",D$\IFD$=""THENEND\N=VAL(D$)\M=1\B$=""
90 M=M+1\IFM>LEN(D$)THEN70\IFD$(M,M)=" "THENA$=D$(M+1)ELSE90\GOSUB140
100 READC$,A\IFA$=C$THEN200\IFC$<>" "THEN100\O=1\GOTO180
110 INPUT" TO WHAT ? ",B$\A$=B$\GOSUB140\IFB$(1,3)="SQU"THEN130
120 IFFTHENB$="SQUARE "+B$
130 READC$,A,B\IFA$=C$THEN180\IFC$<>" "THEN130\O=1\GOTO180
140 IFLEN(A$)<6THEN150\IFA$(1,6)<>"SQUARE"THEN150\F=1\A$=A$(8)\E=2
150 L=LEN(A$)
160 IFA$(L)<>"S"THEN170\L=L-1\A$=A$(1,L)\IFA$(L-1,L)="HE"THENA$=A$(1,L-1)
170 IFA$="FOOT"THENA$="FEET"\RETURN
180 IFB$=""THENB$="ANYTHING"\IFOTHEN190\ID$,"=",%C,A^E#N/B^E," ",B$!\RETURN
190 !": CAN'T CONVERT ",D$," TO ",B$,"."!\RETURN
```

## On & Off

ON and OFF: Any opinions?

We've noticed that different Horizon users have different habits in power-up and power-down procedure. Some are careful to turn their Horizons on and off without diskettes in the drive. Others leave the diskettes in and turn on the entire system with the flick of one switch.

Rodney Zak's Don't proclaims on this subject, "As a general rule, never insert a diskette into a disk drive until power to the entire computer has been turned on" (p. 29). Other users

claim that turning on the Horizon without a disk in the drive causes the read-write head to crash against the counter-pressure device, or against the opposite head on a double-sided drive, in either case submitting the head(s) to wear and tear.

The Revision 1 Horizon manual advises: "Insert a diskette into drive #1 ... If power is not already on, ... then turn on the power switch. ..." The manual says nothing about power down.

The Horizon drives are not engaged until some seconds after power up. The heads are not in contact with the diskette at power-down unless the user turns the machine off during a read/write operation, which is a clear error.

Opinions???



# A BIT ABOUT TAXES

By Jim Lind

As a result of the ECONOMIC RECOVERY TAX ACT the tax rate schedules are changing each year through 1984. If you are using your computer to calculate your taxes, this means the program must be changed each time the tax rate changes.

The following routine will provide the same information as the IRS tax tables and is updated by changing the DATA statements, lines 60 through 130. The DATA statements shown are for the 1982 tax year. If you are interested in only one

FILING STATUS, remove the others and change lines 160 through 200 accordingly.

The DATA statements can be updated from the IRS TAX RATE SCHEDULES or from a number of commercially available tax publications. Although each line of the TAX RATE SCHEDULES contains five numbers, only two from each line are used. The two values are "But not Over" and the percent value. The "But not over" value is in hundreds. For example, lines 60 and 70 held the data for a SINGLE taxpayer.

The 1982 TAX RATE SCHEDULE line below the "zero tax" line has column/values of "Over

\$2,300", "But not Over \$3,400", "Tax is 0 + 12%" and "Of the amount over \$2,300". The two DATA values from this line are 34 (for \$3,400) and 12 (for 12%). The next line has "Over \$3,400", "But not Over \$4,400", "Tax is \$132 + 14%", etc. Only 44 and 14 are used. The last "But not Over" value (6E6) is not from the SCHEDULE but it doesn't matter because if your income is around this amount you can afford to hire someone to do your taxes.

The following was removed from a rather large tax program and renumbered, which is why the subroutines are as they are. I use these same subroutines for other SCHEDULE calculations.

# \$ Taxes \$



```

10 !/!"Enter filing Status as follows: (1) SINGLE, (2) MARRIED FILING JOINT, "
20 !"(3) MARRIED FILING SEPARATE or (4) HEAD OF HOUSEHOLD ",
30 INPUTT$ \IFFT$="THENEND\AO=VAL(T$) \IFA0>4THEN10
40 INPUT"EXEMPTIONS:" \G\INPUT"INCOME:" \C\E=C-G*1E3\GOSUB140
50 !"TAXES FROM TAX TABLE : ",%C$8I,U\GOTO10
60 DATA34,12,24,14,65,16,85,17,108,19,129,22,150,23\REM SINGLE
70 DATA182,27,235,31,288,35,341,40,415,44,553,50,818,50,1083,50,6E6,50
80 DATA55,12,76,14,119,16,160,19,202,22,246,25\REM MARRIED FILING JOINT
90 DATA299,29,352,33,458,39,600,44,856,49,1094,50,1624,50,2154,50,6E6,50
100 DATA27.5,12,38,14,59.5,16,80,19,101,22,123,25\REM MARRIED FILING SEPARATE
110 DATA149.5,29,176,33,229,39,300,44,428,49,547,50,812,50,1077,50,6E6,50
120 DATA44,12,65,14,87,16,118,20,150,22,182,23\REM HEAD OF HOUSEHOLD
130 DATA235,28,288,32,341,38,447,41,606,49,818,50,1083,50,1613,50,6E6,50
140 T=E*.02\IFT-INT(T)=OTHENT=T*50-25ELSET=50*INT(T)+25\GOSUB160
150 U=INT(U+.5)\RETURN
160 U=0\ONAOGOTO170,180,190,200\REM SELECT FILING STATUS
170 RESTORE60\B=23\GOTO210\REM B=MAX EARNINGS (HUNDREDS) WITHOUT TAX
180 RESTORE80\B=34\GOTO210
190 RESTORE100\B=17\GOTO210
200 RESTORE120\B=23
210 A=B\C=0\IFT<=B*100THENRETURN
220 C=C+(B-A)*D\A=B\READB,D\IFT>B*100THEN220\U=FNR(C+(T*.01-A)*D)\RETURN
230 DEFFNR(R)=INT(100*R+.5)*.01

```

# Pilot

PILOT is the original computer assisted instruction (CAI) language developed by Dr. John Starkweather of the University of California at San Francisco. The name is an acronym for Programmed Inquiry, Learning Or Teaching. It is a very simple language to use for its intended purpose, much simpler to use than BASIC. Typically in a CAI situation you wish to present text, question the user about the information presented, and then present new material (or review old material) on that basis. A sophisticated CAI system could also keep track of the student's progress by administering tests and keeping its level of presentation suitable for the student's level of com-

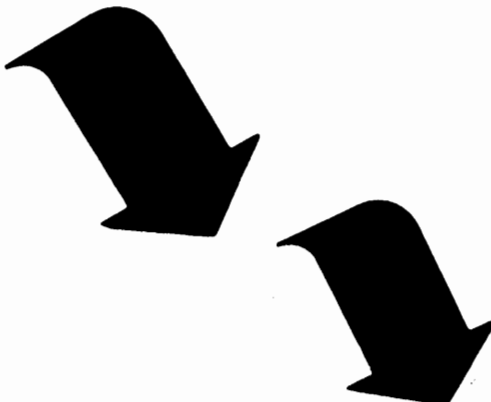
prehension; it could also store test results from many individuals for later analysis for the benefit of the instructor.

## FEATURES:

Recently Dr. Starkweather has made available PILOT 4.3 (or Nevada PILOT as it is marketed through Ellis Computing) for CP/M. This \$149 interpreter is a revision of a cassette tape version developed for the Processor Technology SOL computer; it has many new and expanded features for CP/M including file handling, a full screen editor, and control of a video cassette recorder as well as being able to send output to a speech synthesizer unit such as the Votrax Type 'N Talk. The core statements that Type information to

the screen, Accept and Match answers, Jump, Compute and Use subroutines have been greatly expanded both for more convenient use and for more advanced file handling features.

The new commands include:



AH:	Accept answer, stay on same line	KILLF:	Kill data file
APPEND:	Add data to existing data file	LIST:	List the current program
AS:	Accept single character entry	LOAD:	Load new program or program segment
BYE:	Exit fro PILOT	MJ:	Match followed by JN:@M
CA:r,c	Cursor address (row and column)	NEW:	Erase program and restart PILOT
CALL:	Call program elsewhere in memory	OPENF:	Open data file
CE:	Clear to end of screen	PAUSE:t	Pause t seconds
CH:	Clear screen and home cursor	PR:	Problem start (target for J:@P)
CL:	Clear to end of line	REWIND:	Rewind file
CLOSEF:	Close data file	RW:	Remark with write data
CREATEF:	Create data file	RUN:	Execute program in memory
EDIT:	Edit current program	SAVE:	Save current program
EOF:	Set end of data file	SET:	Set memory size or set display speed
FOOT:	Foot of screen, halt and prompt	TH:	Type, stay on same line
GET:	Load program but don't execute	VIEW:	Control video cassette recorder
INFO:	Display file size information	VNEW:	Clear numeric and/or string variable
INMAX:	Input line length maximum	WRITE:	Write into data file
JM:	Jump according to match	XI:	Execute immediate

# *Pilot... continued*

## PERFORMANCE:

Nevada PILOT is a much enhanced language that offers the user many valuable features. It is a computer language and is not intended to be a complete computer managed instruction (CMI) system, though such a system could be completely written in PILOT. As a matter of fact, one of the demonstration programs included is WAPP--Write-A-PILOT-Program. It is a PILOT program which prompts the user for information to construct a multiple choice test; the output of WAPP is a PILOT program which then administers the test. Shades of The Last One!

I was disappointed with the speed of the built-in full screen editor. The 'delete line' command was so slow that I issued it twice, thinking that my keyboard had failed; of course PILOT then deleted two lines for me. On the other hand, I can't think of any other language that comes with a full screen editor at any price, much less one so reasonably priced. You could use a standard word processor to create your program files, but then you lose one of the inherent features of a good interpretive language--the ability to quickly switch between writing the program and running and debugging it.

## EASE OF USE:

Since a full screen editor is provided, some customization must be done for your particular terminal as to clear screen codes, cursor addressing codes, etc. As well you do not have to use the editing commands as supplied; you can make them conform closely (if not exactly) to your current word processor. However, these customizations are rather primitive compared to many other packages. You must

be familiar with the use of DDT and hex codes to make some of these changes. I would much prefer a complete installation program which presents you with a wide range of terminal types and the ability to use any combination of control characters and/or multi-character escape sequences for the editing commands.

This criticism is perhaps nit-picking because it is directed at just the screen editor. PILOT itself is one of the easiest of all computer languages to learn. The extensions presented are logical and flexible; the only other language features which I miss are 1) a directory command and 2) the ability to chain to a CP/M program after exiting PILOT.

## ERROR HANDLING:

There are just seven error conditions flagged by PILOT; any other error message are presumed to come from CP/M. The error messages tell you that a referenced statement or subroutine does not exist, that a Compute expression is either illegal or has a value which is out of range, that a string variable has no assigned value, that a numeric response is required for a request, that there is insufficient space in memory for string variables, or that the program being executed has more than seven subroutines in execution. This is an area for improvement in PILOT. It would certainly help the beginning PILOT programmer to be given more feedback and more detailed information than is currently provided.

## DOCUMENTATION:

The 82 page manual is mostly a reference manual. Ten pages are devoted to program development, with the rest being a syntactical description of each command including a brief exam-

ple of its use. I think that it is a shame that an extensive PILOT tutorial is not either included or at least offered at extra cost. I would be more than willing to pay an additional \$50 or even \$100 for a series of PILOT programs which teach good PILOT programming techniques. The Write-A-PILOT-Program mentioned above is a tantalizing taste of what could be developed into a much more extensive course authoring system written entirely in PILOT. While PILOT is a powerful tool for teaching, I am disappointed that a more sophisticated example of its power is not commercially available. I would suspect that there is a market for a good "How to Program in PILOT" book.

#### SUMMARY:

Nevada PILOT is an excellent extension of Starkweather's original language for CP/M based systems. I would recommend it for anyone interested in computer assisted instruction.

RATINGS (on a scale of 1 to 10):

PERFORMANCE:	9
EASE OF USE:	7
ERROR HANDLING:	5
DOCUMENTATION:	6

Nevada PILOT is available from

Ellis Computing  
600 41st Avenue  
San Francisco, CA 64121

Reviewed by: Robert J. Stek, Ph.D.  
19 Mayfield Road  
Regina, Saskatchewan S4V 0B7

## The pascal corner

### THE PASCAL CORNER

By: Mark Sheppard

This column marks the beginning of INSUA involvement in PASCAL. To start with, we are distributing the JRT PASCAL System. It is a fairly complete system. The programs, utilities, and documentation (we have put the 120 page Users Guide on disk) take up two full double density disk sides, or almost 320K. We put the manual on disk to save about \$12.00 in costs. For those who want the users manual in harcopy, please so indicate on the order form and include an additional \$12.00. To run the system requires at the absolute minimum a 48K CP/M system. 56K would be very desirable. As with all PASCALS, this one is a core hog. However, because the system allows for calls to externals and clears unused externals from memory, the programs can use externals as if they were overlays. The maximum program

size becomes your disk size. Just compile in small sections. As bugs become known we will be listing them (with fixes) both here and on the distribution disks as they become known. At present, no bugs have cropped up.



As you know, we have access to a large base of software, much of it in PASCAL lately. So, this is your chance to tell us what type of PASCAL programs you would like to see your Association put together. Do you want utilities, applications (what areas and what types), program notes, or ??? Please write attn: the Librarian and we will try to put together the type of programs you want. Hopefully we can put out a

PASCAL disk each newsletter. But I do need your help.

I would like to make this PASCAL CORNER a standard column. We will print questions, user tips, contents of PASCAL disks, bug updates, etc. What we would very much like to know is your experience with PASCAL, articles, comments, problems, solutions, etc. relating to PASCAL in general and your experience with JRT PASCAL in particular. In other words this is your column. Do write.  
.fi b:modem.cnr

## The Library Corner

### THE LIBRARY CORNER

by: Mark Sheppard

This newsletter we are putting out three new disk. First, we are getting into PASCAL. We are distributing the JRT PASCAL System at our cost. \$15.00 for the two sides of programs. User's manual is included on the disks. Hardcopy is \$12.00 additional. The JRT PASCAL is very good and appears to be bug free. See the PASCAL CORNER for more information. Order Disk #12. \$15.00

The second disk is a MODEM disk for CP/M. It will open up the world of "FREE" software via your telephone. It is the companion to the Telstar disk running under N\* DOS. PLEASE NOTE: >>As with Telstar, you do need your own modem hardware. <<< The disk contains the full source code of the latest edition of Ward Christensen's excellent modem program (presently MODEM780 but you may receive a newer version), (with his original MODEM program Ward set the standard for communication between micro-

computers.), a version assembled for Sol-PMMI, a general version assembled for the Hayes modem, a program donated by Pavel Breder to change the phone numbers in the MODEM dialling program without needing to reassembling the MODEM program (We really do appreciate it when members donate a program, utility, etc. to our library), a recent list of public bulletin boards you can call with the MODEM program, and some other MODEM related goodies. If you don't know about the wonderful world of FREE software that you can get with a modem, please read the modem article in this issue. PLEASE NOTE: >>> you do need your own modem hardware .<<< Order Disk #13. \$15.00.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

The third disk this month is the second in our line of CP/M utility disks. Again, this is a group of utilities that I have found most useful.

1. SUBGEN/SUPERSUB pair of programs. They let you do everything that submit forgot to do. For instance, did you ever try to PIP everything EXCEPT files ending in .COM. Or nested submits. These programs can.
2. SWEEP26/SAP. These programs will Sort (the directory) And Pack (the disk and directory). By moving all the files to the tracks nearest the directory and all the empty space furthest from the directory seek time for you disks is greatly reduced.
3. RESOURCE-(8080) / ZESOURCE (Z80). MERELY the most useful and productive dissamblers around. Again, great programs by that wiz, Ward Christensen. Be sure to READ THE DOC file before use. These programs are POWERFUL.

As usual, these programs come fully documented with a seperate explanation file where useful. They come with a running COM file and the full ASM file where ever available. The DOC and ASM files come

squeezed so USQ15 is also included. Full price, \$15.00. Order Disk #14.

### H E L P

I need your help in putting out our INSUA library disks. What is it that YOU the members want? Do you want it on N\* DOS, on CP/M, some on each, or what? I need ideas for the next disks. Please write. Thanks.

NOTICE: Per our announcement in the previous issue of Compass, due to the number and size of files on the CP/M disks, they are being distributed in double density format. If you require single density format please so indicate on your order form and include an additional \$5.00 to cover the added costs of copying to an additional disk.

# How To Get Free Software

## THE MODEM OR HOW TO GET FREE SOFTWARE

by: Mark Sheppard

Out there in telephone land are Things called Computerized Bulletin Boards or Remote CP/M Systems. These systems are made of Modems (which attach your computer to the phone lines and thence to other computers) and computers and SOFTWARE. Programs in Basic (32 Flavors), PASCAL, "C", assembly, Fortran, etc.etc. Games, utilities, fixes for CP/M, programs, how to's, help files, and you just name it. All available for the price of a phone call (watch out for long distance).

Also out there are Bulletin Boards. You know, a place to stick a message to someone else. Or play chess. Or comment on the state of the world. Or sell (buy) some used equipment. Or set up meetings. Or ask others for help in solving your problems. Or just plain gossiping.

These systems exist from Maine to San Diego, Miami to Seattle, Montreal to Vancouver, and all places in between. All you need is a Modem and our MODEM program by Ward Christensen, et.al. If you have

a friend with a Modem, give his a try. You can probably ask around on the Bulletin Boards and get the Modem for cheap.

When you get set up, please read the directions first. Then enter MODEM. This will bring up a rather complete menu. CAL will bring up a list of numbers. Choose the letter that goes with a number or just dial in your own. When the other computer answers, enter T.300. Then press RETURN three or four times. When you get something on the screen, just follow the directions on the screen. The world of free software is yours. Do call around to different systems. They often have different software, and bulletin boards, available. Oh, and once you see your phone bill call SPRINT or MCI or METRO or some other long distance company. They can cut your long distance costs by about 40%.



# Software Directory



In March 1982 North Star issued a "North Star Compatible Software Directory" which was very popular and is now almost out of print. A new directory is in the works--the text is being reviewed and proofread to insure maximum accuracy.

The directory will contain information primarily on domestically available software packages which are compatible with North Star Horizon and/or Advantage. Some international packages will appear in the upcoming directory or in future directories.

Categories of software include Accounting, Financial Analysis, Word Processing, Data Base Management Systems, Project/Time Management, Communications, Other General Applications, Industry Specific Applications, Languages, Operating Systems, Utilities, and Games. Listings include current prices.

Users may secure a copy of the directory by writing to

Marketing Communications  
North Star Computers, Inc.  
14440 Catalina St.  
San Leandro, CA 94577

Software vendors may write to

Software Directory  
Mail Stop 25

at the same address.

We repeat that the new revised directory has not yet been published--so write, but be patient!

## CLIP TIPS

### 5.0 MONITOR FOR 5.2 DOS

INSUA members who received an updated 5.2 DOS and BASIC will discover that most of the 5.0 monitors are unuseable with 5.2 because they depend on the I/O routines in 5.0. The 5.2 disk provides a monitor at 0E00, but this cannot be used with 5.2 BASIC loaded into memory, since 5.2 BASIC also uses memory starting at 0E00.

The M5700 monitor which comes with 5.0 DOS will work with the 5.2 DOS and BASIC, however, because this monitor supplies its own I/O routine.

Boot up in 5.2 DOS, place your old 5.0 system disk in drive #2, and use the command

+GO M5700,2

You should find yourself in the 5700 monitor. A quick and dirty re-entry into 5.2 DOS is

>JP 0117

Although 5.2 DOS starts at 0100, an instruction "JP 0100" or any jump to an earlier address than 0117 will reboot DOS, destroying any changes you have made. Return to the monitor with the instruction

+JP 5700

If 5.2 BASIC has been invoked, and escaped with a BYE command, you can get back from either DOS or the monitor with the instruction

JP 0E00

Don't try to get from the 5.0 5700 monitor to BASIC by typing "OS", since the DOS won't be where the monitor thinks it is.

## CLIP TIPS

### FORMFEEDS FOR WORDSTAR

Pressing ^P (followed by "Y") to interrupt WordStar while it is printing a file causes WordStar to abandon the printing session without ejecting the sheet or issuing a FORMFEED to position the next sheet of paper correctly. If you use continuous paper or an automatic sheet feeder, it is then necessary to readjust the paper by hand, or to push the FF button on the printer. This can be a nuisance if your printer is some distance from your console.

One way to correct this problem is to place a FF instruction in the user-installed PSFINI: area. This, however, will result in a FF for all printing jobs, even those which have continued to the end.

Another, better way is to set up a command which can be issued from the keyboard. Any print code which can be modified by the user can be employed for this purpose. In this example, the FORMFEED option has been substituted for the ^Y "ribbon-color-change" function:

1) Use INSTALL to insert the following code in the user-patch area:

