

# SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

Dec/Jan 1983  
Vol. 2, No. 6

**W**hat a year!

A new line of SuperBrain and CompuStars were introduced. Many new CP/M software packages became available. Powerful hard-disk devices and other peripherals were introduced in the marketplace all with the special needs of the Intertec user in mind.

Next year will introduce new and vastly improved DBMS software packages. 1982 saw an avalanche of word-processors and spreadsheets. 1983, we predict, will see a comparable explosion of database management systems.

dBase II will have to compete with the likes of an improved FMS-80, InfoStar and the new Selector V, which we believe will be the grand winner of them all. It will handshake with Spellbinder and will be the first to provide a complete bridge between word-processing and database management for the end-user.

Games will also begin to arrive for the CP/M user. We're proud to premier an excellent one, Ultra-Trek, which was designed specifically for the SuperBrain I and II. It's a superior game that's very hard to beat, but it can be played at several levels of difficulty. An ad for this new product can be found inside this issue of Superletter.

COMDEX was a huge success - the largest convention in Las Vegas history. Curiously, Intertec chose not to appear, but every other major manufacturer did. And there's going to be some real head-on fighting in the micro marketplace in the months ahead. We had planned to meet with all of you who called, but because of time and circumstances we got swamped. For those of you we missed, accept our apologies. Please be in touch. We'd like to hear from you.

Imitation is the best form of flattery. Intertec is finally about to launch its version of an end-user oriented publication. They'll supposedly be featuring technical notes, fac-

tory news, and letters to the editor. The yearly charge will be \$20.00 for U.S. customers, more for foreign users. Whether or not the factory can really cater to the needs of their users, however, remains to be seen. We welcome this long over-due consumer oriented effort and wish them well.

Jonathan Platt pointed out to us that there may be an error in his screen-dump programs of two issues ago. If you are having difficulty running them, you may give him a call directly for any corrections. Jonathan is also providing professional technical consultation for SuperBrain/CompuStar users and dealers on variety of subjects. Incidentally, an objective review of Jonathan's SOS package will also be found inside this issue.

We were able to snare the 1200 modem we promised to find for you. We looked at the Hayes, but it's a four-month wait. We did find a better 212-A modem, called the Cermetek. It's the sleek, modern modem selected by the U.S. Postal Service and rated 4-Star by InfoWorld. The Price? \$539, plus shipping. It's an excellent auto-answer, auto-dial, 300 to 1200 Baud modem worthy of your consideration. This product joins our 10 MB hard-disk and Daisywriter special priced-offers for our readers.

One last opinion and prediction. Intertec will have to come out with an 8/16 bit machine to stay alive in the jungle atmosphere of the marketplace. Without it there will be no growth. We also think they should deliver or get off the pot with regard to their Irwin Technology internal hard-disk machine.

Let us know what you'd like to see in articles for 1983. This is your forum to exchange information with thousands of other SuperBrain and CompuStar users. Take advantage of us. We're here to help.

*Albert Abrams*  
EDITOR

## Technical Corner

### WHAT CODES DOES THE SUPERBRAIN KEYBOARD SEND?

By Dr. George Corliss  
Dept. of Mathematics  
Marquette University  
Milwaukee, WI 53233

An assembly language program running under CP/M can read a character from the keyboard (console) using at least two methods:

- call BDOS (Basic Disk Operating System) function 6, (direct console I/O), or functions 11, (get console status), and 1 (console input); or
- read directly from appropriate input ports.

Using BDOS calls is generally better because such programs tend to be more easily transported between different CP/M systems. A simple program to read and echo keystrokes is shown in Listing 1.

BDOS function 1 returns the same code, 31H (xxH denotes hexadecimal numbers), for the 1 (one) on the keyboard and for the 1 (one) on the SB keypad. In many applications, one would like to be able to distinguish between these two different keys by reading the appropriate ports directly. This has the disadvantage of requiring knowledge of port addresses and functions on each machine to be programmed, so it is highly machine dependent. It has the advantages of providing many more distinct key codes, of not automatically echoing entered keys, and of making it possible for an applications program to handle properly the arrow keys on the right edge of the SB keypad.