```
RIBBON:      = 01
RIBBON:+1    = 0C
```

2) Create a WordStar file with the following commands; name the file "FF":

```
.plØ
^Y
```

3) Whenever you wish to issue the FF command, type the "P" (or ^KP) command for "print", ask for file "FF", and hit <esc>. The ^Y print command will now cause 0C Hex to be sent to the printer, resulting in a FORMFEED.

The FF command can also be used to make the printer advance one entire blank sheet. This function is particularly useful with tractor-feed printers, since the last page of a printed text normally remains engaged on the pins, and cannot be torn off until the paper is advanced.

## New Newsletter?

### NEW NEWSLETTER?

[An INSUA member sent us the following newspaper clipping. --Eds.]

A newsletter, designed to improve communication between North Star and its users and user's groups, has been started by Ted Betley, a retailer in Tampa, FL.

The newsletter, entitled North Star Information Exchange, will contain information gathered from national user groups, as well as software and hardware reviews. It will also include sample programs and sub-routines.

Betley, who specializes in selling North Star and Altos systems to real estate firms, feels that there is a real need for a North Star newsletter. "North Star is a great machine, but one of its problems is that it is not too well known. I would like to help make North Star a household word."

But the newsletter won't just sing praises of North Star, Betley says, "We aren't going to gloss over North Star just because we are dealers; we are going to try and report everything factually. We would like to offer feedback to North Star by discussing problems and complaints people have."

For more information, contact Ted Betley at Micro Business Systems, P.O. Box 15995, Tampa FL 33684.

[Your INSUA editors say--"The more the merrier!!"]



# Miscellaneous of Import

## MISCELLANEOUS OF IMPORT

by: Mark Sheppard

A North Star Users Group is forming in the Big Apple. They are eager to contact all North Star users in the New York area. Please call Jeremy Shapiro at 212/496-6050 or Charlie Keith at 212/340-7124.

Robert Bartels: regarding the MAD assembler which you extensively modified. YES please send us a copy on disk along with the documentation. Also, if you could re-assemble a second version with DOS at 100H and maybe with Solos at F000H we would be glad to distribute that also. Please note our new address of P.O. BOX 2789, FAIRFIELD, CA. 94585.

From James Evert of Evert Drywall in Yakima, Wa. we have the following bug fixes to Micro-count II:

program change to

### GLPOST -

5800 ERRSET > 6150  
12600 ERRSET > 13300

### CRENTRY

3200 C=C+10  
3250 IF I=F2 THEN 3600

### CRREPORT

2900 C=C+10  
2950 IF I=F2 THEN 3300

### CRJEDIT

3200 C=C+10  
3250 IF I=F2 THEN 3600

### CDENTRY

3100 C=C+10  
3150 IF I=F2 THEN 3500

### CDREPORT

2900 C=C+10  
2950 IF I=F2 THEN 3300

### CDJEDIT

3100 C=C+10  
3150 IF I=F2 THEN 3500

### GLPREP

4700 ERRSET TO 5050  
8100 ERRSET TO 8250

Thanks again Jim.

From Matthew Farrell we have a question on running Micro - Count II on an Advantage. Seems the program needs a 5.2 Basic or N-basic to run. Anyone out there know how to get it to run with the Graphics Basic that comes with the Advantage? Seems that G-Basic can't take Type 3 (data) files. Send your answer here and we'll both forward it to Matt and print it here.

From Dr. James Gardner we have the offer of simple software for a medical office. YES we are definitely interested in adding this to the INSUA library for distribution to any interested member. So send it on disk with any documentation or use guide that you may have. Thanks Dr. Gardner.

Measurement Master, INC.,  
2740-H South harbor Blvd., Santa Ana, Ca. 92704 714/754-0528 is offering a number of products for the Advantage.

1. Serial Number Software Protection Board: if the serial number of the board doesn't match the serial number of the software, the software won't run. \$100.00 in 1-10. \$75 11+.

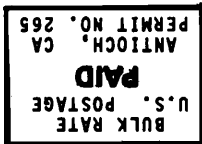
2. Parallel Centronics Interface Board. Allows use of standard centronics connectors. \$195.00.

3. Corvus Hard Disk Interface. \$350.00.

4. Office Manager program to interact with Wordstar programs. Seems to do a large number of office tasks including

TA 276E  
JAMES TATE  
23914 SPRING DAY LN.  
SPRING, TX 77373

PUBLISHERS OF THE COMPASS NEWSLETTER  
INTERNATIONAL NORTH STAR USERS ASSOCIATION  
POST OFFICE BOX 2789, FAIRFIELD, CA 94533



*Misc*

accounting. No price given.  
5. Graphics Software. Set of assembly language subroutines callable from Microsoft languages. Works best with Okidat a and Epson printers including screen dump facility. No price given.

Our own Pavel Breder has come out with a program called Power. And that is just what it gives you. No more need to use DDT, PIP, STAT. This program has its own Monitor built in. It can also unerase files. You don't need to type in the whole program name, just its number. Voila'. Much typing saved. An extremely useful program with very good documentation. Contact Compute!, 2519 Greenwich Street, San Francisco, Ca. 94123

for more info.

To Clyde Steiner goes thanks for the following patch to Wordstar 3.0 to run on the Sol-20 with Solus at F000:

2A2H	FF
2A3H	00
2A4H	FC

These changes were extremely easy using Power. Thanks Clyde.

Well that's it for this issue. If you have something of general interest, a bug fix, an article, a piece of software or hardware that you've developed, or just something special to pass on to the rest of the members, please send it to the Librarian, INSUA, PO.BOX 2789, FAIRFIELD, CA. 94533.



# ANNOUNCEMENT

## MEETING OF INSUA

The Chairman of the Board announces that the annual meeting of the International North Star Users Association, Inc., will take place at the West Coast Computer Faire on Saturday, March 19, 1983. The provisional time of the meeting is 1:30 p.m.

Among other business to take place, there will be an election of seven members to the Board for the coming year. The powers of the Corporation are vested in the Board of Directors which may delegate the performance of duties and exercise of powers to officers and agents of the Corporation. The term of office of a Director is one year and a Director may not serve more than three consecutive terms.

There have generally been monthly meetings of the Board which in the past have taken place in the San Francisco Bay area of California. To date, travel to and from the meetings has been the responsibility of the Director and there has been no provision for these expenses.

At this time we are soliciting nominations of candidates for membership on the Board of Directors for the coming year.

Although the election will take place at the annual meeting, absentee ballots will be included in the total count of votes. It is our expectation that every member will thus have an opportunity to vote for Board members.

Any member can submit one or more nominations and may include oneself as a nominee. However, the name of no member should be submitted until the proposed nominee has been contacted by the nominating member and agrees to the nomination.

The deadlines in respect to the nomination are as follows:

Members can be nominated by voice at the meeting on March 19, 1983. The names of such individuals will not, of course, be on the printed ballot previously submitted to the members for the purpose of absentee voting.

The names of nominees received on the Nominating Form at the INSUA office will be included with the absentee ballot sent to members if they are received by February 28, 1983. Late nominations will be presented at the annual meeting, but not on the mail ballot. It is suggested that a short statement be included on the Form as to the qualifications of the nominee for the position of Director.

Clyde Steiner, Chairman

# SEE BACK PAGE

# FINANCE

## Compound Interest Formulae Robert Beaver

In my favorite nightmare I'm at a carnival, standing in front of a shell game booth. I'm compelled to pick from the three cups, one of which is supposed to have a ball under it...I'll be darned if I know which one...no one will say what the stakes are...and I suspect sleight of hand...

In my favorite daymare I'm in a bank arranging a loan, experiencing a funny little deja vu feeling (haven't I been here before?)...

These days I show up with my calculator and formulas, read the fine print, and ask questions if I don't understand something. Clerks to vice presidents are usually very willing to help, and even enjoy trying to explain financial 'relativity'.

For those of you who shop for investment or loan opportunities, or would like to track present value of a loan or investment, here are some handy dandy formulas for your home computer. These can be particularly helpful in tracking charge accounts which pre-charge interest, for example.

A note of caution before I begin. For computing purposes, percentages should be expressed in their decimal equivalents. Thus 5.25% becomes 0.0525. To convert values back to percentages, multiply by 100%.

Last Compass issue contained calendar routines in NorthStar Basic which may be useful for some of these calculations, especially in calculating days between dates.

## CLIP TIPS

### FLIPPY CLIP TIP

A = Annual Percentage Rate\*  
E = Effective Annual Rate\*  
(\* expressed as a decimal)  
p = Compounding Periods per year  
q = Computing Periods per year  
F = Computing Factor  
n = Computing Periods to Term  
Xn = Regular Payment Amount  
I<sub>r</sub> = Interest Paid  
Q<sub>0</sub> = Initial Value  
Q<sub>r</sub> = Value After r Periods

### Annual Percentage Rate (APR)

This is the percentage provided in truth-in-lending disclosures and most commonly provided for savings accounts and similar investments. It is used here as the basis for calculation, and is given the symbol  $\Delta$ . You need to know or find out what the APR is for your particular case before you can proceed with these calculations. Please note that  $\Delta$  is expressed as a decimal in all calculations, not as a percentage.

### Compounding Periods

The APR is not the only thing that affects the amount of interest you pay or earn. How often your interest is compounded is of equal importance, since an accurate calculation cannot be performed without this information. These days, most financial institutions compound daily (based on a balance at closing time on the day in question). However, it is still possible to encounter monthly, quarterly, or even annually compounded interest situations.

Here, the symbol  $p$  is used for the number of compounding periods per year. There are 365.25 days, 12 months, or 4 quarters in each year.

## 31 THE ULTIMATE

### FLIPPY CLIP TIP

$$(1) E = (1 + A/p)^p - 1$$

$$(2) F = (1 + A/p)^{p/q}$$

$$(3) Q_r = F^r Q_0 + X_n (F^r - 1) / (F - 1)$$

$$(4) X_n = -F^n (F - 1) Q_0 / (F^n - 1)$$

$$(5) I_r = Q_r - Q_0 - r X_n$$

$Q_0, Q_r, I_r$  are negative if Loan

(FINANCE continued...)

### Effective Annual Rate (EAPR)

As the bank clerk is quick to point out, a 5.25% APR (compounded daily) savings account has an effective annual rate of 5.39%. Right they are. Knowing the effective annual percentage rates (EAPR) can be useful, although you should concentrate on using APR whenever possible to avoid comparing apples and oranges.

The effective annual rate, here given the symbol  $E$ , can be computed from the APR ( $A$ ) and the number of compounding periods per year ( $p$ ), as shown in equation (1).

$$E = (1 + A / p)^p - 1 \quad (1)$$

For example, 5.25% APR compounded daily yields an effective interest rate of

$$E = (1 + 0.0525/365.25)^{365.25} - 1 \\ = 0.0539$$

Note that  $E$  is calculated as a decimal equivalent. To convert this to a percentage, multiply by 100% to get 5.39 % EAPR.

### Computing Factor

This is an intermediate result which is calculated once, and is used in all formulas which follow. Conceptually, this factor is  $1 +$  the interest rate per computing period, and is calculated from the annual percentage rate, compounding period, and computing periods, as follows:

$$F = (1 + A/p)^{p/q} \quad (2)$$

$A$  = annual percentage rate (APR)  
 $p$  = compounding periods per year  
 $q$  = computing periods per year

For example, savings accounts pay 5.25% APR compounded daily. You wish to compute monthly balances. The computing factor for this is:

$$F = (1 + 0.0525/365.25)^{365.25/12} \\ = 1.0043843 \\ \text{(or 0.438 \% per month)}$$

### Computing Periods

It is frequently convenient to calculate interest on some other basis than the compounding period  $p$ . For example, to calculate results on a monthly basis even though interest is compounded daily. To facilitate this, and to simplify formulas given later, I introduce  $q$  as the number of computing periods per year.  $q$  must be numerically smaller than  $p$ . For a monthly computing period,  $q=12$ .

(continued on next page...)



(FINANCE continued...)

### Present/Future Value

The value of an investment/loan after  $r$  computing periods have elapsed is computed from the general formula:

$$Q_r = F^r Q_0 + X_n (F^r - 1) / (F - 1) \quad (3)$$

Here,  $X_n$  is a regular payment made at the beginning of each computing period.  $Q_0$  is the initial value,  $Q_r$  is the value after  $r$  computing periods, and  $F$  is as described in equation (2).  $Q_0$  and  $Q_r$  are positive for an investment, negative for a loan.  $X_n$  is always positive.

For example, an initial investment ( $Q_0$ ) of \$1000 is placed in a savings account at 5.25 % APR compounded daily. Regular monthly deposits ( $X_n$ ) of \$100 are made every 30.4 days. Compute the value after the 12th payment.

$$\begin{aligned} Q_{12} &= 1000 * (1.004384)^{12} \\ &+ 100 * (1.004384^{12} - 1) / (0.004384) \\ &= 1053.90 + 1229.36 = 2283.26 \end{aligned}$$

As a second example, a loan of \$1000 is obtained at 18% APR compounded daily and is to be paid off in 12 monthly installments. What monthly payment is required?

-In this case,  $Q_0 = -1000$ ,  $p = 365.25$ , and  $q = 12$ . At the end of 12 months the value of the loan is zero, so  $Q_r = 0$  when  $r = 12$ . To signify that this calculation is for the term of the loan, the variable  $n$  is substituted for  $r$  in all equations. Thus,

$$0 = F^n Q_0 + (F^n - 1) X_n / (F - 1)$$

or, solving for  $X_n$

$$X_n = - F^n (F - 1) Q_0 / (F^n - 1) \quad (4)$$

Equation (4) can now be used to compute the regular payment amount to repay a loan after  $n$  computing periods ( $n$  payments). For the case given above  $F = 1.01511$ ,  $X_n = \$91.74$ , and the effective annual rate for this loan is 19.72% .

### Total Interest

To calculate the cumulative interest ( $I_r$ ) paid through a given computing period, use equation (5).

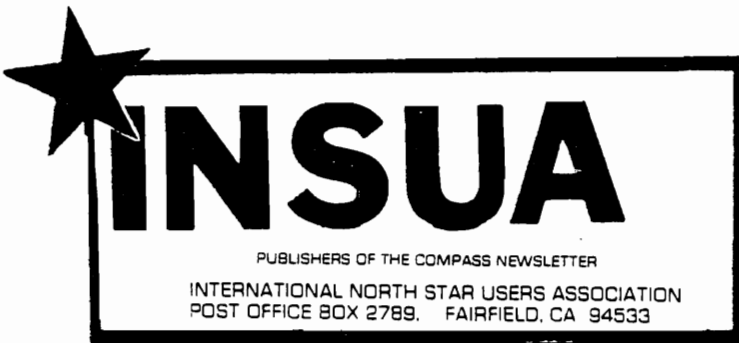
$$I_r = Q_r - Q_0 - r X_n \quad (5)$$

Note that  $I_r$  is negative if interest is paid out, and positive if interest is received.

### Conclusion

These equations provide some of the basic 'working' equations needed to perform compound interest calculations, and can be of considerable assistance in evaluating investment or loan opportunities. Since terms can vary on both loans and investments it is always prudent to check terms carefully, especially noting where they differ from the simple examples given above.

Perhaps some of you will incorporate these into a useful application program, or will find common situations not covered here. If so, don't forget to drop the Compass a line, or share your program through the INSUA Library. Happy Computing -Bob



# I/O FARM

by  
Steve Leibson  
4040 Greenbriar Blvd.  
Boulder, CO 80303

## Brain Surgery on the North Star 32K RAM Board

This episode of the I/O Farm is not for the squeamish. We are going to cut into the North Star 32K Ram board and perform a transplant operation. When we are finished, it won't be a 32K Ram board any more. It will be a 64K Ram board.

There are two main reasons for wishing to perform this risky RAMectomy. The first is that a 64K board fills the Horizon's (or any other Z80 computer's) memory (not counting block switching) while only requiring one bus slot. The other reason is that the North Star 32K Ram board is based on 8K-bit RAM chips.

When the 32K board was designed by North Star in 1979, 8K chips (really half-good 16K chips or "partials") were less expensive than the 16K's. Today the price of 16K RAM's is quite low and the yields are so good that partials have all but disappeared. That means if one of your 8K chips gives up the ghost, a replacement might be difficult to find. Especially since North Star used six types, each incompatible with the other 5. You'll end up using a 16K part and wasting half of it. The 16K chips are found in the Apple, TRS-80 and other inexpensive computers and will be plentiful for years to come.

This technique was sent to me by Mike Bowland, of S.A.I.L. software (1136 S. Grand Street, Mesa, AZ 85202). He specializes in the North Star (they have a CP/M for the Horizon) and has performed this operation



many times. I have done it only once, to my own machine, Liberator. It worked for me and I'm sure it will work for you.

\*\*\*\*\*

### Warning

If you don't feel comfortable cutting into your RAM board or using a soldering iron, don't try to perform this procedure. You could cause more problems for yourself than you solve.

\*\*\*\*\*

First, I want to discuss in general terms what it is we are going to do. A pin diagram of the 16K RAM chip appears in figure 1. We are interested in the address pins, A0 through A6. Dynamic RAMs have multiplexed address lines. Half of the desired address is placed on the address pins and the Row Address Strobe (RAS) control line is clocked. Then the second half of the address is applied and the Column Address Strobe (CAS) is clocked.

On partial RAM chips, only half of the part operates reliably. The approach used by



the semiconductor manufacturers was to state that either the A5 or A6 pin always had to assume a certain state (either 1 or 0) during either RAS or CAS. Whether it was A5 or A6, 1 or 0 and RAS or CAS depended on the manufacturer of the RAM. The rules for addressing the various partials are listed on page 28 of the North Star 32K Ram Board.

By placing 16K RAMs on the 32K Ram board and allowing one more address line to connect to the RAMs, we double the memory size of the board and eliminate the need for partials evermore. In addition, we will be rewiring the address switch on the board so that it is selectable in 8K-byte banks. For a standard North Star Horizon, the top 8K must be deselected to avoid bus conflict with the North Star Disk Controller.

The new switch assignments for the switch at location 7A on the 32K Ram Board are:

Switch #	Address Range
1	0000 - 1FFF
2	4000 - 5FFF
3	8000 - 9FFF
4	C000 - DFFF
5	2000 - 3FFF
6	6000 - 7FFF
7	A000 - BFFF
8	E000 - FFFF

If the switch is "on", the corresponding address block of memory is enabled.

### Materials Required

You will need some tools and parts for this project. The tools required are: needlenose pliers, diagonal cutters, a low-wattage soldering iron with a small tip, and rosin (not acid) core solder. Materials required are 32 (or 36 for parity) 4116 16K RAM chips and some small gauge (#30 or so) insulated wire. I use wire-wrap wire as it is just about perfect for board patches. You can find all the tools and wire at Radio Shack.

The 4116's are made by several manufacturers and are available from advertisers in Byte magazine. Some vendors to check for low prices are Microprocessors Unlimited, JDR Microdevices and Chips and Dale. Buy RAMs that are no slower than 200 ns or you will be asking for problems.

### The Procedure

#### A. Back (circuit) Side of Board

1. Cut the trace leading to pin 7 of the chip at location 6B as shown in figure 2.

2. Jumper pin 6 of the chip at 6B to the trace which used to go to pin 7, as shown in figure 2.

3. Jumper pin 7 of the chip at 6B to pin 85 of the S100 bus connector. Connector numbering is shown on page 29 of the North Star Z80 Processor Board manual. Be extra careful on this step. Use the absolute minimum of solder right at the top of the connector finger. You don't want any solder to wick down the finger and interfere with the operation of the edge connector.

#### B. Front (component) Side of Board

1. Make sure the jumpers at location 8D are wired as A to B and D to C. (Mine were like this.)

2. Remove any jumper wires attached to H, G, R6, R6A, C0, 12. (Mine were wired H to R6, 12 to C0, R6A open, G open) See figure 3 to help locate these jumper areas.

3. Cut the CS trace as shown in figure 3.

4. Cut the 13 trace as shown in figure 3.

5. Solder a jumper wire between 12 and R6A.

6. Solder a jumper between CS and 13.

7. Solder a jumper wire from the pad in between the CS and 13 pads to C0.

8. Replace all RAM chips with 4116's.

This completes the rewiring. Figures 4 and 5 are the new schematics for the rewired portion of the board. This is a good point to examine all of your work. Are the cuts good? Are the solder joints shiny and not "cold"? Check to make sure that switch 8 is "off" and all the other switches are on. Remove all the other memory boards from your system and put the modified board in. Power the system up and it should run. If not, turn it off and recheck all your work.

OK, now for the hard words. This isn't a Heathkit folks. If you have never soldered before, don't know an integrated circuit chip from a potato chip, or pale at the thought of opening your computer, don't try this technique! I'm not going to be able to bail you out. You perform this at your own risk.

Cost for the project is essentially the cost of the 4116's. At the time of this writing, that is about \$40 or \$50. Very cheap for an extra 32K bytes! Good Luck.

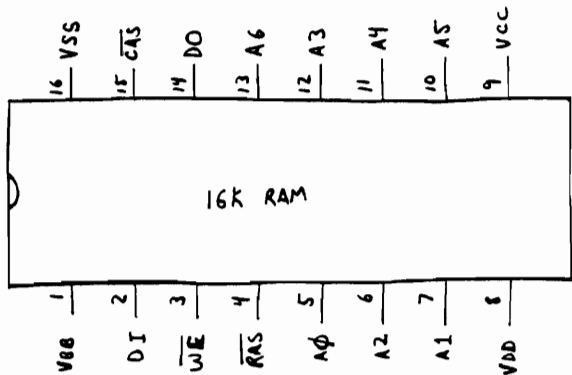


Figure 1

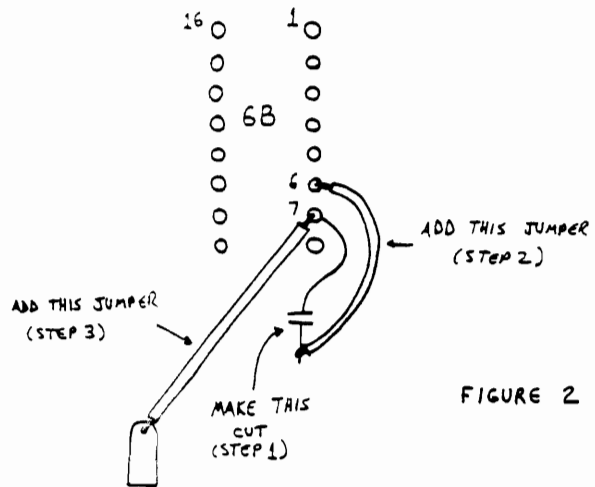


FIGURE 2

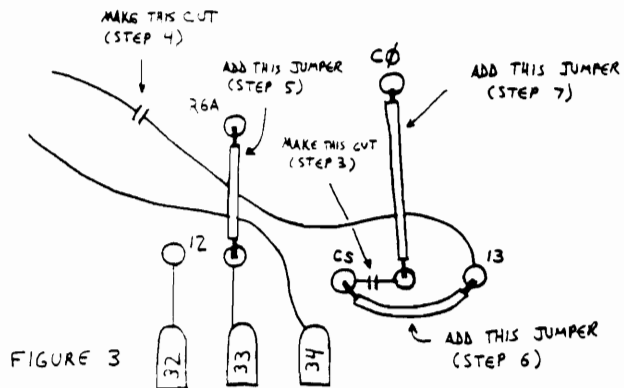


FIGURE 3

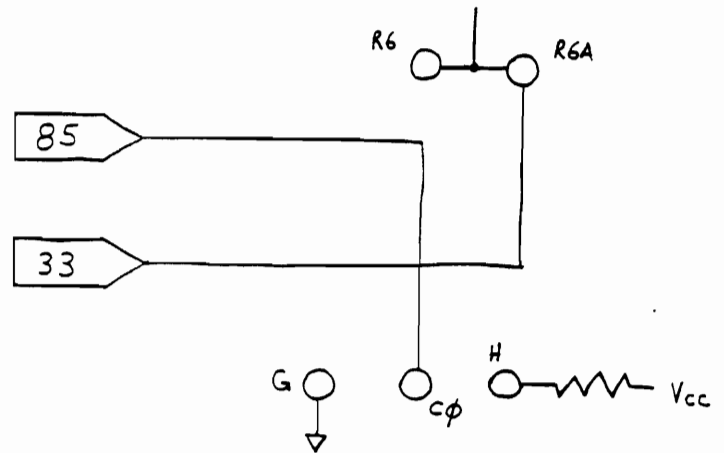


FIGURE 4

CHANGE TO SHEET 2 OF SCHEMATIC

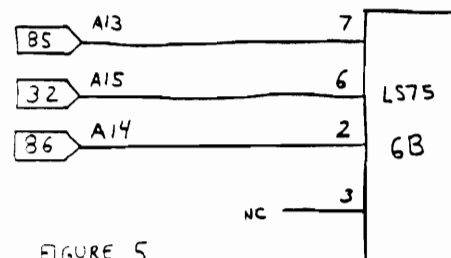


FIGURE 5

CHANGE TO SHEET 3 OF SCHEMATIC

# ASSEMBLY LANGUAGE PROGRAM

How to read them and use them in your system.

By Joe Maguire

The plea for help from Henry Spelman (Compass Vol. 2 no. 2, p.28) came right on the heels of a request from another friend to shed some light on the mysteries of assembly language programs.

What follows is a step-by-step explanation of how to use a program that will work on your computer if you use North Star's DOS.

The program is shown in Listing 1. It is keyed with circled numbers which correspond to the items discussed in this explanation. As you read, refer to them.

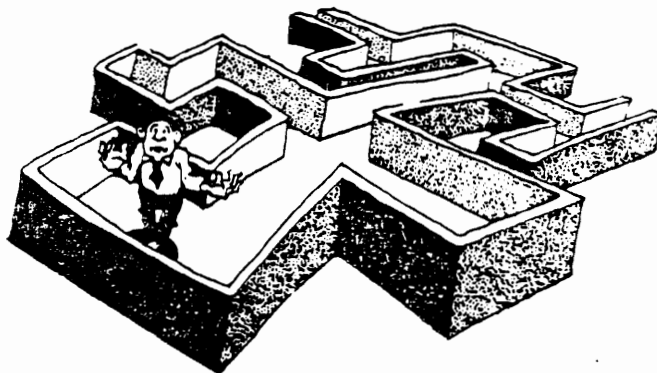
## What they are

"Assembly" refers to the first step in the language hierarchy away from binary coding. As you know, digital computers receive their instructions in the form of series of bits retrieved from memory. The bits are either ones or zeros, hence, binary.

But long strings of binary words are almost impossible for humans to comprehend, so, early on in the computer age, the wizards came up with a program to help write programs. These programs "assembled" the bits in a form the machine could understand using a form of cryptic English commands called mnemonics. The programs became known as assemblers and the list of mnemonic commands became known as assembly language.

You are familiar, I'm sure, with another program which writes programs called BASIC. I will use some analogies from BASIC to help explain assembly language.

Assembly is a low level language whereas BASIC is a high level language. The program of Listing 1 can only be used on a computer which has an 8080 or a Z80 CPU. It won't work with a 6502 or 6800 CPU because those processors recognize a different series of instruction bits. A BASIC program, on the other hand, can be transferred from machine to machine with only minor alterations: hence it is "higher up" on the scale of machine independence.



Why use assembly language? Well, size and speed are the two reasons most often given. As an example, the program of Listing 1, which displays the disk directory in two columns, is run once for each directory listing. Using BASIC for such a job would take much too long, not to mention the amount of memory it would occupy.

While BASIC seems much easier to understand than assembly language, it is really a matter of becoming familiar with the various operation codes (opcodes).

Let's begin with Listing 1 and see just what it tells us and how we can put it to use in our computer.

## By the numbers

(1) This is the title block. All good programs should tell you what they do and who wrote it. A semicolon ";" to the assembler is like a REMARK in BASIC. Everything after the semicolon is ignored. Some assemblers use "\*" for remarks.

The listing shown here uses the CP/M assembler written by Digital Research. Other companies wrote assemblers too, among them Processor Technology, whose assembler is very similar to CP/M's, and TDL (Technical Design Labs) whose assembler is quite different. TDL uses Zilog mnemonics, which were developed for the Z80. Any of the above may be used: it's all a matter of what you are most comfortable with.

There are more CP/M systems in use than any other so the CP/M version seems to be winning out.

(2) This is the address field. From left to right everything is divided into "fields" (a hold-over from punched cards). The address field is produced by the assembler showing the address in memory where each byte of object code should be stored. In the CP/M assembler, the address field is also used to show computed values produced by EQUals and ORiGin statements.

(3) This is the label field. Labels are like line numbers in BASIC in that they provide targets for jumps (GOTO) or calls (GOSUB) to other statements.

In this case, DOS: is a variable which has been assigned (EQUals) a value of 100 hexadecimal.

Most assemblers can work with numbers expressed in any of four bases: binary (B), decimal (D or no designator), octal (Q), and hex (H--the most common).

(4) This is a programming trick. Let's say you have a huge program with a subroutine called LOOP:. LOOP is called from a hundred different points in the program. Now, you decide that you want to modify the loop routine so you invoke the search command of your editor to look for LOOP. The search mode will stop at each LOOP in the file before finally hitting the one you want. But instead, if you search for LOOP: (with a colon attached) it will find it immediately, since there is only one. The assembler conveniently ignores the colon in the label to allow you to do this.

(5) This ORiGin statement means: set the address counter to the value computed by adding the value of DOS (already defined above) to 33 Hex (found from the N\* software manual). Sure enough, the assembler has printed the value 0133 in the address field.

(6) Now the reason for the ORG becomes clear. We want to fill that address with a data byte (DB) which the assembler will compute by multiplying 24 decimal by 2 decimal and displaying the value in hexadecimal in the object code field (7).

The assembler will always show the result of its work in hex since that is the usual form used when placing the result in memory.

Assemblers can do a limited amount of math, usually just the four functions (+-\*/) and some logical operations such as ANDing and ORing. Each assembler is different, so the appropriate manual should be consulted.

(8) This is a data word (DW) or two bytes of data. Note that the address of the MOVE routine, 08B2H, has been turned around by the DW statement and stored tail first in memory. That is, B2H will go in address 038BH and 08H will go in address 038CH.

At some time you may see a statement such as: DB 0,23H,10H. In this case the assembler does not turn the bytes tail first but stores them in the order written. Only the data word gets flipped.

If the bytes in the object code field are all on one line, the counter only shows the address of the first byte. The other bytes go into the next higher addresses reading from left to right.

(9) This is an unconditional jump instruction and when the bytes are poked into memory with C3 going into 0615H, ED going into 0616H and 00 in 0617H, the computer will indeed jump to the RESTOR routine at address 00EDH.

(10) This is the opcode field and with the operand field (11) this is where the assembler really gets down to business. A source code program must have something in these two fields or there isn't any program.

(12) The comment field is, of course, optional, but plenty of comments is good programming practice. You may not agree but just think of trying to remember what went into the design of a program a year after you last looked at it.

Notice the nice formatting which makes the program easy to read. The assembler didn't do that, the programmer did. A good editor is essential to good programming. Unfortunately, the editor supplied with CP/M is poor at best but there are many good ones including Wordstar and VEDIT, to name two.

(13) This is another programming trick. The dollar sign is a way of forcing the assembler to assign the current value of the address counter to a variable, in this case, CODE:. CODE and FIN are used to compute the length of the patch code, a job the assembler can do much better than a human when dealing with hexadecimal numbers.

(14) Understanding what is going on in the opcodes just takes a little practice. Here, the mnemonic LDA FLAG means load the accumulator with the value stored at the address of FLAG. In this case, 00 will be loaded from address 0C8H. That value will change in time as can be seen by scanning further down the program where we see STA FLAG which means store the value now in the accumulator at the address location of FLAG.

### Programming Aids

There are many good books on assembly language available. A favorite of mine is Z80 and 8080 Assembly Language Programming by Kathe Spracklen (of Sargon chess fame) available from Hayden Books.

Osborne and Associates publish many good reference books for a variety of CPUs.

Whatever your choice, I would advise you to get a book that is compatible with the assembler you will be using. The CP/M assembler uses Intel mnemonics. Trying to use that with a book espousing Zilog mnemonics will just cause confusion. Also, the book should have a quick reference list. You will be using that often. For serious programming, a hex calculator is a must. I've worn out two TI Programmers already.

Programming at the gut level can be fun and it makes the full power of your computer available to you. It's not difficult if you start with some simple routines.

### Putting in the Patch

Now that we have the listing figured out, how do we get the patch into the DOS?

North Star gave you a nice tool for doing this called the Monitor program. Let's cover the procedure step by step.

A. Initialize a fresh disk and copy onto it an unmodified copy of the DOS and the Monitor pro-