*Continued on Page 6*

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# —Guest Article—

## AN END-USER'S LOOK AT SuperBrain II

by Ralph Manildi, Consultant

For the past 22 months I have had almost daily use of a SuperBrain I QD. The first impression I had of the newer SuperBrain II was that the overall quality, as Superletter first reported, had been improved, especially the cosmetics, cabinet fit and general operation. Most of the PC boards appear to have been redesigned. A number of internal layout improvements have been incorporated. The new character set is easy to read. The fan seems stronger.

There's also better documentation. This pleasant surprise has been very useful for the new features. The new Users Manual is good (not great), but a definite improvement over the SuperBrain I.

The key features of the SuperBrain II are listed below in the order of importance. Following the list is a discussion of each attribute. The features I like the most are:

1. Automatic shut-off of disk drive spindle motors.
2. Keyboard type-ahead (incorporated on late SuperBrain I units).
3. Lower case descenders and new character set.
4. Creation of auto-load disks.
5. Video graphics display control.
6. Alternate character set capability.
7. A battery driven clock.

### AUTOMATIC SHUT-OFF OF SPINDLE MOTORS

This long awaited feature shuts off the disk drive spindle motors when they are not being accessed. To obtain this capability on the SuperBrain I required the purchase of an enhanced DOS (Jon Platt's SOS or IE's SB/E DOS). This feature is especially important when most of one's time is spent writing at the keyboard, not to the disk. The unnecessary motor noise can be distracting, particularly in a very quiet environment. It also saves wear on the motors, extending their life by an estimated 50-500 times in a creative writing application.

### KEYBOARD TYPE-AHEAD

This feature was provided in the later SuperBrain I models. It allows keys to be pressed before a prompt for input appears on the screen. Many application and utility programs can be speeded up.

### LOWER CASE DESCENDERS

After using both SB I & II on a day-to-day basis, the descenders are definitely preferred. The descenders necessitated a new character set and the result is unique. They are unlike any computer screen characters that I have observed. Pleasing, modern and clean are words that describe them well.

### AUTO-LOAD DISK CAPABILITY

This allows the user to create auto-load disks by following the instructions given in the manual (exactly). No other knowledge of assembly language programming is needed. When done, just turn on the SuperBrain, insert the auto-load disk and close the A drive door. If the system is already up, you just hit the red keys (cold boot). The system will boot-up and load the selected program, then begin execution. This technique has merit when a disk is to be used only for a specific application, particularly by non-computer personnel. One disadvantage, there is no convenient method of accessing the CP/M operating system or utilities.

### VIDEO DISPLAY CONTROL

Video display control capability is provided for blinking, half-intensity, underlining and reverse video. The capability for control is via a programming language, BASIC, ASSEMBLY, FORTRAN or PASCAL for example. Only the BASIC code is described in the manual, however, conversion should be no problem for those who need it. The example given in the manual has several omissions and errors in it. A corrected example is shown at the end of this report.

### ALTERNATE CHARACTER SET CAPABILITY

Provision is made for generating a user defined alternate character set. This is a very powerful capability. The programs and instructions are provided so the user can do it with a minimum of head scratching. This is a complex task, and the thought Intertec put into the design of the programs seems well executed.

### BATTERY DRIVEN CLOCK

This provides the user with the time of day. The clock is battery powered so that it is independent of line power. This makes the clock a truly useful feature as compared with the earlier line-power-on dependent clock. The date is also tracked and can be accessed by the user. This will be useful to those who use or write programs that can be enhanced by access to time/date.

### FACTORY SUPPORT EXCELLENT

Shortly after receiving the SuperBrain II, some non-operational problems were noted. A letter to the factory got response within 2-3 days that solved the problems. A subsequent telephone call was promptly returned and my questions and requests answered with a very positive attitude.

### OPTIONAL DIAGNOSTIC DISK

The extra cost Intertec DAI diagnostic disk can be useful as an aid in servicing the computer. This was purchased as a part of my SuperBrain II package. It is well worth the investment if you are so inclined. The disk and written material is reasonably good (15 pages). The programs contained on the disk test the main memory, main and auxiliary ports, both A & B drives, and provide a means to align the video if necessary. In addition, troubleshooting flow charts are provided. The programs are menu driven and easy to follow, even with a minimum of technical knowledge.