```

*****
; Two column List routine for North Star DOS 5.200
*****

```

①

```

; from INSUA Compass Vol. 1, #4, p. 25
; modified for DOS 5.200, December 87, by:
; Joe Masuine
; 2321 Foxhall Dr.
; Anchorage, AK 99504

```

```

; This routine will enable the List command to
; display the directory in two columns instead of
; the present single column. For example: Up to
; 48 file names can be displayed on a 24 line
; video terminal.

```

②

```

0100 =
③ DOS: EQU 100H ;For DOS at 0100H as supplied
; on factory master disk. You
; can change this as required.

```

```

; Patch addresses within DOS 5.200

```

⑦

```

0133
0133 30
⑥ DB ⑤ 24*2 ;Screen length is here
; ;2x # of lines on CRT

```

```

038B
038B B208
⑧ DW MOVE ;Warm start routine
; ;Patch jump to MOVE

```

```

0615
0615 C3ED00
⑨ JMP RESTOR ;Exit routine of List
; ;Go clean up

```

```

06AD
06AD E500
GOADD: ORG DOS+5ADH ;Print GO address
; DW OUT5 ;5 spaces if no GO

```

```

06BA
06BA CDC900
NULIN: ORG DOS+5BAH ;Old start of new line
; CALL DOUBL ;Start 2 col routine

```

```

0720 =
0734 =
0C07 =
SPACE: EQU DOS+620H ;Output a space
CRLF: EQU DOS+634H ;Output a C/R & L/F
TURNKY: EQU DOS+0B07H ;Turnkey startup routine

```

```

; Note: The factory master disk as supplied for
; the Horizon computer has the I/O block complet-
; 1Y filled. Therefore, the following routine
; moves the patch from the BUFFER area of the DOS
; (which will be overwritten) to an area outside
; the DOS. In this example, the patch is moved to
; just below the DOS origin at 100H. Users who
; are not using the HRZ version can locate the
; patch at the end of the I/O area. In that case,
; delete the WARM patch and the MOVE routine and
; change the ORG after the label CODE: to your
; free memory area. The ORG below places the MOVE
; routine just after the N* supplied sector loader
; (8-9) which is also in the BUFFER area.

```

```

08B2
; ORG DOS+7B2H
;
08B2 21C800 MOVE: LXI H,FLAG ;Point to RAM dest.
08B5 11CB08 LXI D, CODE ;Point to code
08B8 0E35 MVI C,BYTES ;Byte count
08BA 1A M1: LDAX D ;Get a byte
08BB 77 MOV M,A ;Move it!
08BC 23 INX H ;Bump pointers

```

```

08BD 13          INX    D
08BE 0D          DCR    C          ;Decrement counter
08BF C2BA08     JNZ    M1          ;Loop until done
08C2 21070C     LXI    H,TURNKY ;Restore warm start
08C5 228B03     SHLD   WARM       ;address
08C8 C3070C     JMP    TURNKY     ;Go start up
;
; Note: The following code is stored in the
; BUFFER area of the DOS and is relocated by the
; MOVE routine above during bootup. Enter the
; bytes in the BUFFER area beginning at the add-
; ress shown to the left of the label CODE:. The
; last byte, C9, should fit just before the start
; of the I/O block. Remember: the DOS is stored
; in compacted form on the disk. See the N* soft-
; ware manual for additional details.
;
08CB =          CODE:   EQU    $ - 13          ;Address marker
;
00C8           ORG    DOS-38H
;
00C8 00          FLAG:   DB     0          ;14 ;Been here before flas
00C9 3AC800     DOUBL:  LDA    FLAG          ;Get the flas
00CC B7          ORA     A          ;See if zero or non
00CD C2DE00     JNZ    D2          ;If NZ do CRLF else spaces
00DD 2F          CMA     ;Flip flas
00D1 32C800     STA    FLAG          ;Store it, we've been here
;
; Note: If you have 64 col video, use 7 spaces
;
00D4 0E08           MVI    C,8          ;Set up space counter
;
00D6 CD2C07     D1:    CALL   SPACE     ;Output spaces
00D9 0D          DCR    C          ;Decrement counter
00DA C2D600     JNZ    D1          ;Loop until finished
00DD C9          RET     ;Return for next entry
;
00DE AF          D2:    XRA    A          ;Zero the flas
00DF 32C800     STA    FLAG          ;Store it
00E2 C33407     JMP    CRLF         ;New line & next entry
;
00E5 0E05     OUT5:  MVI    C,5          ;5 spaces this time
00E7 CDD600     CALL   D1          ;Put em out
00EA C3BA06     JMP    NULIN       ;Next entry in col 2
;
00ED 3AC800     RESTOR: LDA   FLAG     ;Get the flas
00F0 B7          ORA    A          ;See if zero or not
00F1 CAF700     JZ     NOCR       ;Zero means cursor is
;                          at left margin
00F4 CD3407     CALL   CRLF        ;Give C/R if not
00F7 AF          NOCR:  XRA    A          ;Zero the flas
00F8 32C800     STA    FLAG        ;Store it
00FB 3C          INR    A          ;Make A non zero
00FC C9          RET     ;Return to DOS
;
00FD =          FIN:   EQU    $          ;Address marker
;
0035 =          BYTES:  EQU    FIN-FLAG     ;Length of patch
08FF =          MARK:  EQU    CODE+BYTES-1 ;Last addr in BUFFER
;
00FD           END
;

```

gram. Nothing else need be on the disk yet. Remember: the DOS must be the first program on the disk.

I'll assume that your DOS loads at 100H. If not, adjust the addresses I give by an appropriate offset.

B. Using the LF command, load a copy of the DOS at 2100H.

```
+LF DOS 2100
```

C. Now GO the Monitor.

```
+GO MOE00
```

D. Now, using the DS command of the Monitor and Listing 1, poke in the values at the specified addresses. Remember: since we loaded the DOS with an offset of 2000H, we must add that value to all the addresses given in the listing.

```
>DS 2133
2133 18= 30 <= you enter the 30
                        then type return
```

```
>DS 238B
238B 07= B2 0C= 08 <=ret.
```

Note: Pressing the space bar moves you from byte to byte. Pressing return ends the insertions.

```
>DS 2615
2615 AF= C3 3C= ED C9= 00
```

Type return after the 00. Continue by entering the bytes at addresses 26ADH and 26BAH. Beginning at 28B2H you will enter a long string of bytes ending at address 28CAH.

You can see if you entered the bytes correctly by using the DH command.

```
>DH 28B2-28CA
```

```
>DH 28B2-28FF
```

```
28B2 21 C8 00 11 CB 08 0E 35 1A 77 23 13 0D C2 BA 08
28C2 21 07 0C 22 8B 03 C3 07 0C 00 3A C8 00 B7 C2 DE
28D2 00 2F 32 C8 00 0E 08 CD 2C 07 0D C2 D6 00 C9 AF
28E2 32 C8 00 C3 34 07 0E 05 CD D4 00 C3 BA 04 3A C8
28F2 00 B7 CA F7 00 CD 34 07 AF 32 C8 00 3C C9
```

Compare your dump with that in Listing 2.

E. This part is the trickiest. Beginning at 28CBH you enter the remaining 53 bytes of data with the last byte going into 28FFH. Now using the DH command, check if you got everything correct.

```
>DH 28B2-28FF
```

Compare with Listing 2.

F. Exit the Monitor and go back to the DOS.

```
>OS
```

G. Now save the patched DOS onto the disk.