Here is the corrected BASIC program without remarks, from page 4-30 of the manual. The omissions or corrections are underlined>.

```
100 CY = 20
110 CX = 5
140 PRINT CHR$(12)
160 GOSUB 510
170 PRINT "Superbrain II Video Attribute Demo"
210 CX = 7:GOSUB 510
220 PRINT CHR$(27);"~";"R";
230 PRINT "Superbrain II Video Attribute Demo"
280 CX = 9:GOSUB 510
290 PRINT CHR$(27);"~";"H";
300 PRINT "Superbrain II Video Attribute Demo"
340 CX = 11:GOSUB 510
350 PRINT CHR$(27);"~";"r"CHR$(27);"~";"U";
360 PRINT "Superbrain II Video Attribute Demo"
430 CX = 13:GOSUB 510
450 PRINT CHR$(27);"~";"h";
470 PRINT "Superbrain II Video Attribute Demo"
480 PRINT CHR$(27);"~";"N"
500 END
510 PRINT CHR$(11)
520 PRINT CHR$(27);"Y";CHR$(CX+31);CHR$(CY+31);
530 RETURN
```

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# REVIEW

## The SOS Operating System by David Storrs

Several issues ago Superletter announced a new product- a BIOS for the SuperBrain - developed by Jonathan Platt. Dubbed the "SuperBrain Operating System" (SOS), the package consists of a replacement for the factory-supplied PROM and the software to run it. The purpose of SOS is to allow user access to capabilities built into the SuperBrain that are inaccessible with the BIOS supplied by Intertec.

I've had an opportunity to work with the system for four weeks now, and while that is not enough time to thoroughly test out a system as versatile as this one, in my opinion, Platt has created a major add-on product that deserves serious attention from anyone owning an Intertec machine.

The enhancements SOS offers consist of greater control over the disk drives, including motor shutoff, a greater ability to program the function keys, more precise control over things like key-click volume and auto-repeat on any key, greatly expanded control of the main and auxiliary ports, the ability to easily and permanently reset the I/O byte and even a tachometer program to check your disk drives for speed stability.

### INSTALLATION

To install the system requires replacing the factory PROM with a custom one supplied. **THIS VOIDS THE WARRANTY!** Intertec has begun using a little piece of tape over one of the case screws that must be destroyed to open the case. Since you can't install the SOS PROM without getting into the case, installing it means voiding your warranty. If that concerns you, you might like to wait until your warranty expires. You don't have to give up the system, however, since the software will also run with the factory PROM and the SB/E PROM from IE Systems, though some limitations are enforced.

If you do decide to install the SOS PROM, it's an easy process: pull the four case screws and open the case, carefully remove the factory PROM and replace it with Platt's version, then close the case. There is a further hardware modification necessary to enable a SuperBrain to use the disk drive motor shut-off capability, but this is no more complicated than snipping a wire and installing a jumper.

The software installation consists of altering the standard CP/M system (using a supplied

program), formatting a disk using the new version of CP/M and setting up the system parameters the way you want them.

### SETSIS

You get into the system by going to the CP/M prompt and entering: SETSYS (CR).

A menu of system parameters comes up, showing you six categories: 1. Main port, 2. Auxiliary port, 3. Screen, 4. Disk, 5. Keyboard, 6. Other.

The first two categories deal with the I/O ports. Twelve parameters may be adjusted from the menu: mode (synchronous /asynchronous), baud rate (50 - 19200), character length (5/6/7/8), parity (odd, even, none), stop bits (1, 1.5, 2), protocol (DSR, XON/XOFF, ETX/ACK or NONE), transmit and receive buffers (activated/deactivated), synch characters (1 or 2), which hex character synch character 1 and 2 will be, and whether SYNc DETect will be input or output.

Compare this to the six parameters that Intertec's Config program allows you to alter: Intertec allows a baud rate from 50 to 9600, while Setsys allows those rates plus 19200; Intertec allows DSR handshaking or none - Setsys also allows xon/xoff and ETC/ACK; Intertec allows a choice of mode only on the main port - the auxiliary port is limited asynchronous operation only while Setsys allows synchronous operation on both ports, essentially equalizing the ports.

The most obviously impressive of SOS's abilities is the great flexibility it gives in configuring the disk drives. You may set up to four drives for number of sides, number of tracks (35 to 128 if your drives can handle that many), seek rate, read-after-write verification, and motor shut off. Being able to vary the number of tracks allows you to read some disks that might be unreadable otherwise. One data disk I had created on a SuperBrain I, using the SB/E PROM, wouldn't read completely on a SuperBrain II until SOS allowed me to reconfigure the drives for 40 track operation.

All the function keys plus the top row of numerical keys may be reprogrammed. Each key may have up to three characters assigned to it and it may be linked to any other key to create functions longer than three characters. Key-click volume, delay before auto-repeat and auto-repeat rate are easily programmed.

All the functions, including those I haven't mentioned here, work and work well. Any problems I had have been my fault because I was in a hurry and didn't do things properly. And in fact, this is my one caveat regarding this product: because there is so much capability, you must take a little more time and a little

more care when setting things up than is necessary with the Intertec system. But what you get is a greatly enhanced machine capable of operating in accordance with your needs and tastes, rather than Intertec's judgement of your needs and tastes.

All in all, I give SOS my highest marks and strongly recommend it for the SuperBrain system.

## —New Products—

### Kramer Systems International Inc.

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Silver Spring, Maryland 20910  
(301) 585-7480

### HARDWARE:

#### KSI S-100 Interface

Kramer Systems announced the availability of a Z-80 S-100 Bus interface. This interface allows any SuperBrain, or CompuStar to directly control devices connected to an S-100 Bus. The KSI S-100 Interface is compatible with IEEE S-100 Bus Standard Specification 696. Capabilities supported include:

- Functional support of interrupts, DMA, and temporary bus masters.
- All read/write data, address, status, and control bus signals generated per IEEE-696.

In addition, while using the KSI S-100 Interface, all inherent SuperBrain and CompuStar capabilities are still available.

- SuperBrain as permanent bus master.
- An 8-bit data path between the SuperBrain and S-100 Bus.
- A 64K bytes S-100 memory space (standard addressing) plus a 64K byte S-100 I/O space (extended addressing), in addition to the SuperBrain internal address space.

### NRD

#### North Ridge Data

1700 Southwest 12th Avenue  
Boca Raton, Florida 33432  
(305) 392-6740  
Contact: J. Neil Haynie

NORTH RIDGE DATA offers documentation covering the SuperBrain II BIOS (DD, QD, SD); Z-80 decoding documentation of the V.4.1 EPROM from Intertec; the V.4.1 NRD EPROM which allows disc timing diagnostics; double-size characters creating 40X24 display on the SuperBrain II; and, NRD PASCAL (similar to UCSD PASCAL).

Listing 2 shows a program which reads the keyboard and displays the character and the hex code returned. This program will let you really explore your keyboard. Codes for the keys on the SB keypad are like the codes for the corresponding keys on the keyboard, except that they have the parity bit set. Hence RETURN is 0DH, and ENTER is 8DH. The CTRL and SHIFT keys in combination with non-letters also generate distinct codes. I was able to generate 180 distinct codes. More codes could be produced in the CAPS LOCK condition, but I prefer to retain a conventional keyboard operation.

I discovered the appropriate port numbers and their functions by reading the source for BIOS (Basic I/O System) and by using the DDT disassembler L command to follow the resulting jumps. This matched the information given in Jonathan Platt's articles in earlier Superletter issues. In the process, I discovered that in normal operation, CTRL W toggles a memory location and returns a null character (00H). I would welcome information regarding what function this provides.

Following the model of Listing 2, direct keyboard reading can be incorporated into your applications program. The subroutine CONINPF can be made as fancy as you like. It could include further CAPS LOCK conversions, printer tog-

gling, or user programmable special function keys. You could even redefine your entire keyboard, to experiment with alternatives to the QWERTY layout, for example.