```
+SF DOS 2100
```

H. Reboot the computer to bring the new patched DOS into action. Try the LI command. The files DOS and MOE00 should appear on the same line. If the DOS crashes, go through the entire procedure again checking carefully that you didn't make a mistake in entering the data.

Remember: this listing is for DOS version 5.2DQ located at 100H. For other versions some addresses will change but once they are found and correctly patched the program will work.

Other assembly listings found in Compass can be patched into programs in the same manner. If the author or the editor has deleted the object code in order to save space, the source program will have to be assembled before you can use the listing as in the above example. AUTHORS AND EDITORS PLEASE NOTE!

Don't be afraid to experiment.



In spite of what you may have heard, there is no way you can damage your computer through a software error. The worst that can happen is that you wipe out the data on the disk and believe me, it's happened to all of us!

### Macros etc.

This explanation has been simplified due to space limitations. Other, more sophisticated assemblers exist, including macro-, relocating-, and cross-assemblers.

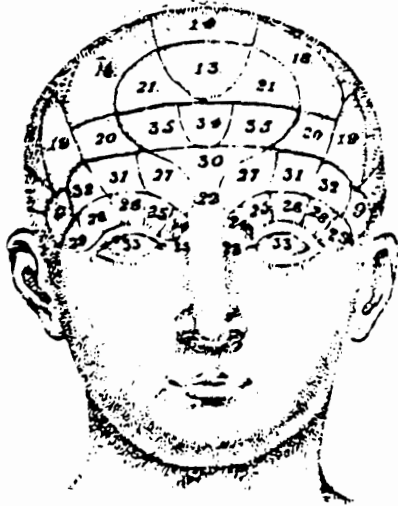
A macro assembler contains a library of subroutines which the programmer can call via a list of user-defined mnemonics. This can greatly simplify the creation of large programs.

A relocating assembler produces code which does not have a defined address in memory. At runtime a "linking loader" is used to load the object code into memory at the proper address. Relocating assemblers are often part of compilers since the exact length of the program is not known until all segments of the source program (such as CBASIC) are compiled.

A cross assembler is one which runs on one machine but produces code for another. Microsoft's XMACRO 86 is one. It runs on an 8080 or Z80 and produces code for the 8086.

Any good book on programming should give you more insight into this fascinating world. Enjoy.

# NORTH STAR ANSWERS



By Robert D. Cowart  
TechnicalSupportSpecialist  
NorthStar Computers Inc.

Q: I am now the proud owner of an Advantage computer, and am currently working on a graphics screen dump utility to dump screen images to my Okidata ML 82A. I do not wish to reinvent the wheel and therefore I am interested in obtaining information on other screen dump utilities and printer interfaces or drivers.

A: You are not alone! I typically receive about 3 to 5 calls per week on this issue. I can do two things for you. First, I do have a hard-copy of something like the program "NS100.COM" which I can mail to you. Based on this, you should not have too much difficulty changing the control codes to suit the OKI. Or, on the other hand, if you can wait for a few months, you will be able to purchase a complete graphics package from NorthStar which includes a driver for the OKI as well as for lots of other devices like Hewlett Packard plotters. This package will also include the ability to create images on the screen similar to the ones you have in the Advantage Demo-Diagnostic diskette and the CP/M demo disk. The package is called IMAGEMAKER and is scheduled for release in March. IMAGEMAKER, by the way, is only part of a much larger graphics package which NorthStar will be offering.

Q: I have a Morrow Designs Disk-Jockey 8" disk controller and would like to know how I can use it to transfer 8" disks to NorthStar 5" disks.

A: Ah! This is one of my favorite topics, as I come from 8" land, and have had to deal with transferring disks from work onto my 5" system at home.

George Morrow, founder of Morrow Designs, was and still is well aware that there are at least 30,000 Horizons out there with people like yourself feeling isolated from the world of 8" single density IBM disks. Considering that most software is written on that format, he decided to fill a need by supplying a program to do just what you need. In fact, it is even written for the Disk-Jockey, and I may be wrong but I think that it is included with his later releases of CP/M. If not, then the program is only about \$30. It works like this: You plug in both controller boards (your N\* and the DJ) and then the program, which is called DJ-Link, does the rest.

Choice 2 is Morrow's latest invention, which is a DMA (Direct Memory Access) controller for 8" and 5" drives. This will control up to 8 drives at the same time, running different formats, including N\*, IBM, TRS-80, and others to come. To use this one, you actually remove your N\* controller, replacing it with the Morrow DJ-DMA. (This gives you more memory area since the N\* controller is no longer sitting there at E800.) The CP/M they supply with the controller figures out what kind of drives you have (single or double sided) and the format of the disks (single or double density) and acts accordingly.

The literature claims that it WILL work with N\* RAM if the RAM boards are slightly modified. Instructions are included. I used the board for several weeks and it seemed to work fairly

well. Occasionally, however, it failed to read a disk I had formatted on my N\* controller, and several times I had to power down to get things straightened out. This may have been a problem with my hardware. Anyway, you already have the Dick Jockey, which is a time-tested product, so I recommend that you simply get the program from Morrow Designs in San Leandro, CA.

For those of you with other controllers, notably Tarbell and California Computer Systems, there is a series of programs called The Connectors which are designed to do the same thing for these boards. These are available from John Dvorak, and if you write to me, I can send you the address. For you DISK-1 owners (that's the Compupro 8" DMA board), be sure you are using static RAM (i.e. not N\*) and then write to Pavel Breder c/o the Editor regarding his transfer program.

-----  
Q: I have been advised through NorthStar that your organization might be able to help me find a manual on an old NorthStar disk drive unit. During a company take over, my company acquired a 1977 Compal-80 CPU that is driven by a 1977 5" disk drive unit make by NorthStar. After talking to Compal in Encino they advised me to call NorthStar to get the manual on that drive unit. The disks for this unit read N\* 1977 Dos 2, Basic 6. I have been able to address the drive unit by keying in F500G. I can then program in the CPU but I have not been able to figure out how to save the programs on the disk. I would appreciate any information.

A: Actually you are out of luck, but it doesn't make any difference. You see, NorthStar has never manufactured disk-drives! They have sold them in what we called ADCs (auxillary drive

cabinets) though. This is probably what has confused you. If you look at the drives themselves by opening the box, you will most likely find Shugart SA400's in there. If you need a manual for these, contact Shugart, or the manufacturer indicated on the I.D. label.

Assuming that the drive and the power supply are in working order, you now need to do a little homework on how operating systems save programs on the disks themselves. Unless you are very determined, you probably do not want to write the programs which figure out how to take care of disk drives. This would require your writing an operating system, and Gary Kildall who wrote CP/M isn't raking it in for nothing. It is far easier to just learn the commands for saving programs on the disk. For this, it sounds as though you should 1) find a N\* dealer who can give you a little help testing your drives to make sure they are OK, and 2) get hold of the documentation for the operating system you are using. North Star DOS is up to revision 5.2 now, and CP/M is up to revision 1.1.0. If you are going to be using DOS, then you should have the N\* Software Documentation which covers both DOS and N\* BASIC. For CP/M you need the N\* CP/M manual (not GCP/M which is for the Advantage). You can purchase these through your dealer or through N\* directly if there is no other choice. You can purchase the latest version of DOS from INSUA for a modest fee, but the CP/M will cost you about \$150. I should also note that if your computer's input/output routines are even slightly different than a stock Horizon, you will have to modify DOS or CP/M to accommodate them. Otherwise when you load the operating system, nothing will happen. The general procedure for doing these modifications is described in both manuals.

Q: I have two systems. One is a horizon with 64 K RAM, two 5 inch double density drives. The other is identical except that it has quad density (double sided) drives. If you have information on how to convert the first system to quad density, I would appreciate it.

A: All you have to do is replace your single-sided drives with double sided ones. Your MDS controller board will handle either type. We use the Tandon drives most often. Refer to your other drives for the configuration of the little 16-pin "header" on each drive. This little header looks like a chip in a socket, but is actually just several wires which determine which drive will be considered A or B (in CP/M) or 1 or 2 (in DOS). Also, make sure that you have the drive at the end of the ribbon cable properly "terminated". This means that there should be a little resistor pack (again looking like a chip) plugged into the terminator socket. The locations of these two sockets differs from manufacturer to manufacturer, so read the manuals which come with the drives. If you have a dealer near you, he/she should be able to help you with the transition.

Also, be aware that you have to tell CP/M that you have quad drives by running the CPMGEN program and answering the questions regarding the nature of your system. This is also true for N\* DOS, in which case you GO BASIC, then LOAD SYSGEN, then RUN it. This program will ask questions similar to CPMGEN (BASIC and the BASIC program "SYSGEN" must be on your disk of course).

-----

Q: I am using an IMSAI 8080 computer and an IMSAI MIO board for my I/O (input/output). I purchased Lifeboat Associate's version of CP/M several years

ago, and have never been able to load this into my computer. Perhaps one of the club members can help me.

A: I would love to give you the intricate details, but I do not know them. If anyone out there has the same setup, please let us know. You are correct in assuming that a patch or two is needed. Actually Lifeboat may be of some help. But, in the meantime, let me give you a brief idea of what has to be done. As your CP/M now stands, it is looking for input from the left serial port of a Horizon. This happens to be port 2 for data, and 3 for status. The printer is assigned to ports 4 for data and 5 for status. If you can set up your MIO for that configuration, you may solve the problem without doing the patches at all. Fig. 1 is a short listing of what the I/O routines for the stock HORIZON look like in our CP/M.

What we can see from this is that your terminal has to be connected somehow to port # 2 with status on port #3. Status must appear on bit 1, which is the second bit since we start counting at 0.

This means that when your terminal is ready to send a new character to the computer, bit 1 on port 3 has to go to a +5 volts (i.e. "logic high" in

computerese). Then the computer will check on port 2 for the actual character. If you can get your MIO set for this configuration, you should be most of the way there, assuming your 3 year old CP/M is still intact. Then you will have to modify the printer I/O later, but at least your console I/O will be working so that you can do that with your computer up and running CP/M.

If you can get your hands on a manual for the MIO you may find that there is something in it about emulating a NorthStar since the two companies existed about the same time. The fact that my IMSAI VIO-C video card uses the exact same console input routine as the Horizon is another suggestion of the probable similarities.

Lastly, check out your local computer store's collection of CP/M books, and/or the documentation from Lifeboat on modifying CP/M I/O routines. You will find it well worth your while if you plan on playing around with other systems in the future. I realized the other day that I have had to modify 5 CP/Ms in the last 2 years. Well, I didn't have to, but.....

Goodbye for now from the letterman, R.C.

```

;
;*** STANDARD HORIZON USART I/O ROUTINES ***
;
;INPUT FROM STANDARD (LEFT) SERIAL PORT
;most of this will work with the IMSAI VIIOC video card by the way.- R.C.

CINL   IN       3       ;GET STATUS FOR LEFT SERIAL PORT
      ANI      2       ;RCVR READY ?- note: status is bit 2
      JZ      CINL    ;NO, KEEP TESTING
      IN      2       ;GET THE ACTUAL CHARACTER
      ANI     7FH     ;STRIP PARITY BIT (D7)
      RET

;INPUT FROM SECONDARY (RIGHT) SERIAL PORT
CINR   IN       5       ;GET STATUS FOR RIGHT SERIAL PORT
      ANI      2       ;RCVR READY ? note: looking at bit 2 again.
      JZ      CINR    ;NO, LOOP TILL RECEIVED
      IN      4       ;GET CHAR FROM DATA PORT
      ANI     7FH
      RET
```

Figure 1

```

;INPUT FROM PARALLEL PORT
CINP  IN      6      ;MOTHERBOARD STATUS
      ANI      2      ;PI FLAG
      JZ      CINP    ;LOOP UNTIL DATA
      IN      0      ;READ DATA FROM PARALLEL PORT
      PUSH    PSW     ;SAVE BYTE
      MVI     A,30H   ;RESET VALUE
      OUT     6      ;RESET PI FLAG
      POP     PSW     ;RESTORE INPUT BYTE
      ANI     7FH    ;CLEAR PARITY BIT
      RET

```

```

;CONSOLE INPUT PENDING TEST
CONST IN      3      ;GET LEFT USART STATUS
      ANI     2      ;HAS BYTE BEEN RECEIVED?
      RZ      ;NO, RETURN WITH ZERO IN A
      MVI     A,OFFH ;YES, RETURN WITH FFH IN A
      RET

```

```

;OUTPUT TO CONSOLE OR STANDARD (LEFT) SERIAL PORT
COUTL IN      3      ;GET STATUS
      ANI     1      ;IS TX READY?
      JZ      COUTL  ;NO, LOOP UNTIL IT IS
      MOV     A,C     ;GET BYTE TO SEND
      OUT     2      ;SEND IT
      RET          ;DONE

```

```

;OUTPUT TO SECONDARY (RIGHT) SERIAL PORT (PRINTER)
COUTR IN      05H    ;GET USART STATUS

```

```

      ANI     1      ;IS TX READY?
      JZ      COUTR  ;LOOP TIL READY
      MOV     A,C     ;BYTE FROM C TO A
      OUT     04H    ;SEND BYTE VIA DATA PORT
      RET          ;DONE

```