As a point of interest, KB-SCAN was first developed using FORTH from SuperSoft, Inc. In that environment, only the lowest level subroutines which access the hardware are written in assembler, while the rest of the program can be written in a high level language (see Listing 3). KB-SCAN was then converted to 8080 assembly language in order to make it accessible to a wider audience.

If you use or improve this tool, I would appreciate hearing from you.

Listing 1. Using BDOS Calls to Read and Echo the Keyboard.

```

; KB_SCAN.ASM          Using direct read of input ports
;
;      09-12-82      George Corliss
;
;      What codes do Superbrain keys really generate?
eof      equ      1AH
lf       equ      0AH
cr       equ      0DH
bdos     equ      0005H

org      100H

loop:    lxi      d,msg          ; Display prompt
call    stringf
lpl      call    constaf        ; Get console status
ora      a
jz       lpl                  ; If char ready
call    coninpf              ; then read and echo
call    intohex              ; Convert ASCII code to hex
cpi      eof
jnz     loop
ret

msg      db      cr,lf,'enter key',cr,lf,'$'

intohex: ; Convert binary byte into hex characters
; Entry: (A) = integer
; Returns (A) = integer restored
;         (BC) = hex characters

push    psw
mvi     e,'='
call    conoutf
pop     psw
push    psw
ani     0F0H                ; high order nib
rrc
rrc
rrc
rrc

cpi      0AH
jm       int3                ; if >= 10
adi     55                    ; then A..F
jmp     int4
adi     30H
mov     e,a
call    conoutf              ; Display high order bit
pop     psw
push    psw
ani     0FH                    ; low order nib
cpi     0AH
jm       int1                ; if >= 10
adi     55                    ; then A..F
jmp     int2
adi     30H
mov     e,a
call    conoutf              ; Display low order bit
call    putcr
pop     psw
ret

putcr    mvi     e,cr          ; Send CR, LF to console
call    conoutf
mvi     e,lf
call    conoutf
ret

; FUNCTION 1: CONSOLE INPUT
; RETURN: (A) = ASCII CHARACTER
;
; CONINPF MVI     C,1
;         JMP     BDOS

; FUNCTION 2: CONSOLE OUTPUT
; ENTRY: (E) = ASCII CHARACTER
;
; CONOUTF MVI     C,2
;         JMP     BDOS
    
```

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```

; FUNCTION 9: PRINT STRING
;
; ENTRY: (DE) = ADDRESS OF MESSAGE
; MESSAGE MUST END WITH '$'
STRINGF MVI C,9
JMP BDOS

; FUNCTION 11: GET CONSOLE STATUS
; RETURN: (A) = 0FFH IF CHARACTER IS READY
; = 00H OTHERWISE
CONSTAF MVI C,11
JMP BDOS

;
;
; END

```

Listing 2. Using Direct Port Access for the Keyboard.

```

; KB_SCAN.ASM Using direct read of input ports
;
; 11-14-82 George Corliss
;
; What codes do Superbrain keys really generate?

kbdata equ 50H ; Data port address
kbrset equ 6BH ; Reset port address
kbstat equ 69H ; Status port address

eof equ 1AH
lf equ 0AH
cr equ 0DH
bdos equ 0005H

org 100H

loop: lxi d,msg
call stringf ; Display prompt
call constaf ; Get console status
ora a
jz lpl ; If char ready
call coninpf ; then read (no echo)
call intohex ; Convert ASCII code to hex
cpi eof
jnz loop
ret

msg db cr,lf,'enter key',cr,lf,'$'

intohex: ; Convert binary byte into hex characters
; Entry: (A) = integer
; Returns (A) = integer restored
; (BC) = hex characters