```

;
;OUTPUT TO PARALLEL PORT - IF CPMGEN TOLD THAT PRINTER
; IS PARALLEL, JUMP VECTOR ALTERED TO JUMP HERE
COUTP IN      6      ;MOTHERBOARD STATUS
      ANI     1      ;TEST PO FLAG
      JZ      COUTP  ;EXTERNAL DEVICE NOT READY YET
      MVI     A,20H  ;RESET THE FLAG
      OUT     6      ;
      MOV     A,C     ;CHAR TO BE SENT TO A
TOGGLEP ORI     80H   ;SET STROBE FALSE
      OUT     0      ;SEND CHARACTER
      XRI     80H    ;TOGGLE STROBE TO TRUE
      OUT     0      ;KEEP SENDING
      XRI     80H    ;TOGGLE STROBE BACK TO FALSE
      OUT     0      ;
      RET          ;DONE

```

+++ Remote CP/M Software Exchange Systems, List # 31 \*\*\*

Last Revised December 15, 1982

=====

A summary of all known (and running) Remote CP/M Software Exchange Systems using XPDDEM for program transfers. It would be appreciated if operators of new RCP/M systems will transmit the needed information about their systems to Jud Newell, [Toronto Ontario RCP/M System One (416) 231-9538], or Kim Levitt, [in L.A. Calif. area c/o Webber Hall's Granada Engineering Group RCP/M (213) 360-5053 or voice phone at (213) 455-8894 weeknights and weekends.] (NEW SYSOPS: PLEASE READ THE NOTE AT BOTTOM RE: ACQUIRED DATA FOR NEW ENTRIES.)

Jud and Kim will attempt to coordinate updates to the RCP/M list as they occur...

PLEASE LOCK FOR squeezed versions named RCPM-Onn.LOT. Also note use of DIF files with SSEC to receive updates. (KEEP UP TO DATE WITHOUT AN EXPENSIVE PHONE BILL!) (Named RLISTonn.DIF or .DGF where on-sole list #, nn=new list #.) (Read RCPMLIST.DOC/.DOC..)

List # 31 reviseo and updated courtesy of:  
Kim Levitt -- Hollywood, CA.

Revision Summary as of December 15, 1982:

Note: [>>= RCPMLIST.031 - 12/15/82 - 42 changes:  
15 New systems, 3 phone #'s, 24 other changes]  
[+= RCPMLIST.030 - 11/20/82, (date wasn't updated!)]  
[# = RCPMLIST.029 - 11/20/82]  
[# = RCPM-028-LST - 11/06/82 - Includes:  
RCPM-027-UPU, RCPMLIST.27X]  
[+= RCPMLIST.27 - 08/28/82]  
[# = RCPMLIST.26 - 06/20/82]  
[> = RCPMLIST.25A - 05/08/82]

NORTHEAST

Programmer's Anonymous RCP/M, (207) 839-2337. Ralph Trynor. No call back. 24 hours. 300 baud. No a.l.d.s. Up as of 10/3/82. 180K on 2 drives. Interest in new software, modem programs, help and software for the Osborne. (System runs on an Osborne 1.) [Gorham, Maine]  
>> NEW SYSTEM: Info. from msgs to Jud on 10/3/82 and 10/10/82.  
PROVIDENCE RCP/M, (401) 751-5025. Mark Rippe. Call back. 1000-2300 Sat., 1100-2200 Sun. 300 baud. SPRINT, MCI. Up as of 10/29/82. 1.2 Mb on 1 drive. (Maybe 2nd after Xmas.) [Providence, R.I.]  
>> NEW SYSTEM: Info. from msg on Tech CBBS dated 10/29/82.

TORONTO ONTARIO RCP/M SYSTEM ONE, (416) 231-9538, Jud Newell. No call back. 24 hrs. 300 and 1200 baud. No A.L.D.S. Up as of 08/28/82. 20Mb hard disc now on line 24 hrs/day. Special Interest in New and New Releases of Software. System supports extensive HELP files and Software DATABASE. (System formerly named MISSISSAUGA RCP/M.) [Toronto, Ontario, Canada]  
\*\* PMPI available now only on request. 300/1200 baud standard.  
>> NEW PHONE NUMBER: Changed from (416) 826-5394 on 12/1/82.  
>> MESSAGE JUD NEWELL ON THIS SYSTEM WITH UPDATES FOR RCPMLIST

TORONTO ONTARIO RCP/M SYSTEM TWO, (416) 231-1262, Jud Newell, 24 hours. 300,450,600,710 Baud. No A.L.D.S. Up as of 12/13/82. 2.4mb on two 8" disks. [Toronto, Ontario, Canada]  
>> NEW SYSTEM, operated by SYSOP of TORONTO ONTARIO RCP/M SYSTEM ONE (formerly Mississauga RCP/M System). Sysop plans extensive revisions to both systems to move Database and HELP files to system TMC thus freeing up system ONE for software exchange only. System ONE and system TWO will both have 10mb of hard disk after revisions. System under test. Please report any problems to SYSOP on Toronto Ontario RCP/M System ONE at (416) 231-9538.

MISSISSAUGA ONTARIO HUG-KCP/M, (416) 273-3011, Toronto Health Users Group. 1800-C600 wkdys. 24 hrs wkends. 116,300,450,600,710 baud. No A.L.D.S. Up as of 06/20/82. 2+ Mb of files on 5 drives. [Toronto, Ontario, Canada]

MIC-Suffolk RCP/M and Data Exchange, (516) 751-5839, Al Klein, 1700-0900 weekdays, 1700 Friday - 0900 Monday. 300,450 Baud. SPRINT, MCI. Up as of 6/12/82. 4400K on 4 drives. [Long Island, NY]

Sysop interested in new programs for all micros. Note Phone will be answered voice 0900-1700 Monday-Friday.  
\*\*NEW SYSTEM. SYSOP interested in all micros.

Johnson City, NY SJ885, (607) 797-6416, Charles ---. No call back. Eves., etc. 300 baud. No alternative long-distance service. Up as of 08/27/82. 2 Mb of files on 2 drives. [Upstate New York]

SuperBrain RCP/M, (617) 872-0781, Paul Kelly, 190C-0700 wkdys, 24 hrs wkends. 110, 300, & 1200 baud. SPRINT, ITT, MCI. Up as of 08/27/82. 2 300 K files on-line. [Lexington, MA: Boston area]

(Special interest in Superbrain-adapted CP/M programs)

Rochester KBBS, (716) 524-1785, Arnie McCall. No call back. 24 hrs. 30C/1200 baud. SPRINT, MCI, ITT. Up as of 08/27/82. 2-4 Mb of files on 4 drives. (780 S-100) [Upstate New York]  
>> NEW PHONE NUMBER: Changed from (716) 223-1100 as of 12/3/82.  
>> 1200 baud uses 212A standard, Vacic VA3400 not supported.  
>> (Data-Net (tm) system, (formerly Data-Star), now separate.)

Bearsville Town SIBBS, (914) 679-6559, Hank Szyzka. No call back. 110,300,450,600,710 baud. No a.l.-d.s. Up as of 08/27/82. 2 4MB of files on 4 drives. [Upstate New York] [Installing MP/M. All CP/M programs available by request. General CP/M software]

--Double Sided/DD Drives now on line. Capacity doubled.

Woodstock RCP/M RBBS, (914) 679-8734. John Doak. No Call Back. 24 Hrs. (Machine answers after 3rd ring.) 75-450 Baud. SPRINT. Up as of 08/27/82. 2 2.6 Mb on 5 drives. [Woodstock, New York]

(Heath H8 System. Sysop interested in all CP/M software, plus hardware radio software. CP/MUG and RCP/M library is available.)

>> Now 24 Hours, has SPRINT access, disk capacity now known.

>> New information from msg to Kim from John on 12/9/82.

Brewster RBBS, (914) 275-5693, Paul Bosshold & Carl Erhorn. Call Back at all times. 9p-8am weekdays, 24 hour weekends. 300,450, 600, 710 baud. No a.l.-d.s. Up as of 02/28/82. 2 500 K of files on 1 drive. [Downstate New York] [S-100 based. General CP/M software]

EAST CENTRAL

Flanders, NJ. (201) 584-9227, Ken Stritzel. No Call Back. 24 hrs. 110,300,450,600,710 baud. MCI. Up as of 08/27/82. Has 2mb on hard disk (= 3 logical drives) + 1.2mb on 2 floppies. [Northern New Jersey]

-- 20mb hard disk now installed.

>> [Does NCT have Sprint access as earlier indicated.]

Paul Bogdanovich's RBBS, (201) 747-7301. No callback. 1800-2300 wdays, 0800-2300 weekends. PMMI baud rates. No ALDS. 2 1 Mb on 2 drives. Up as of 08/27/82. [New Jersey]

> NEW SYSTEM. Further data needed.

>> System now has PMMI baud rates, disk capacity now known.

Kenote CP/M and Bulletin Board System of Cranford, New Jersey (201) 272-1874, Bruce Katoff, Eyes, etc. No call back. 110,300, 450 & 600 baud. SPRINT, MCI. Up as of 08/27/82. 2-3 Mb of files on 3 drives. Bulletin Board of SIG/M Group. [New Jersey]

(General CP/M software; active also as a bulletin board)

Allentown RBBS/RCP/M System, (215) 398-3937, Bill Earnest. 24 hrs. No call back. 110, 300, 450, 600, 710 baud. SPRINT & III. Up as of 08/27/82. 2 10. Mb. of files on hard disk (=4 logical disks). [Pennsylvania]

(General CP/M software. Bulletin board of the Lehigh Valley Computer Club and SIG/M Group)

Laurel, MD. RCP/M/RBBS, (301) 953-3753, Wayne Hammerly. No call back. 24 hours. SPRINT. 2 drives with 600k capacity now on line. PMMI on order, currently running at 300 baud only. Up as of 08/27/82. [Washington DC Area]

>> [OGES have Sprint access.]

BHCC RBBS/RCP/M, (301) 661-4447, Walt Jung, Charlie Schnepf, Harry Barley. No call back. 6pm-9:30am Daily, 9pm Thu-9:30am Fri, 5pm Sat-9:30am Mon. 300/450 baud. Sprint/MCI/III. Up as of 10/82. 2 10.2 Mb on 6 logical drives. [Baltimore, MD]

--NEW SYSTEM: Info from message to Kim from Walt on 11/27/82.

>> Heath H89 + Corvus system; interest in CP/MUG and Heath CP/M

>> software, BOSC & HDOS programs. Wide variety of system sub-directories, clu newsletters, key RCP/M DIR's. XMODEM from

>> A0: master DIR, DISKMENU.DOC, for latest files, SYSTEM-MAP, >> for layout, NEWFILES for latest system files.

RLP RCP/M, McLean VA, (703) 524-2549, Bob Plouffe. No Call back. 24 hours. SPRINT/MCI. 2 2.7 Mb on 4 Drives. Running CBS for messages. Up as of 08/27/82. [Kash DC Area]

X Phone Number corrected. Note correct number is 703-524-2549

>> INCREASED DISK SPACE: Info from msg to Kim by Bob on 12/12.

Grafton, VA. RBBS, (804) 898-7493, Dave Holmes. No call back. 24 hrs. 300 baud. SPRINT. 2 200 K of files on 2 drives. Up as of 08/27/82. [Hidewater, VA.]

(Carries CP/M, TRS-80 & Apple software; plans for setting up a dual system (on one line) with an LNM-80 as well as the CP/M computer. Active as bulletin board)

>> Note that SPRINT access is available.

State College, PA. CUG-NCDE, (814) 238-4857, Joe Shannon. No call back. 24 hours. 300 baud on login, then PMMI baud rates. No a.l.-d.s. Has 3 mt of files on 3 drives. Up as of 05/08/82. [Pennsylvania]

+ New System. Runs C-NCDE software, with UNIX-like commands

> ltype 'cat commands' after reaching the '2' prompt) and file

> xfer programs called 'send' & 'rcv' which are MODEM/XMODEM compatible. Only BDS- and other C software for downloading;

> no msg system.

MIDWEST

Geneseo, Ill, (309) 667-2504, Richard Blessings. Call back. C760-1700. 110,300,450,600,710 baud, No ALDS. Up as of 04/22/82. 2 500 k on two drives. [Illinois]

--NEW PHONE. System may not yet be back in operation.

IRM-PC RBBS, (312) 647-7636, Gene Plantz. No call back. 1800-0766 wdays & 24 hrs weekends. 300 & 1200 baud. SPRINT, MCI, III. Up as of 08/13/82. 2 200 k of files. [Infile: Chicago area] 2 NEW SYSTEM. Run for members of ACPU. Access to operating system requires password -- contact sysop. Bell 212A freqs at 1200 baud.

AIMS, Hinsdale, Ill. (312) 789-0499, Mark Pulver. No call back. 24 hours. PPMI baud rates. SPRINT, MCI, ITT. @ 10 mb of files on hard disk. Up as of 08/27/82. (Chicago area)  
>> NEW INFO ADDED: per msg from Tim Linehan to Kim on 11/23/82.  
>> (System now has PPMI baud rates instead of 300 baud only.)  
>> System now up 24 hours according to Logan Square listing...

MEI RCPM Systems (312) 949-6189, Chuck Witbeck. No call back. 1800-0100 wkdays, 1200-0100 wkends. 300,450,600,710 baud. MCI, SPRINT, ITT. Up as of 08/27/82. @ 2 Mb of files on 2 drives. (Chicago area)  
(Main emphasis is on communications programs, including versions adapted to non-standard CPM systems)

Logan Square RCPM, (312) 252-2136, Earl Bockenfeld. No call back. 24 hours - 7 days/wk. 110, 300, 450, 600, 710 baud. SPRINT, ITT, MCI. Up as of 08/27/82. @ 1 Mb of files on 2 drives. (Special interest in recent releases and developing on-line databases, with daily change of software on B drive) (Chicago)  
>> System now up 24 hours according to Logan Square listing...

Palatine RCPM, (312) 359-8086, Tim Cannon. No call back. 1800-0600 wkdays, 24 hours weekends. PPMI baud rates Thursdays 1800-Sunday 1800. 300/1200 Vaalc all other times. SPRINT,MCI,ITT. Up as of 08/27/82. @ 4.8mb of files on 4 drives. Emphasis on very recent releases, updates to existing programs and BDS C programs. Disks on B;C; and D: are rotated with a second set daily. (Chicago)

Technical CBBS, (313) 846-6127, Dave Harroy. No call back. 24 hrs. 110, 300, 450 & 600 baud. ITT, SPRINT, PCL. Up as of 08/27/82. @ 3 Mb of files on 3 drives. (Detroit area)  
(Emphasis on very recent releases. RCPM sysops desiring access to the passworded RCPM Clearing House system should leave a msg on ICBS. Active message system)

Royal Oak CPM, (313) 754-6509, Keith Petersen. Call back. 24 hrs. 110, 300, 450, 600, baud. 1200 baud modem now available on request. Use CHAT or leave a message if you want the 212A switched in. ITT, SPRINT, MCI. Up as of 08/27/82. @ 600 K on 2 floppy drives + 10 Mb on hard disk (1-2 logical drives). (Detroit area)  
(Emphasis on new programs & recent updates of standard progs.)

Pontiac, MI. RBBS/RCPM, (313) 338-8505, Larry Breaux, 2pm-midnight, (Detroit area)  
## NEED MCRE INFO!!

Southfield, MI, RBBS/RCPM, (313) 559-5326, Howard Booker. No call back. 24 hrs. 300, 450 baud. ITT, SPRINT, MCI. Up as of 07/22/82. @ 2.7mb on 8 (logical) drives. (Michigan)  
(Special interest in BDS C programs, doc. files and recent updates of standard programs.)  
^^DISK Capacity increased.

MINICBBS/Sorcerer's Apprentice Group, (313) 535-9186, Bob Hageman. Call back. 24 hrs. 110, 300, 450, 600 baud. ITT, SPRINT,MCI. Up as of 02/27/82. @ 500 K on 2 drives. (Michigan)

(Running on an Exidy Sorcerer. Needs password, "SORCERER". Special interest in adapting CPM software and assorted hardware to Sorcerer systems)

Fort Fone File Folder, (414) 563-9932, Al Jewers, Shawn Everson, Ron Fowler. No Call Back. 24 hours. 110-710 baud. NO ALDS. Up as of 8/27/82. Has 20mb on Corvus mini as 6 logical drives. (ft. Atkinson, Wisconsin)

^^ SYSOP now has 20 meg installed.  
\$ NEW SYSTEM. Specializing in MP/M, CP/MET and BDS C programs.  
\$ Ron Fowler, of Westland fame, now co-sysop.  
>> NEW PHONE NUMBER: changed from (414) 563-7442 on 10/20/82.  
>> New areas: Atari 400/800, printer graphics, FORTRAN.  
>> Recently upgraded and moved. Info from msg to Jud on 10/20.

Cincinnati RBBS, (513) 489-0149, Henry Deutsch. No call back. 1800-0600 daily. PPMI Baud rates. SPRINT. @1.8mb on two drives. Up as of 6/20/82. Specializes in Telecommunications. (Ohio)

^^ NEW SYSTEM. Information Needed.  
>> (DOES have Sprint access.)  
West Carrollton RCPM, (513) 435-5201, Rich Malafa & Bob Drake. No call back. 24 hours. PPMI Baud rates. SPRINT. @11 mb of files on hard disk (= 4 logical drives). Up as of 6/24/82. (Dayton, OH)

^^ NEW SYSTEM.  
>> (DOES have Sprint access.)  
Columbus CBUS, (614) 272-2227, (268-CBBS), John Malpole. No call back. 24 hrs. 110-600 baud. SPRINT, ITT, MCI. Up as of 08/27/82. @ 300 K of files on 3 drives. (Ohio)  
(Now running MP/M, on a Tarbell SD controller; occasional slow response means the sysop is also using the system; Special interest in BDS-C programs. Also active as a bulletin board)

Pickerington RBBS, (614) 837-3269. Greg Bridgewater. No Call Back. ??? Schedule. 300 baud. SPRINT. @1mb on 4 drives. Running TMS-80 with Gtrakron. Up as of 06/27/82. (Ohio)  
^^ NEW SYSTEM. Information Needed.  
>> (DOES have Sprint access.)



Mission, KA, (913) 362-9583, Dave Kobets. No Call Back. 24 Hrs. 300/1200 Baud 212A Standard. SPRINT. Up as of 5/31/82. 4 2meg of files on 2 drives. [Kansas]  
\$ NEW SYSTEM. Running Heath H89, DD/DS drives, with high speed \$ access.  
>> (DOES have Sprint access.)

SOUTH

NACS/UAH RBBS/RCP, (205) 895-6749, Don Wilkes. Call back. 24 hrs. 110, 300, 450, 600 baud. No a.i.d.s. Up as of 08/27/82. 4 700 K of files on 4 drives. [Huntsville, Alabama]  
(Run for N. Ala. Computer Soc. at U. of Ala.; general CP/M software)

REDSTICK RCP, (504) 766-8962, Phil Cary. No call back. 7 days 2300-1900. 4 ends 2300-0900. Sprint. (MCI?). PMM baud rates. Runs on North Star with 4 drives. Message system "REDSTICK" written by sysop. General software, 2 IME. [Baton Rouge, La.]  
+ NEW SYSTEM: Info from RCPMLIST.030 off of Technical CBBS.  
+ MORE INFO NEEDED: MCI/ITT? Msg. Kim of Jud with data.

SOUTHERN CALIFORNIA

Los Angeles RCP/M, (213) 296-5927, Bob P'cDown. No Call Back. 24 hours. PMM Baud Rates. SPRINT, MCI, ITT. Up as of 07/22/82. 2-5 Mb on 2 Drives. System features catalog of the latest CP/M, Apple, Atari, TRS-80 and IBM PC software. [West L.A.]

NEW SYSTEM. SYSOP expects to have software for all types of microcomputers available for download.  
# NEW PHONE NUMBER: Changed from 213-479-3189 as of 11/17/82.  
# Bob expects to have Smartmodem 1200 up in 30 days for 300 # and 1200 Baud operation. (Instead of PMM.)  
>> Note that system can be reached via ITT Longer Distance.

Granada Engineering Group RCP/M, (213) 360-5053, Webber Hall. Kim Levitt. No Call Back. 24 Hrs. 300 baud. SPRINT/MCI/ITT. Altair 8800 with 1Mb on four drives. Up as of 02/21/82. Special interest in CP/M utilities, assembly language programs, hardware/software technical information. [Granada Hills, CA]  
# Removed from list in RCPMLIST.027, re-added 'cause still up.  
# Note that online files periodically changed, extensive off-line library of CP/M UG programs. System interests changed  
# since last entry in RCPMLIST.

>> Note that system can be reached via ITT Longer Distance.  
>> MESSAGE KIM LEVITT ON THIS SYSTEM WITH UPDATES FOR RCPMLIST  
>> [Kim Levitt is now Co-Sysop on this system as of 12/6/82...]

Pasadena CBBS, (213) 799-1632, Dick Head. No call back. 24hrs. 110-600+ baud. ITT, SPRINT, MCI. Up as of 06/20/82. 2 1.5 Mb of files on 2 floppies & 8.3 Mb on hard disk. All data now on hard disk. [Los Angeles Area]  
(Also active as bulletin board. General CP/M software)

Pasadena RBBS, (213) 577-9947, Rich Berg. No call back. 1600-0700 weekdays, 24 hours weekends. 300 Baud. Sprint, ITT and MCI. Two 782K Disks on a Heath H89. Up as of 07/13/82. [Los Angeles Area]  
# NEW PHONE NUMBER: Changed from 577-6034 as of 9/17/82.

G.F.R.N. Data Exchange (RBBS), (213) 541-2503, Skip Hansen. 24 hrs. 300 & 1200 baud. SPRINT, MCI, ITT. Up as of 08/27/82. 2.4 Mb of files on 2 drives. [Palos Verdes, CA]  
(Standard CP/M software with special interest in ham radio-related programs. Soon (with MP/M) will also be reachable thru 450 #hz radio. Note the 1200 baud capability)

The MCG-UR'S HBBS, (213) 366-1238, Tom Icimpidis. 24Hrs a day, 7 days/wk. 300/1200 Baud. MCI, ITT, SPRINT. Started 06/01/81, XPCDEM on 09/05/81. 2 1Mb on three drives, 42Mb by approx 1/20/83. [San Fernando valley, LA Area]  
# NEW SYSTEM, Ito RCPMLIST, but has been XMODEMing since '81  
# Supports both HDOS and CP/M file transfers, uses custom program written and running as a background task, system is a # Heath H8, full access to operating system is allowed.  
>> MISPELLED AS "MOC-..." on #29, corrected 11/22/82. OOPS!!  
>> Note that system now has 1200 baud capability. An additional  
>> 1 Mb of storage expected in 2 to 3 weeks as of 12/13/82

San Diego RCP/M, (619) 273-4354, Brian Kantor. No call back. 24 hrs. 300/1200 baud. ITT, SPRINT, MCI. Up as of 05/01/82. has 2-4 Mb of files on 2 drives. [San Diego, CA]  
# NEW AREA CODE AND PHONE NUMBER as of 11/06/82.

G.F.R.N. Data Exchange (RBBS), Garden Grove, (714) 534-1547, Doug Laing, 24 Hours, 300 and 1200 Baud, SPRINT. 5 mb of files on 6 drives, up as of 08/27/82. Special interest in amateur radio and apple/cpm software, also general interest CP/M. This is the second G.F.R.N system. [Garden Grove, CA]  
>> System does have SPRINT access.

Anahag RCP/M/CBBS, (714) 774-7860, Bob Mathias, John Secor. No call back. 24 hours. 300 baud. SPRINT, MCI, ITT. Up since 10/28/81. 10 Mb on hard disk + 1 Mb on 8" floppy. Special interest in hobby computing, ham, electronics hobbyists. [Anaheim, CA]

>> NEW SYSTEM: (to RCPM list, although has up since 10/28/81...)  
>> Will have 300/1200 baud as soon as Smartmodem 1200 arrives..

CP/M-net(m), (805) 527-9321, Kelly Smith. 1900-2300 (Pacific) Mon-Fri, 1900 Fri to 0700 Mon. 110-600+ baud. SPRINT. Up as of 08/27/82 with 20Mb of files on 2 hard disks (=8 logical disks) [Simi Valley, CA]

# Changed from MD ALDS to SPRINT (Only) as per RCPM-027.UPD...  
# Currently only drives A: thru D: are available.  
>> System phone temporarily down but expected back up soon.

Thousand Oaks RBBS, (805) 492-5472, Trevor Marshall, No Call Back. 24 hours. 300/600 baud. No ALDS. Up as of 08/27/82. @ 2mb on two floppies. [Thousand Oaks, CA]  
^NEW PHONE NUMBER. Now running INFO50FT with 4 logical disks. Supports subdirectories.

NORTHERN CALIFORNIA

San Jose Oxdgate, (408) 287-5901, Paul Traina. No call back. 1800-0800 wkdys, 24 hrs wkends. 300 baud. SPRINT, MCI, ITT. Up as of 08/27/82. @ 2.4 mb of files on 3 drives. [SF Bay Area]

> Formerly Siliconia RCPM, inadvertently dropped from this list > due to the name change. Networked with other systems using > the Oxdgate software.  
>> This system, formerly node 001 is now node 005. A new node >> 001 will be located at Saratoga, Ca. at another phone #...

Colossal Oxdgate, (408) 263-2588, Mel Kruts, Call back. SPRINT. Hours & other info not known. Up as of 08/27/82. [SF Area]  
> NEW SYSTEM. Part of Oxdgate network. This 'Colossal' has 2 > shells.

>> (D) hie Srint a c ss.)

Cro'sNEST RCP/M -- DataTech node 004, (408) 732-2433, Robert Kuhman. 24 hours. No call back, 110-710 baud PMML, SPRINT, ITT, MCI. Up since 10/01/82. 1000K of files on two drives. [Sunnyvale, California]

[CROMEMCO system two based. Specializing in CP/M, CUOS, CROMIX, and DAVIS software. Many new CUOS programs Inever before released to public domain] are available.)  
>> NEW SYSTEM: Info from msg to Kim from Robert on 11/28/82.

Silicon Valley Interchange RCP/M, (408) 732-9190, Edward Svoboda. 7:45am-11:00pm 7 days/week. No call back. 0-300 baud. MCI, SPRINT, ITT. Up as of 11/20/82. @ 2.4 Mb on 2 drives. [Apple II based system with Vista 8" drives.] [Sunnyvale, California]

[Sysop interested in recent releases and older programs, special interest in telecommunications, Apple CP/M, Osborne, updates. Sysop almost always available. Will swap disks every other day when it becomes necessary.]  
>> NEW SYSTEM: Info from msg to Kim from Edward on 12/13/82.

San Francisco RCP/M, (415) 563-4953, S.F. Avanti. No call back. 8pm-8am 7 days/wk & when not used for business. 300 baud. SPRINT, MCI, ITT. Up as of 10/8/82. Currently has 270 K on 3 drives, but soon 2.5 M more on 2 additional drives. [San Francisco, CA]

[Main interest in CP/M utilities. Un-line catalog of off-line CP/M pgms. available.]  
>> NEW SYSTEM: Info. from msg. to Jud from SF on 10/8/82.

DataTech Network Headquarters System, (415) 595-0541, Edward Huang. 24 hours. 300 and 1200 baud (Bell 103, Bell 212A, Vadic 3400) No call back. SPRINT, ITT, MCI. Up since 07/04/82. 200K of files on a 5" drive and a 110K RAMDISK. [Box 290, San Carlos, CA 94070 S.F. Bay Area]

[Leath/Leath based. Special interest in utilities and communications as well as general software. Another 5" drive and double-density controller coming soon boosting total disk space to 410K with daily rotation of software exchange. DataTech nodes are networked with each other for automatic message forwarding.]

>> NEW SYSTEM: Info from msg to Kim from Edward on 11/27/82.

Piconet Oxdgate, (415) 965-4097, Byron McKay. No call back. 24 hrs. 110-710 baud. SPRINT, MCI, ITT. Up as of 08/27/82. @ 2 mb on 2 drives. [SF Bay Area]  
> NEW SYSTEM. Part of Oxdgate network. Sponsored by Piconet > CPM Interest Group.

RBBS of Marin County, (415) 383-0473, Jim Ayers. No call back. Even & nites wkdys, 24 hrs wkends. 110, 300, 450, 600 baud. SPRINT, ITT, MCI. Up as of 08/27/82. @ 1000 K of files on 2 drives. [SF Bay Area]

[S-100 [IMSAL] based. 24-hour operation expected soon)

Larkspur RBBS/RCPM, (415) 461-7726, Jim C. No call back. 24 hrs. 110,300,450,600,710 baud. SPRINT, ITT, MCI. Up as of 08/27/82. 2+ Mb on 2 drives. [SF Bay Area]

Napa Valley RCP/M RBBS, (707) 226-6502, Dave Austin. No call back. 24 Hours. PPMI baud rates. No ALDS. Up since 1/2/82. Has 600 K on 3 drives. [IMSAL 280.] [Napa, CA]  
[Supports TRS, Apple, Osborne, Atari and CP/M systems. Also interested in amateur radio and net info.]

>> NEW SYSTEM: Info from msg to Jud from Dave on 12/8/82, (and also from RCPM-NEW.SYS.)

Sacramento CBBS/RCPM, (916) 483-8718, Sacramento Microcomputer Users Group. No call back. 24 hours a day. 110,300,450,600,710 baud. SPRINT. 700K+ Files on two drives. Expansion planned to 1.5m). Up as of 03/20/82. Joe Bergin, Don Bozarth, John Moorhead, & Bob Ress Sysops. [Sacramento, CA]

[S-100 based, with special interest in CP/M; disks will change bi-monthly]  
(The system carries general & new CP/M software)

SOUTHWEST

Dallas RCP/M CBBS, (214) 931-8274, Dave Crane. No call back. 1800-0800 Mon-Fri, 24 Hrs Sat/Sun/holidays. 110-710 baud PMCI, ITT, SPRINT, MCI. Up as of 9/9/82. @ 2.4 Mb on two drives. Special interest in programs for and discussions of application of micros to science & engineering, especially earth sciences. Initially making general CP/M & IBM PC public-domain utilities available on two 1.2 MB drives. [Dallas, Texas]  
 >> NEW SYSTEM: Info. from msg to Jud from Dave on 9/9/82.  
 >> Info also entered in RCPMLIST.30: Sys has section for Forth.

Boulder, Colorado RCP/M, (303) 499-9169, Jack Kiley. No call back. 1900-2230 weekdays, 1200-2230 weekends. 110,300,450,600,710 baud. MCI/SPRINT. Up as of 6/20/82. 32mb hard disk on line at all times. [Boulder, Colorado]  
 # Changed ND A.L.D.S. to PCI/SPRINT as per RCPM-027.UPD

Colorado Springs RIBBS RCP/M, (303) 634-1158, ??? Sysop? No call back. ?? Hours? 300/1200 baud. SPRINT, (MCI? ITT?). Up as of ???/??/?? @ 2.4 Pb on 2 drives. [Colorado Springs, Colorado]  
 (Zenith Z-89 with 2 8" 1.2 Pb disks, Hayes Smartmodem 1200, Hayes Stack Chronograph, Source ID is TCH049.)  
 >> NEW SYSTEM: Need more information!!! Sysop? Hours? Up date?  
 >> (Only 300 baud supported until further notices.)

Pinecliffe RMP/M RBS, (303) 642-3034, Craig Baker. No call back. Irregular hours, 24 hrs. soon, (try anytime). 300/1200 212A baud rates. SPRINT, MCI, (ITT?). Up as of 12/15/82. ?? ?b on ? drives? [Pinecliffe, Colorado]  
 >> NEW SYSTEM: Remote MP/M-II system. Login by using "LOGIN" program. Similar to RCP/M to user, has XMODEM for file transfer. RBS for messages, some "normal" programs. On-line databases on such topics as nuclear power, (sysop is pro-nuclear, but loves to defend himself), and survival. Demo programs, on-line hardware/software catalog, can take Visa/MC orders. Retrieval system, MP/M-KI mods, interest in active discussions.

Denver CUG-NODE, (303) 781-4937. No call back. 24 hrs. 61-710 baud. SPRINT, MCI, (ITT?). Up as of 06/10/82. @ 1 mb on 2 drives. [Denver, Colorado]  
 > NEW SYSTEM, sponsored by (BDS) C Users' Group. For info on use & s'ware see the State College Pa. CUG-NODE entry above.

College Station OXGATE MCP/M, (713) 693-3462, ??? Sysop?? ?? Call Back? ?? Hours? 300/1200 baud. No ALDS. Up as of ???/??/?? Disk capacity not known. [College Station, TX]  
 >> NEW SYSTEM: MORE INFORMATION NEEDED!!!!!!

El Paso Texas RCP/M, (915) 598-1668, Sig Kluger. No Call Back. 1700-0600 weekdays, all day w'ends. PMCI baud rates. MCI, SPRINT, (ITT?). Up as of 06/20/82. @ 1.3 Mb online, 5MB off line. XMODEM C:MST.CAT for list of available files. Diskettes related every 2 days. Runs on North Star. [El Paso, TX]  
 # New information from RCPM-027.UPD added, moved from 5 to SW.  
 >> Updated on 11/29/82 using info from RCPMLIST.30  
 >> SYSTEM NOW HAS PMMI BAUD RATES, MORE DISK CAPACITY.

El Paso Texas Apple UG RBS/RCPM, (915) 533-2202. No call back. 24 hrs. 110/300 baud. SPRINT, MCI, (ITT?). Up as of 09/01/82. Runs on a 1.7Mb segment of North Star Hard Disk (multiuser system.) General, APPLE, and 80S C software. [El Paso, TX]  
 ## NEW SYSTEM. Added on RCPMLIST.27X.

NORTHWEST

Olympia RCP/M, (206) 352-7530. Tim Linehan. No call back. 24 hrs. PMMI baud rates. No a.l.d.s. Up as of 7/22/82. @ 16 Mb on Northstar system. General interest. [Olympia, Washington]  
 >> NEW INFORMATION ADDED: 11/22/82. (baudrates, ALDS, more Mb)  
 >> Updated on 11/29/82 using info from RCPMLIST.30

Yelm RBS & CP/M, (206) 458-3086, Dave Stanhope. Call back. 24 hrs. PMMI baud rates. No a.l.d.s. Up as of 08/27/82. @ 250+? K on 3 drives. [Olympia, Washington]  
 >> NEW INFORMATION ADDED: as per msg from Tim Linehan to Kim on 11/23/82. Sys now has PMMI baud rates, added 3rd disk drive.

Chuck Forsberg's RCP/M, (503) 621-3193, No call back. 24 hrs. 300/1200 baud. SPRINT. Up as of 08/27/82. @ ? Files on line. \$ Now can be reached with SPRINT.

Beaverton, Oregon RCP/M, (503) 641-7276, (641-RCPM), Dave Morgan. 24 hrs. PMMI baud rates. SPRINT. Up as of 6/30/82. @ 2c mb of files on Hard disk (4 logical drives). Interest in very recent releases and computer art. [Oregon]  
 >> NEW INFO ADDED: per msg from Tim Linehan to Kim on 11/23/82. >> PMMI baud rates, SPRINT, corrected Beaverton misspelling.

Froy Hollow CBBS/RCPM, (604) 873-4007, David Bowerman. No call back. 24 hrs. 100-710 baud. No ALDS. 1.2 mb on 2 drives. Up as of 08/27/82. [Vancouver, BC, Canada]  
 > System missed in earlier RCPMLISTS. General CP/M s'ware; SIG-M & CP/MUG s'ware available by request. Current trial project > requiring use of 100 baud ends 05/08; system may then force > use at -> 300 baud.

Anchorage RCPM, (AMS), (907) 337-1984, Thomas Hill. No call back. 12am-8:30am 7 days/wk. 300 baud. No a.l.d.s. Up as of 11/21/82. 12.4 Mb of online storage, (2.4 Mb on 2 DS/DD 8" floppies + 10 Mb on Microdata 9000 hard disk.) System on CCS300. Sysop interested in "just about everything". Has text files on articles written for Lifelines on C: user 6. Voice contact at same phone, 9am to about 7pm. [Anchorage, Alaska]  
 >> NEW SYSTCP: Info. from msg to Jud from Tom on 11/21/82.  
 >> SHOULD HAVE 24HRS, MPM AND MORE MICRODATA HARD DISKS 500M!!!

GENERAL NORTH AMERICA

CP-MIG. On MicroNet, type 'R CP-MIG' or GO PCS-47, Sysops Dave Kozinn, Tom Jorgenson & Charlie Strom are arranging to have MN carry much of the new CP/MUG and SIG/M software, plus a newsletter and a CP/M-oriented CBBS.

OVERSEAS

Paul Taylor's Remote Computer and RBBS, Australian local; 09 459-3787, Paul Taylor. Available most Australian evenings. Manual connection only, requires CCITT 300 Baud modem in ANSHER or ORIGINAL mode for access. Running 10S (CP/M compatible), 64K 280, 5Phz system, 2MB on 2 8" disks with 48K CACHE buffers. Up as of 12/01/81. [Perth, Western Australia].

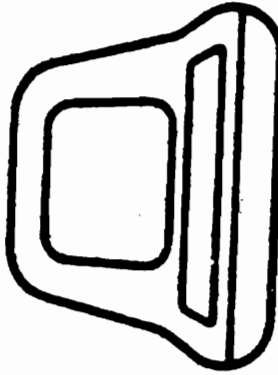
## [Int'l Direct Distance Dialing = 011-61-9-459-3787.]

NOTES:

- Whether a program exchange system is accessible by an a.l.d.s. (=alternative long-distance service) should be considered when planning to modem over long programs. Charges on SPRINT, ITT/CITYCALL and MCI are 50-60% of Ma Bell's regular long distance rates.
- Call-back systems are those where a computer and real people share the same telephone line. To contact the people, just dial & let the phone ring until you get an answer. To contact the computer: (1) dial, (2) let the phone ring once, (3) hang up just before the 2nd ring, & (4) re-dial.
- Note that the 212A/Vadic 1200 baud modems may not be compatible with yours. Most of the above systems are using Vadic 3451 Triple modems, compatible with both Bell and Vadic Standard. Sign on the first time at 300 baud to determine the system capabilities. Note also that PHM's can sometimes be used over 300 baud with 1200 baud systems. PHM baud rates are: 110, 300, 450, 600, 710.
- All times listed are local time.

- For further notes & explanations, see RCPM DATA.17
- For notes regarding distribution of RCPMLISTS in a squeezed format and updates using SSED, read RCPMLIST.DOC.
- NEW SYSDPS: When messaging Jud or Kim with information about your system, please include the following data:

- Your System's Name (E BBS type)  
(examples: Joe Blow's RBBS, Home Town RCPM/CBBS)
- Your System's area code and phone number.
- Your Name.
- Call Back/No Call Back.
- Hours of operation.
- Baud rates supported.
- Alternative Long Distance Services that can call you.  
(Note that you don't have to subscribe to any, just list ones that can call your area. If you don't know, call the local MCI, SPRINT and/or ITT offices or their 800 numbers and ask 'em.)
- Date you started operations. (And date you started using an XMODEM protocol file transfer utility, if different.)
- Your on-line storage capacity. (TOT. k/Mb & # of drives)
- Your location. (City, State; State; Area).
- Special features and interests, hardware notes, etc.



LETTER TO INSUA

By Saul G. Levy  
micro-BASIC Services  
2555 E. Irvington Rd., Lot 47  
Tucson, AZ 85714  
(602) 889-7753

INSUA:

I crave more software listings each issue! I have several comments about Vol. II, no. 2. I presume you know by now that the programs for the User-Friendly Input article were missing.

Mr. Spelman's long letter raised many excellent points that I agree with. Finding good, useful business articles is still very difficult. Popular Computing has had a number of excellent ones, but still leaves much to be desired by the novice business user. Their coverage is very limited due to their "popular" magazine viewpoint.

The cartoon embedded in Mr. Spelman's letter was very apt because it is so true! There are many people who just don't have the time or wish to spend the effort it takes to really learn a computer language or to exploit fully the hardware they use. Many authors prefer not to write for such a novice user. I also think that most of our members would not be very interested in that type of article. I am very knowledgeable about BASIC programming for most applications, but am a rank beginner on hardware and only slightly better at assembly language programming (I use Allen Ashley's PDS assembler). What we need is a Peter Stark for the North Star Computer!

More on Mr. Spelman: I haven't found any friendly dealers in Tucson. If you walk in with a sheaf of bills in your hands, they will probably talk to you, but most of them don't know that much, so beware! The local repair shops also don't have a very good idea of all the funny

things that can go wrong, especially with the disk drives and disk-controller board. Some (most?) of them don't even know the simple causes of various ills. As for mail order houses, I have had mixed luck with them so far (the bigger your order, the worse their service). Service is slow, they take liberties with my money due to their stupid manner of operation, and the company I bought my computer and terminal from ('way back in '78) never sent me a receipt for my order (they were still working on the program for that back then)! Sometimes it is frightening to think that I don't even have any proof that I did buy my system!

A Question and Answer column would not be out of line. I think it could be very useful to our members. Reviews of software tend to fill publications like Popular Computing and Info-World. If you are interested in that software, it is nice to see a useful review; if not, then it is usually a waste of space.

Edgar Coudal's review of Secretary in Vol. I, no. 4, didn't mention all of the very serious bugs, which the author has been very slow to fix. A friend of mine wrote a review of the N\*BUS editor which claimed it was bombproof! It was, until I had worked with it for a half hour doing nothing very unusual. Both of these are very fine additions to the list of North-Star-compatible software, but they are hardly error-free (a new version of Secretary is now available with most of the bugs fixed). But you have to look carefully at any product before you spend your hard-earned cash.

Burt Andrews's Aftercrash article didn't make much sense to me. Release 4 BASIC was very hard to crash, but 5.2 is a real pain at times. I just reboot the DOS and jump to one of the three BASIC special entry points (don't GO BASIC after a crash!!) The entire BASIC program will still be in memory with a jump

to E04H or E14H. Jumping to E00H (like GO BASIC) will scratch your program. Other releases use similar addresses.

A few final notes on your Wanted list. The first time I finally got my hands on an Advantage, I loved it! I wish I could afford one!

I am bored to death with modem articles. Every magazine has to publish a lot of them and I get my fill at our weekly computer club meetings too!

Microsystems already covers CP/M quite thoroughly. I am very unhappy with this "standard" operating system and don't like to use it. My last job forced me to use it a lot (with CBASIC). I even more firmly believe that North Star DOS and BASIC is the best overall combination available! I would like to see an article on North Star's version of CP/M and why it is so expensive. As for other languages, I am not interested in learning them unless they will be of more value to me than BASIC is. So far they have failed to win me over. I have been very unhappy about the grandiose claims made for them (especially about Pascal).

I have a few comments about Vol. II, no. 3. The WordStar/Epson articles were of no interest to me. I greatly dislike overkill programs such as WordStar. It runs much too slowly with snail-like CP/M. I also loathe having to use a jumble of control codes for the commands.

If you don't need its special features, you are much better off using Secretary with the North Star DOS, and can save a lot of money too!

The "ON & OFF" article deserves the following comments. If the manufacturer says to remove any diskettes from the drives before turning the power on or off, then you had better do it! North Star has never claimed a need for this except if you are running their disk systems with other companies'

computers. After all, North Star Computers expect a copy of the DOS to be in the first drive starting at sector 4 on power up.

North Star has been shipping Tandon drives on all quad-density systems for a while. These drives have the head IN CONTACT WITH THE DISK AT ALL TIMES (unless the door is open). There is no load operation! This may or may not cause trouble, but North Star has not, as far as I know, changed their thinking. Also, the Tandon drives apparently run the whole time the computer is turned on! I don't know if this is true of all of them, or even why they should work differently. This does cause excessive wear of the diskettes and has been a problem to non-North Star users too. I am going to stick with Shugart drives, even if I have to pay a bit more for them at discount.

I was interested in James Evert's corrections to MicroCount II until I saw exactly what the corrections were. Three of the four Error Set changes refer to line numbers that do not exist in the referenced programs (13300 is the only reasonable one)! All of the added IF statements are within FOR...TO loops and need EXITS before the referenced line numbers! North Star BASIC will

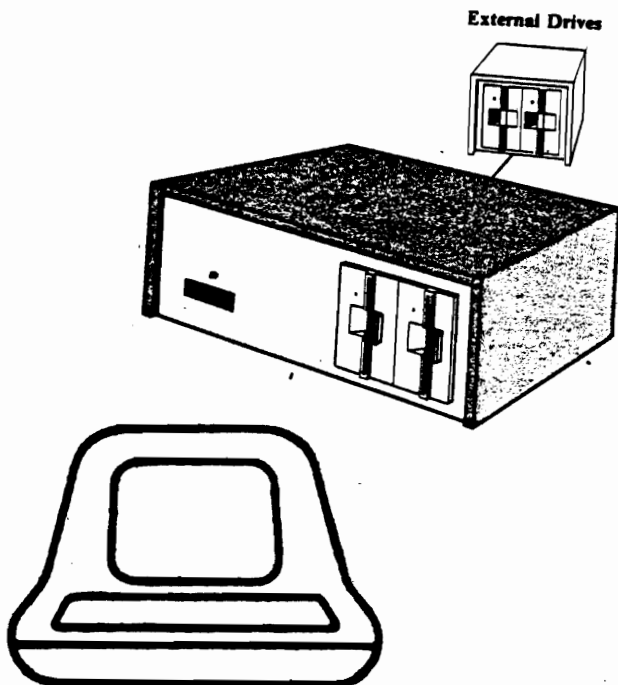
occasionally accept these without EXITS, but not all of the time! I wonder whether Mr. Evert has made a lot of other changes to this package to make it work. I first tried using it when I received it, but didn't spend the time needed to figure out what was wrong. The very limited documentation didn't help any. I have used another accounting package with similar problems at the church where I have been working. I suggested to the minister that he junk that package last July. He is finally agreeable, but it may be too late to get their \$500.00 back.

[Editor's comments:

The User Friendly Input programs are very lengthy: we will try to include more program listings, but are reluctant to devote more than a quarter of each issue to listings. We will give more thought to this matter.

Compass has not had many articles on modems, and feels an obligation to provide some modem information to North Star users.

We agree that Compass should continue to print articles on DOS and North Star BASIC; nevertheless, it is a fact that CP/M is by far the most popular operating system, probably among North Star users as among other Z80 users, WordStar is the most popular editor, languages other than BASIC are becoming more and more popular, and Epson is probably the most widely used printer among microcomputer owners. The INSUA board of directors, partly as a result of a poll at the 1981 and 1982 annual meetings, has officially agreed to branch out from products and programs narrowly restricted to North Star.]



## YOUR QUESTIONS ANSWERED

The Directors of INSUA realize that their attempts to deal with inquiries from INSUA members have not always been as successful as might be imagined. Members of the Board serve as volunteers, and have a hard time keeping up with meetings, the mail operation, editing Compass, keeping financial records straight, and so forth. They are therefore not in a position to do research on questions to which they do not already know the answers.

In order to serve the INSUA membership better, the Board has made an arrangement with several micro computer experts to respond to inquiries. Bob Cowart's column in this issue is an example of how the inquiry system will work. Here are the rules:

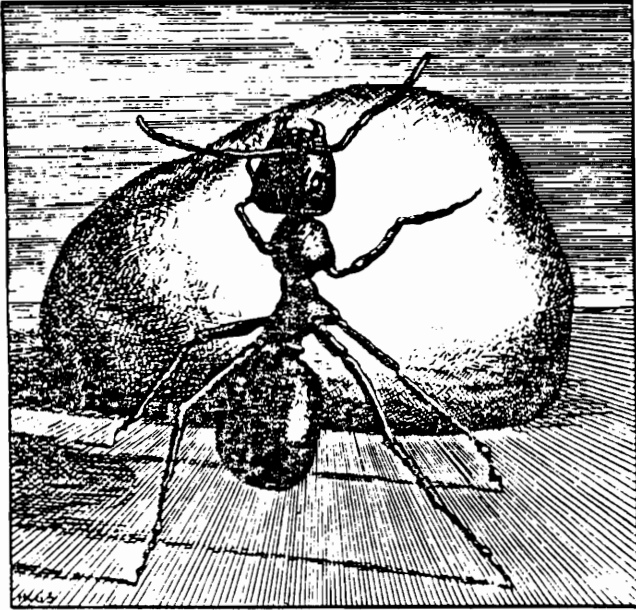
1) INSUA members should send inquiries concerning hardware or software to the Editor of Compass. The Editor will make a first screening, and will turn significant inquiries over to one of INSUA's Experts. The Expert will normally reply by mail to the inquirer, and will deliver a copy of the question and answer to the Editor of Compass. At the Editor's option, the question and answer will be printed in Compass.

2) INSUA and Compass will do their best to answer inquiries, and will try for but cannot guarantee a turn-around time of one month.

3) Neither the Expert nor INSUA nor Compass can be held responsible for any untoward consequences of any advice transmitted directly by mail or indirectly by publication in Compass.

4) Names will be withheld from publication upon request.

# ALIEN



# EQUIPMENT

"Alien Equipment" is a users' review of hardware and software bought by North Star Horizon owners from vendors other than North Star. Send in anecdotes, opinions, and technical tips concerning the jungle of products out there advertised as N\* or S-100 compatible.

Send your notes or crank calls about specific products to: Warren Lambert, 5980 Lyons View Drive, Knoxville TN 37919 (615 584-1561 X7724). CP/M ASCII or WordStar files are appreciated for longer notes, and disks will be returned quickly. Name names and prices to give your friends in INSUA the benefit of your experiences good or bad.

John R. Dye, a microcomputer systems consultant at 4807 15th Ave. S.E., Lacey, Washington 98503 (206) 491-7412 reviewed some products he had good luck

with. He runs his Horizon with 58K and works mostly in C/PM. He uses Textwriter, a text formatting program, and a Diablo WH54 daisy wheel printer.

## I. MEMORY: MOSTEST FOR LEATEST

VENDOR: Central Data Corporation  
P.O. Box 2484, Station A  
Champaign, Illinois 61820

PRODUCT: 64K RAM Board for S-100

REVIEWER: John R. Dye

FEATURES: Can be populated in 16K increments; can be deselected in 2K increment; can be addressed at any 16K boundary.

COMMENTS: I purchased this Central Data Corporation (CDC) board populated with 16K to run a 48K CP/M system and a 40K North Star system, because I got tired of pulling the cover off my Horizon to readdress the original 32K RAM board between 0000H and 0800H every time I changed system disks. (I had some North Star BASIC programs that refused to run in 24K, thus the readdressing problem.)

I soon discovered some CP/M applications that required 56K to run. Central Data Corporation provides add-on kits to expand their RAM board, so I expanded it to 32K. I had been running the 16K version at 0000H with the North Star board above it, but I readdressed the North Star board (for the last time) to 0000H and addressed the CDC board to start at 8000H. This allowed me to deselect the 2K from E800H to EFFFH where the Horizon ROM is located. My final MOVCPM was to a 58K system.

I twiddled with DESPOOL so it would load at F000H and have a full 4K to operate in without wasting memory in the transient program area. I suppose you could tuck any desired callable subroutines there as well.



P.S. The Central Data Corporation board was priced lower than any comparable board at the time. I was looking for the mostest for the leastest, and they delivered what I wanted.

**II. RUN N\* BASIC in CP/M**

**VENDOR: InfoSoft Systems, Inc.**  
25 Sylvan Road South  
Westport, CT 06880

**PRODUCT: NS BASIC double density  
PROGRAM INTERFACE**

**REVIEWER: John R. Dye**

**FEATURES: Runs under CP/M 1.4  
or 2.x; works with release 5.2  
N\* software only**

**COMMENTS: This package cost  
\$108.00 including shipping  
charges when I bought it. It  
came with a warning -- Only a  
standard release 5.2 NS BASIC  
without floating point hardware,  
with 8 digit precision BASIC can  
be converted.**



The master disk, NSDD format, contains several .COM programs and a couple of control files. The program NSDD provides the capability to move files and programs from a NSDOS disk to a CP/M disk. It allows individual files to be copied or the whole disk. It is designed to work

like NSDOS (in other words, under CP/M, you can use NSDOS commands), and includes the ability to list the NS disk directory.

A program called NS5CNVT installs the conversion. It uses the -BASIC file on the NS 5.2 master disk, the same one MOVER uses. The programs NSLIST and NSENER are used to convert NS BASIC packed format program files to/from standard CP/M text files to allow the use of standard CP/M text editors. This in itself is worth the price of admission if you have a full screen editor running under CP/M!

There is an additional warning note in the user manual -- when using the program NSDD, always have your CP/M system disk in drive A and your North Star DOS disk in drive 2. When the instructions are followed, the system works.

\*\*\*\*\*  
**HELP WANTED: Compass** could use additional reviews of ALIEN EQUIPMENT that worked or failed to work with your N\*. If you are using an advanced product, such as a \$1600 Morrow hard disk, one of the "warp" RAM drives, an SSM VB3 video board, MP/M or MP/M2, or an 8/16 CPU (such as the CompuPro 8085/88), your experiences would be especially interesting to other N\* users.

W.L.

\*\*\*\*\*

**WANTED**

I will need a North Star Horizon for one week this summer. I would prefer to rent it from someone in Sunnyvale or vicinity rather than transporting my own across the country. It will be used in an office environment only. I must have two quad capacity disk drives and 56K memory. Contact F.H. Raab, Green Mountain Radio Company, 240 Staniford Road, Burlington, VT 05401. Tel. (802) 862-0997.

# DIRUTIL



## DirectoryUtilityProgram

by  
Saul G. Levy  
2555 E. Irvington Rd., Lot 47  
Tucson, AZ 85714  
(602) 889-7753

DIRUTIL is a complete directory utility written entirely in BASIC. It will work with all North Star Micro Disk Systems in both densities (with one minor change for quad). The program will first ask for the name of the directory file which must be on every diskette (also on the back sides, if you use floppy disks). To create a directory file name, enter DOS and type:

CR DIR 4 0    OR    CR DIR 8 0

The first one is for single-density, the second for double/quad. The name DIR (or whatever) may be used for all of your diskettes, or you can number them or use a different name on each to give a better idea of the contents (for example: ASSY, ASSY2, ASSY3, etc.). If different names are used, the program will check for the same diskette before allowing writing of the directory back onto it. Otherwise, you can write a perfectly valid directory back onto the wrong diskette! Note that the directory file was not TYPed

(see Modifications below). You must use the '0' to create a directory file which starts at disk address zero.

## Features

DIRUTIL was written to run as fast as possible when reading and writing the directory. A modified bubble sort is included due to its simplicity of code and because most directories are fairly short anyway (10 to 40 files per diskette). After the directory file is read byte by byte, the following menu options will be given:

### Sort by:

**disk address** (for neat directories and easy notice of the next available address),

**file names** (for ease of finding files), or

**file types** in name order (if you prefer)

**Crunch** any or all BASIC program files (Type 2) of all unused space

**End** the program without writing the current directory file (you must end this way or reboot due to the Error Sets)

**List** the directory in two columns in almost the normal format

**Rename** a file with a valid name including the directory's name (do not embed spaces within the name or make duplicates)

**Reread** the same directory (aborting all changes so far)

**Read** a different directory file (change diskettes first)

**List statistics** about this diskette (in blocks)

Write the current version of the directory file (see Warnings below)

All directory sorts will move the directory name to the first file location so it will be easy to find. As the directory is read it will be compacted. Any deleted file names will be ignored so a new file name will always appear at the bottom of the list instead of anywhere.

This program was written with Release 5.2 software. It was tested with single- and double-density (and mixed) directories. Release 5.1 software was also used.

DIRUTIL is a large program which will run as is in a 44K or larger system. If you remove all REMarks and unnecessary spaces, it will run in 38K of memory.

### Modifications

A completeness variable is used to shorten the reading and writing of the directory file. It will end these functions after five empty file names in a row have occurred (Line 470). Change it to suit (up to 127), but it is not harmful in any way: file names which have not been read will not be written over. If you are using quad drives, change Line 7470 from the 350 to 700. If you are still using early Release 4 (no NSAVE) or even earlier software (gosh!), you will have to Type the directory file name as a Type 3 file and delete the %T1's in the OPEN file statements in Lines 560 and 8080. Change the clear screen string in Line 210 to whatever you need (an ADM-3A here). Note that the commas (,) after the clear screens may cause trouble with certain terminals (like Soroc-120's). Remove them or add spaces in Lines 220, 1010, 2000, 4000, 5000, 6000, and 8000. Direct cursor addressing is used in Lines 7420 and 7500. Change this to suit your terminal or just print

blank lines for the first one (the second one jumps back up to the menu INPUT).

A variable and line number cross-reference listing is included if you wish to change anything else. The program to do this is by Larry Hudson (see Dr. Dobb's, No. 49, October, 1980, p.32). It is the best cross-reference program I have seen.

### Warnings

If you have entered this program by hand, you had better test it before ruining one of your directory files (a very large disaster if you have no backup)! Copy a suitable directory to another diskette or write another copy of it at the bottom of the available disk space (remember where you put it!). Failure to do this until the program is fully checked out is asking for trouble. Other problems can include: power glitches, thunderstorms, bad memory, etc. You should list the directory after every change to make sure each one worked. To check out this program fully, you should then LOAD, GO, or otherwise check every file on a real diskette to be sure the directory is still all right. I have never had this or any other directory utility program destroy a directory, but you have been warned!



**Copyright Notice**  
and  
**Distribution Rights**

You may remove all REMarks and unnecessary spaces, which take up over 46% of this program, but do not remove my copyright notice in Line 40. This program may not be sold in any way or in any form by anyone (except INSUA) including user group diskettes which have any fee connected with them. I do authorize free distribution of this program ONLY IN ITS COMPLETE FORM to anyone you wish.

I have warned you about destroying directories and will not be liable for any damages resulting from anyone's doing so. If you give this program to anyone without this warning, you will be liable for any damages!

**Final Comments**

This program contains a number of subtleties, so change it at your own risk. Every line of executable code has a reason for being included! A complete description of what every line does is being prepared and will be available for \$3.00 to cover copying, postage, and handling. Please feel free to write or call me if there is anything else you would like to discuss. I hope you will find this program to be as useful as I have.