push psw
mov e,a
call conoutf ; Echo character
mvi e,'='
call conoutf
pop psw
push psw
ani 0F0H ; High order nib
rrc
rrc
rrc
rrc
cpi 0AH
jm int3
adi 55 ; If >= 10
; then A..F
jmp int4
adi 30H ; else 0..9
int3 mov b,a
mov e,a
call conoutf ; Display high order bit
pop psw
push psw
ani 0FH ; Low order nib
cpi 0AH
jm int1
adi 55 ; If >= 10
; then A..F
jmp int2
adi 30H ; else 0..9
int1 mov c,a
mov e,a
call conoutf ; Display low order bit
call putcr
pop psw
ret

putcr mvi e,cr ; Send CR, LF to console
call conoutf
mvi e,lf
call conoutf
ret

; FUNCTION 1: CONSOLE INPUT
; RETURN: (A) = ASCII CHARACTER
;
coninpf: ; Console input function.
; Like BDOS function 1 except for
; direct port read and no echo
; Returns: (A) = character code

```

```

in kbstat ; Read status port
mov c,a ; Save port contents
ani l ; If nothing
jz coninpf ; then wait
mvi a,0EH ; Reset port
out kbrset
mvi a,0FH
out kbrset
in kbdata ; Read data port
mov b,a ; Save char
mov a,c ; Handle CAPS LOCK flag from

status port
ani 10H ; If shift lock is not active
jnz chcvl ; then continue
mov a,b ; else process shift lock for

letters
sui 61H ; If char < 'a'
jm chcvl ; then continue
sui 1AH ; If char > 'z'
jp chcvl ; then continue
adi 5BH ; Convert lc char to UC
ret

chcvl mov a,b ; Restore port
ret

```

```

; FUNCTION 2: CONSOLE OUTPUT
; ENTRY: (E) = ASCII CHARACTER
;
CONOUTF MVI C,2
JMP BDOS

; FUNCTION 9: PRINT STRING
; ENTRY: (DE) = ADDRESS OF MESSAGE
; MESSAGE MUST END WITH '$'
STRINGF MVI C,9
JMP BDOS

; FUNCTION 11: GET CONSOLE STATUS
; RETURN: (A) = 0FFH IF CHARACTER IS READY
; = 00H OTHERWISE
constaf: ; Console status. Like BDOS function 11
; except for direct port read
; Returns: (A) = 0FFH if char ready
; = 000H otherwise

in kbstat ; Read status port
ani l ; If nothing
rz ; then return 0
mvi a,0FFH ; else return 0FFH
ret

;
;
; END

```

Listing 3. Using Direct Port Access for the Keyboard from FORTH.

```

( FORTH KEYBOARD SCANNER 11-06-82 G. CORLISS )
( WHAT CODES DO THE SUPERBRAIN KEYS REALLY GENERATE? )

HEX
CODE CONSTAT ; ( MACHINE LANGUAGE PRIMITIVE TO )
69 ; ( READ CONSOL STATUS PORT )
A L LD
0 H LD ; ( HL = STATUS )
$PUSH JP ; ( STATUS ONTO STACK )
EDOC

CODE PORTRST ; ( MACHINE LANGUAGE PRIMITIVE TO )
0E A LD ; ( RESET CONSOL INPUT PORT )
A 6B OUT
0F A LD
A 6B OUT
$NEXT JP
EDOC

CODE CONIN ; ( MACHINE LANGUAGE PRIMITIVE TO )
50 ; ( READ CONSOL INPUT PORT )
A L LD
0 H LD ; ( HL = CHAR )
$PUSH JP ; ( ASCII CODE FOR CHAR ONTO STACK )
)
EDOC

; CONINPF ( LIKE BDOS FUNCTION 1 - WAIT FOR
CHARACTER ) ( --> ASCII CODE )
BEGIN
CONSTAT ; ( STATUS )
1 & ; ( 0 - NOTHING YET, 1 - SOMETHING
WAITING)
END ; ( EXIT IF A CHAR IS WAITING )
PORTRST CONIN ; ( RESET THE PORT, AND READ THE
CHAR )
;

; KB-SCAN ( READ THE KEYBOARD AND ECHO CODE
GENERATED )
BEGIN-
CONINPF DUP DUP ; ( GET CHAR AND ECHO CODE )
4 SPACES COUT CR ; ( ECHO CHARACTER )
1A =
END ; ( EXIT IF CTRL Z )

```



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