```

10 REM PROGRAM DIRECTORY UTILITY, VERSION 1 (ENTIRELY IN BASIC)
20 REM WRITTEN BY SAUL G. LEVY, TUCSON, ARIZONA, JULY 24-31, 1982
30 REM LAST CHANGED SEPTEMBER 21, 1982
40 REM (C) COPYRIGHT SAUL G. LEVY, 1982
50 REM
60 REM SET COMPLETENESS FLAG (C) AS NEEDED (JT IS HARMLESS)
70 REM
80 REM
90 REM ERROR SET
100 ERRSET 9000,28,29
110 REM
120 REM DIMENSIONS
130 REM D(X,Y) WILL CONTAIN THE LAST 2 Y'S AS DUMMY COLUMNS FOR USE DURING
140 REM SORTS, THE 16TH FOR TEMPORARY DATA AND THE 17TH FOR THE POINTER
150 DIM D(127,17),N$(128*12),P(127),H$(16),O$(8),Z9$(17),D1$(12)
160 REM
170 REM HEX DIGIT'S STRING (PLUS 0) FOR GO ADDRESSES
180 H$="123456789ABCDEF0"
190 REM
200 REM CLEAR SCREEN
210 A$=CHR$(26)
220 I A$,"NORTH STAR DISKETTE DIRECTORY UTILITY PROGRAM, VERSION 1"
230 I
240 REM
250 REM ENTER DIRECTORY NAME
260 INPUT "ENTER DIRECTORY NAME (,DRIVE #): ",D$
270 REM
280 REM HOW LONG IS DIRECTORY NAME WITHOUT ANY DRIVE NUMBER
290 IF D$(LEN(D$)-1,LEN(D$)-1)="," THEN R=LEN(D$)-2 ELSE R=LEN(D$)
300 REM
310 REM IS DIRECTORY NAME VALID? J I IS THE FILE TYPE
320 T1=FILE(D$)
330 IF T1<>-1 THEN 400
340 I
350 I "DIRECTORY NAME IS INCORRECT, CTRL-G WILL REENTER SAME ONE"
360 I
370 GOTO 230
380 REM
390 REM CLEAR MOST OF D-ARRAY TO BLANKS (32'S), SET P-ARRAY TO THE VALUE OF J
400 FOR I= 0 TO 127
410 D(I,0)=32 \ D(I,1)=32 \ D(I,2)=32 \ D(I,3)=32 \ D(I,4)=32 \ D(I,5)=32
420 D(I,6)=32 \ D(I,7)=32 \ D(I,8)=32 \ D(I,9)=32 \ D(I,10)=32 \ D(I,11)=32
430 D(I,12)=32 \ D(I,13)=32 \ D(I,14)=32 \ D(I,15)=32 \ P(I)=J
440 NEXT I
450 REM
460 REM RESET FLAGS
470 C=5 \ REM COMPLETENESS FLAG, 127=READ THE WHOLE DIRECTORY,
480 \ REM 5=QUIT AFTER 5 EMPTY ENTRIES IN A ROW
490 S=0 \ REM SORT FLAG, 0=NOT SORTED, 1, 2, OR 3=NUMBER OF LAST SORTING
500 T=0 \ REM STATISTICS FLAG, 0=NONE, 1=EXISTING, 2=RECALCULATE
510 REM
520 REM N IS THE NUMBER OF VALID ENTRIES-1
530 N=-1
540 REM
550 REM OPEN DIRECTORY FILE, Z IS THE SIZE OF THE FILE IN BLOCKS
560 OPEN #OST1,D$,Z
570 REM
580 REM READ DIRECTORY, D(4,15) WILL ALWAYS BE A BLANK SO DO NOT READ IT, IF
590 REM D=32 THEN THIS ENTRY IS EMPTY, C1 IS THE NUMBER OF EMPTY ENTRIES
600 REM SKIPPED OVER SO RESET JT TO 0 EACH TIME A VALID ENTRY IS READ
610 FOR I= 0 TO 16*Z-1

```

```

620 READ #EXT#16,&D
630 IF D=32 THEN 700
640 C1=0
650 H=N+1
660 D(N,0)=D
670 READ #0,&D(N,1),&D(N,2),&D(N,3),&D(N,4),&D(N,5),&D(N,6),&D(N,7),&D(N,8)
680 READ #0,&D(N,9),&D(N,10),&D(N,11),&D(N,12),&D(N,13),&D(N,14)
690 GOTO 720
700 C1=C1+1
710 IF C1>C THEN EXIT 780
720 NEXT J
730 I=J-1
740 REM
750 REM SAVE LAST DIRECTORY ENTRY READ OR SKIPPED OVER SO COMPLETENESS TEST IS
760 REM HARMLESS (ANY ENTRY NOT READ WILL NOT BE ERASED WHEN THE COMPACTED
770 REM DIRECTORY FILE IS WRITTEN BACK TO THE DISKETTE)
780 I=J
790 REM
800 REM CLOSE DIRECTORY FILE
810 CLOSE #0
820 REM
830 REM PRINT MENU ROUTINE
840 REM
850 ERRSET \ ERRSET 9000,28,29
1010 I A$,TAB(26),D$, " DIRECTORY MENU"
1020 I
1030 I "DIRECTORY SORTING OPTIONS:",TAB(40),"OTHER OPTIONS:"
1040 I
1050 I "S1 =SECTOR ADDRESS",TAB(40),"C =CRUNCH BASIC PROGRAM FILE SPACE"
1060 I "S2 =FILE NAME",TAB(40),"E =END PROGRAM (NO FILE CHANGES)"
1070 I "S3 =FILE TYPE",TAB(40),"L =LIST DIRECTORY"
1080 I TAB(40),"N =RENAME FILE"
1090 I TAB(40),"R1 =READ SAME DIRECTORY (ABORT CHANGES)"
1100 I TAB(40),"R2 =READ NEW DIRECTORY (CHANGE DISKS)"
1110 I TAB(40),"T =DISKETTE STATISTICS"
1120 I TAB(40),"W =WRITE CURRENT DIRECTORY"
1130 I
1140 IF T>0 THEN 7000
1150 INPUT "ENTER CHOICE: ",C$
1160 IF LEN(C$)=0 THEN 1150
1170 REM
1180 REM MENU ITEM SELECTION ROUTINE
1190 REM
1200 IF C$(1,1)="S" THEN 2000
1210 IF C$(1,1)="R" THEN 3000
1220 IF C$="C" THEN 4000
1230 IF C$<>"E" THEN 1250
1240 END
1250 IF C$="L" THEN 5000
1260 IF C$="N" THEN 6000
1270 IF C$="T" THEN 7000
1280 IF C$="W" THEN 8000
1290 GOTO 1150
1300 REM FINISHED
1370 REM
1980 REM DIRECTORY SORT ROUTINE
1990 REM
2000 I A$, "DIRECTORY SORT"
2010 I
2020 I
2030 IF LEN(C$)>2 THEN 1000
2040 IF C$(2)<"1" THEN 1000
2050 IF C$(2)>"3" THEN 1000
2060 I "CREATING STRING TO SORT"
2070 I
2080 S=VAL(C$(2))
990 ON S GOTO 2150,2410,2650
100 REM
110 REM SORT BY DISK ADDRESS (BYTES 8-9)
120 REM PUT DISK ADDRESS INTO DUMMY ARRAY COLUMN 16, CREATE GIANT STRING N$
130 REM FOR SORT (RIGHT JUSTIFIED), PUT POINTER INTO DUMMY ARRAY COLUMN 17,
140 REM N1 IS THE SIZE OF EACH SUBSTRING IN N$
150 N1=4
160 N$=""
170 FOR J=0 TO N
180 D(J,16)=D(J,8)+256*D(J,9)
190 N$=N$+STR$(D(J,16))
200 IF LEN(N$)<(J+1)*N1 THEN N$=N$+" " ELSE 2220
210 GOTO 2200
220 IF N$(LEN(N$))=" " THEN N$(LEN(N$)-N1+2)=N$(LEN(N$)-N1+1) ELSE 2240
230 GOTO 2220
240 D(J,17)=J
250 NEXT J
260 REM
270 REM CALL THE SORT
280 N=FNA(H,N1)
290 REM
300 REM SAVE POINTERS IN P-ARRAY
310 FOR J=0 TO N
320 P(J)=D(J,17)
330 NEXT J
340 GOTO 1000
350 REM
360 REM SORT BY FILE NAME (BYTES 0-7)
370 REM CREATE GIANT STRING N$ FOR SORT, CHANGE FIRST CHARACTER OF DIRECTORY
380 REM FILE NAME TO A BLANK SO IT WILL SORT TO THE FIRST PLACE (THIS WOULD BE
390 REM AN ILLEGAL FILE NAME), PUT POINTER IN DUMMY ARRAY COLUMN 17, N1 IS THE
400 REM SIZE OF EACH SUBSTRING IN N$
410 N1=8
420 N$=""
430 FOR J=0 TO N
440 GOSUB 9400
450 IF D$(1,R)<N$(J*N1+1,J*N1+R) THEN 2470
460 IF D(J,8)=0 AND D(J,9)=0 THEN N$(J*N1+1,J*N1+1)=" "
470 D(J,17)=J
480 NEXT J
490 REM
500 REM CALL THE SORT
510 N=FNA(H,N1)
520 REM
530 REM SAVE POINTERS IN P-ARRAY
540 FOR J=0 TO N
550 P(J)=D(J,17)
560 NEXT J
570 GOTO 1000
580 REM
590 REM SORT BY FILE TYPE (BYTE 12)
600 REM PUT FILE TYPE WITHOUT DOUBLE-DENSITY BIT 7 INTO DUMMY ARRAY COLUMN 16,
610 REM PUT FILE NAME INTO STRING H$, CHANGE TYPE OF DIRECTORY NAME TO -1 SO
620 REM IT WILL SORT TO THE FIRST PLACE, THEN CREATE GIANT STRING N$ WITH FILE
630 REM TYPE FIRST THEN FILE NAME FOR NAME SORT WITHIN EACH TYPE, PUT POINTER
640 REM INTO DUMMY ARRAY COLUMN 17, N1 IS THE SIZE OF EACH SUBSTRING IN N$
650 FOR J=0 TO N
660 N$=""
670 GOSUB 9400
680 D(J,16)=D(J,12)-128*(D(J,12)>127)
690 IF D$(1,R)<N$(1,R) THEN 2710
2700 IF D(J,16)=T1 AND D(J,8)=0 AND D(J,9)=0 THEN D(J,16)=-1
2710 NEXT J
2720 N1=12
2730 N$=""
2740 FOR I=0 TO N

```

```

4,70 I
4330 I "FILE NOT TYPE 2"
4390 GOTO 4420
4400 I
4410 I "FILE NOT CHANGED"
4420 I #
4430 I
4440 INPUT "CRUNCH ANOTHER FILE (Y OR N): ",C$
4450 I
4460 IF C$="Y" THEN 4000
4470 GOTO 1000
4480 REM
4490 REM CRUNCH ALL TYPE 2 FILES
4500 I #51
4510 FOR I= 0 TO N
4520 REM
4530 REM TYPE 2 FILE?
4540 IF D(I,12)-128*(D(I,12)>127)<>2 THEN 4670
4550 IF D(I,12)>127 THEN Z=2 ELSE Z=1
4560 REM
4570 REM PRINT NAME OF FILE
4580 N$=""
4590 GOSUB 9400
4600 I "BASIC PROGRAM FILE ",N$," WAS",Z*D(I,10)," BLOCKS LONG, ",
4610 REM
4620 REM CAN THE FILE SPACE BE CRUNCHED? IF SO, CRUNCH IT
4630 IF Z*D(I,10)<=D(I,13)+C THEN 4660
4640 D(I,10)=D(I,13)+C
4650 GOSUB 9900
4660 I "IT IS NOW",Z*D(I,10)
4670 NEXT I
4680 I #
4690 INPUT "HIT RETURN TO CONTINUE ",C$
4700 GOTO 1000
4710 REM FINISHED
4790 REM
4980 REM LIST DIRECTORY ROUTINE (IN DOUBLE-COLUMNS)
4990 REM
5000 I A$,"DIRECTORY LISTING"
5010 I1=INT(N/2)
5020 FOR I= 0 TO I1
5030 I2=I+I1+1
5040 K=P(I) \ K1=P(I2)
5050 D1$=" D" \ D2$=" D"
5060 IF D(K,12)<128 THEN D1$=" S" \ IF D(K1,12)<128 THEN D2$=" S"
5070 B=D(K,10)+256*D(K,11) \ B1=D(K1,10)+256*D(K1,11)
5080 IF D1$=" D" THEN B=2*B \ IF D2$=" D" THEN B1=2*B1
5090 FOR J= 0 TO 7 \ I CHR$(D(K,J)) \ NEXT J
5100 I #4I,D(K,8)+256*D(K,9),#5I,B,D1$,#4I,D(K,12)-128*(D(K,12)>127),
5110 I #M$(D(K,13),D(K,14),1),TAB(41)),
5120 IF I<I1 THEN 5160
5130 IF I1<>N/2 THEN 5160
5140 I
5150 GOTO 5210
5160 FOR J= 0 TO 7 \ I CHR$(D(K1,J)) \ NEXT J
5170 I #4I,D(K1,8)+256*D(K1,9),#5I,B1,D2$,#4I,D(K1,12)-128*(D(K1,12)>1)
5180 I #M$(D(K1,13),D(K1,14),2)
5190 REM
5200 REM STOP LISTING AT END OF EACH PAGE OR AT END OF DIRECTORY
5210 IF J=22 OR J=45 OR J=11 THEN INPUT "HIT RETURN TO CONTINUE ",C$
5220 NEXT J
5230 I #
5240 GOTO 1000
5250 REM FINISHED
5970 REM
5980 REM RENAME FILE ROUTINE

```

```

2750 N$=N$+STR$(D(I,10))
2760 IF LEN(N$)<>J*N1+4 THEN N$=N$+" " ELSE 2780
2770 GOTO 2760
2780 GOSUB 9400
2790 D(I,17)=I
2800 NEXT I
2810 REM
2820 REM CALL THE SORT
2830 H=FNA(H,N1)
2840 REM
2850 REM SAVE POINTERS IN P-ARRAY
2860 FOR J= 0 TO N
2870 P(J)=D(I,17)
2880 NEXT J
2890 GOTO 1000
2900 REM FINISHED
2970 REM
2980 REM READ SAME/NEW DIRECTORY ROUTINE
2990 REM
3000 IF LEN(C$)<>2 THEN 1000
3010 IF C$(2)<"1" THEN 1000
3020 IF C$(2)>"2" THEN 1000
3030 C=VAL(C$(2))
3040 CLOSE #0
3050 ON C GOTO 400,220
3060 REM FINISHED
3970 REM
3980 REM CRUNCH BASIC PROGRAM FILE SPACE ROUTINE
3990 REM
4000 I A$,"CRUNCH BASIC PROGRAM FILE SPACE"
4010 I "YOU CAN USE CTRL-C TO EXIT FROM ANY INPUT STATEMENT HALT"
4020 I
4030 INPUT "LEAVE HOW MANY EXTRA BLOCKS (IF POSSIBLE, CR=0): ",C$
4040 IF LEN(C$)=0 THEN C=0 ELSE C=VAL(C$)
4050 O$=""
4060 INPUT "CRUNCH ALL BASIC PROGRAM FILES (Y OR N): ",C$
4070 IF C$="Y" THEN 4500
4080 REM
4090 REM CRUNCH SINGLE FILE NAME
4100 INPUT "CRUNCH WHICH FILE NAME: ",O$
4110 O$=O$+" "
4120 I #51
4130 REM
4140 REM FIND FILE NAME
4150 FOR I= 0 TO N
4160 N$=""
4170 GOSUB 9400
4180 IF O$<>N$ THEN 4330
4190 REM
4200 REM TYPE 2 FILE?
4210 IF D(I,12)-128*(D(I,12)>127)<>2 THEN EXIT 4370
4220 IF D(I,12)>127 THEN Z=2 ELSE Z=1
4230 REM
4240 REM CAN THE FILE SPACE BE CRUNCHED? IF SO, CRUNCH IT
4250 IF Z*D(I,10)<=D(I,13)+C THEN EXIT 4400
4260 REM
4270 REM PRINT NAME OF FILE
4280 I "BASIC PROGRAM FILE ",N$," WAS",Z*D(I,10)," BLOCKS LONG, ",
4290 D(I,10)=D(I,13)+C
4300 GOSUB 9900
4310 I "IT IS NOW",Z*D(I,10)
4320 EXIT 4420
4330 NEXT I
4340 I
4350 I "FILE NAME NOT FOUND"
4360 GOTO 4420

```

```

5990 REM
6000 I A$, "RENAME FILE"
6010 I
6020 INPUT "OLD FILE NAME: ", O$
6030 IF LEN(O$)=0 THEN 6020
6040 IF O$(1,1)=" " THEN 6020
6050 INPUT "NEW FILE NAME: ", O1$
6060 IF LEN(O1$)=0 THEN 6050
6070 IF O1$(1,1)=" " THEN 6050
6080 O$=O1$+" "
6090 O1$=O1$+" "
6100 REM
6110 REM FIND OLD FILE NAME
6120 FOR J=0 TO N
6130 N$=""
6140 GOSUB 9400
6150 IF O$<>N$ THEN 6240
6160 REM
6170 REM CHANGE OLD NAME TO NEW NAME
6180 FOR J=0 TO 7
6190 D(I,J)=ASC(O1$(J+1,J+1))
6200 NEXT J
6210 I
6220 I "FILE RENAMED"
6230 EXIT 6270
6240 NEXT J
6250 I
6260 I "FILE NAME NOT FOUND"
6270 I
6280 INPUT "RENAME ANOTHER FILE (Y OR N): ", C$
6290 IF C$="Y" THEN 6000
6300 GOTO 1000
6310 REM FINISHED
6360 REM
6370 REM DISKETTE STATISTICS ROUTINE
6380 REM
6390 REM CHANGE SORT FLAG INTO A STRING FOR PRINTING
7000 IF S=0 THEN S$="NOT SORTED"
7010 IF S=1 THEN S$="ADDRESS"
7020 IF S=2 THEN S$="NAMES"
7030 IF S=3 THEN S$="TYPE"
7040 REM
7050 REM TEST STATISTICS FLAG SO CALCULATIONS ARE DONE ONLY WHEN NEEDED
7060 IF T=1 THEN 7420
7070 S1=0 \ S2=0 \ S3=0 \ Y=0 \ Z1=1
7080 REM
7090 REM READ ALL FILE ENTRIES
7100 FOR I=0 TO N
7110 REM
7120 REM SAVE THE HIGHEST DISK ADDRESS IN Y AND ITS DIRECTORY LOCATION IN S3
7130 REM TO CALCULATE COMPACTABLE BLOCKS
7140 X=D(I,8)+256*D(I,9)
7150 IF X<=Y THEN 7210
7160 Y=X
7170 S3=I
7180 REM
7190 REM SET Z TO DENSITY FOR PROPER CALCULATION OF FILE SIZES, RESET Z1 IF ANY
7200 REM DOUBLE-DENSITY FILES EXIST
7210 IF D(I,12)>127 THEN Z=2 ELSE Z=1
7220 IF Z=2 THEN Z1=2
7230 REM
7240 REM S1 IS THE TOTAL NUMBER OF BLOCKS ACTUALLY IN USE
7250 S1=S1+1*(D(I,10)+256*D(I,11))
7260 REM
7270 REM S2 IS THE TOTAL NUMBER OF CRUNCHABLE BLOCKS (CORRECTED FOR DOUBLE-
7280 REM DENSITY FILES ALWAYS USING AN EVEN NUMBER OF BLOCKS), D(I,14) IS
5990 REM ALWAYS A ZERO (YOU CANNOT LOAD A 256-BLOCK BASIC PROGRAM FILE)
7300 IF D(I,12)-128*(D(I,12)>127)<>2 THEN 7340
7310 W=Z*D(I,10)-D(I,13)
7320 IF Z=2 AND W>1 AND W/2<>INT(W/2) THEN W=W-1
7330 IF Z=1 THEN S2=S2+Z1*W ELSE IF W>1 THEN S2=S2+W
7340 NEXT I
7350 REM
7360 REM S4 IS THE NEXT AVAILABLE FILE BLOCK ADDRESS, THIS IS THE NUMBER OF
7370 REM BLOCKS IN USE PLUS COMPACTABLE BLOCKS
7380 IF D(S3,12)>127 THEN Z=2 ELSE Z=1
7390 S4=Z1*(D(S3,8)+256*D(S3,9))+Z*(D(S3,10)+256*D(S3,11))
7400 REM
7410 REM PRINT STATISTICS
7420 I CHR$(27),CHR$(61),CHR$(47),CHR$(32)
7430 I TAB(26),"DISKETTE STATISTICS:"
7440 I
7450 I TAB(26)," NUMBER OF FILES:",#5I,N+1," SORT FLAG: ",S$
7460 I TAB(26)," ALLOCATED BLOCKS:",S4
7470 I TAB(26)," AVAILABLE BLOCKS:",Z1*350-S4
7480 I TAB(26)," COMPACTABLE BLOCKS:",S4-S1
7490 I TAB(26)," CRUNCHABLE BLOCKS:",S2
7500 I #,CHR$(27),CHR$(61),CHR$(45),CHR$(32),
7510 REM
7520 REM SET STATISTICS FLAG
7530 T=1
7540 GOTO 1150
7550 REM FINISHED
7560 REM
7570 REM WRITE DIRECTORY ROUTINE
7580 REM
7590 REM CHECK THAT THE SAME DIRECTORY NAME AND TYPE IS ON THE CURRENT DISKETT
8000 I A$,"WRITE DIRECTORY FILE"
8010 IF FILE(D$)=1 THEN 8080
8020 I
8030 I "DIRECTORY FILE NAME NOT ON CURRENT DISKETTE, WAS THE DISKETTE CHANGED?"
8040 I "DIRECTORY FILE CANNOT BE WRITTEN UNTIL YOU FIX THIS PROBLEM!"
8050 GOTO 8230
8060 REM
8070 REM OPEN DIRECTORY FILE
8080 OPEN #0:1,D$,Z
8090 REM
8100 REM I IS THE TOTAL NUMBER OF DIRECTORY ENTRIES READ OR SKIPPED OVER, THE
8110 REM P-ARRAY HOLDS THE CURRENT ORDER, D(J,15) WILL BE WRITTEN TO CLEAR IT
8120 FOR I=0 TO L
8130 J=P(I)
8140 WRITE #0:1#16,&D(J,0),&D(J,1),&D(J,2),&D(J,3),&D(J,4),&D(J,5),NOENDMARK
8150 WRITE #0,&D(J,6),&D(J,7),&D(J,8),&D(J,9),&D(J,10),&D(J,11),NOENDMARK
8160 WRITE #0,&D(J,12),&D(J,13),&D(J,14),&D(J,15),NOENDMARK
8170 NEXT I
8180 REM
8190 REM CLOSE DIRECTORY FILE
8200 CLOSE #0
8210 I
8220 I "DIRECTORY FILE WRITTEN"
8230 I
8240 INPUT "HIT RETURN TO CONTINUE ", C$
8250 GOTO 1000
8260 REM FINISHED
8270 REM
8280 REM ERROR MESSAGE ROUTINE
8290 REM
9000 ERRSET \ ERRSET 9000,Z8,Z9
9010 RESTORE 9020
9020 DATA "INVALID ARGUMENT","DIMENSION","OUT OF BOUNDS","TYPE","FORMAT"
9030 DATA "LINE NUMBER","FILE","HARD DISK","DIVIDE BY ZERO","SYNTAX","READ"
9040 DATA "INPUT","ARGUMENT MISMATCH","NUMERIC OVERFLOW","STOP","LENGTH"

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9050 FOR I= 1 TO Z9
9060 READ Z9$
9070 NEXT I
9080 I =#
9090 I Z9$, " ERROR IN LINE",Z8
9100 I
9110 INPUT "HIT RETURN TO CONTINUE ",C$
9120 GOTO 1000
9130 REM FINISHED
9170 REM
9180 REM MODIFIED BUBBLE SORT ROUTINE (FOR STRINGS), N IS THE NUMBER OF
9190 REM SUBSTRINGS OF SIZE N1
9200 REM
9210 DEF FMA(N,N1)
9220 I "SORTING "
9230 FOR J= 0 TO N-1
9240 FOR J= J+1 TO N
9250 P=J*N1+1 \ P1=(J+1)*N1
9260 P2=J*N1+1 \ P3=(J+1)*N1
9270 IF N$(P,P1)<N$(P2,P3) THEN 9300
9280 D1=N$(P,P1) \ N$(P,P1)=N$(P2,P3) \ N$(P2,P3)=D1$
9290 D=D(J,17) \ D(I,17)=D(J,17) \ D(J,17)=D
9300 NEXT J
9310 NEXT J
9320 I "FINISHED"
9330 RETURN N
9340 FNEND
9350 REM FINISHED
9370 REM
9380 REM CONVERT FILE NAME INTO STRING N$ ROUTINE
9390 REM
9400 FOR J= 0 TO 7
9410 M$=M$+CHR$(D(I,J))
9420 NEXT J
9430 RETURN
9440 REM FINISHED
9560 REM
9570 REM DECIMAL TO HEX CONVERSION ROUTINE, LOW- AND HIGH-BYTE CONVERTED INTO 2
9580 REM CHARACTERS EACH, L=LOW-BYTE, H=HIGH, P=PRINT COLUMN FLAG
9590 REM
9600 DEF FNH$(L,H,P)
9610 G$=""
9620 ON P GOTO 9630,9650
9630 IF D(P(I),12)<>1 AND D(P(I),12)<>129 THEN RETURN G$
9650 IF D(P(I2),12)<>1 AND D(P(I2),12)<>129 THEN RETURN G$
9660 Z(1)=INT(H/16)
9670 Z(2)=H-16*Z(1)
9680 Z(3)=INT(L/16)
9690 Z(4)=L-16*Z(3)
9700 FOR J= 1 TO 4
9710 IF Z(J)=0 THEN Z(J)=16
9720 G$(J+1,J+1)=H$(Z(J),Z(J))
9730 NEXT J
9740 RETURN G$
9750 FNEND
9760 REM FINISHED
9860 REM
9870 REM DOUBLE-DENSITY FILE HANDLER ROUTINE
9880 REM
9890 REM FORCE DOUBLE-DENSITY FILES TO AN EVEN NUMBER OF BLOCKS, THERE IS ROOM
9900 IF Z=1 THEN 9970
9910 IF D(I,10)/2<>INT(D(I,10)/2) THEN D(I,10)=D(I,10)+1
9920 REM
9930 REM DOUBLE-DENSITY FILES ARE TWO BLOCKS PER SECTOR
9940 D(I,10)=D(I,10)/2

```

VARIABLE	CROSS	REFERENCE FOR DIRUTIL	2000	4000	5000	6000	8000
A\$	210	220	1010	2000	4000	5000	6000
B	5070	5080	5100				
B1	5070	5080	5170				
C	470	710	3030	3050	4250	4290	4630
C\$	1150	1160	1200	1210	1230	1250	1260
	1280	2030	2050	2080	3000	3010	3020
	4030	4040	4060	4440	4460	4690	5210
	6290	8240	9110				
C1	640	700	710				
D	620	630	660	9290	2450	2690	8010
D\$	260	290	320	560	670	680	2180
D(I)	150	410	420	430	2680	2700	2790
	2240	2320	2460	2470	2550	2700	2790
	2870	4210	4220	4250	4290	4310	4540
	4600	4630	4640	4660	5070	5090	5110
	5160	5170	5180	6190	7140	7250	7300
	7380	7390	8140	8150	9290	9410	9630
	9910	9940					
D1\$	150	5050	5060	5080	5100	9280	
D2\$	5050	5060	5080	5170			
G\$	9610	9630	9650	9720	9740		
H	9600	9660	9670				
I\$	150	180	9720				
I	400	410	420	430	610	620	720
	780	2170	2180	2190	2240	2250	2310
	2330	2430	2450	2460	2480	2550	2560
	2650	2680	2700	2710	2750	2760	2800
	2860	2870	2880	4120	4210	4220	4280
	4290	4310	4330	4500	4540	4550	4630
	4640	4660	4670	5020	5040	5100	5170
	5210	5220	6120	6190	7100	7140	7210
	7250	7300	7310	7340	8120	8130	8170
	9050	9070	9230	9240	9290	9310	9410
	9910	9940					
I1	5010	5020	5030	5120	5130	5210	
I2	5030	5040	9650				
J	5090	5160	6180	6190	6200	8130	8160
	9240	9260	9290	9300	9400	9410	9700
	9720	9730					
K	5040	5060	5070	5090	5100	5110	
K1	5040	5060	5070	5160	5170	5180	
L	780	8120	9600	9680	9690		
N	530	650	670	680	2170	2280	2430
	2510	2540	2650	2740	2830	2860	4510
	5130	6120	7100	7450	9210	9230	9330
N\$	150	2160	2190	2200	2220	2450	2660
	2690	2730	2750	2760	4160	4280	4600
	6130	6150	9270	9280	9410		
N1	2150	2200	2220	2280	2410	2450	2720
	2760	2830	9210	9250	9260		
O\$	150	4050	4100	4110	4180	6020	6040
	6150	6050	6060	6070	6090	6190	
O1\$	150	9250	9270	9600	9620		
P	150	430	2320	2550	2870	5040	9630
P(I)	150	9270	9280				
P1	9250	9270	9280				
P2	9260	9270	9280				
P3	9260	9270	9280				
R	290	2450	2690				



S	490	2080	2090	7000	7010	7020	7030
S\$	7000	7010	7020	7030	7040		
S1	7070	7250	7480				
S2	7070	7330	7490				
S3	7070	7170	7380	7390			
S4	7390	7460	7470	7480			
T	500	1140	7060	7530	9970		
T1	320	330	560	2700	8010	8080	
T2	7310	7320	7330				
X	7140	7150	7160				
Y	7070	7150	7160				
Y	560	610	4220				
Z	4660	7210	7220	4250	4280	4310	4550
Z()	9900			7310	7320	7330	7380
Z1	9660	9670	9680	9690	9710	9720	4600
Z1	7070	7220	7250	7330	7390	7470	7390
Z8	100	1000	9000	9090			
Z9	100	1000	9000	9050			
Z9\$	150	9060	9090				
FNA	2280	2510	2830	9210			
FNH\$	5110	5180	9600				

LINE NUMBER CROSS REFERENCE FOR DIRUTIL

220	-	3050					
230	-	370					
400	-	330	3050				
700	-	630					
720	-	690					
780	-	710					
1000	-	2030	2040	2050	2340	2570	3000
		1160	4470	4700	6300	8250	3010
		1230	1290	7540		2890	3020
		1200				9120	
		2090					
		2210					
		2220	2230				
		2220					
		2090					
		2450					
		2090					
		2690					
		2770					
		2760					
		2760					
		1210					
		4180	4460				
		4210					
		4250					
		4320	4360	4390			
		4070					
		4630					
		4540					
		1250					
		5120	5130				
		1260					
		6030	6290				
		6060	6040				
		6150	6070				
		6230					
		1140	1270				
		7300					
		7060					
		1280					
		8010					
		8050					
		100	1000	9000			
		9010					
		9270					
		9440					
		9670	9780	4170	4590	6140	
		9620					
		9640					
		4300					
		9900					
		9970					
		9990					

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I hereby nominate \_\_\_\_\_ INSUA membership number (optional) \_\_\_\_\_ as a candidate for the position of Director on the Board of the International North Star Users Association, Inc. This nominee has agreed to become a candidate.

Signature of the nominator \_\_\_\_\_ INSUA no. \_\_\_\_\_

Qualifications: \_\_\_\_\_

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